

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING (NOTES omitted)

SHAPING

B22 CASTING; POWDER METALLURGY

B22F WORKING METALLIC POWDER; MANUFACTURE OF ARTICLES FROM METALLIC POWDER; MAKING METALLIC POWDER (processes or devices for granulating materials in general [B01J 2/00](#); making ceramics by compacting or sintering [C04B](#), e.g. [C04B 35/64](#); for the production of metals as such, see class [C22](#); reduction or decomposition of metal compounds in general [C22B](#); making alloys by powder metallurgy [C22C](#); electrolytic production of metal powder [C25C 5/00](#))

NOTES

1. This subclass covers the making of metallic powder only insofar as powder with specific physical characteristics is made;
2. In this subclass, the following terms or expressions are used with the meanings indicated:
 - "metallic powder" covers powders containing a substantial proportion of non-metallic material;
 - "powder" includes somewhat larger particles which are worked, obtained or behave in a manner similar to powder, e.g. fibres.

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:

B22F 3/035	covered by	B22F 3/03
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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.

1/00	Special treatment of metallic powder, e.g. to facilitate working, to improve properties {(treatment of powder by mechanical means, e.g. by grinding, milling, rolling B22F 9/04); Metallic powders per se, e.g. mixtures of particles of different composition (C04 , C08 take precedence; {amorphous powder B22F 9/002)}	1/0055 . . . {Flake form powders}
		1/0059 . . {Metallic powders mixed with a lubricating or binding agent or organic material}
		1/0062 . . . {Powders coated with organic material}
		2001/0066 . . . {Organic binder comprising a mixture or obtained by reaction of more than one component other than solvent, lubricant}
1/0003	. {Metallic powders <u>per se</u> ; Mixtures of metallic powders; Metallic powders mixed with a lubricating or binding agent (making ferrous alloys using a mixture of prealloyed powders C22C 33/0207)}	1/007 . . . {Non-organic or metal salt binders or lubricants}
1/0007	. . {Metallic powder characterised by its shape or structure, e.g. fibre structure}	1/0074 . . . {Organic materials comprising a solvent, e.g. for slip casting}
1/0011	. . . {Metallic powder characterised by size or surface area only}	1/0077 . . . {Mixtures obtained by warm mixing}
1/0014	. . . . {by size mixtures or distribution}	1/0081 . {Special treatment of metallic powder, e.g. to facilitate working, to improve properties (coating with organic material B22F 1/0062)}
1/0018	. . . . {Nanometer sized particles}	1/0085 . . {Thermal or thermo-mechanical treatment}
1/0022	. . . . . {Dispersions or suspensions thereof}	1/0088 . . {Chemical treatment, e.g. passivation}
1/0025	. . . . . {Nanofibres or nanotubes}	2001/0092 . . . {Making a dispersion}
2001/0029	. . . . . {Hollow particles, including tubes and shells}	1/0096 . . {Treatment resulting in the production of agglomerates}
2001/0033	. . . . . {Flake form nanoparticles}	1/02 . . comprising coating of the powder {(coating with organic material B22F 1/0062 ; chemical surface treatment B22F 1/0088)}
2001/0037	. . . . . {Complex form nanoparticles, e.g.. prism, pyramid, octahedron}	1/025 . . {Metallic coating}
1/004	. . . {Fibre structure (B22F 1/0025 takes precedence)}	
1/0044	. . . {Nanometer size structures}	
1/0048	. . . {Spherical powder}	
1/0051	. . . . {Hollow particles}	

