

# CPC COOPERATIVE PATENT CLASSIFICATION

## H ELECTRICITY

(NOTE omitted)

## H01 ELECTRIC ELEMENTS

(NOTES omitted)

**H01L SEMICONDUCTOR DEVICES NOT COVERED BY CLASS [H10](#)** (use of semiconductor devices for measuring [G01](#); resistors in general [H01C](#); magnets, inductors or transformers [H01F](#); capacitors in general [H01G](#); electrolytic devices [H01G 9/00](#); batteries or accumulators [H01M](#); waveguides, resonators or lines of the waveguide type [H01P](#); line connectors or current collectors [H01R](#); stimulated-emission devices [H01S](#); electromechanical resonators [H03H](#); loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers [H04R](#); electric light sources in general [H05B](#); printed circuits, hybrid circuits, casings or constructional details of electrical apparatus, manufacture of assemblages of electrical components [H05K](#); use of semiconductor devices in circuits having a particular application, see the subclass for the application)

### NOTES

1. This subclass is residual to class [H10](#).
2. This subclass covers:
  - a. semiconductor devices for rectifying, amplifying, oscillating or switching; their constructional details or arrangements; their assemblies or integrated devices; their manufacture or treatment;
  - b. semiconductor devices sensitive to radiation; their constructional details or arrangements; their assemblies or integrated devices; their manufacture or treatment;
  - c. semiconductor devices for light emission; their constructional details or arrangements; their assemblies or integrated devices; their manufacture or treatment;
  - d. processes or apparatus for the manufacture or treatment of semiconductor or solid-state devices where the type of device is not listed under bullets a to c, above, or not essential;
  - e. constructional details or arrangements of semiconductor or solid-state devices not covered by class [H10](#) and not specific to types of devices listed under bullets a to c, above;
  - f. packaging or assembling of semiconductor or solid-state devices covered by this subclass or by class [H10](#).
3. In this subclass, the following terms or expressions are used with the meaning indicated:
  - "wafer" means a slice of semiconductor or crystalline substrate material, which can be modified by impurity diffusion (doping), ion implantation or epitaxy, and whose active surface can be processed into arrays of discrete components or integrated circuits;
  - "solid state body" means the body of material within which, or at the surface of which, the physical effects characteristic of the device occur;
  - "electrode" is a region in or on the body of the device (other than the solid state body itself), which exerts an electrical influence on the solid state body, irrespective of whether or not an external electrical connection is made thereto. An electrode may include several portions and the term includes metallic regions which exert influence on the solid state body through an insulating region (e.g. capacitive coupling) and inductive coupling arrangements to the body. The dielectric region in a capacitive arrangement is regarded as part of the electrode. In arrangements including several portions, only those portions which exert an influence on the solid state body by virtue of their shape, size, or disposition or the material of which they are formed are considered to be part of the electrode. The other portions are considered to be "arrangements for conducting electric current to or from the solid state body" or "interconnections between solid state components formed in or on a common substrate", i.e. leads;
  - "device" means an electric circuit element; where an electric circuit element is one of a plurality of elements formed in or on a common substrate; it is referred to as a "component";
  - "complete device" is a device in its fully assembled state which may or may not require further treatment, e.g. electroforming, before it is ready for use but which does not require the addition of further structural units;
  - "parts" includes all structural units which are included in a complete device;
  - "container" is an enclosure forming part of the complete device and is essentially a solid construction in which the body of the device is placed, or which is formed around the body without forming an intimate layer thereon. An enclosure which consists of one or more layers formed on the body and in intimate contact therewith is referred to as an "encapsulation";
  - "integrated circuit" is a device where all components, e.g. diodes or resistors, are built up on a common substrate and form the device including interconnections between the components;
  - "assembly" of a device is the building up of the device from its constructional units; the term covers the provision of fillings in containers.

## H01L

### H01L

(continued)

4. In this subclass, both the process or apparatus for the manufacture or treatment of a device and the device itself are classified, whenever both of these are described sufficiently to be of interest.
5. Attention is drawn to Note (3) after the title of section [C](#), which Note indicates to which version of the Periodic Table of chemical elements the CPC refers. In this subclass, the system used is the 8 group system, indicated by Roman numerals in the Periodic Table thereunder.

#### **WARNINGS**

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

<a href="#">H01L 21/203</a>	covered by	<a href="#">H01L 21/02631</a>
<a href="#">H01L 21/205</a>	covered by	<a href="#">H01L 21/0262</a>
<a href="#">H01L 21/208</a>	covered by	<a href="#">H01L 21/02623</a>
<a href="#">H01L 21/301</a>	covered by	<a href="#">H01L 21/30</a>
<a href="#">H01L 21/36 - H01L 21/368</a>	covered by	<a href="#">H01L 21/02107</a>
<a href="#">H01L 21/58</a>	covered by	<a href="#">H01L 24/80</a>
<a href="#">H01L 21/66</a>	covered by	<a href="#">H01L 22/00</a>
<a href="#">H01L 21/98</a>	covered by	<a href="#">H01L 25/50</a>
2. {In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.}
3. Due to the ongoing developments in class [H10](#) and related subclasses, the information displayed in notes, references and definitions of this subclass may not be entirely accurate. For each specific subject matter referred to in this subclass, users are invited to consult the relevant place in class [H10](#) and to consider the class [H10](#) information as correct, in case of conflict.

#### **21/00 Processes or apparatus adapted for the manufacture or treatment of semiconductor or solid state devices or of parts thereof**

##### **NOTE**

{Due to the ongoing developments in class [H10](#) and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class [H10](#) and to consider the class [H10](#) information as correct, in case of conflict}

21/02 . . Manufacture or treatment of semiconductor devices or of parts thereof

21/02002 . . {Preparing wafers}

##### **NOTES**

1. {This group covers processes for manufacturing wafers prior to the fabrication of any device, i.e. between the sawing of ingots (covered by [B28D](#)) and the cleaning of substrates (covered by [H01L 21/02041](#)). }
2. {This group does not cover:
  - simple use of grinding or polishing machines [B24B](#)
  - thermal smoothening [H01L 21/324](#). }

21/02005 . . . {Preparing bulk and homogeneous wafers}

21/02008 . . . . {Multistep processes}

21/0201 . . . . . {Specific process step}

21/02013 . . . . . {Grinding, lapping}

21/02016 . . . . . {Backside treatment}

21/02019 . . . . . {Chemical etching}

21/02021 . . . . . {Edge treatment, chamfering}

21/02024 . . . . . {Mirror polishing}

21/02027 . . . . . {Setting crystal orientation}

21/0203 . . . . . {Making porous regions on the surface}

21/02032 . . . . . {by reclaiming or re-processing}

21/02035 . . . . . {Shaping}

21/02041 . . {Cleaning}

21/02043 . . . {Cleaning before device manufacture, i.e. Begin-Of-Line process}

21/02046 . . . . {Dry cleaning only ([H01L 21/02085](#) takes precedence)}

21/02049 . . . . . {with gaseous HF}

21/02052 . . . . {Wet cleaning only ([H01L 21/02085](#) takes precedence)}

21/02054 . . . . {combining dry and wet cleaning steps ([H01L 21/02085](#) takes precedence)}

21/02057 . . . {Cleaning during device manufacture}

21/0206 . . . . {during, before or after processing of insulating layers}

21/02063 . . . . . {the processing being the formation of vias or contact holes}

21/02065 . . . . . {the processing being a planarization of insulating layers}

21/02068 . . . . {during, before or after processing of conductive layers, e.g. polysilicon or amorphous silicon layers}

21/02071 . . . . . {the processing being a delineation, e.g. RIE, of conductive layers}

21/02074 . . . . . {the processing being a planarization of conductive layers}

21/02076 . . . {Cleaning after the substrates have been singulated}

21/02079 . . . {Cleaning for reclaiming}

21/02082 . . . {product to be cleaned}

21/02085 . . . . {Cleaning of diamond}

21/02087 . . . . {Cleaning of wafer edges}

21/0209 . . . . . {Cleaning of wafer backside}

21/02093 . . . . . {Cleaning of porous materials}

21/02096 . . . {only mechanical cleaning}

21/02098 . . . {only involving lasers, e.g. laser ablation}

21/02101 . . . {only involving supercritical fluids}

21/02104 . . {Forming layers ([deposition in general C23C](#); [crystal growth in general C30B](#))}

21/02107 . . . {Forming insulating materials on a substrate}

- 21/02109 . . . . {characterised by the type of layer, e.g. type of material, porous/non-porous, pre-cursors, mixtures or laminates}
- 21/02112 . . . . {characterised by the material of the layer}

**NOTE**

{Layers comprising sublayers, i.e. multi-layers, are additionally classified in [H01L 21/022](#); porous layers are additionally classified in [H01L 21/02203](#).}

- 21/02115 . . . . {the material being carbon, e.g. alpha-C, diamond or hydrogen doped carbon}
- 21/02118 . . . . {carbon based polymeric organic or inorganic material, e.g. polyimides, poly cyclobutene or PVC (polymers per se [C08G](#), photoresist per se [G03F](#))}
- 21/0212 . . . . {the material being fluoro carbon compounds, e.g. (CF<sub>x</sub>)<sub>n</sub>, (CH<sub>x</sub>F<sub>y</sub>)<sub>n</sub> or polytetrafluoroethylene}
- 21/02123 . . . . {the material containing silicon}
- 21/02126 . . . . {the material containing Si, O, and at least one of H, N, C, F, or other non-metal elements, e.g. SiOC, SiOC:H or SiONC}
- 21/02129 . . . . {the material being boron or phosphorus doped silicon oxides, e.g. BPSG, BSG or PSG}

**NOTE**

{Halogen, e.g. fluorine, containing BPSG, PSG, BSG, and the like, are additionally classified in [H01L 21/02131](#).}

- 21/02131 . . . . {the material being halogen doped silicon oxides, e.g. FSG}
- 21/02134 . . . . {the material comprising hydrogen silsesquioxane, e.g. HSQ}
- 21/02137 . . . . {the material comprising alkyl silsesquioxane, e.g. MSQ}
- 21/0214 . . . . {the material being a silicon oxynitride, e.g. SiON or SiON:H}
- 21/02142 . . . . {the material containing silicon and at least one metal element, e.g. metal silicate based insulators or metal silicon oxynitrides}
- 21/02145 . . . . {the material containing aluminium, e.g. AlSiO<sub>x</sub>}
- 21/02148 . . . . {the material containing hafnium, e.g. HfSiO<sub>x</sub> or HfSiON}
- 21/0215 . . . . {the material containing tantalum, e.g. TaSiO<sub>x</sub>}
- 21/02153 . . . . {the material containing titanium, e.g. TiSiO<sub>x</sub>}
- 21/02156 . . . . {the material containing at least one rare earth element, e.g. silicate of lanthanides, scandium or yttrium}
- 21/02159 . . . . {the material containing zirconium, e.g. ZrSiO<sub>x</sub>}
- 21/02161 . . . . {the material containing more than one metal element}

- 21/02164 . . . . {the material being a silicon oxide, e.g. SiO<sub>2</sub>}

**NOTE**

{The formation of silicon oxide layers is classified in this group regardless of the precursor or of the process of formation; in case of explicit statements on doping, on rest-groups, or on material components see [H01L 21/02126](#) and subgroups; deposition of silicon oxide from organic precursors without further statements on film composition is classified here and in [H01L 21/02205](#) and subgroups. }

- 21/02167 . . . . {the material being a silicon carbide not containing oxygen, e.g. SiC, SiC:H or silicon carbonitrides ([H01L 21/02126](#) and [H01L 21/0214](#) take precedence)}
- 21/0217 . . . . {the material being a silicon nitride not containing oxygen, e.g. SixNy or SixByNz ([H01L 21/02126](#) and [H01L 21/0214](#) take precedence)}
- 21/02172 . . . . {the material containing at least one metal element, e.g. metal oxides, metal nitrides, metal oxynitrides or metal carbides (materials containing silicon [H01L 21/02123](#); metal silicates [H01L 21/02142](#))}
- 21/02175 . . . . {characterised by the metal ([H01L 21/02197](#) takes precedence)}
- 21/02178 . . . . {the material containing aluminium, e.g. Al<sub>2</sub>O<sub>3</sub>}
- 21/02181 . . . . {the material containing hafnium, e.g. HfO<sub>2</sub>}
- 21/02183 . . . . {the material containing tantalum, e.g. Ta<sub>2</sub>O<sub>5</sub>}
- 21/02186 . . . . {the material containing titanium, e.g. TiO<sub>2</sub>}
- 21/02189 . . . . {the material containing zirconium, e.g. ZrO<sub>2</sub>}
- 21/02192 . . . . {the material containing at least one rare earth metal element, e.g. oxides of lanthanides, scandium or yttrium}
- 21/02194 . . . . {the material containing more than one metal element}
- 21/02197 . . . . {the material having a perovskite structure, e.g. BaTiO<sub>3</sub>}
- 21/022 . . . . {the layer being a laminate, i.e. composed of sublayers, e.g. stacks of alternating high-k metal oxides (adhesion layers or buffer layers [H01L 21/02304](#), [H01L 21/02362](#))}
- 21/02203 . . . . {the layer being porous}
- 21/02205 . . . . {the layer being characterised by the precursor material for deposition}
- 21/02208 . . . . {the precursor containing a compound comprising Si}
- 21/02211 . . . . {the compound being a silane, e.g. disilane, methylsilane or chlorosilane}

21/02214 . . . . .	{the compound comprising silicon and oxygen}	from targets or heating of source material. }
	<b>NOTE</b> {This group <u>does not cover</u> mixtures of a silane and oxygen. }	
21/02216 . . . . .	{the compound being a molecule comprising at least one silicon-oxygen bond and the compound having hydrogen or an organic group attached to the silicon or oxygen, e.g. a siloxane}	
21/02219 . . . . .	{the compound comprising silicon and nitrogen}	
	<b>NOTE</b> {This group <u>does not cover</u> mixtures of silane and nitrogen. }	
21/02222 . . . . .	{the compound being a silazane}	
21/02225 . . . . .	{characterised by the process for the formation of the insulating layer}	
21/02227 . . . . .	{formation by a process other than a deposition process}	
	<b>NOTE</b> {Subject matter classified in the range of <a href="#">H01L 21/0223</a> - <a href="#">H01L 21/02249</a> is additionally classified in <a href="#">H01L 21/02249</a> , <a href="#">H01L 21/02255</a> and <a href="#">H01L 21/02252</a> , depending on the type of reaction. }	
21/0223 . . . . .	{formation by oxidation, e.g. oxidation of the substrate}	
21/02233 . . . . .	{of the semiconductor substrate or a semiconductor layer}	
21/02236 . . . . .	{group IV semiconductor}	
21/02238 . . . . .	{silicon in uncombined form, i.e. pure silicon}	
21/02241 . . . . .	{III-V semiconductor}	
21/02244 . . . . .	{of a metallic layer}	
21/02247 . . . . .	{formation by nitridation, e.g. nitridation of the substrate}	
21/02249 . . . . .	{formation by combined oxidation and nitridation performed simultaneously}	
21/02252 . . . . .	{formation by plasma treatment, e.g. plasma oxidation of the substrate (after treatment of an insulating film by plasma <a href="#">H01L 21/3105</a> and subgroups)}	
21/02255 . . . . .	{formation by thermal treatment ( <a href="#">H01L 21/02252</a> takes precedence; after treatment of an insulating film <a href="#">H01L 21/3105</a> and subgroups)}	
21/02258 . . . . .	{formation by anodic treatment, e.g. anodic oxidation}	
21/0226 . . . . .	{formation by a deposition process ( <a href="#">per se C23C</a> )}	
21/02263 . . . . .	{deposition from the gas or vapour phase}	
	<b>NOTE</b> {This group and subgroups also cover deposition methods in which the gas or vapour is produced by physical means, e.g. ablation	
21/02266 . . . . .	{deposition by physical ablation of a target, e.g. sputtering, reactive sputtering, physical vapour deposition or pulsed laser deposition}	
21/02269 . . . . .	{deposition by thermal evaporation ( <a href="#">H01L 21/02293</a> takes precedence)}	
	<b>NOTE</b> {Subject matter relating to molecular beam epitaxy is classified in this group. }	
21/02271 . . . . .	{deposition by decomposition or reaction of gaseous or vapour phase compounds, i.e. chemical vapour deposition ( <a href="#">H01L 21/02266</a> takes precedence)}	
21/02274 . . . . .	{in the presence of a plasma [PECVD]}	
21/02277 . . . . .	{the reactions being activated by other means than plasma or thermal, e.g. photo-CVD}	
21/0228 . . . . .	{deposition by cyclic CVD, e.g. ALD, ALE, pulsed CVD}	
	<b>NOTE</b> {Subject matter relating to cyclic plasma CVD is additionally classified in <a href="#">H01L 21/02274</a> . }	
21/02282 . . . . .	{liquid deposition, e.g. spin-coating, sol-gel techniques, spray coating}	
21/02285 . . . . .	{Langmuir-Blodgett techniques}	
21/02288 . . . . .	{printing, e.g. ink-jet printing ( <a href="#">per se B41J</a> )}	
21/0229 . . . . .	{liquid atomic layer deposition}	
21/02293 . . . . .	{formation of epitaxial layers by a deposition process ( <a href="#">epitaxial growth per se C30B</a> )}	
	<b>NOTE</b> {Formation of non-epitaxial layers by MBE, ALE, etc. is not covered by this group; for MBE see <a href="#">H01L 21/02269</a> ; for ALE see <a href="#">H01L 21/0228</a> . }	
21/02296 . . . . .	{characterised by the treatment performed before or after the formation of the layer ( <a href="#">H01L 21/02227</a> and subgroups take precedence)}	
	<b>NOTE</b> {This group and subgroups only cover processes which are directly linked to the layer formation; routine anneals, i.e. thermal treatment without further features like a special atmosphere, presence of a plasma, thermally induced chemical reactions, change of phase (crystal structure) etc. are not classified here; for cleaning see <a href="#">H01L 21/02041</a> and subgroups; for etching processes see <a href="#">H01L 21/311</a> and	

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H01L 21/02296

(continued)

subgroups; for planarization processes  
see [H01L 21/31051](#) and subgroups;  
for processes to repair etch damage  
see [H01L 21/3105](#) and subgroups . }

21/02299 . . . . . {pre-treatment}

### **NOTE**

{This group and subgroups cover  
treatments to improve adhesion  
or change the surface termination;  
for etching see [H01L 21/306](#) and  
subgroups and [H01L 21/311](#) and  
subgroups.

21/02301 . . . . . {in-situ cleaning}

### **NOTE**

{Subject matter relating to the  
cleaning processes for semiconductor  
devices in general is covered by  
[H01L 21/02041](#) and subgroups. }

21/02304 . . . . . {formation of intermediate layers,  
e.g. buffer layers, layers to improve  
adhesion, lattice match or diffusion  
barriers}

21/02307 . . . . . {treatment by exposure to a liquid}

21/0231 . . . . . {treatment by exposure to  
electromagnetic radiation, e.g. UV  
light}

21/02312 . . . . . {treatment by exposure to a gas or  
vapour}

21/02315 . . . . . {treatment by exposure to a plasma}

21/02318 . . . . . {post-treatment}

### **NOTE**

{This group only covers processes  
that are part of the layer formation;  
treatments which are performed after  
completion of the insulating layer  
are covered by [H01L 21/3105](#) and  
subgroups. }

21/02321 . . . . . {introduction of substances into an  
already existing insulating layer  
([H01L 21/02227](#) and subgroups take  
precedence)}

### **NOTE**

{Processes like the introduction of  
phosphorus into silicon oxide by  
diffusion, or doping of an already  
existing insulating layer are covered  
by this group and subgroups;  
for the method of introduction,  
see [H01L 21/02337](#), [H01L 21/02343](#),  
[H01L 21/02345](#) and subgroups. }

21/02323 . . . . . {introduction of oxygen}

21/02326 . . . . . {into a nitride layer, e.g. changing  
SiN to SiON}

21/02329 . . . . . {introduction of nitrogen}

21/02332 . . . . . {into an oxide layer, e.g. changing  
SiO to SiON}

21/02334 . . . . . {in-situ cleaning after layer formation,  
e.g. removing process residues}

### **NOTE**

{Subject matter relating to the  
cleaning processes for semiconductor  
devices in general is covered by  
[H01L 21/02041](#) and subgroups. }

21/02337 . . . . . {treatment by exposure to a gas or  
vapour}

21/0234 . . . . . {treatment by exposure to a plasma}

21/02343 . . . . . {treatment by exposure to a liquid}

21/02345 . . . . . {treatment by exposure to radiation, e.g.  
visible light}

21/02348 . . . . . {treatment by exposure to UV light}

21/02351 . . . . . {treatment by exposure to corpuscular  
radiation, e.g. exposure to electrons,  
alpha-particles, protons or ions}

21/02354 . . . . . {using a coherent radiation, e.g. a  
laser}

21/02356 . . . . . {treatment to change the morphology of  
the insulating layer, e.g. transformation  
of an amorphous layer into a crystalline  
layer}

21/02359 . . . . . {treatment to change the surface groups  
of the insulating layer}

21/02362 . . . . . {formation of intermediate layers, e.g.  
capping layers or diffusion barriers}

21/02365 . . . {Forming inorganic semiconducting materials  
on a substrate}

21/02367 . . . . {Substrates}

21/0237 . . . . {Materials}

21/02373 . . . . . {Group 14 semiconducting materials}

21/02376 . . . . . {Carbon, e.g. diamond-like carbon}

21/02378 . . . . . {Silicon carbide}

21/02381 . . . . . {Silicon, silicon germanium,  
germanium}

21/02384 . . . . . {including tin}

21/02387 . . . . . {Group 13/15 materials}

21/02389 . . . . . {Nitrides}

21/02392 . . . . . {Phosphides}

21/02395 . . . . . {Arsenides}

21/02398 . . . . . {Antimonides}

21/024 . . . . . {Group 12/16 materials}

21/02403 . . . . . {Oxides}

21/02406 . . . . . {Sulfides}

21/02409 . . . . . {Selenides}

21/02411 . . . . . {Tellurides}

21/02414 . . . . . {Oxide semiconducting materials  
not being Group 12/16 materials, e.g.  
ternary compounds}

21/02417 . . . . . {Chalcogenide semiconducting  
materials not being oxides, e.g. ternary  
compounds}

21/0242 . . . . . {Crystalline insulating materials}

21/02422 . . . . . {Non-crystalline insulating materials,  
e.g. glass, polymers}

21/02425 . . . . . {Conductive materials, e.g. metallic  
silicides}

21/02428 . . . . . {Structure}

21/0243 . . . . . {Surface structure}

21/02433 . . . . . {Crystal orientation}



21/02436	. . . . .	{Intermediate layers between substrates and deposited layers}	21/02573	. . . . .	{Conductivity type}
21/02439	. . . . .	{Materials}	21/02576	. . . . .	{N-type}
21/02441	. . . . .	{Group 14 semiconducting materials}	21/02579	. . . . .	{P-type}
21/02444	. . . . .	{Carbon, e.g. diamond-like carbon}	21/02581	. . . . .	{Transition metal or rare earth elements}
21/02447	. . . . .	{Silicon carbide}	21/02584	. . . . .	{Delta-doping}
21/0245	. . . . .	{Silicon, silicon germanium, germanium}	21/02587	. . . . .	{Structure}
21/02452	. . . . .	{including tin}	21/0259	. . . . .	{Microstructure}
21/02455	. . . . .	{Group 13/15 materials}	21/02592	. . . . .	{amorphous}
21/02458	. . . . .	{Nitrides}	21/02595	. . . . .	{polycrystalline}
21/02461	. . . . .	{Phosphides}	21/02598	. . . . .	{monocrystalline}
21/02463	. . . . .	{Arsenides}	21/02601	. . . . .	{Nanoparticles ( <a href="#">fullerenes H10K 85/211</a> )}
21/02466	. . . . .	{Antimonides}	21/02603	. . . . .	{Nanowires}
21/02469	. . . . .	{Group 12/16 materials}	21/02606	. . . . .	{Nanotubes ( <a href="#">carbon nanotubes H10K 85/211</a> )}
21/02472	. . . . .	{Oxides}	21/02609	. . . . .	{Crystal orientation}
21/02474	. . . . .	{Sulfides}	21/02612	. . . . .	{Formation types}
21/02477	. . . . .	{Selenides}	21/02614	. . . . .	{Transformation of metal, e.g. oxidation, nitridation}
21/0248	. . . . .	{Tellurides}	21/02617	. . . . .	{Deposition types}
21/02483	. . . . .	{Oxide semiconducting materials not being Group 12/16 materials, e.g. ternary compounds}	21/0262	. . . . .	{Reduction or decomposition of gaseous compounds, e.g. CVD}
21/02485	. . . . .	{Other chalcogenide semiconducting materials not being oxides, e.g. ternary compounds}	21/02623	. . . . .	{Liquid deposition}
21/02488	. . . . .	{Insulating materials}	21/02625	. . . . .	{using melted materials}
21/02491	. . . . .	{Conductive materials}	21/02628	. . . . .	{using solutions}
21/02494	. . . . .	{Structure}	21/02631	. . . . .	{Physical deposition at reduced pressure, e.g. MBE, sputtering, evaporation}
21/02496	. . . . .	{Layer structure}	21/02634	. . . . .	{Homoepitaxy}
21/02499	. . . . .	{Monolayers}	21/02636	. . . . .	{Selective deposition, e.g. simultaneous growth of mono- and non-monocrystalline semiconductor materials}
21/02502	. . . . .	{consisting of two layers}	21/02639	. . . . .	{Preparation of substrate for selective deposition}
21/02505	. . . . .	{consisting of more than two layers}	21/02642	. . . . .	{Mask materials other than SiO <sub>2</sub> or SiN}
21/02507	. . . . .	{Alternating layers, e.g. superlattice}	21/02645	. . . . .	{Seed materials}
21/0251	. . . . .	{Graded layers}	21/02647	. . . . .	{Lateral overgrowth}
21/02513	. . . . .	{Microstructure}	21/0265	. . . . .	{Pendeoepitaxy}
21/02516	. . . . .	{Crystal orientation}	21/02653	. . . . .	{Vapour-liquid-solid growth}
21/02518	. . . . .	{Deposited layers}	21/02656	. . . . .	{Special treatments}
21/02521	. . . . .	{Materials}	21/02658	. . . . .	{Pretreatments ( <a href="#">cleaning in general H01L 21/02041</a> )}
21/02524	. . . . .	{Group 14 semiconducting materials}	21/02661	. . . . .	{In-situ cleaning}
21/02527	. . . . .	{Carbon, e.g. diamond-like carbon}	21/02664	. . . . .	{Aftertreatments ( <a href="#">planarisation in general H01L 21/304</a> )}
21/02529	. . . . .	{Silicon carbide}	21/02667	. . . . .	{Crystallisation or recrystallisation of non-monocrystalline semiconductor materials, e.g. regrowth}
21/02532	. . . . .	{Silicon, silicon germanium, germanium}	21/02669	. . . . .	{using crystallisation inhibiting elements}
21/02535	. . . . .	{including tin}	21/02672	. . . . .	{using crystallisation enhancing elements}
21/02538	. . . . .	{Group 13/15 materials}	21/02675	. . . . .	{using laser beams}
21/0254	. . . . .	{Nitrides}	21/02678	. . . . .	{Beam shaping, e.g. using a mask}
21/02543	. . . . .	{Phosphides}	21/0268	. . . . .	{Shape of mask}
21/02546	. . . . .	{Arsenides}	21/02683	. . . . .	{Continuous wave laser beam}
21/02549	. . . . .	{Antimonides}	21/02686	. . . . .	{Pulsed laser beam}
21/02551	. . . . .	{Group 12/16 materials}	21/02689	. . . . .	{using particle beams}
21/02554	. . . . .	{Oxides}	21/02691	. . . . .	{Scanning of a beam}
21/02557	. . . . .	{Sulfides}			
21/0256	. . . . .	{Selenides}			
21/02562	. . . . .	{Tellurides}			
21/02565	. . . . .	{Oxide semiconducting materials not being Group 12/16 materials, e.g. ternary compounds}			
21/02568	. . . . .	{Chalcogenide semiconducting materials not being oxides, e.g. ternary compounds}			
21/0257	. . . . .	{Doping during depositing}			

21/02694	. . . . . {Controlling the interface between substrate and epitaxial layer, e.g. by ion implantation followed by annealing}	21/0455	. . . . . {Making n or p doped regions or layers, e.g. using diffusion}
21/02697	. . . {Forming conducting materials on a substrate}	21/046	. . . . . {using ion implantation}
21/027	. . Making masks on semiconductor bodies for further photolithographic processing not provided for in group <a href="#">H01L 21/18</a> or <a href="#">H01L 21/34</a> {(photographic masks or originals <a href="#">per se G03F 1/00</a> ; registration or positioning of photographic masks or originals <a href="#">G03F 9/00</a> ; photographic cameras <a href="#">G03B</a> ; control of position <a href="#">G05D 3/00</a> )}	<b>NOTE</b>  {Processes where ion implantation of boron and subsequent annealing does not produce a p-doped region are classified elsewhere, e.g. <a href="#">H01L 21/0445</a> .}	
21/0271	. . . {comprising organic layers}	21/0465	. . . . . {using masks}
21/0272	. . . . {for lift-off processes}	21/047	. . . . . {characterised by the angle between the ion beam and the crystal planes or the main crystal surface}
21/0273	. . . . {characterised by the treatment of photoresist layers}	21/0475	. . . . {Changing the shape of the semiconductor body, e.g. forming recesses, ( <a href="#">etching of the semiconductor body H01L 21/302</a> )}
21/0274	. . . . . {Photolithographic processes}	21/048	. . . . . {Making electrodes}
21/0275	. . . . . {using lasers}	21/0485	. . . . . {Ohmic electrodes}
21/0276	. . . . . {using an anti-reflective coating ( <a href="#">anti-reflective coating for lithography in general G03F 7/09</a> )}	21/049	. . . . . {Conductor-insulator-semiconductor electrodes, e.g. MIS contacts}
21/0277	. . . . . {Electrolithographic processes}	21/0495	. . . . . {Schottky electrodes}
21/0278	. . . . . {Röntgenlithographic or X-ray lithographic processes}	21/18	. . . the devices having semiconductor bodies comprising elements of Group IV of the Periodic Table or $A_{III}B_V$ compounds with or without impurities, e.g. doping materials {( <a href="#">H01L 21/041</a> - <a href="#">H01L 21/0425</a> , <a href="#">H01L 21/045</a> - <a href="#">H01L 21/048</a> take precedence)}
21/0279	. . . . . {Ionlithographic processes}	<b>NOTE</b>  This group covers also processes and apparatus which, by using the appropriate technology, are clearly suitable for manufacture or treatment of devices whose bodies comprise elements of Group IV of the Periodic Table or $A_{III}B_V$ compounds, even if the material used is not explicitly specified.	
21/033	. . . comprising inorganic layers	21/182	. . . . . {Intermixing or interdiffusion or disordering of III-V heterostructures, e.g. IILD}
21/0331	. . . . {for lift-off processes}	21/185	. . . . . {Joining of semiconductor bodies for junction formation}
21/0332	. . . . {characterised by their composition, e.g. multilayer masks, materials}	21/187	. . . . . {by direct bonding}
21/0334	. . . . {characterised by their size, orientation, disposition, behaviour, shape, in horizontal or vertical plane}	21/20	. . . . . Deposition of semiconductor materials on a substrate, e.g. epitaxial growth {solid phase epitaxy}
21/0335	. . . . . {characterised by their behaviour during the process, e.g. soluble masks, redeposited masks}	21/2003	. . . . . {characterised by the substrate}
21/0337	. . . . . {characterised by the process involved to create the mask, e.g. lift-off masks, sidewalls, or to modify the mask, e.g. pre-treatment, post-treatment}	21/2007	. . . . . {Bonding of semiconductor wafers to insulating substrates or to semiconducting substrates using an intermediate insulating layer ( <a href="#">H01L 21/2011</a> takes precedence; bonding of semiconductor wafers to semiconductor wafers for junction formation <a href="#">H01L 21/187</a> )}
21/0338	. . . . . {Process specially adapted to improve the resolution of the mask}	21/2011	. . . . . {the substrate being of crystalline insulating material, e.g. sapphire}
21/04	. . the devices having potential barriers, e.g. a PN junction, depletion layer or carrier concentration layer	21/2015	. . . . . {the substrate being of crystalline semiconductor material, e.g. lattice adaptation, heteroepitaxy}
21/0405	. . . {the devices having semiconductor bodies comprising semiconducting carbon, e.g. diamond, diamond-like carbon}		
<b>NOTE</b>  {This group <u>covers</u> passivation.}			
21/041	. . . . . {Making n- or p-doped regions}		
21/0415	. . . . . {using ion implantation}		
21/042	. . . . . {Changing their shape, e.g. forming recesses ( <a href="#">etching of the semiconductor body H01L 21/302</a> )}		
21/0425	. . . . . {Making electrodes}		
21/043	. . . . . {Ohmic electrodes}		
21/0435	. . . . . {Schottky electrodes}		
21/044	. . . . . {Conductor-insulator-semiconductor electrodes}		
21/0445	. . . {the devices having semiconductor bodies comprising crystalline silicon carbide}		
21/045	. . . . {passivating silicon carbide surfaces}		

21/22	. . . .	Diffusion of impurity materials, e.g. doping materials, electrode materials, into or out of a semiconductor body, or between semiconductor regions; {Interactions between two or more impurities; Redistribution of impurities}	21/26	. . . .	Bombardment with radiation { <a href="#">(H01L 21/3105 takes precedence)</a> }
21/2205	. . . .	{from the substrate during epitaxy, e.g. autodoping; Preventing or using autodoping}	21/2605	. . . .	{using natural radiation, e.g. alpha, beta or gamma radiation}
21/221	. . . .	{of killers}	21/261	. . . .	to produce a nuclear reaction transmuting chemical elements
21/2215	. . . .	{in A <sub>III</sub> B <sub>V</sub> compounds}	21/263	. . . .	with high-energy radiation ( <a href="#">H01L 21/261 takes precedence</a> )
21/222	. . . .	{Lithium-drift}	21/2633	. . . .	{for etching, e.g. sputteretching}
21/2225	. . . .	{Diffusion sources}	21/2636	. . . .	{for heating, e.g. electron beam heating}
21/223	. . . .	using diffusion into or out of a solid from or into a gaseous phase { <a href="#">(H01L 21/221 - H01L 21/222 take precedence; diffusion through an applied layer H01L 21/225)</a> }	21/265	. . . .	producing ion implantation
21/2233	. . . .	{Diffusion into or out of A <sub>III</sub> B <sub>V</sub> compounds}	21/26506	. . . .	{in group IV semiconductors}
21/2236	. . . .	{from or into a plasma phase}	21/26513	. . . .	{of electrically active species}
21/225	. . . .	using diffusion into or out of a solid from or into a solid phase, e.g. a doped oxide layer { <a href="#">(H01L 21/221 - H01L 21/222 take precedence)</a> }	21/2652	. . . .	{Through-implantation}
21/2251	. . . .	{Diffusion into or out of group IV semiconductors}	21/26526	. . . .	{Recoil-implantation}
		<b>NOTE</b>	21/26533	. . . .	{of electrically inactive species in silicon to make buried insulating layers}
		{In groups <a href="#">H01L 21/2254 - H01L 21/2257</a> one should consider the main compositional parts of the applied layer just before the diffusion step}	21/2654	. . . .	{in A <sub>III</sub> B <sub>V</sub> compounds}
21/2252	. . . .	{using predeposition of impurities into the semiconductor surface, e.g. from a gaseous phase}	21/26546	. . . .	{of electrically active species}
21/2253	. . . .	{by ion implantation}	21/26553	. . . .	{Through-implantation}
21/2254	. . . .	{from or through or into an applied layer, e.g. photoresist, nitrides}	21/2656	. . . .	{characterised by the implantation of both electrically active and inactive species in the same semiconductor region to be doped}
21/2255	. . . .	{the applied layer comprising oxides only, e.g. P <sub>2</sub> O <sub>5</sub> , PSG, H <sub>3</sub> BO <sub>3</sub> , doped oxides}	21/26566	. . . .	{of a cluster, e.g. using a gas cluster ion beam}
21/2256	. . . .	{through the applied layer}	2021/26573	. . . .	{in diamond}
21/2257	. . . .	{the applied layer being silicon or silicide or SIPOS, e.g. polysilicon, porous silicon}	21/2658	. . . .	{of a molecular ion, e.g. decaborane}
21/2258	. . . .	{Diffusion into or out of A <sub>III</sub> B <sub>V</sub> compounds}	21/26586	. . . .	{characterised by the angle between the ion beam and the crystal planes or the main crystal surface}
21/228	. . . .	using diffusion into or out of a solid from or into a liquid phase, e.g. alloy diffusion processes { <a href="#">(H01L 21/221 - H01L 21/222 take precedence)</a> }	21/26593	. . . .	{at a temperature lower than room temperature}
21/24	. . . .	Alloying of impurity materials, e.g. doping materials, electrode materials, with a semiconductor body { <a href="#">(H01L 21/182 takes precedence)</a> }	21/266	. . . .	using masks { <a href="#">(H01L 21/26586 takes precedence)</a> }
21/242	. . . .	{Alloying of doping materials with A <sub>III</sub> B <sub>V</sub> compounds}	21/268	. . . .	using electromagnetic radiation, e.g. laser radiation
21/244	. . . .	{Alloying of electrode materials}	21/2683	. . . .	{using X-ray lasers}
21/246	. . . .	{with A <sub>III</sub> B <sub>V</sub> compounds}	21/2686	. . . .	{using incoherent radiation}
21/248	. . . .	{Apparatus specially adapted for the alloying}	21/28	. . . .	Manufacture of electrodes on semiconductor bodies using processes or apparatus not provided for in groups <a href="#">H01L 21/20 - H01L 21/268</a>
			21/28008	. . . .	{Making conductor-insulator-semiconductor electrodes}
			21/28017	. . . .	{the insulator being formed after the semiconductor body, the semiconductor being silicon}
					<b>NOTE</b>
					{This group covers deposition of the insulators, including epitaxial insulators, and the conductors within the same process or chamber.}
			21/28026	. . . .	{characterised by the conductor <a href="#">(H01L 21/28176 takes precedence)</a> }
					<b>NOTE</b>
					{When the final conductor comprises a superconductor, subject matter is not classified according to the subgroups <a href="#">H01L 21/28035 - H01L 21/28097</a> .



## H01L

H01L 21/28026

(continued)

	Instead, it is classified in <a href="#">H01L 21/28026</a> .}	21/28123 . . . . . {Lithography-related aspects, e.g. sub-lithography lengths; Isolation-related aspects, e.g. to solve problems arising at the crossing with the side of the device isolation; Planarisation aspects}
21/28035 . . . . .	{the final conductor layer next to the insulator being silicon, e.g. polysilicon, with or without impurities ( <a href="#">H01L 21/28105</a> takes precedence)}	21/28132 . . . . . {conducting part of electrode is defined by a sidewall spacer or a similar technique, e.g. oxidation under mask, plating}
	<b>NOTE</b>  {A very thin, e.g. silicon, adhesion or seed layer is not considered as the one next to the insulator.}	21/28141 . . . . . {insulating part of the electrode is defined by a sidewall spacer, e.g. dummy spacer, or a similar technique, e.g. oxidation under mask, plating}
21/28044 . . . . .	{the conductor comprising at least another non-silicon conductive layer}	21/2815 . . . . . {part or whole of the electrode is a sidewall spacer or made by a similar technique, e.g. transformation under mask, plating}
21/28052 . . . . .	{the conductor comprising a silicide layer formed by the silicidation reaction of silicon with a metal layer ( <a href="#">formed by metal ion implantation H01L 21/28044</a> )}	21/28158 . . . . . {Making the insulator}
		21/28167 . . . . . {on single crystalline silicon, e.g. using a liquid, i.e. chemical oxidation}
21/28061 . . . . .	{the conductor comprising a metal or metal silicide formed by deposition, e.g. sputter deposition, i.e. without a silicidation reaction ( <a href="#">H01L 21/28052</a> takes precedence)}	21/28176 . . . . . {with a treatment, e.g. annealing, after the formation of the definitive gate conductor}
	<b>NOTE</b>  {To assess the coverage of groups <a href="#">H01L 21/28052</a> and <a href="#">H01L 21/28061</a> , barrier layers, e.g. TaSiN, are not considered. }	21/28185 . . . . . {with a treatment, e.g. annealing, after the formation of the gate insulator and before the formation of the definitive gate conductor}
		21/28194 . . . . . {by deposition, e.g. evaporation, ALD, CVD, sputtering, laser deposition ( <a href="#">H01L 21/28202</a> takes precedence)}
21/2807 . . . . .	{the final conductor layer next to the insulator being Si or Ge or C and their alloys except Si}	21/28202 . . . . . {in a nitrogen-containing ambient, e.g. nitride deposition, growth, oxynitridation, NH <sub>3</sub> nitridation, N <sub>2</sub> O oxidation, thermal nitridation, RTN, plasma nitridation, RPN}
21/28079 . . . . .	{the final conductor layer next to the insulator being a single metal, e.g. Ta, W, Mo, Al}	21/28211 . . . . . {in a gaseous ambient using an oxygen or a water vapour, e.g. RTO, possibly through a layer ( <a href="#">H01L 21/28194</a> and <a href="#">H01L 21/28202</a> take precedence)}
21/28088 . . . . .	{the final conductor layer next to the insulator being a composite, e.g. TiN}	<b>NOTE</b>  {Thin oxidation layers used as a barrier layer or as a buffer layer, e.g. before the formation of a high-k insulator, are classified here only if important <u>per se</u> .}
21/28097 . . . . .	{the final conductor layer next to the insulator being a metallic silicide}	
21/28105 . . . . .	{the final conductor next to the insulator having a lateral composition or doping variation, or being formed laterally by more than one deposition step}	
21/28114 . . . . .	{characterised by the sectional shape, e.g. T, inverted-T}	
	<b>NOTE</b>  {Documents are also classified in groups <a href="#">H01L 21/28035</a> - <a href="#">H01L 21/2810</a> ; when the composition is also relevant.}	21/2822 . . . . . {with substrate doping, e.g. N, Ge, C implantation, before formation of the insulator}
		21/28229 . . . . . {by deposition of a layer, e.g. metal, metal compound or polysilicon, followed by transformation thereof into an insulating layer}
		21/28238 . . . . . {with sacrificial oxide}

21/28247	. . . . .	{passivation or protection of the electrode, e.g. using re-oxidation}	21/302	. . . . .	to change their surface-physical characteristics or shape, e.g. etching, polishing, cutting
21/28255	. . . . .	{the insulator being formed after the semiconductor body, the semiconductor belonging to Group IV and not being elemental silicon, e.g. Ge, SiGe, SiGeC}	21/304	. . . . .	Mechanical treatment, e.g. grinding, polishing, cutting {(H01L 21/30625 takes precedence)}
21/28264	. . . . .	{the insulator being formed after the semiconductor body, the semiconductor being a III-V compound}	21/3043	. . . . .	{Making grooves, e.g. cutting}
21/283	. . . . .	Deposition of conductive or insulating materials for electrodes {conducting electric current}	21/3046	. . . . .	{using blasting, e.g. sand-blasting (H01L 21/2633 takes precedence)}
21/285	. . . . .	from a gas or vapour, e.g. condensation	21/306	. . . . .	Chemical or electrical treatment, e.g. electrolytic etching (to form insulating layers H01L 21/31)
21/28506	. . . . .	{of conductive layers}	21/30604	. . . . .	{Chemical etching}
21/28512	. . . . .	{on semiconductor bodies comprising elements of Group IV of the Periodic Table}	21/30608	. . . . .	{Anisotropic liquid etching (H01L 21/3063 takes precedence)}
21/28518	. . . . .	{the conductive layers comprising silicides (H01L 21/28537 takes precedence)}	21/30612	. . . . .	{Etching of A <sub>III</sub> B <sub>V</sub> compounds}
21/28525	. . . . .	{the conductive layers comprising semiconducting material (H01L 21/28518, H01L 21/28537 take precedence)}	21/30617	. . . . .	{Anisotropic liquid etching}
21/28531	. . . . .	{Making of side-wall contacts}	21/30621	. . . . .	{Vapour phase etching}
21/28537	. . . . .	{Deposition of Schottky electrodes}	21/30625	. . . . .	{With simultaneous mechanical treatment, e.g. mechanico-chemical polishing}
21/2855	. . . . .	{by physical means, e.g. sputtering, evaporation (H01L 21/28518 - H01L 21/28537 and H01L 21/28568 take precedence)}	21/3063	. . . . .	Electrolytic etching
21/28556	. . . . .	{by chemical means, e.g. CVD, LPCVD, PECVD, laser CVD (H01L 21/28518 - H01L 21/28537 and H01L 21/28568 take precedence)}	21/30635	. . . . .	{of A <sub>III</sub> B <sub>V</sub> compounds}
21/28562	. . . . .	{Selective deposition}	21/3065	. . . . .	Plasma etching; Reactive-ion etching
21/28568	. . . . .	{the conductive layers comprising transition metals (H01L 21/28518 takes precedence)}	21/30655	. . . . .	{comprising alternated and repeated etching and passivation steps, e.g. Bosch process}
21/28575	. . . . .	{on semiconductor bodies comprising A <sub>III</sub> B <sub>V</sub> compounds}	21/308	. . . . .	using masks (H01L 21/3063, H01L 21/3065 take precedence)
21/28581	. . . . .	{Deposition of Schottky electrodes}	21/3081	. . . . .	{characterised by their composition, e.g. multilayer masks, materials}
21/28587	. . . . .	{characterised by the sectional shape, e.g. T, inverted T}	21/3083	. . . . .	{characterised by their size, orientation, disposition, behaviour, shape, in horizontal or vertical plane}
21/28593	. . . . .	{asymmetrical sectional shape}	21/3085	. . . . .	{characterised by their behaviour during the process, e.g. soluble masks, redeposited masks}
21/288	. . . . .	from a liquid, e.g. electrolytic deposition	21/3086	. . . . .	{characterised by the process involved to create the mask, e.g. lift-off masks, sidewalls, or to modify the mask, e.g. pre-treatment, post-treatment}
21/2885	. . . . .	{using an external electrical current, i.e. electro-deposition}	21/3088	. . . . .	{Process specially adapted to improve the resolution of the mask}
21/30	. . . . .	Treatment of semiconductor bodies using processes or apparatus not provided for in groups H01L 21/20 - H01L 21/26 (manufacture of electrodes thereon H01L 21/28)	21/31	. . . . .	to form insulating layers thereon, e.g. for masking or by using photolithographic techniques (encapsulating layers H01L 21/56); After treatment of these layers; Selection of materials for these layers
21/3003	. . . . .	{Hydrogenation or deuterisation, e.g. using atomic hydrogen from a plasma}	21/3105	. . . . .	After-treatment
21/3006	. . . . .	{of A <sub>III</sub> B <sub>V</sub> compounds}	21/31051	. . . . .	{Planarisation of the insulating layers (H01L 21/31058 takes precedence)}
			21/31053	. . . . .	{involving a dielectric removal step}
			21/31055	. . . . .	{the removal being a chemical etching step, e.g. dry etching (etching per se H01L 21/311)}

- 21/31056 . . . . . {the removal being a selective chemical etching step, e.g. selective dry etching through a mask}
- 21/31058 . . . . . {of organic layers}
- 21/311 . . . . . Etching the insulating layers {by chemical or physical means ([H01L 21/31058](#) takes precedence)}
- 21/31105 . . . . . {Etching inorganic layers}
- 21/31111 . . . . . {by chemical means}
- 21/31116 . . . . . {by dry-etching}
- 21/31122 . . . . . {of layers not containing Si, e.g. PZT, Al<sub>2</sub>O<sub>3</sub>}
- 21/31127 . . . . . {Etching organic layers}
- 21/31133 . . . . . {by chemical means}
- 21/31138 . . . . . {by dry-etching}
- 21/31144 . . . . . {using masks}
- 21/3115 . . . . . Doping the insulating layers
- 21/31155 . . . . . {by ion implantation}
- 21/312 . . . . . Organic layers, e.g. photoresist (*Frozen*)  
([H01L 21/3105](#), [H01L 21/32](#) take precedence; {photoresists *per se* [G03C](#)})

**WARNING**

Groups [H01L 21/312](#) – [H01L 21/3128](#) are no longer used for the classification of documents as of May 1, 2011. The content of these groups is being reclassified into groups [H01L 21/02107](#) – [H01L 21/02326](#).

Groups [H01L 21/02107](#) – [H01L 21/02326](#) should be considered in order to perform a complete search.

- 21/3121 . . . . . {Layers comprising organo-silicon compounds} (*Frozen*)
- 21/3122 . . . . . {layers comprising polysiloxane compounds} (*Frozen*)
- 21/3124 . . . . . {layers comprising hydrogen silsesquioxane} (*Frozen*)
- 21/3125 . . . . . {layers comprising silazane compounds} (*Frozen*)
- 21/3127 . . . . . {Layers comprising fluoro (hydro)carbon compounds, e.g. polytetrafluoroethylene} (*Frozen*)
- 21/3128 . . . . . {by Langmuir-Blodgett techniques} (*Frozen*)
- 21/314 . . . . . Inorganic layers ([H01L 21/3105](#), [H01L 21/32](#) take precedence) (*Frozen*)

**WARNING**

Groups [H01L 21/314](#) – [H01L 21/3185](#) are no longer used for the classification of documents as of May 1, 2011. The content of these group is being reclassified into group [H01L 21/02107](#) – [H01L 21/02326](#).

Groups [H01L 21/02107](#) – [H01L 21/02326](#) should be considered in order to perform a complete search.

- 21/3141 . . . . . {Deposition using atomic layer deposition techniques [ALD]} (*Frozen*)
- 21/3142 . . . . . {of nano-laminates, e.g. alternating layers of Al<sub>2</sub>O<sub>3</sub>-HfO<sub>2</sub>} (*Frozen*)
- 21/3143 . . . . . {composed of alternated layers or of mixtures of nitrides and oxides or of oxinitrides, e.g. formation of oxinitride by oxidation of nitride layers} (*Frozen*)
- 21/3144 . . . . . {on silicon} (*Frozen*)
- 21/3145 . . . . . {formed by deposition from a gas or vapour} (*Frozen*)
- 21/3146 . . . . . {Carbon layers, e.g. diamond-like layers} (*Frozen*)
- 21/3147 . . . . . {Epitaxial deposition of insulating materials} (*Frozen*)
- 21/3148 . . . . . {Silicon Carbide layers} (*Frozen*)
- 2021/3149 . . . . . {Langmuir-Blodgett techniques} (*Frozen*)
- 21/316 . . . . . composed of oxides or glassy oxides or oxide based glass (*Frozen*)

**WARNING**

Group [H01L 21/316](#) is no longer used for the classification of documents as of May 1, 2011. The content of this group is being reclassified into groups [H01L 21/02107](#) – [H01L 21/02326](#).

Groups [H01L 21/02107](#) – [H01L 21/02326](#) should be considered in order to perform a complete search.

- 21/31604 . . . . . {Deposition from a gas or vapour} (*Frozen*)  
([H01L 21/31691](#), [H01L 21/31695](#) take precedence)
- 21/31608 . . . . . {Deposition of SiO<sub>2</sub>} (*Frozen*)  
([H01L 21/31625](#), [H01L 21/31629](#) and [H01L 21/31633](#) take precedence)
- 21/31612 . . . . . {on a silicon body} (*Frozen*)
- 21/31616 . . . . . {Deposition of Al<sub>2</sub>O<sub>3</sub>} (*Frozen*)
- 21/3162 . . . . . {on a silicon body} (*Frozen*)
- 21/31625 . . . . . {Deposition of boron or phosphorus doped silicon oxide, e.g. BSG, PSG, BPSG} (*Frozen*)
- 21/31629 . . . . . {Deposition of halogen doped silicon oxide, e.g. fluorine doped silicon oxide} (*Frozen*)
- 21/31633 . . . . . {Deposition of carbon doped silicon oxide, e.g. SiOC} (*Frozen*)
- 21/31637 . . . . . {Deposition of Tantalum oxides, e.g. Ta<sub>2</sub>O<sub>5</sub>} (*Frozen*)
- 21/31641 . . . . . {Deposition of Zirconium oxides, e.g. ZrO<sub>2</sub>} (*Frozen*)
- 21/31645 . . . . . {Deposition of Hafnium oxides, e.g. HfO<sub>2</sub>} (*Frozen*)

21/3165 (Frozen)	. . . . . {formed by oxidation ( <a href="#">H01L 21/31691</a> , <a href="#">H01L 21/31695</a> take precedence)}
21/31654 (Frozen)	. . . . . {of semiconductor materials, e.g. the body itself}
21/31658 (Frozen)	. . . . . {by thermal oxidation, e.g. of SiGe}
21/31662 (Frozen)	. . . . . {of silicon in uncombined form}
21/31666 (Frozen)	. . . . . {of AIII BV compounds}
21/3167 (Frozen)	. . . . . {of anodic oxidation}
21/31675 (Frozen)	. . . . . {of silicon}
21/31679 (Frozen)	. . . . . {of AIII BV compounds}
21/31683 (Frozen)	. . . . . {of metallic layers, e.g. Al deposited on the body, e.g. formation of multi-layer insulating structures}
21/31687 (Frozen)	. . . . . {by anodic oxidation}
21/31691 (Frozen)	. . . . . {with perovskite structure}
21/31695 (Frozen)	. . . . . {Deposition of porous oxides or porous glassy oxides or oxide based porous glass}
21/318 (Frozen)	. . . . . composed of nitrides

**WARNING**

Group [H01L 21/318](#) is no longer used for the classification of documents as of May 1, 2011. The content of this group is being reclassified into groups [H01L 21/02107](#) – [H01L 21/02326](#).

Groups [H01L 21/02107](#) – [H01L 21/02326](#) should be considered in order to perform a complete search.

21/3185 (Frozen)	. . . . . {of siliconnitrides}
21/32 (Frozen)	. . . . . using masks
21/3205	. . . . . Deposition of non-insulating-, e.g. conductive- or resistive-, layers on insulating layers; After-treatment of these layers ( <a href="#">manufacture of electrodes</a> <a href="#">H01L 21/28</a> )
21/32051	. . . . . {Deposition of metallic or metal- silicide layers}
21/32053	. . . . . {of metal-silicide layers}
21/32055	. . . . . {Deposition of semiconductive layers, e.g. poly - or amorphous silicon layers}
21/32056	. . . . . {Deposition of conductive or semi-conductive organic layers ( <a href="#">H01L 21/32058</a> takes precedence)}
21/32058	. . . . . {Deposition of superconductive layers}
21/321	. . . . . After treatment
21/32105	. . . . . {Oxidation of silicon-containing layers}

21/3211	. . . . . {Nitridation of silicon-containing layers}
21/32115	. . . . . {Planarisation}
21/3212	. . . . . {by chemical mechanical polishing [CMP]}
21/32125	. . . . . {by simultaneously passing an electrical current, i.e. electrochemical mechanical polishing, e.g. ECMP}
21/3213	. . . . . Physical or chemical etching of the layers, e.g. to produce a patterned layer from a pre- deposited extensive layer
21/32131	. . . . . {by physical means only}
21/32132	. . . . . {of silicon-containing layers}
21/32133	. . . . . {by chemical means only}
21/32134	. . . . . {by liquid etching only}
21/32135	. . . . . {by vapour etching only}
21/32136	. . . . . {using plasmas}
21/32137	. . . . . {of silicon-containing layers}
21/32138	. . . . . {pre- or post-treatments, e.g. anti-corrosion processes}
21/32139	. . . . . {using masks}
21/3215	. . . . . Doping the layers
21/32155	. . . . . {Doping polycrystalline - or amorphous silicon layers}
21/322	. . . . . to modify their internal properties, e.g. to produce internal imperfections
21/3221	. . . . . {of silicon bodies, e.g. for gettering}
21/3223	. . . . . {using cavities formed by hydrogen or noble gas ion implantation}
21/3225	. . . . . {Thermally inducing defects using oxygen present in the silicon body for intrinsic gettering ( <a href="#">H01L 21/3226</a> takes precedence)}

**NOTE**

{Gettering using both extrinsic and intrinsic gettering techniques is classified in both [H01L 21/3221](#) and [H01L 21/3225](#).}

21/3226	. . . . . {of silicon on insulator}
21/3228	. . . . . {of AIII BV compounds, e.g. to make them semi-insulating}
21/324	. . . . . Thermal treatment for modifying the properties of semiconductor bodies, e.g. annealing, sintering ( <a href="#">H01L 21/20</a> - <a href="#">H01L 21/288</a> and <a href="#">H01L 21/302</a> - <a href="#">H01L 21/322</a> take precedence)
21/3242	. . . . . {for the formation of PN junctions without addition of impurities ( <a href="#">H01L 21/22</a> takes precedence)}
21/3245	. . . . . {of AIII BV compounds}

21/3247	. . . . . {for altering the shape, e.g. smoothing the surface}	21/465	. . . . . Chemical or electrical treatment, e.g. electrolytic etching (to form insulating layers <a href="#">H01L 21/469</a> )
	<b>WARNING</b>	21/467	. . . . . using masks
	Group <a href="#">H01L 21/3247</a> is incomplete pending reclassification of documents from group <a href="#">H01L 21/324</a> .	21/469	. . . . . to form insulating layers thereon, e.g. for masking or by using photolithographic techniques (encapsulating layers <a href="#">H01L 21/56</a> ); After-treatment of these layers
	Groups <a href="#">H01L 21/324</a> and <a href="#">H01L 21/3247</a> should be considered in order to perform a complete search.	21/47	. . . . . Organic layers, e.g. photoresist ( <a href="#">H01L 21/475</a> , <a href="#">H01L 21/4757</a> take precedence)
21/326	. . . . . Application of electric currents or fields, e.g. for electroforming ( <a href="#">H01L 21/20</a> - <a href="#">H01L 21/288</a> and <a href="#">H01L 21/302</a> - <a href="#">H01L 21/324</a> take precedence)	21/471	. . . . . Inorganic layers ( <a href="#">H01L 21/475</a> , <a href="#">H01L 21/4757</a> take precedence)
21/34	. . . the devices having semiconductor bodies not provided for in groups <a href="#">H01L 21/18</a> , <a href="#">H10D 48/04</a> and <a href="#">H10D 48/07</a> , with or without impurities, e.g. doping materials	21/473	. . . . . composed of oxides or glassy oxides or oxide based glass
21/38	. . . . . Diffusion of impurity materials, e.g. doping materials, electrode materials, into or out of a semiconductor body, or between semiconductor regions	21/475	. . . . . using masks
21/383	. . . . . using diffusion into or out of a solid from or into a gaseous phase	21/4757	. . . . . After-treatment
21/385	. . . . . using diffusion into or out of a solid from or into a solid phase, e.g. a doped oxide layer	21/47573	. . . . . {Etching the layer}
21/388	. . . . . using diffusion into or out of a solid from or into a liquid phase, e.g. alloy diffusion processes	21/47576	. . . . . {Doping the layer}
21/40	. . . . . Alloying of impurity materials, e.g. doping materials, electrode materials, with a semiconductor body	21/4763	. . . . . Deposition of non-insulating, e.g. conductive -, resistive -, layers on insulating layers; After-treatment of these layers (manufacture of electrodes <a href="#">H01L 21/28</a> , ( <a href="#">H01L 21/44</a> ))
21/42	. . . . . Bombardment with radiation	21/47635	. . . . . {After-treatment of these layers}
21/423	. . . . . with high-energy radiation	21/477	. . . . . Thermal treatment for modifying the properties of semiconductor bodies, e.g. annealing, sintering ( <a href="#">H01L 21/38</a> - <a href="#">H01L 21/449</a> and <a href="#">H01L 21/461</a> - <a href="#">H01L 21/475</a> take precedence)
21/425	. . . . . producing ion implantation	21/479	. . . . . Application of electric currents or fields, e.g. for electroforming ( <a href="#">H01L 21/38</a> - <a href="#">H01L 21/449</a> and <a href="#">H01L 21/461</a> - <a href="#">H01L 21/475</a> take precedence)
21/426	. . . . . using masks	21/48	. . . . . Manufacture or treatment of parts, e.g. containers, prior to assembly of the devices, using processes not provided for in a single one of the groups <a href="#">H01L 21/18</a> - <a href="#">H01L 21/326</a> or <a href="#">H10D 48/04</a> - <a href="#">H10D 48/07</a>
21/428	. . . . . using electromagnetic radiation, e.g. laser radiation		<b>NOTE</b>
21/44	. . . . . Manufacture of electrodes on semiconductor bodies using processes or apparatus not provided for in groups <a href="#">H01L 21/38</a> - <a href="#">H01L 21/428</a>		{In this group, the expression "treatment" covers also the removal of leads from parts.}
21/441	. . . . . Deposition of conductive or insulating materials for electrodes	21/4803	. . . . . {Insulating or insulated parts, e.g. mountings, containers, diamond heatsinks ( <a href="#">H01L 21/4846</a> takes precedence; printed circuit boards <a href="#">H05K 1/00</a> )}
21/443	. . . . . from a gas or vapour, e.g. condensation	21/4807	. . . . . {Ceramic parts}
21/445	. . . . . from a liquid, e.g. electrolytic deposition	21/481	. . . . . {Insulating layers on insulating parts, with or without metallisation}
21/447	. . . . . involving the application of pressure, e.g. thermo-compression bonding	21/4814	. . . . . {Conductive parts}
21/449	. . . . . involving the application of mechanical vibrations, e.g. ultrasonic vibrations	21/4817	. . . . . {for containers, e.g. caps ( <a href="#">H01L 21/4871</a> takes precedence)}
21/46	. . . . . Treatment of semiconductor bodies using processes or apparatus not provided for in groups <a href="#">H01L 21/428</a> (manufacture of electrodes thereon <a href="#">H01L 21/44</a> )	21/4821	. . . . . {Flat leads, e.g. lead frames with or without insulating supports}
21/461	. . . . . to change their surface-physical characteristics or shape, e.g. etching, polishing, cutting	21/4825	. . . . . {Connection or disconnection of other leads to or from flat leads, e.g. wires, bumps, other flat leads}
21/463	. . . . . Mechanical treatment, e.g. grinding, ultrasonic treatment	21/4828	. . . . . {Etching (etching for cleaning without patterning <a href="#">H01L 21/4835</a> )}



21/4832	. . . . .	{Etching a temporary substrate after encapsulation process to form leads}	21/563	. . . . .	{Encapsulation of active face of flip-chip device, e.g. underfilling or underencapsulation of flip-chip, encapsulation preform on chip or mounting substrate}
21/4835	. . . . .	{Cleaning, e.g. removing of solder}	21/565	. . . . .	{Moulds}
21/4839	. . . . .	{Assembly of a flat lead with an insulating support, e.g. for TAB}	21/566	. . . . .	{Release layers for moulds, e.g. release layers, layers against residue during moulding}
21/4842	. . . . .	{Mechanical treatment, e.g. punching, cutting, deforming, cold welding}	21/568	. . . . .	{Temporary substrate used as encapsulation process aid ( <a href="#">H01L 21/4832</a> and <a href="#">H01L 21/566</a> take precedence)}
21/4846	. . . . .	{Leads on or in insulating or insulated substrates, e.g. metallisation ( <a href="#">H01L 21/4821</a> takes precedence; metallisation of ceramics in general <a href="#">C04B 41/51</a> ; printed circuits <a href="#">H05K 3/00</a> )}	21/60	. . . . .	Attaching {or detaching} leads or other conductive members, to be used for carrying current to or from the device in operation
21/485	. . . . .	{Adaptation of interconnections, e.g. engineering charges, repair techniques}	2021/60007	. . . . .	{involving a soldering or an alloying process}
21/4853	. . . . .	{Connection or disconnection of other leads to or from a metallisation, e.g. pins, wires, bumps}	2021/60015	. . . . .	{using plate connectors, e.g. layer, film}
21/4857	. . . . .	{Multilayer substrates (multilayer metallisation on monolayer substrate <a href="#">H01L 21/4846</a> )}	2021/60022	. . . . .	{using bump connectors, e.g. for flip chip mounting}
21/486	. . . . .	{Via connections through the substrate with or without pins}	2021/6003	. . . . .	{Apparatus therefor}
21/4864	. . . . .	{Cleaning, e.g. removing of solder}	2021/60037	. . . . .	{Right-up bonding}
21/4867	. . . . .	{Applying pastes or inks, e.g. screen printing ( <a href="#">H01L 21/486</a> takes precedence)}	2021/60045	. . . . .	{Pre-treatment step of the bump connectors prior to bonding}
21/4871	. . . . .	{Bases, plates or heatsinks}	2021/60052	. . . . .	{Oxide removing step, e.g. flux, rosin}
21/4875	. . . . .	{Connection or disconnection of other leads to or from bases or plates}	2021/6006	. . . . .	{with temporary supporting member not part of an apparatus, e.g. removable coating, film or substrate}
21/4878	. . . . .	{Mechanical treatment, e.g. deforming}	2021/60067	. . . . .	{Aligning the bump connectors with the mounting substrate}
21/4882	. . . . .	{Assembly of heatsink parts}	2021/60075	. . . . .	{involving active alignment, i.e. by apparatus steering, e.g. using alignment marks, sensors}
21/4885	. . . . .	{Wire-like parts or pins (wire ball formation <a href="#">B23K 20/00</a> ; methods related to connecting semiconductor or other solid state bodies <a href="#">H01L 24/00</a> )}	2021/60082	. . . . .	{involving passive alignment, e.g. using surface energy, chemical reactions, thermal equilibrium}
21/4889	. . . . .	{Connection or disconnection of other leads to or from wire-like parts, e.g. wires}	2021/6009	. . . . .	{involving guiding structures, e.g. structures that are left at least partly in the bonded product, spacers}
21/4892	. . . . .	{Cleaning}	2021/60097	. . . . .	{Applying energy, e.g. for the soldering or alloying process}
21/4896	. . . . .	{Mechanical treatment, e.g. cutting, bending}	2021/60105	. . . . .	{using electromagnetic radiation}
21/50	. . .	Assembly of semiconductor devices using processes or apparatus not provided for in a single one of the groups <a href="#">H01L 21/18</a> - <a href="#">H01L 21/326</a> or <a href="#">H10D 48/04</a> - <a href="#">H10D 48/07</a> {e.g. sealing of a cap to a base of a container}	2021/60112	. . . . .	{Coherent radiation, i.e. laser beam}
<b>NOTE</b>			2021/6012	. . . . .	{Incoherent radiation, e.g. polychromatic heating lamp}
{Arrangements for connecting or disconnecting semiconductor or other solid state bodies, or methods related thereto, other than those arrangements or methods covered by the following subgroups, are covered by <a href="#">H01L 24/00</a> .}			2021/60127	. . . . .	{Induction heating, i.e. eddy currents}
21/52	. . . .	Mounting semiconductor bodies in containers	2021/60135	. . . . .	{using convection, e.g. reflow oven}
21/54	. . . .	Providing fillings in containers, e.g. gas fillings	2021/60142	. . . . .	{with a graded temperature profile}
21/56	. . . .	Encapsulations, e.g. encapsulation layers, coatings	2021/6015	. . . . .	{using conduction, e.g. chuck heater, thermocompression}
21/561	. . . . .	{Batch processing}	2021/60157	. . . . .	{with a graded temperature profile}
			2021/60165	. . . . .	{using an electron beam}
			2021/60172	. . . . .	{using static pressure}
			2021/6018	. . . . .	{Unidirectional static pressure}
			2021/60187	. . . . .	{Isostatic pressure, e.g. degassing using vacuum or pressurised liquid}

2021/60195	. . . . .	{using dynamic pressure, e.g. ultrasonic or thermosonic bonding}	21/67005	. .	{Apparatus not specifically provided for elsewhere ( <a href="#">processes per se H01L 21/30, H01L 21/46, H01L 23/00</a> ; simple temporary support means, e.g. using adhesives, electric or magnetic means <a href="#">H01L 21/68, H01L 21/302</a> )}
2021/60202	. . . . .	{using a protective atmosphere, e.g. with forming or shielding gas}	21/67011	. . .	{Apparatus for manufacture or treatment ( <a href="#">processes H01L 21/30, H01L 21/46</a> ; for production or after-treatment of single crystals or homogeneous polycrystalline material <a href="#">C30B 35/00</a> )}
2021/6021	. . . . .	{using an autocatalytic reaction}	21/67017	. . . .	{Apparatus for fluid treatment ( <a href="#">H01L 21/67126, H01L 21/6715</a> take precedence)}
2021/60217	. . . . .	{Detaching bump connectors, e.g. after testing}	21/67023	. . . . .	{for general liquid treatment, e.g. etching followed by cleaning}
2021/60225	. . . . .	{Arrangement of bump connectors prior to mounting}	21/67028	. . . . .	{for cleaning followed by drying, rinsing, stripping, blasting or the like}
2021/60232	. . . . .	{wherein the bump connectors are disposed only on the semiconductor chip}	21/67034	. . . . .	{for drying}
2021/6024	. . . . .	{wherein the bump connectors are disposed only on the mounting substrate}	21/6704	. . . . .	{for wet cleaning or washing}
2021/60247	. . . . .	{wherein the bump connectors are disposed on both the semiconductor chip and the mounting substrate, e.g. bump to bump}	21/67046	. . . . .	{using mainly scrubbing means, e.g. brushes}
2021/60255	. . . . .	{wherein the bump connectors are provided as prepeg, e.g. are provided in an insulating plate member}	21/67051	. . . . .	{using mainly spraying means, e.g. nozzles}
2021/60262	. . . . .	{Lateral distribution of bump connectors prior to mounting}	21/67057	. . . . .	{with the semiconductor substrates being dipped in baths or vessels}
2021/6027	. . . . .	{Mounting on semiconductor conductive members}	21/67063	. . . . .	{for etching}
2021/60277	. . . . .	{involving the use of conductive adhesives}	21/67069	. . . . .	{for drying etching}
2021/60285	. . . . .	{involving the use of mechanical auxiliary parts without the use of an alloying or soldering process, e.g. pressure contacts}	21/67075	. . . . .	{for wet etching}
2021/60292	. . . . .	{involving the use of an electron or laser beam}	21/6708	. . . . .	{using mainly spraying means, e.g. nozzles}
21/603	. . . . .	involving the application of pressure, e.g. thermo-compression bonding ( <a href="#">H01L 21/607</a> takes precedence)	21/67086	. . . . .	{with the semiconductor substrates being dipped in baths or vessels}
21/607	. . . . .	involving the application of mechanical vibrations, e.g. ultrasonic vibrations	21/67092	. . . .	{Apparatus for mechanical treatment ( <a href="#">or grinding or cutting, see the relevant groups in subclasses B24B or B28D</a> )}
21/62	. .	the devices having no potential barriers	21/67098	. . . . .	{Apparatus for thermal treatment}
21/64	. .	Manufacture or treatment of solid state devices other than semiconductor devices, or of parts thereof, not peculiar to a single device provided for in subclasses <a href="#">H10E, H10H, H10K</a> or <a href="#">H10N</a>	21/67103	. . . . .	{mainly by conduction}
21/67	. .	Apparatus specially adapted for handling semiconductor or electric solid state devices during manufacture or treatment thereof; Apparatus specially adapted for handling wafers during manufacture or treatment of semiconductor or electric solid state devices or components {; Apparatus not specifically provided for elsewhere ( <a href="#">processes per se H01L 21/30, H01L 21/46, H01L 23/00</a> ; simple temporary support means, e.g. using adhesives, electric or magnetic means <a href="#">H01L 21/68, H01L 21/302</a> ; apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies and for methods related thereto <a href="#">H01L 24/74</a> ;)}	21/67109	. . . . .	{mainly by convection}
			21/67115	. . . . .	{mainly by radiation}
			21/67121	. . . . .	{Apparatus for making assemblies not otherwise provided for, e.g. package constructions}
			21/67126	. . . . .	{Apparatus for sealing, encapsulating, glassing, decapsulating or the like ( <a href="#">processes H01L 23/02, H01L 23/28</a> )}
			21/67132	. . . . .	{Apparatus for placing on an insulating substrate, e.g. tape}
			21/67138	. . . . .	{Apparatus for wiring semiconductor or solid state device}
			21/67144	. . . . .	{Apparatus for mounting on conductive members, e.g. leadframes or conductors on insulating substrates}
			21/6715	. . . . .	{Apparatus for applying a liquid, a resin, an ink or the like ( <a href="#">H01L 21/67126</a> takes precedence)}
			21/67155	. . . . .	{Apparatus for manufacturing or treating in a plurality of work-stations}
			21/67161	. . . . .	{characterized by the layout of the process chambers}
			21/67167	. . . . .	{surrounding a central transfer chamber}
			21/67173	. . . . .	{in-line arrangement}
			21/67178	. . . . .	{vertical arrangement}

