

CPC**COOPERATIVE PATENT CLASSIFICATION****B29C****SHAPING OR JOINING OF PLASTICS; SHAPING OF SUBSTANCES IN A PLASTIC STATE, IN GENERAL; AFTER-TREATMENT OF THE SHAPED PRODUCTS, e.g. REPAIRING**

{moulding devices for producing toilet or cosmetic sticks [A45D 40/16](#)}; working in the manner of metal [B23](#); grinding, polishing [B24](#); cutting [B26D](#), [B26F](#); making preforms [B29B 11/00](#); making laminated products by combining previously unconnected layers which become one product whose layers will remain together [B32B 37/00](#) - [B32B 41/00](#))

NOTES

1. Attention is drawn to Note (3) following the title of class [B29](#).
2. In this subclass:
 - repairing of articles made from plastics or substances in a plastic state, e.g. of articles shaped or produced by using techniques covered by this subclass or subclass [B29D](#), is classified in group [B29C 73/00](#);
 - component parts, details, accessories or auxiliary operations which are applicable to more than one moulding technique a reclassified in groups [B29C 31/00](#) to [B29C 37/00](#);
 - component parts, details, accessories or auxiliary operations which are only of use for one specific shaping technique a reclassified only in the relevant subgroups of groups [B29C 39/00](#) to [B29C 71/00](#).

Component parts, details or accessories; Auxiliary operations**NOTE**

Attention is drawn to Note (3) following the subclass title

B29C 31/00

Handling, e.g. feeding of the material to be shaped, {storage of plastics material before moulding; Automation, i.e. automated handling lines in plastics processing plants, e.g. using manipulators or robots (discharging moulded articles from the mould [B29C 37/0003](#); storage of prepregs or SMC after impregnation or during ageing [B29C 70/54](#); baling of rubber [B29B 15/02](#); in general [B65G](#))}

B29C 31/002

- {Handling tubes, e.g. transferring between shaping stations, loading on mandrels}

B29C 31/004

- {Arrangements for converting the motion of a material which is continuously fed to a working station in a stepwise motion}

B29C 31/006

- {Handling moulds, e.g. between a mould store and a moulding machine (movable moulds [B29C 33/34](#); for injection moulding [B29C 45/1756](#))}

B29C 31/008

- {Handling preformed parts, e.g. inserts ([B29C 37/001](#) takes precedence; for injection moulding [B29C 45/14008](#); for blow moulding [B29C 49/2408](#); for thermoforming [B29C 51/165](#))}

B29C 31/02

- Dispensing from vessels, e.g. hoppers {(into a mould cavity [B29C 31/04](#); large containers characterised by discharge means [B65D 88/28](#), [B65D 88/54](#))}

- B29C 31/04 . Feeding {of the material to be moulded}, e.g. into a mould cavity ({B29C 39/08 takes precedence; using a material distribution system to two or more fixed injection moulds B29C 45/125} ; to presses in general B30B 15/30)
- B29C 31/041 . . {using filling or dispensing heads placed in closed moulds or in contact with mould walls (B29C 45/27 takes precedence)}
- B29C 31/042 . . {using dispensing heads, e.g. extruders, placed over or apart from the moulds (positioning extruded preforms on conveyers B29C 31/085)}
- B29C 31/044 . . . {with moving heads for distributing liquid or viscous material into the moulds}
- B29C 31/045 {moving along predetermined circuits or distributing the material according to predetermined patterns}
- B29C 31/047 . . . {combined with moving moulds (B29C 31/044, B29C 31/048 take precedence)}
- B29C 31/048 . . . {the material being severed at the dispensing head exit, e.g. as ring, drop or gob, and transported immediately into the mould, e.g. by gravity}
- B29C 31/06 . . in measured doses, {e.g. by weighting (feeding mixers with measured doses B01F 15/0216, B01F 15/0454, B29B 7/24, B29B 7/603; in general G01F)}
- B29C 31/061 . . . {using stationary volumetric measuring chambers}
- B29C 31/063 {of the piston type}
- B29C 31/065 . . . {using volumetric measuring chambers moving between a charging station and a discharge station}
- B29C 31/066 {using feed frames, e.g. for dry material}
- B29C 31/068 {of the piston type}
- B29C 31/08 . . of preforms {to be moulded, e.g. tablets, fibre reinforced preforms, extruded ribbons, tubes or profiles; Manipulating means specially adapted for feeding preforms, e.g. supports conveyers (B29C 31/066, B29C 37/001, B29C 43/085 take precedence)}