3/00	Manufacture of workpieces or articles from metallic powder characterised by the manner of compacting or sintering; Apparatus specially adapted therefor {; Presses and furnaces}	
	WARNING	
	Group B22F 3/00 is impacted by reclassification into groups B22F 10/00 - B22F 12/90 .	
	Groups B22F 3/00 and B22F 10/00 - B22F 12/90 should be considered in order to perform a complete search.	
3/001	. {Starting from powder comprising reducible metal compounds (making ferrous alloys starting from compounds C22C 33/0235)}	
3/002	. {Manufacture of articles essentially made from metallic fibres}	
3/003	. {Apparatus, e.g. furnaces (in general F27B)}	
3/004	. {Filling molds with powder (feeding material to presses in general B30B 15/302)}	
3/005	. {Loading or unloading powder metal objects (transport in general B65G)}	
3/006	. {Amorphous articles}	
3/007	. . {by diffusion starting from non-amorphous articles prepared by powder metallurgy}	
3/02	. Compacting only	
2003/023	. . {Lubricant mixed with the metal powder}	
2003/026	. . {Mold wall lubrication or article surface lubrication}	
3/03	. . Press-moulding apparatus therefor	
2003/031	. . . {with punches moving in different directions in different planes}	
2003/033	. . . {with multiple punches working in the same direction}	
3/04	. . by applying fluid pressure {, e.g. by cold isostatic pressing [CIP]}	
3/045	. . . {Semi-isostatic pressure}	
3/06	. . by centrifugal forces	
3/08	. . by explosive forces {(generating shock waves in general G10K 15/043)}	
3/087	. . using high energy impulses, e.g. magnetic field impulses	
3/093	. . using vibrations {or friction}	
3/10	. Sintering only	
3/1003	. . {Use of special medium during sintering, e.g. sintering aid}	
3/1007	. . . {Atmosphere (B22F 3/1021 takes precedence)}	
3/101	. . . . {Changing atmosphere}	
2003/1014	. . . {Getter}	
3/1017	. . {Multiple heating or additional steps (B22F 3/101 takes precedence)}	
3/1021	. . . {Removal of binder or filler (removal of binder from ceramics C04B 35/638)}	
3/1025	. . . . {not by heating only}	
3/1028	. . . {Controlled cooling}	
2003/1032	. . {comprising a grain growth inhibitor}	
3/1035	. . {Liquid phase sintering}	
3/1039	. . {by reaction (B22F 3/001 , B22F 3/23 take precedence)}	
2003/1042	. . {with support for articles to be sintered}	
2003/1046	. . . {with separating means for articles to be sintered}	
3/105	. . by using electric current {other than for infra-red radiant energy}, laser radiation or plasma (B22F 3/11 takes precedence){; by ultrasonic bonding (B22F 3/115 takes precedence)}	
2003/1051	. . . {by electric discharge}	
2003/1052	. . . {assisted by energy absorption enhanced by the coating or powder}	
2003/1053	. . . {by induction}	
2003/1054	. . . {by microwave}	
3/11	. . Making porous workpieces or articles	
3/1103	. . . {with particular physical characteristics}	
2003/1106	. . . . {Product comprising closed porosity}	
3/1109	. . . . {Inhomogenous pore distribution (composite layers of porous nature B22F 7/002)}	
3/1112	. . . . {comprising hollow spheres or hollow fibres}	
3/1115	. . . . {comprising complex forms, e.g. honeycombs}	
3/1118	. . . . {comprising internal reinforcements}	
3/1121	. . . {by using decomposable, meltable or sublimatable fillers}	
3/1125	. . . . {involving a foaming process}	
2003/1128	. . . . . {Foaming by expansion of dissolved gas, other than with foaming agent}	
2003/1131	. . . . . {Foaming in a liquid suspension and decomposition}	
3/1134	. . . . . {Inorganic fillers (carbonaceous or paper filler B22F 3/1121)}	
3/1137	. . . . . {by coating porous removable preforms}	
3/114	. . . {the porous products being formed by impregnation (B22F 3/1137 , B22F 3/26 take precedence)}	
3/1143	. . . {involving an oxidation, reduction or reaction step}	
3/1146	. . . {After-treatment maintaining the porosity (B22F 3/114 takes precedence)}	
3/115	. by spraying molten metal, i.e. spray sintering, spray casting	
3/12	. Both compacting and sintering (by forging B22F 3/17)	
3/1208	. . {Containers or coating used therefor}	
3/1216	. . . {Container composition}	
3/1225	. . . . {Glass}	
3/1233	. . . . {Organic material}	
3/1241	. . . . {layered}	
3/125	. . . {Initially porous container}	
3/1258	. . . {Container manufacturing}	
3/1266	. . . . {by coating or sealing the surface of the preformed article, e.g. by melting}	
3/1275	. . . . . {by coating a model and eliminating the model before consolidation}	
3/1283	. . . . . {Container formed as an undeformable model eliminated after consolidation}	
3/1291	. . . . . {Solid insert eliminated after consolidation}	
3/14	. . simultaneously	
2003/145	. . . {by warm compacting, below debinding temperature}	
3/15	. . . Hot isostatic pressing	
2003/153	. . . . {apparatus specific to HIP}	
3/156	. . . . {by a pressure medium in liquid or powder form}	
3/16	. . in successive or repeated steps	
3/162	. . . {Machining, working after consolidation}	