**NOTE**

{In this subgroup the term substrate designates a semiconductor or electric solid state device or component, or a wafer.}

- 21/67184 . . . . {characterized by the presence of more than one transfer chamber}
- 21/6719 . . . . {characterized by the construction of the processing chambers, e.g. modular processing chambers}
- 21/67196 . . . . {characterized by the construction of the transfer chamber}
- 21/67201 . . . . {characterized by the construction of the load-lock chamber}
- 21/67207 . . . . {comprising a chamber adapted to a particular process}
- 21/67213 . . . . {comprising at least one ion or electron beam chamber (coating by ion implantation [C23C](#); ion or electron beam tubes [H01J 37/00](#))}
- 21/67219 . . . . {comprising at least one polishing chamber (polishing apparatuses [B24B](#))}
- 21/67225 . . . . {comprising at least one lithography chamber (lithographic apparatuses [G03F 7/00](#))}
- 21/6723 . . . . {comprising at least one plating chamber (electroless plating apparatuses [C23C](#), electroplating apparatuses [C25D](#))}
- 21/67236 . . . . {the substrates being processed being not semiconductor wafers, e.g. leadframes or chips}
- 21/67242 . . . {Apparatus for monitoring, sorting or marking (testing or measuring during manufacture [H01L 22/00](#), marks per se [H01L 23/544](#); testing individual semiconductor devices [G01R 31/26](#))}
- 21/67248 . . . . {Temperature monitoring}
- 21/67253 . . . . {Process monitoring, e.g. flow or thickness monitoring}
- 21/67259 . . . . {Position monitoring, e.g. misposition detection or presence detection}
- 21/67265 . . . . {of substrates stored in a container, a magazine, a carrier, a boat or the like}
- 21/67271 . . . . {Sorting devices}
- 21/67276 . . . . {Production flow monitoring, e.g. for increasing throughput (program-control systems per se [G05B 19/00](#), e.g. total factory control [G05B 19/418](#))}
- 21/67282 . . . . {Marking devices}
- 21/67288 . . . . {Monitoring of warpage, curvature, damage, defects or the like}
- 21/67294 . . . . {using identification means, e.g. labels on substrates or labels on containers}
- 21/673 . . . using specially adapted carriers {or holders; Fixing the workpieces on such carriers or holders (holders for supporting a complete device in operation [H01L 23/32](#))}
- 21/67303 . . . {Vertical boat type carrier whereby the substrates are horizontally supported, e.g. comprising rod-shaped elements}
- 21/67306 . . . . {characterized by a material, a roughness, a coating or the like}
- 21/67309 . . . . {characterized by the substrate support}
- 21/67313 . . . {Horizontal boat type carrier whereby the substrates are vertically supported, e.g. comprising rod-shaped elements}
- 21/67316 . . . . {characterized by a material, a roughness, a coating or the like}
- 21/6732 . . . {Vertical carrier comprising wall type elements whereby the substrates are horizontally supported, e.g. comprising sidewalls}
- 21/67323 . . . . {characterized by a material, a roughness, a coating or the like}
- 21/67326 . . . {Horizontal carrier comprising wall type elements whereby the substrates are vertically supported, e.g. comprising sidewalls}
- 21/6733 . . . . {characterized by a material, a roughness, a coating or the like}
- 21/67333 . . . {Trays for chips ([magazine for components H05K 13/0084](#))}
- 21/67336 . . . . {characterized by a material, a roughness, a coating or the like}
- 21/6734 . . . {specially adapted for supporting large square shaped substrates (containers and packaging elements for glass sheets [B65D 85/48](#), transporting of glass products during their manufacture [C03B 35/00](#))}
- 21/67343 . . . . {characterized by a material, a roughness, a coating or the like}
- 21/67346 . . . {characterized by being specially adapted for supporting a single substrate or by comprising a stack of such individual supports}
- 21/6735 . . . {Closed carriers}
- 21/67353 . . . . {specially adapted for a single substrate}
- 21/67356 . . . . {specially adapted for containing chips, dies or ICs}
- 21/67359 . . . . {specially adapted for containing masks, reticles or pellicles}
- 21/67363 . . . . {specially adapted for containing substrates other than wafers ([H01L 21/67356](#), [H01L 21/67359](#) take precedence)}
- 21/67366 . . . . {characterised by materials, roughness, coatings or the like (materials relating to an injection moulding process [B29C 45/00](#); chemical composition of materials [C08L 51/00](#))}
- 21/67369 . . . . {characterised by shock absorbing elements, e.g. retainers or cushions}
- 21/67373 . . . . {characterised by locking systems}
- 21/67376 . . . . {characterised by sealing arrangements}
- 21/67379 . . . . {characterised by coupling elements, kinematic members, handles or elements to be externally gripped}
- 21/67383 . . . . {characterised by substrate supports}
- 21/67386 . . . . {characterised by the construction of the closed carrier}
- 21/67389 . . . . {characterised by atmosphere control}
- 21/67393 . . . . {characterised by the presence of atmosphere modifying elements inside or attached to the closed carrier}
- 21/67396 . . . . {characterised by the presence of antistatic elements}
- 21/677 . . . for conveying, e.g. between different workstations
- 21/67703 . . . {between different workstations}
- 21/67706 . . . . {Mechanical details, e.g. roller, belt ([H01L 21/67709](#) takes precedence)}
- 21/67709 . . . . {using magnetic elements}
- 21/67712 . . . . {the substrate being handled substantially vertically}
- 21/67715 . . . . {Changing the direction of the conveying path}

- 21/67718 . . . . {Changing orientation of the substrate, e.g. from a horizontal position to a vertical position}
- 21/67721 . . . . {the substrates to be conveyed not being semiconductor wafers or large planar substrates, e.g. chips, lead frames ([H01L 21/6773 takes precedence](#))}
- 21/67724 . . . . {by means of a cart or a vehicle}
- 21/67727 . . . . {using a general scheme of a conveying path within a factory}
- 21/6773 . . . . {Conveying cassettes, containers or carriers}
- 21/67733 . . . . {Overhead conveying}
- 21/67736 . . . . {Loading to or unloading from a conveyor}
- 21/67739 . . . {into and out of processing chamber}
- 21/67742 . . . . {Mechanical parts of transfer devices ([robots in general in B25J](#))}
- 21/67745 . . . . {characterized by movements or sequence of movements of transfer devices}
- 21/67748 . . . . {horizontal transfer of a single workpiece}
- 21/67751 . . . . {vertical transfer of a single workpiece}
- 21/67754 . . . . {horizontal transfer of a batch of workpieces}
- 21/67757 . . . . {vertical transfer of a batch of workpieces}
- 21/6776 . . . . {Continuous loading and unloading into and out of a processing chamber, e.g. transporting belts within processing chambers}
- 21/67763 . . . {the wafers being stored in a carrier, involving loading and unloading ([H01L 21/6779 takes precedence](#))}
- 21/67766 . . . . {Mechanical parts of transfer devices ([robots in general in B25J](#))}
- 21/67769 . . . . {Storage means}
- 21/67772 . . . . {involving removal of lid, door, cover}
- 21/67775 . . . . {Docking arrangements}
- 21/67778 . . . . {involving loading and unloading of wafers}
- 21/67781 . . . . {Batch transfer of wafers}
- 21/67784 . . . {using air tracks}
- 21/67787 . . . . {with angular orientation of the workpieces}
- 21/6779 . . . . {the workpieces being stored in a carrier, involving loading and unloading}
- 21/67793 . . . {with orientating and positioning by means of a vibratory bowl or track}
- 21/67796 . . . {with angular orientation of workpieces ([H01L 21/67787](#) and [H01L 21/67793 take precedence](#))}
- 21/68 . . for positioning, orientation or alignment
- 21/681 . . . {using optical controlling means}
- 21/682 . . . {Mask-wafer alignment ([in general G03F 7/70, G03F 9/70](#))}
- 21/683 . . for supporting or gripping ([for conveying H01L 21/677, for positioning, orientation or alignment H01L 21/68](#))
- 21/6831 . . . {using electrostatic chucks}
- 21/6833 . . . . {Details of electrostatic chucks}
- 21/6835 . . . {using temporarily an auxiliary support}
- NOTE**
- {[H01L 21/6835](#), details of the apparatus are to be further indexed using the indexing codes chosen from [H01L 2221/68304](#) and subgroups.}
- 21/6836 . . . . {Wafer tapes, e.g. grinding or dicing support tapes ([adhesive tapes in general C09J 7/20](#))}
- 21/6838 . . . {with gripping and holding devices using a vacuum; Bernoulli devices}
- 21/687 . . . using mechanical means, e.g. chucks, clamps or pinches ([using electrostatic chucks H01L 21/6831](#))}
- 21/68707 . . . . {the wafers being placed on a robot blade, or gripped by a gripper for conveyance}
- 21/68714 . . . . {the wafers being placed on a susceptor, stage or support}
- 21/68721 . . . . {characterised by edge clamping, e.g. clamping ring}
- 21/68728 . . . . {characterised by a plurality of separate clamping members, e.g. clamping fingers}
- 21/68735 . . . . {characterised by edge profile or support profile}
- 21/68742 . . . . {characterised by a lifting arrangement, e.g. lift pins}
- 21/6875 . . . . {characterised by a plurality of individual support members, e.g. support posts or protrusions}
- 21/68757 . . . . {characterised by a coating or a hardness or a material}
- 21/68764 . . . . {characterised by a movable susceptor, stage or support, others than those only rotating on their own vertical axis, e.g. susceptors on a rotating carousel}
- 21/68771 . . . . {characterised by supporting more than one semiconductor substrate}
- 21/68778 . . . . {characterised by supporting substrates others than wafers, e.g. chips}
- 21/68785 . . . . {characterised by the mechanical construction of the susceptor, stage or support}
- 21/68792 . . . . {characterised by the construction of the shaft}
- 21/70 . Manufacture or treatment of devices consisting of a plurality of solid state components formed in or on a common substrate or of parts thereof; Manufacture of integrated circuit devices or of parts thereof ([multistep manufacturing processes of assemblies consisting of a plurality of individual semiconductor or other solid state devices H01L 25/00; manufacture of assemblies consisting of preformed electrical components H05K 3/00, H05K 13/00](#))
- 21/702 . . {of thick-or thin-film circuits or parts thereof}
- 21/705 . . . {of thick-film circuits or parts thereof}
- 21/707 . . . {of thin-film circuits or parts thereof}
- 21/71 . . Manufacture of specific parts of devices defined in group [H01L 21/70](#) ([H01L 21/0405, H01L 21/0445](#)), [H01L 21/28, H01L 21/44, H01L 21/48 take precedence](#))
- 21/74 . . . Making of {localized} buried regions, e.g. buried collector layers, internal connections {substrate contacts}
- 21/743 . . . . {Making of internal connections, substrate contacts}
- 21/746 . . . . {for AIII-BV integrated circuits}
- 21/76 . . . Making of isolation regions between components
- 21/7602 . . . . {between components manufactured in an active substrate comprising SiC compounds}



- 21/7605 . . . . {between components manufactured in an active substrate comprising AIII BV compounds}
- 21/7607 . . . . {between components manufactured in an active substrate comprising A<sub>II</sub>B<sub>VI</sub> compounds}
- 21/761 . . . . PN junctions
- 21/762 . . . . Dielectric regions {, e.g. EPIC dielectric isolation, LOCOS; Trench refilling techniques, SOI technology, use of channel stoppers}
- 21/76202 . . . . {using a local oxidation of silicon, e.g. LOCOS, SWAMI, SILO ([H01L 21/76235](#) takes precedence; together with vertical isolation, e.g. LOCOS in a SOI substrate, [H01L 21/76264](#))}
- 21/76205 . . . . {in a region being recessed from the surface, e.g. in a recess, groove, tub or trench region}
- 21/76208 . . . . {using auxiliary pillars in the recessed region, e.g. to form LOCOS over extended areas}
- 21/7621 . . . . {the recessed region having a shape other than rectangular, e.g. rounded or oblique shape ([H01L 21/76208](#) takes precedence)}
- 21/76213 . . . . {introducing electrical inactive or active impurities in the local oxidation region, e.g. to alter LOCOS oxide growth characteristics or for additional isolation purpose}
- 21/76216 . . . . {introducing electrical active impurities in the local oxidation region for the sole purpose of creating channel stoppers}
- 21/76218 . . . . {introducing both types of electrical active impurities in the local oxidation region for the sole purpose of creating channel stoppers, e.g. for isolation of complementary doped regions}
- 21/76221 . . . . {with a plurality of successive local oxidation steps}
- 21/76224 . . . . {using trench refilling with dielectric materials ([trench filling with polycrystalline silicon \[H01L 21/763\]\(#\); together with vertical isolation, e.g. trench refilling in a SOI substrate \[H01L 21/76264\]\(#\)](#))}
- 21/76227 . . . . {the dielectric materials being obtained by full chemical transformation of non-dielectric materials, such as polycrystalline silicon, metals}
- 21/76229 . . . . {Concurrent filling of a plurality of trenches having a different trench shape or dimension, e.g. rectangular and V-shaped trenches, wide and narrow trenches, shallow and deep trenches}
- 21/76232 . . . . {of trenches having a shape other than rectangular or V-shape, e.g. rounded corners, oblique or rounded trench walls ([H01L 21/76229](#) takes precedence)}
- 21/76235 . . . . {trench shape altered by a local oxidation of silicon process step, e.g. trench corner rounding by LOCOS}
- 21/76237 . . . . {introducing impurities in trench side or bottom walls, e.g. for forming channel stoppers or alter isolation behavior}
- 21/7624 . . . . {using semiconductor on insulator [SOI] technology}
- 21/76243 . . . . {using silicon implanted buried insulating layers, e.g. oxide layers, i.e. SIMOX techniques}
- 21/76245 . . . . {using full isolation by porous oxide silicon, i.e. FIPOS techniques}
- 21/76248 . . . . {using lateral overgrowth techniques, i.e. ELO techniques}
- 21/76251 . . . . {using bonding techniques}
- 21/76254 . . . . {with separation/delamination along an ion implanted layer, e.g. Smart-cut, Unibond}
- 21/76256 . . . . {using silicon etch back techniques, e.g. BESOI, ELTRAN}
- 21/76259 . . . . {with separation/delamination along a porous layer}
- 21/76262 . . . . {using selective deposition of single crystal silicon, i.e. SEG techniques}
- 21/76264 . . . . {SOI together with lateral isolation, e.g. using local oxidation of silicon, or dielectric or polycrystalline material refilled trench or air gap isolation regions, e.g. completely isolated semiconductor islands}
- 21/76267 . . . . {Vertical isolation by silicon implanted buried insulating layers, e.g. oxide layers, i.e. SIMOX techniques}
- 21/7627 . . . . {Vertical isolation by full isolation by porous oxide silicon, i.e. FIPOS techniques}
- 21/76272 . . . . {Vertical isolation by lateral overgrowth techniques, i.e. ELO techniques}
- 21/76275 . . . . {Vertical isolation by bonding techniques}
- 21/76278 . . . . {Vertical isolation by selective deposition of single crystal silicon, i.e. SEG techniques}
- 21/76281 . . . . {Lateral isolation by selective oxidation of silicon}
- 21/76283 . . . . {Lateral isolation by refilling of trenches with dielectric material}
- 21/76286 . . . . {Lateral isolation by refilling of trenches with polycrystalline material}
- 21/76289 . . . . {Lateral isolation by air gap}
- 21/76291 . . . . {Lateral isolation by field effect}
- 21/76294 . . . . {using selective deposition of single crystal silicon, i.e. SEG techniques}
- 21/76297 . . . . {Dielectric isolation using EPIC techniques, i.e. epitaxial passivated integrated circuit}
- 21/763 . . . . Polycrystalline semiconductor regions {([H01L 21/76264](#) takes precedence)}
- 21/764 . . . . Air gaps {([H01L 21/76264](#) takes precedence)}
- 21/765 . . . . by field effect {([H01L 21/76264](#) takes precedence)}



21/768 . . . Applying interconnections to be used for carrying current between separate components within a device {comprising conductors and dielectrics}

#### NOTE

{Groups  
[H01L 21/768](#) - [H01L 21/76898](#) cover multi-step processes for manufacturing interconnections. Information peculiar to single-step processes should also be classified in the corresponding group, e.g.

- cleaning [H01L 21/02041](#)
- etching [H01L 21/311](#), [H01L 21/3213](#)
- masking [H01L 21/027](#), [H01L 21/033](#), [H01L 21/31144](#), [H01L 21/32139](#)
- planarizing [H01L 21/3105](#), [H01L 21/321](#) }

21/76801 . . . . {characterised by the formation and the after-treatment of the dielectrics, e.g. smoothing}  
 21/76802 . . . . . {by forming openings in dielectrics}  
 21/76804 . . . . . {by forming tapered via holes}  
 21/76805 . . . . . {the opening being a via or contact hole penetrating the underlying conductor}  
 21/76807 . . . . . {for dual damascene structures}  
 21/76808 . . . . . {involving intermediate temporary filling with material}  
 21/7681 . . . . . {involving one or more buried masks}  
 21/76811 . . . . . {involving multiple stacked pre-patterned masks}  
 21/76813 . . . . . {involving a partial via etch}  
 21/76814 . . . . . {post-treatment or after-treatment, e.g. cleaning or removal of oxides on underlying conductors}  
 21/76816 . . . . . {Aspects relating to the layout of the pattern or to the size of vias or trenches ([layout of the interconnections per se H01L 23/528](#); CAD of ICs [G06F 30/00](#))}  
 21/76817 . . . . . {using printing or stamping techniques}  
 21/76819 . . . . . {Smoothing of the dielectric ([planarisation of insulating materials per se H01L 21/31051](#))}  
 21/7682 . . . . . {the dielectric comprising air gaps}  
 21/76822 . . . . . {Modification of the material of dielectric layers, e.g. grading, after-treatment to improve the stability of the layers, to increase their density etc.}  
 21/76823 . . . . . {transforming an insulating layer into a conductive layer}  
 21/76825 . . . . . {by exposing the layer to particle radiation, e.g. ion implantation, irradiation with UV light or electrons etc. ([plasma treatment H01L 21/76826](#))}  
 21/76826 . . . . . {by contacting the layer with gases, liquids or plasmas}  
 21/76828 . . . . . {thermal treatment}  
 21/76829 . . . . . {characterised by the formation of thin functional dielectric layers, e.g. dielectric etch-stop, barrier, capping or liner layers}  
 21/76831 . . . . . {in via holes or trenches, e.g. non-conductive sidewall liners}  
 21/76832 . . . . . {Multiple layers}

21/76834 . . . . . {formation of thin insulating films on the sidewalls or on top of conductors ([H01L 21/76831](#) takes precedence)}  
 21/76835 . . . . . {Combinations of two or more different dielectric layers having a low dielectric constant ([H01L 21/76832](#) takes precedence)}  
 21/76837 . . . . . {Filling up the space between adjacent conductive structures; Gap-filling properties of dielectrics}  
 21/76838 . . . . . {characterised by the formation and the after-treatment of the conductors ([etching for patterning the conductors H01L 21/3213](#))}

#### NOTE

{When the interconnect is also used as the conductor part of a conductor insulator semiconductor electrode (gate level interconnections), documents are classified in the relevant electrode manufacture groups, e.g. [H01L 21/28026](#) }.

21/7684 . . . . . {Smoothing; Planarisation}  
 21/76841 . . . . . {Barrier, adhesion or liner layers}  
 21/76843 . . . . . {formed in openings in a dielectric}  
 21/76844 . . . . . {Bottomless liners}  
 21/76846 . . . . . {Layer combinations}  
 21/76847 . . . . . {the layer being positioned within the main fill metal}  
 21/76849 . . . . . {the layer being positioned on top of the main fill metal}  
 21/7685 . . . . . {the layer covering a conductive structure ([H01L 21/76849](#) takes precedence)}  
 21/76852 . . . . . {the layer also covering the sidewalls of the conductive structure}  
 21/76853 . . . . . {characterized by particular after-treatment steps}  
 21/76855 . . . . . {After-treatment introducing at least one additional element into the layer}  
 21/76856 . . . . . {by treatment in plasmas or gaseous environments, e.g. nitriding a refractory metal liner}  
 21/76858 . . . . . {by diffusing alloying elements}  
 21/76859 . . . . . {by ion implantation}  
 21/76861 . . . . . {Post-treatment or after-treatment not introducing additional chemical elements into the layer}  
 21/76862 . . . . . {Bombardment with particles, e.g. treatment in noble gas plasmas; UV irradiation}  
 21/76864 . . . . . {Thermal treatment}  
 21/76865 . . . . . {Selective removal of parts of the layer ([H01L 21/76844](#) takes precedence)}  
 21/76867 . . . . . {characterized by methods of formation other than PVD, CVD or deposition from a liquids ([PVD H01L 21/2855](#); [CVD H01L 21/28556](#); deposition from liquids [H01L 21/288](#))}  
 21/76868 . . . . . {Forming or treating discontinuous thin films, e.g. repair, enhancement or reinforcement of discontinuous thin films}

21/7687	. . . . .	{Thin films associated with contacts of capacitors}	22/10	. {Measuring as part of the manufacturing process ( <a href="#">burn-in G01R 31/2855</a> )}
21/76871	. . . . .	{Layers specifically deposited to enhance or enable the nucleation of further layers, i.e. seed layers}	22/12	. . {for structural parameters, e.g. thickness, line width, refractive index, temperature, warp, bond strength, defects, optical inspection, electrical measurement of structural dimensions, metallurgic measurement of diffusions ( <a href="#">electrical measurement of diffusions H01L 22/14</a> )}
21/76873	. . . . .	{for electroplating}	22/14	. . {for electrical parameters, e.g. resistance, deep-levels, CV, diffusions by electrical means}
21/76874	. . . . .	{for electroless plating}	22/20	. {Sequence of activities consisting of a plurality of measurements, corrections, marking or sorting steps}
21/76876	. . . . .	{for deposition from the gas phase, e.g. CVD}	22/22	. . {Connection or disconnection of sub-entities or redundant parts of a device in response to a measurement ( <a href="#">testing and repair of stores after manufacture including at wafer scale G11C 29/00</a> ; <a href="#">fuses per se H01L 23/525</a> )}
21/76877	. . . . .	{Filling of holes, grooves or trenches, e.g. vias, with conductive material}	22/24	. . {Optical enhancement of defects or not directly visible states, e.g. selective electrolytic deposition, bubbles in liquids, light emission, colour change ( <a href="#">voltage contrast G01R 31/311</a> )}
21/76879	. . . . .	{by selective deposition of conductive material in the vias, e.g. selective C.V.D. on semiconductor material, plating ( <a href="#">plating on semiconductors in general H01L 21/288</a> )}	22/26	. . {Acting in response to an ongoing measurement without interruption of processing, e.g. endpoint detection, in-situ thickness measurement ( <a href="#">endpoint detection arrangements in CMP apparatus B24B 37/013</a> , in discharge apparatus <a href="#">H01J 37/32</a> )}
21/7688	. . . . .	{by deposition over sacrificial masking layer, e.g. lift-off ( <a href="#">lift-off per se H01L 21/0272</a> )}	22/30	. {Structural arrangements specially adapted for testing or measuring during manufacture or treatment, or specially adapted for reliability measurements}
21/76882	. . . . .	{Reflowing or applying of pressure to better fill the contact hole}	22/32	. . {Additional lead-in metallisation on a device or substrate, e.g. additional pads or pad portions, lines in the scribe line, sacrificed conductors ( <a href="#">arrangements for conducting electric current to or from the solid state body in operation H01L 23/48</a> )}
21/76883	. . . . .	{Post-treatment or after-treatment of the conductive material}	22/34	. . {Circuits for electrically characterising or monitoring manufacturing processes, e. g. whole test die, wafers filled with test structures, on-board-devices incorporated on each die, process control monitors or pad structures thereof, devices in scribe line ( <a href="#">switching, multiplexing, gating devices G01R 19/25</a> ; process control with lithography, e.g. dose control, <a href="#">G03F 7/20</a> ; structures for alignment control by optical means <a href="#">G03F 7/0633</a> )}
21/76885	. . . . .	{By forming conductive members before deposition of protective insulating material, e.g. pillars, studs}		
21/76886	. . . . .	{Modifying permanently or temporarily the pattern or the conductivity of conductive members, e.g. formation of alloys, reduction of contact resistances}		
21/76888	. . . . .	{By rendering at least a portion of the conductor non conductive, e.g. oxidation}		
21/76889	. . . . .	{by forming silicides of refractory metals}		
21/76891	. . . . .	{by using superconducting materials}		
21/76892	. . . . .	{modifying the pattern}		
21/76894	. . . . .	{using a laser, e.g. laser cutting, laser direct writing, laser repair}		
21/76895	. . . . .	{Local interconnects; Local pads, as exemplified by patent document EP0896365}		
21/76897	. . . . .	{Formation of self-aligned vias or contact plugs, i.e. involving a lithographically uncritical step}		
21/76898	. . . . .	{formed through a semiconductor substrate}		
21/77	. .	Manufacture or treatment of devices consisting of a plurality of solid state components or integrated circuits formed in, or on, a common substrate ( <a href="#">manufacture or treatment of electronic memory devices H10B</a> )	23/00	<b>Details of semiconductor or other solid state devices</b> ( <a href="#">H01L 25/00</a> takes precedence {; structural arrangements for testing or measuring during manufacture or treatment, or for reliability measurements <a href="#">H01L 22/00</a> ; arrangements for connecting or disconnecting semiconductor or solid-state bodies, or methods related thereto <a href="#">H01L 24/00</a> ; finger print sensors <a href="#">G06V 40/12</a> )}
21/78	. . .	with subsequent division of the substrate into plural individual devices ( <a href="#">cutting to change the surface-physical characteristics or shape of semiconductor bodies H01L 21/304</a> )		
21/7806	. . . . .	{involving the separation of the active layers from a substrate}		
21/7813	. . . . .	{leaving a reusable substrate, e.g. epitaxial lift off}		
22/00		<b>{Testing or measuring during manufacture or treatment; Reliability measurements, i.e. testing of parts without further processing to modify the parts as such; Structural arrangements therefor}</b>		<b>NOTE</b> This group <u>does not cover</u> : <ul style="list-style-type: none"> <li>• details of semiconductor bodies or of electrodes of devices provided for in subclass <a href="#">H10D</a>, which details are covered by that group;</li> <li>• details peculiar to devices provided for in a single subclass of subclasses <a href="#">H10F</a>, <a href="#">H10H</a>,</li> </ul>

## H01L

H01L 23/00

(continued)

[H10K](#) or [H10N](#), which details are covered by those places.

- 23/02 . Containers; Seals ([H01L 23/12](#), [H01L 23/34](#), [H01L 23/48](#), [H01L 23/552](#), {[H01L 23/66](#) take precedence; {for memories [G11C](#)})
- 23/04 . . characterised by the shape {of the container or parts, e.g. caps, walls}
- 23/041 . . . {the container being a hollow construction having no base used as a mounting for the semiconductor body}
- 23/043 . . . the container being a hollow construction and having a conductive base as a mounting as well as a lead for the semiconductor body
- 23/045 . . . . the other leads having an insulating passage through the base
- 23/047 . . . . the other leads being parallel to the base
- 23/049 . . . . the other leads being perpendicular to the base
- 23/051 . . . . another lead being formed by a cover plate parallel to the base plate, e.g. sandwich type
- 23/053 . . . the container being a hollow construction and having an insulating {or insulated} base as a mounting for the semiconductor body
- 23/055 . . . . the leads having a passage through the base {([H01L 23/057](#) takes precedence)}
- 23/057 . . . . the leads being parallel to the base
- 23/06 . . characterised by the material of the container or its electrical properties
- 23/08 . . . the material being an electrical insulator, e.g. glass
- 23/10 . . characterised by the material or arrangement of seals between parts, e.g. between cap and base of the container or between leads and walls of the container
- 23/12 . Mountings, e.g. non-detachable insulating substrates
- 23/13 . . characterised by the shape
- 23/14 . . characterised by the material or its electrical properties {([printed circuit boards H05K 1/00](#))}
- 23/142 . . . {Metallic substrates having insulating layers}
- 23/145 . . . {Organic substrates, e.g. plastic}
- 23/147 . . . {Semiconductor insulating substrates (semiconductor conductive substrates [H01L 23/4926](#))}
- 23/15 . . . Ceramic or glass substrates {([H01L 23/142](#), [H01L 23/145](#), [H01L 23/147](#) take precedence)}
- 23/16 . Fillings or auxiliary members in containers {or encapsulations}, e.g. centering rings ([H01L 23/42](#), [H01L 23/552](#) take precedence)
- 23/18 . . Fillings characterised by the material, its physical or chemical properties, or its arrangement within the complete device

### NOTE

Group [H01L 23/26](#) takes precedence over groups [H01L 23/20](#) - [H01L 23/24](#)

- 23/20 . . . gaseous at the normal operating temperature of the device
- 23/22 . . . liquid at the normal operating temperature of the device
- 23/24 . . . solid or gel at the normal operating temperature of the device {([H01L 23/3135](#) takes precedence)}

- 23/26 . . . including materials for absorbing or reacting with moisture or other undesired substances {, e.g. getters}
- 23/28 . Encapsulations, e.g. encapsulating layers, coatings, {e.g. for protection} ([H01L 23/552](#) takes precedence; {insulating layers for contacts or interconnections [H01L 23/5329](#)})
- 23/29 . . characterised by the material {, e.g. carbon (interlayer dielectrics [H01L 23/5329](#))}
- 23/291 . . . {Oxides or nitrides or carbides, e.g. ceramics, glass}
- 23/293 . . . {Organic, e.g. plastic}
- 23/295 . . . . {containing a filler ([H01L 23/296](#) takes precedence)}
- 23/296 . . . . {Organo-silicon compounds}
- 23/298 . . . {Semiconductor material, e.g. amorphous silicon}
- 23/31 . . characterised by the arrangement {or shape}
- 23/3107 . . . {the device being completely enclosed}
- 23/3114 . . . . {the device being a chip scale package, e.g. CSP}
- 23/3121 . . . . {a substrate forming part of the encapsulation}
- 23/3128 . . . . . {the substrate having spherical bumps for external connection}
- 23/3135 . . . . {Double encapsulation or coating and encapsulation}
- 23/3142 . . . . {Sealing arrangements between parts, e.g. adhesion promoters}
- 23/315 . . . . {the encapsulation having a cavity}
- 23/3157 . . . {Partial encapsulation or coating (mask layer used as insulation layer [H01L 21/31](#))}
- 23/3164 . . . . {the coating being a foil}
- 23/3171 . . . . {the coating being directly applied to the semiconductor body, e.g. passivation layer ([H01L 23/3178](#) takes precedence)}
- 23/3178 . . . . {Coating or filling in grooves made in the semiconductor body}
- 23/3185 . . . . {the coating covering also the sidewalls of the semiconductor body}
- 23/3192 . . . . {Multilayer coating}
- 23/32 . Holders for supporting the complete device in operation, i.e. detachable fixtures ([H01L 23/40](#) takes precedence)
- 23/34 . Arrangements for cooling, heating, ventilating or temperature compensation {; Temperature sensing arrangements (thermal treatment apparatus [H01L 21/00](#))}
- 23/345 . . {Arrangements for heating (thermal treatment apparatus [H01L 21/00](#))}
- 23/36 . . Selection of materials, or shaping, to facilitate cooling or heating, e.g. heatsinks {([H01L 23/28](#), [H01L 23/40](#), [H01L 23/42](#), [H01L 23/44](#), [H01L 23/46](#) take precedence; heating [H01L 23/345](#))}
- 23/367 . . . Cooling facilitated by shape of device {([H01L 23/38](#), [H01L 23/40](#), [H01L 23/42](#), [H01L 23/44](#), [H01L 23/46](#) take precedence)}
- 23/3672 . . . . {Foil-like cooling fins or heat sinks (being part of lead-frames [H01L 23/49568](#))}
- 23/3675 . . . . {characterised by the shape of the housing}
- 23/3677 . . . . {Wire-like or pin-like cooling fins or heat sinks}

- 23/373 . . . Cooling facilitated by selection of materials for the device {or materials for thermal expansion adaptation, e.g. carbon}
  - 23/3731 . . . . {Ceramic materials or glass ([H01L 23/3732](#), [H01L 23/3733](#), [H01L 23/3735](#), [H01L 23/3737](#), [H01L 23/3738](#) take precedence)}
  - 23/3732 . . . . {Diamonds}
  - 23/3733 . . . . {having a heterogeneous or anisotropic structure, e.g. powder or fibres in a matrix, wire mesh, porous structures ([H01L 23/3732](#), [H01L 23/3737](#) take precedence)}
  - 23/3735 . . . . {Laminates or multilayers, e.g. direct bond copper ceramic substrates}
  - 23/3736 . . . . {Metallic materials ([H01L 23/3732](#), [H01L 23/3733](#), [H01L 23/3735](#), [H01L 23/3737](#), [H01L 23/3738](#) take precedence)}
  - 23/3737 . . . . {Organic materials with or without a thermoconductive filler}
  - 23/3738 . . . . {Semiconductor materials}
  - 23/38 . . Cooling arrangements using the Peltier effect
  - 23/40 . . Mountings or securing means for detachable cooling or heating arrangements {(heating [H01L 23/345](#)); fixed by friction, plugs or springs}
  - 23/4006 . . . {with bolts or screws}
  - 23/4012 . . . . {for stacked arrangements of a plurality of semiconductor devices ([assemblies per se](#) [H01L 25/00](#))}
  - 2023/4018 . . . . {characterised by the type of device to be heated or cooled}
  - 2023/4025 . . . . . {Base discrete devices, e.g. presspack, disc-type transistors}
  - 2023/4031 . . . . . {Packaged discrete devices, e.g. to-3 housings, diodes}
  - 2023/4037 . . . . {characterised by thermal path or place of attachment of heatsink}
  - 2023/4043 . . . . . {heatsink to have chip}
  - 2023/405 . . . . . {heatsink to package}
  - 2023/4056 . . . . . {heatsink to additional heatsink}
  - 2023/4062 . . . . . {heatsink to or through board or cabinet}
  - 2023/4068 . . . . . {Heatconductors between device and heatsink, e.g. compliant heat-spreaders, heat-conducting bands}
  - 2023/4075 . . . . {Mechanical elements}
  - 2023/4081 . . . . . {Compliant clamping elements not primarily serving heat-conduction}
  - 2023/4087 . . . . . {Mounting accessories, interposers, clamping or screwing parts}
  - 23/4093 . . . {Snap-on arrangements, e.g. clips}
  - 23/42 . . Fillings or auxiliary members in containers {or encapsulations} selected or arranged to facilitate heating or cooling
  - 23/427 . . . Cooling by change of state, e.g. use of heat pipes {(by liquefied gas [H01L 23/445](#))}
  - 23/4275 . . . . {by melting or evaporation of solids}
  - 23/433 . . . Auxiliary members {in containers} characterised by their shape, e.g. pistons
  - 23/4332 . . . . {Bellows}
  - 23/4334 . . . . {Auxiliary members in encapsulations ([H01L 23/49568](#) takes precedence)}
  - 23/4336 . . . . {in combination with jet impingement}
  - 23/4338 . . . . {Pistons, e.g. spring-loaded members}
  - 23/44 . . the complete device being wholly immersed in a fluid other than air {([H01L 23/427](#) takes precedence)}
  - 23/445 . . . {the fluid being a liquefied gas, e.g. in a cryogenic vessel}
  - 23/46 . . involving the transfer of heat by flowing fluids ([H01L 23/42](#), [H01L 23/44](#) take precedence)
  - 23/467 . . . by flowing gases, e.g. air {([H01L 23/473](#) takes precedence)}
  - 23/473 . . . by flowing liquids {([H01L 23/4332](#), [H01L 23/4338](#) take precedence)}
  - 23/4735 . . . . {Jet impingement ([H01L 23/4336](#) takes precedence)}
  - 23/48 . Arrangements for conducting electric current to or from the solid state body in operation, e.g. leads, terminal arrangements {; Selection of materials therefor}
- NOTE**
- {Arrangements for connecting or disconnecting semiconductor or other solid state bodies, or methods related thereto, other than those arrangements or methods covered by the following subgroups, are covered by [H01L 24/00](#).}
- 23/481 . . {Internal lead connections, e.g. via connections, feedthrough structures}
  - 23/482 . . consisting of lead-in layers inseparably applied to the semiconductor body {(electrodes)}
  - 23/4821 . . . {Bridge structure with air gap}
  - 23/4822 . . . {Beam leads}
  - 23/4824 . . . {Pads with extended contours, e.g. grid structure, branch structure, finger structure}
  - 23/4825 . . . {for devices consisting of semiconductor layers on insulating or semi-insulating substrates, e.g. silicon on sapphire devices, i.e. SOS}
  - 23/4827 . . . {Materials}
  - 23/4828 . . . . {Conductive organic material or pastes, e.g. conductive adhesives, inks}
  - 23/485 . . . consisting of layered constructions comprising conductive layers and insulating layers, e.g. planar contacts {([H01L 23/4821](#), [H01L 23/4822](#), [H01L 23/4824](#), [H01L 23/4825](#) take precedence; materials [H01L 23/532](#), bond pads [H01L 24/02](#), bump connectors [H01L 24/10](#))}
  - 23/4855 . . . . {Overhang structure}
  - 23/488 . . consisting of soldered {or bonded} constructions {(bump connectors [H01L 24/01](#))}
  - 23/49 . . . wire-like {arrangements or pins or rods (using optical fibres [H01L 23/48](#); pins attached to insulating substrates [H01L 23/49811](#))}
  - 23/492 . . . Bases or plates {or solder therefor}
  - 23/4922 . . . . {having a heterogeneous or anisotropic structure}
  - 23/4924 . . . . {characterised by the materials}
  - 23/4926 . . . . . {the materials containing semiconductor material}
  - 23/4928 . . . . . {the materials containing carbon}
  - 23/495 . . . Lead-frames {or other flat leads ([H01L 23/498](#) takes precedence; lead frame interconnections between components [H01L 23/52](#))}
  - 23/49503 . . . . {characterised by the die pad}



- 23/49506 . . . . . {an insulative substrate being used as a diepad, e.g. ceramic, plastic ([H01L 23/49531](#) takes precedence)}
- 23/4951 . . . . . {Chip-on-leads or leads-on-chip techniques, i.e. inner lead fingers being used as die pad}
- 23/49513 . . . . . {having bonding material between chip and die pad}
- 23/49517 . . . . . {Additional leads}
- 23/4952 . . . . . {the additional leads being a bump or a wire}
- 23/49524 . . . . . {the additional leads being a tape carrier or flat leads}
- 23/49527 . . . . . {the additional leads being a multilayer}
- 23/49531 . . . . . {the additional leads being a wiring board}
- 23/49534 . . . . . {Multi-layer}
- 23/49537 . . . . . {Plurality of lead frames mounted in one device}
- 23/49541 . . . . . {Geometry of the lead-frame}
- 23/49544 . . . . . {Deformation absorbing parts in the lead frame plane, e.g. meanderline shape ([H01L 23/49562](#) takes precedence)}
- 23/49548 . . . . . {Cross section geometry ([H01L 23/49562](#) takes precedence)}
- 23/49551 . . . . . {characterised by bent parts}
- 23/49555 . . . . . {the bent parts being the outer leads}
- 23/49558 . . . . . {Insulating layers on lead frames, e.g. bridging members}
- 23/49562 . . . . . {for individual devices of subclass [H10D](#)}
- 23/49565 . . . . . {Side rails of the lead frame, e.g. with perforations, sprocket holes}
- 23/49568 . . . . . {specifically adapted to facilitate heat dissipation}
- 23/49572 . . . . . {consisting of thin flexible metallic tape with or without a film carrier ([H01L 23/49503](#) - [H01L 23/49568](#) and [H01L 23/49575](#) - [H01L 23/49579](#) take precedence)}
- 23/49575 . . . . . {Assemblies of semiconductor devices on lead frames}
- 23/49579 . . . . . {characterised by the materials of the lead frames or layers thereon}
- 23/49582 . . . . . {Metallic layers on lead frames}
- 23/49586 . . . . . {Insulating layers on lead frames}
- 23/49589 . . . . . {Capacitor integral with or on the leadframe}
- 23/49593 . . . . . {Battery in combination with a leadframe}
- 23/49596 . . . . . {Oscillators in combination with lead-frames}
- 23/498 . . . . . Leads, {i.e. metallisations or lead-frames} on insulating substrates, {e.g. chip carriers (shape of the substrate [H01L 23/13](#))}
- 23/49805 . . . . . {the leads being also applied on the sidewalls or the bottom of the substrate, e.g. leadless packages for surface mounting}
- 23/49811 . . . . . {Additional leads joined to the metallisation on the insulating substrate, e.g. pins, bumps, wires, flat leads ([H01L 23/49827](#) takes precedence)}
- 23/49816 . . . . . {Spherical bumps on the substrate for external connection, e.g. ball grid arrays [BGA]}
- 23/49822 . . . . . {Multilayer substrates (multilayer metallisation on monolayer substrate [H01L 23/498](#))}
- 23/49827 . . . . . {Via connections through the substrates, e.g. pins going through the substrate, coaxial cables ([H01L 23/49822](#), [H01L 23/49833](#), [H01L 23/4985](#), [H01L 23/49861](#) take precedence)}
- 23/49833 . . . . . {the chip support structure consisting of a plurality of insulating substrates}
- 23/49838 . . . . . {Geometry or layout}
- 23/49844 . . . . . {for individual devices of subclass [H10D](#)}
- 23/4985 . . . . . {Flexible insulating substrates ([H01L 23/49572](#) and [H01L 23/49855](#) take precedence)}
- 23/49855 . . . . . {for flat-cards, e.g. credit cards (cards [per se](#) [G06K 19/00](#))}
- 23/49861 . . . . . {Lead-frames fixed on or encapsulated in insulating substrates ([H01L 23/4985](#), [H01L 23/49805](#) take precedence)}
- 23/49866 . . . . . {characterised by the materials (materials of the substrates [H01L 23/14](#), of the lead-frames [H01L 23/49579](#))}
- 23/49872 . . . . . {the conductive materials containing semiconductor material}
- 23/49877 . . . . . {Carbon, e.g. fullerenes (superconducting fullerenes [H10N 60/853](#))}
- 23/49883 . . . . . {the conductive materials containing organic materials or pastes, e.g. for thick films (for printed circuits [H05K 1/092](#))}
- 23/49888 . . . . . {the conductive materials containing superconducting material}
- 23/49894 . . . . . {Materials of the insulating layers or coatings}
- 23/50 . . . . . for integrated circuit devices, {e.g. power bus, number of leads} ([H01L 23/482](#) - [H01L 23/498](#) take precedence)
- 23/52 . . . . . Arrangements for conducting electric current within the device in operation from one component to another {, i.e. interconnections, e.g. wires, lead frames (optical interconnections [G02B 6/00](#))}
- 23/522 . . . . . including external interconnections consisting of a multilayer structure of conductive and insulating layers inseparably formed on the semiconductor body
- 23/5221 . . . . . {Crossover interconnections}
- 23/5222 . . . . . {Capacitive arrangements or effects of, or between wiring layers (other capacitive arrangements [H01L 23/642](#))}
- 23/5223 . . . . . {Capacitor integral with wiring layers}
- 23/5225 . . . . . {Shielding layers formed together with wiring layers}
- 23/5226 . . . . . {Via connections in a multilevel interconnection structure}
- 23/5227 . . . . . {Inductive arrangements or effects of, or between, wiring layers (other inductive arrangements [H01L 23/645](#))}
- 23/5228 . . . . . {Resistive arrangements or effects of, or between, wiring layers (other resistive arrangements [H01L 23/647](#))}
- 23/525 . . . . . with adaptable interconnections
- 23/5252 . . . . . {comprising anti-fuses, i.e. connections having their state changed from non-conductive to conductive}
- 23/5254 . . . . . {the change of state resulting from the use of an external beam, e.g. laser beam or ion beam}



- 23/5256 . . . . {comprising fuses, i.e. connections having their state changed from conductive to non-conductive}
- 23/5258 . . . . . {the change of state resulting from the use of an external beam, e.g. laser beam or ion beam}
- 23/528 . . . . Layout of the interconnection structure
- 23/5283 . . . . . {Cross-sectional geometry}
- 23/5286 . . . . . {Arrangements of power or ground buses}
- 23/532 . . . . characterised by the materials
- 23/53204 . . . . . {Conductive materials}
- 23/53209 . . . . . {based on metals, e.g. alloys, metal silicides ([H01L 23/53285](#) takes precedence)}
- 23/53214 . . . . . {the principal metal being aluminium}
- 23/53219 . . . . . {Aluminium alloys}
- 23/53223 . . . . . {Additional layers associated with aluminium layers, e.g. adhesion, barrier, cladding layers}
- 23/53228 . . . . . {the principal metal being copper}
- 23/53233 . . . . . {Copper alloys}
- 23/53238 . . . . . {Additional layers associated with copper layers, e.g. adhesion, barrier, cladding layers}
- 23/53242 . . . . . {the principal metal being a noble metal, e.g. gold}
- 23/53247 . . . . . {Noble-metal alloys}
- 23/53252 . . . . . {Additional layers associated with noble-metal layers, e.g. adhesion, barrier, cladding layers}
- 23/53257 . . . . . {the principal metal being a refractory metal}
- 23/53261 . . . . . {Refractory-metal alloys}
- 23/53266 . . . . . {Additional layers associated with refractory-metal layers, e.g. adhesion, barrier, cladding layers}
- 23/53271 . . . . . {containing semiconductor material, e.g. polysilicon}
- 23/53276 . . . . . {containing carbon, e.g. fullerenes ([superconducting fullerenes H10N 60/853](#))}
- 23/5328 . . . . . {containing conductive organic materials or pastes, e.g. conductive adhesives, inks}
- 23/53285 . . . . . {containing superconducting materials}
- 23/5329 . . . . . {Insulating materials}
- 23/53295 . . . . . {Stacked insulating layers}
- 23/535 . . . including internal interconnections, e.g. cross-under constructions {([internal lead connections H01L 23/481](#))}
- 23/538 . . . the interconnection structure between a plurality of semiconductor chips being formed on, or in, insulating substrates {([H05K](#) takes precedence; [manufacture or treatment H01L 21/4846](#)) ; [mountings per se H01L 23/12](#); {materials [H01L 23/49866](#))}
- 23/5381 . . . {Crossover interconnections, e.g. bridge stepovers}
- 23/5382 . . . {Adaptable interconnections, e.g. for engineering changes}
- 23/5383 . . . {Multilayer substrates ([H01L 23/5385](#) takes precedence; [multilayer metallisation on monolayer substrates H01L 23/538](#))}
- 23/5384 . . . {Conductive vias through the substrate with or without pins, e.g. buried coaxial conductors ([H01L 23/5383](#), [H01L 23/5385](#) take precedence; pins attached to insulating substrates [H01L 23/49811](#))}
- 23/5385 . . . {Assembly of a plurality of insulating substrates}
- 23/5386 . . . {Geometry or layout of the interconnection structure}
- 23/5387 . . . {Flexible insulating substrates ([H01L 23/5388](#) takes precedence)}
- 23/5388 . . . {for flat cards, e.g. credit cards ([cards per se G06K 19/00](#))}
- 23/5389 . . . {the chips being integrally enclosed by the interconnect and support structures}
- 23/544 . Marks applied to semiconductor devices {or parts}, e.g. registration marks, {alignment structures, wafer maps ([test patterns for characterising or monitoring manufacturing processes H01L 22/00](#))}
- NOTE**
- {When classifying in group [H01L 23/544](#), details are to be further indexed by using the indexing codes chosen from [H01L 2223/544](#) and subgroups. }
- 23/552 . Protection against radiation, e.g. light {or electromagnetic waves}
- 23/556 . . against alpha rays
- 23/562 . {Protection against mechanical damage ([H01L 23/02](#), [H01L 23/28](#) take precedence)}
- 23/564 . {Details not otherwise provided for, e.g. protection against moisture ([getters H01L 23/26](#))}
- 23/57 . {Protection from inspection, reverse engineering or tampering}
- 23/573 . . {using passive means}
- 23/576 . . {using active circuits}
- 23/58 . Structural electrical arrangements for semiconductor devices not otherwise provided for {, e.g. in combination with batteries ([H01L 23/49593](#), [H01L 23/49596](#) take precedence)}
- 23/585 . . {comprising conductive layers or plates or strips or rods or rings ([H01L 23/60](#), [H01L 23/62](#), [H01L 23/64](#), [H01L 23/66](#) take precedence)}
- 23/60 . . Protection against electrostatic charges or discharges, e.g. Faraday shields
- 23/62 . . Protection against overvoltage, e.g. fuses, shunts
- 23/64 . . Impedance arrangements
- 23/642 . . . {Capacitive arrangements ([H01L 23/49589](#), [H01L 23/645](#), [H01L 23/647](#), [H01L 23/66](#) take precedence; capacitive effects between wiring layers on the semiconductor body [H01L 23/5222](#))}
- 23/645 . . . {Inductive arrangements ([H01L 23/647](#), [H01L 23/66](#) take precedence)}
- 23/647 . . . {Resistive arrangements ([H01L 23/66](#), [H01L 23/62](#) take precedence)}
- 23/66 . . . High-frequency adaptations
- NOTE**
- {When classifying in group [H01L 23/66](#), details are to be further indexed by using the indexing codes chosen from [H01L 2223/66](#) and subgroups. }

24/00	<b>{Arrangements for connecting or disconnecting semiconductor or solid-state bodies; Methods or apparatus related thereto}</b>	24/10	. . {Bump connectors (bumps on insulating substrates, e.g. chip carriers, <a href="#">H01L 23/49816</a> ); Manufacturing methods related thereto}
	<b>NOTES</b>	24/11	. . . {Manufacturing methods (for bumps on insulating substrates <a href="#">H01L 21/4853</a> )}
1.	This group <u>does not</u> cover:	24/12	. . . {Structure, shape, material or disposition of the bump connectors prior to the connecting process}
	• details of semiconductor bodies or of electrodes of devices provided for in subclass <a href="#">H10D</a> , which details are covered by that group;	24/13	. . . . {of an individual bump connector}
	• details peculiar to devices provided for in a single subclass of subclasses <a href="#">H10F</a> , <a href="#">H10H</a> , <a href="#">H10K</a> or <a href="#">H10N</a> , which details are covered by those places.	24/14	. . . . {of a plurality of bump connectors}
	• printed circuits, which are covered by groups <a href="#">H05K 1/00</a> - <a href="#">H05K 1/189</a> ;	24/15	. . . {Structure, shape, material or disposition of the bump connectors after the connecting process}
	• apparatus or manufacturing processes for printed circuits, which are covered by groups <a href="#">H05K 3/00</a> - <a href="#">H05K 3/4685</a> ;	24/16	. . . . {of an individual bump connector}
	• manufacture or treatment of parts, which are covered by group <a href="#">H01L 21/48</a> and subgroups except <a href="#">H01L 21/4885</a> - <a href="#">H01L 21/4896</a> ;	24/17	. . . . {of a plurality of bump connectors}
	• assemblies of semiconductor devices, which are covered by groups <a href="#">H01L 21/50</a> - <a href="#">H01L 21/568</a> ;	24/18	. . {High density interconnect [HDI] connectors; Manufacturing methods related thereto (interconnection structure between a plurality of semiconductor chips <a href="#">H01L 23/5389</a> )}
	• applying interconnections to be used for carrying current between separate components within a device, which is covered by group <a href="#">H01L 21/768</a> and subgroups;	24/19	. . . {Manufacturing methods of high density interconnect preforms}
	• containers or seals, which are covered by groups <a href="#">H01L 23/02</a> - <a href="#">H01L 23/10</a> ;	24/20	. . . {Structure, shape, material or disposition of high density interconnect preforms}
	• mountings, which are covered by groups <a href="#">H01L 23/12</a> - <a href="#">H01L 23/15</a> and subgroups;	24/23	. . . {Structure, shape, material or disposition of the high density interconnect connectors after the connecting process}
	• arrangements for cooling, heating, ventilating or temperature compensation, which are covered by groups <a href="#">H01L 23/34</a> - <a href="#">H01L 23/4735</a> ;	24/24	. . . . {of an individual high density interconnect connector}
	• arrangements for conducting electric current, which are covered by groups <a href="#">H01L 23/48</a> - <a href="#">H01L 23/50</a> , and by groups <a href="#">H01L 23/52</a> - <a href="#">H01L 23/5389</a> ;	24/25	. . . . {of a plurality of high density interconnect connectors}
	• structural electrical arrangements, which are covered by groups <a href="#">H01L 23/58</a> - <a href="#">H01L 23/66</a> ;	24/26	. . {Layer connectors, e.g. plate connectors, solder or adhesive layers; Manufacturing methods related thereto}
	• assemblies of semiconductor or other solid state devices, which are covered by groups <a href="#">H01L 25/00</a> - <a href="#">H01L 25/18</a> .	24/27	. . . {Manufacturing methods}
		24/28	. . . {Structure, shape, material or disposition of the layer connectors prior to the connecting process}
	2. In this group the following indexing codes are used : <a href="#">H01L 24/00</a> , <a href="#">H01L 2224/00</a> , <a href="#">H01L 2924/00</a> , and subgroups thereof	24/29	. . . . {of an individual layer connector}
24/01	. {Means for bonding being attached to, or being formed on, the surface to be connected, e.g. chip-to-package, die-attach, "first-level" interconnects; Manufacturing methods related thereto}	24/30	. . . . {of a plurality of layer connectors}
24/02	. . {Bonding areas (on insulating substrates, e.g. chip carriers, <a href="#">H01L 23/49816</a> , <a href="#">H01L 23/49838</a> , <a href="#">H01L 23/5389</a> ); Manufacturing methods related thereto}	24/31	. . . {Structure, shape, material or disposition of the layer connectors after the connecting process}
24/03	. . . {Manufacturing methods}	24/32	. . . . {of an individual layer connector}
24/04	. . . {Structure, shape, material or disposition of the bonding areas prior to the connecting process}	24/33	. . . . {of a plurality of layer connectors}
24/05	. . . . {of an individual bonding area}	24/34	. . {Strap connectors, e.g. copper straps for grounding power devices; Manufacturing methods related thereto}
24/06	. . . . {of a plurality of bonding areas}	24/35	. . . {Manufacturing methods}
24/07	. . . {Structure, shape, material or disposition of the bonding areas after the connecting process}	24/36	. . . {Structure, shape, material or disposition of the strap connectors prior to the connecting process}
24/08	. . . . {of an individual bonding area}	24/37	. . . . {of an individual strap connector}
24/09	. . . . {of a plurality of bonding areas}	24/38	. . . . {of a plurality of strap connectors}
		24/39	. . . {Structure, shape, material or disposition of the strap connectors after the connecting process}
		24/40	. . . . {of an individual strap connector}
		24/41	. . . . {of a plurality of strap connectors}
		24/42	. . {Wire connectors; Manufacturing methods related thereto}
		24/43	. . . {Manufacturing methods}
		24/44	. . . {Structure, shape, material or disposition of the wire connectors prior to the connecting process}
		24/45	. . . . {of an individual wire connector}
		24/46	. . . . {of a plurality of wire connectors}

- 24/47 . . . {Structure, shape, material or disposition of the wire connectors after the connecting process}
  - 24/48 . . . . {of an individual wire connector}
  - 24/49 . . . . {of a plurality of wire connectors}
  - 24/50 . . {Tape automated bonding [TAB] connectors, i.e. film carriers; Manufacturing methods related thereto (thin flexible metallic tape with or without a film carrier [H01L 23/49572](#), flexible insulating substrates [H01L 23/4985](#), [H01L 23/5387](#))}
  - 24/63 . . {Connectors not provided for in any of the groups [H01L 24/10](#) - [H01L 24/50](#) and subgroups; Manufacturing methods related thereto}
  - 24/64 . . . {Manufacturing methods}
  - 24/65 . . . {Structure, shape, material or disposition of the connectors prior to the connecting process}
  - 24/66 . . . . {of an individual connector}
  - 24/67 . . . . {of a plurality of connectors}
  - 24/68 . . . {Structure, shape, material or disposition of the connectors after the connecting process}
  - 24/69 . . . . {of an individual connector}
  - 24/70 . . . . {of a plurality of connectors}
  - 24/71 . {Means for bonding not being attached to, or not being formed on, the surface to be connected (holders for supporting the complete device in operation [H01L 23/32](#))}
  - 24/72 . . {Detachable connecting means consisting of mechanical auxiliary parts connecting the device, e.g. pressure contacts using springs or clips}
  - 24/73 . {Means for bonding being of different types provided for in two or more of groups [H01L 24/10](#), [H01L 24/18](#), [H01L 24/26](#), [H01L 24/34](#), [H01L 24/42](#), [H01L 24/50](#), [H01L 24/63](#), [H01L 24/71](#)}
  - 24/74 . {Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies}
  - 24/741 . . {Apparatus for manufacturing means for bonding, e.g. connectors}
  - 24/742 . . . {Apparatus for manufacturing bump connectors}
  - 24/743 . . . {Apparatus for manufacturing layer connectors}
  - 24/744 . . . {Apparatus for manufacturing strap connectors}
  - 24/745 . . . {Apparatus for manufacturing wire connectors}
  - 24/75 . . {Apparatus for connecting with bump connectors or layer connectors}
  - 24/76 . . {Apparatus for connecting with build-up interconnects}
  - 24/77 . . {Apparatus for connecting with strap connectors}
  - 24/78 . . {Apparatus for connecting with wire connectors}
  - 24/79 . . {Apparatus for Tape Automated Bonding [TAB]}
  - 24/799 . . {Apparatus for disconnecting}
  - 24/80 . {Methods for connecting semiconductor or other solid state bodies using means for bonding being attached to, or being formed on, the surface to be connected}
  - 24/81 . . {using a bump connector}
  - 24/82 . . {by forming build-up interconnects at chip-level, e.g. for high density interconnects [HDI] (interconnection structure between a plurality of semiconductor chips [H01L 23/5389](#))}
  - 24/83 . . {using a layer connector}
  - 24/84 . . {using a strap connector}
  - 24/85 . . {using a wire connector ([wire bonding in general B23K 20/004](#))}
  - 24/86 . . {using tape automated bonding [TAB]}
  - 24/89 . . {using at least one connector not provided for in any of the groups [H01L 24/81](#) - [H01L 24/86](#)}
  - 24/90 . {Methods for connecting semiconductor or solid state bodies using means for bonding not being attached to, or not being formed on, the body surface to be connected, e.g. pressure contacts using springs or clips}
  - 24/91 . {Methods for connecting semiconductor or solid state bodies including different methods provided for in two or more of groups [H01L 24/80](#) - [H01L 24/90](#)}
  - 24/92 . . {Specific sequence of method steps}
  - 24/93 . {Batch processes}
  - 24/94 . . {at wafer-level, i.e. with connecting carried out on a wafer comprising a plurality of undiced individual devices}
  - 24/95 . . {at chip-level, i.e. with connecting carried out on a plurality of singulated devices, i.e. on diced chips}
  - 24/96 . . . {the devices being encapsulated in a common layer, e.g. neo-wafer or pseudo-wafer, said common layer being separable into individual assemblies after connecting}
  - 24/97 . . . {the devices being connected to a common substrate, e.g. interposer, said common substrate being separable into individual assemblies after connecting}
  - 24/98 . {Methods for disconnecting semiconductor or solid-state bodies}
  - 25/00 **Assemblies consisting of a plurality of semiconductor or other solid state devices (devices consisting of a plurality of solid-state components formed in or on a common substrate [H10D 89/00](#); photovoltaic modules or arrays of photovoltaic cells [H10F 19/00](#))**
- NOTE**
- {Due to the ongoing developments in class [H10](#) and related subclasses, the information displayed in notes, references and definitions of this main group and indents may not be entirely accurate. For each specific subject matter referred to in this main group and indents, users are invited to consult the relevant place in class [H10](#) and to consider the class [H10](#) information as correct, in case of conflict}
- 25/03 . all the devices being of a type provided for in a single subclass of subclasses [H10B](#), [H10D](#), [H10F](#), [H10H](#), [H10K](#) or [H10N](#), e.g. assemblies of rectifier diodes
  - 25/04 . . the devices not having separate containers
- WARNING**
- Group [H01L 25/04](#) is impacted by reclassification into groups [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).
- All groups listed in this Warning should be considered in order to perform a complete search.