NOTE

Documents describing feeding preforms, e.g. parisons, tubes, sheets in connection with shaping techniques described in groups B29C 49/00 to B29C 65/00 are not classified in group B29C 31/08, but in the relevant groups of these techniques

- B29C 31/085 . . . {combined with positioning the preforms according to predetermined patterns, e.g. positioning extruded preforms on conveyers (B29C 70/30 takes precedence; for building tyres B29D 30/08)}
- B29C 31/10 . . of several materials

B29C 33/00**Moulds or cores; Details thereof or accessories therefor**

- B29C 2033/0005 . {with transparent parts, e.g. permitting visual inspection of the interior of the cavity}
- B29C 33/0011 . {thin-walled moulds}
- B29C 33/0016 . . {Lost moulds, e.g. staying on the moulded object (flexible bags without particular shape filled with expandable material B29C 44/182; single use mandrels for winding and forming B29C 53/822)}
- B29C 33/0022 . {Multi-cavity moulds (B29C 33/301 takes precedence)}

- B29C 33/0027 . . {with deep narrow cavities, e.g. for making piles (non-woven pile fabrics [D04H 11/00](#))}
- B29C 33/0033 . {constructed for making articles provided with holes}
- NOTE**
If the hole is made by cutting means associated with the mould, see the relevant moulding technique
- B29C 33/0038 . {with sealing means or the like (seals on envelopes used in tyre retreading [B29D 30/542](#); for injection moulding footwear [B29D 35/0045](#))}
- B29C 33/0044 . . {for sealing off parts of inserts projecting into the mould cavity}
- B29C 33/005 . {characterised by the location of the parting line of the mould parts}
- B29C 33/0055 . {with incorporated overflow cavities (in particular in injection moulds [B29C 45/2669](#))}
- B29C 33/0061 . {characterised by the configuration of the material feeding channel (sprue channels for injection moulding [B29C 45/27](#))}
- B29C 33/0066 . . {with a subdivided channel for feeding the material to a plurality of locations}
- B29C 33/0072 . . {with a configuration promoting turbulency, e.g. for after-mixing in the mould}
- B29C 33/0077 . {characterised by the configuration of the mould filling gate (mixing chambers situated in the mould opening [B29B 7/7471](#)); accessories for connecting the mould filling gate with the filling spout}
- B29C 33/0083 . {Electrical or fluid connection systems therefor}
- B29C 33/0088 . {Multi-face stack moulds}
- B29C 2033/0094 . {Means for masking a part of the moulding surface}
- B29C 33/02 . with incorporated heating or cooling means
- B29C 2033/023 . . {Thermal insulation of moulds or mould parts}
- B29C 33/026 . . {in rolls, calenders or drums}
- B29C 33/04 . . using liquids, gas or steam {(tyre moulds with incorporated heating or cooling means using liquids, gas or steam [B29D 30/0601](#))}
- B29C 2033/042 . . . {Meander or zig-zag shaped cooling channels, i.e. continuous cooling channels whereby a plurality of cooling channel sections are oriented in a substantial parallel direction}
- B29C 33/044 . . . {in rolls calenders or drums}
- B29C 33/046 . . . {using gas}
- B29C 33/048 . . . {using steam}
- B29C 33/06 . . using radiation, {e.g. electro-magnetic waves, induction heating}
- B29C 33/065 . . . {in rolls, calenders or drums}
- B29C 33/08 . . for dielectric heating
- B29C 33/085 . . . {using rolls, calenders or drums}
- B29C 33/10 . with incorporated venting means
- B29C 33/12 . with incorporated means for positioning inserts, e.g. labels {(positioning reinforcements [B29C 70/541](#))}
- B29C 33/123 . . {for centering the inserts}
- B29C 33/126 . . . {using centering means forming part of the insert}