3/164	. . . {Partial deformation or calibration}	5/10	. of articles with cavities or holes, not otherwise provided for in the preceding subgroups
2003/166	. . . . {Surface calibration, blasting, burnishing, sizing, coining}	2005/103	. . {Cavity made by removal of insert}
3/168	. . . . {Local deformation}	5/106	. . {Tube or ring forms}
3/17	. by forging	5/12	. of wires {(of tubes B22F 5/10)}
3/172	. . {Continuous compaction, e.g. rotary hammering (with axial pressure and without reduction of section B22F 3/204)}	7/00	Manufacture of composite layers, workpieces, or articles, comprising metallic powder, by sintering the powder, with or without compacting {wherein at least one part is obtained by sintering or compression (application of coating layers by use of metal powders, see C23C)}
2003/175	. . {by hot forging, below sintering temperature}	7/002	. {of porous nature}
3/177	. . {Rocking die forging}	7/004	. . {comprising at least one non-porous part}
3/18	. by using pressure rollers	7/006	. . . {the porous part being obtained by foaming}
2003/185	. . {by hot rolling, below sintering temperature}	7/008	. {characterised by the composition}
3/20	. by extruding	7/02	. of composite layers {(B22F 7/002 takes precedence)}
2003/202	. . {with back pressure}	7/04	. . with one or more layers not made from powder, e.g. made from solid metal
3/204	. . {Continuous compaction with axial pressure and without reduction of section}	2007/042	. . . {characterised by the layer forming method}
2003/206	. . {Hydrostatic or hydraulic extrusion}	2007/045	. . . . {accompanied by fusion or impregnation}
2003/208	. . {Warm or hot extruding}	2007/047	. . . . {non-pressurised baking of the paste or slurry containing metal powder}
3/22	. for producing castings from a slip	7/06	. of composite workpieces or articles from parts, e.g. to form tipped tools {(B22F 7/002 takes precedence)}
3/222	. . {by freeze-casting or in a supercritical fluid}	7/062	. . {involving the connection or repairing of preformed parts}
3/225	. . {by injection molding}	7/064	. . . {using an intermediate powder layer}
3/227	. . {by organic binder assisted extrusion}	2007/066	. . . {using impregnation}
3/23	. involving a self-propagating high-temperature synthesis or reaction sintering step {(making cermets by reaction sintering C22C 1/058)}	2007/068	. . . {repairing articles}
3/24	. After-treatment of workpieces or articles {(B22F 3/1146 takes precedence)}	7/08	. . with one or more parts not made from powder {(B22F 7/062 takes precedence)}
2003/241	. . {Chemical after-treatment on the surface}	8/00	Manufacture of articles from scrap or waste metal particles
2003/242	. . . {Coating}	9/00	Making metallic powder or suspensions thereof
2003/244	. . . {Leaching}	2009/001	. {from scrap particles}
2003/245	. . {Making recesses, grooves etc on the surface by removing material}	9/002	. {amorphous or microcrystalline}
2003/247	. . {Removing material: carving, cleaning, grinding, hobbing, honing, lapping, polishing, milling, shaving, skiving, turning the surface}	9/004	. . {by diffusion, e.g. solid state reaction}
2003/248	. . {Thermal after-treatment}	9/005	. . . {Transformation into amorphous state by milling}
3/26	. . Impregnating {(making ferrous alloys by impregnation C22C 33/0242)}	9/007	. . {Transformation of amorphous into microcrystalline state}
5/00	Manufacture of workpieces or articles from metallic powder characterised by the special shape of the product	9/008	. . {Rapid solidification processing}
2005/001	. {Cutting tools, earth boring or grinding tool other than table ware}	9/02	. using physical processes
2005/002	. {Tools other than cutting tools}	9/023	. . {Hydrogen absorption}
5/003	. {Articles made for being fractured or separated into parts}	9/026	. . {Spray drying of solutions or suspensions}
2005/004	. {Article comprising helical form elements (B22F 5/085 takes precedence)}	9/04	. . starting from solid material, e.g. by crushing, grinding or milling {(C22C 1/1084 takes precedence); crushing, grinding or milling, in general, see the relevant subclasses, e.g. B02C }
2005/005	. {Article surface comprising protrusions}	2009/041	. . . {by mechanical alloying, e.g. blending, milling}
5/006	. {of flat products, e.g. sheets (B22F 3/1103 takes precedence; by using pressure rollers only see B22F 3/18)}	2009/042	. . . {using a particular milling fluid}
5/007	. {of moulds}	2009/043	. . . {by ball milling}
5/008	. {of engine cylinder parts or of piston parts other than piston rings (of piston rings B22F 5/02)}	2009/044	. . . {by jet milling}
5/009	. {of turbine components other than turbine blades (of turbine blades B22F 5/04)}	2009/045	. . . {by other means than ball or jet milling}
5/02	. of piston rings	2009/046	. . . . {by cutting}
5/04	. of turbine blades	2009/047	. . . . {by rolling}
5/06	. of threaded articles, e.g. nuts	2009/048	. . . {by pulverising a quenched ribbon}
5/08	. of toothed articles, e.g. gear wheels; of cam discs	2009/049	. . . {by pulverising at particular temperature}
5/085	. . {with helical contours}		