- 25/041 . . . {the devices being of a type provided for in subclass [H10F](#)}
- 25/042 . . . . {the devices being arranged next to each other (solar cells [H10F 19/00](#))}
- 25/043 . . . . {Stacked arrangements of devices}
- 25/065 . . . the devices being of a type provided for in group [H10D 89/00](#)

**NOTE**

{Group [H01L 25/0652](#) takes precedence over groups [H01L 25/0655](#) and [H01L 25/0657](#).}

**WARNING**

Group [H01L 25/065](#) is impacted by reclassification into groups [H10B 80/00](#), [H10K 39/10](#), [H10K 39/12](#), [H10K 39/15](#), [H10K 39/18](#), [H10K 39/601](#), [H10K 39/621](#), [H10K 59/90](#), [H10K 59/95](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 25/0652 . . . . {the devices being arranged next and on each other, i.e. mixed assemblies}

**WARNING**

Group [H01L 25/0652](#) is impacted by reclassification into groups [H10B 80/00](#), [H10K 39/10](#), [H10K 39/12](#), [H10K 39/15](#), [H10K 39/18](#), [H10K 39/601](#), [H10K 39/621](#), [H10K 59/90](#), [H10K 59/95](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 25/0655 . . . . {the devices being arranged next to each other}

**WARNING**

Group [H01L 25/0655](#) is impacted by reclassification into groups [H10B 80/00](#), [H10K 39/10](#), [H10K 39/12](#), [H10K 39/15](#), [H10K 39/18](#), [H10K 39/601](#), [H10K 39/621](#), [H10K 59/90](#), [H10K 59/95](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 25/0657 . . . . {Stacked arrangements of devices}

**WARNING**

Group [H01L 25/0657](#) is impacted by reclassification into groups [H10B 80/00](#), [H10K 39/10](#), [H10K 39/12](#), [H10K 39/15](#), [H10K 39/18](#), [H10K 39/601](#), [H10K 39/621](#), [H10K 59/90](#), [H10K 59/95](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 25/07 . . . the devices being of a type provided for in group subclass [H10D](#)

**NOTE**

{Group [H01L 25/071](#) takes precedence over groups [H01L 25/072](#) - [H01L 25/074](#).}

- 25/071 . . . . {the devices being arranged next and on each other, i.e. mixed assemblies}
- 25/072 . . . . {the devices being arranged next to each other}
- 25/073 . . . . {Apertured devices mounted on one or more rods passed through the apertures}
- 25/074 . . . . {Stacked arrangements of non-apertured devices}
- 25/075 . . . the devices being of a type provided for in group [H10H 20/00](#)
- 25/0753 . . . . {the devices being arranged next to each other}
- 25/0756 . . . . {Stacked arrangements of devices}
- 25/10 . . the devices having separate containers
- 25/105 . . . {the devices being integrated devices of class [H10](#)}

**NOTE**

{When classifying in group [H01L 25/105](#), details of the assemblies are to be further indexed by using the indexing codes chosen from [H01L 2225/1005](#) and subgroups.}

- 25/11 . . . the devices being of a type provided for in subclass [H10D](#)

**NOTE**

{Group [H01L 25/112](#) takes precedence over groups [H01L 25/115](#) and [H01L 25/117](#).}

- 25/112 . . . . {Mixed assemblies}
- 25/115 . . . . {the devices being arranged next to each other}
- 25/117 . . . . {Stacked arrangements of devices}
- 25/13 . . . the devices being of a type provided for in group [H10H 20/00](#)



- 25/16 . the devices being of types provided for in two or more different subclasses of [H10B](#), [H10D](#), [H10E](#), [H10H](#), [H10K](#) or [H10N](#), e.g. forming hybrid circuits

**WARNING**

Group [H01L 25/16](#) is impacted by reclassification into groups [H10B 80/00](#), [H10K 39/10](#), [H10K 39/12](#), [H10K 39/15](#), [H10K 39/18](#), [H10K 39/601](#), [H10K 39/621](#), [H10K 59/90](#), [H10K 59/95](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 25/162 . . {the devices being mounted on two or more different substrates}

**WARNING**

Group [H01L 25/162](#) is impacted by reclassification into groups [H10B 80/00](#), [H10K 39/10](#), [H10K 39/12](#), [H10K 39/15](#), [H10K 39/18](#), [H10K 39/601](#), [H10K 39/621](#), [H10K 59/90](#), [H10K 59/95](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 25/165 . . {Containers}

**WARNING**

Group [H01L 25/165](#) is impacted by reclassification into groups [H10B 80/00](#), [H10K 39/10](#), [H10K 39/12](#), [H10K 39/15](#), [H10K 39/18](#), [H10K 39/601](#), [H10K 39/621](#), [H10K 59/90](#), [H10K 59/95](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 25/167 . . {comprising optoelectronic devices, e.g. LED, photodiodes}

**WARNING**

Group [H01L 25/167](#) is impacted by reclassification into groups [H10B 80/00](#), [H10K 39/10](#), [H10K 39/12](#), [H10K 39/15](#), [H10K 39/18](#), [H10K 39/601](#), [H10K 39/621](#), [H10K 59/90](#), [H10K 59/95](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 25/18 . the devices being of the types provided for in two or more different main groups of the same subclass of [H10B](#), [H10D](#), [H10E](#), [H10H](#), [H10K](#) or [H10N](#)

**WARNING**

Group [H01L 25/18](#) is impacted by reclassification into groups [H10B 80/00](#), [H10K 19/00](#), [H10K 39/10](#), [H10K 39/12](#), [H10K 39/15](#), [H10K 39/18](#), [H10K 39/601](#), [H10K 39/621](#), [H10K 59/90](#), [H10K 59/95](#), [H10K 65/00](#), [H10N 19/00](#), [H10N 39/00](#), [H10N 59/00](#), [H10N 69/00](#), [H10N 79/00](#) and [H10N 89/00](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 25/50 . {Multistep manufacturing processes of assemblies consisting of devices, the devices being individual devices of subclass [H10D](#) or integrated devices of class [H10](#) ([H01L 21/50](#) takes precedence)}

**2221/00 Processes or apparatus adapted for the manufacture or treatment of semiconductor or solid state devices or of parts thereof covered by [H01L 21/00](#)**

- 2221/10 . Applying interconnections to be used for carrying current between separate components within a device

- 2221/1005 . . Formation and after-treatment of dielectrics

- 2221/101 . . . Forming openings in dielectrics

- 2221/1015 . . . . for dual damascene structures

- 2221/1021 . . . . . Pre-forming the dual damascene structure in a resist layer

- 2221/1026 . . . . . the via being formed by burying a sacrificial pillar in the dielectric and removing the pillar

- 2221/1031 . . . . . Dual damascene by forming vias in the via-level dielectric prior to deposition of the trench-level dielectric

- 2221/1036 . . . . . Dual damascene with different via-level and trench-level dielectrics

- 2221/1042 . . . the dielectric comprising air gaps

- 2221/1047 . . . . the air gaps being formed by pores in the dielectric

- 2221/1052 . . . Formation of thin functional dielectric layers

- 2221/1057 . . . . in via holes or trenches

- 2221/1063 . . . . . Sacrificial or temporary thin dielectric films in openings in a dielectric

- 2221/1068 . . Formation and after-treatment of conductors

- 2221/1073 . . . Barrier, adhesion or liner layers

- 2221/1078 . . . . Multiple stacked thin films not being formed in openings in dielectrics

- 2221/1084 . . . . Layers specifically deposited to enhance or enable the nucleation of further layers, i.e. seed layers

- 2221/1089 . . . . . Stacks of seed layers

- 2221/1094 . . . Conducting structures comprising nanotubes or nanowires

- 2221/67 . Apparatus for handling semiconductor or electric solid state devices during manufacture or treatment thereof; Apparatus for handling wafers during manufacture or treatment of semiconductor or electric solid state devices or components; Apparatus not specifically provided for elsewhere



2221/683	. . .	for supporting or gripping	2223/54486	. . .	Located on package parts, e.g. encapsulation, leads, package substrate
2221/68304	. . .	using temporarily an auxiliary support	2223/54493	. . .	Peripheral marks on wafers, e.g. orientation flats, notches, lot number
2221/68309	. . .	Auxiliary support including alignment aids	2223/58	. . .	Structural electrical arrangements for semiconductor devices not otherwise provided for
2221/68313	. . .	Auxiliary support including a cavity for storing a finished device, e.g. IC package, or a partly finished device, e.g. die, during manufacturing or mounting	2223/64	. . .	Impedance arrangements
2221/68318	. . .	Auxiliary support including means facilitating the separation of a device or wafer from the auxiliary support	2223/66	. . .	High-frequency adaptations
2221/68322	. . .	Auxiliary support including means facilitating the selective separation of some of a plurality of devices from the auxiliary support	2223/6605	. . .	High-frequency electrical connections
2221/68327	. . .	used during dicing or grinding	2223/6611	. . .	Wire connections
2221/68331	. . .	of passive members, e.g. die mounting substrate	2223/6616	. . .	Vertical connections, e.g. vias
2221/68336	. . .	involving stretching of the auxiliary support post dicing	2223/6622	. . .	Coaxial feed-throughs in active or passive substrates
2221/6834	. . .	used to protect an active side of a device or wafer	2223/6627	. . .	Waveguides, e.g. microstrip line, strip line, coplanar line
2221/68345	. . .	used as a support during the manufacture of self supporting substrates	2223/6633	. . .	Transition between different waveguide types
2221/6835	. . .	used as a support during build up manufacturing of active devices	2223/6638	. . .	Differential pair signal lines
2221/68354	. . .	used to support diced chips prior to mounting	2223/6644	. . .	Packaging aspects of high-frequency amplifiers
2221/68359	. . .	used as a support during manufacture of interconnect decals or build up layers	2223/665	. . .	Bias feed arrangements
2221/68363	. . .	used in a transfer process involving transfer directly from an origin substrate to a target substrate without use of an intermediate handle substrate	2223/6655	. . .	Matching arrangements, e.g. arrangement of inductive and capacitive components
2221/68368	. . .	used in a transfer process involving at least two transfer steps, i.e. including an intermediate handle substrate	2223/6661	. . .	for passive devices
2221/68372	. . .	used to support a device or wafer when forming electrical connections thereto	2223/6666	. . .	for decoupling, e.g. bypass capacitors
2221/68377	. . .	with parts of the auxiliary support remaining in the finished device	2223/6672	. . .	for integrated passive components, e.g. semiconductor device with passive components only
2221/68381	. . .	Details of chemical or physical process used for separating the auxiliary support from a device or wafer	2223/6677	. . .	for antenna, e.g. antenna included within housing of semiconductor device
2221/68386	. . .	Separation by peeling	2223/6683	. . .	for monolithic microwave integrated circuit [MMIC]
2221/6839	. . .	using peeling wedge or knife or bar	2223/6688	. . .	Mixed frequency adaptations, i.e. for operation at different frequencies
2221/68395	. . .	using peeling wheel	2223/6694	. . .	Optical signal interface included within high-frequency semiconductor device housing
<b>2223/00</b>	<b>Details relating to semiconductor or other solid state devices covered by the group <a href="#">H01L 23/00</a></b>				
2223/544	. . .	Marks applied to semiconductor devices or parts	<b>2224/00</b>	<b>Indexing scheme for arrangements for connecting or disconnecting semiconductor or solid-state bodies and methods related thereto as covered by <a href="#">H01L 24/00</a></b>	
2223/54406	. . .	comprising alphanumeric information	2224/01	. . .	Means for bonding being attached to, or being formed on, the surface to be connected, e.g. chip-to-package, die-attach, "first-level" interconnects; Manufacturing methods related thereto
2223/54413	. . .	comprising digital information, e.g. bar codes, data matrix	2224/02	. . .	Bonding areas; Manufacturing methods related thereto
2223/5442	. . .	comprising non digital, non alphanumeric information, e.g. symbols	2224/0212	. . .	Auxiliary members for bonding areas, e.g. spacers
2223/54426	. . .	for alignment	2224/02122	. . .	being formed on the semiconductor or solid-state body
2223/54433	. . .	containing identification or tracking information	2224/02123	. . .	inside the bonding area
2223/5444	. . .	for electrical read out	2224/02125	. . .	Reinforcing structures
2223/54446	. . .	Wireless electrical read out	2224/02126	. . .	Collar structures
2223/54453	. . .	for use prior to dicing	2224/0213	. . .	Alignment aids
2223/5446	. . .	Located in scribe lines	2224/02135	. . .	Flow barrier
2223/54466	. . .	Located in a dummy or reference die	2224/0214	. . .	Structure of the auxiliary member
2223/54473	. . .	for use after dicing	2224/02141	. . .	Multilayer auxiliary member
2223/5448	. . .	Located on chip prior to dicing and remaining on chip after dicing	2224/02145	. . .	Shape of the auxiliary member
			2224/0215	. . .	Material of the auxiliary member
			2224/02163	. . .	on the bonding area
			2224/02165	. . .	Reinforcing structures
			2224/02166	. . .	Collar structures
			2224/0217	. . .	Alignment aids

2224/02175	. . . . .	Flow barrier	2224/03011	. . . . .	Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature
2224/0218	. . . . .	Structure of the auxiliary member	2224/03013	. . . . .	for holding or confining the bonding area, e.g. solder flow barrier
2224/02181	. . . . .	Multilayer auxiliary member	2224/03015	. . . . .	for aligning the bonding area, e.g. marks, spacers
2224/02185	. . . . .	Shape of the auxiliary member	2224/03019	. . . . .	for protecting parts during the process
2224/0219	. . . . .	Material of the auxiliary member	2224/031	. . . . .	Manufacture and pre-treatment of the bonding area preform
2224/022	. . . . .	Protective coating, i.e. protective bond-through coating	2224/0311	. . . . .	Shaping
2224/02205	. . . . .	Structure of the protective coating	2224/0312	. . . . .	Applying permanent coating
2224/02206	. . . . .	Multilayer protective coating	2224/033	. . . . .	by local deposition of the material of the bonding area
2224/0221	. . . . .	Shape of the protective coating	2224/0331	. . . . .	in liquid form
2224/02215	. . . . .	Material of the protective coating	2224/03312	. . . . .	Continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion
2224/02233	. . . . .	not in direct contact with the bonding area	2224/03318	. . . . .	by dispensing droplets
2224/02235	. . . . .	Reinforcing structures	2224/0332	. . . . .	Screen printing, i.e. using a stencil
2224/0224	. . . . .	Alignment aids	2224/0333	. . . . .	in solid form
2224/02245	. . . . .	Flow barrier	2224/03332	. . . . .	using a powder
2224/0225	. . . . .	Structure of the auxiliary member	2224/03334	. . . . .	using a preform
2224/02251	. . . . .	Multilayer auxiliary member	2224/034	. . . . .	by blanket deposition of the material of the bonding area
2224/02255	. . . . .	Shape of the auxiliary member	2224/0341	. . . . .	in liquid form
2224/0226	. . . . .	Material of the auxiliary member	2224/03416	. . . . .	Spin coating
2224/023	. . .	Redistribution layers [RDL] for bonding areas	2224/03418	. . . . .	Spray coating
2224/0231	. . . . .	Manufacturing methods of the redistribution layers	2224/0342	. . . . .	Curtain coating
2224/02311	. . . . .	Additive methods	2224/03422	. . . . .	by dipping, e.g. in a solder bath
2224/02313	. . . . .	Subtractive methods	2224/03424	. . . . .	Immersion coating, e.g. in a solder bath
2224/02315	. . . . .	Self-assembly processes	2224/03426	. . . . .	Chemical solution deposition [CSD], i.e. using a liquid precursor
2224/02317	. . . . .	by local deposition	2224/03428	. . . . .	Wave coating
2224/02319	. . . . .	by using a preform	2224/0343	. . . . .	in solid form
2224/02321	. . . . .	Reworking	2224/03436	. . . . .	Lamination of a preform, e.g. foil, sheet or layer
2224/0233	. . . . .	Structure of the redistribution layers	2224/03438	. . . . .	the preform being at least partly pre-patterned
2224/02331	. . . . .	Multilayer structure	2224/0344	. . . . .	by transfer printing
2224/02333	. . . . .	being a bump	2224/03442	. . . . .	using a powder
2224/02335	. . . . .	Free-standing redistribution layers	2224/03444	. . . . .	in gaseous form
2224/0235	. . . . .	Shape of the redistribution layers	2224/0345	. . . . .	Physical vapour deposition [PVD], e.g. evaporation, or sputtering
2224/02351	. . . . .	comprising interlocking features	2224/03452	. . . . .	Chemical vapour deposition [CVD], e.g. laser CVD
2224/0236	. . . . .	Shape of the insulating layers therebetween	2224/0346	. . . . .	Plating
2224/0237	. . . . .	Disposition of the redistribution layers	2224/03462	. . . . .	Electroplating
2224/02371	. . . . .	connecting the bonding area on a surface of the semiconductor or solid-state body with another surface of the semiconductor or solid-state body	2224/03464	. . . . .	Electroless plating
2224/02372	. . . . .	connecting to a via connection in the semiconductor or solid-state body	2224/03466	. . . . .	Conformal deposition, i.e. blanket deposition of a conformal layer on a patterned surface
2224/02373	. . . . .	Layout of the redistribution layers	2224/0347	. . . . .	using a lift-off mask
2224/02375	. . . . .	Top view	2224/03472	. . . . .	Profile of the lift-off mask
2224/02377	. . . . .	Fan-in arrangement	2224/03474	. . . . .	Multilayer masks
2224/02379	. . . . .	Fan-out arrangement	2224/0348	. . . . .	Permanent masks, i.e. masks left in the finished device, e.g. passivation layers
2224/02381	. . . . .	Side view	2224/035	. . . . .	by chemical or physical modification of a pre-existing or pre-deposited material
2224/0239	. . . . .	Material of the redistribution layers	2224/03502	. . . . .	Pre-existing or pre-deposited material
2224/024	. . . . .	Material of the insulating layers therebetween	2224/03505	. . . . .	Sintering
2224/03	. . .	Manufacturing methods	2224/0351	. . . . .	Anodisation
2224/03001	. . . . .	Involving a temporary auxiliary member not forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or substrate			
2224/03002	. . . . .	for supporting the semiconductor or solid-state body			
2224/03003	. . . . .	for holding or transferring a preform			
2224/03005	. . . . .	for aligning the bonding area, e.g. marks, spacers			
2224/03009	. . . . .	for protecting parts during manufacture			

2224/03515	. . . . .	Curing and solidification, e.g. of a photosensitive material	2224/03901	. . . . .	with repetition of the same manufacturing step
2224/0352	. . . . .	Self-assembly, e.g. self-agglomeration of the material in a fluid	2224/03902	. . . . .	Multiple masking steps
2224/03522	. . . . .	Auxiliary means therefor, e.g. for self-assembly activation	2224/03903	. . . . .	using different masks
2224/03524	. . . . .	with special adaptation of the surface of the body to be connected or of an auxiliary substrate, e.g. surface shape specially adapted for the self-assembly process	2224/03906	. . . . .	with modification of the same mask
2224/0355	. . . . .	Selective modification	2224/0391	. . . . .	Forming a passivation layer after forming the bonding area
2224/03552	. . . . .	using a laser or a focussed ion beam [FIB]	2224/03912	. . . . .	the bump being used as a mask for patterning the bonding area
2224/03554	. . . . .	Stereolithography, i.e. solidification of a pattern defined by a laser trace in a photosensitive resin	2224/03914	. . . . .	the bonding area, e.g. under bump metallisation [UBM], being used as a mask for patterning other parts
2224/036	. . . . .	by patterning a pre-deposited material	2224/03916	. . . . .	a passivation layer being used as a mask for patterning the bonding area
2224/03602	. . . . .	Mechanical treatment, e.g. polishing, grinding	2224/0392	. . . . .	specifically adapted to include a probing step
2224/0361	. . . . .	Physical or chemical etching	2224/03921	. . . . .	by repairing the bonding area damaged by the probing step
2224/03612	. . . . .	by physical means only	2224/04	. . . . .	Structure, shape, material or disposition of the bonding areas prior to the connecting process
2224/03614	. . . . .	by chemical means only	2224/0401	. . . . .	Bonding areas specifically adapted for bump connectors, e.g. under bump metallisation [UBM]
2224/03616	. . . . .	Chemical mechanical polishing [CMP]	2224/04026	. . . . .	Bonding areas specifically adapted for layer connectors
2224/03618	. . . . .	with selective exposure, development and removal of a photosensitive material, e.g. of a photosensitive conductive resin	2224/04034	. . . . .	Bonding areas specifically adapted for strap connectors
2224/0362	. . . . .	Photolithography	2224/04042	. . . . .	Bonding areas specifically adapted for wire connectors, e.g. wirebond pads
2224/03622	. . . . .	using masks	2224/0405	. . . . .	Bonding areas specifically adapted for tape automated bonding [TAB] connectors
2224/0363	. . . . .	using a laser or a focused ion beam [FIB]	2224/04073	. . . . .	Bonding areas specifically adapted for connectors of different types
2224/03632	. . . . .	Ablation by means of a laser or focused ion beam [FIB]	2224/04105	. . . . .	Bonding areas formed on an encapsulation of the semiconductor or solid-state body, e.g. bonding areas on chip-scale packages
2224/037	. . . . .	involving monitoring, e.g. feedback loop	2224/05	. . . . .	of an individual bonding area
2224/038	. . . . .	Post-treatment of the bonding area	2224/05001	. . . . .	Internal layers
2224/0381	. . . . .	Cleaning, e.g. oxide removal step, desmearing	2224/05005	. . . . .	Structure
2224/0382	. . . . .	Applying permanent coating, e.g. in-situ coating	2224/05006	. . . . .	Dual damascene structure
2224/03821	. . . . .	Spray coating	2224/05007	. . . . .	comprising a core and a coating
2224/03822	. . . . .	by dipping, e.g. in a solder bath	2224/05008	. . . . .	Bonding area integrally formed with a redistribution layer on the semiconductor or solid-state body, e.g.
2224/03823	. . . . .	Immersion coating, e.g. in a solder bath	2224/05009	. . . . .	Bonding area integrally formed with a via connection of the semiconductor or solid-state body
2224/03824	. . . . .	Chemical solution deposition [CSD], i.e. using a liquid precursor	2224/0501	. . . . .	Shape
2224/03825	. . . . .	Plating, e.g. electroplating, electroless plating	2224/05011	. . . . .	comprising apertures or cavities
2224/03826	. . . . .	Physical vapour deposition [PVD], e.g. evaporation, or sputtering	2224/05012	. . . . .	in top view
2224/03827	. . . . .	Chemical vapour deposition [CVD], e.g. laser CVD	2224/05013	. . . . .	being rectangular
2224/03828	. . . . .	Applying flux	2224/05014	. . . . .	being square
2224/03829	. . . . .	Applying a precursor material	2224/05015	. . . . .	being circular or elliptic
2224/0383	. . . . .	Reworking, e.g. shaping	2224/05016	. . . . .	in side view
2224/03831	. . . . .	involving a chemical process, e.g. etching the bonding area	2224/05017	. . . . .	comprising protrusions or indentations
2224/0384	. . . . .	involving a mechanical process, e.g. planarising the bonding area	2224/05018	. . . . .	being a conformal layer on a patterned surface
2224/03845	. . . . .	Chemical mechanical polishing [CMP]	2224/05019	. . . . .	being a non conformal layer on a patterned surface
2224/03848	. . . . .	Thermal treatments, e.g. annealing, controlled cooling	2224/0502	. . . . .	Disposition
2224/03849	. . . . .	Reflowing	2224/05022	. . . . .	the internal layer being at least partially embedded in the surface
2224/039	. . . . .	Methods of manufacturing bonding areas involving a specific sequence of method steps			

2224/05023	. . . . .	the whole internal layer protruding from the surface	2224/05114	. . . . .	Thallium [Tl] as principal constituent
2224/05024	. . . . .	the internal layer being disposed on a redistribution layer on the semiconductor or solid-state body	2224/05116	. . . . .	Lead [Pb] as principal constituent
2224/05025	. . . . .	the internal layer being disposed on a via connection of the semiconductor or solid-state body	2224/05117	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/05026	. . . . .	the internal layer being disposed in a recess of the surface	2224/05118	. . . . .	Zinc [Zn] as principal constituent
2224/05027	. . . . .	the internal layer extending out of an opening	2224/0512	. . . . .	Antimony [Sb] as principal constituent
2224/05073	. . . . .	Single internal layer	2224/05123	. . . . .	Magnesium [Mg] as principal constituent
2224/05075	. . . . .	Plural internal layers	2224/05124	. . . . .	Aluminium [Al] as principal constituent
2224/05076	. . . . .	being mutually engaged together, e.g. through inserts	2224/05138	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/05078	. . . . .	being disposed next to each other, e.g. side-to-side arrangements	2224/05139	. . . . .	Silver [Ag] as principal constituent
2224/0508	. . . . .	being stacked	2224/05144	. . . . .	Gold [Au] as principal constituent
2224/05082	. . . . .	Two-layer arrangements	2224/05147	. . . . .	Copper [Cu] as principal constituent
2224/05083	. . . . .	Three-layer arrangements	2224/05149	. . . . .	Manganese [Mn] as principal constituent
2224/05084	. . . . .	Four-layer arrangements	2224/05155	. . . . .	Nickel [Ni] as principal constituent
2224/05085	. . . . .	with additional elements, e.g. vias arrays, interposed between the stacked layers	2224/05157	. . . . .	Cobalt [Co] as principal constituent
2224/05086	. . . . .	Structure of the additional element	2224/0516	. . . . .	Iron [Fe] as principal constituent
2224/05087	. . . . .	being a via with at least a lining layer	2224/05163	. . . . .	the principal constituent melting at a temperature of greater than 1550°C
2224/05088	. . . . .	Shape of the additional element	2224/05164	. . . . .	Palladium [Pd] as principal constituent
2224/05089	. . . . .	Disposition of the additional element	2224/05166	. . . . .	Titanium [Ti] as principal constituent
2224/0509	. . . . .	of a single via	2224/05169	. . . . .	Platinum [Pt] as principal constituent
2224/05091	. . . . .	at the center of the internal layers	2224/0517	. . . . .	Zirconium [Zr] as principal constituent
2224/05092	. . . . .	at the periphery of the internal layers	2224/05171	. . . . .	Chromium [Cr] as principal constituent
2224/05093	. . . . .	of a plurality of vias	2224/05172	. . . . .	Vanadium [V] as principal constituent
2224/05094	. . . . .	at the center of the internal layers	2224/05173	. . . . .	Rhodium [Rh] as principal constituent
2224/05095	. . . . .	at the periphery of the internal layers	2224/05176	. . . . .	Ruthenium [Ru] as principal constituent
2224/05096	. . . . .	Uniform arrangement, i.e. array	2224/05178	. . . . .	Iridium [Ir] as principal constituent
2224/05097	. . . . .	Random arrangement	2224/05179	. . . . .	Niobium [Nb] as principal constituent
2224/05098	. . . . .	Material of the additional element	2224/0518	. . . . .	Molybdenum [Mo] as principal constituent
2224/05099	. . . . .	Material	2224/05181	. . . . .	Tantalum [Ta] as principal constituent
2224/051	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/05183	. . . . .	Rhenium [Re] as principal constituent
2224/05101	. . . . .	the principal constituent melting at a temperature of less than 400°C	2224/05184	. . . . .	Tungsten [W] as principal constituent
2224/05105	. . . . .	Gallium [Ga] as principal constituent	2224/05186	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/05109	. . . . .	Indium [In] as principal constituent			
2224/05111	. . . . .	Tin [Sn] as principal constituent			
2224/05113	. . . . .	Bismuth [Bi] as principal constituent			



2224/05187	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/05224	. . . . .	Aluminium [Al] as principal constituent
2224/05188	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/05238	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/0519	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/05239	. . . . .	Silver [Ag] as principal constituent
2224/05191	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/05244	. . . . .	Gold [Au] as principal constituent
2224/05193	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/051</a> - <a href="#">H01L 2224/05191</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/05247	. . . . .	Copper [Cu] as principal constituent
2224/05194	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/051</a> - <a href="#">H01L 2224/05191</a>	2224/05249	. . . . .	Manganese [Mn] as principal constituent
2224/05195	. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/051</a> - <a href="#">H01L 2224/05191</a>	2224/05255	. . . . .	Nickel [Ni] as principal constituent
2224/05198	. . . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/05257	. . . . .	Cobalt [Co] as principal constituent
2224/05199	. . . . .	Material of the matrix	2224/0526	. . . . .	Iron [Fe] as principal constituent
2224/052	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/05263	. . . . .	the principal constituent melting at a temperature of greater than 1550°C
2224/05201	. . . . .	the principal constituent melting at a temperature of less than 400°C	2224/05264	. . . . .	Palladium [Pd] as principal constituent
2224/05205	. . . . .	Gallium [Ga] as principal constituent	2224/05266	. . . . .	Titanium [Ti] as principal constituent
2224/05209	. . . . .	Indium [In] as principal constituent	2224/05269	. . . . .	Platinum [Pt] as principal constituent
2224/05211	. . . . .	Tin [Sn] as principal constituent	2224/0527	. . . . .	Zirconium [Zr] as principal constituent
2224/05213	. . . . .	Bismuth [Bi] as principal constituent	2224/05271	. . . . .	Chromium [Cr] as principal constituent
2224/05214	. . . . .	Thallium [Tl] as principal constituent	2224/05272	. . . . .	Vanadium [V] as principal constituent
2224/05216	. . . . .	Lead [Pb] as principal constituent	2224/05273	. . . . .	Rhodium [Rh] as principal constituent
2224/05217	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/05276	. . . . .	Ruthenium [Ru] as principal constituent
2224/05218	. . . . .	Zinc [Zn] as principal constituent	2224/05278	. . . . .	Iridium [Ir] as principal constituent
2224/0522	. . . . .	Antimony [Sb] as principal constituent	2224/05279	. . . . .	Niobium [Nb] as principal constituent
2224/05223	. . . . .	Magnesium [Mg] as principal constituent	2224/0528	. . . . .	Molybdenum [Mo] as principal constituent
			2224/05281	. . . . .	Tantalum [Ta] as principal constituent
			2224/05283	. . . . .	Rhenium [Re] as principal constituent
			2224/05284	. . . . .	Tungsten [W] as principal constituent
			2224/05286	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
			2224/05287	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
			2224/05288	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
			2224/0529	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy

2224/05291	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/05349	. . . . .	Manganese [Mn] as principal constituent
2224/05293	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/052</a> - <a href="#">H01L 2224/05291</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/05355	. . . . .	Nickel [Ni] as principal constituent
2224/05294	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/052</a> - <a href="#">H01L 2224/05291</a>	2224/05357	. . . . .	Cobalt [Co] as principal constituent
2224/05295	. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/052</a> - <a href="#">H01L 2224/05291</a>	2224/0536	. . . . .	Iron [Fe] as principal constituent
2224/05298	. . . . .	Fillers	2224/05363	. . . . .	the principal constituent melting at a temperature of greater than 1550°C
2224/05299	. . . . .	Base material	2224/05364	. . . . .	Palladium [Pd] as principal constituent
2224/053	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/05366	. . . . .	Titanium [Ti] as principal constituent
2224/05301	. . . . .	the principal constituent melting at a temperature of less than 400°C	2224/05369	. . . . .	Platinum [Pt] as principal constituent
2224/05305	. . . . .	Gallium [Ga] as principal constituent	2224/0537	. . . . .	Zirconium [Zr] as principal constituent
2224/05309	. . . . .	Indium [In] as principal constituent	2224/05371	. . . . .	Chromium [Cr] as principal constituent
2224/05311	. . . . .	Tin [Sn] as principal constituent	2224/05372	. . . . .	Vanadium [V] as principal constituent
2224/05313	. . . . .	Bismuth [Bi] as principal constituent	2224/05373	. . . . .	Rhodium [Rh] as principal constituent
2224/05314	. . . . .	Thallium [Tl] as principal constituent	2224/05376	. . . . .	Ruthenium [Ru] as principal constituent
2224/05316	. . . . .	Lead [Pb] as principal constituent	2224/05378	. . . . .	Iridium [Ir] as principal constituent
2224/05317	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/05379	. . . . .	Niobium [Nb] as principal constituent
2224/05318	. . . . .	Zinc [Zn] as principal constituent	2224/0538	. . . . .	Molybdenum [Mo] as principal constituent
2224/0532	. . . . .	Antimony [Sb] as principal constituent	2224/05381	. . . . .	Tantalum [Ta] as principal constituent
2224/05323	. . . . .	Magnesium [Mg] as principal constituent	2224/05383	. . . . .	Rhenium [Re] as principal constituent
2224/05324	. . . . .	Aluminium [Al] as principal constituent	2224/05384	. . . . .	Tungsten [W] as principal constituent
2224/05338	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/05386	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/05339	. . . . .	Silver [Ag] as principal constituent	2224/05387	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/05344	. . . . .	Gold [Au] as principal constituent	2224/05388	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/05347	. . . . .	Copper [Cu] as principal constituent	2224/0539	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
			2224/05391	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
			2224/05393	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/053</a> - <a href="#">H01L 2224/05391</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
			2224/05394	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/053</a> - <a href="#">H01L 2224/05391</a>

2224/05395	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/053</a> - <a href="#">H01L 2224/05391</a>	2224/05463	the principal constituent melting at a temperature of greater than 1550°C
2224/05398	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/05464	Palladium [Pd] as principal constituent
2224/05399	Coating material	2224/05466	Titanium [Ti] as principal constituent
2224/054	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/05469	Platinum [Pt] as principal constituent
2224/05401	the principal constituent melting at a temperature of less than 400°C	2224/0547	Zirconium [Zr] as principal constituent
2224/05405	Gallium [Ga] as principal constituent	2224/05471	Chromium [Cr] as principal constituent
2224/05409	Indium [In] as principal constituent	2224/05472	Vanadium [V] as principal constituent
2224/05411	Tin [Sn] as principal constituent	2224/05473	Rhodium [Rh] as principal constituent
2224/05413	Bismuth [Bi] as principal constituent	2224/05476	Ruthenium [Ru] as principal constituent
2224/05414	Thallium [Tl] as principal constituent	2224/05478	Iridium [Ir] as principal constituent
2224/05416	Lead [Pb] as principal constituent	2224/05479	Niobium [Nb] as principal constituent
2224/05417	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/0548	Molybdenum [Mo] as principal constituent
2224/05418	Zinc [Zn] as principal constituent	2224/05481	Tantalum [Ta] as principal constituent
2224/0542	Antimony [Sb] as principal constituent	2224/05483	Rhenium [Re] as principal constituent
2224/05423	Magnesium [Mg] as principal constituent	2224/05484	Tungsten [W] as principal constituent
2224/05424	Aluminium [Al] as principal constituent	2224/05486	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/05438	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/05487	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/05439	Silver [Ag] as principal constituent	2224/05488	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/05444	Gold [Au] as principal constituent	2224/0549	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/05447	Copper [Cu] as principal constituent	2224/05491	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/05449	Manganese [Mn] as principal constituent	2224/05493	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/054</a> - <a href="#">H01L 2224/05491</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/05455	Nickel [Ni] as principal constituent	2224/05494	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/054</a> - <a href="#">H01L 2224/05491</a>
2224/05457	Cobalt [Co] as principal constituent	2224/05495	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/054</a> - <a href="#">H01L 2224/05491</a>
2224/0546	Iron [Fe] as principal constituent		

2224/05498	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/05584	Four-layer coating
2224/05499	Shape or distribution of the fillers	2224/05599	Material
2224/0554	External layer	2224/056	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/05541	Structure	2224/05601	the principal constituent melting at a temperature of less than 400°C
2224/05546	Dual damascene structure	2224/05605	Gallium [Ga] as principal constituent
2224/05547	comprising a core and a coating	2224/05609	Indium [In] as principal constituent
2224/05548	Bonding area integrally formed with a redistribution layer on the semiconductor or solid-state body	2224/05611	Tin [Sn] as principal constituent
2224/0555	Shape	2224/05613	Bismuth [Bi] as principal constituent
2224/05551	comprising apertures or cavities	2224/05614	Thallium [Tl] as principal constituent
2224/05552	in top view	2224/05616	Lead [Pb] as principal constituent
2224/05553	being rectangular	2224/05617	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/05554	being square	2224/05618	Zinc [Zn] as principal constituent
2224/05555	being circular or elliptic	2224/0562	Antimony [Sb] as principal constituent
2224/05556	in side view	2224/05623	Magnesium [Mg] as principal constituent
2224/05557	comprising protrusions or indentations	2224/05624	Aluminium [Al] as principal constituent
2224/05558	conformal layer on a patterned surface	2224/05638	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/05559	non conformal layer on a patterned surface	2224/05639	Silver [Ag] as principal constituent
2224/0556	Disposition	2224/05644	Gold [Au] as principal constituent
2224/05561	On the entire surface of the internal layer	2224/05647	Copper [Cu] as principal constituent
2224/05562	On the entire exposed surface of the internal layer	2224/05649	Manganese [Mn] as principal constituent
2224/05563	Only on parts of the surface of the internal layer	2224/05655	Nickel [Ni] as principal constituent
2224/05564	Only on the bonding interface of the bonding area	2224/05657	Cobalt [Co] as principal constituent
2224/05565	Only outside the bonding interface of the bonding area	2224/0566	Iron [Fe] as principal constituent
2224/05566	Both on and outside the bonding interface of the bonding area	2224/05663	the principal constituent melting at a temperature of greater than 1550°C
2224/05567	the external layer being at least partially embedded in the surface	2224/05664	Palladium [Pd] as principal constituent
2224/05568	the whole external layer protruding from the surface	2224/05666	Titanium [Ti] as principal constituent
2224/05569	the external layer being disposed on a redistribution layer on the semiconductor or solid-state body	2224/05669	Platinum [Pt] as principal constituent
2224/0557	the external layer being disposed on a via connection of the semiconductor or solid-state body	2224/0567	Zirconium [Zr] as principal constituent
2224/05571	the external layer being disposed in a recess of the surface	2224/05671	Chromium [Cr] as principal constituent
2224/05572	the external layer extending out of an opening	2224/05672	Vanadium [V] as principal constituent
2224/05573	Single external layer	2224/05673	Rhodium [Rh] as principal constituent
2224/05575	Plural external layers		
2224/05576	being mutually engaged together, e.g. through inserts		
2224/05578	being disposed next to each other, e.g. side-to-side arrangements		
2224/0558	being stacked		
2224/05582	Two-layer coating		
2224/05583	Three-layer coating		



2224/05676	Ruthenium [Ru] as principal constituent	2224/05713	Bismuth [Bi] as principal constituent
2224/05678	Iridium [Ir] as principal constituent	2224/05714	Thallium [Tl] as principal constituent
2224/05679	Niobium [Nb] as principal constituent	2224/05716	Lead [Pb] as principal constituent
2224/0568	Molybdenum [Mo] as principal constituent	2224/05717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/05681	Tantalum [Ta] as principal constituent	2224/05718	Zinc [Zn] as principal constituent
2224/05683	Rhenium [Re] as principal constituent	2224/0572	Antimony [Sb] as principal constituent
2224/05684	Tungsten [W] as principal constituent	2224/05723	Magnesium [Mg] as principal constituent
2224/05686	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/05724	Aluminium [Al] as principal constituent
2224/05687	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/05738	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/05688	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/05739	Silver [Ag] as principal constituent
2224/0569	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/05744	Gold [Au] as principal constituent
2224/05691	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/05747	Copper [Cu] as principal constituent
2224/05693	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/056</a> - <a href="#">H01L 2224/05691</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/05749	Manganese [Mn] as principal constituent
2224/05694	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/056</a> - <a href="#">H01L 2224/05691</a>	2224/05755	Nickel [Ni] as principal constituent
2224/05695	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/056</a> - <a href="#">H01L 2224/05691</a>	2224/05757	Cobalt [Co] as principal constituent
2224/05698	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/0576	Iron [Fe] as principal constituent
2224/05699	Material of the matrix	2224/05763	the principal constituent melting at a temperature of greater than 1550°C
2224/057	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/05764	Palladium [Pd] as principal constituent
2224/05701	the principal constituent melting at a temperature of less than 400°C	2224/05766	Titanium [Ti] as principal constituent
2224/05705	Gallium [Ga] as principal constituent	2224/05769	Platinum [Pt] as principal constituent
2224/05709	Indium [In] as principal constituent	2224/0577	Zirconium [Zr] as principal constituent
2224/05711	Tin [Sn] as principal constituent	2224/05771	Chromium [Cr] as principal constituent
		2224/05772	Vanadium [V] as principal constituent
		2224/05773	Rhodium [Rh] as principal constituent
		2224/05776	Ruthenium [Ru] as principal constituent
		2224/05778	Iridium [Ir] as principal constituent
		2224/05779	Niobium [Nb] as principal constituent
		2224/0578	Molybdenum [Mo] as principal constituent
		2224/05781	Tantalum [Ta] as principal constituent

2224/05783	Rhenium [Re] as principal constituent	2224/05823	Magnesium [Mg] as principal constituent
2224/05784	Tungsten [W] as principal constituent	2224/05824	Aluminium [Al] as principal constituent
2224/05786	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/05838	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/05787	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/05839	Silver [Ag] as principal constituent
2224/05788	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/05844	Gold [Au] as principal constituent
2224/0579	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/05847	Copper [Cu] as principal constituent
2224/05791	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/05849	Manganese [Mn] as principal constituent
2224/05793	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/057</a> - <a href="#">H01L 2224/05791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/05855	Nickel [Ni] as principal constituent
2224/05794	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/057</a> - <a href="#">H01L 2224/05791</a>	2224/05857	Cobalt [Co] as principal constituent
2224/05795	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/057</a> - <a href="#">H01L 2224/05791</a>	2224/0586	Iron [Fe] as principal constituent
2224/05798	Fillers	2224/05863	the principal constituent melting at a temperature of greater than 1550°C
2224/05799	Base material	2224/05864	Palladium [Pd] as principal constituent
2224/058	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/05866	Titanium [Ti] as principal constituent
2224/05801	the principal constituent melting at a temperature of less than 400°C	2224/05869	Platinum [Pt] as principal constituent
2224/05805	Gallium [Ga] as principal constituent	2224/0587	Zirconium [Zr] as principal constituent
2224/05809	Indium [In] as principal constituent	2224/05871	Chromium [Cr] as principal constituent
2224/05811	Tin [Sn] as principal constituent	2224/05872	Vanadium [V] as principal constituent
2224/05813	Bismuth [Bi] as principal constituent	2224/05873	Rhodium [Rh] as principal constituent
2224/05814	Thallium [Tl] as principal constituent	2224/05876	Ruthenium [Ru] as principal constituent
2224/05816	Lead [Pb] as principal constituent	2224/05878	Iridium [Ir] as principal constituent
2224/05817	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/05879	Niobium [Nb] as principal constituent
2224/05818	Zinc [Zn] as principal constituent	2224/0588	Molybdenum [Mo] as principal constituent
2224/0582	Antimony [Sb] as principal constituent	2224/05881	Tantalum [Ta] as principal constituent
		2224/05883	Rhenium [Re] as principal constituent
		2224/05884	Tungsten [W] as principal constituent
		2224/05886	with a principal constituent of the material being a non metallic, non metalloid inorganic material
		2224/05887	Ceramics, e.g. crystalline carbides, nitrides or oxides
		2224/05888	Glasses, e.g. amorphous oxides, nitrides or fluorides

2224/0589	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/05938	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/05891	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/05939	Silver [Ag] as principal constituent
2224/05893	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/058</a> - <a href="#">H01L 2224/05891</a>	2224/05944	Gold [Au] as principal constituent
	e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/05947	Copper [Cu] as principal constituent
2224/05894	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/058</a> - <a href="#">H01L 2224/05891</a>	2224/05949	Manganese [Mn] as principal constituent
2224/05895	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/058</a> - <a href="#">H01L 2224/05891</a>	2224/05955	Nickel [Ni] as principal constituent
2224/05898	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/05957	Cobalt [Co] as principal constituent
2224/05899	Coating material	2224/0596	Iron [Fe] as principal constituent
2224/059	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/05963	the principal constituent melting at a temperature of greater than 1550°C
2224/05901	the principal constituent melting at a temperature of less than 400°C	2224/05964	Palladium [Pd] as principal constituent
2224/05905	Gallium [Ga] as principal constituent	2224/05966	Titanium [Ti] as principal constituent
2224/05909	Indium [In] as principal constituent	2224/05969	Platinum [Pt] as principal constituent
2224/05911	Tin [Sn] as principal constituent	2224/0597	Zirconium [Zr] as principal constituent
2224/05913	Bismuth [Bi] as principal constituent	2224/05971	Chromium [Cr] as principal constituent
2224/05914	Thallium [Tl] as principal constituent	2224/05972	Vanadium [V] as principal constituent
2224/05916	Lead [Pb] as principal constituent	2224/05973	Rhodium [Rh] as principal constituent
2224/05917	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/05976	Ruthenium [Ru] as principal constituent
2224/05918	Zinc [Zn] as principal constituent	2224/05978	Iridium [Ir] as principal constituent
2224/0592	Antimony [Sb] as principal constituent	2224/05979	Niobium [Nb] as principal constituent
2224/05923	Magnesium [Mg] as principal constituent	2224/0598	Molybdenum [Mo] as principal constituent
2224/05924	Aluminium [Al] as principal constituent	2224/05981	Tantalum [Ta] as principal constituent
		2224/05983	Rhenium [Re] as principal constituent
		2224/05984	Tungsten [W] as principal constituent
		2224/05986	with a principal constituent of the material being a non metallic, non metalloid inorganic material
		2224/05987	Ceramics, e.g. crystalline carbides, nitrides or oxides
		2224/05988	Glasses, e.g. amorphous oxides, nitrides or fluorides
		2224/0599	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
		2224/05991	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene

2224/05993	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/059</a> - <a href="#">H01L 2224/05991</a> e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/06145	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/05994	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/059</a> - <a href="#">H01L 2224/05991</a>	2224/06146	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/05995	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/059</a> - <a href="#">H01L 2224/05991</a>	2224/06147	with specially adapted redistribution layers [RDL]
2224/05998	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/06148	being disposed in a single wiring level, i.e. planar layout
2224/05999	Shape or distribution of the fillers	2224/06149	being disposed in different wiring levels, i.e. resurf layout
2224/06	of a plurality of bonding areas	2224/0615	Mirror array, i.e. array having only a reflection symmetry, i.e. bilateral symmetry
2224/0601	Structure	2224/06151	being uniform, i.e. having a uniform pitch across the array
2224/0603	Bonding areas having different sizes, e.g. different heights or widths	2224/06152	being non uniform, i.e. having a non uniform pitch across the array
2224/0605	Shape	2224/06153	with a staggered arrangement, e.g. depopulated array
2224/06051	Bonding areas having different shapes	2224/06154	covering only portions of the surface to be connected
2224/061	Disposition	2224/06155	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/06102	the bonding areas being at different heights	2224/06156	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/0612	Layout	2224/06157	with specially adapted redistribution layers [RDL]
2224/0613	Square or rectangular array	2224/06158	being disposed in a single wiring level, i.e. planar layout
2224/06131	being uniform, i.e. having a uniform pitch across the array	2224/06159	being disposed in different wiring levels, i.e. resurf layout
2224/06132	being non uniform, i.e. having a non uniform pitch across the array	2224/0616	Random array, i.e. array with no symmetry
2224/06133	with a staggered arrangement, e.g. depopulated array	2224/06163	with a staggered arrangement
2224/06134	covering only portions of the surface to be connected	2224/06164	covering only portions of the surface to be connected
2224/06135	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements	2224/06165	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/06136	Covering only the central area of the surface to be connected, i.e. central arrangements	2224/06166	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/06137	with specially adapted redistribution layers [RDL]	2224/06167	with specially adapted redistribution layers [RDL]
2224/06138	being disposed in a single wiring level, i.e. planar layout	2224/06168	being disposed in a single wiring level, i.e. planar layout
2224/06139	being disposed in different wiring levels, i.e. resurf layout	2224/06169	being disposed in different wiring levels, i.e. resurf layout
2224/0614	Circular array, i.e. array with radial symmetry	2224/06177	Combinations of arrays with different layouts
2224/06141	being uniform, i.e. having a uniform pitch across the array	2224/06179	Corner adaptations, i.e. disposition of the bonding areas at the corners of the semiconductor or solid-state body
2224/06142	being non uniform, i.e. having a non uniform pitch across the array	2224/0618	being disposed on at least two different sides of the body, e.g. dual array
2224/06143	with a staggered arrangement, e.g. depopulated array	2224/06181	On opposite sides of the body
2224/06144	covering only portions of the surface to be connected	2224/06182	with specially adapted redistribution layers [RDL]
		2224/06183	On contiguous sides of the body



2224/06187	. . . . .	with specially adapted redistribution layers [RDL]	2224/08151	. . . . .	the bonding area connecting between a semiconductor or solid-state body and an item not being a semiconductor or solid-state body, e.g. chip-to-substrate, chip-to-passive
2224/06188	. . . . .	being disposed in a single wiring level, i.e. planar layout	2224/08153	. . . . .	the body and the item being arranged next to each other, e.g. on a common substrate
2224/06189	. . . . .	being disposed in different wiring levels, i.e. resurf layout	2224/08155	. . . . .	the item being non-metallic, e.g. being an insulating substrate with or without metallisation
2224/065	. . . . .	Material	2224/0816	. . . . .	the bonding area connecting to a pin of the item
2224/06505	. . . . .	Bonding areas having different materials	2224/08163	. . . . .	the bonding area connecting to a potential ring of the item
2224/0651	. . . . .	Function	2224/08165	. . . . .	the bonding area connecting to a via metallisation of the item
2224/06515	. . . . .	Bonding areas having different functions	2224/08167	. . . . .	the bonding area connecting to a bonding area disposed in a recess of the surface of the item
2224/06517	. . . . .	including bonding areas providing primarily mechanical bonding	2224/08168	. . . . .	the bonding area connecting to a bonding area protruding from the surface of the item
2224/06519	. . . . .	including bonding areas providing primarily thermal dissipation	2224/08175	. . . . .	the item being metallic
2224/07	. . .	Structure, shape, material or disposition of the bonding areas after the connecting process	2224/08183	. . . . .	the bonding area connecting to a potential ring of the item
2224/08	. . . . .	of an individual bonding area	2224/08187	. . . . .	the bonding area connecting to a bonding area disposed in a recess of the surface of the item
2224/0801	. . . . .	Structure	2224/08188	. . . . .	the bonding area connecting to a bonding area protruding from the surface of the item
2224/0805	. . . . .	Shape	2224/08195	. . . . .	the item being a discrete passive component
2224/08052	. . . . .	in top view	2224/08197	. . . . .	the bonding area connecting to a bonding area disposed in a recess of the surface of the item
2224/08053	. . . . .	being non uniform along the bonding area	2224/08198	. . . . .	the bonding area connecting to a bonding area protruding from the surface of the item
2224/08054	. . . . .	being rectangular	2224/08221	. . . . .	the body and the item being stacked
2224/08055	. . . . .	being square	2224/08225	. . . . .	the item being non-metallic, e.g. insulating substrate with or without metallisation
2224/08056	. . . . .	being circular or elliptic	2224/0823	. . . . .	the bonding area connecting to a pin of the item
2224/08057	. . . . .	in side view	2224/08233	. . . . .	the bonding area connecting to a potential ring of the item
2224/08058	. . . . .	being non uniform along the bonding area	2224/08235	. . . . .	the bonding area connecting to a via metallisation of the item
2224/08059	. . . . .	comprising protrusions or indentations	2224/08237	. . . . .	the bonding area connecting to a bonding area disposed in a recess of the surface of the item
2224/0807	. . . . .	of bonding interfaces, e.g. interlocking features	2224/08238	. . . . .	the bonding area connecting to a bonding area protruding from the surface of the item
2224/081	. . . . .	Disposition	2224/08245	. . . . .	the item being metallic
2224/08111	. . . . .	the bonding area being disposed in a recess of the surface of the body	2224/08253	. . . . .	the bonding area connecting to a potential ring of the item
2224/08112	. . . . .	the bonding area being at least partially embedded in the surface of the body			
2224/08113	. . . . .	the whole bonding area protruding from the surface of the body			
2224/0812	. . . . .	the bonding area connecting directly to another bonding area, i.e. connectorless bonding, e.g. bumpless bonding			
2224/08121	. . . . .	the connected bonding areas being not aligned with respect to each other			
2224/08123	. . . . .	the bonding area connecting directly to at least two bonding areas			
2224/08135	. . . . .	the bonding area connecting between different semiconductor or solid-state bodies, i.e. chip-to-chip			
2224/08137	. . . . .	the bodies being arranged next to each other, e.g. on a common substrate			
2224/08145	. . . . .	the bodies being stacked			
2224/08146	. . . . .	the bonding area connecting to a via connection in the body			
2224/08147	. . . . .	the bonding area connecting to a bonding area disposed in a recess of the surface of the body			
2224/08148	. . . . .	the bonding area connecting to a bonding area protruding from the surface of the body			

2224/08257	. . . . .	the bonding area connecting to a bonding area disposed in a recess of the surface of the item	2224/09152	. . . . .	being non uniform, i.e. having a non uniform pitch across the array
2224/08258	. . . . .	the bonding area connecting to a bonding area protruding from the surface of the item	2224/09153	. . . . .	with a staggered arrangement, e.g. depopulated array
2224/08265	. . . . .	the item being a discrete passive component	2224/09154	. . . . .	covering only portions of the surface to be connected
2224/08267	. . . . .	the bonding area connecting to a bonding area disposed in a recess of the surface of the item	2224/09155	. . . . .	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/08268	. . . . .	the bonding area connecting to a bonding area protruding from the surface of the item	2224/09156	. . . . .	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/085	. . . . .	Material	2224/0916	. . . . .	Random array, i.e. array with no symmetry
2224/08501	. . . . .	at the bonding interface	2224/09163	. . . . .	with a staggered arrangement
2224/08502	. . . . .	comprising an eutectic alloy	2224/09164	. . . . .	covering only portions of the surface to be connected
2224/08503	. . . . .	comprising an intermetallic compound	2224/09165	. . . . .	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/08505	. . . . .	outside the bonding interface	2224/09177	. . . . .	Combinations of arrays with different layouts
2224/08506	. . . . .	comprising an eutectic alloy	2224/09179	. . . . .	Corner adaptations, i.e. disposition of the bonding areas at the corners of the semiconductor or solid-state body
2224/09	. . . . .	of a plurality of bonding areas	2224/0918	. . . . .	being disposed on at least two different sides of the body, e.g. dual array
2224/0901	. . . . .	Structure	2224/09181	. . . . .	On opposite sides of the body
2224/0903	. . . . .	Bonding areas having different sizes, e.g. different diameters, heights or widths	2224/09183	. . . . .	On contiguous sides of the body
2224/0905	. . . . .	Shape	2224/095	. . . . .	Material
2224/09051	. . . . .	Bonding areas having different shapes	2224/09505	. . . . .	Bonding areas having different materials
2224/09055	. . . . .	of their bonding interfaces	2224/0951	. . . . .	Function
2224/091	. . . . .	Disposition	2224/09515	. . . . .	Bonding areas having different functions
2224/09102	. . . . .	the bonding areas being at different heights	2224/09517	. . . . .	including bonding areas providing primarily mechanical support
2224/09103	. . . . .	on the semiconductor or solid-state body	2224/09519	. . . . .	including bonding areas providing primarily thermal dissipation
2224/09104	. . . . .	outside the semiconductor or solid-state body	2224/10	. . . . .	Bump connectors; Manufacturing methods related thereto
2224/0912	. . . . .	Layout	2224/1012	. . . . .	Auxiliary members for bump connectors, e.g. spacers
2224/0913	. . . . .	Square or rectangular array	2224/10122	. . . . .	being formed on the semiconductor or solid-state body to be connected
2224/09132	. . . . .	being non uniform, i.e. having a non uniform pitch across the array	2224/10125	. . . . .	Reinforcing structures
2224/09133	. . . . .	with a staggered arrangement, e.g. depopulated array	2224/10126	. . . . .	Bump collar
2224/09134	. . . . .	covering only portions of the surface to be connected	2224/10135	. . . . .	Alignment aids
2224/09135	. . . . .	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements	2224/10145	. . . . .	Flow barriers
2224/0914	. . . . .	Circular array, i.e. array with radial symmetry	2224/10152	. . . . .	being formed on an item to be connected not being a semiconductor or solid-state body
2224/09142	. . . . .	being non uniform, i.e. having a non uniform pitch across the array	2224/10155	. . . . .	Reinforcing structures
2224/09143	. . . . .	with a staggered arrangement	2224/10156	. . . . .	Bump collar
2224/09144	. . . . .	covering only portions of the surface to be connected	2224/10165	. . . . .	Alignment aids
2224/09145	. . . . .	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements	2224/10175	. . . . .	Flow barriers
2224/0915	. . . . .	Mirror array, i.e. array having only a reflection symmetry, i.e. bilateral symmetry	2224/11	. . . . .	Manufacturing methods
2224/09151	. . . . .	being uniform, i.e. having a uniform pitch across the array	2224/11001	. . . . .	Involving a temporary auxiliary member not forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or substrate
			2224/11002	. . . . .	for supporting the semiconductor or solid-state body
			2224/11003	. . . . .	for holding or transferring the bump preform

2224/11005	. . . . .	for aligning the bump connector, e.g. marks, spacers	2224/115	. . . . .	by chemical or physical modification of a pre-existing or pre-deposited material
2224/11009	. . . . .	for protecting parts during manufacture	2224/11502	. . . . .	Pre-existing or pre-deposited material
2224/11011	. . . . .	Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature	2224/11505	. . . . .	Sintering
2224/11013	. . . . .	for holding or confining the bump connector, e.g. solder flow barrier	2224/1151	. . . . .	Anodisation
2224/11015	. . . . .	for aligning the bump connector, e.g. marks, spacers	2224/11515	. . . . .	Curing and solidification, e.g. of a photosensitive bump material
2224/11019	. . . . .	for protecting parts during the process	2224/1152	. . . . .	Self-assembly, e.g. self-agglomeration of the bump material in a fluid
2224/111	. . . . .	Manufacture and pre-treatment of the bump connector preform	2224/11522	. . . . .	Auxiliary means therefor, e.g. for self-assembly activation
2224/1111	. . . . .	Shaping	2224/11524	. . . . .	with special adaptation of the surface or of an auxiliary substrate, e.g. surface shape specially adapted for the self-assembly process
2224/1112	. . . . .	Applying permanent coating	2224/11526	. . . . .	involving the material of the bonding area, e.g. bonding pad or under bump metallisation [UBM]
2224/113	. . . . .	by local deposition of the material of the bump connector	2224/1155	. . . . .	Selective modification
2224/1131	. . . . .	in liquid form	2224/11552	. . . . .	using a laser or a focussed ion beam [FIB]
2224/11312	. . . . .	Continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion	2224/11554	. . . . .	Stereolithography, i.e. solidification of a pattern defined by a laser trace in a photosensitive resin
2224/11318	. . . . .	by dispensing droplets	2224/116	. . . . .	by patterning a pre-deposited material
2224/1132	. . . . .	Screen printing, i.e. using a stencil	2224/11602	. . . . .	Mechanical treatment, e.g. polishing, grinding
2224/1133	. . . . .	in solid form	2224/1161	. . . . .	Physical or chemical etching
2224/11332	. . . . .	using a powder	2224/11612	. . . . .	by physical means only
2224/11334	. . . . .	using preformed bumps	2224/11614	. . . . .	by chemical means only
2224/1134	. . . . .	Stud bumping, i.e. using a wire-bonding apparatus	2224/11616	. . . . .	Chemical mechanical polishing [CMP]
2224/114	. . . . .	by blanket deposition of the material of the bump connector	2224/11618	. . . . .	with selective exposure, development and removal of a photosensitive bump material, e.g. of a photosensitive conductive resin
2224/1141	. . . . .	in liquid form	2224/1162	. . . . .	using masks
2224/11416	. . . . .	Spin coating	2224/11622	. . . . .	Photolithography
2224/11418	. . . . .	Spray coating	2224/1163	. . . . .	using a laser or a focused ion beam [FIB]
2224/1142	. . . . .	Curtain coating	2224/11632	. . . . .	Ablation by means of a laser or focused ion beam [FIB]
2224/11422	. . . . .	by dipping, e.g. in a solder bath	2224/117	. . . . .	involving monitoring, e.g. feedback loop
2224/11424	. . . . .	Immersion coating, e.g. in a solder bath	2224/118	. . . . .	Post-treatment of the bump connector
2224/11426	. . . . .	Chemical solution deposition [CSD], i.e. using a liquid precursor	2224/1181	. . . . .	Cleaning, e.g. oxide removal step, desmearing
2224/11428	. . . . .	Wave coating	2224/1182	. . . . .	Applying permanent coating, e.g. in-situ coating
2224/1143	. . . . .	in solid form	2224/11821	. . . . .	Spray coating
2224/11436	. . . . .	Lamination of a preform, e.g. foil, sheet or layer	2224/11822	. . . . .	by dipping, e.g. in a solder bath
2224/11438	. . . . .	the preform being at least partly pre-patterned	2224/11823	. . . . .	Immersion coating, e.g. in a solder bath
2224/1144	. . . . .	by transfer printing	2224/11824	. . . . .	Chemical solution deposition [CSD], i.e. using a liquid precursor
2224/11442	. . . . .	using a powder	2224/11825	. . . . .	Plating, e.g. electroplating, electroless plating
2224/11444	. . . . .	in gaseous form	2224/11826	. . . . .	Physical vapour deposition [PVD], e.g. evaporation, or sputtering
2224/1145	. . . . .	Physical vapour deposition [PVD], e.g. evaporation, or sputtering	2224/11827	. . . . .	Chemical vapour deposition [CVD], e.g. laser CVD
2224/11452	. . . . .	Chemical vapour deposition [CVD], e.g. laser CVD	2224/1183	. . . . .	Reworking, e.g. shaping
2224/1146	. . . . .	Plating	2224/11831	. . . . .	involving a chemical process, e.g. etching the bump connector
2224/11462	. . . . .	Electroplating	2224/1184	. . . . .	involving a mechanical process, e.g. planarising the bump connector
2224/11464	. . . . .	Electroless plating	2224/11845	. . . . .	Chemical mechanical polishing [CMP]
2224/11466	. . . . .	Conformal deposition, i.e. blanket deposition of a conformal layer on a patterned surface			
2224/1147	. . . . .	using a lift-off mask			
2224/11472	. . . . .	Profile of the lift-off mask			
2224/11474	. . . . .	Multilayer masks			
2224/1148	. . . . .	Permanent masks, i.e. masks left in the finished device, e.g. passivation layers			

2224/11848	. . . . .	Thermal treatments, e.g. annealing, controlled cooling	2224/13023	. . . . .	the whole bump connector protruding from the surface
2224/11849	. . . . .	Reflowing	2224/13024	. . . . .	the bump connector being disposed on a redistribution layer on the semiconductor or solid-state body
2224/119	. . . . .	Methods of manufacturing bump connectors involving a specific sequence of method steps	2224/13025	. . . . .	the bump connector being disposed on a via connection of the semiconductor or solid-state body
2224/11901	. . . . .	with repetition of the same manufacturing step	2224/13026	. . . . .	relative to the bonding area, e.g. bond pad, of the semiconductor or solid-state body
2224/11902	. . . . .	Multiple masking steps	2224/13027	. . . . .	the bump connector being offset with respect to the bonding area, e.g. bond pad
2224/11903	. . . . .	using different masks	2224/13028	. . . . .	the bump connector being disposed on at least two separate bonding areas, e.g. bond pads
2224/11906	. . . . .	with modification of the same mask	2224/13075	. . . . .	Plural core members
2224/1191	. . . . .	Forming a passivation layer after forming the bump connector	2224/13076	. . . . .	being mutually engaged together, e.g. through inserts
2224/11912	. . . . .	the bump being used as a mask for patterning other parts	2224/13078	. . . . .	being disposed next to each other, e.g. side-to-side arrangements
2224/11914	. . . . .	the under bump metallisation [UBM] being used as a mask for patterning other parts	2224/1308	. . . . .	being stacked
2224/11916	. . . . .	a passivation layer being used as a mask for patterning other parts	2224/13082	. . . . .	Two-layer arrangements
2224/12	. . . . .	Structure, shape, material or disposition of the bump connectors prior to the connecting process	2224/13083	. . . . .	Three-layer arrangements
2224/12105	. . . . .	Bump connectors formed on an encapsulation of the semiconductor or solid-state body, e.g. bumps on chip-scale packages	2224/13084	. . . . .	Four-layer arrangements
2224/13	. . . . .	of an individual bump connector	2224/13099	. . . . .	Material
2224/13001	. . . . .	Core members of the bump connector	2224/131	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/13005	. . . . .	Structure	2224/13101	. . . . .	the principal constituent melting at a temperature of less than 400°C
2224/13006	. . . . .	Bump connector larger than the underlying bonding area, e.g. than the under bump metallisation [UBM]	2224/13105	. . . . .	Gallium [Ga] as principal constituent
2224/13007	. . . . .	Bump connector smaller than the underlying bonding area, e.g. than the under bump metallisation [UBM]	2224/13109	. . . . .	Indium [In] as principal constituent
2224/13008	. . . . .	Bump connector integrally formed with a redistribution layer on the semiconductor or solid-state body	2224/13111	. . . . .	Tin [Sn] as principal constituent
2224/13009	. . . . .	Bump connector integrally formed with a via connection of the semiconductor or solid-state body	2224/13113	. . . . .	Bismuth [Bi] as principal constituent
2224/1301	. . . . .	Shape	2224/13114	. . . . .	Thallium [Tl] as principal constituent
2224/13011	. . . . .	comprising apertures or cavities, e.g. hollow bump	2224/13116	. . . . .	Lead [Pb] as principal constituent
2224/13012	. . . . .	in top view	2224/13117	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/13013	. . . . .	being rectangular or square	2224/13118	. . . . .	Zinc [Zn] as principal constituent
2224/13014	. . . . .	being circular or elliptic	2224/1312	. . . . .	Antimony [Sb] as principal constituent
2224/13015	. . . . .	comprising protrusions or indentations	2224/13123	. . . . .	Magnesium [Mg] as principal constituent
2224/13016	. . . . .	in side view	2224/13124	. . . . .	Aluminium [Al] as principal constituent
2224/13017	. . . . .	being non uniform along the bump connector	2224/13138	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/13018	. . . . .	comprising protrusions or indentations	2224/13139	. . . . .	Silver [Ag] as principal constituent
2224/13019	. . . . .	at the bonding interface of the bump connector, i.e. on the surface of the bump connector	2224/13144	. . . . .	Gold [Au] as principal constituent
2224/1302	. . . . .	Disposition			
2224/13021	. . . . .	the bump connector being disposed in a recess of the surface			
2224/13022	. . . . .	the bump connector being at least partially embedded in the surface			



2224/13147	Copper [Cu] as principal constituent	2224/13195	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/131</a> - <a href="#">H01L 2224/13191</a>
2224/13149	Manganese [Mn] as principal constituent	2224/13198	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/13155	Nickel [Ni] as principal constituent	2224/13199	Material of the matrix
2224/13157	Cobalt [Co] as principal constituent	2224/132	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/1316	Iron [Fe] as principal constituent	2224/13201	the principal constituent melting at a temperature of less than 400°C
2224/13163	the principal constituent melting at a temperature of greater than 1550°C	2224/13205	Gallium [Ga] as principal constituent
2224/13164	Palladium [Pd] as principal constituent	2224/13209	Indium [In] as principal constituent
2224/13166	Titanium [Ti] as principal constituent	2224/13211	Tin [Sn] as principal constituent
2224/13169	Platinum [Pt] as principal constituent	2224/13213	Bismuth [Bi] as principal constituent
2224/1317	Zirconium [Zr] as principal constituent	2224/13214	Thallium [Tl] as principal constituent
2224/13171	Chromium [Cr] as principal constituent	2224/13216	Lead [Pb] as principal constituent
2224/13172	Vanadium [V] as principal constituent	2224/13217	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/13173	Rhodium [Rh] as principal constituent	2224/13218	Zinc [Zn] as principal constituent
2224/13176	Ruthenium [Ru] as principal constituent	2224/1322	Antimony [Sb] as principal constituent
2224/13178	Iridium [Ir] as principal constituent	2224/13223	Magnesium [Mg] as principal constituent
2224/13179	Niobium [Nb] as principal constituent	2224/13224	Aluminium [Al] as principal constituent
2224/1318	Molybdenum [Mo] as principal constituent	2224/13238	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/13181	Tantalum [Ta] as principal constituent	2224/13239	Silver [Ag] as principal constituent
2224/13183	Rhenium [Re] as principal constituent	2224/13244	Gold [Au] as principal constituent
2224/13184	Tungsten [W] as principal constituent	2224/13247	Copper [Cu] as principal constituent
2224/13186	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/13249	Manganese [Mn] as principal constituent
2224/13187	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/13255	Nickel [Ni] as principal constituent
2224/13188	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/13257	Cobalt [Co] as principal constituent
2224/1319	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/1326	Iron [Fe] as principal constituent
2224/13191	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene		
2224/13193	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/131</a> - <a href="#">H01L 2224/13191</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond		
2224/13194	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/131</a> - <a href="#">H01L 2224/13191</a>		

2224/13263	the principal constituent melting at a temperature of greater than 1550°C	2224/133	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/13264	Palladium [Pd] as principal constituent	2224/13301	the principal constituent melting at a temperature of less than 400°C
2224/13266	Titanium [Ti] as principal constituent	2224/13305	Gallium [Ga] as principal constituent
2224/13269	Platinum [Pt] as principal constituent	2224/13309	Indium [In] as principal constituent
2224/1327	Zirconium [Zr] as principal constituent	2224/13311	Tin [Sn] as principal constituent
2224/13271	Chromium [Cr] as principal constituent	2224/13313	Bismuth [Bi] as principal constituent
2224/13272	Vanadium [V] as principal constituent	2224/13314	Thallium [Tl] as principal constituent
2224/13273	Rhodium [Rh] as principal constituent	2224/13316	Lead [Pb] as principal constituent
2224/13276	Ruthenium [Ru] as principal constituent	2224/13317	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/13278	Iridium [Ir] as principal constituent	2224/13318	Zinc [Zn] as principal constituent
2224/13279	Niobium [Nb] as principal constituent	2224/1332	Antimony [Sb] as principal constituent
2224/1328	Molybdenum [Mo] as principal constituent	2224/13323	Magnesium [Mg] as principal constituent
2224/13281	Tantalum [Ta] as principal constituent	2224/13324	Aluminium [Al] as principal constituent
2224/13283	Rhenium [Re] as principal constituent	2224/13338	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/13284	Tungsten [W] as principal constituent	2224/13339	Silver [Ag] as principal constituent
2224/13286	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/13344	Gold [Au] as principal constituent
2224/13287	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/13347	Copper [Cu] as principal constituent
2224/13288	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/13349	Manganese [Mn] as principal constituent
2224/1329	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/13355	Nickel [Ni] as principal constituent
2224/13291	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/13357	Cobalt [Co] as principal constituent
2224/13293	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/132</a> - <a href="#">H01L 2224/13291</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/1336	Iron [Fe] as principal constituent
2224/13294	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/132</a> - <a href="#">H01L 2224/13291</a>	2224/13363	the principal constituent melting at a temperature of greater than 1550°C
2224/13295	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/132</a> - <a href="#">H01L 2224/13291</a>	2224/13364	Palladium [Pd] as principal constituent
2224/13298	Fillers	2224/13366	Titanium [Ti] as principal constituent
2224/13299	Base material	2224/13369	Platinum [Pt] as principal constituent
		2224/1337	Zirconium [Zr] as principal constituent

2224/13371	Chromium [Cr] as principal constituent	2224/13401	the principal constituent melting at a temperature of less than 400°C
2224/13372	Vanadium [V] as principal constituent	2224/13405	Gallium [Ga] as principal constituent
2224/13373	Rhodium [Rh] as principal constituent	2224/13409	Indium [In] as principal constituent
2224/13376	Ruthenium [Ru] as principal constituent	2224/13411	Tin [Sn] as principal constituent
2224/13378	Iridium [Ir] as principal constituent	2224/13413	Bismuth [Bi] as principal constituent
2224/13379	Niobium [Nb] as principal constituent	2224/13414	Thallium [Tl] as principal constituent
2224/1338	Molybdenum [Mo] as principal constituent	2224/13416	Lead [Pb] as principal constituent
2224/13381	Tantalum [Ta] as principal constituent	2224/13417	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/13383	Rhenium [Re] as principal constituent	2224/13418	Zinc [Zn] as principal constituent
2224/13384	Tungsten [W] as principal constituent	2224/1342	Antimony [Sb] as principal constituent
2224/13386	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/13423	Magnesium [Mg] as principal constituent
2224/13387	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/13424	Aluminium [Al] as principal constituent
2224/13388	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/13438	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/1339	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/13439	Silver [Ag] as principal constituent
2224/13391	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/13444	Gold [Au] as principal constituent
2224/13393	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/133</a> - <a href="#">H01L 2224/13391</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/13447	Copper [Cu] as principal constituent
2224/13394	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/133</a> - <a href="#">H01L 2224/13391</a>	2224/13449	Manganese [Mn] as principal constituent
2224/13395	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/133</a> - <a href="#">H01L 2224/13391</a>	2224/13455	Nickel [Ni] as principal constituent
2224/13398	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/13457	Cobalt [Co] as principal constituent
2224/13399	Coating material	2224/1346	Iron [Fe] as principal constituent
2224/134	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/13463	the principal constituent melting at a temperature of greater than 1550°C
		2224/13464	Palladium [Pd] as principal constituent
		2224/13466	Titanium [Ti] as principal constituent
		2224/13469	Platinum [Pt] as principal constituent
		2224/1347	Zirconium [Zr] as principal constituent
		2224/13471	Chromium [Cr] as principal constituent
		2224/13472	Vanadium [V] as principal constituent
		2224/13473	Rhodium [Rh] as principal constituent
		2224/13476	Ruthenium [Ru] as principal constituent

2224/13478	Iridium [Ir] as principal constituent	2224/13563	Only on parts of the surface of the core, i.e. partial coating
2224/13479	Niobium [Nb] as principal constituent	2224/13564	Only on the bonding interface of the bump connector
2224/1348	Molybdenum [Mo] as principal constituent	2224/13565	Only outside the bonding interface of the bump connector
2224/13481	Tantalum [Ta] as principal constituent	2224/13566	Both on and outside the bonding interface of the bump connector
2224/13483	Rhenium [Re] as principal constituent	2224/1357	Single coating layer
2224/13484	Tungsten [W] as principal constituent	2224/13575	Plural coating layers
2224/13486	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/13576	being mutually engaged together, e.g. through inserts
2224/13487	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/13578	being disposed next to each other, e.g. side-to-side arrangements
2224/13488	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/1358	being stacked
2224/1349	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/13582	Two-layer coating
2224/13491	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/13583	Three-layer coating
2224/13493	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/134</a> - <a href="#">H01L 2224/13491</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/13584	Four-layer coating
2224/13494	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/134</a> - <a href="#">H01L 2224/13491</a>	2224/13599	Material
2224/13495	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/134</a> - <a href="#">H01L 2224/13491</a>	2224/136	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/13498	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/13601	the principal constituent melting at a temperature of less than 400°C
2224/13499	Shape or distribution of the fillers	2224/13605	Gallium [Ga] as principal constituent
2224/1354	Coating	2224/13609	Indium [In] as principal constituent
2224/13541	Structure	2224/13611	Tin [Sn] as principal constituent
2224/1355	Shape	2224/13613	Bismuth [Bi] as principal constituent
2224/13551	being non uniform	2224/13614	Thallium [Tl] as principal constituent
2224/13552	comprising protrusions or indentations	2224/13616	Lead [Pb] as principal constituent
2224/13553	at the bonding interface of the bump connector, i.e. on the surface of the bump connector	2224/13617	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/1356	Disposition	2224/13618	Zinc [Zn] as principal constituent
2224/13561	On the entire surface of the core, i.e. integral coating	2224/1362	Antimony [Sb] as principal constituent
2224/13562	On the entire exposed surface of the core	2224/13623	Magnesium [Mg] as principal constituent
		2224/13624	Aluminium [Al] as principal constituent
		2224/13638	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
		2224/13639	Silver [Ag] as principal constituent
		2224/13644	Gold [Au] as principal constituent
		2224/13647	Copper [Cu] as principal constituent
		2224/13649	Manganese [Mn] as principal constituent
		2224/13655	Nickel [Ni] as principal constituent
		2224/13657	Cobalt [Co] as principal constituent
		2224/1366	Iron [Fe] as principal constituent

2224/13663	the principal constituent melting at a temperature of greater than 1550°C	2224/13699	Material of the matrix
2224/13664	Palladium [Pd] as principal constituent	2224/137	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/13666	Titanium [Ti] as principal constituent	2224/13701	the principal constituent melting at a temperature of less than 400°C
2224/13669	Platinum [Pt] as principal constituent	2224/13705	Gallium [Ga] as principal constituent
2224/1367	Zirconium [Zr] as principal constituent	2224/13709	Indium [In] as principal constituent
2224/13671	Chromium [Cr] as principal constituent	2224/13711	Tin [Sn] as principal constituent
2224/13672	Vanadium [V] as principal constituent	2224/13713	Bismuth [Bi] as principal constituent
2224/13673	Rhodium [Rh] as principal constituent	2224/13714	Thallium [Tl] as principal constituent
2224/13676	Ruthenium [Ru] as principal constituent	2224/13716	Lead [Pb] as principal constituent
2224/13678	Iridium [Ir] as principal constituent	2224/13717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/13679	Niobium [Nb] as principal constituent	2224/13718	Zinc [Zn] as principal constituent
2224/1368	Molybdenum [Mo] as principal constituent	2224/1372	Antimony [Sb] as principal constituent
2224/13681	Tantalum [Ta] as principal constituent	2224/13723	Magnesium [Mg] as principal constituent
2224/13683	Rhenium [Re] as principal constituent	2224/13724	Aluminium [Al] as principal constituent
2224/13684	Tungsten [W] as principal constituent	2224/13738	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/13686	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/13739	Silver [Ag] as principal constituent
2224/13687	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/13744	Gold [Au] as principal constituent
2224/13688	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/13747	Copper [Cu] as principal constituent
2224/1369	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/13749	Manganese [Mn] as principal constituent
2224/13691	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/13755	Nickel [Ni] as principal constituent
2224/13693	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/136</a> - <a href="#">H01L 2224/13691</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/13757	Cobalt [Co] as principal constituent
2224/13694	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/136</a> - <a href="#">H01L 2224/13691</a>	2224/1376	Iron [Fe] as principal constituent
2224/13695	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/136</a> - <a href="#">H01L 2224/13691</a>	2224/13763	the principal constituent melting at a temperature of greater than 1550°C
2224/13698	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/13764	Palladium [Pd] as principal constituent
		2224/13766	Titanium [Ti] as principal constituent
		2224/13769	Platinum [Pt] as principal constituent
		2224/1377	Zirconium [Zr] as principal constituent