- B29C 33/14 . . . against the mould wall
- B29C 33/16 using magnetic means
- B29C 33/18 using vacuum
- B29C 33/20 . Opening, closing or clamping
- B29C 33/202 . . {Clamping means operating on closed or nearly closed mould parts, the clamping means being independently movable of the opening or closing means (clamping devices for injection moulding machines [B29C 45/64](#))}
- B29C 2033/205 {mould clamping by membranes e.g. inflatable membranes or cushions}
- B29C 2033/207 {mould clamping by pivoting members}
- B29C 33/22 . . by rectilinear movement
- B29C 33/24 using hydraulic or pneumatic means
- B29C 33/26 . . by pivotal movement
- B29C 33/28 using hydraulic or pneumatic means
- B29C 33/30 . Mounting, exchanging or centering {(moulds, mould parts or cores; [B29C 33/485](#) takes precedence)}
- B29C 33/301 . . {Modular mould systems [MMS], i.e. moulds built up by stacking mould elements, e.g. plates, blocks, rods ([B29C 33/0088](#) takes precedence)}
- B29C 33/302 {Assembling a large number of mould elements to constitute one cavity}
- B29C 33/303 . . {centering mould parts or halves, e.g. during mounting}
- B29C 33/304 {centering cores}
- B29C 33/305 . . {Mounting of moulds or mould support plates (handling of moulds [B29C 31/006](#); mounting of moulds for injection moulding [B29C 45/1742](#))}
- B29C 33/306 . . {Exchangeable mould parts, e.g. cassette moulds, mould inserts (moulds with exchangeable mould parts for injection moulding [B29C 45/2673](#); mounting of exchangeable mould inserts for injection moulding [B29C 45/2675](#))}
- B29C 33/307 . . {Mould plates mounted on frames; Mounting the mould plates; Frame constructions therefor (shaping plates for making moulds [B29C 33/3842](#); thin walled moulds [B29C 33/0011](#))}
- B29C 33/308 . . {Adjustable moulds (for injection moulding [B29C 45/376](#))}
- B29C 33/32 . . using magnetic means
- B29C 33/34 . movable, e.g. to or from the moulding station
- B29C 33/36 . . continuously movable {in one direction, e.g. in a closed circuit ([B29C 49/0021](#) takes precedence)}
- B29C 33/38 . characterised by the material or the manufacturing process ([B29C 33/44](#) takes precedence; manufacture of moulds or parts thereof from metal [B22](#), [B23](#))}
- B29C 33/3807 . . {Resin-bonded materials, e.g. inorganic particles}
- B29C 33/3814 . . {Porous moulds (adapted for vacuum forming [B29C 51/365](#))}
- B29C 33/3821 . . {composed of particles enclosed in a bag}
- B29C 33/3828 . . {Moulds made of at least two different materials having different thermal conductivities}
- B29C 33/3835 . . {Designing moulds, e.g. using CAD-CAM}
- B29C 33/3842 . . {Manufacturing moulds, e.g. shaping the mould surface by machining}