9/06	. .	starting from liquid material
2009/065	. . .	{Melting inside a liquid, e.g. making spherical balls}
9/08	. . .	by casting, e.g. through sieves or in water, by atomising or spraying (using electric discharge B22F 9/14)
2009/0804	. . . .	{Dispersion in or on liquid, other than with sieves}
2009/0808	. . . . .	{Mechanical dispersion of melt, e.g. by sieves}
2009/0812	. . . . .	{Pulverisation with a moving liquid coolant stream, by centrifugally rotating stream}
2009/0816	. . . . .	{by casting with pressure or pulsating pressure on the metal bath}
9/082	. . . . .	{atomising using a fluid (using centrifugal force B22F 9/10)}
2009/0824	. . . . .	{with a specific atomising fluid}
2009/0828	. . . . .	{with water}
2009/0832	. . . . .	{Handling of atomising fluid, e.g. heating, cooling, cleaning, recirculating}
2009/0836	. . . . .	{with electric or magnetic field or induction}
2009/084	. . . . .	{combination of methods}
2009/0844	. . . . .	{in controlled atmosphere}
2009/0848	. . . . .	{Melting process before atomisation}
2009/0852	. . . . .	{Electroslag melting}
2009/0856	. . . . .	{Skull melting}
2009/086	. . . . .	{Cooling after atomisation}
2009/0864	. . . . .	{by oil, other non-aqueous fluid or fluid-bed cooling}
2009/0868	. . . . .	{by injection of solid particles in the melt stream}
2009/0872	. . . . .	{by water}
2009/0876	. . . . .	{by gas}
2009/088	. . . . .	{Fluid nozzles, e.g. angle, distance}
2009/0884	. . . . .	{Spiral fluid}
2009/0888	. . . . .	{casting construction of the melt process, apparatus, intermediate reservoir, e.g. tundish, devices for temperature control}
2009/0892	. . . . .	{casting nozzle; controlling metal stream in or after the casting nozzle}
2009/0896	. . . . .	{particle transport, separation: process and apparatus}
9/10	. . . .	using centrifugal force
9/12	. .	starting from gaseous material
9/14	. .	using electric discharge
9/16	. .	using chemical processes
2009/165	. .	{Chemical reaction in an Ionic Liquid [IL] (B22F 2009/245 takes precedence)}
9/18	. .	with reduction of metal compounds
9/20	. . .	starting from solid metal compounds
9/22	. . . .	using gaseous reductors
9/24	. . .	starting from liquid metal compounds, e.g. solutions
2009/245	. . . . .	{Reduction reaction in an Ionic Liquid [IL]}
9/26	. . . .	using gaseous reductors
9/28	. . .	starting from gaseous metal compounds
9/30	. .	with decomposition of metal compounds, e.g. by pyrolysis
9/305	. . .	{of metal carbonyls}