2224/13771	Chromium [Cr] as principal constituent	2224/13811	Tin [Sn] as principal constituent
2224/13772	Vanadium [V] as principal constituent	2224/13813	Bismuth [Bi] as principal constituent
2224/13773	Rhodium [Rh] as principal constituent	2224/13814	Thallium [Tl] as principal constituent
2224/13776	Ruthenium [Ru] as principal constituent	2224/13816	Lead [Pb] as principal constituent
2224/13778	Iridium [Ir] as principal constituent	2224/13817	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/13779	Niobium [Nb] as principal constituent	2224/13818	Zinc [Zn] as principal constituent
2224/1378	Molybdenum [Mo] as principal constituent	2224/1382	Antimony [Sb] as principal constituent
2224/13781	Tantalum [Ta] as principal constituent	2224/13823	Magnesium [Mg] as principal constituent
2224/13783	Rhenium [Re] as principal constituent	2224/13824	Aluminium [Al] as principal constituent
2224/13784	Tungsten [W] as principal constituent	2224/13838	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/13786	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/13839	Silver [Ag] as principal constituent
2224/13787	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/13844	Gold [Au] as principal constituent
2224/13788	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/13847	Copper [Cu] as principal constituent
2224/1379	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/13849	Manganese [Mn] as principal constituent
2224/13791	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/13855	Nickel [Ni] as principal constituent
2224/13793	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/137</a> - <a href="#">H01L 2224/13791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/13857	Cobalt [Co] as principal constituent
2224/13794	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/137</a> - <a href="#">H01L 2224/13791</a>	2224/1386	Iron [Fe] as principal constituent
2224/13795	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/137</a> - <a href="#">H01L 2224/13791</a>	2224/13863	the principal constituent melting at a temperature of greater than 1550°C
2224/13798	Fillers	2224/13864	Palladium [Pd] as principal constituent
2224/13799	Base material	2224/13866	Titanium [Ti] as principal constituent
2224/138	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/13869	Platinum [Pt] as principal constituent
2224/13801	the principal constituent melting at a temperature of less than 400°C	2224/1387	Zirconium [Zr] as principal constituent
2224/13805	Gallium [Ga] as principal constituent	2224/13871	Chromium [Cr] as principal constituent
2224/13809	Indium [In] as principal constituent	2224/13872	Vanadium [V] as principal constituent
		2224/13873	Rhodium [Rh] as principal constituent
		2224/13876	Ruthenium [Ru] as principal constituent
		2224/13878	Iridium [Ir] as principal constituent
		2224/13879	Niobium [Nb] as principal constituent
		2224/1388	Molybdenum [Mo] as principal constituent

2224/13881	Tantalum [Ta] as principal constituent	2224/13916	Lead [Pb] as principal constituent
2224/13883	Rhenium [Re] as principal constituent	2224/13917	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/13884	Tungsten [W] as principal constituent	2224/13918	Zinc [Zn] as principal constituent
2224/13886	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/1392	Antimony [Sb] as principal constituent
2224/13887	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/13923	Magnesium [Mg] as principal constituent
2224/13888	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/13924	Aluminium [Al] as principal constituent
2224/1389	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/13938	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/13891	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/13939	Silver [Ag] as principal constituent
2224/13893	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/138</a> - <a href="#">H01L 2224/13891</a>	2224/13944	Gold [Au] as principal constituent
	e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/13947	Copper [Cu] as principal constituent
2224/13894	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/138</a> - <a href="#">H01L 2224/13891</a>	2224/13949	Manganese [Mn] as principal constituent
		2224/13955	Nickel [Ni] as principal constituent
2224/13895	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/138</a> - <a href="#">H01L 2224/13891</a>	2224/13957	Cobalt [Co] as principal constituent
		2224/1396	Iron [Fe] as principal constituent
2224/13898	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/13963	the principal constituent melting at a temperature of greater than 1550°C
		2224/13964	Palladium [Pd] as principal constituent
2224/13899	Coating material	2224/13966	Titanium [Ti] as principal constituent
2224/139	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/13969	Platinum [Pt] as principal constituent
		2224/1397	Zirconium [Zr] as principal constituent
2224/13901	the principal constituent melting at a temperature of less than 400°C	2224/13971	Chromium [Cr] as principal constituent
2224/13905	Gallium [Ga] as principal constituent	2224/13972	Vanadium [V] as principal constituent
2224/13909	Indium [In] as principal constituent	2224/13973	Rhodium [Rh] as principal constituent
2224/13911	Tin [Sn] as principal constituent	2224/13976	Ruthenium [Ru] as principal constituent
2224/13913	Bismuth [Bi] as principal constituent	2224/13978	Iridium [Ir] as principal constituent
2224/13914	Thallium [Tl] as principal constituent	2224/13979	Niobium [Nb] as principal constituent
		2224/1398	Molybdenum [Mo] as principal constituent
		2224/13981	Tantalum [Ta] as principal constituent
		2224/13983	Rhenium [Re] as principal constituent
		2224/13984	Tungsten [W] as principal constituent

2224/13986	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/14136	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/13987	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/1414	Circular array, i.e. array with radial symmetry
2224/13988	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/14141	being uniform, i.e. having a uniform pitch across the array
2224/1399	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/14142	being non uniform, i.e. having a non uniform pitch across the array
2224/13991	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/14143	with a staggered arrangement, e.g. depopulated array
2224/13993	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/139</a> - <a href="#">H01L 2224/13991</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/14144	covering only portions of the surface to be connected
2224/13994	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/139</a> - <a href="#">H01L 2224/13991</a>	2224/14145	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/13995	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/139</a> - <a href="#">H01L 2224/13991</a>	2224/14146	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/13998	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/1415	Mirror array, i.e. array having only a reflection symmetry, i.e. bilateral symmetry
2224/13999	Shape or distribution of the fillers	2224/14151	being uniform, i.e. having a uniform pitch across the array
2224/14	of a plurality of bump connectors	2224/14152	being non uniform, i.e. having a non uniform pitch across the array
2224/1401	Structure	2224/14153	with a staggered arrangement, e.g. depopulated array
2224/1403	Bump connectors having different sizes, e.g. different diameters, heights or widths	2224/14154	covering only portions of the surface to be connected
2224/1405	Shape	2224/14155	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/14051	Bump connectors having different shapes	2224/14156	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/141	Disposition	2224/1416	Random layout, i.e. layout with no symmetry
2224/14104	relative to the bonding areas, e.g. bond pads, of the semiconductor or solid-state body	2224/14163	with a staggered arrangement
2224/1411	the bump connectors being bonded to at least one common bonding area	2224/14164	covering only portions of the surface to be connected
2224/1412	Layout	2224/14165	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/1413	Square or rectangular array	2224/14166	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/14131	being uniform, i.e. having a uniform pitch across the array	2224/14177	Combinations of arrays with different layouts
2224/14132	being non uniform, i.e. having a non uniform pitch across the array	2224/14179	Corner adaptations, i.e. disposition of the bump connectors at the corners of the semiconductor or solid-state body
2224/14133	with a staggered arrangement, e.g. depopulated array	2224/1418	being disposed on at least two different sides of the body, e.g. dual array
2224/14134	covering only portions of the surface to be connected	2224/14181	On opposite sides of the body
2224/14135	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements	2224/14183	On contiguous sides of the body
		2224/145	Material
		2224/14505	Bump connectors having different materials
		2224/1451	Function
		2224/14515	Bump connectors having different functions
		2224/14517	including bump connectors providing primarily mechanical bonding

2224/14519	. . . . .	including bump connectors providing primarily thermal dissipation	2224/16151	. . . . .	the bump connector connecting between a semiconductor or solid-state body and an item not being a semiconductor or solid-state body, e.g. chip-to-substrate, chip-to-passive
2224/15	. . .	Structure, shape, material or disposition of the bump connectors after the connecting process	2224/16153	. . . . .	the body and the item being arranged next to each other, e.g. on a common substrate
2224/16	. . . .	of an individual bump connector	2224/16155	. . . . .	the item being non-metallic, e.g. being an insulating substrate with or without metallisation
2224/1601	. . . . .	Structure	2224/16157	. . . . .	the bump connector connecting to a bond pad of the item
2224/16012	. . . . .	relative to the bonding area, e.g. bond pad	2224/1616	. . . . .	the bump connector connecting to a pin of the item
2224/16013	. . . . .	the bump connector being larger than the bonding area, e.g. bond pad	2224/16163	. . . . .	the bump connector connecting to a potential ring of the item
2224/16014	. . . . .	the bump connector being smaller than the bonding area, e.g. bond pad	2224/16165	. . . . .	the bump connector connecting to a via metallisation of the item
2224/1605	. . . . .	Shape	2224/16167	. . . . .	the bump connector connecting to a bonding area disposed in a recess of the surface of the item
2224/16052	. . . . .	in top view	2224/16168	. . . . .	the bump connector connecting to a bonding area protruding from the surface of the item
2224/16054	. . . . .	being rectangular or square	2224/16175	. . . . .	the item being metallic
2224/16055	. . . . .	being circular or elliptic	2224/16183	. . . . .	the bump connector connecting to a potential ring of the item
2224/16056	. . . . .	comprising protrusions or indentations	2224/16187	. . . . .	the bump connector connecting to a bonding area disposed in a recess of the surface of the item
2224/16057	. . . . .	in side view	2224/16188	. . . . .	the bump connector connecting to a bonding area protruding from the surface of the item
2224/16058	. . . . .	being non uniform along the bump connector	2224/16195	. . . . .	the item being a discrete passive component
2224/16059	. . . . .	comprising protrusions or indentations	2224/16197	. . . . .	the bump connector connecting to a bonding area disposed in a recess of the surface of the item
2224/1607	. . . . .	of bonding interfaces, e.g. interlocking features	2224/16198	. . . . .	the bump connector connecting to a bonding area protruding from the surface of the item
2224/161	. . . . .	Disposition	2224/16221	. . . . .	the body and the item being stacked
2224/16104	. . . . .	relative to the bonding area, e.g. bond pad	2224/16225	. . . . .	the item being non-metallic, e.g. insulating substrate with or without metallisation
2224/16105	. . . . .	the bump connector connecting bonding areas being not aligned with respect to each other	2224/16227	. . . . .	the bump connector connecting to a bond pad of the item
2224/16106	. . . . .	the bump connector connecting one bonding area to at least two respective bonding areas	2224/1623	. . . . .	the bump connector connecting to a pin of the item
2224/16108	. . . . .	the bump connector not being orthogonal to the surface	2224/16233	. . . . .	the bump connector connecting to a potential ring of the item
2224/16111	. . . . .	the bump connector being disposed in a recess of the surface	2224/16235	. . . . .	the bump connector connecting to a via metallisation of the item
2224/16112	. . . . .	the bump connector being at least partially embedded in the surface	2224/16237	. . . . .	the bump connector connecting to a bonding area disposed in a recess of the surface of the item
2224/16113	. . . . .	the whole bump connector protruding from the surface	2224/16238	. . . . .	the bump connector connecting to a bonding area protruding from the surface of the item
2224/1613	. . . . .	the bump connector connecting within a semiconductor or solid-state body, i.e. connecting two bonding areas on the same semiconductor or solid-state body	2224/1624	. . . . .	the bump connector connecting between the body and an opposite side of the item with respect to the body
2224/16135	. . . . .	the bump connector connecting between different semiconductor or solid-state bodies, i.e. chip-to-chip	2224/16245	. . . . .	the item being metallic
2224/16137	. . . . .	the bodies being arranged next to each other, e.g. on a common substrate			
2224/16141	. . . . .	the bodies being arranged on opposite sides of a substrate, e.g. mirror arrangements			
2224/16145	. . . . .	the bodies being stacked			
2224/16146	. . . . .	the bump connector connecting to a via connection in the semiconductor or solid-state body			
2224/16147	. . . . .	the bump connector connecting to a bonding area disposed in a recess of the surface			
2224/16148	. . . . .	the bump connector connecting to a bonding area protruding from the surface			

2224/16253	. . . . .	the bump connector connecting to a potential ring of the item	2224/17143	. . . . .	with a staggered arrangement
2224/16257	. . . . .	the bump connector connecting to a bonding area disposed in a recess of the surface of the item	2224/17144	. . . . .	covering only portions of the surface to be connected
2224/16258	. . . . .	the bump connector connecting to a bonding area protruding from the surface of the item	2224/17145	. . . . .	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/1626	. . . . .	the bump connector connecting between the body and an opposite side of the item with respect to the body	2224/17146	. . . . .	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/16265	. . . . .	the item being a discrete passive component	2224/1715	. . . . .	Mirror array, i.e. array having only a reflection symmetry, i.e. bilateral symmetry
2224/16267	. . . . .	the bump connector connecting to a bonding area disposed in a recess of the surface of the item	2224/17151	. . . . .	being uniform, i.e. having a uniform pitch across the array
2224/16268	. . . . .	the bump connector connecting to a bonding area protruding from the surface of the item	2224/17152	. . . . .	being non uniform, i.e. having a non uniform pitch across the array
2224/165	. . . . .	Material	2224/17153	. . . . .	with a staggered arrangement, e.g. depopulated array
2224/16501	. . . . .	at the bonding interface	2224/17154	. . . . .	covering only portions of the surface to be connected
2224/16502	. . . . .	comprising an eutectic alloy	2224/17155	. . . . .	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/16503	. . . . .	comprising an intermetallic compound	2224/17156	. . . . .	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/16505	. . . . .	outside the bonding interface, e.g. in the bulk of the bump connector	2224/1716	. . . . .	Random layout, i.e. layout with no symmetry
2224/16506	. . . . .	comprising an eutectic alloy	2224/17163	. . . . .	with a staggered arrangement
2224/16507	. . . . .	comprising an intermetallic compound	2224/17164	. . . . .	covering only portions of the surface to be connected
2224/17	. . . . .	of a plurality of bump connectors	2224/17165	. . . . .	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/1701	. . . . .	Structure	2224/17166	. . . . .	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/1703	. . . . .	Bump connectors having different sizes, e.g. different diameters, heights or widths	2224/17177	. . . . .	Combinations of arrays with different layouts
2224/1705	. . . . .	Shape	2224/17179	. . . . .	Corner adaptations, i.e. disposition of the bump connectors at the corners of the semiconductor or solid-state body
2224/17051	. . . . .	Bump connectors having different shapes	2224/1718	. . . . .	being disposed on at least two different sides of the body, e.g. dual array
2224/17055	. . . . .	of their bonding interfaces	2224/17181	. . . . .	On opposite sides of the body
2224/171	. . . . .	Disposition	2224/17183	. . . . .	On contiguous sides of the body
2224/17104	. . . . .	relative to the bonding areas, e.g. bond pads	2224/175	. . . . .	Material
2224/17106	. . . . .	the bump connectors being bonded to at least one common bonding area	2224/17505	. . . . .	Bump connectors having different materials
2224/17107	. . . . .	the bump connectors connecting two common bonding areas	2224/1751	. . . . .	Function
2224/1712	. . . . .	Layout	2224/17515	. . . . .	Bump connectors having different functions
2224/1713	. . . . .	Square or rectangular array	2224/17517	. . . . .	including bump connectors providing primarily mechanical support
2224/17132	. . . . .	being non uniform, i.e. having a non uniform pitch across the array	2224/17519	. . . . .	including bump connectors providing primarily thermal dissipation
2224/17133	. . . . .	with a staggered arrangement, e.g. depopulated array	2224/18	. . . . .	High density interconnect [HDI] connectors; Manufacturing methods related thereto
2224/17134	. . . . .	covering only portions of the surface to be connected	2224/19	. . . . .	Manufacturing methods of high density interconnect preforms
2224/17135	. . . . .	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements	2224/20	. . . . .	Structure, shape, material or disposition of high density interconnect preforms
2224/17136	. . . . .	Covering only the central area of the surface to be connected, i.e. central arrangements	2224/21	. . . . .	of an individual HDI interconnect
2224/1714	. . . . .	Circular array, i.e. array with radial symmetry	2224/2101	. . . . .	Structure
2224/17142	. . . . .	being non uniform, i.e. having a non uniform pitch across the array			



2224/2105	. . . . .	Shape	2224/24175	. . . . .	the item being metallic
2224/211	. . . . .	Disposition	2224/24195	. . . . .	the item being a discrete passive component
2224/214	. . . . .	Connecting portions	2224/24221	. . . . .	the body and the item being stacked
2224/215	. . . . .	Material	2224/24225	. . . . .	the item being non-metallic, e.g. insulating substrate with or without metallisation
2224/22	. . . . .	of a plurality of HDI interconnects	2224/24226	. . . . .	the HDI interconnect connecting to the same level of the item at which the semiconductor or solid-state body is mounted, e.g. the item being planar
2224/2201	. . . . .	Structure	2224/24227	. . . . .	the HDI interconnect not connecting to the same level of the item at which the semiconductor or solid-state body is mounted, e.g. the semiconductor or solid-state body being mounted in a cavity or on a protrusion of the item
2224/2205	. . . . .	Shape	2224/24245	. . . . .	the item being metallic
2224/221	. . . . .	Disposition	2224/24246	. . . . .	the HDI interconnect connecting to the same level of the item at which the semiconductor or solid-state body is mounted, e.g. the item being planar
2224/224	. . . . .	Connecting portions	2224/24247	. . . . .	the HDI interconnect not connecting to the same level of the item at which the semiconductor or solid-state body is mounted, e.g. the semiconductor or solid-state body being mounted in a cavity or on a protrusion of the item
2224/225	. . . . .	Material	2224/24265	. . . . .	the item being a discrete passive component
2224/22505	. . . . .	HDI interconnects having different materials	2224/244	. . . . .	Connecting portions
2224/23	. . .	Structure, shape, material or disposition of the high density interconnect connectors after the connecting process	2224/245	. . . . .	Material
2224/24	. . . .	of an individual high density interconnect connector	2224/2499	. . . . .	Auxiliary members for HDI interconnects, e.g. spacers, alignment aids
2224/2401	. . . . .	Structure	2224/24991	. . . . .	being formed on the semiconductor or solid-state body to be connected
2224/24011	. . . . .	Deposited, e.g. MCM-D type	2224/24992	. . . . .	Flow barrier
2224/2402	. . . . .	Laminated, e.g. MCM-L type	2224/24996	. . . . .	being formed on an item to be connected not being a semiconductor or solid-state body
2224/2405	. . . . .	Shape	2224/24997	. . . . .	Flow barrier
2224/24051	. . . . .	Conformal with the semiconductor or solid-state device	2224/24998	. . . . .	Reinforcing structures, e.g. ramp-like support
2224/241	. . . . .	Disposition	2224/25	. . . . .	of a plurality of high density interconnect connectors
2224/24101	. . . . .	Connecting bonding areas at the same height	2224/2501	. . . . .	Structure
2224/24105	. . . . .	Connecting bonding areas at different heights	2224/2505	. . . . .	Shape
2224/2413	. . . . .	Connecting within a semiconductor or solid-state body	2224/251	. . . . .	Disposition
2224/24135	. . . . .	Connecting between different semiconductor or solid-state bodies, i.e. chip-to-chip	2224/25105	. . . . .	Connecting at different heights
2224/24137	. . . . .	the bodies being arranged next to each other, e.g. on a common substrate	2224/2511	. . . . .	the connectors being bonded to at least one common bonding area
2224/24141	. . . . .	the bodies being arranged on opposite sides of a substrate, e.g. mirror arrangements	2224/25111	. . . . .	the connectors connecting two common bonding areas
2224/24145	. . . . .	the bodies being stacked	2224/25112	. . . . .	the connectors connecting a common bonding area on the semiconductor or solid-state body to different bonding areas outside the body
2224/24146	. . . . .	the HDI interconnect connecting to the same level of the lower semiconductor or solid-state body at which the upper semiconductor or solid-state body is mounted			
2224/24147	. . . . .	the HDI interconnect not connecting to the same level of the lower semiconductor or solid-state body at which the upper semiconductor or solid-state body is mounted, e.g. the upper semiconductor or solid-state body being mounted in a cavity or on a protrusion of the lower semiconductor or solid-state body			
2224/24151	. . . . .	Connecting between a semiconductor or solid-state body and an item not being a semiconductor or solid-state body, e.g. chip-to-substrate, chip-to-passive			
2224/24153	. . . . .	the body and the item being arranged next to each other, e.g. on a common substrate			
2224/24155	. . . . .	the item being non-metallic, e.g. insulating substrate with or without metallisation			

2224/25113	. . . . .	the connectors connecting different bonding areas on the semiconductor or solid-state body to a common bonding area outside the body	2224/2733	. . . . .	in solid form
2224/2512	. . . . .	Layout	2224/27332	. . . . .	using a powder
2224/25171	. . . . .	Fan-out arrangements	2224/27334	. . . . .	using preformed layer
2224/25174	. . . . .	Stacked arrangements	2224/274	. . . . .	by blanket deposition of the material of the layer connector
2224/25175	. . . . .	Parallel arrangements	2224/2741	. . . . .	in liquid form
2224/25177	. . . . .	Combinations of a plurality of arrangements	2224/27416	. . . . .	Spin coating
2224/2518	. . . . .	being disposed on at least two different sides of the body, e.g. dual array	2224/27418	. . . . .	Spray coating
2224/254	. . . . .	Connecting portions	2224/2742	. . . . .	Curtain coating
2224/2541	. . . . .	the connecting portions being stacked	2224/27422	. . . . .	by dipping, e.g. in a solder bath
2224/2543	. . . . .	the connecting portions being staggered	2224/27424	. . . . .	Immersion coating, e.g. in a solder bath
2224/255	. . . . .	Material	2224/27426	. . . . .	Chemical solution deposition [CSD], i.e. using a liquid precursor
2224/26	. .	Layer connectors, e.g. plate connectors, solder or adhesive layers; Manufacturing methods related thereto	2224/27428	. . . . .	Wave coating
2224/2612	. . .	Auxiliary members for layer connectors, e.g. spacers	2224/2743	. . . . .	in solid form
2224/26122	. . . .	being formed on the semiconductor or solid-state body to be connected	2224/27436	. . . . .	Lamination of a preform, e.g. foil, sheet or layer
2224/26125	. . . . .	Reinforcing structures	2224/27438	. . . . .	the preform being at least partly pre-patterned
2224/26135	. . . . .	Alignment aids	2224/2744	. . . . .	by transfer printing
2224/26145	. . . . .	Flow barriers	2224/27442	. . . . .	using a powder
2224/26152	. . . . .	being formed on an item to be connected not being a semiconductor or solid-state body	2224/27444	. . . . .	in gaseous form
2224/26155	. . . . .	Reinforcing structures	2224/2745	. . . . .	Physical vapour deposition [PVD], e.g. evaporation, or sputtering
2224/26165	. . . . .	Alignment aids	2224/27452	. . . . .	Chemical vapour deposition [CVD], e.g. laser CVD
2224/26175	. . . . .	Flow barriers	2224/2746	. . . . .	Plating
2224/27	. . .	Manufacturing methods	2224/27462	. . . . .	Electroplating
2224/27001	. . . .	Involving a temporary auxiliary member not forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or substrate	2224/27464	. . . . .	Electroless plating
2224/27002	. . . . .	for supporting the semiconductor or solid-state body	2224/27466	. . . . .	Conformal deposition, i.e. blanket deposition of a conformal layer on a patterned surface
2224/27003	. . . . .	for holding or transferring the layer preform	2224/2747	. . . . .	using a lift-off mask
2224/27005	. . . . .	for aligning the layer connector, e.g. marks, spacers	2224/27472	. . . . .	Profile of the lift-off mask
2224/27009	. . . . .	for protecting parts during manufacture	2224/27474	. . . . .	Multilayer masks
2224/27011	. . . . .	Involving a permanent auxiliary member, i.e. a member which is left at least partly in the finished device, e.g. coating, dummy feature	2224/2748	. . . . .	Permanent masks, i.e. masks left in the finished device, e.g. passivation layers
2224/27013	. . . . .	for holding or confining the layer connector, e.g. solder flow barrier	2224/275	. . . . .	by chemical or physical modification of a pre-existing or pre-deposited material
2224/27015	. . . . .	for aligning the layer connector, e.g. marks, spacers	2224/27502	. . . . .	Pre-existing or pre-deposited material
2224/27019	. . . . .	for protecting parts during the process	2224/27505	. . . . .	Sintering
2224/271	. . . .	Manufacture and pre-treatment of the layer connector preform	2224/2751	. . . . .	Anodisation
2224/2711	. . . . .	Shaping	2224/27515	. . . . .	Curing and solidification, e.g. of a photosensitive layer material
2224/2712	. . . . .	Applying permanent coating	2224/2752	. . . . .	Self-assembly, e.g. self-agglomeration of the layer material in a fluid
2224/273	. . . . .	by local deposition of the material of the layer connector	2224/27522	. . . . .	Auxiliary means therefor, e.g. for self-assembly activation
2224/2731	. . . . .	in liquid form	2224/27524	. . . . .	with special adaptation of the surface or of an auxiliary substrate, e.g. surface shape specially adapted for the self-assembly process
2224/27312	. . . . .	Continuous flow, e.g. using a microsyringe, a pump, a nozzle or extrusion	2224/27526	. . . . .	involving the material of the bonding area, e.g. bonding pad
2224/27318	. . . . .	by dispensing droplets	2224/2755	. . . . .	Selective modification
2224/2732	. . . . .	Screen printing, i.e. using a stencil	2224/27552	. . . . .	using a laser or a focussed ion beam [FIB]
			2224/27554	. . . . .	Stereolithography, i.e. solidification of a pattern defined by a laser trace in a photosensitive resin
			2224/276	. . . . .	by patterning a pre-deposited material
			2224/27602	. . . . .	Mechanical treatment, e.g. polishing, grinding

2224/2761	. . . . .	Physical or chemical etching	2224/29007	. . . . .	Layer connector smaller than the underlying bonding area
2224/27612	. . . . .	by physical means only	2224/29008	. . . . .	Layer connector integrally formed with a redistribution layer on the semiconductor or solid-state body
2224/27614	. . . . .	by chemical means only	2224/29009	. . . . .	Layer connector integrally formed with a via connection of the semiconductor or solid-state body
2224/27616	. . . . .	Chemical mechanical polishing [CMP]	2224/2901	. . . . .	Shape
2224/27618	. . . . .	with selective exposure, development and removal of a photosensitive layer material, e.g. of a photosensitive conductive resin	2224/29011	. . . . .	comprising apertures or cavities
2224/2762	. . . . .	using masks	2224/29012	. . . . .	in top view
2224/27622	. . . . .	Photolithography	2224/29013	. . . . .	being rectangular or square
2224/2763	. . . . .	using a laser or a focused ion beam [FIB]	2224/29014	. . . . .	being circular or elliptic
2224/27632	. . . . .	Ablation by means of a laser or focused ion beam [FIB]	2224/29015	. . . . .	comprising protrusions or indentations
2224/277	. . . . .	involving monitoring, e.g. feedback loop	2224/29016	. . . . .	in side view
2224/278	. . . . .	Post-treatment of the layer connector	2224/29017	. . . . .	being non uniform along the layer connector
2224/2781	. . . . .	Cleaning, e.g. oxide removal step, desmearing	2224/29018	. . . . .	comprising protrusions or indentations
2224/2782	. . . . .	Applying permanent coating, e.g. in-situ coating	2224/29019	. . . . .	at the bonding interface of the layer connector, i.e. on the surface of the layer connector
2224/27821	. . . . .	Spray coating	2224/2902	. . . . .	Disposition
2224/27822	. . . . .	by dipping, e.g. in a solder bath	2224/29021	. . . . .	the layer connector being disposed in a recess of the surface
2224/27823	. . . . .	Immersion coating, e.g. in a solder bath	2224/29022	. . . . .	the layer connector being at least partially embedded in the surface
2224/27824	. . . . .	Chemical solution deposition [CSD], i.e. using a liquid precursor	2224/29023	. . . . .	the whole layer connector protruding from the surface
2224/27825	. . . . .	Plating, e.g. electroplating, electroless plating	2224/29024	. . . . .	the layer connector being disposed on a redistribution layer on the semiconductor or solid-state body
2224/27826	. . . . .	Physical vapour deposition [PVD], e.g. evaporation, or sputtering	2224/29025	. . . . .	the layer connector being disposed on a via connection of the semiconductor or solid-state body
2224/27827	. . . . .	Chemical vapour deposition [CVD], e.g. laser CVD	2224/29026	. . . . .	relative to the bonding area, e.g. bond pad, of the semiconductor or solid-state body
2224/2783	. . . . .	Reworking, e.g. shaping	2224/29027	. . . . .	the layer connector being offset with respect to the bonding area, e.g. bond pad
2224/27831	. . . . .	involving a chemical process, e.g. etching the layer connector	2224/29028	. . . . .	the layer connector being disposed on at least two separate bonding areas, e.g. bond pads
2224/2784	. . . . .	involving a mechanical process, e.g. planarising the layer connector	2224/29034	. . . . .	the layer connector covering only portions of the surface to be connected
2224/27845	. . . . .	Chemical mechanical polishing [CMP]	2224/29035	. . . . .	covering only the peripheral area of the surface to be connected
2224/27848	. . . . .	Thermal treatments, e.g. annealing, controlled cooling	2224/29036	. . . . .	covering only the central area of the surface to be connected
2224/27849	. . . . .	Reflowing	2224/29075	. . . . .	Plural core members
2224/279	. . . . .	Methods of manufacturing layer connectors involving a specific sequence of method steps	2224/29076	. . . . .	being mutually engaged together, e.g. through inserts
2224/27901	. . . . .	with repetition of the same manufacturing step	2224/29078	. . . . .	being disposed next to each other, e.g. side-to-side arrangements
2224/27902	. . . . .	Multiple masking steps	2224/2908	. . . . .	being stacked
2224/27903	. . . . .	using different masks	2224/29082	. . . . .	Two-layer arrangements
2224/27906	. . . . .	with modification of the same mask	2224/29083	. . . . .	Three-layer arrangements
2224/2791	. . . . .	Forming a passivation layer after forming the layer connector	2224/29084	. . . . .	Four-layer arrangements
2224/27912	. . . . .	the layer being used as a mask for patterning other parts	2224/29099	. . . . .	Material
2224/27916	. . . . .	a passivation layer being used as a mask for patterning other parts			
2224/28	. . . . .	Structure, shape, material or disposition of the layer connectors prior to the connecting process			
2224/28105	. . . . .	Layer connectors formed on an encapsulation of the semiconductor or solid-state body, e.g. layer connectors on chip-scale packages			
2224/29	. . . . .	of an individual layer connector			
2224/29001	. . . . .	Core members of the layer connector			
2224/29005	. . . . .	Structure			
2224/29006	. . . . .	Layer connector larger than the underlying bonding area			

2224/291	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/29178	Iridium [Ir] as principal constituent
2224/29101	the principal constituent melting at a temperature of less than 400°C	2224/29179	Niobium [Nb] as principal constituent
2224/29105	Gallium [Ga] as principal constituent	2224/2918	Molybdenum [Mo] as principal constituent
2224/29109	Indium [In] as principal constituent	2224/29181	Tantalum [Ta] as principal constituent
2224/29111	Tin [Sn] as principal constituent	2224/29183	Rhenium [Re] as principal constituent
2224/29113	Bismuth [Bi] as principal constituent	2224/29184	Tungsten [W] as principal constituent
2224/29114	Thallium [Tl] as principal constituent	2224/29186	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/29116	Lead [Pb] as principal constituent	2224/29187	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/29117	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/29188	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/29118	Zinc [Zn] as principal constituent	2224/2919	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/2912	Antimony [Sb] as principal constituent	2224/29191	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/29123	Magnesium [Mg] as principal constituent	2224/29193	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/291</a> - <a href="#">H01L 2224/29191</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/29124	Aluminium [Al] as principal constituent	2224/29194	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/291</a> - <a href="#">H01L 2224/29191</a>
2224/29138	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/29195	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/291</a> - <a href="#">H01L 2224/29191</a>
2224/29139	Silver [Ag] as principal constituent	2224/29198	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/29144	Gold [Au] as principal constituent	2224/29199	Material of the matrix
2224/29147	Copper [Cu] as principal constituent	2224/292	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/29149	Manganese [Mn] as principal constituent	2224/29201	the principal constituent melting at a temperature of less than 400°C
2224/29155	Nickel [Ni] as principal constituent	2224/29205	Gallium [Ga] as principal constituent
2224/29157	Cobalt [Co] as principal constituent	2224/29209	Indium [In] as principal constituent
2224/2916	Iron [Fe] as principal constituent	2224/29211	Tin [Sn] as principal constituent
2224/29163	the principal constituent melting at a temperature of greater than 1550°C	2224/29213	Bismuth [Bi] as principal constituent
2224/29164	Palladium [Pd] as principal constituent		
2224/29166	Titanium [Ti] as principal constituent		
2224/29169	Platinum [Pt] as principal constituent		
2224/2917	Zirconium [Zr] as principal constituent		
2224/29171	Chromium [Cr] as principal constituent		
2224/29172	Vanadium [V] as principal constituent		
2224/29173	Rhodium [Rh] as principal constituent		
2224/29176	Ruthenium [Ru] as principal constituent		

2224/29214	Thallium [Tl] as principal constituent	2224/29284	Tungsten [W] as principal constituent
2224/29216	Lead [Pb] as principal constituent	2224/29286	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/29217	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/29287	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/29218	Zinc [Zn] as principal constituent	2224/29288	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/29222	Antimony [Sb] as principal constituent	2224/2929	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/29223	Magnesium [Mg] as principal constituent	2224/29291	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/29224	Aluminium [Al] as principal constituent	2224/29293	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/292</a> - <a href="#">H01L 2224/29291</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/29238	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/29294	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/292</a> - <a href="#">H01L 2224/29291</a>
2224/29239	Silver [Ag] as principal constituent	2224/29295	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/292</a> - <a href="#">H01L 2224/29291</a>
2224/29244	Gold [Au] as principal constituent	2224/29298	Fillers
2224/29247	Copper [Cu] as principal constituent	2224/29299	Base material
2224/29249	Manganese [Mn] as principal constituent	2224/293	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/29255	Nickel [Ni] as principal constituent	2224/29301	the principal constituent melting at a temperature of less than 400°C
2224/29257	Cobalt [Co] as principal constituent	2224/29305	Gallium [Ga] as principal constituent
2224/2926	Iron [Fe] as principal constituent	2224/29309	Indium [In] as principal constituent
2224/29263	the principal constituent melting at a temperature of greater than 1550°C	2224/29311	Tin [Sn] as principal constituent
2224/29264	Palladium [Pd] as principal constituent	2224/29313	Bismuth [Bi] as principal constituent
2224/29266	Titanium [Ti] as principal constituent	2224/29314	Thallium [Tl] as principal constituent
2224/29269	Platinum [Pt] as principal constituent	2224/29316	Lead [Pb] as principal constituent
2224/2927	Zirconium [Zr] as principal constituent	2224/29317	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/29271	Chromium [Cr] as principal constituent	2224/29318	Zinc [Zn] as principal constituent
2224/29272	Vanadium [V] as principal constituent	2224/2932	Antimony [Sb] as principal constituent
2224/29273	Rhodium [Rh] as principal constituent	2224/29323	Magnesium [Mg] as principal constituent
2224/29276	Ruthenium [Ru] as principal constituent		
2224/29278	Iridium [Ir] as principal constituent		
2224/29279	Niobium [Nb] as principal constituent		
2224/2928	Molybdenum [Mo] as principal constituent		
2224/29281	Tantalum [Ta] as principal constituent		
2224/29283	Rhenium [Re] as principal constituent		



2224/29324	Aluminium [Al] as principal constituent	2224/29391	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/29338	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/29393	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/293</a> - <a href="#">H01L 2224/29391</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/29339	Silver [Ag] as principal constituent	2224/29394	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/293</a> - <a href="#">H01L 2224/29391</a>
2224/29344	Gold [Au] as principal constituent	2224/29395	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/293</a> - <a href="#">H01L 2224/29391</a>
2224/29347	Copper [Cu] as principal constituent	2224/29398	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/29349	Manganese [Mn] as principal constituent	2224/29399	Coating material
2224/29355	Nickel [Ni] as principal constituent	2224/294	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/29357	Cobalt [Co] as principal constituent	2224/29401	the principal constituent melting at a temperature of less than 400°C
2224/2936	Iron [Fe] as principal constituent	2224/29405	Gallium [Ga] as principal constituent
2224/29363	the principal constituent melting at a temperature of greater than 1550°C	2224/29409	Indium [In] as principal constituent
2224/29364	Palladium [Pd] as principal constituent	2224/29411	Tin [Sn] as principal constituent
2224/29366	Titanium [Ti] as principal constituent	2224/29413	Bismuth [Bi] as principal constituent
2224/29369	Platinum [Pt] as principal constituent	2224/29414	Thallium [Tl] as principal constituent
2224/2937	Zirconium [Zr] as principal constituent	2224/29416	Lead [Pb] as principal constituent
2224/29371	Chromium [Cr] as principal constituent	2224/29417	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/29372	Vanadium [V] as principal constituent	2224/29418	Zinc [Zn] as principal constituent
2224/29373	Rhodium [Rh] as principal constituent	2224/2942	Antimony [Sb] as principal constituent
2224/29376	Ruthenium [Ru] as principal constituent	2224/29423	Magnesium [Mg] as principal constituent
2224/29378	Iridium [Ir] as principal constituent	2224/29424	Aluminium [Al] as principal constituent
2224/29379	Niobium [Nb] as principal constituent	2224/29438	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/2938	Molybdenum [Mo] as principal constituent		
2224/29381	Tantalum [Ta] as principal constituent		
2224/29383	Rhenium [Re] as principal constituent		
2224/29384	Tungsten [W] as principal constituent		
2224/29386	with a principal constituent of the material being a non metallic, non metalloid inorganic material		
2224/29387	Ceramics, e.g. crystalline carbides, nitrides or oxides		
2224/29388	Glasses, e.g. amorphous oxides, nitrides or fluorides		
2224/2939	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy		

2224/29439	...	Silver [Ag] as principal constituent	2224/29493	...	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/294</a> - <a href="#">H01L 2224/29491</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/29444	...	Gold [Au] as principal constituent	2224/29494	...	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/294</a> - <a href="#">H01L 2224/29491</a>
2224/29447	...	Copper [Cu] as principal constituent	2224/29495	...	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/294</a> - <a href="#">H01L 2224/29491</a>
2224/29449	...	Manganese [Mn] as principal constituent	2224/29498	...	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/29455	...	Nickel [Ni] as principal constituent	2224/29499	...	Shape or distribution of the fillers
2224/29457	...	Cobalt [Co] as principal constituent	2224/2954	...	Coating
2224/2946	...	Iron [Fe] as principal constituent	2224/29541	...	Structure
2224/29463	...	the principal constituent melting at a temperature of greater than 1550°C	2224/2955	...	Shape
2224/29464	...	Palladium [Pd] as principal constituent	2224/29551	...	being non uniform
2224/29466	...	Titanium [Ti] as principal constituent	2224/29552	...	comprising protrusions or indentations
2224/29469	...	Platinum [Pt] as principal constituent	2224/29553	...	at the bonding interface of the layer connector, i.e. on the surface of the layer connector
2224/2947	...	Zirconium [Zr] as principal constituent	2224/2956	...	Disposition
2224/29471	...	Chromium [Cr] as principal constituent	2224/29561	...	On the entire surface of the core, i.e. integral coating
2224/29472	...	Vanadium [V] as principal constituent	2224/29562	...	On the entire exposed surface of the core
2224/29473	...	Rhodium [Rh] as principal constituent	2224/29563	...	Only on parts of the surface of the core, i.e. partial coating
2224/29476	...	Ruthenium [Ru] as principal constituent	2224/29564	...	Only on the bonding interface of the layer connector
2224/29478	...	Iridium [Ir] as principal constituent	2224/29565	...	Only outside the bonding interface of the layer connector
2224/29479	...	Niobium [Nb] as principal constituent	2224/29566	...	Both on and outside the bonding interface of the layer connector
2224/2948	...	Molybdenum [Mo] as principal constituent	2224/2957	...	Single coating layer
2224/29481	...	Tantalum [Ta] as principal constituent	2224/29575	...	Plural coating layers
2224/29483	...	Rhenium [Re] as principal constituent	2224/29576	...	being mutually engaged together, e.g. through inserts
2224/29484	...	Tungsten [W] as principal constituent	2224/29578	...	being disposed next to each other, e.g. side-to-side arrangements
2224/29486	...	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/2958	...	being stacked
2224/29487	...	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/29582	...	Two-layer coating
2224/29488	...	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/29583	...	Three-layer coating
2224/2949	...	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/29584	...	Four-layer coating
2224/29491	...	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/29599	...	Material
			2224/296	...	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
			2224/29601	...	the principal constituent melting at a temperature of less than 400°C

2224/29605	Gallium [Ga] as principal constituent	2224/29683	Rhenium [Re] as principal constituent
2224/29609	Indium [In] as principal constituent	2224/29684	Tungsten [W] as principal constituent
2224/29611	Tin [Sn] as principal constituent	2224/29686	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/29613	Bismuth [Bi] as principal constituent	2224/29687	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/29614	Thallium [Tl] as principal constituent	2224/29688	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/29616	Lead [Pb] as principal constituent	2224/2969	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/29617	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/29691	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/29618	Zinc [Zn] as principal constituent	2224/29693	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/296</a> - <a href="#">H01L 2224/29691</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/2962	Antimony [Sb] as principal constituent	2224/29694	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/296</a> - <a href="#">H01L 2224/29691</a>
2224/29623	Magnesium [Mg] as principal constituent	2224/29695	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/296</a> - <a href="#">H01L 2224/29691</a>
2224/29624	Aluminium [Al] as principal constituent	2224/29698	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/29638	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/29699	Material of the matrix
2224/29639	Silver [Ag] as principal constituent	2224/297	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/29644	Gold [Au] as principal constituent	2224/29701	the principal constituent melting at a temperature of less than 400°C
2224/29647	Copper [Cu] as principal constituent	2224/29705	Gallium [Ga] as principal constituent
2224/29649	Manganese [Mn] as principal constituent	2224/29709	Indium [In] as principal constituent
2224/29655	Nickel [Ni] as principal constituent	2224/29711	Tin [Sn] as principal constituent
2224/29657	Cobalt [Co] as principal constituent	2224/29713	Bismuth [Bi] as principal constituent
2224/2966	Iron [Fe] as principal constituent	2224/29714	Thallium [Tl] as principal constituent
2224/29663	the principal constituent melting at a temperature of greater than 1550°C	2224/29716	Lead [Pb] as principal constituent
2224/29664	Palladium [Pd] as principal constituent	2224/29717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/29666	Titanium [Ti] as principal constituent		
2224/29669	Platinum [Pt] as principal constituent		
2224/2967	Zirconium [Zr] as principal constituent		
2224/29671	Chromium [Cr] as principal constituent		
2224/29672	Vanadium [V] as principal constituent		
2224/29673	Rhodium [Rh] as principal constituent		
2224/29676	Ruthenium [Ru] as principal constituent		
2224/29678	Iridium [Ir] as principal constituent		
2224/29679	Niobium [Nb] as principal constituent		
2224/2968	Molybdenum [Mo] as principal constituent		
2224/29681	Tantalum [Ta] as principal constituent		

2224/29718	. . . . .	Zinc [Zn] as principal constituent	2224/2979	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/2972	. . . . .	Antimony [Sb] as principal constituent	2224/29791	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/29723	. . . . .	Magnesium [Mg] as principal constituent	2224/29793	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/297</a> - <a href="#">H01L 2224/29791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/29724	. . . . .	Aluminium [Al] as principal constituent	2224/29794	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/297</a> - <a href="#">H01L 2224/29791</a>
2224/29738	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/29795	. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/297</a> - <a href="#">H01L 2224/29791</a>
2224/29739	. . . . .	Silver [Ag] as principal constituent	2224/29798	. . . . .	Fillers
2224/29744	. . . . .	Gold [Au] as principal constituent	2224/29799	. . . . .	Base material
2224/29747	. . . . .	Copper [Cu] as principal constituent	2224/298	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/29749	. . . . .	Manganese [Mn] as principal constituent	2224/29801	. . . . .	the principal constituent melting at a temperature of less than 400°C
2224/29755	. . . . .	Nickel [Ni] as principal constituent	2224/29805	. . . . .	Gallium [Ga] as principal constituent
2224/29757	. . . . .	Cobalt [Co] as principal constituent	2224/29809	. . . . .	Indium [In] as principal constituent
2224/2976	. . . . .	Iron [Fe] as principal constituent	2224/29811	. . . . .	Tin [Sn] as principal constituent
2224/29763	. . . . .	the principal constituent melting at a temperature of greater than 1550°C	2224/29813	. . . . .	Bismuth [Bi] as principal constituent
2224/29764	. . . . .	Palladium [Pd] as principal constituent	2224/29814	. . . . .	Thallium [Tl] as principal constituent
2224/29766	. . . . .	Titanium [Ti] as principal constituent	2224/29816	. . . . .	Lead [Pb] as principal constituent
2224/29769	. . . . .	Platinum [Pt] as principal constituent	2224/29817	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/2977	. . . . .	Zirconium [Zr] as principal constituent	2224/29818	. . . . .	Zinc [Zn] as principal constituent
2224/29771	. . . . .	Chromium [Cr] as principal constituent	2224/2982	. . . . .	Antimony [Sb] as principal constituent
2224/29772	. . . . .	Vanadium [V] as principal constituent	2224/29823	. . . . .	Magnesium [Mg] as principal constituent
2224/29773	. . . . .	Rhodium [Rh] as principal constituent	2224/29824	. . . . .	Aluminium [Al] as principal constituent
2224/29776	. . . . .	Ruthenium [Ru] as principal constituent	2224/29838	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/29778	. . . . .	Iridium [Ir] as principal constituent	2224/29839	. . . . .	Silver [Ag] as principal constituent
2224/29779	. . . . .	Niobium [Nb] as principal constituent			
2224/2978	. . . . .	Molybdenum [Mo] as principal constituent			
2224/29781	. . . . .	Tantalum [Ta] as principal constituent			
2224/29783	. . . . .	Rhenium [Re] as principal constituent			
2224/29784	. . . . .	Tungsten [W] as principal constituent			
2224/29786	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material			
2224/29787	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides			
2224/29788	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides			

2224/29844	Gold [Au] as principal constituent	2224/29893	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/298</a> - <a href="#">H01L 2224/29891</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/29847	Copper [Cu] as principal constituent	2224/29894	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/298</a> - <a href="#">H01L 2224/29891</a>
2224/29849	Manganese [Mn] as principal constituent	2224/29895	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/298</a> - <a href="#">H01L 2224/29891</a>
2224/29855	Nickel [Ni] as principal constituent	2224/29898	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/29857	Cobalt [Co] as principal constituent	2224/29899	Coating material
2224/2986	Iron [Fe] as principal constituent	2224/299	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/29863	the principal constituent melting at a temperature of greater than 1550°C	2224/29901	the principal constituent melting at a temperature of less than 400°C
2224/29864	Palladium [Pd] as principal constituent	2224/29905	Gallium [Ga] as principal constituent
2224/29866	Titanium [Ti] as principal constituent	2224/29909	Indium [In] as principal constituent
2224/29869	Platinum [Pt] as principal constituent	2224/29911	Tin [Sn] as principal constituent
2224/2987	Zirconium [Zr] as principal constituent	2224/29913	Bismuth [Bi] as principal constituent
2224/29871	Chromium [Cr] as principal constituent	2224/29914	Thallium [Tl] as principal constituent
2224/29872	Vanadium [V] as principal constituent	2224/29916	Lead [Pb] as principal constituent
2224/29873	Rhodium [Rh] as principal constituent	2224/29917	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/29876	Ruthenium [Ru] as principal constituent	2224/29918	Zinc [Zn] as principal constituent
2224/29878	Iridium [Ir] as principal constituent	2224/2992	Antimony [Sb] as principal constituent
2224/29879	Niobium [Nb] as principal constituent	2224/29923	Magnesium [Mg] as principal constituent
2224/2988	Molybdenum [Mo] as principal constituent	2224/29924	Aluminium [Al] as principal constituent
2224/29881	Tantalum [Ta] as principal constituent	2224/29938	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/29883	Rhenium [Re] as principal constituent	2224/29939	Silver [Ag] as principal constituent
2224/29884	Tungsten [W] as principal constituent	2224/29944	Gold [Au] as principal constituent
2224/29886	with a principal constituent of the material being a non metallic, non metalloid inorganic material		
2224/29887	Ceramics, e.g. crystalline carbides, nitrides or oxides		
2224/29888	Glasses, e.g. amorphous oxides, nitrides or fluorides		
2224/2989	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy		
2224/29891	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene		



2224/29947	Copper [Cu] as principal constituent	2224/29994	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/299</a> - <a href="#">H01L 2224/29991</a>
2224/29949	Manganese [Mn] as principal constituent	2224/29995	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/299</a> - <a href="#">H01L 2224/29991</a>
2224/29955	Nickel [Ni] as principal constituent	2224/29998	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/29957	Cobalt [Co] as principal constituent	2224/29999	Shape or distribution of the fillers
2224/2996	Iron [Fe] as principal constituent	2224/30	of a plurality of layer connectors
2224/29963	the principal constituent melting at a temperature of greater than 1550°C	2224/3001	Structure
2224/29964	Palladium [Pd] as principal constituent	2224/3003	Layer connectors having different sizes, e.g. different heights or widths
2224/29966	Titanium [Ti] as principal constituent	2224/3005	Shape
2224/29969	Platinum [Pt] as principal constituent	2224/30051	Layer connectors having different shapes
2224/2997	Zirconium [Zr] as principal constituent	2224/301	Disposition
2224/29971	Chromium [Cr] as principal constituent	2224/30104	relative to the bonding areas, e.g. bond pads, of the semiconductor or solid-state body
2224/29972	Vanadium [V] as principal constituent	2224/3011	the layer connectors being bonded to at least one common bonding area
2224/29973	Rhodium [Rh] as principal constituent	2224/3012	Layout
2224/29976	Ruthenium [Ru] as principal constituent	2224/3013	Square or rectangular array
2224/29978	Iridium [Ir] as principal constituent	2224/30131	being uniform, i.e. having a uniform pitch across the array
2224/29979	Niobium [Nb] as principal constituent	2224/30132	being non uniform, i.e. having a non uniform pitch across the array
2224/2998	Molybdenum [Mo] as principal constituent	2224/30133	with a staggered arrangement, e.g. depopulated array
2224/29981	Tantalum [Ta] as principal constituent	2224/30134	covering only portions of the surface to be connected
2224/29983	Rhenium [Re] as principal constituent	2224/30135	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/29984	Tungsten [W] as principal constituent	2224/30136	Covering only the central area of the surface to be connected, i.e. central arrangements
2224/29986	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/3014	Circular array, i.e. array with radial symmetry
2224/29987	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/30141	being uniform, i.e. having a uniform pitch across the array
2224/29988	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/30142	being non uniform, i.e. having a non uniform pitch across the array
2224/2999	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/30143	covering only portions of the surface to be connected
2224/29991	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/30145	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/29993	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/299</a> - <a href="#">H01L 2224/29991</a>	2224/30146	Covering only the central area of the surface to be connected, i.e. central arrangements
	e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/3015	Mirror array, i.e. array having only a reflection symmetry, i.e. bilateral symmetry
		2224/30151	being uniform, i.e. having a uniform pitch across the array

2224/30152	being non uniform, i.e. having a non uniform pitch across the array	2224/32059	comprising protrusions or indentations
2224/30153	with a staggered arrangement, e.g. depopulated array	2224/3207	of bonding interfaces, e.g. interlocking features
2224/30154	covering only portions of the surface to be connected	2224/321	Disposition
2224/30155	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements	2224/32104	relative to the bonding area, e.g. bond pad
2224/30156	Covering only the central area of the surface to be connected, i.e. central arrangements	2224/32105	the layer connector connecting bonding areas being not aligned with respect to each other
2224/3016	Random layout, i.e. layout with no symmetry	2224/32106	the layer connector connecting one bonding area to at least two respective bonding areas
2224/30163	with a staggered arrangement	2224/32111	the layer connector being disposed in a recess of the surface
2224/30164	covering only portions of the surface to be connected	2224/32112	the layer connector being at least partially embedded in the surface
2224/30165	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements	2224/32113	the whole layer connector protruding from the surface
2224/30166	Covering only the central area of the surface to be connected, i.e. central arrangements	2224/3213	the layer connector connecting within a semiconductor or solid-state body, i.e. connecting two bonding areas on the same semiconductor or solid-state body
2224/30177	Combinations of arrays with different layouts	2224/32135	the layer connector connecting between different semiconductor or solid-state bodies, i.e. chip-to-chip
2224/30179	Corner adaptations, i.e. disposition of the layer connectors at the corners of the semiconductor or solid-state body	2224/32137	the bodies being arranged next to each other, e.g. on a common substrate
2224/3018	being disposed on at least two different sides of the body, e.g. dual array	2224/32141	the bodies being arranged on opposite sides of a substrate, e.g. mirror arrangements
2224/30181	On opposite sides of the body	2224/32145	the bodies being stacked
2224/30183	On contiguous sides of the body	2224/32146	the layer connector connecting to a via connection in the semiconductor or solid-state body
2224/305	Material	2224/32147	the layer connector connecting to a bonding area disposed in a recess of the surface
2224/30505	Layer connectors having different materials	2224/32148	the layer connector connecting to a bonding area protruding from the surface
2224/3051	Function	2224/32151	the layer connector connecting between a semiconductor or solid-state body and an item not being a semiconductor or solid-state body, e.g. chip-to-substrate, chip-to-passive
2224/30515	Layer connectors having different functions	2224/32153	the body and the item being arranged next to each other, e.g. on a common substrate
2224/30517	including layer connectors providing primarily mechanical bonding	2224/32155	the item being non-metallic, e.g. being an insulating substrate with or without metallisation
2224/30519	including layer connectors providing primarily thermal dissipation	2224/32157	the layer connector connecting to a bond pad of the item
2224/31	Structure, shape, material or disposition of the layer connectors after the connecting process	2224/3216	the layer connector connecting to a pin of the item
2224/32	of an individual layer connector	2224/32163	the layer connector connecting to a potential ring of the item
2224/3201	Structure	2224/32165	the layer connector connecting to a via metallisation of the item
2224/32012	relative to the bonding area, e.g. bond pad	2224/32167	the layer connector connecting to a bonding area disposed in a recess of the surface of the item
2224/32013	the layer connector being larger than the bonding area, e.g. bond pad		
2224/32014	the layer connector being smaller than the bonding area, e.g. bond pad		
2224/3205	Shape		
2224/32052	in top view		
2224/32053	being non uniform along the layer connector		
2224/32054	being rectangular or square		
2224/32055	being circular or elliptic		
2224/32056	comprising protrusions or indentations		
2224/32057	in side view		
2224/32058	being non uniform along the layer connector		

2224/32168	the layer connector connecting to a bonding area protruding from the surface of the item	2224/32501	at the bonding interface
2224/32175	the item being metallic	2224/32502	comprising an eutectic alloy
2224/32183	the layer connector connecting to a potential ring of the item	2224/32503	comprising an intermetallic compound
2224/32187	the layer connector connecting to a bonding area disposed in a recess of the surface of the item	2224/32505	outside the bonding interface, e.g. in the bulk of the layer connector
2224/32188	the layer connector connecting to a bonding area protruding from the surface of the item	2224/32506	comprising an eutectic alloy
2224/32195	the item being a discrete passive component	2224/32507	comprising an intermetallic compound
2224/32197	the layer connector connecting to a bonding area disposed in a recess of the surface of the item	2224/33	of a plurality of layer connectors
2224/32198	the layer connector connecting to a bonding area protruding from the surface of the item	2224/3301	Structure
2224/32221	the body and the item being stacked	2224/3303	Layer connectors having different sizes, e.g. different heights or widths
2224/32225	the item being non-metallic, e.g. insulating substrate with or without metallisation	2224/3305	Shape
2224/32227	the layer connector connecting to a bond pad of the item	2224/33051	Layer connectors having different shapes
2224/3223	the layer connector connecting to a pin of the item	2224/33055	of their bonding interfaces
2224/32233	the layer connector connecting to a potential ring of the item	2224/331	Disposition
2224/32235	the layer connector connecting to a via metallisation of the item	2224/33104	relative to the bonding areas, e.g. bond pads
2224/32237	the layer connector connecting to a bonding area disposed in a recess of the surface of the item	2224/33106	the layer connectors being bonded to at least one common bonding area
2224/32238	the layer connector connecting to a bonding area protruding from the surface of the item	2224/33107	the layer connectors connecting two common bonding areas
2224/3224	the layer connector connecting between the body and an opposite side of the item with respect to the body	2224/3312	Layout
2224/32245	the item being metallic	2224/3313	Square or rectangular array
2224/32253	the layer connector connecting to a potential ring of the item	2224/33132	being non uniform, i.e. having a non uniform pitch across the array
2224/32257	the layer connector connecting to a bonding area disposed in a recess of the surface of the item	2224/33133	with a staggered arrangement, e.g. depopulated array
2224/32258	the layer connector connecting to a bonding area protruding from the surface of the item	2224/33134	covering only portions of the surface to be connected
2224/3226	the layer connector connecting between the body and an opposite side of the item with respect to the body	2224/33135	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
2224/32265	the item being a discrete passive component	2224/3314	Circular array, i.e. array with radial symmetry
2224/32267	the layer connector connecting to a bonding area disposed in a recess of the surface of the item	2224/33142	being non uniform, i.e. having a non uniform pitch across the array
2224/32268	the layer connector connecting to a bonding area protruding from the surface of the item	2224/33143	with a staggered arrangement
2224/325	Material	2224/33144	covering only portions of the surface to be connected
		2224/33145	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
		2224/3315	Mirror array, i.e. array having only a reflection symmetry, i.e. bilateral symmetry
		2224/33151	being uniform, i.e. having a uniform pitch across the array
		2224/33152	being non uniform, i.e. having a non uniform pitch across the array
		2224/33153	with a staggered arrangement, e.g. depopulated array
		2224/33154	covering only portions of the surface to be connected
		2224/33155	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements
		2224/33156	Covering only the central area of the surface to be connected, i.e. central arrangements
		2224/3316	Random layout, i.e. layout with no symmetry

2224/33163	. . . . .	with a staggered arrangement	2224/35847	. . . . .	with a mechanical process, e.g. with flattening of the connector
2224/33164	. . . . .	covering only portions of the surface to be connected	2224/35848	. . . . .	Thermal treatments, e.g. annealing, controlled cooling
2224/33165	. . . . .	Covering only the peripheral area of the surface to be connected, i.e. peripheral arrangements	2224/35985	. . . . .	Methods of manufacturing strap connectors involving a specific sequence of method steps
2224/33177	. . . . .	Combinations of arrays with different layouts	2224/35986	. . . . .	with repetition of the same manufacturing step
2224/33179	. . . . .	Corner adaptations, i.e. disposition of the layer connectors at the corners of the semiconductor or solid-state body	2224/36	. . . . .	Structure, shape, material or disposition of the strap connectors prior to the connecting process
2224/3318	. . . . .	being disposed on at least two different sides of the body, e.g. dual array	2224/37	. . . . .	of an individual strap connector
2224/33181	. . . . .	On opposite sides of the body	2224/37001	. . . . .	Core members of the connector
2224/33183	. . . . .	On contiguous sides of the body	2224/37005	. . . . .	Structure
2224/335	. . . . .	Material	2224/3701	. . . . .	Shape
2224/33505	. . . . .	Layer connectors having different materials	2224/37011	. . . . .	comprising apertures or cavities
2224/3351	. . . . .	Function	2224/37012	. . . . .	Cross-sectional shape
2224/33515	. . . . .	Layer connectors having different functions	2224/37013	. . . . .	being non uniform along the connector
2224/33517	. . . . .	including layer connectors providing primarily mechanical support	2224/3702	. . . . .	Disposition
2224/33519	. . . . .	including layer connectors providing primarily thermal dissipation	2224/37025	. . . . .	Plural core members
2224/34	. . . . .	Strap connectors, e.g. copper straps for grounding power devices; Manufacturing methods related thereto	2224/37026	. . . . .	being mutually engaged together, e.g. through inserts
2224/35	. . . . .	Manufacturing methods	2224/37028	. . . . .	Side-to-side arrangements
2224/35001	. . . . .	Involving a temporary auxiliary member not forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or substrate	2224/3703	. . . . .	Stacked arrangements
2224/351	. . . . .	Pre-treatment of the preform connector	2224/37032	. . . . .	Two-layer arrangements
2224/3512	. . . . .	Applying permanent coating, e.g. in-situ coating	2224/37033	. . . . .	Three-layer arrangements
2224/35125	. . . . .	Plating, e.g. electroplating, electroless plating	2224/37034	. . . . .	Four-layer arrangements
2224/352	. . . . .	Mechanical processes	2224/37099	. . . . .	Material
2224/3521	. . . . .	Pulling	2224/371	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/355	. . . . .	Modification of a pre-existing material	2224/37101	. . . . .	the principal constituent melting at a temperature of less than 400°C
2224/3551	. . . . .	Sintering	2224/37105	. . . . .	Gallium [Ga] as principal constituent
2224/3552	. . . . .	Anodisation	2224/37109	. . . . .	Indium [In] as principal constituent
2224/357	. . . . .	Involving monitoring, e.g. feedback loop	2224/37111	. . . . .	Tin [Sn] as principal constituent
2224/358	. . . . .	Post-treatment of the connector	2224/37113	. . . . .	Bismuth [Bi] as principal constituent
2224/3581	. . . . .	Cleaning, e.g. oxide removal step, desmearing	2224/37114	. . . . .	Thallium [Tl] as principal constituent
2224/3582	. . . . .	Applying permanent coating, e.g. in-situ coating	2224/37116	. . . . .	Lead [Pb] as principal constituent
2224/35821	. . . . .	Spray coating	2224/37117	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/35822	. . . . .	Dip coating	2224/37118	. . . . .	Zinc [Zn] as principal constituent
2224/35823	. . . . .	Immersion coating, e.g. solder bath	2224/3712	. . . . .	Antimony [Sb] as principal constituent
2224/35824	. . . . .	Chemical solution deposition [CSD], i.e. using a liquid precursor	2224/37123	. . . . .	Magnesium [Mg] as principal constituent
2224/35825	. . . . .	Plating, e.g. electroplating, electroless plating	2224/37124	. . . . .	Aluminium [Al] as principal constituent
2224/35826	. . . . .	Physical vapour deposition [PVD], e.g. evaporation, sputtering	2224/37138	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/35827	. . . . .	Chemical vapour deposition [CVD], e.g. laser CVD	2224/37139	. . . . .	Silver [Ag] as principal constituent
2224/3583	. . . . .	Reworking			
2224/35831	. . . . .	with a chemical process, e.g. with etching of the connector			

2224/37144	Gold [Au] as principal constituent	2224/37194	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/371</a> - <a href="#">H01L 2224/37191</a>
2224/37147	Copper [Cu] as principal constituent	2224/37195	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/371</a> - <a href="#">H01L 2224/37191</a>
2224/37149	Manganese [Mn] as principal constituent	2224/37198	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/37155	Nickel [Ni] as principal constituent	2224/37199	Material of the matrix
2224/37157	Cobalt [Co] as principal constituent	2224/372	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/3716	Iron [Fe] as principal constituent	2224/37201	the principal constituent melting at a temperature of less than 400°C
2224/37163	the principal constituent melting at a temperature of greater than 1550°C	2224/37205	Gallium [Ga] as principal constituent
2224/37164	Palladium [Pd] as principal constituent	2224/37209	Indium [In] as principal constituent
2224/37166	Titanium [Ti] as principal constituent	2224/37211	Tin [Sn] as principal constituent
2224/37169	Platinum [Pt] as principal constituent	2224/37213	Bismuth [Bi] as principal constituent
2224/3717	Zirconium [Zr] as principal constituent	2224/37214	Thallium [Tl] as principal constituent
2224/37171	Chromium [Cr] as principal constituent	2224/37216	Lead [Pb] as principal constituent
2224/37172	Vanadium [V] as principal constituent	2224/37217	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/37173	Rhodium [Rh] as principal constituent	2224/37218	Zinc [Zn] as principal constituent
2224/37176	Ruthenium [Ru] as principal constituent	2224/3722	Antimony [Sb] as principal constituent
2224/37178	Iridium [Ir] as principal constituent	2224/37223	Magnesium [Mg] as principal constituent
2224/37179	Niobium [Nb] as principal constituent	2224/37224	Aluminium [Al] as principal constituent
2224/3718	Molybdenum [Mo] as principal constituent	2224/37238	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/37181	Tantalum [Ta] as principal constituent	2224/37239	Silver [Ag] as principal constituent
2224/37183	Rhenium [Re] as principal constituent	2224/37244	Gold [Au] as principal constituent
2224/37184	Tungsten [W] as principal constituent	2224/37247	Copper [Cu] as principal constituent
2224/37186	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/37249	Manganese [Mn] as principal constituent
2224/37187	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/37255	Nickel [Ni] as principal constituent
2224/37188	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/37257	Cobalt [Co] as principal constituent
2224/3719	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy		
2224/37191	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene		
2224/37193	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/371</a> - <a href="#">H01L 2224/37191</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond		

2224/3726	Iron [Fe] as principal constituent	2224/373	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/37263	the principal constituent melting at a temperature of greater than 1550°C	2224/37301	the principal constituent melting at a temperature of less than 400°C
2224/37264	Palladium [Pd] as principal constituent	2224/37305	Gallium [Ga] as principal constituent
2224/37266	Titanium [Ti] as principal constituent	2224/37309	Indium [In] as principal constituent
2224/37269	Platinum [Pt] as principal constituent	2224/37311	Tin [Sn] as principal constituent
2224/3727	Zirconium [Zr] as principal constituent	2224/37313	Bismuth [Bi] as principal constituent
2224/37271	Chromium [Cr] as principal constituent	2224/37314	Thallium [Tl] as principal constituent
2224/37272	Vanadium [V] as principal constituent	2224/37316	Lead [Pb] as principal constituent
2224/37273	Rhodium [Rh] as principal constituent	2224/37317	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/37276	Ruthenium [Ru] as principal constituent	2224/37318	Zinc [Zn] as principal constituent
2224/37278	Iridium [Ir] as principal constituent	2224/3732	Antimony [Sb] as principal constituent
2224/37279	Niobium [Nb] as principal constituent	2224/37323	Magnesium [Mg] as principal constituent
2224/3728	Molybdenum [Mo] as principal constituent	2224/37324	Aluminium [Al] as principal constituent
2224/37281	Tantalum [Ta] as principal constituent	2224/37338	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/37283	Rhenium [Re] as principal constituent	2224/37339	Silver [Ag] as principal constituent
2224/37284	Tungsten [W] as principal constituent	2224/37344	Gold [Au] as principal constituent
2224/37286	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/37347	Copper [Cu] as principal constituent
2224/37287	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/37349	Manganese [Mn] as principal constituent
2224/37288	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/37355	Nickel [Ni] as principal constituent
2224/3729	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/37357	Cobalt [Co] as principal constituent
2224/37291	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/3736	Iron [Fe] as principal constituent
2224/37293	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/372</a> - <a href="#">H01L 2224/37291</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/37363	the principal constituent melting at a temperature of greater than 1550°C
2224/37294	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/372</a> - <a href="#">H01L 2224/37291</a>	2224/37364	Palladium [Pd] as principal constituent
2224/37295	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/372</a> - <a href="#">H01L 2224/37291</a>	2224/37366	Titanium [Ti] as principal constituent
2224/37298	Fillers	2224/37369	Platinum [Pt] as principal constituent
2224/37299	Base material	2224/3737	Zirconium [Zr] as principal constituent



2224/37371	Chromium [Cr] as principal constituent	2224/37401	the principal constituent melting at a temperature of less than 400°C
2224/37372	Vanadium [V] as principal constituent	2224/37405	Gallium [Ga] as principal constituent
2224/37373	Rhodium [Rh] as principal constituent	2224/37409	Indium [In] as principal constituent
2224/37376	Ruthenium [Ru] as principal constituent	2224/37411	Tin [Sn] as principal constituent
2224/37378	Iridium [Ir] as principal constituent	2224/37413	Bismuth [Bi] as principal constituent
2224/37379	Niobium [Nb] as principal constituent	2224/37414	Thallium [Tl] as principal constituent
2224/3738	Molybdenum [Mo] as principal constituent	2224/37416	Lead [Pb] as principal constituent
2224/37381	Tantalum [Ta] as principal constituent	2224/37417	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/37383	Rhenium [Re] as principal constituent	2224/37418	Zinc [Zn] as principal constituent
2224/37384	Tungsten [W] as principal constituent	2224/3742	Antimony [Sb] as principal constituent
2224/37386	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/37423	Magnesium [Mg] as principal constituent
2224/37387	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/37424	Aluminium [Al] as principal constituent
2224/37388	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/37438	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/3739	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/37439	Silver [Ag] as principal constituent
2224/37391	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/37444	Gold [Au] as principal constituent
2224/37393	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/373</a> - <a href="#">H01L 2224/37391</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/37447	Copper [Cu] as principal constituent
2224/37394	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/373</a> - <a href="#">H01L 2224/37391</a>	2224/37449	Manganese [Mn] as principal constituent
2224/37395	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/373</a> - <a href="#">H01L 2224/37391</a>	2224/37455	Nickel [Ni] as principal constituent
2224/37398	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/37457	Cobalt [Co] as principal constituent
2224/37399	Coating material	2224/3746	Iron [Fe] as principal constituent
2224/374	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/37463	the principal constituent melting at a temperature of greater than 1550°C
		2224/37464	Palladium [Pd] as principal constituent
		2224/37466	Titanium [Ti] as principal constituent
		2224/37469	Platinum [Pt] as principal constituent
		2224/3747	Zirconium [Zr] as principal constituent
		2224/37471	Chromium [Cr] as principal constituent
		2224/37472	Vanadium [V] as principal constituent
		2224/37473	Rhodium [Rh] as principal constituent
		2224/37476	Ruthenium [Ru] as principal constituent