- B29C 2033/385 . . . {by laminating a plurality of layers (moulds built up by stacking mould elements, e.g. plates, blocks, rods, in general [B29C 33/301](#), tyre moulds made of a plurality of laminations [B29D 2030/0609](#))}
- B29C 33/3857 . . . {by making impressions of one or more parts of models, e.g. shaped articles and including possible subsequent assembly of the parts}
- B29C 2033/3864 {Spraying at least one layer to create the mould}
- B29C 2033/3871 {the models being organic material, e.g. living or dead bodies or parts thereof}
- B29C 33/3878 {used as masters for making successive impressions}
- B29C 33/3885 {the mould parts being co-operating impressions}
- B29C 33/3892 {Preparation of the model, e.g. by assembling parts}
- B29C 33/40 . . . Plastics, e.g. foam, rubber
- B29C 33/405 . . . {Elastomers, e.g. rubber ([B29C 33/50](#) takes precedence)}
- B29C 33/42 . . . characterised by the shape of the moulding surface, e.g. ribs, grooves
- B29C 2033/422 . . . {Moulding surfaces provided with a shape to promote flow of material in the mould cavity}
- B29C 33/424 . . . {Moulding surfaces provided with means for marking or patterning (for injection moulding [B29C 45/372](#))}
- B29C 2033/426 {Stampers}
- B29C 33/428 {For altering indicia, e.g. data, numbers (for injection moulding [B29C 45/374](#))}
- B29C 33/44 . . . with means for , or specially constructed to facilitate, the removal of articles, e.g. of undercut articles
- B29C 33/442 . . . {with mechanical ejector or drive means therefor}
- B29C 33/444 {for stripping articles from a mould core, e.g. using stripper plates}
- B29C 33/446 {and using a rotating movement to unscrew articles (in particular in injection moulds [B29C 45/262](#))}
- B29C 33/448 . . . {destructible ([B29C 33/52](#) takes precedence; in particular used in injection moulding [B29C 45/4457](#))}
- B29C 33/46 . . . using fluid pressure
- B29C 33/48 . . . with means for collapsing or disassembling
- B29C 33/485 {cores or mandrels (collapsible mandrels for shaping tube ends [B29C 57/02](#); collapsible mandrels for winding and joining [B29C 53/824](#))}
- B29C 33/50 elastic {or flexible (for isostatic pressing [B29C 43/3642](#))}
- B29C 33/505 {cores or mandrels, e.g. inflatable ([B29C 33/0016](#) takes precedence; for winding and joining [B29C 53/824](#); for supporting articles during joining [B29C 66/634](#); flexible cores for vulcanizing tyres [B29D 30/0654](#))}
- B29C 33/52 . . . soluble or fusible {(in particular used in injection moulding [B29C 45/4457](#))}
- B29C 2033/525 {Cores made of frozen liquids, e.g. ice}
- B29C 33/54 . . . made of powdered or granular material
- B29C 33/56 . . . Coatings, {e.g. enamelled, galvanised}; Releasing, lubricating or separating agents {(in-mould coating [B29C 37/0028](#); using or applying separating agents [B29C 37/0067](#))}
- B29C 33/565 . . . {Consisting of shell-like structures supported by backing material}

- B29C 33/58 . . Applying the releasing agents
- B29C 33/60 . . Releasing, lubricating or separating agents {(in general [C10M](#))}
- B29C 33/62 . . . based on polymers or oligomers
- B29C 33/64 Silicone
- B29C 33/66 Cellulose; Derivatives thereof
- B29C 33/68 . . Release sheets
- B29C 33/70 . Maintenance
- B29C 2033/705 . . {Mould inspection means, e.g. cameras}
- B29C 33/72 . . Cleaning {(extruder parts [B29C 47/0877](#); in general [B08B 7/00](#))}
- B29C 33/722 . . . {Compositions for cleaning moulds}
- B29C 2033/725 . . . {cleaning by plasma treatment}
- B29C 2033/727 . . . {cleaning during moulding}
- B29C 33/74 . . Repairing
- B29C 33/76 . Cores ([B29C 33/02](#) to [B29C 33/70](#), {[B29C 41/40](#), [B29C 53/74](#), [B29C 53/82](#)} take precedence)

B29C 35/00 Heating, cooling or curing, e.g. crosslinking, vulcanising; Apparatus therefor (moulds with incorporated heating or cooling means [B29C 33/02](#); {thermal after-treatment of shaped articles [B29C 71/02](#)} ; curing devices for plastic dental prostheses [A61C 13/14](#); before moulding [B29B 13/00](#); Chemical aspects [C08J 3/00](#))