10/00

Additive manufacturing of workpieces or articles from metallic powder (apparatus or devices therefor [B22F 12/00](#))

WARNING

Group [B22F 10/00](#) is incomplete pending reclassification of documents from group [B22F 3/00](#).

Group [B22F 10/00](#) is also impacted by reclassification into groups [B22F 10/10](#) - [B22F 12/90](#).

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

10/10 . Formation of a green body

WARNING

Groups [B22F 10/10](#) - [B22F 10/18](#) are incomplete pending reclassification of documents from groups [B22F 3/00](#) and [B22F 10/00](#).

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

- 10/12 . . by photopolymerisation, e.g. stereolithography [SLA] or digital light processing [DLP]
- 10/14 . . by jetting of binder onto a bed of metal powder
- 10/16 . . by embedding the binder within the powder bed
- 10/18 . . by mixing binder with metal in filament form, e.g. fused filament fabrication [FFF]
- 10/20 . Direct sintering or melting

WARNING

Groups [B22F 10/20](#) - [B22F 10/28](#) are incomplete pending reclassification of documents from groups [B22F 3/00](#) and [B22F 10/00](#).

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

- 10/22 . . Direct deposition of molten metal
- 10/25 . . Direct deposition of metal particles, e.g. direct metal deposition [DMD] or laser engineered net shaping [LENS]
- 10/28 . . Powder bed fusion, e.g. selective laser melting [SLM] or electron beam melting [EBM]
- 10/30 . Process control

WARNING

Groups [B22F 10/30](#) - [B22F 10/39](#) are incomplete pending reclassification of documents from groups [B22F 3/00](#) and [B22F 10/00](#).

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

- 10/31 . . Calibration of process steps or apparatus settings, e.g. before or during manufacturing
- 10/32 . . of the atmosphere, e.g. composition or pressure in a building chamber
- 10/322 . . . of the gas flow, e.g. rate or direction
- 10/34 . . of powder characteristics, e.g. density, oxidation or flowability
- 10/36 . . of energy beam parameters
- 10/362 . . . for preheating
- 10/364 . . . for post-heating, e.g. remelting

- 10/366 . . . Scanning parameters, e.g. hatch distance or scanning strategy
- 10/368 . . . Temperature or temperature gradient, e.g. temperature of the melt pool
- 10/37 . . of powder bed aspects, e.g. density
- 10/38 . . to achieve specific product aspects, e.g. surface smoothness, density, porosity or hollow structures
- 10/385 . . . {Overhang structures}
- 10/39 . . Traceability, e.g. incorporating identifier into a workpiece or article
- 10/40 . Structures for supporting workpieces or articles during manufacture and removed afterwards

WARNING

Groups [B22F 10/40](#) - [B22F 10/47](#) are incomplete pending reclassification of documents from groups [B22F 3/00](#) and [B22F 10/00](#).

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

- 10/43 . . characterised by material
- 10/47 . . characterised by structural features
- 10/50 . Treatment of workpieces or articles during build-up, e.g. treatments applied to fused layers during build-up

WARNING

Group [B22F 10/50](#) is incomplete pending reclassification of documents from groups [B22F 3/00](#) and [B22F 10/00](#).