2224/37478	Iridium [Ir] as principal constituent	2224/37599	Material
2224/37479	Niobium [Nb] as principal constituent	2224/376	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/3748	Molybdenum [Mo] as principal constituent	2224/37601	the principal constituent melting at a temperature of less than 400°C
2224/37481	Tantalum [Ta] as principal constituent	2224/37605	Gallium [Ga] as principal constituent
2224/37483	Rhenium [Re] as principal constituent	2224/37609	Indium [In] as principal constituent
2224/37484	Tungsten [W] as principal constituent	2224/37611	Tin [Sn] as principal constituent
2224/37486	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/37613	Bismuth [Bi] as principal constituent
2224/37487	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/37614	Thallium [Tl] as principal constituent
2224/37488	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/37616	Lead [Pb] as principal constituent
2224/3749	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/37617	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/37491	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/37618	Zinc [Zn] as principal constituent
2224/37493	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/374</a> - <a href="#">H01L 2224/37491</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/3762	Antimony [Sb] as principal constituent
2224/37494	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/374</a> - <a href="#">H01L 2224/37491</a>	2224/37623	Magnesium [Mg] as principal constituent
2224/37495	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/374</a> - <a href="#">H01L 2224/37491</a>	2224/37624	Aluminium [Al] as principal constituent
2224/37498	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/37638	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/37499	Shape or distribution of the fillers	2224/37639	Silver [Ag] as principal constituent
2224/3754	Coating	2224/37644	Gold [Au] as principal constituent
2224/37541	Structure	2224/37647	Copper [Cu] as principal constituent
2224/3755	Shape	2224/37649	Manganese [Mn] as principal constituent
2224/3756	Disposition, e.g. coating on a part of the core	2224/37655	Nickel [Ni] as principal constituent
2224/37565	Single coating layer	2224/37657	Cobalt [Co] as principal constituent
2224/3757	Plural coating layers	2224/3766	Iron [Fe] as principal constituent
2224/37572	Two-layer stack coating	2224/37663	the principal constituent melting at a temperature of greater than 1550°C
2224/37573	Three-layer stack coating	2224/37664	Palladium [Pd] as principal constituent
2224/37574	Four-layer stack coating	2224/37666	Titanium [Ti] as principal constituent
2224/37576	being mutually engaged together, e.g. through inserts	2224/37669	Platinum [Pt] as principal constituent
2224/37578	being disposed next to each other, e.g. side-to-side arrangements	2224/3767	Zirconium [Zr] as principal constituent
		2224/37671	Chromium [Cr] as principal constituent
		2224/37672	Vanadium [V] as principal constituent
		2224/37673	Rhodium [Rh] as principal constituent

2224/37676	Ruthenium [Ru] as principal constituent	2224/37713	Bismuth [Bi] as principal constituent
2224/37678	Iridium [Ir] as principal constituent	2224/37714	Thallium [Tl] as principal constituent
2224/37679	Niobium [Nb] as principal constituent	2224/37716	Lead [Pb] as principal constituent
2224/3768	Molybdenum [Mo] as principal constituent	2224/37717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/37681	Tantalum [Ta] as principal constituent	2224/37718	Zinc [Zn] as principal constituent
2224/37683	Rhenium [Re] as principal constituent	2224/3772	Antimony [Sb] as principal constituent
2224/37684	Tungsten [W] as principal constituent	2224/37723	Magnesium [Mg] as principal constituent
2224/37686	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/37724	Aluminium [Al] as principal constituent
2224/37687	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/37738	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/37688	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/37739	Silver [Ag] as principal constituent
2224/3769	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/37744	Gold [Au] as principal constituent
2224/37691	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/37747	Copper [Cu] as principal constituent
2224/37693	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/376</a> - <a href="#">H01L 2224/37691</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/37749	Manganese [Mn] as principal constituent
2224/37694	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/376</a> - <a href="#">H01L 2224/37691</a>	2224/37755	Nickel [Ni] as principal constituent
2224/37695	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/376</a> - <a href="#">H01L 2224/37691</a>	2224/37757	Cobalt [Co] as principal constituent
2224/37698	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/3776	Iron [Fe] as principal constituent
2224/37699	Material of the matrix	2224/37763	the principal constituent melting at a temperature of greater than 1550°C
2224/377	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/37764	Palladium [Pd] as principal constituent
2224/37701	the principal constituent melting at a temperature of less than 400°C	2224/37766	Titanium [Ti] as principal constituent
2224/37705	Gallium [Ga] as principal constituent	2224/37769	Platinum [Pt] as principal constituent
2224/37709	Indium [In] as principal constituent	2224/3777	Zirconium [Zr] as principal constituent
2224/37711	Tin [Sn] as principal constituent	2224/37771	Chromium [Cr] as principal constituent
		2224/37772	Vanadium [V] as principal constituent
		2224/37773	Rhodium [Rh] as principal constituent
		2224/37776	Ruthenium [Ru] as principal constituent
		2224/37778	Iridium [Ir] as principal constituent
		2224/37779	Niobium [Nb] as principal constituent
		2224/3778	Molybdenum [Mo] as principal constituent
		2224/37781	Tantalum [Ta] as principal constituent

2224/37783	Rhenium [Re] as principal constituent	2224/37823	Magnesium [Mg] as principal constituent
2224/37784	Tungsten [W] as principal constituent	2224/37824	Aluminium [Al] as principal constituent
2224/37786	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/37838	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/37787	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/37839	Silver [Ag] as principal constituent
2224/37788	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/37844	Gold [Au] as principal constituent
2224/3779	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/37847	Copper [Cu] as principal constituent
2224/37791	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/37849	Manganese [Mn] as principal constituent
2224/37793	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/377</a> - <a href="#">H01L 2224/37791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/37855	Nickel [Ni] as principal constituent
2224/37794	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/377</a> - <a href="#">H01L 2224/37791</a>	2224/37857	Cobalt [Co] as principal constituent
2224/37795	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/377</a> - <a href="#">H01L 2224/37791</a>	2224/3786	Iron [Fe] as principal constituent
2224/37798	Fillers	2224/37863	the principal constituent melting at a temperature of greater than 1550°C
2224/37799	Base material	2224/37864	Palladium [Pd] as principal constituent
2224/378	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/37866	Titanium [Ti] as principal constituent
2224/37801	the principal constituent melting at a temperature of less than 400°C	2224/37869	Platinum [Pt] as principal constituent
2224/37805	Gallium [Ga] as principal constituent	2224/3787	Zirconium [Zr] as principal constituent
2224/37809	Indium [In] as principal constituent	2224/37871	Chromium [Cr] as principal constituent
2224/37811	Tin [Sn] as principal constituent	2224/37872	Vanadium [V] as principal constituent
2224/37813	Bismuth [Bi] as principal constituent	2224/37873	Rhodium [Rh] as principal constituent
2224/37814	Thallium [Tl] as principal constituent	2224/37876	Ruthenium [Ru] as principal constituent
2224/37816	Lead [Pb] as principal constituent	2224/37878	Iridium [Ir] as principal constituent
2224/37817	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/37879	Niobium [Nb] as principal constituent
2224/37818	Zinc [Zn] as principal constituent	2224/3788	Molybdenum [Mo] as principal constituent
2224/3782	Antimony [Sb] as principal constituent	2224/37881	Tantalum [Ta] as principal constituent
		2224/37883	Rhenium [Re] as principal constituent
		2224/37884	Tungsten [W] as principal constituent
		2224/37886	with a principal constituent of the material being a non metallic, non metalloid inorganic material
		2224/37887	Ceramics, e.g. crystalline carbides, nitrides or oxides
		2224/37888	Glasses, e.g. amorphous oxides, nitrides or fluorides

2224/3789	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/37938	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/37891	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/37939	Silver [Ag] as principal constituent
2224/37893	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/378</a> - <a href="#">H01L 2224/37891</a>	2224/37944	Gold [Au] as principal constituent
	e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/37947	Copper [Cu] as principal constituent
2224/37894	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/378</a> - <a href="#">H01L 2224/37891</a>	2224/37949	Manganese [Mn] as principal constituent
2224/37895	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/378</a> - <a href="#">H01L 2224/37891</a>	2224/37955	Nickel [Ni] as principal constituent
2224/37898	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/37957	Cobalt [Co] as principal constituent
2224/37899	Coating material	2224/3796	Iron [Fe] as principal constituent
2224/379	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/37963	the principal constituent melting at a temperature of greater than 1550°C
2224/37901	the principal constituent melting at a temperature of less than 400°C	2224/37964	Palladium [Pd] as principal constituent
2224/37905	Gallium [Ga] as principal constituent	2224/37966	Titanium [Ti] as principal constituent
2224/37909	Indium [In] as principal constituent	2224/37969	Platinum [Pt] as principal constituent
2224/37911	Tin [Sn] as principal constituent	2224/3797	Zirconium [Zr] as principal constituent
2224/37913	Bismuth [Bi] as principal constituent	2224/37971	Chromium [Cr] as principal constituent
2224/37914	Thallium [Tl] as principal constituent	2224/37972	Vanadium [V] as principal constituent
2224/37916	Lead [Pb] as principal constituent	2224/37973	Rhodium [Rh] as principal constituent
2224/37917	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/37976	Ruthenium [Ru] as principal constituent
2224/37918	Zinc [Zn] as principal constituent	2224/37978	Iridium [Ir] as principal constituent
2224/3792	Antimony [Sb] as principal constituent	2224/37979	Niobium [Nb] as principal constituent
2224/37923	Magnesium [Mg] as principal constituent	2224/3798	Molybdenum [Mo] as principal constituent
2224/37924	Aluminium [Al] as principal constituent	2224/37981	Tantalum [Ta] as principal constituent
		2224/37983	Rhenium [Re] as principal constituent
		2224/37984	Tungsten [W] as principal constituent
		2224/37986	with a principal constituent of the material being a non metallic, non metalloid inorganic material
		2224/37987	Ceramics, e.g. crystalline carbides, nitrides or oxides
		2224/37988	Glasses, e.g. amorphous oxides, nitrides or fluorides
		2224/3799	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
		2224/37991	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene



2224/37993	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/379</a> - <a href="#">H01L 2224/37991</a>	2224/40145	the bodies being stacked
	e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/40147	with an intermediate bond, e.g. continuous strap daisy chain
2224/37994	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/379</a> - <a href="#">H01L 2224/37991</a>	2224/40151	Connecting between a semiconductor or solid-state body and an item not being a semiconductor or solid-state body, e.g. chip-to-substrate, chip-to-passive
2224/37995	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/379</a> - <a href="#">H01L 2224/37991</a>	2224/40153	the body and the item being arranged next to each other, e.g. on a common substrate
2224/37998	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/40155	the item being non-metallic, e.g. insulating substrate with or without metallisation
2224/37999	Shape or distribution of the fillers	2224/40157	Connecting the strap to a bond pad of the item
2224/38	of a plurality of strap connectors	2224/40158	the bond pad being disposed in a recess of the surface of the item
2224/39	Structure, shape, material or disposition of the strap connectors after the connecting process	2224/40159	the bond pad protruding from the surface of the item
2224/40	of an individual strap connector	2224/4016	Connecting the strap to a pin of the item
2224/4001	Structure	2224/40163	Connecting the strap to a potential ring of the item
2224/4005	Shape	2224/40165	Connecting the strap to a via metallisation of the item
2224/4007	of bonding interfaces, e.g. interlocking features	2224/40175	the item being metallic
2224/4009	Loop shape	2224/40177	Connecting the strap to a bond pad of the item
2224/40091	Arched	2224/40178	the bond pad being disposed in a recess of the surface of the item
2224/40095	Kinked	2224/40179	the bond pad protruding from the surface of the item
2224/401	Disposition	2224/40183	Connecting the strap to a potential ring of the item
2224/40101	Connecting bonding areas at the same height, e.g. horizontal bond	2224/40195	the item being a discrete passive component
2224/40105	Connecting bonding areas at different heights	2224/40221	the body and the item being stacked
2224/40106	the connector being orthogonal to a side surface of the semiconductor or solid-state body, e.g. parallel layout	2224/40225	the item being non-metallic, e.g. insulating substrate with or without metallisation
2224/40108	the connector not being orthogonal to a side surface of the semiconductor or solid-state body, e.g. fanned-out connectors, radial layout	2224/40227	Connecting the strap to a bond pad of the item
2224/40111	the strap connector extending above another semiconductor or solid-state body	2224/40228	the bond pad being disposed in a recess of the surface of the item
2224/4013	Connecting within a semiconductor or solid-state body, i.e. fly strap, bridge strap	2224/40229	the bond pad protruding from the surface of the item
2224/40132	with an intermediate bond, e.g. continuous strap daisy chain	2224/4023	Connecting the strap to a pin of the item
2224/40135	Connecting between different semiconductor or solid-state bodies, i.e. chip-to-chip	2224/40233	Connecting the strap to a potential ring of the item
2224/40137	the bodies being arranged next to each other, e.g. on a common substrate	2224/40235	Connecting the strap to a via metallisation of the item
2224/40139	with an intermediate bond, e.g. continuous strap daisy chain	2224/40237	Connecting the strap to a die pad of the item
2224/40141	the bodies being arranged on opposite sides of a substrate, e.g. mirror arrangements	2224/4024	Connecting between the body and an opposite side of the item with respect to the body
		2224/40245	the item being metallic
		2224/40247	Connecting the strap to a bond pad of the item



2224/40248	. . . . .	the bond pad being disposed in a recess of the surface of the item	2224/41052	. . . . .	Different loop heights
2224/40249	. . . . .	the bond pad protruding from the surface of the item	2224/411	. . . . .	Disposition
2224/40253	. . . . .	Connecting the strap to a potential ring of the item	2224/41105	. . . . .	Connecting at different heights
2224/40257	. . . . .	Connecting the strap to a die pad of the item	2224/41107	. . . . .	on the semiconductor or solid-state body being
2224/4026	. . . . .	Connecting between the body and an opposite side of the item with respect to the body	2224/41109	. . . . .	outside the semiconductor or solid-state body
2224/40265	. . . . .	the item being a discrete passive component	2224/4111	. . . . .	the connectors being bonded to at least one common bonding area, e.g. daisy chain
2224/404	. . . . .	Connecting portions	2224/41111	. . . . .	the connectors connecting two common bonding areas
2224/4046	. . . . .	with multiple bonds on the same bonding area	2224/41112	. . . . .	the connectors connecting a common bonding area on the semiconductor or solid-state body to different bonding areas outside the body, e.g. diverging straps
2224/40475	. . . . .	connected to auxiliary connecting means on the bonding areas	2224/41113	. . . . .	the connectors connecting different bonding areas on the semiconductor or solid-state body to a common bonding area outside the body, e.g. converging straps
2224/40477	. . . . .	being a pre-ball (i.e. a ball formed by capillary bonding)	2224/4112	. . . . .	Layout
2224/40479	. . . . .	on the semiconductor or solid-state body	2224/4117	. . . . .	Crossed straps
2224/4048	. . . . .	outside the semiconductor or solid-state body	2224/41171	. . . . .	Fan-out arrangements
2224/40484	. . . . .	being a plurality of pre-balls disposed side-to-side	2224/41173	. . . . .	Radial fan-out arrangements
2224/40486	. . . . .	on the semiconductor or solid-state body	2224/41174	. . . . .	Stacked arrangements
2224/40487	. . . . .	outside the semiconductor or solid-state body	2224/41175	. . . . .	Parallel arrangements
2224/40491	. . . . .	being an additional member attached to the bonding area through an adhesive or solder, e.g. buffer pad	2224/41176	. . . . .	Strap connectors having the same loop shape and height
2224/40496	. . . . .	not being interposed between the connector and the bonding area	2224/41177	. . . . .	Combinations of different arrangements
2224/40499	. . . . .	Material of the auxiliary connecting means	2224/41179	. . . . .	Corner adaptations, i.e. disposition of the strap connectors at the corners of the semiconductor or solid-state body
2224/405	. . . . .	Material	2224/4118	. . . . .	being disposed on at least two different sides of the body, e.g. dual array
2224/40505	. . . . .	at the bonding interface	2224/414	. . . . .	Connecting portions
2224/40506	. . . . .	comprising an eutectic alloy	2224/4141	. . . . .	the connecting portions being stacked
2224/40507	. . . . .	comprising an intermetallic compound	2224/41421	. . . . .	on the semiconductor or solid-state body
2224/4051	. . . . .	Morphology of the connecting portion, e.g. grain size distribution	2224/41422	. . . . .	outside the semiconductor or solid-state body
2224/4052	. . . . .	Bonding interface between the connecting portion and the bonding area	2224/4143	. . . . .	the connecting portions being staggered
2224/4099	. . . . .	Auxiliary members for strap connectors, e.g. flow-barriers, spacers	2224/415	. . . . .	Material
2224/40991	. . . . .	being formed on the semiconductor or solid-state body to be connected	2224/41505	. . . . .	Connectors having different materials
2224/40992	. . . . .	Reinforcing structures	2224/42	. . . . .	Wire connectors; Manufacturing methods related thereto
2224/40993	. . . . .	Alignment aids	2224/43	. . . . .	Manufacturing methods
2224/40996	. . . . .	being formed on an item to be connected not being a semiconductor or solid-state body	2224/43001	. . . . .	Involving a temporary auxiliary member not forming part of the manufacturing apparatus, e.g. removable or sacrificial coating, film or substrate
2224/40997	. . . . .	Reinforcing structures	2224/431	. . . . .	Pre-treatment of the preform connector
2224/40998	. . . . .	Alignment aids	2224/4312	. . . . .	Applying permanent coating, e.g. in-situ coating
2224/41	. . . . .	of a plurality of strap connectors	2224/43125	. . . . .	Plating, e.g. electroplating, electroless plating
2224/4101	. . . . .	Structure	2224/432	. . . . .	Mechanical processes
2224/4103	. . . . .	Connectors having different sizes	2224/4321	. . . . .	Pulling
2224/4105	. . . . .	Shape	2224/435	. . . . .	Modification of a pre-existing material
2224/41051	. . . . .	Connectors having different shapes	2224/4351	. . . . .	Sintering
			2224/4352	. . . . .	Anodisation

2224/437	. . . .	Involving monitoring, e.g. feedback loop	2224/45109	. . . . .	Indium (In) as principal constituent
2224/438	. . . .	Post-treatment of the connector	2224/45111	. . . . .	Tin (Sn) as principal constituent
2224/4381	. . . .	Cleaning, e.g. oxide removal step, desmearing	2224/45113	. . . . .	Bismuth (Bi) as principal constituent
2224/4382	. . . .	Applying permanent coating, e.g. in-situ coating	2224/45114	. . . . .	Thallium (Tl) as principal constituent
2224/43821	. . . . .	Spray coating	2224/45116	. . . . .	Lead (Pb) as principal constituent
2224/43822	. . . . .	Dip coating	2224/45117	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/43823	. . . . .	Immersion coating, e.g. solder bath	2224/45118	. . . . .	Zinc (Zn) as principal constituent
2224/43824	. . . . .	Chemical solution deposition [CSD], i.e. using a liquid precursor	2224/4512	. . . . .	Antimony (Sb) as principal constituent
2224/43825	. . . . .	Plating, e.g. electroplating, electroless plating	2224/45123	. . . . .	Magnesium (Mg) as principal constituent
2224/43826	. . . . .	Physical vapour deposition [PVD], e.g. evaporation, sputtering	2224/45124	. . . . .	Aluminium (Al) as principal constituent
2224/43827	. . . . .	Chemical vapour deposition [CVD], e.g. laser CVD	2224/45138	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/4383	. . . . .	Reworking	2224/45139	. . . . .	Silver (Ag) as principal constituent
2224/43831	. . . . .	with a chemical process, e.g. with etching of the connector	2224/45144	. . . . .	Gold (Au) as principal constituent
2224/43847	. . . . .	with a mechanical process, e.g. with flattening of the connector	2224/45147	. . . . .	Copper (Cu) as principal constituent
2224/43848	. . . . .	Thermal treatments, e.g. annealing, controlled cooling	2224/45149	. . . . .	Manganese (Mn) as principal constituent
2224/43985	. . . .	Methods of manufacturing wire connectors involving a specific sequence of method steps	2224/45155	. . . . .	Nickel (Ni) as principal constituent
2224/43986	. . . . .	with repetition of the same manufacturing step	2224/45157	. . . . .	Cobalt (Co) as principal constituent
2224/44	. . .	Structure, shape, material or disposition of the wire connectors prior to the connecting process	2224/4516	. . . . .	Iron (Fe) as principal constituent
2224/45	. . . .	of an individual wire connector	2224/45163	. . . . .	the principal constituent melting at a temperature of greater than 1550°C
2224/45001	. . . . .	Core members of the connector	2224/45164	. . . . .	Palladium (Pd) as principal constituent
2224/45005	. . . . .	Structure	2224/45166	. . . . .	Titanium (Ti) as principal constituent
2224/4501	. . . . .	Shape	2224/45169	. . . . .	Platinum (Pt) as principal constituent
2224/45012	. . . . .	Cross-sectional shape	2224/4517	. . . . .	Zirconium (Zr) as principal constituent
2224/45013	. . . . .	being non uniform along the connector	2224/45171	. . . . .	Chromium (Cr) as principal constituent
2224/45014	. . . . .	Ribbon connectors, e.g. rectangular cross-section	2224/45172	. . . . .	Vanadium (V) as principal constituent
2224/45015	. . . . .	being circular	2224/45173	. . . . .	Rhodium (Rh) as principal constituent
2224/45016	. . . . .	being elliptic	2224/45176	. . . . .	Ruthenium (Ru) as principal constituent
2224/4502	. . . . .	Disposition	2224/45178	. . . . .	Iridium (Ir) as principal constituent
2224/45025	. . . . .	Plural core members	2224/45179	. . . . .	Niobium (Nb) as principal constituent
2224/45026	. . . . .	being mutually engaged together, e.g. through inserts	2224/4518	. . . . .	Molybdenum (Mo) as principal constituent
2224/45028	. . . . .	Side-to-side arrangements	2224/45181	. . . . .	Tantalum (Ta) as principal constituent
2224/4503	. . . . .	Stacked arrangements	2224/45183	. . . . .	Rhenium (Re) as principal constituent
2224/45032	. . . . .	Two-layer arrangements			
2224/45033	. . . . .	Three-layer arrangements			
2224/45034	. . . . .	Four-layer arrangements			
2224/45099	. . . . .	Material			
2224/451	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof			
2224/45101	. . . . .	the principal constituent melting at a temperature of less than 400°C			
2224/45105	. . . . .	Gallium (Ga) as principal constituent			

2224/45184	. . . . . Tungsten (W) as principal constituent	2224/4522	. . . . . Antimony (Sb) as principal constituent
2224/45186	. . . . . with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/45223	. . . . . Magnesium (Mg) as principal constituent
2224/45187	. . . . . Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/45224	. . . . . Aluminium (Al) as principal constituent
2224/45188	. . . . . Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/45238	. . . . . the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/4519	. . . . . with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/45239	. . . . . Silver (Ag) as principal constituent
2224/45191	. . . . . The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/45244	. . . . . Gold (Au) as principal constituent
2224/45193	. . . . . with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/451</a> - <a href="#">H01L 2224/45191</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/45247	. . . . . Copper (Cu) as principal constituent
2224/45194	. . . . . with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/451</a> - <a href="#">H01L 2224/45191</a>	2224/45249	. . . . . Manganese (Mn) as principal constituent
2224/45195	. . . . . with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/451</a> - <a href="#">H01L 2224/45191</a>	2224/45255	. . . . . Nickel (Ni) as principal constituent
2224/45198	. . . . . with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/45257	. . . . . Cobalt (Co) as principal constituent
2224/45199	. . . . . Material of the matrix	2224/4526	. . . . . Iron (Fe) as principal constituent
2224/452	. . . . . with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof	2224/45263	. . . . . the principal constituent melting at a temperature of greater than 1550°C
2224/45201	. . . . . the principal constituent melting at a temperature of less than 400°C	2224/45264	. . . . . Palladium (Pd) as principal constituent
2224/45205	. . . . . Gallium (Ga) as principal constituent	2224/45266	. . . . . Titanium (Ti) as principal constituent
2224/45209	. . . . . Indium (In) as principal constituent	2224/45269	. . . . . Platinum (Pt) as principal constituent
2224/45211	. . . . . Tin (Sn) as principal constituent	2224/4527	. . . . . Zirconium (Zr) as principal constituent
2224/45213	. . . . . Bismuth (Bi) as principal constituent	2224/45271	. . . . . Chromium (Cr) as principal constituent
2224/45214	. . . . . Thallium (Tl) as principal constituent	2224/45272	. . . . . Vanadium (V) as principal constituent
2224/45216	. . . . . Lead (Pb) as principal constituent	2224/45273	. . . . . Rhodium (Rh) as principal constituent
2224/45217	. . . . . the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/45276	. . . . . Ruthenium (Ru) as principal constituent
2224/45218	. . . . . Zinc (Zn) as principal constituent	2224/45278	. . . . . Iridium (Ir) as principal constituent
		2224/45279	. . . . . Niobium (Nb) as principal constituent
		2224/4528	. . . . . Molybdenum (Mo) as principal constituent
		2224/45281	. . . . . Tantalum (Ta) as principal constituent
		2224/45283	. . . . . Rhenium (Re) as principal constituent
		2224/45284	. . . . . Tungsten (W) as principal constituent
		2224/45286	. . . . . with a principal constituent of the material being a non metallic, non metalloid inorganic material
		2224/45287	. . . . . Ceramics, e.g. crystalline carbides, nitrides or oxides
		2224/45288	. . . . . Glasses, e.g. amorphous oxides, nitrides or fluorides

2224/4529	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/45344	Gold (Au) as principal constituent
2224/45291	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/45347	Copper (Cu) as principal constituent
2224/45293	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/452</a> - <a href="#">H01L 2224/45291</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/45349	Manganese (Mn) as principal constituent
2224/45294	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/452</a> - <a href="#">H01L 2224/45291</a>	2224/45355	Nickel (Ni) as principal constituent
2224/45295	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/452</a> - <a href="#">H01L 2224/45291</a>	2224/45357	Cobalt (Co) as principal constituent
2224/45298	Fillers	2224/4536	Iron (Fe) as principal constituent
2224/45299	Base material	2224/45363	the principal constituent melting at a temperature of greater than 1550°C
2224/453	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof	2224/45364	Palladium (Pd) as principal constituent
2224/45301	the principal constituent melting at a temperature of less than 400°C	2224/45366	Titanium (Ti) as principal constituent
2224/45305	Gallium (Ga) as principal constituent	2224/45369	Platinum (Pt) as principal constituent
2224/45309	Indium (In) as principal constituent	2224/4537	Zirconium (Zr) as principal constituent
2224/45311	Tin (Sn) as principal constituent	2224/45371	Chromium (Cr) as principal constituent
2224/45313	Bismuth (Bi) as principal constituent	2224/45372	Vanadium (V) as principal constituent
2224/45314	Thallium (Tl) as principal constituent	2224/45373	Rhodium (Rh) as principal constituent
2224/45316	Lead (Pb) as principal constituent	2224/45376	Ruthenium (Ru) as principal constituent
2224/45317	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/45378	Iridium (Ir) as principal constituent
2224/45318	Zinc (Zn) as principal constituent	2224/45379	Niobium (Nb) as principal constituent
2224/4532	Antimony (Sb) as principal constituent	2224/4538	Molybdenum (Mo) as principal constituent
2224/45323	Magnesium (Mg) as principal constituent	2224/45381	Tantalum (Ta) as principal constituent
2224/45324	Aluminium (Al) as principal constituent	2224/45383	Rhenium (Re) as principal constituent
2224/45338	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/45384	Tungsten (W) as principal constituent
2224/45339	Silver (Ag) as principal constituent	2224/45386	with a principal constituent of the material being a non metallic, non metalloid inorganic material
		2224/45387	Ceramics, e.g. crystalline carbides, nitrides or oxides
		2224/45388	Glasses, e.g. amorphous oxides, nitrides or fluorides
		2224/4539	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
		2224/45391	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene

2224/45393	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/453</a> - <a href="#">H01L 2224/45391</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/45447	Copper (Cu) as principal constituent
2224/45394	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/453</a> - <a href="#">H01L 2224/45391</a>	2224/45449	Manganese (Mn) as principal constituent
2224/45395	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/453</a> - <a href="#">H01L 2224/45391</a>	2224/45455	Nickel (Ni) as principal constituent
2224/45398	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/45457	Cobalt (Co) as principal constituent
2224/45399	Coating material	2224/4546	Iron (Fe) as principal constituent
2224/454	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof	2224/45463	the principal constituent melting at a temperature of greater than 1550°C
2224/45401	the principal constituent melting at a temperature of less than 400°C	2224/45464	Palladium (Pd) as principal constituent
2224/45405	Gallium (Ga) as principal constituent	2224/45466	Titanium (Ti) as principal constituent
2224/45409	Indium (In) as principal constituent	2224/45469	Platinum (Pt) as principal constituent
2224/45411	Tin (Sn) as principal constituent	2224/4547	Zirconium (Zr) as principal constituent
2224/45413	Bismuth (Bi) as principal constituent	2224/45471	Chromium (Cr) as principal constituent
2224/45414	Thallium (Tl) as principal constituent	2224/45472	Vanadium (V) as principal constituent
2224/45416	Lead (Pb) as principal constituent	2224/45473	Rhodium (Rh) as principal constituent
2224/45417	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/45476	Ruthenium (Ru) as principal constituent
2224/45418	Zinc (Zn) as principal constituent	2224/45478	Iridium (Ir) as principal constituent
2224/4542	Antimony (Sb) as principal constituent	2224/45479	Niobium (Nb) as principal constituent
2224/45423	Magnesium (Mg) as principal constituent	2224/4548	Molybdenum (Mo) as principal constituent
2224/45424	Aluminium (Al) as principal constituent	2224/45481	Tantalum (Ta) as principal constituent
2224/45438	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/45483	Rhenium (Re) as principal constituent
2224/45439	Silver (Ag) as principal constituent	2224/45484	Tungsten (W) as principal constituent
2224/45444	Gold (Au) as principal constituent	2224/45486	with a principal constituent of the material being a non metallic, non metalloid inorganic material
		2224/45487	Ceramics, e.g. crystalline carbides, nitrides or oxides
		2224/45488	Glasses, e.g. amorphous oxides, nitrides or fluorides
		2224/4549	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
		2224/45491	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
		2224/45493	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/454</a> - <a href="#">H01L 2224/45491</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond

2224/45494	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/454</a> - <a href="#">H01L 2224/45491</a>	2224/45639	Silver (Ag) as principal constituent
2224/45495	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/454</a> - <a href="#">H01L 2224/45491</a>	2224/45644	Gold (Au) as principal constituent
2224/45498	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/45647	Copper (Cu) as principal constituent
2224/45499	Shape or distribution of the fillers	2224/45649	Manganese (Mn) as principal constituent
2224/4554	Coating	2224/45655	Nickel (Ni) as principal constituent
2224/45541	Structure	2224/45657	Cobalt (Co) as principal constituent
2224/4555	Shape	2224/4566	Iron (Fe) as principal constituent
2224/4556	Disposition, e.g. coating on a part of the core	2224/45663	the principal constituent melting at a temperature of greater than 1550°C
2224/45565	Single coating layer	2224/45664	Palladium (Pd) as principal constituent
2224/4557	Plural coating layers	2224/45666	Titanium (Ti) as principal constituent
2224/45572	Two-layer stack coating	2224/45669	Platinum (Pt) as principal constituent
2224/45573	Three-layer stack coating	2224/4567	Zirconium (Zr) as principal constituent
2224/45574	Four-layer stack coating	2224/45671	Chromium (Cr) as principal constituent
2224/45576	being mutually engaged together, e.g. through inserts	2224/45672	Vanadium (V) as principal constituent
2224/45578	being disposed next to each other, e.g. side-to-side arrangements	2224/45673	Rhodium (Rh) as principal constituent
2224/45599	Material	2224/45676	Ruthenium (Ru) as principal constituent
2224/456	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof	2224/45678	Iridium (Ir) as principal constituent
2224/45601	the principal constituent melting at a temperature of less than 400°C	2224/45679	Niobium (Nb) as principal constituent
2224/45605	Gallium (Ga) as principal constituent	2224/4568	Molybdenum (Mo) as principal constituent
2224/45609	Indium (In) as principal constituent	2224/45681	Tantalum (Ta) as principal constituent
2224/45611	Tin (Sn) as principal constituent	2224/45683	Rhenium (Re) as principal constituent
2224/45613	Bismuth (Bi) as principal constituent	2224/45684	Tungsten (W) as principal constituent
2224/45614	Thallium (Tl) as principal constituent	2224/45686	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/45616	Lead (Pb) as principal constituent	2224/45687	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/45617	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/45688	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/45618	Zinc (Zn) as principal constituent	2224/4569	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/4562	Antimony (Sb) as principal constituent	2224/45691	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/45623	Magnesium (Mg) as principal constituent	2224/45693	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/456</a> - <a href="#">H01L 2224/45691</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/45624	Aluminium (Al) as principal constituent		
2224/45638	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C		



2224/45694	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/456</a> - <a href="#">H01L 2224/45691</a>	2224/4576	Iron (Fe) as principal constituent
2224/45695	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/456</a> - <a href="#">H01L 2224/45691</a>	2224/45763	the principal constituent melting at a temperature of greater than 1550°C
2224/45698	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/45764	Palladium (Pd) as principal constituent
2224/45699	Material of the matrix	2224/45766	Titanium (Ti) as principal constituent
2224/457	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof	2224/45769	Platinum (Pt) as principal constituent
2224/45701	the principal constituent melting at a temperature of less than 400°C	2224/4577	Zirconium (Zr) as principal constituent
2224/45705	Gallium (Ga) as principal constituent	2224/45771	Chromium (Cr) as principal constituent
2224/45709	Indium (In) as principal constituent	2224/45772	Vanadium (V) as principal constituent
2224/45711	Tin (Sn) as principal constituent	2224/45773	Rhodium (Rh) as principal constituent
2224/45713	Bismuth (Bi) as principal constituent	2224/45776	Ruthenium (Ru) as principal constituent
2224/45714	Thallium (Tl) as principal constituent	2224/45778	Iridium (Ir) as principal constituent
2224/45716	Lead (Pb) as principal constituent	2224/45779	Niobium (Nb) as principal constituent
2224/45717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/4578	Molybdenum (Mo) as principal constituent
2224/45718	Zinc (Zn) as principal constituent	2224/45781	Tantalum (Ta) as principal constituent
2224/4572	Antimony (Sb) as principal constituent	2224/45783	Rhenium (Re) as principal constituent
2224/45723	Magnesium (Mg) as principal constituent	2224/45784	Tungsten (W) as principal constituent
2224/45724	Aluminium (Al) as principal constituent	2224/45786	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/45738	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/45787	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/45739	Silver (Ag) as principal constituent	2224/45788	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/45744	Gold (Au) as principal constituent	2224/4579	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/45747	Copper (Cu) as principal constituent	2224/45791	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/45749	Manganese (Mn) as principal constituent	2224/45793	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/457</a> - <a href="#">H01L 2224/45791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/45755	Nickel (Ni) as principal constituent	2224/45794	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/457</a> - <a href="#">H01L 2224/45791</a>
2224/45757	Cobalt (Co) as principal constituent	2224/45795	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/457</a> - <a href="#">H01L 2224/45791</a>
		2224/45798	Fillers
		2224/45799	Base material

2224/458	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof	2224/45871	Chromium (Cr) as principal constituent
2224/45801	the principal constituent melting at a temperature of less than 400°C	2224/45872	Vanadium (V) as principal constituent
2224/45805	Gallium (Ga) as principal constituent	2224/45873	Rhodium (Rh) as principal constituent
2224/45809	Indium (In) as principal constituent	2224/45876	Ruthenium (Ru) as principal constituent
2224/45811	Tin (Sn) as principal constituent	2224/45878	Iridium (Ir) as principal constituent
2224/45813	Bismuth (Bi) as principal constituent	2224/45879	Niobium (Nb) as principal constituent
2224/45814	Thallium (Tl) as principal constituent	2224/4588	Molybdenum (Mo) as principal constituent
2224/45816	Lead (Pb) as principal constituent	2224/45881	Tantalum (Ta) as principal constituent
2224/45817	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/45883	Rhenium (Re) as principal constituent
2224/45818	Zinc (Zn) as principal constituent	2224/45884	Tungsten (W) as principal constituent
2224/4582	Antimony (Sb) as principal constituent	2224/45886	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/45823	Magnesium (Mg) as principal constituent	2224/45887	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/45824	Aluminium (Al) as principal constituent	2224/45888	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/45838	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/4589	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/45839	Silver (Ag) as principal constituent	2224/45891	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/45844	Gold (Au) as principal constituent	2224/45893	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/458</a> - <a href="#">H01L 2224/45891</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/45847	Copper (Cu) as principal constituent	2224/45894	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/458</a> - <a href="#">H01L 2224/45891</a>
2224/45849	Manganese (Mn) as principal constituent	2224/45895	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/458</a> - <a href="#">H01L 2224/45891</a>
2224/45855	Nickel (Ni) as principal constituent	2224/45898	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/45857	Cobalt (Co) as principal constituent	2224/45899	Coating material
2224/4586	Iron (Fe) as principal constituent	2224/459	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof
2224/45863	the principal constituent melting at a temperature of greater than 1550°C		
2224/45864	Palladium (Pd) as principal constituent		
2224/45866	Titanium (Ti) as principal constituent		
2224/45869	Platinum (Pt) as principal constituent		
2224/4587	Zirconium (Zr) as principal constituent		

2224/45901	the principal constituent melting at a temperature of less than 400°C	2224/45978	Iridium (Ir) as principal constituent
2224/45905	Gallium (Ga) as principal constituent	2224/45979	Niobium (Nb) as principal constituent
2224/45909	Indium (In) as principal constituent	2224/4598	Molybdenum (Mo) as principal constituent
2224/45911	Tin (Sn) as principal constituent	2224/45981	Tantalum (Ta) as principal constituent
2224/45913	Bismuth (Bi) as principal constituent	2224/45983	Rhenium (Re) as principal constituent
2224/45914	Thallium (Tl) as principal constituent	2224/45984	Tungsten (W) as principal constituent
2224/45916	Lead (Pb) as principal constituent	2224/45986	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/45917	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/45987	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/45918	Zinc (Zn) as principal constituent	2224/45988	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/4592	Antimony (Sb) as principal constituent	2224/4599	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/45923	Magnesium (Mg) as principal constituent	2224/45991	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/45924	Aluminium (Al) as principal constituent	2224/45993	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/459</a> - <a href="#">H01L 2224/45991</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/45938	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/45994	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/459</a> - <a href="#">H01L 2224/45991</a>
2224/45939	Silver (Ag) as principal constituent	2224/45995	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/459</a> - <a href="#">H01L 2224/45991</a>
2224/45944	Gold (Au) as principal constituent	2224/45998	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/45947	Copper (Cu) as principal constituent	2224/45999	Shape or distribution of the fillers
2224/45949	Manganese (Mn) as principal constituent	2224/46	of a plurality of wire connectors
2224/45955	Nickel (Ni) as principal constituent	2224/47	Structure, shape, material or disposition of the wire connectors after the connecting process
2224/45957	Cobalt (Co) as principal constituent	2224/48	of an individual wire connector
2224/4596	Iron (Fe) as principal constituent	2224/4801	Structure
2224/45963	the principal constituent melting at a temperature of greater than 1550°C	2224/48011	Length
2224/45964	Palladium (Pd) as principal constituent	2224/4805	Shape
2224/45966	Titanium (Ti) as principal constituent	2224/4807	of bonding interfaces, e.g. interlocking features
2224/45969	Platinum (Pt) as principal constituent	2224/4809	Loop shape
2224/4597	Zirconium (Zr) as principal constituent	2224/48091	Arched
2224/45971	Chromium (Cr) as principal constituent	2224/48092	Helix
2224/45972	Vanadium (V) as principal constituent	2224/48095	Kinked
2224/45973	Rhodium (Rh) as principal constituent		
2224/45976	Ruthenium (Ru) as principal constituent		

2224/48096	. . . . .	the kinked part being in proximity to the bonding area on the semiconductor or solid-state body	2224/48155	. . . . .	the item being non-metallic, e.g. insulating substrate with or without metallisation
2224/48097	. . . . .	the kinked part being in proximity to the bonding area outside the semiconductor or solid-state body	2224/48157	. . . . .	connecting the wire to a bond pad of the item
2224/481	. . . . .	Disposition	2224/48158	. . . . .	the bond pad being disposed in a recess of the surface of the item
2224/48101	. . . . .	Connecting bonding areas at the same height, e.g. horizontal bond	2224/48159	. . . . .	the bond pad protruding from the surface of the item
2224/48105	. . . . .	Connecting bonding areas at different heights	2224/4816	. . . . .	connecting the wire to a pin of the item
2224/48106	. . . . .	the connector being orthogonal to a side surface of the semiconductor or solid-state body, e.g. parallel layout	2224/48163	. . . . .	connecting the wire to a potential ring of the item
2224/48108	. . . . .	the connector not being orthogonal to a side surface of the semiconductor or solid-state body, e.g. fanned-out connectors, radial layout	2224/48165	. . . . .	connecting the wire to a via metallisation of the item
2224/4811	. . . . .	Connecting to a bonding area of the semiconductor or solid-state body located at the far end of the body with respect to the bonding area outside the semiconductor or solid-state body	2224/48175	. . . . .	the item being metallic
2224/48111	. . . . .	the wire connector extending above another semiconductor or solid-state body	2224/48177	. . . . .	connecting the wire to a bond pad of the item
2224/4813	. . . . .	Connecting within a semiconductor or solid-state body, i.e. fly wire, bridge wire	2224/48178	. . . . .	the bond pad being disposed in a recess of the surface of the item
2224/48132	. . . . .	with an intermediate bond, e.g. continuous wire daisy chain	2224/48179	. . . . .	the bond pad protruding from the surface of the item
2224/48135	. . . . .	Connecting between different semiconductor or solid-state bodies, i.e. chip-to-chip	2224/48183	. . . . .	connecting the wire to a potential ring of the item
2224/48137	. . . . .	the bodies being arranged next to each other, e.g. on a common substrate	2224/48195	. . . . .	the item being a discrete passive component
2224/48138	. . . . .	the wire connector connecting to a bonding area disposed in a recess of the surface	2224/48221	. . . . .	the body and the item being stacked
2224/48139	. . . . .	with an intermediate bond, e.g. continuous wire daisy chain	2224/48225	. . . . .	the item being non-metallic, e.g. insulating substrate with or without metallisation
2224/4814	. . . . .	the wire connector connecting to a bonding area protruding from the surface	2224/48227	. . . . .	connecting the wire to a bond pad of the item
2224/48141	. . . . .	the bodies being arranged on opposite sides of a substrate, e.g. mirror arrangements	2224/48228	. . . . .	the bond pad being disposed in a recess of the surface of the item
2224/48145	. . . . .	the bodies being stacked	2224/48229	. . . . .	the bond pad protruding from the surface of the item
2224/48147	. . . . .	with an intermediate bond, e.g. continuous wire daisy chain	2224/4823	. . . . .	connecting the wire to a pin of the item
2224/48148	. . . . .	the wire connector connecting to a bonding area disposed in a recess of the surface	2224/48233	. . . . .	connecting the wire to a potential ring of the item
2224/48149	. . . . .	the wire connector connecting to a bonding area protruding from the surface	2224/48235	. . . . .	connecting the wire to a via metallisation of the item
2224/48151	. . . . .	Connecting between a semiconductor or solid-state body and an item not being a semiconductor or solid-state body, e.g. chip-to-substrate, chip-to-passive	2224/48237	. . . . .	connecting the wire to a die pad of the item
2224/48153	. . . . .	the body and the item being arranged next to each other, e.g. on a common substrate	2224/4824	. . . . .	Connecting between the body and an opposite side of the item with respect to the body
			2224/48245	. . . . .	the item being metallic
			2224/48247	. . . . .	connecting the wire to a bond pad of the item
			2224/48248	. . . . .	the bond pad being disposed in a recess of the surface of the item
			2224/48249	. . . . .	the bond pad protruding from the surface of the item
			2224/48253	. . . . .	connecting the wire to a potential ring of the item
			2224/48257	. . . . .	connecting the wire to a die pad of the item
			2224/4826	. . . . .	Connecting between the body and an opposite side of the item with respect to the body

2224/48265	. . . . .	the item being a discrete passive component	2224/4849	. . . . .	outside the semiconductor or solid-state body
2224/484	. . . . .	Connecting portions	2224/48491	. . . . .	being an additional member attached to the bonding area through an adhesive or solder, e.g. buffer pad
2224/4845	. . . . .	Details of ball bonds	2224/48496	. . . . .	not being interposed between the wire connector and the bonding area
2224/48451	. . . . .	Shape	2224/48499	. . . . .	Material of the auxiliary connecting means
2224/48453	. . . . .	of the interface with the bonding area	2224/485	. . . . .	Material
2224/48455	. . . . .	Details of wedge bonds	2224/48505	. . . . .	at the bonding interface
2224/48456	. . . . .	Shape	2224/48506	. . . . .	comprising an eutectic alloy
2224/48458	. . . . .	of the interface with the bonding area	2224/48507	. . . . .	comprising an intermetallic compound
2224/4846	. . . . .	with multiple bonds on the same bonding area	2224/4851	. . . . .	Morphology of the connecting portion, e.g. grain size distribution
2224/48463	. . . . .	the connecting portion on the bonding area of the semiconductor or solid-state body being a ball bond	2224/48511	. . . . .	Heat affected zone [HAZ]
2224/48464	. . . . .	the other connecting portion not on the bonding area also being a ball bond, i.e. ball-to-ball	2224/4852	. . . . .	Bonding interface between the connecting portion and the bonding area
2224/48465	. . . . .	the other connecting portion not on the bonding area being a wedge bond, i.e. ball-to-wedge, regular stitch	2224/48599	. . . . .	Principal constituent of the connecting portion of the wire connector being Gold (Au)
2224/4847	. . . . .	the connecting portion on the bonding area of the semiconductor or solid-state body being a wedge bond	2224/486	. . . . .	with a principal constituent of the bonding area being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof
2224/48471	. . . . .	the other connecting portion not on the bonding area being a ball bond, i.e. wedge-to-ball, reverse stitch	2224/48601	. . . . .	the principal constituent melting at a temperature of less than 400°C
2224/48472	. . . . .	the other connecting portion not on the bonding area also being a wedge bond, i.e. wedge-to-wedge	2224/48605	. . . . .	Gallium (Ga) as principal constituent
2224/48475	. . . . .	connected to auxiliary connecting means on the bonding areas, e.g. pre-ball, wedge-on-ball, ball-on-ball	2224/48609	. . . . .	Indium (In) as principal constituent
2224/48476	. . . . .	between the wire connector and the bonding area	2224/48611	. . . . .	Tin (Sn) as principal constituent
2224/48477	. . . . .	being a pre-ball (i.e. a ball formed by capillary bonding)	2224/48613	. . . . .	Bismuth (Bi) as principal constituent
2224/48478	. . . . .	the connecting portion being a wedge bond, i.e. wedge on pre-ball	2224/48614	. . . . .	Thallium (Tl) as principal constituent
2224/48479	. . . . .	on the semiconductor or solid-state body	2224/48616	. . . . .	Lead (Pb) as principal constituent
2224/4848	. . . . .	outside the semiconductor or solid-state body	2224/48617	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950 °C
2224/48481	. . . . .	the connecting portion being a ball bond, i.e. ball on pre-ball	2224/48618	. . . . .	Zinc (Zn) as principal constituent
2224/48482	. . . . .	on the semiconductor or solid-state body	2224/4862	. . . . .	Antimony (Sb) as principal constituent
2224/48483	. . . . .	outside the semiconductor or solid-state body	2224/48623	. . . . .	Magnesium (Mg) as principal constituent
2224/48484	. . . . .	being a plurality of pre-balls disposed side-to-side	2224/48624	. . . . .	Aluminium (Al) as principal constituent
2224/48485	. . . . .	the connecting portion being a wedge bond, i.e. wedge on pre-ball	2224/48638	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/48486	. . . . .	on the semiconductor or solid-state body	2224/48639	. . . . .	Silver (Ag) as principal constituent
2224/48487	. . . . .	outside the semiconductor or solid-state body			
2224/48488	. . . . .	the connecting portion being a ball bond, i.e. ball on pre-ball			
2224/48489	. . . . .	on the semiconductor or solid-state body			

2224/48644	Gold (Au) as principal constituent	2224/48694	with a principal constituent of the bonding area being a liquid not provided for in groups <a href="#">H01L 2224/486</a> - <a href="#">H01L 2224/4869</a>
2224/48647	Copper (Cu) as principal constituent	2224/48698	with a principal constituent of the bonding area being a combination of two or more material regions, i.e. being a hybrid material, e.g. segmented structures, island patterns
2224/48649	Manganese (Mn) as principal constituent	2224/48699	Principal constituent of the connecting portion of the wire connector being Aluminium (Al)
2224/48655	Nickel (Ni) as principal constituent	2224/487	with a principal constituent of the bonding area being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof
2224/48657	Cobalt (Co) as principal constituent	2224/48701	the principal constituent melting at a temperature of less than 400°C
2224/4866	Iron (Fe) as principal constituent	2224/48705	Gallium (Ga) as principal constituent
2224/48663	the principal constituent melting at a temperature of greater than 1550°C	2224/48709	Indium (In) as principal constituent
2224/48664	Palladium (Pd) as principal constituent	2224/48711	Tin (Sn) as principal constituent
2224/48666	Titanium (Ti) as principal constituent	2224/48713	Bismuth (Bi) as principal constituent
2224/48669	Platinum (Pt) as principal constituent	2224/48714	Thallium (Tl) as principal constituent
2224/4867	Zirconium (Zr) as principal constituent	2224/48716	Lead (Pb) as principal constituent
2224/48671	Chromium (Cr) as principal constituent	2224/48717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950 °C
2224/48672	Vanadium (V) as principal constituent	2224/48718	Zinc (Zn) as principal constituent
2224/48673	Rhodium (Rh) as principal constituent	2224/4872	Antimony (Sb) as principal constituent
2224/48678	Iridium (Ir) as principal constituent	2224/48723	Magnesium (Mg) as principal constituent
2224/48679	Niobium (Nb) as principal constituent	2224/48724	Aluminium (Al) as principal constituent
2224/4868	Molybdenum (Mo) as principal constituent	2224/48738	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/48681	Tantalum (Ta) as principal constituent	2224/48739	Silver (Ag) as principal constituent
2224/48683	Rhenium (Re) as principal constituent	2224/48744	Gold (Au) as principal constituent
2224/48684	Tungsten (W) as principal constituent	2224/48747	Copper (Cu) as principal constituent
2224/48686	with a principal constituent of the bonding area being a non metallic, non metalloid inorganic material	2224/48749	Manganese (Mn) as principal constituent
2224/48687	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/48755	Nickel (Ni) as principal constituent
2224/48688	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/48757	Cobalt (Co) as principal constituent
2224/4869	with a principal constituent of the bonding area being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/4876	Iron (Fe) as principal constituent
2224/48691	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene		
2224/48693	with a principal constituent of the bonding area being a solid not provided for in groups <a href="#">H01L 2224/486</a> - <a href="#">H01L 2224/4869</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond		



2224/48763	the principal constituent melting at a temperature of greater than 1550°C	2224/488	with a principal constituent of the bonding area being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof
2224/48764	Palladium (Pd) as principal constituent	2224/48801	the principal constituent melting at a temperature of less than 400°C
2224/48766	Titanium (Ti) as principal constituent	2224/48805	Gallium (Ga) as principal constituent
2224/48769	Platinum (Pt) as principal constituent	2224/48809	Indium (In) as principal constituent
2224/4877	Zirconium (Zr) as principal constituent	2224/48811	Tin (Sn) as principal constituent
2224/48771	Chromium (Cr) as principal constituent	2224/48813	Bismuth (Bi) as principal constituent
2224/48772	Vanadium (V) as principal constituent	2224/48814	Thallium (Tl) as principal constituent
2224/48773	Rhodium (Rh) as principal constituent	2224/48816	Lead (Pb) as principal constituent
2224/48778	Iridium (Ir) as principal constituent	2224/48817	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950 °C
2224/48779	Niobium (Nb) as principal constituent	2224/48818	Zinc (Zn) as principal constituent
2224/4878	Molybdenum (Mo) as principal constituent	2224/4882	Antimony (Sb) as principal constituent
2224/48781	Tantalum (Ta) as principal constituent	2224/48823	Magnesium (Mg) as principal constituent
2224/48783	Rhenium (Re) as principal constituent	2224/48824	Aluminium (Al) as principal constituent
2224/48784	Tungsten (W) as principal constituent	2224/48838	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/48786	with a principal constituent of the bonding area being a non metallic, non metalloid inorganic material	2224/48839	Silver (Ag) as principal constituent
2224/48787	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/48844	Gold (Au) as principal constituent
2224/48788	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/48847	Copper (Cu) as principal constituent
2224/4879	with a principal constituent of the bonding area being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/48849	Manganese (Mn) as principal constituent
2224/48791	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/48855	Nickel (Ni) as principal constituent
2224/48793	with a principal constituent of the bonding area being a solid not provided for in groups <a href="#">H01L 2224/487</a> - <a href="#">H01L 2224/4879</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/48857	Cobalt (Co) as principal constituent
2224/48794	with a principal constituent of the bonding area being a liquid not provided for in groups <a href="#">H01L 2224/487</a> - <a href="#">H01L 2224/4879</a>	2224/4886	Iron (Fe) as principal constituent
2224/48798	with a principal constituent of the bonding area being a combination of two or more material regions, i.e. being a hybrid material, e.g. segmented structures, island patterns	2224/48863	the principal constituent melting at a temperature of greater than 1550°C
2224/48799	Principal constituent of the connecting portion of the wire connector being Copper (Cu)	2224/48864	Palladium (Pd) as principal constituent
		2224/48866	Titanium (Ti) as principal constituent
		2224/48869	Platinum (Pt) as principal constituent
		2224/4887	Zirconium (Zr) as principal constituent
		2224/48871	Chromium (Cr) as principal constituent

2224/48872	. . . . .	Vanadium (V) as principal constituent	2224/49051	. . . . .	Connectors having different shapes
2224/48873	. . . . .	Rhodium (Rh) as principal constituent	2224/49052	. . . . .	Different loop heights
2224/48878	. . . . .	Iridium (Ir) as principal constituent	2224/4909	. . . . .	Loop shape arrangement
2224/48879	. . . . .	Niobium (Nb) as principal constituent	2224/49095	. . . . .	parallel in plane
2224/4888	. . . . .	Molybdenum (Mo) as principal constituent	2224/49096	. . . . .	horizontal
2224/48881	. . . . .	Tantalum (Ta) as principal constituent	2224/49097	. . . . .	vertical
2224/48883	. . . . .	Rhenium (Re) as principal constituent	2224/491	. . . . .	Disposition
2224/48884	. . . . .	Tungsten (W) as principal constituent	2224/49105	. . . . .	Connecting at different heights
2224/48886	. . . . .	with a principal constituent of the bonding area being a non metallic, non metalloid inorganic material	2224/49107	. . . . .	on the semiconductor or solid-state body
2224/48887	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/49109	. . . . .	outside the semiconductor or solid-state body
2224/48888	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/4911	. . . . .	the connectors being bonded to at least one common bonding area, e.g. daisy chain
2224/4889	. . . . .	with a principal constituent of the bonding area being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/49111	. . . . .	the connectors connecting two common bonding areas, e.g. Litz or braid wires
2224/48891	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/49112	. . . . .	the connectors connecting a common bonding area on the semiconductor or solid-state body to different bonding areas outside the body, e.g. diverging wires
2224/48893	. . . . .	with a principal constituent of the bonding area being a solid not provided for in groups <a href="#">H01L 2224/488</a> - <a href="#">H01L 2224/4889</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/49113	. . . . .	the connectors connecting different bonding areas on the semiconductor or solid-state body to a common bonding area outside the body, e.g. converging wires
2224/48894	. . . . .	with a principal constituent of the bonding area being a liquid not provided for in groups <a href="#">H01L 2224/488</a> - <a href="#">H01L 2224/4889</a>	2224/4912	. . . . .	Layout
2224/48898	. . . . .	with a principal constituent of the bonding area being a combination of two or more material regions, i.e. being a hybrid material, e.g. segmented structures, island patterns	2224/4917	. . . . .	Crossed wires
2224/4899	. . . . .	Auxiliary members for wire connectors, e.g. flow-barriers, reinforcing structures, spacers, alignment aids	2224/49171	. . . . .	Fan-out arrangements
2224/48991	. . . . .	being formed on the semiconductor or solid-state body to be connected	2224/49173	. . . . .	Radial fan-out arrangements
2224/48992	. . . . .	Reinforcing structures	2224/49174	. . . . .	Stacked arrangements
2224/48993	. . . . .	Alignment aids	2224/49175	. . . . .	Parallel arrangements
2224/48996	. . . . .	being formed on an item to be connected not being a semiconductor or solid-state body	2224/49176	. . . . .	Wire connectors having the same loop shape and height
2224/48997	. . . . .	Reinforcing structures	2224/49177	. . . . .	Combinations of different arrangements
2224/48998	. . . . .	Alignment aids	2224/49179	. . . . .	Corner adaptations, i.e. disposition of the wire connectors at the corners of the semiconductor or solid-state body
2224/49	. . . . .	of a plurality of wire connectors	2224/4918	. . . . .	being disposed on at least two different sides of the body, e.g. dual array
2224/4901	. . . . .	Structure	2224/494	. . . . .	Connecting portions
2224/4903	. . . . .	Connectors having different sizes, e.g. different diameters	2224/4941	. . . . .	the connecting portions being stacked
2224/4905	. . . . .	Shape	2224/4942	. . . . .	Ball bonds
			2224/49421	. . . . .	on the semiconductor or solid-state body
			2224/49422	. . . . .	outside the semiconductor or solid-state body
			2224/49425	. . . . .	Wedge bonds
			2224/49426	. . . . .	on the semiconductor or solid-state body
			2224/49427	. . . . .	outside the semiconductor or solid-state body
			2224/49429	. . . . .	Wedge and ball bonds
			2224/4943	. . . . .	the connecting portions being staggered
			2224/49431	. . . . .	on the semiconductor or solid-state body
			2224/49433	. . . . .	outside the semiconductor or solid-state body

- 2224/4945 . . . . . Wire connectors having connecting portions of different types on the semiconductor or solid-state body, e.g. regular and reverse stitches
- 2224/495 . . . . . Material
- 2224/49505 . . . . . Connectors having different materials
- 2224/50 . . . Tape automated bonding [TAB] connectors, i.e. film carriers; Manufacturing methods related thereto
- 2224/63 . . . Connectors not provided for in any of the groups [H01L 2224/10](#) - [H01L 2224/50](#) and subgroups; Manufacturing methods related thereto
- 2224/64 . . . Manufacturing methods
- 2224/65 . . . Structure, shape, material or disposition of the connectors prior to the connecting process
- 2224/66 . . . . . of an individual connector
- 2224/67 . . . . . of a plurality of connectors
- 2224/68 . . . Structure, shape, material or disposition of the connectors after the connecting process
- 2224/69 . . . . . of an individual connector
- 2224/70 . . . . . of a plurality of connectors
- 2224/71 . . . Means for bonding not being attached to, or not being formed on, the surface to be connected
- 2224/72 . . . Detachable connecting means consisting of mechanical auxiliary parts connecting the device, e.g. pressure contacts using springs or clips
- 2224/73 . . . Means for bonding being of different types provided for in two or more of groups [H01L 2224/10](#), [H01L 2224/18](#), [H01L 2224/26](#), [H01L 2224/34](#), [H01L 2224/42](#), [H01L 2224/50](#), [H01L 2224/63](#), [H01L 2224/71](#)
- 2224/731 . . . Location prior to the connecting process
- 2224/73101 . . . . . on the same surface
- 2224/73103 . . . . . Bump and layer connectors
- 2224/73104 . . . . . the bump connector being embedded into the layer connector
- 2224/73151 . . . . . on different surfaces
- 2224/73153 . . . . . Bump and layer connectors
- 2224/732 . . . Location after the connecting process
- 2224/73201 . . . . . on the same surface
- 2224/73203 . . . . . Bump and layer connectors
- 2224/73204 . . . . . the bump connector being embedded into the layer connector
- 2224/73205 . . . . . Bump and strap connectors
- 2224/73207 . . . . . Bump and wire connectors
- 2224/73209 . . . . . Bump and HDI connectors
- 2224/73211 . . . . . Bump and TAB connectors
- 2224/73213 . . . . . Layer and strap connectors
- 2224/73215 . . . . . Layer and wire connectors
- 2224/73217 . . . . . Layer and HDI connectors
- 2224/73219 . . . . . Layer and TAB connectors
- 2224/73221 . . . . . Strap and wire connectors
- 2224/73223 . . . . . Strap and HDI connectors
- 2224/73225 . . . . . Strap and TAB connectors
- 2224/73227 . . . . . Wire and HDI connectors
- 2224/73229 . . . . . Wire and TAB connectors
- 2224/73231 . . . . . HDI and TAB connectors
- 2224/73251 . . . . . on different surfaces
- 2224/73253 . . . . . Bump and layer connectors
- 2224/73255 . . . . . Bump and strap connectors
- 2224/73257 . . . . . Bump and wire connectors
- 2224/73259 . . . . . Bump and HDI connectors
- 2224/73261 . . . . . Bump and TAB connectors
- 2224/73263 . . . . . Layer and strap connectors
- 2224/73265 . . . . . Layer and wire connectors
- 2224/73267 . . . . . Layer and HDI connectors
- 2224/73269 . . . . . Layer and TAB connectors
- 2224/73271 . . . . . Strap and wire connectors
- 2224/73273 . . . . . Strap and HDI connectors
- 2224/73275 . . . . . Strap and TAB connectors
- 2224/73277 . . . . . Wire and HDI connectors
- 2224/73279 . . . . . Wire and TAB connectors
- 2224/73281 . . . . . HDI and TAB connectors
- 2224/74 . . . Apparatus for manufacturing arrangements for connecting or disconnecting semiconductor or solid-state bodies and for methods related thereto
- 2224/741 . . . Apparatus for manufacturing means for bonding, e.g. connectors
- 2224/742 . . . . . Apparatus for manufacturing bump connectors
- 2224/743 . . . . . Apparatus for manufacturing layer connectors
- 2224/744 . . . . . Apparatus for manufacturing strap connectors
- 2224/745 . . . . . Apparatus for manufacturing wire connectors
- 2224/749 . . . . . Tools for reworking, e.g. for shaping
- 2224/75 . . . Apparatus for connecting with bump connectors or layer connectors
- 2224/75001 . . . . . Calibration means
- 2224/7501 . . . . . Means for cleaning, e.g. brushes, for hydro blasting, for ultrasonic cleaning, for dry ice blasting, using gas-flow, by etching, by applying flux or plasma
- 2224/751 . . . . . Means for controlling the bonding environment, e.g. valves, vacuum pumps
- 2224/75101 . . . . . Chamber
- 2224/75102 . . . . . Vacuum chamber
- 2224/7511 . . . . . High pressure chamber
- 2224/7515 . . . . . Means for applying permanent coating, e.g. in-situ coating
- 2224/75151 . . . . . Means for direct writing
- 2224/75152 . . . . . Syringe
- 2224/75153 . . . . . integrated into the bonding head
- 2224/75155 . . . . . Jetting means, e.g. ink jet
- 2224/75158 . . . . . including a laser
- 2224/75161 . . . . . Means for screen printing, e.g. roller, squeegee, screen stencil
- 2224/7517 . . . . . Means for applying a preform, e.g. laminator
- 2224/75171 . . . . . including a vacuum-bag
- 2224/7518 . . . . . Means for blanket deposition
- 2224/75181 . . . . . for spin coating, i.e. spin coater
- 2224/75182 . . . . . for curtain coating
- 2224/75183 . . . . . for immersion coating, i.e. bath
- 2224/75184 . . . . . for spray coating, i.e. nozzle
- 2224/75185 . . . . . Means for physical vapour deposition [PVD], e.g. evaporation, sputtering
- 2224/75186 . . . . . Means for sputtering, e.g. target
- 2224/75187 . . . . . Means for evaporation
- 2224/75188 . . . . . Means for chemical vapour deposition [CVD], e.g. for laser CVD
- 2224/75189 . . . . . Means for plating, e.g. for electroplating, electroless plating
- 2224/752 . . . . . Protection means against electrical discharge
- 2224/7525 . . . . . Means for applying energy, e.g. heating means
- 2224/75251 . . . . . in the lower part of the bonding apparatus, e.g. in the apparatus chuck
- 2224/75252 . . . . . in the upper part of the bonding apparatus, e.g. in the bonding head
- 2224/75253 . . . . . adapted for localised heating

2224/7526	. . . .	Polychromatic heating lamp	2224/75501	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/75261	. . . .	Laser	2224/75502	. . . .	in the upper part of the bonding apparatus, e.g. in the bonding head
2224/75262	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/7555	. . . .	Mechanical means, e.g. for planarising, pressing, stamping
2224/75263	. . . .	in the upper part of the bonding apparatus, e.g. in the bonding head	2224/756	. . . .	Means for supplying the connector to be connected in the bonding apparatus
2224/75264	. . . .	by induction heating, i.e. coils	2224/75601	. . . .	Storing means
2224/75265	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/75611	. . . .	Feeding means
2224/75266	. . . .	in the upper part of the bonding apparatus, e.g. in the bonding head	2224/75621	. . . .	Holding means
2224/75267	. . . .	Flame torch, e.g. hydrogen torch	2224/7565	. . . .	Means for transporting the components to be connected
2224/75268	. . . .	Discharge electrode	2224/75651	. . . .	Belt conveyor
2224/75269	. . . .	Shape of the discharge electrode	2224/75652	. . . .	Chain conveyor
2224/7527	. . . .	Material of the discharge electrode	2224/75653	. . . .	Vibrating conveyor
2224/75271	. . . .	Circuitry of the discharge electrode	2224/75654	. . . .	Pneumatic conveyor
2224/75272	. . . .	Oven	2224/75655	. . . .	in a fluid
2224/7528	. . . .	Resistance welding electrodes, i.e. for ohmic heating	2224/757	. . . .	Means for aligning
2224/75281	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/75701	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/75282	. . . .	in the upper part of the bonding apparatus, e.g. in the bonding head	2224/75702	. . . .	in the upper part of the bonding apparatus, e.g. in the bonding head
2224/75283	. . . .	by infrared heating, e.g. infrared heating lamp	2224/75703	. . . .	Mechanical holding means
2224/753	. . . .	by means of pressure	2224/75704	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/75301	. . . .	Bonding head	2224/75705	. . . .	in the upper part of the bonding apparatus, e.g. in the bonding head
2224/75302	. . . . .	Shape	2224/75723	. . . .	Electrostatic holding means
2224/75303	. . . . .	of the pressing surface	2224/75724	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/75304	. . . . .	being curved	2224/75725	. . . .	in the upper part of the bonding apparatus, e.g. in the bonding head
2224/75305	. . . . .	comprising protrusions	2224/75733	. . . .	Magnetic holding means
2224/7531	. . . . .	of other parts	2224/75734	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/75312	. . . . .	Material	2224/75735	. . . .	in the upper part of the bonding apparatus, e.g. in the bonding head
2224/75313	. . . . .	Removable bonding head	2224/75743	. . . .	Suction holding means
2224/75314	. . . . .	Auxiliary members on the pressing surface	2224/75744	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/75315	. . . . .	Elastomer inlay	2224/75745	. . . .	in the upper part of the bonding apparatus, e.g. in the bonding head
2224/75316	. . . . .	with retaining mechanisms	2224/75753	. . . .	Means for optical alignment, e.g. sensors
2224/75317	. . . . .	Removable auxiliary member	2224/75754	. . . .	Guiding structures
2224/75318	. . . . .	Shape of the auxiliary member	2224/75755	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/7532	. . . . .	Material of the auxiliary member	2224/75756	. . . .	in the upper part of the bonding apparatus, e.g. in the bonding head
2224/75343	. . . . .	by ultrasonic vibrations	2224/758	. . . .	Means for moving parts
2224/75344	. . . . .	Eccentric cams	2224/75801	. . . .	Lower part of the bonding apparatus, e.g. XY table
2224/75345	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/75802	. . . . .	Rotational mechanism
2224/75346	. . . . .	in the upper part of the bonding apparatus, e.g. in the bonding head	2224/75803	. . . . .	Pivoting mechanism
2224/75347	. . . . .	Piezoelectric transducers	2224/75804	. . . . .	Translational mechanism
2224/75348	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/75821	. . . .	Upper part of the bonding apparatus, i.e. bonding head
2224/75349	. . . . .	in the upper part of the bonding apparatus, e.g. in the bonding head	2224/75822	. . . . .	Rotational mechanism
2224/7535	. . . . .	Stable and mobile yokes	2224/75823	. . . . .	Pivoting mechanism
2224/75351	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/75824	. . . . .	Translational mechanism
2224/75352	. . . . .	in the upper part of the bonding apparatus, e.g. in the bonding head	2224/75841	. . . .	of the bonding head
2224/75353	. . . . .	Ultrasonic horns	2224/75842	. . . . .	Rotational mechanism
2224/75354	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/75843	. . . . .	Pivoting mechanism
2224/75355	. . . . .	Design, e.g. of the wave guide			
2224/755	. . . .	Cooling means			

2224/759	. . .	Means for monitoring the connection process	2224/76265	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/75901	. . . .	using a computer, e.g. fully- or semi-automatic bonding	2224/76266	. . . . .	in the upper part of the bonding apparatus
2224/7592	. . . .	Load or pressure adjusting means, e.g. sensors	2224/76267	. . . .	Flame torch, e.g. hydrogen torch
2224/75925	. . . .	Vibration adjusting means, e.g. sensors	2224/76268	. . . .	Discharge electrode
2224/7595	. . .	Means for forming additional members	2224/76269	. . . . .	Shape of the discharge electrode
2224/7598	. . .	specially adapted for batch processes	2224/7627	. . . . .	Material of the discharge electrode
2224/75981	. . .	Apparatus chuck	2224/76271	. . . . .	Circuitry of the discharge electrode
2224/75982	. . . .	Shape	2224/76272	. . . .	Oven
2224/75983	. . . . .	of the mounting surface	2224/7628	. . . .	Resistance welding electrodes, i.e. for ohmic heating
2224/75984	. . . . .	of other portions	2224/76281	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/75985	. . . .	Material	2224/76282	. . . . .	in the upper part of the bonding apparatus
2224/75986	. . . .	Auxiliary members on the pressing surface	2224/76283	. . . .	by infrared heating, e.g. infrared heating lamp
2224/75987	. . . . .	Shape of the auxiliary member	2224/763	. . . .	by means of pressure
2224/75988	. . . . .	Material of the auxiliary member	2224/76301	. . . . .	Pressing head
2224/76	. .	Apparatus for connecting with build-up interconnects	2224/76302	. . . . .	Shape
2224/76001	. . .	Calibration means	2224/76303	. . . . .	of the pressing surface
2224/7601	. . .	Means for cleaning, e.g. brushes, for hydro blasting, for ultrasonic cleaning, for dry ice blasting, using gas-flow, by etching, by applying flux or plasma	2224/76304	. . . . .	being curved
2224/761	. . .	Means for controlling the bonding environment, e.g. valves, vacuum pumps	2224/76305	. . . . .	comprising protrusions
2224/76101	. . . .	Chamber	2224/7631	. . . . .	of other parts
2224/76102	. . . . .	Vacuum chamber	2224/76312	. . . . .	Material
2224/7611	. . . . .	High pressure chamber	2224/76313	. . . . .	Removable pressing head
2224/7615	. . .	Means for depositing	2224/76314	. . . . .	Auxiliary members on the pressing surface
2224/76151	. . . .	Means for direct writing	2224/76315	. . . . .	Elastomer inlay
2224/76152	. . . . .	Syringe	2224/76316	. . . . .	with retaining mechanisms
2224/76155	. . . . .	Jetting means, e.g. ink jet	2224/76317	. . . . .	Removable auxiliary member
2224/76158	. . . . .	including a laser	2224/76318	. . . . .	Shape of the auxiliary member
2224/76161	. . . .	Means for screen printing, e.g. roller, squeegee, screen stencil	2224/7632	. . . . .	Material of the auxiliary member
2224/7617	. . . .	Means for applying a preform, e.g. laminator	2224/76343	. . . . .	by ultrasonic vibrations
2224/76171	. . . . .	including a vacuum-bag	2224/76344	. . . . .	Eccentric cams
2224/7618	. . . .	Means for blanket deposition	2224/76345	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/76181	. . . . .	for spin coating, i.e. spin coater	2224/76346	. . . . .	in the upper part of the bonding apparatus
2224/76182	. . . . .	for curtain coating	2224/76347	. . . . .	Piezoelectric transducers
2224/76183	. . . . .	for immersion coating, i.e. bath	2224/76348	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/76184	. . . . .	for spray coating, i.e. nozzle	2224/76349	. . . . .	in the upper part of the bonding apparatus
2224/76185	. . . . .	Means for physical vapour deposition [PVD]	2224/7635	. . . . .	Stable and mobile yokes
2224/76186	. . . . .	Means for sputtering, e.g. target	2224/76351	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/76187	. . . . .	Means for evaporation	2224/76352	. . . . .	in the upper part of the bonding apparatus
2224/76188	. . . . .	Means for chemical vapour deposition [CVD], e.g. for laser CVD	2224/76353	. . . . .	Ultrasonic horns
2224/76189	. . . . .	Means for plating, e.g. for electroplating, electroless plating	2224/76354	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/762	. . .	Protection means against electrical discharge	2224/76355	. . . . .	Design, e.g. of the wave guide
2224/7625	. . .	Means for applying energy, e.g. heating means	2224/765	. . .	Cooling means
2224/76251	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/76501	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/76252	. . . .	in the upper part of the bonding apparatus	2224/76502	. . . .	in the upper part of the bonding apparatus
2224/76253	. . . .	adapted for localised heating	2224/7655	. . .	Mechanical means, e.g. for planarising, pressing, stamping
2224/7626	. . . .	Polychromatic heating lamp	2224/76552	. . . .	for drilling
2224/76261	. . . .	Laser	2224/76554	. . . .	for abrasive blasting, e.g. sand blasting, wet blasting, hydro-blasting, dry ice blasting
2224/76262	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/766	. . .	Means for supplying the material of the interconnect
2224/76263	. . . . .	in the upper part of the bonding apparatus			
2224/76264	. . . .	by induction heating, i.e. coils			

2224/76601	. . . .	Storing means	2224/76986	. . . .	Auxiliary members on the pressing surface
2224/76611	. . . .	Feeding means	2224/76987	. . . . .	Shape of the auxiliary member
2224/76621	. . . .	Holding means	2224/76988	. . . . .	Material of the auxiliary member
2224/7665	. . .	Means for transporting the components to be connected	2224/77	. .	Apparatus for connecting with strap connectors
2224/76651	. . . .	Belt conveyor	2224/77001	. . .	Calibration means
2224/76652	. . . .	Chain conveyor	2224/7701	. . .	Means for cleaning, e.g. brushes, for hydro blasting, for ultrasonic cleaning, for dry ice blasting, using gas-flow, by etching, by applying flux or plasma
2224/76653	. . . .	Vibrating conveyor	2224/771	. . .	Means for controlling the bonding environment, e.g. valves, vacuum pumps
2224/76654	. . . .	Pneumatic conveyor	2224/77101	. . . .	Chamber
2224/76655	. . . .	in a fluid	2224/77102	. . . . .	Vacuum chamber
2224/767	. . .	Means for aligning	2224/7711	. . . . .	High pressure chamber
2224/76701	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/7715	. . .	Means for applying permanent coating, e.g. in-situ coating
2224/76702	. . . .	in the upper part of the bonding apparatus	2224/77151	. . . .	Means for direct writing
2224/76703	. . . .	Mechanical holding means	2224/77152	. . . . .	Syringe
2224/76704	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/77153	. . . . .	integrated into the capillary or wedge
2224/76705	. . . . .	in the upper part of the bonding apparatus	2224/77155	. . . . .	Jetting means, e.g. ink jet
2224/76723	. . . .	Electrostatic holding means	2224/77158	. . . . .	including a laser
2224/76724	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/77161	. . . .	Means for screen printing, e.g. roller, squeegee, screen stencil
2224/76725	. . . . .	in the upper part of the bonding apparatus	2224/7717	. . . .	Means for applying a preform, e.g. laminator
2224/76733	. . . .	Magnetic holding means	2224/77171	. . . . .	including a vacuum-bag
2224/76734	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/7718	. . . .	Means for blanket deposition
2224/76735	. . . . .	in the upper part of the bonding apparatus	2224/77181	. . . . .	for spin coating, i.e. spin coater
2224/76743	. . . .	Suction holding means	2224/77182	. . . . .	for curtain coating
2224/76744	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/77183	. . . . .	for immersion coating, i.e. bath
2224/76745	. . . . .	in the upper part of the bonding apparatus	2224/77184	. . . . .	for spray coating, i.e. nozzle
2224/76753	. . . .	Means for optical alignment, e.g. sensors	2224/77185	. . . . .	Means for physical vapour deposition [PVD], e.g. evaporation, sputtering
2224/76754	. . . .	Guiding structures	2224/77186	. . . . .	Means for sputtering, e.g. target
2224/76755	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/77187	. . . . .	Means for evaporation
2224/76756	. . . . .	in the upper part of the bonding apparatus	2224/77188	. . . . .	Means for chemical vapour deposition [CVD], e.g. for laser CVD
2224/768	. . .	Means for moving parts	2224/77189	. . . . .	Means for plating, e.g. for electroplating, electroless plating
2224/76801	. . . .	Lower part of the bonding apparatus, e.g. XY table	2224/772	. . .	Protection means against electrical discharge
2224/76802	. . . . .	Rotational mechanism	2224/7725	. . .	Means for applying energy, e.g. heating means
2224/76803	. . . . .	Pivoting mechanism	2224/77251	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/76804	. . . . .	Translational mechanism	2224/77252	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge
2224/76821	. . . .	Upper part of the bonding apparatus, i.e. bonding head	2224/77253	. . . .	adapted for localised heating
2224/76822	. . . . .	Rotational mechanism	2224/7726	. . . .	Polychromatic heating lamp
2224/76823	. . . . .	Pivoting mechanism	2224/77261	. . . .	Laser
2224/76824	. . . . .	Translational mechanism	2224/77262	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/76841	. . . .	of the bonding head	2224/77263	. . . . .	in the upper part of the bonding apparatus, e.g. in the wedge
2224/76842	. . . . .	Rotational mechanism	2224/77264	. . . .	by induction heating, i.e. coils
2224/76843	. . . . .	Pivoting mechanism	2224/77265	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/769	. . .	Means for monitoring the connection process	2224/77266	. . . . .	in the upper part of the bonding apparatus, e.g. in the wedge
2224/76901	. . . .	using a computer, e.g. fully- or semi-automatic bonding	2224/77267	. . . .	Flame torch, e.g. hydrogen torch
2224/7692	. . . .	Load or pressure adjusting means, e.g. sensors	2224/77268	. . . .	Discharge electrode
2224/76925	. . . .	Vibration adjusting means, e.g. sensors	2224/77269	. . . . .	Shape of the discharge electrode
2224/7695	. . .	Means for forming additional members	2224/7727	. . . . .	Material of the discharge electrode
2224/7698	. . .	specially adapted for batch processes	2224/77271	. . . . .	Circuitry of the discharge electrode
2224/76981	. . .	Apparatus chuck	2224/77272	. . . .	Oven
2224/76982	. . . .	Shape			
2224/76983	. . . . .	of the mounting surface			
2224/76984	. . . . .	of other portions			
2224/76985	. . . .	Material			



2224/7728	. . . .	Resistance welding electrodes, i.e. for ohmic heating	2224/77655	. . . .	in a fluid
2224/77281	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/777	. . .	Means for aligning
2224/77282	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge	2224/77701	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/77283	. . . .	by infrared heating, e.g. infrared heating lamp	2224/77702	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge
2224/773	. . . .	by means of pressure	2224/77703	. . . .	Mechanical holding means
2224/77313	. . . .	Wedge	2224/77704	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/77314	. . . .	Shape	2224/77705	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge
2224/77315	. . . .	of the pressing surface, e.g. tip or head	2224/77723	. . . .	Electrostatic holding means
2224/77316	. . . .	comprising protrusions	2224/77724	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/77317	. . . .	of other portions	2224/77725	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge
2224/77318	. . . .	inside the capillary	2224/77733	. . . .	Magnetic holding means
2224/77319	. . . .	outside the capillary	2224/77734	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/7732	. . . .	Removable wedge	2224/77735	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge
2224/77321	. . . .	Material	2224/77743	. . . .	Suction holding means
2224/77325	. . . .	Auxiliary members on the pressing surface	2224/77744	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/77326	. . . .	Removable auxiliary member	2224/77745	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge
2224/77327	. . . .	Shape of the auxiliary member	2224/77753	. . . .	Means for optical alignment, e.g. sensors
2224/77328	. . . .	Material of the auxiliary member	2224/77754	. . . .	Guiding structures
2224/77343	. . . .	by ultrasonic vibrations	2224/77755	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/77344	. . . .	Eccentric cams	2224/77756	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge
2224/77345	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/778	. . .	Means for moving parts
2224/77346	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge	2224/77801	. . . .	Lower part of the bonding apparatus, e.g. XY table
2224/77347	. . . .	Piezoelectric transducers	2224/77802	. . . .	Rotational mechanism
2224/77348	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/77803	. . . .	Pivoting mechanism
2224/77349	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge	2224/77804	. . . .	Translational mechanism
2224/7735	. . . .	Stable and mobile yokes	2224/77821	. . . .	Upper part of the bonding apparatus, i.e. bonding head, e.g. capillary or wedge
2224/77351	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/77822	. . . .	Rotational mechanism
2224/77352	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge	2224/77823	. . . .	Pivoting mechanism
2224/77353	. . . .	Ultrasonic horns	2224/77824	. . . .	Translational mechanism
2224/77354	. . . .	in the lower part of the bonding apparatus, e.g. in the mounting chuck	2224/77841	. . . .	of the pressing portion, e.g. tip or head
2224/77355	. . . .	Design, e.g. of the wave guide	2224/77842	. . . .	Rotational mechanism
2224/775	. . .	Cooling means	2224/77843	. . . .	Pivoting mechanism
2224/77501	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/779	. . .	Means for monitoring the connection process
2224/77502	. . . .	in the upper part of the bonding apparatus, e.g. in the wedge	2224/77901	. . . .	using a computer, e.g. fully- or semi-automatic bonding
2224/7755	. . .	Mechanical means, e.g. for severing, pressing, stamping	2224/7792	. . . .	Load or pressure adjusting means, e.g. sensors
2224/776	. . .	Means for supplying the connector to be connected in the bonding apparatus	2224/77925	. . . .	Vibration adjusting means, e.g. sensors
2224/77601	. . . .	Storing means	2224/7795	. . .	Means for forming additional members
2224/77611	. . . .	Feeding means	2224/7798	. . .	specially adapted for batch processes
2224/77621	. . . .	Holding means, e.g. wire claspers	2224/77981	. . .	Apparatus chuck
2224/77631	. . . .	Means for wire tension adjustments	2224/77982	. . . .	Shape
2224/7765	. . .	Means for transporting the components to be connected	2224/77983	. . . .	of the mounting surface
2224/77651	. . . .	Belt conveyor	2224/77984	. . . .	of other portions
2224/77652	. . . .	Chain conveyor	2224/77985	. . . .	Material
2224/77653	. . . .	Vibrating conveyor	2224/77986	. . . .	Auxiliary members on the pressing surface
2224/77654	. . . .	Pneumatic conveyor	2224/77987	. . . .	Shape of the auxiliary member
			2224/77988	. . . .	Material of the auxiliary member
			2224/78	. .	Apparatus for connecting with wire connectors

2224/78001	. . .	Calibration means	2224/78316	. . . . .	comprising protrusions
2224/7801	. . .	Means for cleaning, e.g. brushes, for hydro blasting, for ultrasonic cleaning, for dry ice blasting, using gas-flow, by etching, by applying flux or plasma	2224/78317	. . . . .	of other portions
2224/781	. . .	Means for controlling the bonding environment, e.g. valves, vacuum pumps	2224/78318	. . . . .	inside the capillary
2224/78101	. . . .	Chamber	2224/78319	. . . . .	outside the capillary
2224/78102	. . . . .	Vacuum chamber	2224/7832	. . . . .	Removable wedge
2224/7811	. . . . .	High pressure chamber	2224/78321	. . . . .	Material
2224/7815	. . .	Means for applying permanent coating, e.g. in-situ coating	2224/78325	. . . . .	Auxiliary members on the pressing surface
2224/782	. . .	Protection means against electrical discharge	2224/78326	. . . . .	Removable auxiliary member
2224/7825	. . .	Means for applying energy, e.g. heating means	2224/78327	. . . . .	Shape of the auxiliary member
2224/78251	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/78328	. . . . .	Material of the auxiliary member
2224/78252	. . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge	2224/78343	. . . . .	by ultrasonic vibrations
2224/78253	. . . .	adapted for localised heating	2224/78344	. . . . .	Eccentric cams
2224/7826	. . . .	Polychromatic heating lamp	2224/78345	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/78261	. . . .	Laser	2224/78346	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge
2224/78262	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/78347	. . . . .	Piezoelectric transducers
2224/78263	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge	2224/78348	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/78264	. . . .	by induction heating, i.e. coils	2224/78349	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge
2224/78265	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/7835	. . . . .	Stable and mobile yokes
2224/78266	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge	2224/78351	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/78267	. . . .	Flame torch, e.g. hydrogen torch	2224/78352	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge
2224/78268	. . . .	Discharge electrode	2224/78353	. . . . .	Ultrasonic horns
2224/78269	. . . . .	Shape of the discharge electrode	2224/78354	. . . . .	in the lower part of the bonding apparatus, e.g. in the mounting chuck
2224/7827	. . . . .	Material of the discharge electrode	2224/78355	. . . . .	Design, e.g. of the wave guide
2224/78271	. . . . .	Circuitry of the discharge electrode	2224/785	. . .	Cooling means
2224/78272	. . . . .	Oven	2224/78501	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/7828	. . . .	Resistance welding electrodes, i.e. for ohmic heating	2224/78502	. . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge
2224/78281	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/7855	. . .	Mechanical means, e.g. for severing, pressing, stamping
2224/78282	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge	2224/786	. . .	Means for supplying the connector to be connected in the bonding apparatus
2224/78283	. . . . .	by infrared heating, e.g. infrared heating lamp	2224/78601	. . . .	Storing means
2224/783	. . . .	by means of pressure	2224/78611	. . . .	Feeding means
2224/78301	. . . . .	Capillary	2224/78621	. . . .	Holding means, e.g. wire claspers
2224/78302	. . . . .	Shape	2224/78631	. . . . .	Means for wire tension adjustments
2224/78303	. . . . .	of the pressing surface, e.g. tip or head	2224/7865	. . .	Means for transporting the components to be connected
2224/78304	. . . . .	comprising protrusions	2224/78651	. . . .	Belt conveyor
2224/78305	. . . . .	of other portions	2224/78652	. . . .	Chain conveyor
2224/78306	. . . . .	inside the capillary	2224/78653	. . . .	Vibrating conveyor
2224/78307	. . . . .	outside the capillary	2224/78654	. . . .	Pneumatic conveyor
2224/78308	. . . . .	Removable capillary	2224/78655	. . . .	in a fluid
2224/78309	. . . . .	Material	2224/787	. . .	Means for aligning
2224/7831	. . . . .	Auxiliary members on the pressing surface	2224/78701	. . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/78311	. . . . .	Removable auxiliary member	2224/78702	. . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge
2224/78312	. . . . .	Shape of the auxiliary member	2224/78703	. . . .	Mechanical holding means
2224/78313	. . . . .	Wedge	2224/78704	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/78314	. . . . .	Shape			
2224/78315	. . . . .	of the pressing surface, e.g. tip or head			

2224/78705	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge	2224/7911	. . . . .	High pressure chamber
2224/78723	. . . . .	Electrostatic holding means	2224/7915	. . . . .	Means for applying permanent coating
2224/78724	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/79151	. . . . .	Means for direct writing
2224/78725	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge	2224/79152	. . . . .	Syringe
2224/78733	. . . . .	Magnetic holding means	2224/79153	. . . . .	integrated into the pressing head
2224/78734	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/79155	. . . . .	Jetting means, e.g. ink jet
2224/78735	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge	2224/79158	. . . . .	including a laser
2224/78743	. . . . .	Suction holding means	2224/79161	. . . . .	Means for screen printing, e.g. roller, squeegee, screen stencil
2224/78744	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/7917	. . . . .	Means for applying a preform, e.g. laminator
2224/78745	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge	2224/79171	. . . . .	including a vacuum-bag
2224/78753	. . . . .	Means for optical alignment, e.g. sensors	2224/7918	. . . . .	Means for blanket deposition
2224/78754	. . . . .	Guiding structures	2224/79181	. . . . .	for spin coating, i.e. spin coater
2224/78755	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/79182	. . . . .	for curtain coating
2224/78756	. . . . .	in the upper part of the bonding apparatus, e.g. in the capillary or wedge	2224/79183	. . . . .	for immersion coating, i.e. bath
2224/788	. . . . .	Means for moving parts	2224/79184	. . . . .	for spray coating, i.e. nozzle
2224/78801	. . . . .	Lower part of the bonding apparatus, e.g. XY table	2224/79185	. . . . .	Means for physical vapour deposition [PVD], e.g. evaporation, sputtering
2224/78802	. . . . .	Rotational mechanism	2224/79186	. . . . .	Means for sputtering, e.g. target
2224/78803	. . . . .	Pivoting mechanism	2224/79187	. . . . .	Means for evaporation
2224/78804	. . . . .	Translational mechanism	2224/79188	. . . . .	Means for chemical vapour deposition [CVD], e.g. for laser CVD
2224/78821	. . . . .	Upper part of the bonding apparatus, i.e. bonding head, e.g. capillary or wedge	2224/79189	. . . . .	Means for plating, e.g. for electroplating, electroless plating
2224/78822	. . . . .	Rotational mechanism	2224/792	. . . . .	Protection means against electrical discharge
2224/78823	. . . . .	Pivoting mechanism	2224/7925	. . . . .	Means for applying energy, e.g. heating means
2224/78824	. . . . .	Translational mechanism	2224/79251	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/78841	. . . . .	of the pressing portion, e.g. tip or head	2224/79252	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head
2224/78842	. . . . .	Rotational mechanism	2224/79253	. . . . .	adapted for localised heating
2224/78843	. . . . .	Pivoting mechanism	2224/7926	. . . . .	Polychromatic heating lamp
2224/789	. . . . .	Means for monitoring the connection process	2224/79261	. . . . .	Laser
2224/78901	. . . . .	using a computer, e.g. fully- or semi-automatic bonding	2224/79262	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/7892	. . . . .	Load or pressure adjusting means, e.g. sensors	2224/79263	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head
2224/78925	. . . . .	Vibration adjusting means, e.g. sensors	2224/79264	. . . . .	by induction heating, i.e. coils
2224/7895	. . . . .	Means for forming additional members	2224/79265	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/7898	. . . . .	specially adapted for batch processes	2224/79266	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head
2224/78981	. . . . .	Apparatus chuck	2224/79267	. . . . .	Flame torch, e.g. hydrogen torch
2224/78982	. . . . .	Shape	2224/79268	. . . . .	Discharge electrode
2224/78983	. . . . .	of the mounting surface	2224/79269	. . . . .	Shape of the discharge electrode
2224/78984	. . . . .	of other portions	2224/7927	. . . . .	Material of the discharge electrode
2224/78985	. . . . .	Material	2224/79271	. . . . .	Circuitry of the discharge electrode
2224/78986	. . . . .	Auxiliary members on the pressing surface	2224/79272	. . . . .	Oven
2224/78987	. . . . .	Shape of the auxiliary member	2224/7928	. . . . .	Resistance welding electrodes, i.e. for ohmic heating
2224/78988	. . . . .	Material of the auxiliary member	2224/79281	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/79	. . . . .	Apparatus for Tape Automated Bonding [TAB]	2224/79282	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head
2224/79001	. . . . .	Calibration means	2224/79283	. . . . .	by infrared heating, e.g. infrared heating lamp
2224/7901	. . . . .	Means for cleaning, e.g. brushes, for hydro blasting, for ultrasonic cleaning, for dry ice blasting, using gas-flow, by etching, by applying flux or plasma	2224/793	. . . . .	by means of pressure
2224/791	. . . . .	Means for controlling the bonding environment, e.g. valves, vacuum pumps	2224/79301	. . . . .	Pressing head
2224/79101	. . . . .	Chamber	2224/79302	. . . . .	Shape
2224/79102	. . . . .	Vacuum chamber	2224/79303	. . . . .	of the pressing surface
			2224/79304	. . . . .	being curved
			2224/79305	. . . . .	comprising protrusions

2224/7931	. . . . .	of other parts	2224/79733	. . . .	Magnetic holding means
2224/79312	. . . . .	Material	2224/79734	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/79313	. . . . .	Removable pressing head	2224/79735	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head
2224/79314	. . . . .	Auxiliary members on the pressing surface	2224/79743	. . . . .	Suction holding means
2224/79315	. . . . .	Elastomer inlay	2224/79744	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/79316	. . . . .	with retaining mechanisms	2224/79745	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head
2224/79317	. . . . .	Removable auxiliary member	2224/79753	. . . . .	Means for optical alignment, e.g. sensors
2224/79318	. . . . .	Shape of the auxiliary member	2224/79754	. . . . .	Guiding structures
2224/7932	. . . . .	Material of the auxiliary member	2224/79755	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck
2224/79343	. . . . .	by ultrasonic vibrations	2224/79756	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head
2224/79344	. . . . .	Eccentric cams	2224/798	. . . .	Means for moving parts
2224/79345	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/79801	. . . . .	Lower part of the bonding apparatus, e.g. XY table
2224/79346	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head	2224/79802	. . . . .	Rotational mechanism
2224/79347	. . . . .	Piezoelectric transducers	2224/79803	. . . . .	Pivoting mechanism
2224/79348	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/79804	. . . . .	Translational mechanism
2224/79349	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head	2224/79821	. . . . .	Upper part of the bonding apparatus, i.e. pressing head
2224/7935	. . . . .	Stable and mobile yokes	2224/79822	. . . . .	Rotational mechanism
2224/79351	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/79823	. . . . .	Pivoting mechanism
2224/79352	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head	2224/79824	. . . . .	Translational mechanism
2224/79353	. . . . .	Ultrasonic horns	2224/79841	. . . . .	of the pressing head
2224/79354	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/79842	. . . . .	Rotational mechanism
2224/79355	. . . . .	Design, e.g. of the wave guide	2224/79843	. . . . .	Pivoting mechanism
2224/795	. . . .	Cooling means	2224/799	. . . .	Means for monitoring the connection process
2224/79501	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/79901	. . . . .	using a computer, e.g. fully- or semi-automatic bonding
2224/79502	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head	2224/7992	. . . . .	Load or pressure adjusting means, e.g. sensors
2224/7955	. . . .	Mechanical means, e.g. for pressing, stamping	2224/79925	. . . . .	Vibration adjusting means, e.g. sensors
2224/796	. . . .	Means for supplying the connector to be connected in the bonding apparatus	2224/7995	. . . .	Means for forming additional members
2224/79601	. . . . .	Storing means	2224/7998	. . . .	specially adapted for batch processes
2224/79611	. . . . .	Feeding means	2224/79981	. . . . .	Apparatus chuck
2224/79621	. . . . .	Holding means	2224/79982	. . . . .	Shape
2224/7965	. . . .	Means for transporting the components to be connected	2224/79983	. . . . .	of the mounting surface
2224/79651	. . . . .	Belt conveyor	2224/79984	. . . . .	of other portions
2224/79652	. . . . .	Chain conveyor	2224/79985	. . . . .	Material
2224/79653	. . . . .	Vibrating conveyor	2224/79986	. . . . .	Auxiliary members on the pressing surface
2224/79654	. . . . .	Pneumatic conveyor	2224/79987	. . . . .	Shape of the auxiliary member
2224/79655	. . . . .	in a fluid	2224/79988	. . . . .	Material of the auxiliary member
2224/797	. . . .	Means for aligning	2224/7999	. . . .	for disconnecting
2224/79701	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/80	. . . .	Methods for connecting semiconductor or other solid state bodies using means for bonding being attached to, or being formed on, the surface to be connected
2224/79702	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head	2224/80001	. . . .	by connecting a bonding area directly to another bonding area, i.e. connectorless bonding, e.g. bumpless bonding
2224/79703	. . . . .	Mechanical holding means	2224/80003	. . . . .	involving a temporary auxiliary member not forming part of the bonding apparatus
2224/79704	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/80004	. . . . .	being a removable or sacrificial coating
2224/79705	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head	2224/80006	. . . . .	being a temporary or sacrificial substrate
2224/79723	. . . . .	Electrostatic holding means	2224/80007	. . . . .	involving a permanent auxiliary member being left in the finished device, e.g. aids for protecting the bonding area during or after the bonding process
2224/79724	. . . . .	in the lower part of the bonding apparatus, e.g. in the apparatus chuck	2224/80009	. . . .	Pre-treatment of the bonding area
2224/79725	. . . . .	in the upper part of the bonding apparatus, e.g. in the pressing head			

2224/8001	. . . .	Cleaning the bonding area, e.g. oxide removal step, desmearing	2224/80132	. . . .	using marks formed outside the semiconductor or solid-state body, i.e. "off-chip"
2224/80011	. . . .	Chemical cleaning, e.g. etching, flux	2224/80136	. . . .	involving guiding structures, e.g. spacers or supporting members
2224/80012	. . . .	Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic cleaning, dry ice blasting, gas-flow	2224/80138	. . . .	the guiding structures being at least partially left in the finished device
2224/80013	. . . .	Plasma cleaning	2224/80139	. . . .	Guiding structures on the body
2224/80014	. . . .	Thermal cleaning, e.g. decomposition, sublimation	2224/8014	. . . .	Guiding structures outside the body
2224/80019	. . . .	Combinations of two or more cleaning methods provided for in at least two different groups from <a href="#">H01L 2224/8001</a> - <a href="#">H01L 2224/80014</a>	2224/80141	. . . .	Guiding structures both on and outside the body
2224/8002	. . . .	Applying permanent coating to the bonding area in the bonding apparatus, e.g. in-situ coating	2224/80143	. . . .	Passive alignment, i.e. self alignment, e.g. using surface energy, chemical reactions, thermal equilibrium
2224/80024	. . . .	Applying flux to the bonding area in the bonding apparatus	2224/80148	. . . .	involving movement of a part of the bonding apparatus
2224/8003	. . . .	Reshaping the bonding area in the bonding apparatus, e.g. flattening the bonding area	2224/80149	. . . .	being the lower part of the bonding apparatus, i.e. holding means for the bodies to be connected, e.g. XY table
2224/80031	. . . .	by chemical means, e.g. etching, anodisation	2224/8015	. . . .	Rotational movements
2224/80035	. . . .	by heating means	2224/8016	. . . .	Translational movements
2224/80037	. . . .	using a polychromatic heating lamp	2224/80169	. . . .	being the upper part of the bonding apparatus, i.e. bonding head
2224/80039	. . . .	using a laser	2224/8017	. . . .	Rotational movements
2224/80041	. . . .	Induction heating, i.e. eddy currents	2224/8018	. . . .	Translational movements
2224/80047	. . . .	by mechanical means, e.g. severing, pressing, stamping	2224/8019	. . . .	Arrangement of the bonding areas prior to mounting
2224/80048	. . . .	Thermal treatments, e.g. annealing, controlled pre-heating or pre-cooling	2224/80194	. . . .	Lateral distribution of the bonding areas
2224/80051	. . . .	Forming additional members	2224/802	. . . .	Applying energy for connecting
2224/80052	. . . .	Detaching bonding areas, e.g. after testing	2224/80201	. . . .	Compression bonding
2224/80053	. . . .	Bonding environment	2224/80203	. . . .	Thermocompression bonding, e.g. diffusion bonding, pressure joining, thermocompression welding or solid-state welding
2224/80054	. . . .	Composition of the atmosphere	2224/80204	. . . .	with a graded temperature profile
2224/80055	. . . .	being oxidating	2224/80205	. . . .	Ultrasonic bonding
2224/80065	. . . .	being reducing	2224/80206	. . . .	Direction of oscillation
2224/80075	. . . .	being inert	2224/80207	. . . .	Thermosonic bonding
2224/80085	. . . .	being a liquid, e.g. for fluidic self-assembly	2224/80209	. . . .	applying unidirectional static pressure
2224/8009	. . . .	Vacuum	2224/80211	. . . .	applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid
2224/80091	. . . .	Under pressure	2224/80213	. . . .	using a reflow oven
2224/80092	. . . .	Atmospheric pressure	2224/80215	. . . .	with a graded temperature profile
2224/80093	. . . .	Transient conditions, e.g. gas-flow	2224/8022	. . . .	with energy being in the form of electromagnetic radiation
2224/80095	. . . .	Temperature settings	2224/80222	. . . .	Induction heating, i.e. eddy currents
2224/80096	. . . .	Transient conditions	2224/80224	. . . .	using a laser
2224/80097	. . . .	Heating	2224/8023	. . . .	Polychromatic or infrared lamp heating
2224/80098	. . . .	Cooling	2224/80232	. . . .	using an autocatalytic reaction, e.g. exothermic brazing
2224/80099	. . . .	Ambient temperature	2224/80234	. . . .	using means for applying energy being within the device, e.g. integrated heater
2224/8011	. . . .	involving protection against electrical discharge, e.g. removing electrostatic charge	2224/80236	. . . .	using electro-static corona discharge
2224/8012	. . . .	Aligning	2224/80237	. . . .	using an electron beam
2224/80121	. . . .	Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors	2224/80238	. . . .	using electric resistance welding, i.e. ohmic heating
2224/80122	. . . .	by detecting inherent features of, or outside, the semiconductor or solid-state body	2224/8034	. . . .	Bonding interfaces of the bonding area
2224/80123	. . . .	Shape or position of the body	2224/80345	. . . .	Shape, e.g. interlocking features
2224/80125	. . . .	Bonding areas on the body	2224/80355	. . . .	having an external coating, e.g. protective bond-through coating
2224/80127	. . . .	Bonding areas outside the body	2224/80357	. . . .	being flush with the surface
2224/80129	. . . .	Shape or position of the other item	2224/80359	. . . .	Material
2224/8013	. . . .	using marks formed on the semiconductor or solid-state body			

2224/8036	. . .	Bonding interfaces of the semiconductor or solid state body	2224/8048	. . . . .	Molybdenum [Mo] as principal constituent
2224/80365	. . . .	Shape, e.g. interlocking features	2224/80481	. . . . .	Tantalum [Ta] as principal constituent
2224/80375	. . . .	having an external coating, e.g. protective bond-through coating	2224/80483	. . . . .	Rhenium [Re] as principal constituent
2224/80379	. . . .	Material	2224/80484	. . . . .	Tungsten [W] as principal constituent
2224/8038	. . .	Bonding interfaces outside the semiconductor or solid-state body	2224/80486	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/80385	. . . .	Shape, e.g. interlocking features	2224/80487	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/80395	. . . .	having an external coating, e.g. protective bond-through coating	2224/80488	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/80399	. . . .	Material	2224/8049	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/804	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/80491	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/80401	. . . . .	the principal constituent melting at a temperature of less than 400°C	2224/80493	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/804</a> - <a href="#">H01L 2224/80491</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/80405	. . . . .	Gallium [Ga] as principal constituent	2224/80494	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/804</a> - <a href="#">H01L 2224/80491</a>
2224/80409	. . . . .	Indium [In] as principal constituent	2224/80495	. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/804</a> - <a href="#">H01L 2224/80491</a>
2224/80411	. . . . .	Tin [Sn] as principal constituent	2224/80498	. . . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/80413	. . . . .	Bismuth [Bi] as principal constituent	2224/80499	. . . . .	Material of the matrix
2224/80414	. . . . .	Thallium [Tl] as principal constituent	2224/805	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/80416	. . . . .	Lead [Pb] as principal constituent	2224/80501	. . . . .	the principal constituent melting at a temperature of less than 400°C
2224/80417	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/80505	. . . . .	Gallium [Ga] as principal constituent
2224/80418	. . . . .	Zinc [Zn] as principal constituent	2224/80509	. . . . .	Indium [In] as principal constituent
2224/8042	. . . . .	Antimony [Sb] as principal constituent	2224/80511	. . . . .	Tin [Sn] as principal constituent
2224/80423	. . . . .	Magnesium [Mg] as principal constituent	2224/80513	. . . . .	Bismuth [Bi] as principal constituent
2224/80424	. . . . .	Aluminium [Al] as principal constituent	2224/80514	. . . . .	Thallium [Tl] as principal constituent
2224/80438	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/80516	. . . . .	Lead [Pb] as principal constituent
2224/80439	. . . . .	Silver [Ag] as principal constituent	2224/80517	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/80444	. . . . .	Gold [Au] as principal constituent	2224/80518	. . . . .	Zinc [Zn] as principal constituent
2224/80447	. . . . .	Copper [Cu] as principal constituent	2224/8052	. . . . .	Antimony [Sb] as principal constituent
2224/80449	. . . . .	Manganese [Mn] as principal constituent	2224/80523	. . . . .	Magnesium [Mg] as principal constituent
2224/80455	. . . . .	Nickel [Ni] as principal constituent	2224/80524	. . . . .	Aluminium [Al] as principal constituent
2224/80457	. . . . .	Cobalt [Co] as principal constituent			
2224/8046	. . . . .	Iron [Fe] as principal constituent			
2224/80463	. . . . .	the principal constituent melting at a temperature of greater than 1550°C			
2224/80464	. . . . .	Palladium [Pd] as principal constituent			
2224/80466	. . . . .	Titanium [Ti] as principal constituent			
2224/80469	. . . . .	Platinum [Pt] as principal constituent			
2224/8047	. . . . .	Zirconium [Zr] as principal constituent			
2224/80471	. . . . .	Chromium [Cr] as principal constituent			
2224/80472	. . . . .	Vanadium [V] as principal constituent			
2224/80473	. . . . .	Rhodium [Rh] as principal constituent			
2224/80476	. . . . .	Ruthenium [Ru] as principal constituent			
2224/80478	. . . . .	Iridium [Ir] as principal constituent			
2224/80479	. . . . .	Niobium [Nb] as principal constituent			



2224/80538	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/80593	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/805</a> - <a href="#">H01L 2224/80591</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/80539	Silver [Ag] as principal constituent	2224/80594	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/805</a> - <a href="#">H01L 2224/80591</a>
2224/80544	Gold [Au] as principal constituent	2224/80595	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/805</a> - <a href="#">H01L 2224/80591</a>
2224/80547	Copper [Cu] as principal constituent	2224/80598	Fillers
2224/80549	Manganese [Mn] as principal constituent	2224/80599	Base material
2224/80555	Nickel [Ni] as principal constituent	2224/806	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/80557	Cobalt [Co] as principal constituent	2224/80601	the principal constituent melting at a temperature of less than 400°C
2224/8056	Iron [Fe] as principal constituent	2224/80605	Gallium [Ga] as principal constituent
2224/80563	the principal constituent melting at a temperature of greater than 1550°C	2224/80609	Indium [In] as principal constituent
2224/80564	Palladium [Pd] as principal constituent	2224/80611	Tin [Sn] as principal constituent
2224/80566	Titanium [Ti] as principal constituent	2224/80613	Bismuth [Bi] as principal constituent
2224/80569	Platinum [Pt] as principal constituent	2224/80614	Thallium [Tl] as principal constituent
2224/8057	Zirconium [Zr] as principal constituent	2224/80616	Lead [Pb] as principal constituent
2224/80571	Chromium [Cr] as principal constituent	2224/80617	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/80572	Vanadium [V] as principal constituent	2224/80618	Zinc [Zn] as principal constituent
2224/80573	Rhodium [Rh] as principal constituent	2224/8062	Antimony [Sb] as principal constituent
2224/80576	Ruthenium [Ru] as principal constituent	2224/80623	Magnesium [Mg] as principal constituent
2224/80578	Iridium [Ir] as principal constituent	2224/80624	Aluminium [Al] as principal constituent
2224/80579	Niobium [Nb] as principal constituent	2224/80638	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/8058	Molybdenum [Mo] as principal constituent	2224/80639	Silver [Ag] as principal constituent
2224/80581	Tantalum [Ta] as principal constituent	2224/80644	Gold [Au] as principal constituent
2224/80583	Rhenium [Re] as principal constituent	2224/80647	Copper [Cu] as principal constituent
2224/80584	Tungsten [W] as principal constituent	2224/80649	Manganese [Mn] as principal constituent
2224/80586	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/80655	Nickel [Ni] as principal constituent
2224/80587	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/80657	Cobalt [Co] as principal constituent
2224/80588	Glasses, e.g. amorphous oxides, nitrides or fluorides		
2224/8059	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy		
2224/80591	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene		

2224/8066	Iron [Fe] as principal constituent	2224/80698	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/80663	the principal constituent melting at a temperature of greater than 1550°C	2224/80699	Coating material
2224/80664	Palladium [Pd] as principal constituent	2224/807	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/80666	Titanium [Ti] as principal constituent	2224/80701	the principal constituent melting at a temperature of less than 400°C
2224/80669	Platinum [Pt] as principal constituent	2224/80705	Gallium [Ga] as principal constituent
2224/8067	Zirconium [Zr] as principal constituent	2224/80709	Indium [In] as principal constituent
2224/80671	Chromium [Cr] as principal constituent	2224/80711	Tin [Sn] as principal constituent
2224/80672	Vanadium [V] as principal constituent	2224/80713	Bismuth [Bi] as principal constituent
2224/80673	Rhodium [Rh] as principal constituent	2224/80714	Thallium [Tl] as principal constituent
2224/80676	Ruthenium [Ru] as principal constituent	2224/80716	Lead [Pb] as principal constituent
2224/80678	Iridium [Ir] as principal constituent	2224/80717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/80679	Niobium [Nb] as principal constituent	2224/80718	Zinc [Zn] as principal constituent
2224/8068	Molybdenum [Mo] as principal constituent	2224/8072	Antimony [Sb] as principal constituent
2224/80681	Tantalum [Ta] as principal constituent	2224/80723	Magnesium [Mg] as principal constituent
2224/80683	Rhenium [Re] as principal constituent	2224/80724	Aluminium [Al] as principal constituent
2224/80684	Tungsten [W] as principal constituent	2224/80738	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/80686	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/80739	Silver [Ag] as principal constituent
2224/80687	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/80744	Gold [Au] as principal constituent
2224/80688	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/80747	Copper [Cu] as principal constituent
2224/8069	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/80749	Manganese [Mn] as principal constituent
2224/80691	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/80755	Nickel [Ni] as principal constituent
2224/80693	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/806</a> - <a href="#">H01L 2224/80691</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/80757	Cobalt [Co] as principal constituent
2224/80694	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/806</a> - <a href="#">H01L 2224/80691</a>	2224/8076	Iron [Fe] as principal constituent
2224/80695	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/806</a> - <a href="#">H01L 2224/80691</a>	2224/80763	the principal constituent melting at a temperature of greater than 1550°C
		2224/80764	Palladium [Pd] as principal constituent
		2224/80766	Titanium [Ti] as principal constituent

2224/80769	Platinum [Pt] as principal constituent	2224/8081	involving forming an intermetallic compound at the bonding interface
2224/8077	Zirconium [Zr] as principal constituent	2224/80815	Reflow soldering
2224/80771	Chromium [Cr] as principal constituent	2224/8082	Diffusion bonding
2224/80772	Vanadium [V] as principal constituent	2224/80825	Solid-liquid interdiffusion
2224/80773	Rhodium [Rh] as principal constituent	2224/8083	Solid-solid interdiffusion
2224/80776	Ruthenium [Ru] as principal constituent	2224/8084	Sintering
2224/80778	Iridium [Ir] as principal constituent	2224/8085	using a polymer adhesive, e.g. an adhesive based on silicone, epoxy, polyimide, polyester
2224/80779	Niobium [Nb] as principal constituent	2224/80855	Hardening the adhesive by curing, i.e. thermosetting
2224/8078	Molybdenum [Mo] as principal constituent	2224/80856	Pre-cured adhesive, i.e. B-stage adhesive
2224/80781	Tantalum [Ta] as principal constituent	2224/80859	Localised curing of parts of the bonding area
2224/80783	Rhenium [Re] as principal constituent	2224/80862	Heat curing
2224/80784	Tungsten [W] as principal constituent	2224/80865	Microwave curing
2224/80786	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/80868	Infrared [IR] curing
2224/80787	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/80871	Visible light curing
2224/80788	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/80874	Ultraviolet [UV] curing
2224/8079	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/80877	Moisture curing, i.e. curing by exposing to humidity, e.g. for silicones and polyurethanes
2224/80791	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/8088	Hardening the adhesive by cooling, e.g. for thermoplastics or hot-melt adhesives
2224/80793	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/807</a> - <a href="#">H01L 2224/80791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/80885	Combinations of two or more hardening methods provided for in at least two different groups from <a href="#">H01L 2224/80855</a> - <a href="#">H01L 2224/8088</a> , e.g. for hybrid thermoplastic-thermosetting adhesives
2224/80794	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/807</a> - <a href="#">H01L 2224/80791</a>	2224/8089	using an inorganic non metallic glass type adhesive, e.g. solder glass
2224/80795	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/807</a> - <a href="#">H01L 2224/80791</a>	2224/80893	Anodic bonding, i.e. bonding by applying a voltage across the interface in order to induce ions migration leading to an irreversible chemical bond
2224/80798	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/80894	Direct bonding, i.e. joining surfaces by means of intermolecular attracting interactions at their interfaces, e.g. covalent bonds, van der Waals forces
2224/80799	Shape or distribution of the fillers	2224/80895	between electrically conductive surfaces, e.g. copper-copper direct bonding, surface activated bonding
2224/808	Bonding techniques	2224/80896	between electrically insulating surfaces, e.g. oxide or nitride layers
2224/80801	Soldering or alloying	2224/80897	Mechanical interlocking, e.g. anchoring, hook and loop-type fastening or the like
2224/80805	involving forming a eutectic alloy at the bonding interface	2224/80898	Press-fitting, i.e. pushing the parts together and fastening by friction, e.g. by compression of one part against the other
		2224/80899	using resilient parts in the bonding area
		2224/809	with the bonding area not providing any mechanical bonding
		2224/80901	Pressing a bonding area against another bonding area by means of a further bonding area or connector
		2224/80902	by means of a further bonding area
		2224/80903	by means of a bump or layer connector
		2224/80904	by means of an encapsulation layer or foil
		2224/80905	Combinations of bonding methods provided for in at least two different groups from <a href="#">H01L 2224/808</a> - <a href="#">H01L 2224/80904</a>

- 2224/80906 . . . . Specific sequence of method steps
- 2224/80907 . . . . Intermediate bonding, i.e. intermediate bonding step for temporarily bonding the semiconductor or solid-state body, followed by at least a further bonding step
- 2224/80908 . . . . involving monitoring, e.g. feedback loop
- 2224/80909 . . . . Post-treatment of the bonding area
- 2224/8091 . . . . Cleaning, e.g. oxide removal step, desmearing
- 2224/80911 . . . . . Chemical cleaning, e.g. etching, flux
- 2224/80912 . . . . . Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic cleaning, dry ice blasting, gas-flow
- 2224/80913 . . . . . Plasma cleaning
- 2224/80914 . . . . . Thermal cleaning, e.g. using laser ablation or by electrostatic corona discharge
- 2224/80919 . . . . . Combinations of two or more cleaning methods provided for in at least two different groups from [H01L 2224/8091](#) - [H01L 2224/80914](#)
- 2224/8092 . . . . Applying permanent coating, e.g. protective coating
- 2224/8093 . . . . Reshaping
- 2224/80931 . . . . . by chemical means, e.g. etching
- 2224/80935 . . . . . by heating means, e.g. reflowing
- 2224/80937 . . . . . using a polychromatic heating lamp
- 2224/80939 . . . . . using a laser
- 2224/80941 . . . . . Induction heating, i.e. eddy currents
- 2224/80943 . . . . . using a flame torch, e.g. hydrogen torch
- 2224/80945 . . . . . using a corona discharge, e.g. electronic flame off [EFO]
- 2224/80947 . . . . . by mechanical means, e.g. pull-and-cut, pressing, stamping
- 2224/80948 . . . . Thermal treatments, e.g. annealing, controlled cooling
- 2224/80951 . . . . Forming additional members, e.g. for reinforcing
- 2224/80986 . . . . Specific sequence of steps, e.g. repetition of manufacturing steps, time sequence
- 2224/81 . . . . using a bump connector
- 2224/81001 . . . . involving a temporary auxiliary member not forming part of the bonding apparatus
- 2224/81002 . . . . . being a removable or sacrificial coating
- 2224/81005 . . . . . being a temporary or sacrificial substrate
- 2224/81007 . . . . involving a permanent auxiliary member being left in the finished device, e.g. aids for holding or protecting the bump connector during or after the bonding process
- 2224/81009 . . . . Pre-treatment of the bump connector or the bonding area
- 2224/8101 . . . . . Cleaning the bump connector, e.g. oxide removal step, desmearing
- 2224/81011 . . . . . Chemical cleaning, e.g. etching, flux
- 2224/81012 . . . . . Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic cleaning, dry ice blasting, gas-flow
- 2224/81013 . . . . . Plasma cleaning
- 2224/81014 . . . . . Thermal cleaning, e.g. decomposition, sublimation
- 2224/81019 . . . . . Combinations of two or more cleaning methods provided for in at least two different groups from [H01L 2224/8101](#) - [H01L 2224/81014](#)
- 2224/8102 . . . . . Applying permanent coating to the bump connector in the bonding apparatus, e.g. in-situ coating
- 2224/81022 . . . . . Cleaning the bonding area, e.g. oxide removal step, desmearing
- 2224/81024 . . . . . Applying flux to the bonding area
- 2224/81026 . . . . . Applying a precursor material to the bonding area
- 2224/8103 . . . . . Reshaping the bump connector in the bonding apparatus, e.g. flattening the bump connector
- 2224/81031 . . . . . by chemical means, e.g. etching, anodisation
- 2224/81035 . . . . . by heating means
- 2224/81037 . . . . . using a polychromatic heating lamp
- 2224/81039 . . . . . using a laser
- 2224/81041 . . . . . Induction heating, i.e. eddy currents
- 2224/81047 . . . . . by mechanical means, e.g. severing, pressing, stamping
- 2224/81048 . . . . Thermal treatments, e.g. annealing, controlled pre-heating or pre-cooling
- 2224/81051 . . . . Forming additional members
- 2224/81052 . . . . Detaching bump connectors, e.g. after testing
- 2224/81053 . . . . Bonding environment
- 2224/81054 . . . . . Composition of the atmosphere
- 2224/81055 . . . . . being oxidating
- 2224/81065 . . . . . being reducing
- 2224/81075 . . . . . being inert
- 2224/81085 . . . . . being a liquid, e.g. for fluidic self-assembly
- 2224/8109 . . . . Vacuum
- 2224/81091 . . . . Under pressure
- 2224/81092 . . . . . Atmospheric pressure
- 2224/81093 . . . . . Transient conditions, e.g. gas-flow
- 2224/81095 . . . . . Temperature settings
- 2224/81096 . . . . . Transient conditions
- 2224/81097 . . . . . Heating
- 2224/81098 . . . . . Cooling
- 2224/81099 . . . . . Ambient temperature
- 2224/811 . . . . the bump connector being supplied to the parts to be connected in the bonding apparatus
- 2224/81101 . . . . . as prepreg comprising a bump connector, e.g. provided in an insulating plate member
- 2224/8111 . . . . involving protection against electrical discharge, e.g. removing electrostatic charge
- 2224/8112 . . . . Aligning
- 2224/81121 . . . . . Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors
- 2224/81122 . . . . . by detecting inherent features of, or outside, the semiconductor or solid-state body
- 2224/81123 . . . . . Shape or position of the body
- 2224/81125 . . . . . Bonding areas on the body
- 2224/81127 . . . . . Bonding areas outside the body
- 2224/81129 . . . . . Shape or position of the other item
- 2224/8113 . . . . . using marks formed on the semiconductor or solid-state body
- 2224/81132 . . . . . using marks formed outside the semiconductor or solid-state body, i.e. "off-chip"
- 2224/81136 . . . . involving guiding structures, e.g. spacers or supporting members
- 2224/81138 . . . . . the guiding structures being at least partially left in the finished device

2224/81139	. . . . .	Guiding structures on the body	2224/81355	. . . . .	having an external coating, e.g. protective bond-through coating
2224/8114	. . . . .	Guiding structures outside the body	2224/81359	. . . . .	Material
2224/81141	. . . . .	Guiding structures both on and outside the body	2224/8136	. . . . .	Bonding interfaces of the semiconductor or solid state body
2224/81143	. . . . .	Passive alignment, i.e. self alignment, e.g. using surface energy, chemical reactions, thermal equilibrium	2224/81365	. . . . .	Shape, e.g. interlocking features
2224/81148	. . . . .	involving movement of a part of the bonding apparatus	2224/81375	. . . . .	having an external coating, e.g. protective bond-through coating
2224/81149	. . . . .	being the lower part of the bonding apparatus, i.e. holding means for the bodies to be connected, e.g. XY table	2224/81379	. . . . .	Material
2224/8115	. . . . .	Rotational movements	2224/8138	. . . . .	Bonding interfaces outside the semiconductor or solid-state body
2224/8116	. . . . .	Translational movements	2224/81385	. . . . .	Shape, e.g. interlocking features
2224/81169	. . . . .	being the upper part of the bonding apparatus, i.e. bonding head	2224/81395	. . . . .	having an external coating, e.g. protective bond-through coating
2224/8117	. . . . .	Rotational movements	2224/81399	. . . . .	Material
2224/8118	. . . . .	Translational movements	2224/814	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/8119	. . . . .	Arrangement of the bump connectors prior to mounting	2224/81401	. . . . .	the principal constituent melting at a temperature of less than 400°C
2224/81191	. . . . .	wherein the bump connectors are disposed only on the semiconductor or solid-state body	2224/81405	. . . . .	Gallium [Ga] as principal constituent
2224/81192	. . . . .	wherein the bump connectors are disposed only on another item or body to be connected to the semiconductor or solid-state body	2224/81409	. . . . .	Indium [In] as principal constituent
2224/81193	. . . . .	wherein the bump connectors are disposed on both the semiconductor or solid-state body and another item or body to be connected to the semiconductor or solid-state body	2224/81411	. . . . .	Tin [Sn] as principal constituent
2224/81194	. . . . .	Lateral distribution of the bump connectors	2224/81413	. . . . .	Bismuth [Bi] as principal constituent
2224/812	. . . . .	Applying energy for connecting	2224/81414	. . . . .	Thallium [Tl] as principal constituent
2224/81201	. . . . .	Compression bonding	2224/81416	. . . . .	Lead [Pb] as principal constituent
2224/81203	. . . . .	Thermocompression bonding, e.g. diffusion bonding, pressure joining, thermocompression welding or solid-state welding	2224/81417	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/81204	. . . . .	with a graded temperature profile	2224/81418	. . . . .	Zinc [Zn] as principal constituent
2224/81205	. . . . .	Ultrasonic bonding	2224/8142	. . . . .	Antimony [Sb] as principal constituent
2224/81206	. . . . .	Direction of oscillation	2224/81423	. . . . .	Magnesium [Mg] as principal constituent
2224/81207	. . . . .	Thermosonic bonding	2224/81424	. . . . .	Aluminium [Al] as principal constituent
2224/81208	. . . . .	applying unidirectional static pressure	2224/81438	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/81209	. . . . .	applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid	2224/81439	. . . . .	Silver [Ag] as principal constituent
2224/8121	. . . . .	using a reflow oven	2224/81444	. . . . .	Gold [Au] as principal constituent
2224/81211	. . . . .	with a graded temperature profile	2224/81447	. . . . .	Copper [Cu] as principal constituent
2224/8122	. . . . .	with energy being in the form of electromagnetic radiation	2224/81449	. . . . .	Manganese [Mn] as principal constituent
2224/81222	. . . . .	Induction heating, i.e. eddy currents	2224/81455	. . . . .	Nickel [Ni] as principal constituent
2224/81224	. . . . .	using a laser	2224/81457	. . . . .	Cobalt [Co] as principal constituent
2224/8123	. . . . .	Polychromatic or infrared lamp heating	2224/8146	. . . . .	Iron [Fe] as principal constituent
2224/81232	. . . . .	using an autocatalytic reaction, e.g. exothermic brazing	2224/81463	. . . . .	the principal constituent melting at a temperature of greater than 1550°C
2224/81234	. . . . .	using means for applying energy being within the device, e.g. integrated heater	2224/81464	. . . . .	Palladium [Pd] as principal constituent
2224/81236	. . . . .	using electro-static corona discharge	2224/81466	. . . . .	Titanium [Ti] as principal constituent
2224/81237	. . . . .	using an electron beam	2224/81469	. . . . .	Platinum [Pt] as principal constituent
2224/81238	. . . . .	using electric resistance welding, i.e. ohmic heating	2224/8147	. . . . .	Zirconium [Zr] as principal constituent
2224/8134	. . . . .	Bonding interfaces of the bump connector	2224/81471	. . . . .	Chromium [Cr] as principal constituent
2224/81345	. . . . .	Shape, e.g. interlocking features	2224/81472	. . . . .	Vanadium [V] as principal constituent
			2224/81473	. . . . .	Rhodium [Rh] as principal constituent
			2224/81476	. . . . .	Ruthenium [Ru] as principal constituent



2224/81478	. . . . .	Iridium [Ir] as principal constituent	2224/81524	. . . . .	Aluminium [Al] as principal constituent
2224/81479	. . . . .	Niobium [Nb] as principal constituent	2224/81538	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/8148	. . . . .	Molybdenum [Mo] as principal constituent	2224/81539	. . . . .	Silver [Ag] as principal constituent
2224/81481	. . . . .	Tantalum [Ta] as principal constituent	2224/81544	. . . . .	Gold [Au] as principal constituent
2224/81483	. . . . .	Rhenium [Re] as principal constituent	2224/81547	. . . . .	Copper [Cu] as principal constituent
2224/81484	. . . . .	Tungsten [W] as principal constituent	2224/81549	. . . . .	Manganese [Mn] as principal constituent
2224/81486	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/81555	. . . . .	Nickel [Ni] as principal constituent
2224/81487	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/81557	. . . . .	Cobalt [Co] as principal constituent
2224/81488	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/8156	. . . . .	Iron [Fe] as principal constituent
2224/8149	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/81563	. . . . .	the principal constituent melting at a temperature of greater than 1550°C
2224/81491	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/81564	. . . . .	Palladium [Pd] as principal constituent
2224/81493	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/814</a> - <a href="#">H01L 2224/81491</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/81566	. . . . .	Titanium [Ti] as principal constituent
2224/81494	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/814</a> - <a href="#">H01L 2224/81491</a>	2224/81569	. . . . .	Platinum [Pt] as principal constituent
2224/81495	. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/814</a> - <a href="#">H01L 2224/81491</a>	2224/8157	. . . . .	Zirconium [Zr] as principal constituent
2224/81498	. . . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/81571	. . . . .	Chromium [Cr] as principal constituent
2224/81499	. . . . .	Material of the matrix	2224/81572	. . . . .	Vanadium [V] as principal constituent
2224/815	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/81573	. . . . .	Rhodium [Rh] as principal constituent
2224/81501	. . . . .	the principal constituent melting at a temperature of less than 400°C	2224/81576	. . . . .	Ruthenium [Ru] as principal constituent
2224/81505	. . . . .	Gallium [Ga] as principal constituent	2224/81578	. . . . .	Iridium [Ir] as principal constituent
2224/81509	. . . . .	Indium [In] as principal constituent	2224/81579	. . . . .	Niobium [Nb] as principal constituent
2224/81511	. . . . .	Tin [Sn] as principal constituent	2224/8158	. . . . .	Molybdenum [Mo] as principal constituent
2224/81513	. . . . .	Bismuth [Bi] as principal constituent	2224/81581	. . . . .	Tantalum [Ta] as principal constituent
2224/81514	. . . . .	Thallium [Tl] as principal constituent	2224/81583	. . . . .	Rhenium [Re] as principal constituent
2224/81516	. . . . .	Lead [Pb] as principal constituent	2224/81584	. . . . .	Tungsten [W] as principal constituent
2224/81517	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/81586	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/81518	. . . . .	Zinc [Zn] as principal constituent	2224/81587	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/8152	. . . . .	Antimony [Sb] as principal constituent	2224/81588	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/81523	. . . . .	Magnesium [Mg] as principal constituent	2224/8159	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
			2224/81591	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene



2224/81593	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/815</a> - <a href="#">H01L 2224/81591</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/8166	Iron [Fe] as principal constituent
2224/81594	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/815</a> - <a href="#">H01L 2224/81591</a>	2224/81663	the principal constituent melting at a temperature of greater than 1550°C
2224/81595	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/815</a> - <a href="#">H01L 2224/81591</a>	2224/81664	Palladium [Pd] as principal constituent
2224/81598	Fillers	2224/81666	Titanium [Ti] as principal constituent
2224/81599	Base material	2224/81669	Platinum [Pt] as principal constituent
2224/816	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/8167	Zirconium [Zr] as principal constituent
2224/81601	the principal constituent melting at a temperature of less than 400°C	2224/81671	Chromium [Cr] as principal constituent
2224/81605	Gallium [Ga] as principal constituent	2224/81672	Vanadium [V] as principal constituent
2224/81609	Indium [In] as principal constituent	2224/81673	Rhodium [Rh] as principal constituent
2224/81611	Tin [Sn] as principal constituent	2224/81676	Ruthenium [Ru] as principal constituent
2224/81613	Bismuth [Bi] as principal constituent	2224/81678	Iridium [Ir] as principal constituent
2224/81614	Thallium [Tl] as principal constituent	2224/81679	Niobium [Nb] as principal constituent
2224/81616	Lead [Pb] as principal constituent	2224/8168	Molybdenum [Mo] as principal constituent
2224/81617	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/81681	Tantalum [Ta] as principal constituent
2224/81618	Zinc [Zn] as principal constituent	2224/81683	Rhenium [Re] as principal constituent
2224/8162	Antimony [Sb] as principal constituent	2224/81684	Tungsten [W] as principal constituent
2224/81623	Magnesium [Mg] as principal constituent	2224/81686	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/81624	Aluminium [Al] as principal constituent	2224/81687	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/81638	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/81688	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/81639	Silver [Ag] as principal constituent	2224/8169	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/81644	Gold [Au] as principal constituent	2224/81691	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/81647	Copper [Cu] as principal constituent	2224/81693	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/816</a> - <a href="#">H01L 2224/81691</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/81649	Manganese [Mn] as principal constituent	2224/81694	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/816</a> - <a href="#">H01L 2224/81691</a>
2224/81655	Nickel [Ni] as principal constituent	2224/81695	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/816</a> - <a href="#">H01L 2224/81691</a>
2224/81657	Cobalt [Co] as principal constituent		

2224/81698	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/81769	Platinum [Pt] as principal constituent
2224/81699	Coating material	2224/8177	Zirconium [Zr] as principal constituent
2224/817	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/81771	Chromium [Cr] as principal constituent
2224/81701	the principal constituent melting at a temperature of less than 400°C	2224/81772	Vanadium [V] as principal constituent
2224/81705	Gallium [Ga] as principal constituent	2224/81773	Rhodium [Rh] as principal constituent
2224/81709	Indium [In] as principal constituent	2224/81776	Ruthenium [Ru] as principal constituent
2224/81711	Tin [Sn] as principal constituent	2224/81778	Iridium [Ir] as principal constituent
2224/81713	Bismuth [Bi] as principal constituent	2224/81779	Niobium [Nb] as principal constituent
2224/81714	Thallium [Tl] as principal constituent	2224/8178	Molybdenum [Mo] as principal constituent
2224/81716	Lead [Pb] as principal constituent	2224/81781	Tantalum [Ta] as principal constituent
2224/81717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/81783	Rhenium [Re] as principal constituent
2224/81718	Zinc [Zn] as principal constituent	2224/81784	Tungsten [W] as principal constituent
2224/8172	Antimony [Sb] as principal constituent	2224/81786	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/81723	Magnesium [Mg] as principal constituent	2224/81787	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/81724	Aluminium [Al] as principal constituent	2224/81788	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/81738	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/8179	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/81739	Silver [Ag] as principal constituent	2224/81791	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/81744	Gold [Au] as principal constituent	2224/81793	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/817</a> - <a href="#">H01L 2224/81791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/81747	Copper [Cu] as principal constituent	2224/81794	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/817</a> - <a href="#">H01L 2224/81791</a>
2224/81749	Manganese [Mn] as principal constituent	2224/81795	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/817</a> - <a href="#">H01L 2224/81791</a>
2224/81755	Nickel [Ni] as principal constituent	2224/81798	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/81757	Cobalt [Co] as principal constituent	2224/81799	Shape or distribution of the fillers
2224/8176	Iron [Fe] as principal constituent	2224/818	Bonding techniques
2224/81763	the principal constituent melting at a temperature of greater than 1550°C	2224/81801	Soldering or alloying
2224/81764	Palladium [Pd] as principal constituent	2224/81805	involving forming a eutectic alloy at the bonding interface
2224/81766	Titanium [Ti] as principal constituent		

- 2224/8181 . . . . . involving forming an intermetallic compound at the bonding interface
- 2224/81815 . . . . . Reflow soldering
- 2224/8182 . . . . . Diffusion bonding
- 2224/81825 . . . . . Solid-liquid interdiffusion
- 2224/8183 . . . . . Solid-solid interdiffusion
- 2224/8184 . . . . . Sintering
- 2224/8185 . . . . . using a polymer adhesive, e.g. an adhesive based on silicone, epoxy, polyimide, polyester
- 2224/81855 . . . . . Hardening the adhesive by curing, i.e. thermosetting
- 2224/81856 . . . . . Pre-cured adhesive, i.e. B-stage adhesive
- 2224/81859 . . . . . Localised curing of parts of the bump connector
- 2224/81862 . . . . . Heat curing
- 2224/81865 . . . . . Microwave curing
- 2224/81868 . . . . . Infrared [IR] curing
- 2224/81871 . . . . . Visible light curing
- 2224/81874 . . . . . Ultraviolet [UV] curing
- 2224/81877 . . . . . Moisture curing, i.e. curing by exposing to humidity, e.g. for silicones and polyurethanes
- 2224/8188 . . . . . Hardening the adhesive by cooling, e.g. for thermoplastics or hot-melt adhesives
- 2224/81885 . . . . . Combinations of two or more hardening methods provided for in at least two different groups from [H01L 2224/81855](#) - [H01L 2224/8188](#), e.g. for hybrid thermoplastic-thermosetting adhesives
- 2224/8189 . . . . . using an inorganic non metallic glass type adhesive, e.g. solder glass
- 2224/81893 . . . . . Anodic bonding, i.e. bonding by applying a voltage across the interface in order to induce ions migration leading to an irreversible chemical bond
- 2224/81894 . . . . . Direct bonding, i.e. joining surfaces by means of intermolecular attracting interactions at their interfaces, e.g. covalent bonds, van der Waals forces
- 2224/81895 . . . . . between electrically conductive surfaces, e.g. copper-copper direct bonding, surface activated bonding
- 2224/81896 . . . . . between electrically insulating surfaces, e.g. oxide or nitride layers
- 2224/81897 . . . . . Mechanical interlocking, e.g. anchoring, hook and loop-type fastening or the like
- 2224/81898 . . . . . Press-fitting, i.e. pushing the parts together and fastening by friction, e.g. by compression of one part against the other
- 2224/81899 . . . . . using resilient parts in the bump connector or in the bonding area
- 2224/819 . . . . . with the bump connector not providing any mechanical bonding
- 2224/81901 . . . . . Pressing the bump connector against the bonding areas by means of another connector
- 2224/81902 . . . . . by means of another bump connector
- 2224/81903 . . . . . by means of a layer connector
- 2224/81904 . . . . . by means of an encapsulation layer or foil
- 2224/81905 . . . . . Combinations of bonding methods provided for in at least two different groups from [H01L 2224/818](#) - [H01L 2224/81904](#)
- 2224/81906 . . . . . Specific sequence of method steps
- 2224/81907 . . . . . Intermediate bonding, i.e. intermediate bonding step for temporarily bonding the semiconductor or solid-state body, followed by at least a further bonding step
- 2224/81908 . . . . . involving monitoring, e.g. feedback loop
- 2224/81909 . . . . . Post-treatment of the bump connector or bonding area
- 2224/8191 . . . . . Cleaning, e.g. oxide removal step, desmearing
- 2224/81911 . . . . . Chemical cleaning, e.g. etching, flux
- 2224/81912 . . . . . Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic cleaning, dry ice blasting, gas-flow
- 2224/81913 . . . . . Plasma cleaning
- 2224/81914 . . . . . Thermal cleaning, e.g. using laser ablation or by electrostatic corona discharge
- 2224/81919 . . . . . Combinations of two or more cleaning methods provided for in at least two different groups from [H01L 2224/8191](#) - [H01L 2224/81914](#)
- 2224/8192 . . . . . Applying permanent coating, e.g. protective coating
- 2224/8193 . . . . . Reshaping
- 2224/81931 . . . . . by chemical means, e.g. etching
- 2224/81935 . . . . . by heating means, e.g. reflowing
- 2224/81937 . . . . . using a polychromatic heating lamp
- 2224/81939 . . . . . using a laser
- 2224/81941 . . . . . Induction heating, i.e. eddy currents
- 2224/81943 . . . . . using a flame torch, e.g. hydrogen torch
- 2224/81945 . . . . . using a corona discharge, e.g. electronic flame off [EFO]
- 2224/81947 . . . . . by mechanical means, e.g. "pull-and-cut", pressing, stamping
- 2224/81948 . . . . . Thermal treatments, e.g. annealing, controlled cooling
- 2224/81951 . . . . . Forming additional members, e.g. for reinforcing
- 2224/81986 . . . . . Specific sequence of steps, e.g. repetition of manufacturing steps, time sequence
- 2224/82 . . . . . by forming build-up interconnects at chip-level, e.g. for high density interconnects [HDI]
- 2224/82001 . . . . . involving a temporary auxiliary member not forming part of the bonding apparatus
- 2224/82002 . . . . . being a removable or sacrificial coating
- 2224/82005 . . . . . being a temporary or sacrificial substrate
- 2224/82007 . . . . . involving a permanent auxiliary member being left in the finished device, e.g. aids for holding or protecting a build-up interconnect during or after the bonding process
- 2224/82009 . . . . . Pre-treatment of the connector or the bonding area
- 2224/8201 . . . . . Cleaning, e.g. oxide removal step, desmearing
- 2224/8203 . . . . . Reshaping, e.g. forming vias
- 2224/82031 . . . . . by chemical means, e.g. etching, anodisation
- 2224/82035 . . . . . by heating means
- 2224/82039 . . . . . using a laser
- 2224/82045 . . . . . using a corona discharge, e.g. electronic flame off [EFO]
- 2224/82047 . . . . . by mechanical means, e.g. severing, pressing, stamping

2224/82048	. . . .	Thermal treatments, e.g. annealing, controlled pre-heating or pre-cooling	2224/82207	. . . . .	Thermosonic bonding
2224/82051	. . . .	Forming additional members	2224/8221	. . . .	with energy being in the form of electromagnetic radiation
2224/82053	. . .	Bonding environment	2224/82212	. . . . .	Induction heating, i.e. eddy currents
2224/82054	. . . .	Composition of the atmosphere	2224/82214	. . . . .	using a laser
2224/82085	. . . .	being a liquid, e.g. for fluidic self-assembly	2224/8223	. . . . .	Polychromatic or infrared lamp heating
2224/8209	. . . .	Vacuum	2224/82232	. . . .	using an autocatalytic reaction, e.g. exothermic brazing
2224/82091	. . . .	Under pressure	2224/82234	. . . .	using means for applying energy being within the device, e.g. integrated heater
2224/82095	. . . .	Temperature settings	2224/82236	. . . .	using electro-static corona discharge
2224/82096	. . . . .	Transient conditions	2224/82237	. . . .	using electron beam
2224/82097	. . . . .	Heating	2224/82238	. . . .	using electric resistance welding, i.e. ohmic heating
2224/82098	. . . . .	Cooling	2224/8234	. . .	Bonding interfaces of the connector
2224/82099	. . . . .	Ambient temperature	2224/82345	. . . .	Shape, e.g. interlocking features
2224/821	. . .	Forming a build-up interconnect	2224/82355	. . . .	having an external coating, e.g. protective bond-through coating
2224/82101	. . . .	by additive methods, e.g. direct writing	2224/82359	. . . .	Material
2224/82102	. . . . .	using jetting, e.g. ink jet	2224/8236	. . .	Bonding interfaces of the semiconductor or solid state body
2224/82103	. . . . .	using laser direct writing	2224/82365	. . . .	Shape, e.g. interlocking features
2224/82104	. . . . .	using screen printing	2224/82375	. . . .	having an external coating, e.g. protective bond-through coating
2224/82105	. . . . .	by using a preform	2224/82379	. . . .	Material
2224/82106	. . . .	by subtractive methods	2224/8238	. . .	Bonding interfaces outside the semiconductor or solid-state body
2224/82108	. . . .	by self-assembly processes	2224/82385	. . . .	Shape, e.g. interlocking features
2224/8211	. . .	involving protection against electrical discharge, e.g. removing electrostatic charge	2224/82395	. . . .	having an external coating, e.g. protective bond-through coating
2224/8212	. . .	Aligning	2224/82399	. . . .	Material
2224/82121	. . . .	Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors	2224/828	. . .	Bonding techniques
2224/82122	. . . . .	by detecting inherent features of, or outside, the semiconductor or solid-state body	2224/82801	. . . .	Soldering or alloying
2224/8213	. . . . .	using marks formed on the semiconductor or solid-state body	2224/82805	. . . . .	involving forming a eutectic alloy at the bonding interface
2224/82132	. . . . .	using marks formed outside the semiconductor or solid-state body, i.e. "off-chip"	2224/8281	. . . . .	involving forming an intermetallic compound at the bonding interface
2224/82136	. . . .	involving guiding structures, e.g. spacers or supporting members	2224/82815	. . . . .	Reflow soldering
2224/82138	. . . . .	the guiding structures being at least partially left in the finished device	2224/8282	. . . . .	Diffusion bonding
2224/82143	. . . .	Passive alignment, i.e. self alignment, e.g. using surface energy, chemical reactions, thermal equilibrium	2224/82825	. . . . .	Solid-liquid interdiffusion
2224/82148	. . . .	involving movement of a part of the bonding apparatus	2224/8283	. . . . .	Solid-solid interdiffusion
2224/82149	. . . . .	being the lower part of the bonding apparatus, i.e. holding means for the bodies to be connected, e.g. XY table	2224/8284	. . . .	Sintering
2224/8215	. . . . .	Rotational movements	2224/8285	. . . .	using a polymer adhesive, e.g. an adhesive based on silicone, epoxy, polyimide, polyester
2224/8216	. . . . .	Translational movements	2224/82855	. . . . .	Hardening the adhesive by curing, i.e. thermosetting
2224/82169	. . . . .	being the upper part of the bonding apparatus, e.g. nozzle	2224/82856	. . . . .	Pre-cured adhesive, i.e. B-stage adhesive
2224/8217	. . . . .	Rotational movement	2224/82859	. . . . .	Localised curing of parts of the connector
2224/8218	. . . . .	Translational movements	2224/82862	. . . . .	Heat curing
2224/82181	. . . . .	connecting first on the semiconductor or solid-state body, i.e. on-chip,	2224/82865	. . . . .	Microwave curing
2224/82186	. . . . .	connecting first outside the semiconductor or solid-state body, i.e. off-chip	2224/82868	. . . . .	Infrared [IR] curing
2224/82191	. . . . .	connecting first both on and outside the semiconductor or solid-state body	2224/82871	. . . . .	Visible light curing
2224/822	. . .	Applying energy for connecting	2224/82874	. . . . .	Ultraviolet [UV] curing
2224/82201	. . . .	Compression bonding	2224/82877	. . . . .	Moisture curing, i.e. curing by exposing to humidity, e.g. for silicones and polyurethanes
2224/82203	. . . . .	Thermocompression bonding	2224/8288	. . . . .	Hardening the adhesive by cooling, e.g. for thermoplastics or hot-melt adhesives
2224/82205	. . . . .	Ultrasonic bonding			