Groups [B22F 3/00](#), [B22F 10/00](#), and [B22F 10/50](#) should be considered in order to perform a complete search.

- 10/60 . Treatment of workpieces or articles after build-up

WARNING

Groups [B22F 10/60](#) - [B22F 10/68](#) are incomplete pending reclassification of documents from groups [B22F 3/00](#) and [B22F 10/00](#).

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

- 10/62 . . by chemical means
- 10/64 . . by thermal means ([control of energy beam parameters for post heating B22F 10/364](#))
- 10/66 . . by mechanical means
- 10/68 . . Cleaning or washing
- 10/70 . Recycling

WARNING

Groups [B22F 10/70](#) - [B22F 10/77](#) are incomplete pending reclassification of documents from groups [B22F 3/00](#) and [B22F 10/00](#).

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

- 10/73 . . of powder
- 10/77 . . of gas

- 10/80 . Data acquisition or data processing

WARNING

Groups [B22F 10/80](#) and [B22F 10/85](#) are incomplete pending reclassification of documents from groups [B22F 3/00](#) and [B22F 10/00](#).

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

- 10/85 . . for controlling or regulating additive manufacturing processes

12/00

Apparatus or devices specially adapted for additive manufacturing; Auxiliary means for additive manufacturing; Combinations of additive manufacturing apparatus or devices with other processing apparatus or devices

WARNING

Groups [B22F 12/00](#) - [B22F 12/90](#) are incomplete pending reclassification of documents from groups [B22F 3/00](#) and [B22F 10/00](#).

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

- 12/10 . Auxiliary heating means
- 12/13 . . to preheat the material
- 12/17 . . to heat the build chamber or platform
- 12/20 . Cooling means
- 12/22 . {Driving means}
- 12/222 . . {for motion along a direction orthogonal to the plane of a layer}
- 12/224 . . {for motion along a direction within the plane of a layer}
- 12/226 . . {for rotary motion}
- 12/30 . Platforms or substrates
- 12/33 . . translatable in the deposition plane
- 12/37 . . Rotatable
- 12/38 . {Housings, e.g. machine housings}
- 12/40 . Radiation means
- 12/41 . . characterised by the type, e.g. laser or electron beam
- 12/42 . . . Light-emitting diodes [LED]
- 12/43 . . . pulsed; frequency modulated
- 12/44 . . characterised by the configuration of the radiation means
- 12/45 . . . Two or more
- 12/46 . . with translatable movement
- 12/47 . . . parallel to the deposition plane
- 12/48 . . . in height, e.g. perpendicular to the deposition plane
- 12/49 . . Scanners
- 12/50 . Means for feeding of material, e.g. heads
- 12/52 . . Hoppers
- 12/53 . . Nozzles
- 12/55 . . Two or more means for feeding material
- 12/57 . . Metering means
- 12/58 . . for changing the material composition, e.g. by mixing
- 12/60 . Planarisation devices; Compression devices
- 12/63 . . Rollers
- 12/67 . . Blades
- 12/70 . Gas flow means