- 2224/82885 . . . . Combinations of two or more hardening methods provided for in at least two different groups from [H01L 2224/82855](#) - [H01L 2224/8288](#), e.g. for hybrid thermoplastic-thermosetting adhesives
- 2224/8289 . . . . using an inorganic non metallic glass type adhesive, e.g. solder glass
- 2224/82893 . . . . Anodic bonding, i.e. bonding by applying a voltage across the interface in order to induce ions migration leading to an irreversible chemical bond
- 2224/82895 . . . . Direct bonding, i.e. joining surfaces by means of intermolecular attracting interactions at their interfaces, e.g. covalent bonds, van der Waals forces
- 2224/82896 . . . . between electrically conductive surfaces, e.g. copper-copper direct bonding, surface activated bonding
- 2224/82897 . . . . between electrically insulating surfaces, e.g. oxide or nitride layers
- 2224/82899 . . . . Combinations of bonding methods provided for in at least two different groups from [H01L 2224/828](#) - [H01L 2224/82897](#)
- 2224/829 . . . . involving monitoring, e.g. feedback loop
- 2224/82909 . . . . Post-treatment of the connector or the bonding area
- 2224/8291 . . . . Cleaning, e.g. oxide removal step, desmearing
- 2224/8293 . . . . Reshaping
- 2224/82931 . . . . by chemical means, e.g. etching, anodisation
- 2224/82935 . . . . by heating means
- 2224/82939 . . . . using a laser
- 2224/82945 . . . . using a corona discharge, e.g. electronic flame off [EFO]
- 2224/82947 . . . . by mechanical means, e.g. severing, pressing, stamping
- 2224/82948 . . . . Thermal treatments, e.g. annealing, controlled pre-heating or pre-cooling
- 2224/82951 . . . . Forming additional members
- 2224/82986 . . . . Specific sequence of steps, e.g. repetition of manufacturing steps, time sequence
- 2224/83 . . . . using a layer connector
- 2224/83001 . . . . involving a temporary auxiliary member not forming part of the bonding apparatus
- 2224/83002 . . . . being a removable or sacrificial coating
- 2224/83005 . . . . being a temporary or sacrificial substrate
- 2224/83007 . . . . involving a permanent auxiliary member being left in the finished device, e.g. aids for holding or protecting the layer connector during or after the bonding process
- 2224/83009 . . . . Pre-treatment of the layer connector or the bonding area
- 2224/8301 . . . . Cleaning the layer connector, e.g. oxide removal step, desmearing
- 2224/83011 . . . . Chemical cleaning, e.g. etching, flux
- 2224/83012 . . . . Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic cleaning, dry ice blasting, gas-flow
- 2224/83013 . . . . Plasma cleaning
- 2224/83014 . . . . Thermal cleaning, e.g. decomposition, sublimation
- 2224/83019 . . . . Combinations of two or more cleaning methods provided for in at least two different groups from [H01L 2224/8301](#) - [H01L 2224/83014](#)
- 2224/8302 . . . . Applying permanent coating to the layer connector in the bonding apparatus, e.g. in-situ coating
- 2224/83022 . . . . Cleaning the bonding area, e.g. oxide removal step, desmearing
- 2224/83024 . . . . Applying flux to the bonding area
- 2224/83026 . . . . Applying a precursor material to the bonding area
- 2224/8303 . . . . Reshaping the layer connector in the bonding apparatus, e.g. flattening the layer connector
- 2224/83031 . . . . by chemical means, e.g. etching, anodisation
- 2224/83035 . . . . by heating means
- 2224/83037 . . . . using a polychromatic heating lamp
- 2224/83039 . . . . using a laser
- 2224/83041 . . . . Induction heating, i.e. eddy currents
- 2224/83047 . . . . by mechanical means, e.g. severing, pressing, stamping
- 2224/83048 . . . . Thermal treatments, e.g. annealing, controlled pre-heating or pre-cooling
- 2224/83051 . . . . Forming additional members, e.g. dam structures
- 2224/83052 . . . . Detaching layer connectors, e.g. after testing
- 2224/83053 . . . . Bonding environment
- 2224/83054 . . . . Composition of the atmosphere
- 2224/83055 . . . . being oxidating
- 2224/83065 . . . . being reducing
- 2224/83075 . . . . being inert
- 2224/83085 . . . . being a liquid, e.g. for fluidic self-assembly
- 2224/8309 . . . . Vacuum
- 2224/83091 . . . . Under pressure
- 2224/83092 . . . . Atmospheric pressure
- 2224/83093 . . . . Transient conditions, e.g. gas-flow
- 2224/83095 . . . . Temperature settings
- 2224/83096 . . . . Transient conditions
- 2224/83097 . . . . Heating
- 2224/83098 . . . . Cooling
- 2224/83099 . . . . Ambient temperature
- 2224/831 . . . . the layer connector being supplied to the parts to be connected in the bonding apparatus
- 2224/83101 . . . . as prepeg comprising a layer connector, e.g. provided in an insulating plate member
- 2224/83102 . . . . using surface energy, e.g. capillary forces
- 2224/83104 . . . . by applying pressure, e.g. by injection
- 2224/8311 . . . . involving protection against electrical discharge, e.g. removing electrostatic charge
- 2224/8312 . . . . Aligning
- 2224/83121 . . . . Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors
- 2224/83122 . . . . by detecting inherent features of, or outside, the semiconductor or solid-state body
- 2224/83123 . . . . Shape or position of the body
- 2224/83125 . . . . Bonding areas on the body
- 2224/83127 . . . . Bonding areas outside the body
- 2224/83129 . . . . Shape or position of the other item
- 2224/8313 . . . . using marks formed on the semiconductor or solid-state body

2224/83132	. . . . .	using marks formed outside the semiconductor or solid-state body, i.e. "off-chip"	2224/83237	. . . . .	using an electron beam
2224/83136	. . . . .	involving guiding structures, e.g. spacers or supporting members	2224/83238	. . . . .	using electric resistance welding, i.e. ohmic heating
2224/83138	. . . . .	the guiding structures being at least partially left in the finished device	2224/8334	. . . . .	Bonding interfaces of the layer connector
2224/83139	. . . . .	Guiding structures on the body	2224/83345	. . . . .	Shape, e.g. interlocking features
2224/8314	. . . . .	Guiding structures outside the body	2224/83355	. . . . .	having an external coating, e.g. protective bond-through coating
2224/83141	. . . . .	Guiding structures both on and outside the body	2224/83359	. . . . .	Material
2224/83143	. . . . .	Passive alignment, i.e. self alignment, e.g. using surface energy, chemical reactions, thermal equilibrium	2224/8336	. . . . .	Bonding interfaces of the semiconductor or solid state body
2224/83148	. . . . .	involving movement of a part of the bonding apparatus	2224/83365	. . . . .	Shape, e.g. interlocking features
2224/83149	. . . . .	being the lower part of the bonding apparatus, i.e. holding means for the bodies to be connected, e.g. XY table	2224/83375	. . . . .	having an external coating, e.g. protective bond-through coating
2224/8315	. . . . .	Rotational movements	2224/83379	. . . . .	Material
2224/8316	. . . . .	Translational movements	2224/8338	. . . . .	Bonding interfaces outside the semiconductor or solid-state body
2224/83169	. . . . .	being the upper part of the bonding apparatus, i.e. bonding head	2224/83385	. . . . .	Shape, e.g. interlocking features
2224/8317	. . . . .	Rotational movements	2224/83395	. . . . .	having an external coating, e.g. protective bond-through coating
2224/8318	. . . . .	Translational movements	2224/83399	. . . . .	Material
2224/8319	. . . . .	Arrangement of the layer connectors prior to mounting	2224/834	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/83191	. . . . .	wherein the layer connectors are disposed only on the semiconductor or solid-state body	2224/83401	. . . . .	the principal constituent melting at a temperature of less than 400°C
2224/83192	. . . . .	wherein the layer connectors are disposed only on another item or body to be connected to the semiconductor or solid-state body	2224/83405	. . . . .	Gallium [Ga] as principal constituent
2224/83193	. . . . .	wherein the layer connectors are disposed on both the semiconductor or solid-state body and another item or body to be connected to the semiconductor or solid-state body	2224/83409	. . . . .	Indium [In] as principal constituent
2224/83194	. . . . .	Lateral distribution of the layer connectors	2224/83411	. . . . .	Tin [Sn] as principal constituent
2224/832	. . . . .	Applying energy for connecting	2224/83413	. . . . .	Bismuth [Bi] as principal constituent
2224/83201	. . . . .	Compression bonding	2224/83414	. . . . .	Thallium [Tl] as principal constituent
2224/83203	. . . . .	Thermocompression bonding, e.g. diffusion bonding, pressure joining, thermocompression welding or solid-state welding	2224/83416	. . . . .	Lead [Pb] as principal constituent
2224/83204	. . . . .	with a graded temperature profile	2224/83417	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/83205	. . . . .	Ultrasonic bonding	2224/83418	. . . . .	Zinc [Zn] as principal constituent
2224/83206	. . . . .	Direction of oscillation	2224/8342	. . . . .	Antimony [Sb] as principal constituent
2224/83207	. . . . .	Thermosonic bonding	2224/83423	. . . . .	Magnesium [Mg] as principal constituent
2224/83208	. . . . .	applying unidirectional static pressure	2224/83424	. . . . .	Aluminium [Al] as principal constituent
2224/83209	. . . . .	applying isostatic pressure, e.g. degassing using vacuum or a pressurised liquid	2224/83438	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/8321	. . . . .	using a reflow oven	2224/83439	. . . . .	Silver [Ag] as principal constituent
2224/83211	. . . . .	with a graded temperature profile	2224/83444	. . . . .	Gold [Au] as principal constituent
2224/8322	. . . . .	with energy being in the form of electromagnetic radiation	2224/83447	. . . . .	Copper [Cu] as principal constituent
2224/83222	. . . . .	Induction heating, i.e. eddy currents	2224/83449	. . . . .	Manganese [Mn] as principal constituent
2224/83224	. . . . .	using a laser	2224/83455	. . . . .	Nickel [Ni] as principal constituent
2224/8323	. . . . .	Polychromatic or infrared lamp heating	2224/83457	. . . . .	Cobalt [Co] as principal constituent
2224/83232	. . . . .	using an autocatalytic reaction, e.g. exothermic brazing	2224/8346	. . . . .	Iron [Fe] as principal constituent
2224/83234	. . . . .	using means for applying energy being within the device, e.g. integrated heater	2224/83463	. . . . .	the principal constituent melting at a temperature of greater than 1550°C
2224/83236	. . . . .	using electro-static corona discharge	2224/83464	. . . . .	Palladium [Pd] as principal constituent
			2224/83466	. . . . .	Titanium [Ti] as principal constituent
			2224/83469	. . . . .	Platinum [Pt] as principal constituent
			2224/8347	. . . . .	Zirconium [Zr] as principal constituent



2224/83471	. . . . .	Chromium [Cr] as principal constituent	2224/83518	. . . . .	Zinc [Zn] as principal constituent
2224/83472	. . . . .	Vanadium [V] as principal constituent	2224/8352	. . . . .	Antimony [Sb] as principal constituent
2224/83473	. . . . .	Rhodium [Rh] as principal constituent	2224/83523	. . . . .	Magnesium [Mg] as principal constituent
2224/83476	. . . . .	Ruthenium [Ru] as principal constituent	2224/83524	. . . . .	Aluminium [Al] as principal constituent
2224/83478	. . . . .	Iridium [Ir] as principal constituent	2224/83538	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/83479	. . . . .	Niobium [Nb] as principal constituent	2224/83539	. . . . .	Silver [Ag] as principal constituent
2224/8348	. . . . .	Molybdenum [Mo] as principal constituent	2224/83544	. . . . .	Gold [Au] as principal constituent
2224/83481	. . . . .	Tantalum [Ta] as principal constituent	2224/83547	. . . . .	Copper [Cu] as principal constituent
2224/83483	. . . . .	Rhenium [Re] as principal constituent	2224/83549	. . . . .	Manganese [Mn] as principal constituent
2224/83484	. . . . .	Tungsten [W] as principal constituent	2224/83555	. . . . .	Nickel [Ni] as principal constituent
2224/83486	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/83557	. . . . .	Cobalt [Co] as principal constituent
2224/83487	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/8356	. . . . .	Iron [Fe] as principal constituent
2224/83488	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/83563	. . . . .	the principal constituent melting at a temperature of greater than 1550°C
2224/8349	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/83564	. . . . .	Palladium [Pd] as principal constituent
2224/83491	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/83566	. . . . .	Titanium [Ti] as principal constituent
2224/83493	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/834</a> - <a href="#">H01L 2224/83491</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/83569	. . . . .	Platinum [Pt] as principal constituent
2224/83494	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/834</a> - <a href="#">H01L 2224/83491</a>	2224/8357	. . . . .	Zirconium [Zr] as principal constituent
2224/83495	. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/834</a> - <a href="#">H01L 2224/83491</a>	2224/83571	. . . . .	Chromium [Cr] as principal constituent
2224/83498	. . . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/83572	. . . . .	Vanadium [V] as principal constituent
2224/83499	. . . . .	Material of the matrix	2224/83573	. . . . .	Rhodium [Rh] as principal constituent
2224/835	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/83576	. . . . .	Ruthenium [Ru] as principal constituent
2224/83501	. . . . .	the principal constituent melting at a temperature of less than 400°C	2224/83578	. . . . .	Iridium [Ir] as principal constituent
2224/83505	. . . . .	Gallium [Ga] as principal constituent	2224/83579	. . . . .	Niobium [Nb] as principal constituent
2224/83509	. . . . .	Indium [In] as principal constituent	2224/8358	. . . . .	Molybdenum [Mo] as principal constituent
2224/83511	. . . . .	Tin [Sn] as principal constituent	2224/83581	. . . . .	Tantalum [Ta] as principal constituent
2224/83513	. . . . .	Bismuth [Bi] as principal constituent	2224/83583	. . . . .	Rhenium [Re] as principal constituent
2224/83514	. . . . .	Thallium [Tl] as principal constituent	2224/83584	. . . . .	Tungsten [W] as principal constituent
2224/83516	. . . . .	Lead [Pb] as principal constituent	2224/83586	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/83517	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/83587	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
			2224/83588	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides

2224/8359	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/83647	Copper [Cu] as principal constituent
2224/83591	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/83649	Manganese [Mn] as principal constituent
2224/83593	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/835</a> - <a href="#">H01L 2224/83591</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/83655	Nickel [Ni] as principal constituent
2224/83594	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/835</a> - <a href="#">H01L 2224/83591</a>	2224/83657	Cobalt [Co] as principal constituent
2224/83595	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/835</a> - <a href="#">H01L 2224/83591</a>	2224/8366	Iron [Fe] as principal constituent
2224/83598	Fillers	2224/83663	the principal constituent melting at a temperature of greater than 1550°C
2224/83599	Base material	2224/83664	Palladium [Pd] as principal constituent
2224/836	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/83666	Titanium [Ti] as principal constituent
2224/83601	the principal constituent melting at a temperature of less than 400°C	2224/83669	Platinum [Pt] as principal constituent
2224/83605	Gallium [Ga] as principal constituent	2224/8367	Zirconium [Zr] as principal constituent
2224/83609	Indium [In] as principal constituent	2224/83671	Chromium [Cr] as principal constituent
2224/83611	Tin [Sn] as principal constituent	2224/83672	Vanadium [V] as principal constituent
2224/83613	Bismuth [Bi] as principal constituent	2224/83673	Rhodium [Rh] as principal constituent
2224/83614	Thallium [Tl] as principal constituent	2224/83676	Ruthenium [Ru] as principal constituent
2224/83616	Lead [Pb] as principal constituent	2224/83678	Iridium [Ir] as principal constituent
2224/83617	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/83679	Niobium [Nb] as principal constituent
2224/83618	Zinc [Zn] as principal constituent	2224/8368	Molybdenum [Mo] as principal constituent
2224/8362	Antimony [Sb] as principal constituent	2224/83681	Tantalum [Ta] as principal constituent
2224/83623	Magnesium [Mg] as principal constituent	2224/83683	Rhenium [Re] as principal constituent
2224/83624	Aluminium [Al] as principal constituent	2224/83684	Tungsten [W] as principal constituent
2224/83638	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/83686	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/83639	Silver [Ag] as principal constituent	2224/83687	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/83644	Gold [Au] as principal constituent	2224/83688	Glasses, e.g. amorphous oxides, nitrides or fluorides
		2224/8369	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
		2224/83691	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
		2224/83693	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/836</a> - <a href="#">H01L 2224/83691</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond

2224/83694	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/836</a> - <a href="#">H01L 2224/83691</a>	2224/8376	Iron [Fe] as principal constituent
2224/83695	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/836</a> - <a href="#">H01L 2224/83691</a>	2224/83763	the principal constituent melting at a temperature of greater than 1550°C
2224/83698	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/83764	Palladium [Pd] as principal constituent
2224/83699	Coating material	2224/83766	Titanium [Ti] as principal constituent
2224/837	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/83769	Platinum [Pt] as principal constituent
2224/83701	the principal constituent melting at a temperature of less than 400°C	2224/8377	Zirconium [Zr] as principal constituent
2224/83705	Gallium [Ga] as principal constituent	2224/83771	Chromium [Cr] as principal constituent
2224/83709	Indium [In] as principal constituent	2224/83772	Vanadium [V] as principal constituent
2224/83711	Tin [Sn] as principal constituent	2224/83773	Rhodium [Rh] as principal constituent
2224/83713	Bismuth [Bi] as principal constituent	2224/83776	Ruthenium [Ru] as principal constituent
2224/83714	Thallium [Tl] as principal constituent	2224/83778	Iridium [Ir] as principal constituent
2224/83716	Lead [Pb] as principal constituent	2224/83779	Niobium [Nb] as principal constituent
2224/83717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/8378	Molybdenum [Mo] as principal constituent
2224/83718	Zinc [Zn] as principal constituent	2224/83781	Tantalum [Ta] as principal constituent
2224/8372	Antimony [Sb] as principal constituent	2224/83783	Rhenium [Re] as principal constituent
2224/83723	Magnesium [Mg] as principal constituent	2224/83784	Tungsten [W] as principal constituent
2224/83724	Aluminium [Al] as principal constituent	2224/83786	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/83738	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/83787	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/83739	Silver [Ag] as principal constituent	2224/83788	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/83744	Gold [Au] as principal constituent	2224/8379	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/83747	Copper [Cu] as principal constituent	2224/83791	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/83749	Manganese [Mn] as principal constituent	2224/83793	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/837</a> - <a href="#">H01L 2224/83791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/83755	Nickel [Ni] as principal constituent	2224/83794	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/837</a> - <a href="#">H01L 2224/83791</a>
2224/83757	Cobalt [Co] as principal constituent	2224/83795	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/837</a> - <a href="#">H01L 2224/83791</a>

- 2224/83798 . . . . . with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
- 2224/83799 . . . . . Shape or distribution of the fillers
- 2224/838 . . . Bonding techniques
- 2224/83801 . . . . Soldering or alloying
- 2224/83805 . . . . . involving forming a eutectic alloy at the bonding interface
- 2224/8381 . . . . . involving forming an intermetallic compound at the bonding interface
- 2224/83815 . . . . . Reflow soldering
- 2224/8382 . . . . . Diffusion bonding
- 2224/83825 . . . . . Solid-liquid interdiffusion
- 2224/8383 . . . . . Solid-solid interdiffusion
- 2224/8384 . . . . Sintering
- 2224/8385 . . . . . using a polymer adhesive, e.g. an adhesive based on silicone, epoxy, polyimide, polyester
- 2224/83851 . . . . . being an anisotropic conductive adhesive
- 2224/83855 . . . . . Hardening the adhesive by curing, i.e. thermosetting
- 2224/83856 . . . . . Pre-cured adhesive, i.e. B-stage adhesive
- 2224/83859 . . . . . Localised curing of parts of the layer connector
- 2224/83862 . . . . . Heat curing
- 2224/83865 . . . . . Microwave curing
- 2224/83868 . . . . . Infrared [IR] curing
- 2224/83871 . . . . . Visible light curing
- 2224/83874 . . . . . Ultraviolet [UV] curing
- 2224/83877 . . . . . Moisture curing, i.e. curing by exposing to humidity, e.g. for silicones and polyurethanes
- 2224/8388 . . . . . Hardening the adhesive by cooling, e.g. for thermoplastics or hot-melt adhesives
- 2224/83885 . . . . . Combinations of two or more hardening methods provided for in at least two different groups from [H01L 2224/83855](#) - [H01L 2224/8388](#), e.g. for hybrid thermoplastic-thermosetting adhesives
- 2224/83886 . . . . . Involving a self-assembly process, e.g. self-agglomeration of a material dispersed in a fluid
- 2224/83887 . . . . . Auxiliary means therefor, e.g. for self-assembly activation
- 2224/83888 . . . . . with special adaptation of the surface of the body to be connected, e.g. surface shape specially adapted for the self-assembly process
- 2224/83889 . . . . . involving the material of the bonding area, e.g. bonding pad
- 2224/8389 . . . . . using an inorganic non metallic glass type adhesive, e.g. solder glass
- 2224/83893 . . . . . Anodic bonding, i.e. bonding by applying a voltage across the interface in order to induce ions migration leading to an irreversible chemical bond
- 2224/83894 . . . . . Direct bonding, i.e. joining surfaces by means of intermolecular attracting interactions at their interfaces, e.g. covalent bonds, van der Waals forces
- 2224/83895 . . . . . between electrically conductive surfaces, e.g. copper-copper direct bonding, surface activated bonding
- 2224/83896 . . . . . between electrically insulating surfaces, e.g. oxide or nitride layers
- 2224/83897 . . . . . Mechanical interlocking, e.g. anchoring, hook and loop-type fastening or the like
- 2224/83898 . . . . . Press-fitting, i.e. pushing the parts together and fastening by friction, e.g. by compression of one part against the other
- 2224/83899 . . . . . using resilient parts in the layer connector or in the bonding area
- 2224/839 . . . with the layer connector not providing any mechanical bonding
- 2224/83901 . . . . . Pressing the layer connector against the bonding areas by means of another connector
- 2224/83902 . . . . . by means of another layer connector
- 2224/83903 . . . . . by means of a bump connector
- 2224/83904 . . . . . by means of an encapsulation layer or foil
- 2224/83905 . . . . Combinations of bonding methods provided for in at least two different groups from [H01L 2224/838](#) - [H01L 2224/83904](#)
- 2224/83906 . . . . . Specific sequence of method steps
- 2224/83907 . . . . . Intermediate bonding, i.e. intermediate bonding step for temporarily bonding the semiconductor or solid-state body, followed by at least a further bonding step
- 2224/83908 . . . . involving monitoring, e.g. feedback loop
- 2224/83909 . . . . Post-treatment of the layer connector or bonding area
- 2224/8391 . . . . . Cleaning, e.g. oxide removal step, desmearing
- 2224/83911 . . . . . Chemical cleaning, e.g. etching, flux
- 2224/83912 . . . . . Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic cleaning, dry ice blasting, gas-flow
- 2224/83913 . . . . . Plasma cleaning
- 2224/83914 . . . . . Thermal cleaning, e.g. using laser ablation or by electrostatic corona discharge
- 2224/83919 . . . . . Combinations of two or more cleaning methods provided for in at least two different groups from [H01L 2224/8391](#) - [H01L 2224/83914](#)
- 2224/8392 . . . . . Applying permanent coating, e.g. protective coating
- 2224/8393 . . . . . Reshaping
- 2224/83931 . . . . . by chemical means, e.g. etching
- 2224/83935 . . . . . by heating means, e.g. reflowing
- 2224/83937 . . . . . using a polychromatic heating lamp
- 2224/83939 . . . . . using a laser
- 2224/83941 . . . . . Induction heating, i.e. eddy currents
- 2224/83943 . . . . . using a flame torch, e.g. hydrogen torch
- 2224/83945 . . . . . using a corona discharge, e.g. electronic flame off [EFO]
- 2224/83947 . . . . . by mechanical means, e.g. "pull-and-cut", pressing, stamping
- 2224/83948 . . . . . Thermal treatments, e.g. annealing, controlled cooling
- 2224/83951 . . . . . Forming additional members, e.g. for reinforcing, fillet sealant

2224/83986	. . .	Specific sequence of steps, e.g. repetition of manufacturing steps, time sequence	2224/84121	. . . .	Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors
2224/84	. .	using a strap connector	2224/84122	. . . .	by detecting inherent features of, or outside, the semiconductor or solid-state body
2224/84001	. . .	involving a temporary auxiliary member not forming part of the bonding apparatus	2224/84123	. . . . .	Shape or position of the body
2224/84002	. . . .	being a removable or sacrificial coating	2224/84125	. . . . .	Bonding areas on the body
2224/84005	. . . .	being a temporary substrate	2224/84127	. . . . .	Bonding areas outside the body
2224/84007	. . .	involving a permanent auxiliary member being left in the finished device, e.g. aids for holding or protecting the strap connector during or after the bonding process	2224/84129	. . . . .	Shape or position of the other item
2224/84009	. . .	Pre-treatment of the connector and/or the bonding area	2224/8413	. . . . .	using marks formed on the semiconductor or solid-state body
2224/8401	. . . .	Cleaning, e.g. oxide removal step, desmearing	2224/84132	. . . . .	using marks formed outside the semiconductor or solid-state body, i.e. "off-chip"
2224/84011	. . . . .	Chemical cleaning, e.g. etching, flux	2224/84136	. . . . .	involving guiding structures, e.g. spacers or supporting members
2224/84012	. . . . .	Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic cleaning, dry ice blasting, gas-flow	2224/84138	. . . . .	the guiding structures being at least partially left in the finished device
2224/84013	. . . . .	Plasma cleaning	2224/84143	. . . . .	Passive alignment, i.e. self alignment, e.g. using surface energy, chemical reactions, thermal equilibrium
2224/84014	. . . . .	Thermal cleaning, e.g. decomposition, sublimation	2224/84148	. . . . .	involving movement of a part of the bonding apparatus
2224/84019	. . . . .	Combinations of two or more cleaning methods provided for in at least two different groups from <a href="#">H01L 2224/8401</a> - <a href="#">H01L 2224/84014</a>	2224/84149	. . . . .	being the lower part of the bonding apparatus, i.e. holding means for the bodies to be connected, e.g. XY table
2224/8402	. . . .	Applying permanent coating, e.g. in-situ coating	2224/8415	. . . . .	Rotational movements
2224/8403	. . . .	Reshaping	2224/8416	. . . . .	Translational movements
2224/84031	. . . . .	by chemical means, e.g. etching, anodisation	2224/84169	. . . . .	being the upper part of the bonding apparatus, i.e. bonding head,
2224/84035	. . . . .	by heating means, e.g. "free-air-ball"	2224/8417	. . . . .	Rotational movements
2224/84037	. . . . .	using a polychromatic heating lamp	2224/8418	. . . . .	Translational movements
2224/84039	. . . . .	using a laser	2224/84181	. . . . .	connecting first on the semiconductor or solid-state body, i.e. on-chip, regular stitch
2224/84041	. . . . .	Induction heating, i.e. eddy currents	2224/84186	. . . . .	connecting first outside the semiconductor or solid-state body, i.e. off-chip, reverse stitch
2224/84043	. . . . .	using a flame torch, e.g. hydrogen torch	2224/84191	. . . . .	connecting first both on and outside the semiconductor or solid-state body, i.e. regular and reverse stitches
2224/84045	. . . . .	using a corona discharge, e.g. electronic flame off [EFO]	2224/84196	. . . . .	involving intermediate connecting steps before cutting the strap connector
2224/84047	. . . . .	by mechanical means, e.g. severing, pressing, stamping	2224/842	. . .	Applying energy for connecting
2224/84048	. . . .	Thermal treatments, e.g. annealing, controlled pre-heating or pre-cooling	2224/84201	. . . .	Compression bonding
2224/84051	. . . .	Forming additional members	2224/84203	. . . . .	Thermocompression bonding
2224/84053	. . .	Bonding environment	2224/84205	. . . . .	Ultrasonic bonding
2224/84054	. . . .	Composition of the atmosphere	2224/84206	. . . . .	Direction of oscillation
2224/84055	. . . . .	being oxidating	2224/84207	. . . . .	Thermosonic bonding
2224/84065	. . . . .	being reducing	2224/8421	. . . . .	with energy being in the form of electromagnetic radiation
2224/84075	. . . . .	being inert	2224/84212	. . . . .	Induction heating, i.e. eddy currents
2224/84085	. . . .	being a liquid (e.g. for fluidic self-assembly)	2224/84214	. . . . .	using a laser
2224/8409	. . . .	Vacuum	2224/8423	. . . . .	Polychromatic or infrared lamp heating
2224/84091	. . . .	Under pressure	2224/84232	. . . . .	using an autocatalytic reaction, e.g. exothermic brazing
2224/84092	. . . . .	Atmospheric pressure	2224/84234	. . . .	using means for applying energy being within the device, e.g. integrated heater
2224/84093	. . . . .	Transient conditions, e.g. gas-flow	2224/84236	. . . .	using electro-static corona discharge
2224/84095	. . . .	Temperature settings	2224/84237	. . . .	using an electron beam
2224/84096	. . . . .	Transient conditions	2224/84238	. . . .	using electric resistance welding, i.e. ohmic heating
2224/84097	. . . . .	Heating			
2224/84098	. . . . .	Cooling			
2224/84099	. . . . .	Ambient temperature			
2224/841	. . .	the connector being supplied to the parts to be connected in the bonding apparatus			
2224/8411	. . .	involving protection against electrical discharge, e.g. removing electrostatic charge			
2224/8412	. . .	Aligning			



2224/8434	. . .	Bonding interfaces of the connector	2224/84476	. . . . .	Ruthenium [Ru] as principal constituent
2224/84345	. . . .	Shape, e.g. interlocking features	2224/84478	. . . . .	Iridium [Ir] as principal constituent
2224/84355	. . . .	having an external coating, e.g. protective bond-through coating	2224/84479	. . . . .	Niobium [Nb] as principal constituent
2224/84359	. . . .	Material	2224/8448	. . . . .	Molybdenum [Mo] as principal constituent
2224/8436	. . .	Bonding interfaces of the semiconductor or solid state body	2224/84481	. . . . .	Tantalum [Ta] as principal constituent
2224/84365	. . . .	Shape, e.g. interlocking features	2224/84483	. . . . .	Rhenium [Re] as principal constituent
2224/84375	. . . .	having an external coating, e.g. protective bond-through coating	2224/84484	. . . . .	Tungsten [W] as principal constituent
2224/84379	. . . .	Material	2224/84486	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/8438	. . .	Bonding interfaces outside the semiconductor or solid-state body	2224/84487	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/84385	. . . .	Shape, e.g. interlocking features	2224/84488	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/84395	. . . .	having an external coating, e.g. protective bond-through coating	2224/8449	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/84399	. . . .	Material	2224/84491	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/844	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2224/84493	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/844</a> - <a href="#">H01L 2224/84491</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/84401	. . . . .	the principal constituent melting at a temperature of less than 400°C	2224/84494	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/844</a> - <a href="#">H01L 2224/84491</a>
2224/84405	. . . . .	Gallium [Ga] as principal constituent	2224/84495	. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/844</a> - <a href="#">H01L 2224/84491</a>
2224/84409	. . . . .	Indium [In] as principal constituent	2224/84498	. . . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/84411	. . . . .	Tin [Sn] as principal constituent	2224/84499	. . . . .	Material of the matrix
2224/84413	. . . . .	Bismuth [Bi] as principal constituent	2224/845	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/84414	. . . . .	Thallium [Tl] as principal constituent	2224/84501	. . . . .	the principal constituent melting at a temperature of less than 400°C
2224/84416	. . . . .	Lead [Pb] as principal constituent	2224/84505	. . . . .	Gallium [Ga] as principal constituent
2224/84417	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/84509	. . . . .	Indium [In] as principal constituent
2224/84418	. . . . .	Zinc [Zn] as principal constituent	2224/84511	. . . . .	Tin [Sn] as principal constituent
2224/8442	. . . . .	Antimony [Sb] as principal constituent	2224/84513	. . . . .	Bismuth [Bi] as principal constituent
2224/84423	. . . . .	Magnesium [Mg] as principal constituent	2224/84514	. . . . .	Thallium [Tl] as principal constituent
2224/84424	. . . . .	Aluminium [Al] as principal constituent	2224/84516	. . . . .	Lead [Pb] as principal constituent
2224/84438	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/84517	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/84439	. . . . .	Silver [Ag] as principal constituent	2224/84518	. . . . .	Zinc [Zn] as principal constituent
2224/84444	. . . . .	Gold [Au] as principal constituent	2224/8452	. . . . .	Antimony [Sb] as principal constituent
2224/84447	. . . . .	Copper [Cu] as principal constituent			
2224/84449	. . . . .	Manganese [Mn] as principal constituent			
2224/84455	. . . . .	Nickel [Ni] as principal constituent			
2224/84457	. . . . .	Cobalt [Co] as principal constituent			
2224/8446	. . . . .	Iron [Fe] as principal constituent			
2224/84463	. . . . .	the principal constituent melting at a temperature of greater than 1550°C			
2224/84464	. . . . .	Palladium [Pd] as principal constituent			
2224/84466	. . . . .	Titanium [Ti] as principal constituent			
2224/84469	. . . . .	Platinum [Pt] as principal constituent			
2224/8447	. . . . .	Zirconium [Zr] as principal constituent			
2224/84471	. . . . .	Chromium [Cr] as principal constituent			
2224/84472	. . . . .	Vanadium [V] as principal constituent			
2224/84473	. . . . .	Rhodium [Rh] as principal constituent			



2224/84523	Magnesium [Mg] as principal constituent	2224/84591	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/84524	Aluminium [Al] as principal constituent	2224/84593	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/845</a> - <a href="#">H01L 2224/84591</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/84538	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/84594	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/845</a> - <a href="#">H01L 2224/84591</a>
2224/84539	Silver [Ag] as principal constituent	2224/84595	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/845</a> - <a href="#">H01L 2224/84591</a>
2224/84544	Gold [Au] as principal constituent	2224/84598	Fillers
2224/84547	Copper [Cu] as principal constituent	2224/84599	Base material
2224/84549	Manganese [Mn] as principal constituent	2224/846	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/84555	Nickel [Ni] as principal constituent	2224/84601	the principal constituent melting at a temperature of less than 400°C
2224/84557	Cobalt [Co] as principal constituent	2224/84605	Gallium [Ga] as principal constituent
2224/8456	Iron [Fe] as principal constituent	2224/84609	Indium [In] as principal constituent
2224/84563	the principal constituent melting at a temperature of greater than 1550°C	2224/84611	Tin [Sn] as principal constituent
2224/84564	Palladium [Pd] as principal constituent	2224/84613	Bismuth [Bi] as principal constituent
2224/84566	Titanium [Ti] as principal constituent	2224/84614	Thallium [Tl] as principal constituent
2224/84569	Platinum [Pt] as principal constituent	2224/84616	Lead [Pb] as principal constituent
2224/8457	Zirconium [Zr] as principal constituent	2224/84617	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/84571	Chromium [Cr] as principal constituent	2224/84618	Zinc [Zn] as principal constituent
2224/84572	Vanadium [V] as principal constituent	2224/8462	Antimony [Sb] as principal constituent
2224/84573	Rhodium [Rh] as principal constituent	2224/84623	Magnesium [Mg] as principal constituent
2224/84576	Ruthenium [Ru] as principal constituent	2224/84624	Aluminium [Al] as principal constituent
2224/84578	Iridium [Ir] as principal constituent	2224/84638	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/84579	Niobium [Nb] as principal constituent	2224/84639	Silver [Ag] as principal constituent
2224/8458	Molybdenum [Mo] as principal constituent	2224/84644	Gold [Au] as principal constituent
2224/84581	Tantalum [Ta] as principal constituent	2224/84647	Copper [Cu] as principal constituent
2224/84583	Rhenium [Re] as principal constituent	2224/84649	Manganese [Mn] as principal constituent
2224/84584	Tungsten [W] as principal constituent		
2224/84586	with a principal constituent of the material being a non metallic, non metalloid inorganic material		
2224/84587	Ceramics, e.g. crystalline carbides, nitrides or oxides		
2224/84588	Glasses, e.g. amorphous oxides, nitrides or fluorides		
2224/8459	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy		

2224/84655	Nickel [Ni] as principal constituent	2224/84695	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/846</a> - <a href="#">H01L 2224/84691</a>
2224/84657	Cobalt [Co] as principal constituent	2224/84698	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/8466	Iron [Fe] as principal constituent	2224/84699	Coating material
2224/84663	the principal constituent melting at a temperature of greater than 1550°C	2224/847	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2224/84664	Palladium [Pd] as principal constituent	2224/84701	the principal constituent melting at a temperature of less than 400°C
2224/84666	Titanium [Ti] as principal constituent	2224/84705	Gallium [Ga] as principal constituent
2224/84669	Platinum [Pt] as principal constituent	2224/84709	Indium [In] as principal constituent
2224/8467	Zirconium [Zr] as principal constituent	2224/84711	Tin [Sn] as principal constituent
2224/84671	Chromium [Cr] as principal constituent	2224/84713	Bismuth [Bi] as principal constituent
2224/84672	Vanadium [V] as principal constituent	2224/84714	Thallium [Tl] as principal constituent
2224/84673	Rhodium [Rh] as principal constituent	2224/84716	Lead [Pb] as principal constituent
2224/84676	Ruthenium [Ru] as principal constituent	2224/84717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/84678	Iridium [Ir] as principal constituent	2224/84718	Zinc [Zn] as principal constituent
2224/84679	Niobium [Nb] as principal constituent	2224/8472	Antimony [Sb] as principal constituent
2224/8468	Molybdenum [Mo] as principal constituent	2224/84723	Magnesium [Mg] as principal constituent
2224/84681	Tantalum [Ta] as principal constituent	2224/84724	Aluminium [Al] as principal constituent
2224/84683	Rhenium [Re] as principal constituent	2224/84738	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/84684	Tungsten [W] as principal constituent	2224/84739	Silver [Ag] as principal constituent
2224/84686	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/84744	Gold [Au] as principal constituent
2224/84687	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/84747	Copper [Cu] as principal constituent
2224/84688	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/84749	Manganese [Mn] as principal constituent
2224/8469	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/84755	Nickel [Ni] as principal constituent
2224/84691	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/84757	Cobalt [Co] as principal constituent
2224/84693	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/846</a> - <a href="#">H01L 2224/84691</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/8476	Iron [Fe] as principal constituent
2224/84694	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/846</a> - <a href="#">H01L 2224/84691</a>	2224/84763	the principal constituent melting at a temperature of greater than 1550°C

2224/84764	. . . . .	Palladium [Pd] as principal constituent	2224/84801	. . . .	Soldering or alloying
2224/84766	. . . . .	Titanium [Ti] as principal constituent	2224/84805	. . . . .	involving forming a eutectic alloy at the bonding interface
2224/84769	. . . . .	Platinum [Pt] as principal constituent	2224/8481	. . . . .	involving forming an intermetallic compound at the bonding interface
2224/8477	. . . . .	Zirconium [Zr] as principal constituent	2224/84815	. . . . .	Reflow soldering
2224/84771	. . . . .	Chromium [Cr] as principal constituent	2224/8482	. . . . .	Diffusion bonding
2224/84772	. . . . .	Vanadium [V] as principal constituent	2224/84825	. . . . .	Solid-liquid interdiffusion
2224/84773	. . . . .	Rhodium [Rh] as principal constituent	2224/8483	. . . . .	Solid-solid interdiffusion
2224/84776	. . . . .	Ruthenium [Ru] as principal constituent	2224/8484	. . . . .	Sintering
2224/84778	. . . . .	Iridium [Ir] as principal constituent	2224/8485	. . . . .	using a polymer adhesive, e.g. an adhesive based on silicone, epoxy, polyimide, polyester
2224/84779	. . . . .	Niobium [Nb] as principal constituent	2224/84855	. . . . .	Hardening the adhesive by curing, i.e. thermosetting
2224/8478	. . . . .	Molybdenum [Mo] as principal constituent	2224/84856	. . . . .	Pre-cured adhesive, i.e. B-stage adhesive
2224/84781	. . . . .	Tantalum [Ta] as principal constituent	2224/84859	. . . . .	Localised curing of parts of the connector
2224/84783	. . . . .	Rhenium [Re] as principal constituent	2224/84862	. . . . .	Heat curing
2224/84784	. . . . .	Tungsten [W] as principal constituent	2224/84865	. . . . .	Microwave curing
2224/84786	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/84868	. . . . .	Infrared [IR] curing
2224/84787	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides	2224/84871	. . . . .	Visible light curing
2224/84788	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides	2224/84874	. . . . .	Ultraviolet [UV] curing
2224/8479	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2224/84877	. . . . .	Moisture curing, i.e. curing by exposing to humidity, e.g. for silicones and polyurethanes
2224/84791	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2224/8488	. . . . .	Hardening the adhesive by cooling, e.g. for thermoplastics or hot-melt adhesives
2224/84793	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/847</a> - <a href="#">H01L 2224/84791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2224/84885	. . . . .	Combinations of two or more hardening methods provided for in at least two different groups from <a href="#">H01L 2224/84855</a> - <a href="#">H01L 2224/8488</a> , e.g. for hybrid thermoplastic-thermosetting adhesives
2224/84794	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/847</a> - <a href="#">H01L 2224/84791</a>	2224/8489	. . . . .	using an inorganic non metallic glass type adhesive, e.g. solder glass
2224/84795	. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/847</a> - <a href="#">H01L 2224/84791</a>	2224/84893	. . . . .	Anodic bonding, i.e. bonding by applying a voltage across the interface in order to induce ions migration leading to an irreversible chemical bond
2224/84798	. . . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/84895	. . . . .	Direct bonding, i.e. joining surfaces by means of intermolecular attracting interactions at their interfaces, e.g. covalent bonds, van der Waals forces
2224/84799	. . . . .	Shape or distribution of the fillers	2224/84897	. . . . .	between electrically conductive surfaces, e.g. copper-copper direct bonding, surface activated bonding
2224/848	. . . .	Bonding techniques	2224/84898	. . . . .	between electrically insulating surfaces, e.g. oxide or nitride layers
			2224/84899	. . . . .	Combinations of bonding methods provided for in at least two different groups from <a href="#">H01L 2224/848</a> - <a href="#">H01L 2224/84898</a>
			2224/849	. . . .	involving monitoring, e.g. feedback loop
			2224/84909	. . . .	Post-treatment of the connector or bonding area
			2224/8491	. . . . .	Cleaning, e.g. oxide removal step, desmearing
			2224/84911	. . . . .	Chemical cleaning, e.g. etching, flux
			2224/84912	. . . . .	Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic cleaning, dry ice blasting, gas-flow
			2224/84913	. . . . .	Plasma cleaning
			2224/84914	. . . . .	Thermal cleaning, e.g. using laser ablation or by electrostatic corona discharge

- 2224/84919 . . . . Combinations of two or more cleaning methods provided for in at least two different groups from [H01L 2224/8491](#) - [H01L 2224/84914](#)
- 2224/8492 . . . . Applying permanent coating, e.g. protective coating
- 2224/8493 . . . . Reshaping, e.g. for severing the strap, modifying the loop shape
- 2224/84931 . . . . by chemical means, e.g. etching
- 2224/84935 . . . . by heating means, e.g. reflowing
- 2224/84937 . . . . using a polychromatic heating lamp
- 2224/84939 . . . . using a laser
- 2224/84941 . . . . Induction heating, i.e. eddy currents
- 2224/84943 . . . . using a flame torch, e.g. hydrogen torch
- 2224/84945 . . . . using a corona discharge, e.g. electronic flame off [EFO]
- 2224/84947 . . . . by mechanical means, e.g. pressing, stamping
- 2224/84948 . . . . Thermal treatments, e.g. annealing, controlled cooling
- 2224/84951 . . . . Forming additional members, e.g. for reinforcing
- 2224/84986 . . . . Specific sequence of steps, e.g. repetition of manufacturing steps, time sequence
- 2224/85 . . . . using a wire connector
- 2224/85001 . . . . involving a temporary auxiliary member not forming part of the bonding apparatus, e.g. removable or sacrificial coating, film or substrate
- 2224/85002 . . . . being a removable or sacrificial coating
- 2224/85005 . . . . being a temporary or sacrificial substrate
- 2224/85007 . . . . involving a permanent auxiliary member being left in the finished device, e.g. aids for holding or protecting the wire connector during or after the bonding process
- 2224/85009 . . . . Pre-treatment of the connector or the bonding area
- 2224/8501 . . . . Cleaning, e.g. oxide removal step, desmearing
- 2224/85011 . . . . Chemical cleaning, e.g. etching, flux
- 2224/85012 . . . . Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic cleaning, dry ice blasting, gas-flow
- 2224/85013 . . . . Plasma cleaning
- 2224/85014 . . . . Thermal cleaning, e.g. decomposition, sublimation
- 2224/85016 . . . . using a laser
- 2224/85017 . . . . Electron beam cleaning
- 2224/85019 . . . . Combinations of two or more cleaning methods provided for in at least two different groups from [H01L 2224/8501](#) - [H01L 2224/85014](#)
- 2224/8502 . . . . Applying permanent coating, e.g. in-situ coating
- 2224/8503 . . . . Reshaping, e.g. forming the ball or the wedge of the wire connector
- 2224/85031 . . . . by chemical means, e.g. etching, anodisation
- 2224/85035 . . . . by heating means, e.g. "free-air-ball"
- 2224/85037 . . . . using a polychromatic heating lamp
- 2224/85039 . . . . using a laser
- 2224/85041 . . . . Induction heating, i.e. eddy currents
- 2224/85043 . . . . using a flame torch, e.g. hydrogen torch
- 2224/85045 . . . . using a corona discharge, e.g. electronic flame off [EFO]
- 2224/85047 . . . . by mechanical means, e.g. severing, pressing, stamping
- 2224/85048 . . . . Thermal treatments, e.g. annealing, controlled pre-heating or pre-cooling
- 2224/85051 . . . . Forming additional members, e.g. for "wedge-on-ball", "ball-on-wedge", "ball-on-ball" connections
- 2224/85053 . . . . Bonding environment
- 2224/85054 . . . . Composition of the atmosphere
- 2224/85055 . . . . being oxidating
- 2224/85065 . . . . being reducing
- 2224/85075 . . . . being inert
- 2224/85085 . . . . being a liquid, e.g. for fluidic self-assembly
- 2224/8509 . . . . Vacuum
- 2224/85091 . . . . Under pressure
- 2224/85092 . . . . Atmospheric pressure
- 2224/85093 . . . . Transient conditions, e.g. gas-flow
- 2224/85095 . . . . Temperature settings
- 2224/85096 . . . . Transient conditions
- 2224/85097 . . . . Heating
- 2224/85098 . . . . Cooling
- 2224/85099 . . . . Ambient temperature
- 2224/851 . . . . the connector being supplied to the parts to be connected in the bonding apparatus
- 2224/8511 . . . . involving protection against electrical discharge, e.g. removing electrostatic charge
- 2224/8512 . . . . Aligning
- 2224/85121 . . . . Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors
- 2224/85122 . . . . by detecting inherent features of, or outside, the semiconductor or solid-state body
- 2224/85123 . . . . Shape or position of the body
- 2224/85125 . . . . Bonding areas on the body
- 2224/85127 . . . . Bonding areas outside the body
- 2224/85129 . . . . Shape or position of the other item
- 2224/8513 . . . . using marks formed on the semiconductor or solid-state body
- 2224/85132 . . . . using marks formed outside the semiconductor or solid-state body, i.e. "off-chip"
- 2224/85136 . . . . involving guiding structures, e.g. spacers or supporting members
- 2224/85138 . . . . the guiding structures being at least partially left in the finished device
- 2224/85143 . . . . Passive alignment, i.e. self alignment, e.g. using surface energy, chemical reactions, thermal equilibrium
- 2224/85148 . . . . involving movement of a part of the bonding apparatus
- 2224/85149 . . . . being the lower part of the bonding apparatus, i.e. holding means for the bodies to be connected, e.g. XY table
- 2224/8515 . . . . Rotational movements
- 2224/8516 . . . . Translational movements
- 2224/85169 . . . . being the upper part of the bonding apparatus, i.e. bonding head, e.g. capillary or wedge
- 2224/8517 . . . . Rotational movements
- 2224/8518 . . . . Translational movements

2224/85181	. . . . .	connecting first on the semiconductor or solid-state body, i.e. on-chip, regular stitch	2224/85417	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C
2224/85186	. . . . .	connecting first outside the semiconductor or solid-state body, i.e. off-chip, reverse stitch	2224/85418	. . . . .	Zinc (Zn) as principal constituent
2224/85191	. . . . .	connecting first both on and outside the semiconductor or solid-state body, i.e. regular and reverse stitches	2224/8542	. . . . .	Antimony (Sb) as principal constituent
2224/85196	. . . . .	involving intermediate connecting steps before cutting the wire connector	2224/85423	. . . . .	Magnesium (Mg) as principal constituent
2224/852	. . .	Applying energy for connecting	2224/85424	. . . . .	Aluminium (Al) as principal constituent
2224/85201	. . . .	Compression bonding	2224/85438	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C
2224/85203	. . . . .	Thermocompression bonding	2224/85439	. . . . .	Silver (Ag) as principal constituent
2224/85205	. . . . .	Ultrasonic bonding	2224/85444	. . . . .	Gold (Au) as principal constituent
2224/85206	. . . . .	Direction of oscillation	2224/85447	. . . . .	Copper (Cu) as principal constituent
2224/85207	. . . . .	Thermosonic bonding	2224/85449	. . . . .	Manganese (Mn) as principal constituent
2224/8521	. . . .	with energy being in the form of electromagnetic radiation	2224/85455	. . . . .	Nickel (Ni) as principal constituent
2224/85212	. . . . .	Induction heating, i.e. eddy currents	2224/85457	. . . . .	Cobalt (Co) as principal constituent
2224/85214	. . . . .	using a laser	2224/8546	. . . . .	Iron (Fe) as principal constituent
2224/8523	. . . . .	Polychromatic or infrared lamp heating	2224/85463	. . . . .	the principal constituent melting at a temperature of greater than 1550°C
2224/85232	. . . .	using an autocatalytic reaction, e.g. exothermic brazing	2224/85464	. . . . .	Palladium (Pd) as principal constituent
2224/85234	. . . .	using means for applying energy being within the device, e.g. integrated heater	2224/85466	. . . . .	Titanium (Ti) as principal constituent
2224/85236	. . . .	using electro-static corona discharge	2224/85469	. . . . .	Platinum (Pt) as principal constituent
2224/85237	. . . .	using electron beam	2224/8547	. . . . .	Zirconium (Zr) as principal constituent
2224/85238	. . . .	using electric resistance welding, i.e. ohmic heating	2224/85471	. . . . .	Chromium (Cr) as principal constituent
2224/8534	. . .	Bonding interfaces of the connector	2224/85472	. . . . .	Vanadium (V) as principal constituent
2224/85345	. . . .	Shape, e.g. interlocking features	2224/85473	. . . . .	Rhodium (Rh) as principal constituent
2224/85355	. . . .	having an external coating, e.g. protective bond-through coating	2224/85476	. . . . .	Ruthenium (Ru) as principal constituent
2224/85359	. . . .	Material	2224/85478	. . . . .	Iridium (Ir) as principal constituent
2224/8536	. . .	Bonding interfaces of the semiconductor or solid state body	2224/85479	. . . . .	Niobium (Nb) as principal constituent
2224/85365	. . . .	Shape, e.g. interlocking features	2224/8548	. . . . .	Molybdenum (Mo) as principal constituent
2224/85375	. . . .	having an external coating, e.g. protective bond-through coating	2224/85481	. . . . .	Tantalum (Ta) as principal constituent
2224/85379	. . . .	Material	2224/85483	. . . . .	Rhenium (Re) as principal constituent
2224/8538	. . .	Bonding interfaces outside the semiconductor or solid-state body	2224/85484	. . . . .	Tungsten (W) as principal constituent
2224/85385	. . . .	Shape, e.g. interlocking features	2224/85486	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/85395	. . . .	having an external coating, e.g. protective bond-through coating	2224/85487	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/85399	. . . .	Material	2224/85488	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/854	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof	2224/8549	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/85401	. . . . .	the principal constituent melting at a temperature of less than 400°C	2224/85491	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/85405	. . . . .	Gallium (Ga) as principal constituent	2224/85493	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/854</a> - <a href="#">H01L 2224/85491</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/85409	. . . . .	Indium (In) as principal constituent	2224/85494	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/854</a> - <a href="#">H01L 2224/85491</a>
2224/85411	. . . . .	Tin (Sn) as principal constituent			
2224/85413	. . . . .	Bismuth (Bi) as principal constituent			
2224/85414	. . . . .	Thallium (Tl) as principal constituent			
2224/85416	. . . . .	Lead (Pb) as principal constituent			



2224/85495	. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/854</a> - <a href="#">H01L 2224/85491</a>	2224/8557	. . . . .	Zirconium (Zr) as principal constituent
2224/85498	. . . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2224/85571	. . . . .	Chromium (Cr) as principal constituent
2224/85499	. . . . .	Material of the matrix	2224/85572	. . . . .	Vanadium (V) as principal constituent
2224/855	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof	2224/85573	. . . . .	Rhodium (Rh) as principal constituent
2224/85501	. . . . .	the principal constituent melting at a temperature of less than 400°C	2224/85576	. . . . .	Ruthenium (Ru) as principal constituent
2224/85505	. . . . .	Gallium (Ga) as principal constituent	2224/85578	. . . . .	Iridium (Ir) as principal constituent
2224/85509	. . . . .	Indium (In) as principal constituent	2224/85579	. . . . .	Niobium (Nb) as principal constituent
2224/85511	. . . . .	Tin (Sn) as principal constituent	2224/8558	. . . . .	Molybdenum (Mo) as principal constituent
2224/85513	. . . . .	Bismuth (Bi) as principal constituent	2224/85581	. . . . .	Tantalum (Ta) as principal constituent
2224/85514	. . . . .	Thallium (Tl) as principal constituent	2224/85583	. . . . .	Rhenium (Re) as principal constituent
2224/85516	. . . . .	Lead (Pb) as principal constituent	2224/85584	. . . . .	Tungsten (W) as principal constituent
2224/85517	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/85586	. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/85518	. . . . .	Zinc (Zn) as principal constituent	2224/85587	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/8552	. . . . .	Antimony (Sb) as principal constituent	2224/85588	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/85523	. . . . .	Magnesium (Mg) as principal constituent	2224/8559	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/85524	. . . . .	Aluminium (Al) as principal constituent	2224/85591	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/85538	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/85593	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/855</a> - <a href="#">H01L 2224/85591</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/85539	. . . . .	Silver (Ag) as principal constituent	2224/85594	. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/855</a> - <a href="#">H01L 2224/85591</a>
2224/85544	. . . . .	Gold (Au) as principal constituent	2224/85595	. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/855</a> - <a href="#">H01L 2224/85591</a>
2224/85547	. . . . .	Copper (Cu) as principal constituent	2224/85598	. . . . .	Fillers
2224/85549	. . . . .	Manganese (Mn) as principal constituent	2224/85599	. . . . .	Base material
2224/85555	. . . . .	Nickel (Ni) as principal constituent	2224/856	. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof
2224/85557	. . . . .	Cobalt (Co) as principal constituent	2224/85601	. . . . .	the principal constituent melting at a temperature of less than 400°C
2224/8556	. . . . .	Iron (Fe) as principal constituent	2224/85605	. . . . .	Gallium (Ga) as principal constituent
2224/85563	. . . . .	the principal constituent melting at a temperature of greater than 1550°C	2224/85609	. . . . .	Indium (In) as principal constituent
2224/85564	. . . . .	Palladium (Pd) as principal constituent			
2224/85566	. . . . .	Titanium (Ti) as principal constituent			
2224/85569	. . . . .	Platinum (Pt) as principal constituent			



2224/85611	.. . . . .	Tin (Sn) as principal constituent	2224/85681	.. . . . .	Tantalum (Ta) as principal constituent
2224/85613	.. . . . .	Bismuth (Bi) as principal constituent	2224/85683	.. . . . .	Rhenium (Re) as principal constituent
2224/85614	.. . . . .	Thallium (Tl) as principal constituent	2224/85684	.. . . . .	Tungsten (W) as principal constituent
2224/85616	.. . . . .	Lead (Pb) as principal constituent	2224/85686	.. . . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2224/85617	.. . . . .	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/85687	.. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/85618	.. . . . .	Zinc (Zn) as principal constituent	2224/85688	.. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/8562	.. . . . .	Antimony (Sb) as principal constituent	2224/8569	.. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/85623	.. . . . .	Magnesium (Mg) as principal constituent	2224/85691	.. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/85624	.. . . . .	Aluminium (Al) as principal constituent	2224/85693	.. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/856</a> - <a href="#">H01L 2224/85691</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/85638	.. . . . .	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/85694	.. . . . .	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/856</a> - <a href="#">H01L 2224/85691</a>
2224/85639	.. . . . .	Silver (Ag) as principal constituent	2224/85695	.. . . . .	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/856</a> - <a href="#">H01L 2224/85691</a>
2224/85644	.. . . . .	Gold (Au) as principal constituent	2224/85698	.. . . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/85647	.. . . . .	Copper (Cu) as principal constituent	2224/85699	.. . . . .	Coating material
2224/85649	.. . . . .	Manganese (Mn) as principal constituent	2224/857	.. . . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te) and polonium (Po), and alloys thereof
2224/85655	.. . . . .	Nickel (Ni) as principal constituent	2224/85701	.. . . . .	the principal constituent melting at a temperature of less than 400°C
2224/85657	.. . . . .	Cobalt (Co) as principal constituent	2224/85705	.. . . . .	Gallium (Ga) as principal constituent
2224/8566	.. . . . .	Iron (Fe) as principal constituent	2224/85709	.. . . . .	Indium (In) as principal constituent
2224/85663	.. . . . .	the principal constituent melting at a temperature of greater than 1550°C	2224/85711	.. . . . .	Tin (Sn) as principal constituent
2224/85664	.. . . . .	Palladium (Pd) as principal constituent	2224/85713	.. . . . .	Bismuth (Bi) as principal constituent
2224/85666	.. . . . .	Titanium (Ti) as principal constituent	2224/85714	.. . . . .	Thallium (Tl) as principal constituent
2224/85669	.. . . . .	Platinum (Pt) as principal constituent	2224/85716	.. . . . .	Lead (Pb) as principal constituent
2224/8567	.. . . . .	Zirconium (Zr) as principal constituent			
2224/85671	.. . . . .	Chromium (Cr) as principal constituent			
2224/85672	.. . . . .	Vanadium (V) as principal constituent			
2224/85673	.. . . . .	Rhodium (Rh) as principal constituent			
2224/85676	.. . . . .	Ruthenium (Ru) as principal constituent			
2224/85678	.. . . . .	Iridium (Ir) as principal constituent			
2224/85679	.. . . . .	Niobium (Nb) as principal constituent			
2224/8568	.. . . . .	Molybdenum (Mo) as principal constituent			

2224/85717	the principal constituent melting at a temperature of greater than or equal to 400°C and less than 950°C	2224/85787	Ceramics, e.g. crystalline carbides, nitrides or oxides
2224/85718	Zinc (Zn) as principal constituent	2224/85788	Glasses, e.g. amorphous oxides, nitrides or fluorides
2224/8572	Antimony (Sb) as principal constituent	2224/8579	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2224/85723	Magnesium (Mg) as principal constituent	2224/85791	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2224/85724	Aluminium (Al) as principal constituent	2224/85793	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2224/857</a> - <a href="#">H01L 2224/85791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2224/85738	the principal constituent melting at a temperature of greater than or equal to 950°C and less than 1550°C	2224/85794	with a principal constituent of the material being a liquid not provided for in groups <a href="#">H01L 2224/857</a> - <a href="#">H01L 2224/85791</a>
2224/85739	Silver (Ag) as principal constituent	2224/85795	with a principal constituent of the material being a gas not provided for in groups <a href="#">H01L 2224/857</a> - <a href="#">H01L 2224/85791</a>
2224/85744	Gold (Au) as principal constituent	2224/85798	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2224/85747	Copper (Cu) as principal constituent	2224/85799	Shape or distribution of the fillers
2224/85749	Manganese (Mn) as principal constituent	2224/858	Bonding techniques
2224/85755	Nickel (Ni) as principal constituent	2224/85801	Soldering or alloying
2224/85757	Cobalt (Co) as principal constituent	2224/85805	involving forming a eutectic alloy at the bonding interface
2224/8576	Iron (Fe) as principal constituent	2224/8581	involving forming an intermetallic compound at the bonding interface
2224/85763	the principal constituent melting at a temperature of greater than 1550°C	2224/85815	Reflow soldering
2224/85764	Palladium (Pd) as principal constituent	2224/8582	Diffusion bonding
2224/85766	Titanium (Ti) as principal constituent	2224/85825	Solid-liquid interdiffusion
2224/85769	Platinum (Pt) as principal constituent	2224/8583	Solid-solid interdiffusion, e.g. "direct bonding"
2224/8577	Zirconium (Zr) as principal constituent	2224/8584	Sintering
2224/85771	Chromium (Cr) as principal constituent	2224/8585	using a polymer adhesive, e.g. an adhesive based on silicone, epoxy, polyimide, polyester
2224/85772	Vanadium (V) as principal constituent	2224/85855	Hardening the adhesive by curing, i.e. thermosetting
2224/85773	Rhodium (Rh) as principal constituent	2224/85856	Pre-cured adhesive, i.e. B-stage adhesive
2224/85776	Ruthenium (Ru) as principal constituent	2224/85859	Localised curing of parts of the connector
2224/85778	Iridium (Ir) as principal constituent	2224/85862	Heat curing
2224/85779	Niobium (Nb) as principal constituent	2224/85865	Microwave curing
2224/8578	Molybdenum (Mo) as principal constituent	2224/85868	Infrared [IR] curing
2224/85781	Tantalum (Ta) as principal constituent	2224/85871	Visible light curing
2224/85783	Rhenium (Re) as principal constituent	2224/85874	Ultraviolet [UV] curing
2224/85784	Tungsten (W) as principal constituent	2224/85877	Moisture curing, i.e. curing by exposing to humidity, e.g. for silicones and polyurethanes
2224/85786	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2224/8588	Hardening the adhesive by cooling, e.g. for thermoplastics or hot-melt adhesives

- 2224/85885 . . . . Combinations of two or more hardening methods provided for in at least two different groups from [H01L 2224/85855](#) - [H01L 2224/8588](#), e.g. for hybrid thermoplastic-thermosetting adhesives
- 2224/8589 . . . . using an inorganic non metallic glass type adhesive, e.g. solder glass
- 2224/85893 . . . . Anodic bonding, i.e. bonding by applying a voltage across the interface in order to induce ions migration leading to an irreversible chemical bond
- 2224/85895 . . . . Direct bonding, i.e. joining surfaces by means of intermolecular attracting interactions at their interfaces, e.g. covalent bonds, van der Waals forces
- 2224/85897 . . . . between electrically conductive surfaces, e.g. copper-copper direct bonding, surface activated bonding
- 2224/85898 . . . . between electrically insulating surfaces, e.g. oxide or nitride layers
- 2224/85899 . . . . Combinations of bonding methods provided for in at least two different groups from [H01L 2224/858](#) - [H01L 2224/85898](#)
- 2224/859 . . . . involving monitoring, e.g. feedback loop
- 2224/85909 . . . . Post-treatment of the connector or wire bonding area
- 2224/8591 . . . . Cleaning, e.g. oxide removal step, desmearing
- 2224/85911 . . . . Chemical cleaning, e.g. etching, flux
- 2224/85912 . . . . Mechanical cleaning, e.g. abrasion using hydro blasting, brushes, ultrasonic cleaning, dry ice blasting, gas-flow
- 2224/85913 . . . . Plasma cleaning
- 2224/85914 . . . . Thermal cleaning, e.g. using laser ablation or by electrostatic corona discharge
- 2224/85916 . . . . using a laser
- 2224/85917 . . . . Electron beam cleaning
- 2224/85919 . . . . Combinations of two or more cleaning methods provided for in at least two different groups from [H01L 2224/8591](#) - [H01L 2224/85914](#)
- 2224/8592 . . . . Applying permanent coating, e.g. protective coating
- 2224/8593 . . . . Reshaping, e.g. for severing the wire, modifying the wedge or ball or the loop shape
- 2224/85931 . . . . by chemical means, e.g. etching
- 2224/85935 . . . . by heating means, e.g. reflowing
- 2224/85937 . . . . using a polychromatic heating lamp
- 2224/85939 . . . . using a laser
- 2224/85941 . . . . Induction heating, i.e. eddy currents
- 2224/85943 . . . . using a flame torch, e.g. hydrogen torch
- 2224/85945 . . . . using a corona discharge, e.g. electronic flame off [EFO]
- 2224/85947 . . . . by mechanical means, e.g. "pull-and-cut", pressing, stamping
- 2224/85948 . . . . Thermal treatments, e.g. annealing, controlled cooling
- 2224/85951 . . . . Forming additional members, e.g. for reinforcing
- 2224/85986 . . . . Specific sequence of steps, e.g. repetition of manufacturing steps, time sequence
- 2224/86 . . . . using tape automated bonding [TAB]
- 2224/86001 . . . . involving a temporary auxiliary member not forming part of the bonding apparatus
- 2224/86002 . . . . being a removable or sacrificial coating
- 2224/86005 . . . . being a temporary or sacrificial substrate
- 2224/86007 . . . . involving a permanent auxiliary member being left in the finished device, e.g. aids for holding or protecting the TAB connector during or after the bonding process
- 2224/86009 . . . . Pre-treatment of the connector or the bonding area
- 2224/8601 . . . . Cleaning, e.g. oxide removal step, desmearing
- 2224/8603 . . . . Reshaping
- 2224/86031 . . . . by chemical means, e.g. etching, anodisation
- 2224/86035 . . . . by heating
- 2224/86039 . . . . using a laser
- 2224/86045 . . . . using a corona discharge, e.g. electronic flame off [EFO]
- 2224/86047 . . . . by mechanical means, e.g. severing, pressing, stamping
- 2224/86048 . . . . Thermal treatment, e.g. annealing, controlled pre-heating or pre-cooling
- 2224/86051 . . . . Forming additional members
- 2224/86053 . . . . Bonding environment
- 2224/86054 . . . . Composition of the atmosphere
- 2224/86085 . . . . being a liquid, e.g. fluidic self-assembly
- 2224/8609 . . . . Vacuum
- 2224/86091 . . . . Under pressure
- 2224/86095 . . . . Temperature settings
- 2224/86096 . . . . Transient conditions
- 2224/86097 . . . . Heating
- 2224/86098 . . . . Cooling
- 2224/86099 . . . . Ambient temperature
- 2224/861 . . . . the connector being supplied to the parts to be connected in the bonding apparatus
- 2224/8611 . . . . involving protection against electrical discharge, e.g. removing electrostatic charge
- 2224/8612 . . . . Aligning
- 2224/86121 . . . . Active alignment, i.e. by apparatus steering, e.g. optical alignment using marks or sensors
- 2224/86122 . . . . by detecting inherent features of, or outside, the semiconductor or solid-state body
- 2224/8613 . . . . using marks formed on the semiconductor or solid-state body
- 2224/86132 . . . . using marks formed outside the semiconductor or solid-state body, i.e. "off-chip"
- 2224/86136 . . . . involving guiding structures, e.g. spacers or supporting members
- 2224/86138 . . . . the guiding structures being at least partially left in the finished device
- 2224/86143 . . . . Passive alignment, i.e. self alignment, e.g. using surface energy, chemical reactions, thermal equilibrium
- 2224/86148 . . . . involving movement of a part of the bonding apparatus
- 2224/86149 . . . . being the lower part of the bonding apparatus, i.e. holding means for the bodies to be connected, e.g. XY table
- 2224/8615 . . . . Rotational movements
- 2224/8616 . . . . Translational movements

2224/86169	. . . . .	being the upper part of the bonding apparatus, e.g. nozzle	2224/86856	. . . . .	Pre-cured adhesive, i.e. B-stage adhesive
2224/8617	. . . . .	Rotational movement	2224/86859	. . . . .	Localised curing of parts of the connector
2224/8618	. . . . .	Translational movements	2224/86862	. . . . .	Heat curing
2224/86181	. . . . .	connecting first on the semiconductor or solid-state body, i.e. on-chip,	2224/86865	. . . . .	Microwave curing
2224/86186	. . . . .	connecting first outside the semiconductor or solid-state body, i.e. off-chip	2224/86868	. . . . .	Infrared [IR] curing
2224/86191	. . . . .	connecting first both on and outside the semiconductor or solid-state body	2224/86871	. . . . .	Visible light curing
2224/862	. . . . .	Applying energy for connecting	2224/86874	. . . . .	Ultraviolet [UV] curing
2224/86201	. . . . .	Compression bonding	2224/86877	. . . . .	Moisture curing, i.e. curing by exposing to humidity, e.g. for silicones and polyurethanes
2224/86203	. . . . .	Thermo-compression bonding	2224/8688	. . . . .	Hardening the adhesive by cooling, e.g. for thermoplastics or hot-melt adhesives
2224/86205	. . . . .	Ultrasonic bonding	2224/86885	. . . . .	Combinations of two or more hardening methods provided for in at least two different groups selected from <a href="#">H01L 2224/86855</a> - <a href="#">H01L 2224/8688</a> , e.g. hybrid thermoplastic-thermosetting adhesives
2224/86207	. . . . .	Thermosonic bonding	2224/8689	. . . . .	using an inorganic non metallic glass type adhesive, e.g. solder glass
2224/8621	. . . . .	with energy being in the form of electromagnetic radiation	2224/86893	. . . . .	Anodic bonding, i.e. bonding by applying a voltage across the interface in order to induce ions migration leading to an irreversible chemical bond
2224/86212	. . . . .	Induction heating, i.e. eddy currents	2224/86895	. . . . .	Direct bonding, i.e. joining surfaces by means of intermolecular attracting interactions at their interfaces, e.g. covalent bonds, van der Waals forces
2224/86214	. . . . .	using a laser	2224/86896	. . . . .	between electrically conductive surfaces, e.g. copper-copper direct bonding, surface activated bonding
2224/8623	. . . . .	Polychromatic or infrared lamp heating	2224/86897	. . . . .	between electrically insulating surfaces, e.g. oxide or nitride layers
2224/86232	. . . . .	using an autocatalytic reaction, e.g. exothermic brazing	2224/86899	. . . . .	Combinations of bonding methods provided for in at least two different groups from <a href="#">H01L 2224/868</a> - <a href="#">H01L 2224/86897</a>
2224/86234	. . . . .	using means for applying energy being within the device, e.g. integrated heater	2224/869	. . . . .	involving monitoring, e.g. feedback loop
2224/86236	. . . . .	using electro-static corona discharge	2224/86909	. . . . .	Post-treatment of the connector or the bonding area
2224/86237	. . . . .	using electron beam	2224/8691	. . . . .	Cleaning, e.g. oxide removal step, desmearing
2224/86238	. . . . .	using electric resistance welding, i.e. ohmic heating	2224/8693	. . . . .	Reshaping
2224/8634	. . . . .	Bonding interfaces of the connector	2224/86931	. . . . .	by chemical means, e.g. etching, anodisation
2224/86345	. . . . .	Shape, e.g. interlocking features	2224/86935	. . . . .	by heating means
2224/86355	. . . . .	having an external coating, e.g. protective bond-through coating	2224/86939	. . . . .	using a laser
2224/86359	. . . . .	Material	2224/86945	. . . . .	using a corona discharge, e.g. electronic flame off [EFO]
2224/8636	. . . . .	Bonding interfaces of the semiconductor or solid state body	2224/86947	. . . . .	by mechanical means, e.g. severing, pressing, stamping
2224/86365	. . . . .	Shape, e.g. interlocking features	2224/86948	. . . . .	Thermal treatments, e.g. annealing, controlled pre-heating or pre-cooling
2224/86375	. . . . .	having an external coating, e.g. protective bond-through coating	2224/86951	. . . . .	Forming additional members
2224/86379	. . . . .	Material	2224/86986	. . . . .	Specific sequence of steps, e.g. repetition of manufacturing steps, time sequence
2224/8638	. . . . .	Bonding interfaces outside the semiconductor or solid-state body	2224/89	. . . . .	using at least one connector not provided for in any of the groups <a href="#">H01L 2224/81</a> - <a href="#">H01L 2224/86</a>
2224/86385	. . . . .	Shape, e.g. interlocking features	2224/90	. . . . .	Methods for connecting semiconductor or solid state bodies using means for bonding not being attached to, or not being formed on, the body surface to be connected, e.g. pressure contacts using springs or clips
2224/86395	. . . . .	having an external coating, e.g. protective bond-through coating			
2224/86399	. . . . .	Material			
2224/868	. . . . .	Bonding techniques			
2224/86801	. . . . .	Soldering or alloying			
2224/86805	. . . . .	involving forming a eutectic alloy at the bonding interface			
2224/8681	. . . . .	involving forming an intermetallic compound at the bonding interface			
2224/86815	. . . . .	Reflow soldering			
2224/8682	. . . . .	Diffusion bonding			
2224/86825	. . . . .	Solid-liquid interdiffusion			
2224/8683	. . . . .	Solid-solid interdiffusion			
2224/8684	. . . . .	Sintering			
2224/8685	. . . . .	using a polymer adhesive, e.g. an adhesive based on silicone, epoxy, polyimide, polyester			
2224/86855	. . . . .	Hardening the adhesive by curing, i.e. thermosetting			

- 2224/91 . . . . . Methods for connecting semiconductor or solid state bodies including different methods provided for in two or more of groups [H01L 2224/80](#) - [H01L 2224/90](#)
- 2224/92 . . . . . Specific sequence of method steps
- 2224/9201 . . . . . Forming connectors during the connecting process, e.g. in-situ formation of bumps
- 2224/9202 . . . . . Forming additional connectors after the connecting process
- 2224/9205 . . . . . Intermediate bonding steps, i.e. partial connection of the semiconductor or solid-state body during the connecting process
- 2224/921 . . . . . Connecting a surface with connectors of different types
- 2224/9211 . . . . . Parallel connecting processes
- 2224/9212 . . . . . Sequential connecting processes
- 2224/92122 . . . . . the first connecting process involving a bump connector
- 2224/92124 . . . . . the second connecting process involving a build-up interconnect
- 2224/92125 . . . . . the second connecting process involving a layer connector
- 2224/92127 . . . . . the second connecting process involving a wire connector
- 2224/92132 . . . . . the first connecting process involving a build-up interconnect
- 2224/92133 . . . . . the second connecting process involving a bump connector
- 2224/92135 . . . . . the second connecting process involving a layer connector
- 2224/92136 . . . . . the second connecting process involving a strap connector
- 2224/92137 . . . . . the second connecting process involving a wire connector
- 2224/92138 . . . . . the second connecting process involving a TAB connector
- 2224/92142 . . . . . the first connecting process involving a layer connector
- 2224/92143 . . . . . the second connecting process involving a bump connector
- 2224/92144 . . . . . the second connecting process involving a build-up interconnect
- 2224/92147 . . . . . the second connecting process involving a wire connector
- 2224/92148 . . . . . the second connecting process involving a TAB connector
- 2224/92152 . . . . . the first connecting process involving a strap connector
- 2224/92153 . . . . . the second connecting process involving a bump connector
- 2224/92155 . . . . . the second connecting process involving a layer connector
- 2224/92157 . . . . . the second connecting process involving a wire connector
- 2224/92158 . . . . . the second connecting process involving a TAB connector
- 2224/92162 . . . . . the first connecting process involving a wire connector
- 2224/92163 . . . . . the second connecting process involving a bump connector
- 2224/92164 . . . . . the second connecting process involving a build-up interconnect
- 2224/92165 . . . . . the second connecting process involving a layer connector
- 2224/92166 . . . . . the second connecting process involving a strap connector
- 2224/92168 . . . . . the second connecting process involving a TAB connector
- 2224/92172 . . . . . the first connecting process involving a TAB connector
- 2224/92173 . . . . . the second connecting process involving a bump connector
- 2224/92174 . . . . . the second connecting process involving a build-up interconnect
- 2224/92175 . . . . . the second connecting process involving a layer connector
- 2224/92176 . . . . . the second connecting process involving a strap connector
- 2224/92177 . . . . . the second connecting process involving a wire connector
- 2224/922 . . . . . Connecting different surfaces of the semiconductor or solid-state body with connectors of different types
- 2224/9221 . . . . . Parallel connecting processes
- 2224/9222 . . . . . Sequential connecting processes
- 2224/92222 . . . . . the first connecting process involving a bump connector
- 2224/92224 . . . . . the second connecting process involving a build-up interconnect
- 2224/92225 . . . . . the second connecting process involving a layer connector
- 2224/92226 . . . . . the second connecting process involving a strap connector
- 2224/92227 . . . . . the second connecting process involving a wire connector
- 2224/92228 . . . . . the second connecting process involving a TAB connector
- 2224/92242 . . . . . the first connecting process involving a layer connector
- 2224/92244 . . . . . the second connecting process involving a build-up interconnect
- 2224/92246 . . . . . the second connecting process involving a strap connector
- 2224/92247 . . . . . the second connecting process involving a wire connector
- 2224/92248 . . . . . the second connecting process involving a TAB connector
- 2224/92252 . . . . . the first connecting process involving a strap connector
- 2224/92253 . . . . . the second connecting process involving a bump connector
- 2224/92255 . . . . . the second connecting process involving a layer connector
- 2224/93 . . . . . Batch processes
- 2224/94 . . . . . at wafer-level, i.e. with connecting carried out on a wafer comprising a plurality of undiced individual devices
- 2224/95 . . . . . at chip-level, i.e. with connecting carried out on a plurality of singulated devices, i.e. on diced chips
- 2224/95001 . . . . . involving a temporary auxiliary member not forming part of the bonding apparatus, e.g. removable or sacrificial coating, film or substrate
- 2224/95053 . . . . . Bonding environment
- 2224/95085 . . . . . being a liquid, e.g. for fluidic self-assembly
- 2224/95091 . . . . . Under pressure
- 2224/95092 . . . . . Atmospheric pressure, e.g. dry self-assembly



2224/95093	. . . . .	Transient conditions, e.g. assisted by a gas flow or a liquid flow	2225/06524	. . . . .	Electrical connections formed on device or on substrate, e.g. a deposited or grown layer
2224/951	. . .	Supplying the plurality of semiconductor or solid-state bodies	2225/06527	. . . . .	Special adaptation of electrical connections, e.g. rewiring, engineering changes, pressure contacts, layout
2224/95101	. . . . .	in a liquid medium	2225/06531	. . . . .	Non-galvanic coupling, e.g. capacitive coupling
2224/95102	. . . . .	being a colloidal droplet	2225/06534	. . . . .	Optical coupling
2224/95111	. . . . .	using a rack or rail	2225/06537	. . . . .	Electromagnetic shielding
2224/95115	. . . . .	using a roll-to-roll transfer technique	2225/06541	. . . . .	Conductive via connections through the device, e.g. vertical interconnects, through silicon via [TSV]
2224/9512	. . .	Aligning the plurality of semiconductor or solid-state bodies	2225/06544	. . . . .	Design considerations for via connections, e.g. geometry or layout
2224/95121	. . . . .	Active alignment, i.e. by apparatus steering	2225/06548	. . . . .	Conductive via connections through the substrate, container, or encapsulation
2224/95122	. . . . .	by applying vibration	2225/06551	. . . . .	Conductive connections on the side of the device
2224/95123	. . . . .	by applying a pressurised fluid flow, e.g. liquid or gas flow	2225/06555	. . . . .	Geometry of the stack, e.g. form of the devices, geometry to facilitate stacking
2224/95133	. . . . .	by applying an electromagnetic field	2225/06558	. . . . .	the devices having passive surfaces facing each other, i.e. in a back-to-back arrangement
2224/95134	. . . . .	Electrowetting, i.e. by changing the surface energy of a droplet	2225/06562	. . . . .	at least one device in the stack being rotated or offset
2224/95136	. . . . .	involving guiding structures, e.g. shape matching, spacers or supporting members	2225/06565	. . . . .	the devices having the same size and there being no auxiliary carrier between the devices
2224/95143	. . . . .	Passive alignment, i.e. self alignment, e.g. using surface energy, chemical reactions, thermal equilibrium	2225/06568	. . . . .	the devices decreasing in size, e.g. pyramidal stack
2224/95144	. . . . .	Magnetic alignment, i.e. using permanent magnetic parts in the semiconductor or solid-state body	2225/06572	. . . . .	Auxiliary carrier between devices, the carrier having an electrical connection structure
2224/95145	. . . . .	Electrostatic alignment, i.e. polarity alignment with Coulomb charges	2225/06575	. . . . .	Auxiliary carrier between devices, the carrier having no electrical connection structure
2224/95146	. . . . .	by surface tension	2225/06579	. . . . .	TAB carriers; beam leads
2224/95147	. . . . .	by molecular lock-key, e.g. by DNA	2225/06582	. . . . .	Housing for the assembly, e.g. chip scale package [CSP]
2224/95148	. . . . .	involving movement of a part of the bonding apparatus	2225/06586	. . . . .	Housing with external bump or bump-like connectors
2224/96	. . .	the devices being encapsulated in a common layer, e.g. neo-wafer or pseudo-wafer, said common layer being separable into individual assemblies after connecting	2225/06589	. . . . .	Thermal management, e.g. cooling
2224/97	. . .	the devices being connected to a common substrate, e.g. interposer, said common substrate being separable into individual assemblies after connecting	2225/06593	. . . . .	Mounting aids permanently on device; arrangements for alignment
2224/98	. .	Methods for disconnecting semiconductor or solid-state bodies	2225/06596	. . . . .	Structural arrangements for testing
<b>2225/00</b>	<b>Details relating to assemblies covered by the group <a href="#">H01L 25/00</a> but not provided for in its subgroups</b>				
2225/03	. . .	All the devices being of a type provided for in the same main group of the same subclass of class <a href="#">H10</a> , e.g. assemblies of rectifier diodes	2225/10	. .	the devices having separate containers
2225/04	. .	the devices not having separate containers	2225/1005	. . .	the devices being integrated devices of class <a href="#">H10</a>
2225/065	. . .	All the devices being of a type provided for in the same main group of the same subclass of class <a href="#">H10</a>	2225/1011	. . . . .	the containers being in a stacked arrangement
2225/06503	. . . . .	Stacked arrangements of devices	2225/1017	. . . . .	the lowermost container comprising a device support
2225/06506	. . . . .	Wire or wire-like electrical connections between devices	2225/1023	. . . . .	the support being an insulating substrate
2225/0651	. . . . .	Wire or wire-like electrical connections from device to substrate	2225/1029	. . . . .	the support being a lead frame
2225/06513	. . . . .	Bump or bump-like direct electrical connections between devices, e.g. flip-chip connection, solder bumps	2225/1035	. . . . .	the device being entirely enclosed by the support, e.g. high-density interconnect [HDI]
2225/06517	. . . . .	Bump or bump-like direct electrical connections from device to substrate	2225/1041	. . . . .	Special adaptations for top connections of the lowermost container, e.g. redistribution layer, integral interposer
2225/0652	. . . . .	Bump or bump-like direct electrical connections from substrate to substrate	2225/1047	. . . . .	Details of electrical connections between containers
			2225/1052	. . . . .	Wire or wire-like electrical connections



2225/1058	. . . . .	Bump or bump-like electrical connections, e.g. balls, pillars, posts	2924/01024	. .	Chromium [Cr]			
2225/1064	. . . . .	Electrical connections provided on a side surface of one or more of the containers	2924/01025	. .	Manganese [Mn]			
2225/107	. . . . .	Indirect electrical connections, e.g. via an interposer, a flexible substrate, using TAB	2924/01026	. .	Iron [Fe]			
2225/1076	. . . . .	Shape of the containers	2924/01027	. .	Cobalt [Co]			
2225/1082	. . . . .	for improving alignment between containers, e.g. interlocking features	2924/01028	. .	Nickel [Ni]			
2225/1088	. . . . .	Arrangements to limit the height of the assembly	2924/01029	. .	Copper [Cu]			
2225/1094	. . . . .	Thermal management, e.g. cooling	2924/0103	. .	Zinc [Zn]			
2924/00	<b>Indexing scheme for arrangements or methods for connecting or disconnecting semiconductor or solid-state bodies as covered by <a href="#">H01L 24/00</a></b>					2924/01031	. .	Gallium [Ga]
2924/0001	. .	Technical content checked by a classifier	2924/01032	. .	Germanium [Ge]			
	<b>NOTE</b>					2924/01033	. .	Arsenic [As]
		Codes <a href="#">H01L 2924/0001</a> - <a href="#">H01L 2924/0002</a> are used to describe the status of reclassification; they do not relate to technical features as such	2924/01034	. .	Selenium [Se]			
2924/00011	. .	Not relevant to the scope of the group, the symbol of which is combined with the symbol of this group	2924/01035	. .	Bromine [Br]			
2924/00012	. .	Relevant to the scope of the group, the symbol of which is combined with the symbol of this group	2924/01036	. .	Krypton [Kr]			
2924/00013	. .	Fully indexed content	2924/01037	. .	Rubidium [Rb]			
2924/00014	. .	the subject-matter covered by the group, the symbol of which is combined with the symbol of this group, being disclosed without further technical details	2924/01038	. .	Strontium [Sr]			
2924/00015	. .	the subject-matter covered by the group, the symbol of which is combined with the symbol of this group, being disclosed as prior art	2924/01039	. .	Yttrium [Y]			
2924/0002	. .	Not covered by any one of groups <a href="#">H01L 24/00</a> , <a href="#">H01L 24/00</a> and <a href="#">H01L 2224/00</a>	2924/0104	. .	Zirconium [Zr]			
2924/01	. .	Chemical elements	2924/01041	. .	Niobium [Nb]			
2924/01001	. .	Hydrogen [H]	2924/01042	. .	Molybdenum [Mo]			
2924/01002	. .	Helium [He]	2924/01043	. .	Technetium [Tc]			
2924/01003	. .	Lithium [Li]	2924/01044	. .	Ruthenium [Ru]			
2924/01004	. .	Beryllium [Be]	2924/01045	. .	Rhodium [Rh]			
2924/01005	. .	Boron [B]	2924/01046	. .	Palladium [Pd]			
2924/01006	. .	Carbon [C]	2924/01047	. .	Silver [Ag]			
2924/01007	. .	Nitrogen [N]	2924/01048	. .	Cadmium [Cd]			
2924/01008	. .	Oxygen [O]	2924/01049	. .	Indium [In]			
2924/01009	. .	Fluorine [F]	2924/0105	. .	Tin [Sn]			
2924/0101	. .	Neon [Ne]	2924/01051	. .	Antimony [Sb]			
2924/01011	. .	Sodium [Na]	2924/01052	. .	Tellurium [Te]			
2924/01012	. .	Magnesium [Mg]	2924/01053	. .	Iodine [I]			
2924/01013	. .	Aluminum [Al]	2924/01054	. .	Xenon [Xe]			
2924/01014	. .	Silicon [Si]	2924/01055	. .	Cesium [Cs]			
2924/01015	. .	Phosphorus [P]	2924/01056	. .	Barium [Ba]			
2924/01016	. .	Sulfur [S]	2924/01057	. .	Lanthanum [La]			
2924/01017	. .	Chlorine [Cl]	2924/01058	. .	Cerium [Ce]			
2924/01018	. .	Argon [Ar]	2924/01059	. .	Praseodymium [Pr]			
2924/01019	. .	Potassium [K]	2924/0106	. .	Neodymium [Nd]			
2924/0102	. .	Calcium [Ca]	2924/01061	. .	Promethium [Pm]			
2924/01021	. .	Scandium [Sc]	2924/01062	. .	Samarium [Sm]			
2924/01022	. .	Titanium [Ti]	2924/01063	. .	Europium [Eu]			
2924/01023	. .	Vanadium [V]	2924/01064	. .	Gadolinium [Gd]			
			2924/01065	. .	Terbium [Tb]			
			2924/01066	. .	Dysprosium [Dy]			
			2924/01067	. .	Holmium [Ho]			
			2924/01068	. .	Erbium [Er]			
			2924/01069	. .	Thulium [Tm]			
			2924/0107	. .	Ytterbium [Yb]			
			2924/01071	. .	Lutetium [Lu]			
			2924/01072	. .	Hafnium [Hf]			
			2924/01073	. .	Tantalum [Ta]			
			2924/01074	. .	Tungsten [W]			
			2924/01075	. .	Rhenium [Re]			
			2924/01076	. .	Osmium [Os]			
			2924/01077	. .	Iridium [Ir]			
			2924/01078	. .	Platinum [Pt]			
			2924/01079	. .	Gold [Au]			
			2924/0108	. .	Mercury [Hg]			
			2924/01081	. .	Thallium [Tl]			
			2924/01082	. .	Lead [Pb]			
			2924/01083	. .	Bismuth [Bi]			
			2924/01084	. .	Polonium [Po]			

2924/01085	. . Astatine [At]	2924/0421	. . 1st Group
2924/01086	. . Radon [Rn]	2924/0422	. . 2nd Group
2924/01087	. . Francium [Fr]	2924/0423	. . 3rd Group
2924/01088	. . Radium [Ra]	2924/0424	. . 4th Group
2924/01089	. . Actinium [Ac]	2924/0425	. . 5th Group
2924/0109	. . Thorium [Th]	2924/0426	. . 6th Group
2924/01091	. . Protactinium [Pa]	2924/0427	. . 7th Group
2924/01092	. . Uranium [U]	2924/0428	. . 8th Group
2924/01093	. . Neptunium [Np]	2924/0429	. . 9th Group
2924/01094	. . Plutonium [Pu]	2924/044	. . 10th Group
2924/011	. Groups of the periodic table	2924/0441	. . 11th Group
2924/01101	. . Alkali metals	2924/0442	. . 12th Group
2924/01102	. . Alkali earth metals	2924/0443	. . 13th Group
2924/01103	. . Transition metals	2924/0444	. . 14th Group
2924/01104	. . Refractory metals	2924/0445	. . Lanthanides
2924/01105	. . Rare earth metals	2924/0446	. . Actinides
2924/01106	. . . Lanthanides, i.e. Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu	2924/0449	. . being a combination of two or more materials provided in the groups <a href="#">H01L 2924/0421</a> - <a href="#">H01L 2924/0446</a>
2924/01107	. . . Actinides, i.e. Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No, Lr	2924/04491	. . having a monocrystalline microstructure
2924/01108	. . Noble metals	2924/04492	. . having a polycrystalline microstructure
2924/01109	. . Metalloids or Semi-metals	2924/04494	. . having an amorphous microstructure, i.e. glass
2924/0111	. . Chalcogens	2924/045	. Carbides composed of metals from groups of the periodic table
2924/01111	. . Halogens	2924/0451	. . 1st Group
2924/01112	. . Noble gases	2924/0452	. . 2nd Group
2924/012	. Semiconductor purity grades	2924/0453	. . 3rd Group
2924/01201	. . 1N purity grades, i.e. 90%	2924/0454	. . 4th Group
2924/01202	. . 2N purity grades, i.e. 99%	2924/04541	. . . TiC
2924/01203	. . 3N purity grades, i.e. 99.9%	2924/0455	. . 5th Group
2924/01204	. . 4N purity grades, i.e. 99.99%	2924/0456	. . 6th Group
2924/01205	. . 5N purity grades, i.e. 99.999%	2924/04563	. . . WC
2924/01206	. . 6N purity grades, i.e. 99.9999%	2924/0457	. . 7th Group
2924/01207	. . 7N purity grades, i.e. 99.99999%	2924/0458	. . 8th Group
2924/01208	. . 8N purity grades, i.e. 99.999999%	2924/0459	. . 9th Group
2924/013	. Alloys	2924/046	. . 10th Group
2924/0132	. . Binary Alloys	2924/0461	. . 11th Group
2924/01321	. . . Isomorphous Alloys	2924/0462	. . 12th Group
2924/01322	. . . Eutectic Alloys, i.e. obtained by a liquid transforming into two solid phases	2924/0463	. . 13th Group
2924/01323	. . . Hypoeutectic alloys i.e. with compositions lying to the left of the eutectic point	2924/0464	. . 14th Group
2924/01324	. . . Hypereutectic alloys i.e. with compositions lying to the right of the eutectic point	2924/04642	. . . SiC
2924/01325	. . . Peritectic Alloys, i.e. obtained by a liquid and a solid transforming into a new and different solid phase	2924/0465	. . Lanthanides
2924/01326	. . . Monotectics, i.e. obtained by a liquid transforming into a solid and a new and different liquid phase	2924/0466	. . Actinides
2924/01327	. . . Intermediate phases, i.e. intermetallics compounds	2924/0469	. . being a combination of two or more materials provided in the groups <a href="#">H01L 2924/0451</a> - <a href="#">H01L 2924/0466</a>
2924/0133	. . Ternary Alloys	2924/04691	. . having a monocrystalline microstructure
2924/0134	. . Quaternary Alloys	2924/04692	. . having a polycrystalline microstructure
2924/0135	. . Quinary Alloys	2924/04694	. . having an amorphous microstructure, i.e. glass
2924/014	. . Solder alloys	2924/047	. Silicides composed of metals from groups of the periodic table
2924/01402	. . Invar, i.e. single-phase alloy of around 36% nickel and 64% iron	2924/0471	. . 1st Group
2924/01403	. . Kovar, i.e. FeNiCo alloys	2924/0472	. . 2nd Group
2924/01404	. . Alloy 42, i.e. FeNi42	2924/0473	. . 3rd Group
2924/01405	. . Inovco, i.e. Fe-33Ni-4.5Co	2924/0474	. . 4th Group
2924/042	. Borides composed of metals from groups of the periodic table	2924/0475	. . 5th Group
		2924/0476	. . 6th Group
		2924/0477	. . 7th Group
		2924/0478	. . 8th Group
		2924/0479	. . 9th Group
		2924/048	. . 10th Group
		2924/0481	. . 11th Group

2924/0482	. . 12th Group	2924/05294	. . having an amorphous microstructure, i.e. glass
2924/0483	. . 13th Group	2924/053	. Oxides composed of metals from groups of the periodic table
2924/0484	. . 14th Group	2924/0531	. . 1st Group
2924/0485	. . Lanthanides	2924/0532	. . 2nd Group
2924/0486	. . Actinides	2924/0533	. . 3rd Group
2924/0489	. . being a combination of two or more materials provided in the groups <a href="#">H01L 2924/0471</a> - <a href="#">H01L 2924/0486</a>	2924/0534	. . 4th Group
2924/04891	. . having a monocrystalline microstructure	2924/05341	. . . TiO <sub>2</sub>
2924/04892	. . having a polycrystalline microstructure	2924/05342	. . . ZrO <sub>2</sub>
2924/04894	. . having an amorphous microstructure, i.e. glass	2924/0535	. . 5th Group
2924/049	. Nitrides composed of metals from groups of the periodic table	2924/0536	. . 6th Group
2924/0491	. . 1st Group	2924/0537	. . 7th Group
2924/0492	. . 2nd Group	2924/0538	. . 8th Group
2924/0493	. . 3rd Group	2924/05381	. . . FeOx
2924/0494	. . 4th Group	2924/0539	. . 9th Group
2924/04941	. . . TiN	2924/054	. . 10th Group
2924/0495	. . 5th Group	2924/0541	. . 11th Group
2924/04953	. . . TaN	2924/0542	. . 12th Group
2924/0496	. . 6th Group	2924/0543	. . 13th Group
2924/0497	. . 7th Group	2924/05432	. . . Al <sub>2</sub> O <sub>3</sub>
2924/0498	. . 8th Group	2924/0544	. . 14th Group
2924/0499	. . 9th Group	2924/05442	. . . SiO <sub>2</sub>
2924/05	. . 10th Group	2924/0545	. . Lanthanides
2924/0501	. . 11th Group	2924/0546	. . Actinides
2924/0502	. . 12th Group	2924/0549	. . being a combination of two or more materials provided in the groups <a href="#">H01L 2924/0531</a> - <a href="#">H01L 2924/0546</a>
2924/0503	. . 13th Group	2924/05491	. . having a monocrystalline microstructure
2924/05032	. . . AlN	2924/05492	. . having a polycrystalline microstructure
2924/0504	. . 14th Group	2924/05494	. . having an amorphous microstructure, i.e. glass
2924/05042	. . . Si <sub>3</sub> N <sub>4</sub>	2924/055	. Chalcogenides other than oxygen i.e. sulfides, selenides and tellurides composed of metals from groups of the periodic table
2924/0505	. . Lanthanides	2924/0551	. . 1st Group
2924/0506	. . Actinides	2924/0552	. . 2nd Group
2924/0509	. . being a combination of two or more materials provided in the groups <a href="#">H01L 2924/0491</a> - <a href="#">H01L 2924/0506</a>	2924/0553	. . 3rd Group
2924/05091	. . having a monocrystalline microstructure	2924/0554	. . 4th Group
2924/05092	. . having a polycrystalline microstructure	2924/0555	. . 5th Group
2924/05094	. . having an amorphous microstructure, i.e. glass	2924/0556	. . 6th Group
2924/051	. Phosphides composed of metals from groups of the periodic table	2924/0557	. . 7th Group
2924/0511	. . 1st Group	2924/0558	. . 8th Group
2924/0512	. . 2nd Group	2924/0559	. . 9th Group
2924/0513	. . 3rd Group	2924/056	. . 10th Group
2924/0514	. . 4th Group	2924/0561	. . 11th Group
2924/0515	. . 5th Group	2924/0562	. . 12th Group
2924/0516	. . 6th Group	2924/0563	. . 13th Group
2924/0517	. . 7th Group	2924/0564	. . 14th Group
2924/0518	. . 8th Group	2924/0565	. . Lanthanides
2924/0519	. . 9th Group	2924/0566	. . Actinides
2924/052	. . 10th Group	2924/0569	. . being a combination of two or more materials provided in the groups <a href="#">H01L 2924/0551</a> - <a href="#">H01L 2924/0566</a>
2924/0521	. . 11th Group	2924/05691	. . having a monocrystalline microstructure
2924/0522	. . 12th Group	2924/05692	. . having a polycrystalline microstructure
2924/0523	. . 13th Group	2924/05694	. . having an amorphous microstructure, i.e. glass
2924/0524	. . 14th Group	2924/057	. Halides composed of metals from groups of the periodic table
2924/0525	. . Lanthanides	2924/0571	. . 1st Group
2924/0526	. . Actinides	2924/0572	. . 2nd Group
2924/0529	. . being a combination of two or more materials provided in the groups <a href="#">H01L 2924/0511</a> - <a href="#">H01L 2924/0526</a>	2924/0573	. . 3rd Group
2924/05291	. . having a monocrystalline microstructure	2924/0574	. . 4th Group
2924/05292	. . having a polycrystalline microstructure	2924/0575	. . 5th Group

2924/0576	. . 6th Group	2924/096	. . Cermets, i.e. composite material composed of ceramic and metallic materials
2924/0577	. . 7th Group	2924/097	. . Glass-ceramics, e.g. devitrified glass
2924/0578	. . 8th Group	2924/09701	. . . Low temperature co-fired ceramic [LTCC]
2924/0579	. . 9th Group	2924/10	. Details of semiconductor or other solid state devices to be connected
2924/058	. . 10th Group	2924/1011	. . Structure
2924/0581	. . 11th Group	2924/1015	. . Shape
2924/0582	. . 12th Group	2924/10155	. . . being other than a cuboid
2924/0583	. . 13th Group	2924/10156	. . . . at the periphery
2924/0584	. . 14th Group	2924/10157	. . . . at the active surface
2924/0585	. . Lanthanides	2924/10158	. . . . at the passive surface
2924/0586	. . Actinides	2924/1016	. . . being a cuboid
2924/0589	. . being a combination of two or more materials provided in the groups <a href="#">H01L 2924/0571</a> - <a href="#">H01L 2924/0586</a>	2924/10161	. . . . with a rectangular active surface
2924/05891	. . having a monocrystalline microstructure	2924/10162	. . . . with a square active surface
2924/05892	. . having a polycrystalline microstructure	2924/1017	. . . being a sphere
2924/05894	. . having an amorphous microstructure, i.e. glass	2924/102	. . Material of the semiconductor or solid state bodies
2924/059	. Being combinations of any of the materials from the groups <a href="#">H01L 2924/042</a> - <a href="#">H01L 2924/0584</a> , e.g. oxynitrides	2924/1025	. . . Semiconducting materials
2924/05991	. . having a monocrystalline microstructure	2924/10251	. . . . Elemental semiconductors, i.e. Group IV
2924/05992	. . having a polycrystalline microstructure	2924/10252	. . . . . Germanium [Ge]
2924/05994	. . having an amorphous microstructure, i.e. glass	2924/10253	. . . . . Silicon [Si]
2924/06	. Polymers	2924/10254	. . . . . Diamond [C]
2924/061	. . Polyolefin polymer	2924/1026	. . . . Compound semiconductors
2924/0615	. . Styrenic polymer	2924/1027	. . . . . IV
2924/062	. . Halogenated polymer	2924/10271	. . . . . Silicon-germanium [SiGe]
2924/0625	. . Polyvinyl alcohol	2924/10272	. . . . . Silicon Carbide [SiC]
2924/063	. . Polyvinyl acetate	2924/1032	. . . . . III-V
2924/0635	. . Acrylic polymer	2924/10321	. . . . . Aluminium antimonide [AlSb]
2924/064	. . Graft polymer	2924/10322	. . . . . Aluminium arsenide [AlAs]
2924/0645	. . Block copolymer	2924/10323	. . . . . Aluminium nitride [AlN]
2924/065	. . ABS	2924/10324	. . . . . Aluminium phosphide [AlP]
2924/0655	. . Polyacetal	2924/10325	. . . . . Boron nitride [BN], e.g. cubic, hexagonal, nanotube
2924/066	. . Phenolic resin	2924/10326	. . . . . Boron phosphide [BP]
2924/0665	. . Epoxy resin	2924/10327	. . . . . Boron arsenide [BAs, B <sub>12</sub> As <sub>2</sub> ]
2924/067	. . Polyphenylene	2924/10328	. . . . . Gallium antimonide [GaSb]
2924/0675	. . Polyester	2924/10329	. . . . . Gallium arsenide [GaAs]
2924/068	. . Polycarbonate	2924/1033	. . . . . Gallium nitride [GaN]
2924/0685	. . Polyether	2924/10331	. . . . . Gallium phosphide [GaP]
2924/069	. . Polyurethane	2924/10332	. . . . . Indium antimonide [InSb]
2924/0695	. . Polyamide	2924/10333	. . . . . Indium arsenide [InAs]
2924/07	. . Polyamine or polyimide	2924/10334	. . . . . Indium nitride [InN]
2924/07001	. . . Polyamine	2924/10335	. . . . . Indium phosphide [InP]
2924/07025	. . . Polyimide	2924/10336	. . . . . Aluminium gallium arsenide [AlGaAs]
2924/0705	. . Sulfur containing polymer	2924/10337	. . . . . Indium gallium arsenide [InGaAs]
2924/0715	. . Polysiloxane	2924/10338	. . . . . Indium gallium phosphide [InGaP]
2924/078	. . Adhesive characteristics other than chemical	2924/10339	. . . . . Aluminium indium arsenide [AlInAs]
2924/07802	. . . not being an ohmic electrical conductor	2924/1034	. . . . . Aluminium indium antimonide [AlInSb]
2924/0781	. . . being an ohmic electrical conductor	2924/10341	. . . . . Gallium arsenide nitride [GaAsN]
2924/07811	. . . . Extrinsic, i.e. with electrical conductive fillers	2924/10342	. . . . . Gallium arsenide phosphide [GaAsP]
2924/07812	. . . . Intrinsic, e.g. polyaniline [PANI]	2924/10343	. . . . . Gallium arsenide antimonide [GaAsSb]
2924/0782	. . . being pressure sensitive	2924/10344	. . . . . Aluminium gallium nitride [AlGaN]
2924/095	. with a principal constituent of the material being a combination of two or more materials provided in the groups <a href="#">H01L 2924/013</a> - <a href="#">H01L 2924/0715</a>	2924/10345	. . . . . Aluminium gallium phosphide [AlGaP]
2924/0951	. . Glass epoxy laminates	2924/10346	. . . . . Indium gallium nitride [InGaN]
2924/09511	. . . FR-4	2924/10347	. . . . . Indium arsenide antimonide [InAsSb]
2924/09512	. . . FR-5	2924/10348	. . . . . Indium gallium antimonide [InGaSb]
2924/09522	. . . G10	2924/10349	. . . . . Aluminium gallium indium phosphide [AlGaInP]
2924/09523	. . . G11	2924/1035	. . . . . Aluminium gallium arsenide phosphide [AlGaInP]

2924/10351	. . . . .	Indium gallium arsenide phosphide [InGaAsP]	2924/10676	. . . . .	Bismuth trioxide [Bi <sub>2</sub> O <sub>3</sub> ]
2924/10352	. . . . .	Indium gallium arsenide antimonide [InGaAsSb]	2924/10677	. . . . .	Tin dioxide [SnO <sub>2</sub> ]
2924/10353	. . . . .	Indium arsenide antimonide phosphide [InAsSbP]	2924/10678	. . . . .	Barium titanate [BaTiO <sub>3</sub> ]
2924/10354	. . . . .	Aluminium indium arsenide phosphide [AlInAsP]	2924/10679	. . . . .	Strontium titanate [SrTiO <sub>3</sub> ]
2924/10355	. . . . .	Aluminium gallium arsenide nitride [AlGaAsN]	2924/1068	. . . . .	Lithium niobate [LiNbO <sub>3</sub> ]
2924/10356	. . . . .	Indium gallium arsenide nitride [InGaAsN]	2924/10681	. . . . .	Lanthanum copper oxide [La <sub>2</sub> CuO <sub>4</sub> ]
2924/10357	. . . . .	Indium aluminium arsenide nitride [InAlAsN]	2924/1072	. . . . .	Layered
2924/10358	. . . . .	Gallium arsenide antimonide nitride [GaAsSbN]	2924/10721	. . . . .	Lead(II)iodide [PbI <sub>2</sub> ]
2924/10359	. . . . .	Gallium indium nitride arsenide antimonide [GaInNAsSb]	2924/10722	. . . . .	Molybdenum disulfide [MoS <sub>2</sub> ]
2924/1036	. . . . .	Gallium indium arsenide antimonide phosphide [GaInAsSbP]	2924/10723	. . . . .	Gallium selenide [GaSe]
2924/1037	. . . . .	II-VI	2924/10724	. . . . .	Tin sulfide [SnS]
2924/10371	. . . . .	Cadmium selenide [CdSe]	2924/10725	. . . . .	Bismuth sulfide [Bi <sub>2</sub> S <sub>3</sub> ]
2924/10372	. . . . .	Cadmium sulfide [CdS]	2924/1077	. . . . .	Magnetic diluted [DMS]
2924/10373	. . . . .	Cadmium telluride [CdTe]	2924/10771	. . . . .	Gallium manganese arsenide [GaMnAs]
2924/10375	. . . . .	Zinc selenide [ZnSe]	2924/10772	. . . . .	Indium manganese arsenide [InMnAs]
2924/10376	. . . . .	Zinc sulfide [ZnS]	2924/10773	. . . . .	Cadmium manganese telluride [CdMnTe]
2924/10377	. . . . .	Zinc telluride [ZnTe]	2924/10774	. . . . .	Lead manganese telluride [PbMnTe]
2924/10378	. . . . .	Cadmium zinc telluride, i.e. CZT [CdZnTe]	2924/10775	. . . . .	Lanthanum calcium manganate [La <sub>0.7</sub> Ca <sub>0.3</sub> MnO <sub>3</sub> ]
2924/10379	. . . . .	Mercury cadmium telluride [HgZnTe]	2924/10776	. . . . .	Iron(II)oxide [FeO]
2924/1038	. . . . .	Mercury zinc telluride [HgZnSe]	2924/10777	. . . . .	Nickel(II)oxide [NiO]
2924/10381	. . . . .	Mercury zinc selenide [HgZnSe]	2924/10778	. . . . .	Europium(II)oxide [EuO]
2924/1042	. . . . .	I-VII	2924/10779	. . . . .	Europium(II)sulfide [EuS]
2924/10421	. . . . .	Cuprous chloride [CuCl]	2924/1078	. . . . .	Chromium(III)bromide [CrBr <sub>3</sub> ]
2924/1047	. . . . .	I-VI	2924/1082	. . . . .	Other
2924/10471	. . . . .	Copper sulfide [CuS]	2924/10821	. . . . .	Copper indium gallium selenide, CIGS [CuInGa]Se <sub>2</sub>
2924/1052	. . . . .	IV-VI	2924/10822	. . . . .	Copper zinc tin sulfide, CZTS [Cu <sub>2</sub> ZnSnS <sub>4</sub> ]
2924/10521	. . . . .	Lead selenide [PbSe]	2924/10823	. . . . .	Copper indium selenide, CIS [CuInSe <sub>2</sub> ]
2924/10522	. . . . .	Lead(II)sulfide [PbS]	2924/10824	. . . . .	Silver gallium sulfide [AgGaS <sub>2</sub> ]
2924/10523	. . . . .	Lead telluride [PbTe]	2924/10825	. . . . .	Zinc silicon phosphide [ZnSiP <sub>2</sub> ]
2924/10524	. . . . .	Tin sulfide [SnS, SnS <sub>2</sub> ]	2924/10826	. . . . .	Arsenic selenide [As <sub>2</sub> S <sub>3</sub> ]
2924/10525	. . . . .	Tin telluride [SnTe]	2924/10827	. . . . .	Platinum silicide [PtSi]
2924/10526	. . . . .	Lead tin telluride [PbSnTe]	2924/10828	. . . . .	Bismuth(III)iodide [BiI <sub>3</sub> ]
2924/10527	. . . . .	Thallium tin telluride [Tl <sub>2</sub> SnTe <sub>3</sub> ]	2924/10829	. . . . .	Mercury(II)iodide [HgI <sub>2</sub> ]
2924/10528	. . . . .	Thallium germanium telluride [Tl <sub>2</sub> GeTe <sub>3</sub> ]	2924/1083	. . . . .	Thallium(I)bromide [TlBr]
2924/1057	. . . . .	V-VI	2924/10831	. . . . .	Selenium [Se]
2924/10571	. . . . .	Bismuth telluride [Bi <sub>2</sub> Te <sub>3</sub> ]	2924/10832	. . . . .	Silver sulfide [Ag <sub>2</sub> S]
2924/1062	. . . . .	II-V	2924/10833	. . . . .	Iron disulfide [FeS <sub>2</sub> ]
2924/10621	. . . . .	Cadmium phosphide [Cd <sub>3</sub> P <sub>2</sub> ]	2924/11	. . . . .	Device type
2924/10622	. . . . .	Cadmium arsenide [Cd <sub>3</sub> As <sub>2</sub> ]	2924/12	. . . . .	Passive devices, e.g. 2 terminal devices
2924/10623	. . . . .	Cadmium antimonide [Cd <sub>3</sub> Sb <sub>2</sub> ]	2924/1203	. . . . .	Rectifying Diode
2924/10624	. . . . .	Zinc phosphide [Zn <sub>3</sub> P <sub>2</sub> ]	2924/12031	. . . . .	PIN diode
2924/10625	. . . . .	Zinc arsenide [Zn <sub>3</sub> As <sub>2</sub> ]	2924/12032	. . . . .	Schottky diode
2924/10626	. . . . .	Zinc antimonide [Zn <sub>3</sub> Sb <sub>2</sub> ]	2924/12033	. . . . .	Gunn diode
2924/1067	. . . . .	Oxide	2924/12034	. . . . .	Varactor
2924/10671	. . . . .	Titanium dioxide, anatase, rutile, brookite [TiO <sub>2</sub> ]	2924/12035	. . . . .	Zener diode
2924/10672	. . . . .	Copper(I)oxide [Cu <sub>2</sub> O]	2924/12036	. . . . .	PN diode
2924/10673	. . . . .	Copper(II)oxide [CuO]	2924/12037	. . . . .	Cat's whisker diode
2924/10674	. . . . .	Uranium dioxide [UO <sub>2</sub> ]	2924/12038	. . . . .	Point contact
2924/10675	. . . . .	Uranium trioxide [UO <sub>3</sub> ]	2924/1204	. . . . .	Optical Diode
			2924/12041	. . . . .	LED
			2924/12042	. . . . .	LASER
			2924/12043	. . . . .	Photo diode
			2924/12044	. . . . .	OLED
			2924/1205	. . . . .	Capacitor
			2924/1206	. . . . .	Inductor
			2924/1207	. . . . .	Resistor
			2924/13	. . . . .	Discrete devices, e.g. 3 terminal devices
			2924/1301	. . . . .	Thyristor

2924/13011	. . . . .	Anode Gate Thyristor [AGT]	2924/13067	. . . . .	FinFET, source/drain region shapes fins on the silicon surface
2924/13013	. . . . .	Bidirectional Control Thyristor [BCT]	2924/13068	. . . . .	Fast-reverse epitaxial diode field-effect transistor [FREDFET]
2924/13014	. . . . .	Breakover Diode [BOD]	2924/13069	. . . . .	Thin film transistor [TFT]
2924/13015	. . . . .	DIAC - Bidirectional trigger device	2924/1307	. . . . .	Organic Field-Effect Transistor [OFET]
2924/13016	. . . . .	Dynistor - Unidirectional switching device	2924/13071	. . . . .	Ballistic transistor
2924/13017	. . . . .	Shockley diode - Unidirectional trigger and switching device	2924/13072	. . . . .	Sensor FET
2924/13018	. . . . .	SIDAC - Bidirectional switching device	2924/13073	. . . . .	ion-sensitive field-effect transistor [ISFET]
2924/13019	. . . . .	Trisil, SIDACtor - Bidirectional protection devices	2924/13074	. . . . .	Electrolyte-oxide-semiconductor field effect transistor [EOSFET], e.g. Neurochip
2924/1302	. . . . .	GTO - Gate Turn-Off thyristor	2924/13075	. . . . .	Deoxyribonucleic acid field-effect transistor [DNAFET]
2924/13021	. . . . .	DB-GTO - Distributed Buffer Gate Turn-Off thyristor	2924/13076	. . . . .	DEPFET
2924/13022	. . . . .	MA-GTO - Modified Anode Gate Turn-Off thyristor	2924/13078	. . . . .	Unijunction transistors
2924/13023	. . . . .	IGCT - Integrated Gate Commutated Thyristor	2924/13079	. . . . .	Single-electron transistors [SET]
2924/13024	. . . . .	LASCR - Light Activated SCR, or LTT - Light triggered thyristor	2924/1308	. . . . .	Nanofluidic transistor
2924/13025	. . . . .	Light Activated Semiconducting Switch [LASS]	2924/13081	. . . . .	Multigate devices
2924/13026	. . . . .	MCT - MOSFET Controlled Thyristor - It contains two additional FET structures for on/off control	2924/13082	. . . . .	Tetrode transistor
2924/13027	. . . . .	BRT - Base Resistance Controlled Thyristor	2924/13083	. . . . .	Pentode transistor
2924/13028	. . . . .	RCT - Reverse Conducting Thyristor	2924/13084	. . . . .	Trigate transistor
2924/13029	. . . . .	PUT or PUJT - Programmable Unijunction Transistor - A thyristor with gate on n-type layer near to the anode used as a functional replacement for unijunction transistor	2924/13085	. . . . .	Dual gate FETs
2924/1303	. . . . .	SCS - Silicon Controlled Switch or Thyristor Tetrode - A thyristor with both cathode and anode gates	2924/13086	. . . . .	Junctionless Nanowire Transistor [JNT]
2924/13032	. . . . .	SITh - Static Induction Thyristor, or FCTh - Field Controlled Thyristor - containing a gate structure that can shut down anode current flow	2924/13087	. . . . .	Vertical-Slit Field-Effect Transistor [VeSFET]
2924/13033	. . . . .	TRIAC - Triode for Alternating Current - A bidirectional switching device containing two thyristor structures with common gate contact	2924/13088	. . . . .	Graphene Nanoribbon Field-Effect Transistor [GNRFET]
2924/13034	. . . . .	Silicon Controlled Rectifier [SCR]	2924/13089	. . . . .	Nanoparticle Organic Memory Field-Effect Transistor [NOMFET]
2924/13035	. . . . .	Asymmetrical SCR [ASCR]	2924/1309	. . . . .	Modulation-Doped Field Effect Transistor [MODFET]
2924/1304	. . . . .	Transistor	2924/13091	. . . . .	Metal-Oxide-Semiconductor Field-Effect Transistor [MOSFET]
2924/1305	. . . . .	Bipolar Junction Transistor [BJT]	2924/13092	. . . . .	Dual Gate Metal-Oxide-Semiconductor Field-Effect Transistor [DGMOSFET]
2924/13051	. . . . .	Heterojunction bipolar transistor [HBT]	2924/14	. . . . .	Integrated circuits
2924/13052	. . . . .	Schottky transistor	2924/141	. . . . .	Analog devices
2924/13053	. . . . .	Avalanche transistor	2924/142	. . . . .	HF devices
2924/13054	. . . . .	Darlington transistor	2924/1421	. . . . .	RF devices
2924/13055	. . . . .	Insulated gate bipolar transistor [IGBT]	2924/14211	. . . . .	Voltage-controlled oscillator [VCO]
2924/13056	. . . . .	Photo transistor	2924/14215	. . . . .	Low-noise amplifier [LNA]
2924/1306	. . . . .	Field-effect transistor [FET]	2924/1422	. . . . .	Mixer
2924/13061	. . . . .	Carbon nanotube field-effect transistor [CNFET]	2924/14221	. . . . .	Electronic mixer
2924/13062	. . . . .	Junction field-effect transistor [JFET]	2924/14222	. . . . .	Frequency mixer
2924/13063	. . . . .	Metal-Semiconductor Field-Effect Transistor [MESFET]	2924/1423	. . . . .	Monolithic Microwave Integrated Circuit [MMIC]
2924/13064	. . . . .	High Electron Mobility Transistor [HEMT, HFET [heterostructure FET], MODFET]	2924/1424	. . . . .	Operational amplifier
2924/13066	. . . . .	Inverted-T field effect transistor [ITFET]	2924/1425	. . . . .	Converter
			2924/14251	. . . . .	Frequency converter
			2924/14252	. . . . .	Voltage converter
			2924/14253	. . . . .	Digital-to-analog converter [DAC]
			2924/1426	. . . . .	Driver
			2924/1427	. . . . .	Voltage regulator [VR]
			2924/143	. . . . .	Digital devices
			2924/1431	. . . . .	Logic devices
			2924/1432	. . . . .	Central processing unit [CPU]
			2924/1433	. . . . .	Application-specific integrated circuit [ASIC]
			2924/14335	. . . . .	Digital signal processor [DSP]
			2924/1434	. . . . .	Memory



2924/1435	. . . . .	Random access memory [RAM]	2924/153	. . .	Connection portion
2924/1436	. . . . .	Dynamic random-access memory [DRAM]	2924/1531	. . . .	the connection portion being formed only on the surface of the substrate opposite to the die mounting surface
2924/14361	. . . . .	Synchronous dynamic random access memory [SDRAM]	2924/15311	. . . . .	being a ball array, e.g. BGA
2924/14362	. . . . .	RAS Only Refresh [ROR]	2924/15312	. . . . .	being a pin array, e.g. PGA
2924/14363	. . . . .	CAS before RAS refresh [CBR]	2924/15313	. . . . .	being a land array, e.g. LGA
2924/14364	. . . . .	Multibank DRAM [MDRAM]	2924/1532	. . . . .	the connection portion being formed on the die mounting surface of the substrate
2924/14365	. . . . .	Video DRAM [VRAM]	2924/15321	. . . . .	being a ball array, e.g. BGA
2924/14366	. . . . .	Window DRAM [WRAM]	2924/15322	. . . . .	being a pin array, e.g. PGA
2924/14367	. . . . .	Fast page mode DRAM [FPM DRAM]	2924/15323	. . . . .	being a land array, e.g. LGA
2924/14368	. . . . .	Extended data out DRAM [EDO DRAM]	2924/1533	. . . . .	the connection portion being formed both on the die mounting surface of the substrate and outside the die mounting surface of the substrate
2924/14369	. . . . .	Burst EDO DRAM [BEDO DRAM]	2924/15331	. . . . .	being a ball array, e.g. BGA
2924/1437	. . . . .	Static random-access memory [SRAM]	2924/15332	. . . . .	being a pin array, e.g. PGA
2924/1438	. . . . .	Flash memory	2924/15333	. . . . .	being a land array, e.g. LGA
2924/1441	. . . . .	Ferroelectric RAM [FeRAM or FRAM]	2924/156	. . .	Material
2924/1442	. . . . .	Synchronous graphics RAM [SGRAM]	2924/157	. . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2924/1443	. . . . .	Non-volatile random-access memory [NVRAM]	2924/15701	. . . . .	the principal constituent melting at a temperature of less than 400 C
2924/1444	. . . . .	PBRAM	2924/15717	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400 C and less than 950 C
2924/145	. . . . .	Read-only memory [ROM]	2924/15724	. . . . .	Aluminium [Al] as principal constituent
2924/1451	. . . . .	EPRAM	2924/15738	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950 C and less than 1550 C
2924/14511	. . . . .	EEPROM	2924/15747	. . . . .	Copper [Cu] as principal constituent
2924/1453	. . . . .	PROM	2924/1576	. . . . .	Iron [Fe] as principal constituent
2924/146	. .	Mixed devices	2924/15763	. . . . .	the principal constituent melting at a temperature of greater than 1550 C
2924/1461	. . .	MEMS	2924/15786	. . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2924/15	. .	Details of package parts other than the semiconductor or other solid state devices to be connected	2924/15787	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
2924/151	. .	Die mounting substrate	2924/15788	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
2924/1511	. . .	Structure	2924/1579	. . . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2924/1515	. . .	Shape	2924/15791	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2924/15151	. . . .	the die mounting substrate comprising an aperture, e.g. for underfilling, outgassing, window type wire connections	2924/15793	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2924/157</a> - <a href="#">H01L 2924/15791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2924/15153	. . . .	the die mounting substrate comprising a recess for hosting the device	2924/15798	. . . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2924/15155	. . . . .	the shape of the recess being other than a cuboid	2924/161	. . .	Cap
2924/15156	. . . . .	Side view	2924/1611	. . .	Structure
2924/15157	. . . . .	Top view	2924/1615	. . .	Shape
2924/15158	. . . .	the die mounting substrate being other than a cuboid			
2924/15159	. . . . .	Side view			
2924/15162	. . . . .	Top view			
2924/15165	. . . .	Monolayer substrate			
2924/1517	. . . .	Multilayer substrate			
2924/15172	. . . . .	Fan-out arrangement of the internal vias			
2924/15173	. . . . .	in a single layer of the multilayer substrate			
2924/15174	. . . . .	in different layers of the multilayer substrate			
2924/15182	. . . . .	Fan-in arrangement of the internal vias			
2924/15183	. . . . .	in a single layer of the multilayer substrate			
2924/15184	. . . . .	in different layers of the multilayer substrate			
2924/15192	. . . .	Resurf arrangement of the internal vias			
2924/152	. . .	Disposition			

2924/16151	. . . .	Cap comprising an aperture, e.g. for pressure control, encapsulation	2924/16586	. . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2924/16152	. . . .	Cap comprising a cavity for hosting the device, e.g. U-shaped cap	2924/16587	. . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
2924/16153	. . . .	Cap enclosing a plurality of side-by-side cavities [e.g. E-shaped cap]	2924/16588	. . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
2924/1616	. . . .	Cavity shape	2924/1659	. . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2924/1617	. . . .	Cavity coating	2924/16593	. . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2924/157</a> - <a href="#">H01L 2924/15791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2924/16171	. . . .	Material	2924/16598	. . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2924/16172	. . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2924/166	. . .	Material
2924/16173	. . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2924/167	. . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof
2924/16174	. . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides	2924/16701	. . . .	the principal constituent melting at a temperature of less than 400 C
2924/16175	. . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides	2924/16717	. . . .	the principal constituent melting at a temperature of greater than or equal to 400 C and less than 950 C
2924/16176	. . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2924/16724	. . . .	Aluminium [Al] as principal constituent
2924/16177	. . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2924/16738	. . . .	the principal constituent melting at a temperature of greater than or equal to 950 C and less than 1550 C
2924/16178	. . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2924/157</a> - <a href="#">H01L 2924/15791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2924/16747	. . . .	Copper [Cu] as principal constituent
2924/16179	. . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2924/1676	. . . .	Iron [Fe] as principal constituent
2924/1619	. . . .	Cavity coating shape	2924/16763	. . . .	the principal constituent melting at a temperature of greater than 1550 C
2924/16195	. . . .	Flat cap [not enclosing an internal cavity]	2924/16786	. . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material
2924/16196	. . . .	Cap forming a cavity, e.g. being a curved metal foil	2924/16787	. . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides
2924/162	. . .	Disposition	2924/16788	. . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides
2924/16235	. . . .	Connecting to a semiconductor or solid-state bodies, i.e. cap-to-chip	2924/1679	. . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy
2924/16251	. . . .	Connecting to an item not being a semiconductor or solid-state body, e.g. cap-to-substrate	2924/16791	. . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene
2924/1626	. . . .	Cap-in-cap assemblies	2924/16793	. . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2924/167</a> - <a href="#">H01L 2924/16791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond
2924/1627	. . . .	stacked type assemblies, e.g. stacked multi-cavities	2924/16798	. . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams
2924/163	. . .	Connection portion, e.g. seal	2924/171	. . .	Frame
2924/1631	. . . .	Structure	2924/1711	. . .	Structure
2924/16315	. . . .	Shape	2924/1715	. . .	Shape
2924/1632	. . . .	Disposition			
2924/164	. . . .	Material			
2924/165	. . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof			

2924/17151	. . . .	Frame comprising an aperture, e.g. for pressure control, encapsulation	2924/19011	. . .	including integrated passive components
2924/172	. . .	Disposition	2924/19015	. . .	including thin film passive components
2924/173	. . .	Connection portion, e.g. seal	2924/1902	. . .	including thick film passive components
2924/176	. . .	Material	2924/1903	. . .	including wave guides
2924/177	. . . .	with a principal constituent of the material being a metal or a metalloid, e.g. boron [B], silicon [Si], germanium [Ge], arsenic [As], antimony [Sb], tellurium [Te] and polonium [Po], and alloys thereof	2924/19031	. . . .	being a strip line type
2924/17701	. . . . .	the principal constituent melting at a temperature of less than 400 C	2924/19032	. . . .	being a microstrip line type
2924/17717	. . . . .	the principal constituent melting at a temperature of greater than or equal to 400 C and less than 950 C	2924/19033	. . . .	being a coplanar line type
2924/17724	. . . . .	Aluminium [Al] as principal constituent	2924/19038	. . . .	being a hybrid line type
2924/17738	. . . . .	the principal constituent melting at a temperature of greater than or equal to 950 C and less than 1550 C	2924/19039	. . . . .	impedance transition between different types of wave guides
2924/17747	. . . . .	Copper [Cu] as principal constituent	2924/1904	. . .	Component type
2924/1776	. . . . .	Iron [Fe] as principal constituent	2924/19041	. . . .	being a capacitor
2924/17763	. . . . .	the principal constituent melting at a temperature of greater than 1550 C	2924/19042	. . . .	being an inductor
2924/17786	. . . .	with a principal constituent of the material being a non metallic, non metalloid inorganic material	2924/19043	. . . .	being a resistor
2924/17787	. . . . .	Ceramics, e.g. crystalline carbides, nitrides or oxides	2924/1905	. .	Shape
2924/17788	. . . . .	Glasses, e.g. amorphous oxides, nitrides or fluorides	2924/19051	. . .	Impedance matching structure [e.g. balun]
2924/1779	. . . .	with a principal constituent of the material being a polymer, e.g. polyester, phenolic based polymer, epoxy	2924/191	. .	Disposition
2924/17791	. . . . .	The principal constituent being an elastomer, e.g. silicones, isoprene, neoprene	2924/19101	. . .	of discrete passive components
2924/17793	. . . . .	with a principal constituent of the material being a solid not provided for in groups <a href="#">H01L 2924/177</a> - <a href="#">H01L 2924/17791</a> , e.g. allotropes of carbon, fullerene, graphite, carbon-nanotubes, diamond	2924/19102	. . . .	in a stacked assembly with the semiconductor or solid state device
2924/17798	. . . . .	with a principal constituent of the material being a combination of two or more materials in the form of a matrix with a filler, i.e. being a hybrid material, e.g. segmented structures, foams	2924/19103	. . . . .	interposed between the semiconductor or solid-state device and the die mounting substrate, i.e. chip-on-passive
2924/181	. .	Encapsulation	2924/19104	. . . . .	on the semiconductor or solid-state device, i.e. passive-on-chip
2924/1811	. . .	Structure	2924/19105	. . . .	in a side-by-side arrangement on a common die mounting substrate
2924/1815	. . .	Shape	2924/19106	. . . .	in a mirrored arrangement on two different side of a common die mounting substrate
2924/1816	. . . .	Exposing the passive side of the semiconductor or solid-state body	2924/19107	. . . .	off-chip wires
2924/18161	. . . . .	of a flip chip	2924/20	. .	Parameters
2924/18162	. . . . .	of a chip with build-up interconnect	2924/201	. .	Temperature ranges
2924/18165	. . . . .	of a wire bonded chip	2924/20101	. . .	Temperature range $T < 0\text{ C}$ , $T < 273.15\text{ K}$
2924/182	. . .	Disposition	2924/20102	. . .	Temperature range $0\text{ C} = < T < 60\text{ C}$ , $273.15\text{ K} = < T < 333.15\text{ K}$
2924/183	. . .	Connection portion, e.g. seal	2924/20103	. . .	Temperature range $60\text{ C} = < T < 100\text{ C}$ , $333.15\text{ K} = < T < 373.15\text{ K}$
2924/18301	. . . .	being an anchoring portion, i.e. mechanical interlocking between the encapsulation resin and another package part	2924/20104	. . .	Temperature range $100\text{ C} = < T < 150\text{ C}$ , $373.15\text{ K} = < T < 423.15\text{ K}$
2924/186	. . .	Material	2924/20105	. . .	Temperature range $150\text{ C} = < T < 200\text{ C}$ , $423.15\text{ K} = < T < 473.15\text{ K}$
2924/19	. .	Details of hybrid assemblies other than the semiconductor or other solid state devices to be connected	2924/20106	. . .	Temperature range $200\text{ C} = < T < 250\text{ C}$ , $473.15\text{ K} = < T < 523.15\text{ K}$
2924/1901	. .	Structure	2924/20107	. . .	Temperature range $250\text{ C} = < T < 300\text{ C}$ , $523.15\text{ K} = < T < 573.15\text{ K}$
			2924/20108	. . .	Temperature range $300\text{ C} = < T < 350\text{ C}$ , $573.15\text{ K} = < T < 623.15\text{ K}$
			2924/20109	. . .	Temperature range $350\text{ C} = < T < 400\text{ C}$ , $623.15\text{ K} = < T < 673.15\text{ K}$
			2924/2011	. . .	Temperature range $400\text{ C} = < T < 450\text{ C}$ , $673.15\text{ K} = < T < 723.15\text{ K}$
			2924/20111	. . .	Temperature range $450\text{ C} = < T < 500\text{ C}$ , $723.15\text{ K} = < T < 773.15\text{ K}$
			2924/202	. .	Electromagnetic wavelength ranges [W]
			2924/20201	. . .	Gamma radiation, i.e. wavelength less than 0.01 nm
			2924/20202	. . .	X-ray radiation, i.e. wavelength 0.01 to 10 nm
			2924/2021	. . .	Ultraviolet radiation
			2924/20211	. . . .	UV-C $100 = < W < 280\text{ nm}$
			2924/20212	. . . .	UV-B $280 = < W < 315\text{ nm}$
			2924/20213	. . . .	UV-A $315 = < W < 400\text{ nm}$
			2924/2024	. . .	Visible spectrum wavelength $390 = < W < 700\text{ nm}$ , i.e. 400-790 THz

2924/2026	. . . Infrared radiation 700=<W<3000 nm	2924/2075	. . . larger or equal to 1 micron less than 10 microns
2924/20261	. . . IR-A 700=<W<1400 nm, i.e. 215 THz-430 THz	2924/20751	. . . larger or equal to 10 microns less than 20 microns
2924/20262	. . . IR-B 1400=<W<3000 nm, i.e. 100THz-215 THz	2924/20752	. . . larger or equal to 20 microns less than 30 microns
2924/20263	. . . IR-C 3000 nm =<W<1 mm, i.e. 300 GHz-100THz	2924/20753	. . . larger or equal to 30 microns less than 40 microns
2924/2027	. . . Radio 1 mm - km 300 GHz - 3 Hz	2924/20754	. . . larger or equal to 40 microns less than 50 microns
2924/20271	. . . Microwave radiation 1 mm - 1 meter, i.e 300 GHz - 300 MHz	2924/20755	. . . larger or equal to 50 microns less than 60 microns
2924/203	. . Ultrasonic frequency ranges, i.e. KHz	2924/20756	. . . larger or equal to 60 microns less than 70 microns
2924/20301	. . . Ultrasonic frequency [f] f<25 kHz	2924/20757	. . . larger or equal to 70 microns less than 80 microns
2924/20302	. . . Ultrasonic frequency [f] 25 Khz=<f< 50 KHz	2924/20758	. . . larger or equal to 80 microns less than 90 microns
2924/20303	. . . Ultrasonic frequency [f] 50 Khz=<f< 75 KHz	2924/20759	. . . larger or equal to 90 microns less than 100 microns
2924/20304	. . . Ultrasonic frequency [f] 75 Khz=<f< 100 KHz	2924/2076	. . . equal to or larger than 100 microns
2924/20305	. . . Ultrasonic frequency [f] 100 Khz=<f< 125 KHz	2924/30	. Technical effects
2924/20306	. . . Ultrasonic frequency [f] 125 Khz=<f< 150 KHz	2924/301	. . Electrical effects
2924/20307	. . . Ultrasonic frequency [f] 150 Khz=<f< 175 KHz	2924/30101	. . . Resistance
2924/20308	. . . Ultrasonic frequency [f] 175 Khz=<f< 200 KHz	2924/30105	. . . Capacitance
2924/20309	. . . Ultrasonic frequency [f] f>=200 KHz	2924/30107	. . . Inductance
2924/206	. . Length ranges	2924/3011	. . . Impedance
2924/2064	. . . larger or equal to 1 micron less than 100 microns	2924/30111	. . . . matching
2924/20641	. . . larger or equal to 100 microns less than 200 microns	2924/302	. . . Electrostatic
2924/20642	. . . larger or equal to 200 microns less than 300 microns	2924/30201	. . . . Charge
2924/20643	. . . larger or equal to 300 microns less than 400 microns	2924/30205	. . . . Discharge
2924/20644	. . . larger or equal to 400 microns less than 500 microns	2924/3025	. . . Electromagnetic shielding
2924/20645	. . . larger or equal to 500 microns less than 600 microns	2924/35	. . Mechanical effects
2924/20646	. . . larger or equal to 600 microns less than 700 microns	2924/351	. . . Thermal stress
2924/20647	. . . larger or equal to 700 microns less than 800 microns	2924/3511	. . . . Warping
2924/20648	. . . larger or equal to 800 microns less than 900 microns	2924/3512	. . . . Cracking
2924/20649	. . . larger or equal to 900 microns less than 1000 microns	2924/35121	. . . . . Peeling or delaminating
2924/2065	. . . larger or equal to 1000 microns less than 1500 microns	2924/36	. . Material effects
2924/20651	. . . larger or equal to 1500 microns less than 2000 microns	2924/364	. . . Polymers
2924/20652	. . . larger or equal to 2000 microns less than 2500 microns	2924/3641	. . . . Outgassing
2924/20653	. . . larger or equal to 2500 microns less than 3000 microns	2924/365	. . . Metallurgical effects
2924/20654	. . . larger or equal to 3000 microns less than 4000 microns	2924/3651	. . . . Formation of intermetallics
2924/20655	. . . larger or equal to 4000 microns less than 5000 microns	2924/36511	. . . . . Purple plague
2924/20656	. . . larger or equal to 5000 microns less than 6000 microns	2924/3656	. . . . Formation of Kirkendall voids
2924/20657	. . . larger or equal to 6000 microns less than 7000 microns	2924/37	. . Effects of the manufacturing process
2924/20658	. . . larger or equal to 7000 microns less than 8000 microns	2924/37001	. . . Yield
2924/207	. . Diameter ranges	2924/37002	. . . Shelf life
		2924/3701	. . . increased through put
		2924/38	. . Effects and problems related to the device integration
		2924/381	. . . Pitch distance
		2924/384	. . . Bump effects
		2924/3841	. . . . Solder bridging
		2924/386	. . . Wire effects
		2924/3861	. . . . Sag
		2924/3862	. . . . Sweep
		2924/40	. Details of apparatuses used for either manufacturing connectors or connecting the semiconductor or solid-state body
		2924/401	. . LASER
		2924/40101	. . . Mode
		2924/40102	. . . . being pulsed
		2924/40103	. . . . being continous

2924/40105	. . .	Beam details
2924/4015	. . . .	Shape
2924/402	. . .	Type
2924/40201	. . . .	being a chemical
2924/40202	. . . . .	Deuterium Flouride [DF] LASER
2924/40203	. . . . .	Hydrogen Flouride [HF] LASER
2924/40207	. . . . .	Dye laser
2924/4025	. . . .	being a gas
2924/40251	. . . . .	argon-ion LASER
2924/40252	. . . . .	CO <sub>2</sub> LASER
2924/40253	. . . . .	HeAg LASER
2924/40254	. . . . .	HeNe LASER
2924/40255	. . . . .	NeCu LASER
2924/403	. . . .	being an Excimer
2924/40301	. . . . .	ArF LASER
2924/40302	. . . . .	F2 LASER
2924/40303	. . . . .	KrCl LASER
2924/40304	. . . . .	KrF LASER
2924/40305	. . . . .	XeCl LASER
2924/40306	. . . . .	XeF LASER
2924/4035	. . . .	being a fiber hosted LASER
2924/404	. . . .	being a solid state
2924/40401	. . . . .	Free electron LASER
2924/40402	. . . . .	Photonic crystal LASER
2924/40403	. . . . .	Fiber solid state LASER
2924/40404	. . . . .	Yttrium Aluminium Garnet Nd:YAG LASER
2924/40405	. . . . .	Yttrium Lithium Flouride Nd:YLF LASER
2924/40406	. . . . .	Ruby LASER
2924/40407	. . . . .	Yb:YAG LASER
2924/405	. . .	Wavelength
2924/40501	. . . .	UV spectrum
2924/40502	. . . .	Visible spectrum
2924/40503	. . . .	IR spectrum