12/80	. Plants, production lines or modules	2301/052	. . Aluminium
12/82	. . Combination of additive manufacturing apparatus or devices with other processing apparatus or devices	2301/054	. . Alkali metals, i.e. Li, Na, K, Rb, Cs, Fr
12/84	. . . Parallel processing within single device	2301/056	. . Alkaline metals, i.e. Ca, Sr, Ba, Ra
12/86	. . . Serial processing with multiple devices grouped	2301/058	. . Magnesium
12/88	. . Handling of additively manufactured products, e.g. by robots	2301/10	. Copper
12/90	. Means for process control, e.g. cameras or sensors	2301/15	. Nickel or cobalt
2201/00	Treatment under specific atmosphere	2301/155	. . Rare Earth - Co or -Ni intermetallic alloys
2201/01	. Reducing atmosphere	2301/20	. Refractory metals
2201/013	. . Hydrogen	2301/205	. . Titanium, zirconium or hafnium
2201/016	. . NH ₃	2301/25	. Noble metals, i.e. Ag Au, Ir, Os, Pd, Pt, Rh, Ru
2201/02	. Nitrogen	2301/255	. . Silver or gold
2201/03	. Oxygen	2301/30	. Low melting point metals, i.e. Zn, Pb, Sn, Cd, In, Ga
2201/04	. CO or CO ₂	2301/35	. Iron
2201/05	. Water or water vapour	2301/355	. . Rare Earth - Fe intermetallic alloys
2201/10	. Inert gases	2301/40	. Intermetallics other than rare earth-Co or -Ni or -Fe intermetallic alloys
2201/11	. . Argon	2301/45	. Rare earth metals, i.e. Sc, Y, Lanthanides (57-71)
2201/12	. . Helium	2302/00	Metal Compound, non-Metallic compound or non-metal composition of the powder or its coating
2201/20	. Use of vacuum	2302/05	. Boride
2201/30	. Carburising atmosphere	2302/10	. Carbide
2201/32	. Decarburising atmosphere	2302/105	. . Silicium carbide (SiC)
2201/40	. Metal compounds	2302/15	. Carbonitride
2201/50	. air	2302/20	. Nitride
2202/00	Treatment under specific physical conditions	2302/205	. Cubic boron nitride
2202/01	. Use of vibrations	2302/25	. Oxide
2202/03	. Treatment under cryogenic or supercritical conditions	2302/253	. . Aluminium oxide (Al ₂ O ₃)
2202/05	. Use of magnetic field	2302/256	. . Silicium oxide (SiO ₂)
2202/06	. Use of electric fields	2302/30	. Oxynitride
2202/07	. by induction	2302/35	. Complex boride, carbide, carbonitride, nitride, oxide or oxynitride
2202/09	. Use of non-gravitational conditions	2302/40	. Carbon, graphite
2202/11	. Use of irradiation	2302/403	. . Carbon nanotube
2202/13	. Use of plasma	2302/406	. . Diamond
2202/15	. Use of fluidised beds	2302/45	. Others, including non-metals
2202/17	. use of centrifugal or vortex forces	2303/00	Functional details of metal or compound in the powder or product,
2203/00	Controlling	2303/01	. Main component
2203/01	. To-be-deleted with administrative transfer to B22F 2203/00	2303/05	. Compulsory alloy component
2203/03	. for feed-back	2303/10	. Optional alloy component
2203/05	. thermal expansion	2303/15	. Intermetallic
2203/11	. temperature, temperature profile	2303/20	. Coating by means of particles
2203/13	. pressure	2303/25	. Coating by means of fibres
2203/15	. weight	2303/30	. Coating alloy
2207/00	Aspects of the compositions, gradients	2303/35	. Molten metal infiltrating a metal preform
2207/01	. Composition gradients	2303/40	. Layer in a composite stack of layers, workpiece or article
2207/03	. . of the metallic binder phase in cermets	2303/405	. . Support layer
2207/05	. . . eta-phase	2303/45	. Part of a final mixture to be processed further
2207/07	. . Particles with core-rim gradient	2304/00	Physical aspects of the powder
2207/11	. Gradients other than composition gradients, e.g. size gradients	2304/05	. Submicron size particles
2207/13	. . Size gradients	2304/052	. . Particle size below 1nm
2207/15	. . Temperature gradients	2304/054	. . Particle size between 1 and 100 nm
2207/17	. . density or porosity gradients	2304/056	. . Particle size above 100 nm up to 300 nm
2207/20	. Cooperating components	2304/058	. . Particle size above 300 nm up to 1 micrometer
2301/00	Metallic composition of the powder or its coating	2304/10	. Micron size particles, i.e. above 1 micrometer up to 500 micrometer
2301/05	. Light metals	2304/15	. Millimeter size particles, i.e. above 500 micrometer

- 2998/00** **Supplementary information concerning processes or compositions relating to powder metallurgy**
- 2998/10 . Processes characterised by the sequence of their steps
- 2999/00** **Aspects linked to processes or compositions used in powder metallurgy**