- B29C 35/002 . {Component parts, details or accessories; Auxiliary operations}
- B29C 2035/005 . . {Enveloping the material to be cured, e.g. by helically winding a film around the material}
- B29C 35/007 . {Tempering units for temperature control of moulds or cores, e.g. comprising heat exchangers, controlled valves, temperature-controlled circuits for fluids ([B29C 35/0294](#) takes precedence)}
- B29C 35/02 . Heating or curing, e.g. crosslinking, vulcanising {during moulding, e.g. in a mould} (coldvulcanisation [B29C 35/18](#); {vulcanising tyres, presses therefor [B29D 30/0601](#)})
- B29C 2035/0205 . . {Not used}
- B29C 2035/0211 . . . {resistance heating ([B29C 2035/0811](#) takes precedence)}
- B29C 2035/0216 . . . {using Peltier-effect}
- B29C 35/0222 . . {the curing continuing after removal from the mould ([B29C 35/0233](#) takes precedence)}
- B29C 35/0227 . . {using pressure vessels, e.g. autoclaves, vulcanising pans ([B29C 35/065](#) takes precedence)}
- B29C 35/0233 . . . {the curing continuing after removal from the mould}
- B29C 35/0238 . . . {Presses provided with pressure vessels, e.g. steam chambers}
- B29C 35/0244 . . {using fluidised bed}
- B29C 35/025 . . . {for articles of indefinite length}
- B29C 35/0255 . . {using friction}
- B29C 35/0261 . . {using ultrasonic or sonic vibrations}
- B29C 35/0266 . . {Local curing (for repairing [B29C 73/34](#))}

- B29C 35/0272 . . {using lost heating elements, i.e. heating means incorporated and remaining in the formed article (for preforms with internal stresses [B29C 61/0625](#); joining using lost heating elements [B29C 65/34](#); making electrically conductive articles [B29C 70/882](#))}
- B29C 35/0277 . . {Apparatus with continuous transport of the material to be cured ([B29C 35/025](#), [B29C 35/06](#), [B29C 35/10](#), [B29C 35/14](#) take precedence)}
- B29C 2035/0283 . . {Thermal pretreatment of the plastics material (thermal after-treatment [B29C 71/02](#))}
- B29C 35/0288 . . {Controlling heating or curing of polymers during moulding, e.g. by measuring temperatures or properties of the polymer and regulating the process (controlling or regulating chemical, physical or physico- chemical processes in general [B01J 19/0006](#))}
- B29C 35/0294 . . . {using tempering units for temperature control of moulds or cores}
- B29C 35/04 . . using liquids, gas or steam
- B29C 35/041 . . . {using liquids}
- B29C 2035/042 {other than water}
- B29C 2035/043 {oil}
- B29C 2035/044 {mercury}
- B29C 35/045 . . . {using gas or flames}
- B29C 2035/046 {dried air}
- B29C 2035/047 {other than air}
- B29C 2035/048 {inert gas}
- B29C 35/049 . . . {using steam or damp}
- B29C 35/06 . . . for articles of indefinite length
- B29C 35/065 {in long tubular vessels}
- B29C 35/08 . . by wave energy or particle radiation {([B29C 67/0051](#), [B29C 71/04](#) take precedence)}
- B29C 35/0805 . . . {using electromagnetic radiation}
- B29C 2035/0811 {using induction}
- B29C 2035/0816 {using eddy currents}
- B29C 2035/0822 {using IR radiation}
- B29C 2035/0827 {using UV radiation}
- B29C 2035/0833 {using actinic light}
- B29C 2035/0838 {using laser}
- B29C 2035/0844 {using X-ray}
- B29C 2035/085 {using gamma-ray}
- B29C 2035/0855 {using micro-wave}
- B29C 2035/0861 {using radio frequency}
- B29C 35/0866 . . . {using particle radiation}
- B29C 2035/0872 {using ion-radiation e.g. alpha-rays}
- B29C 2035/0877 {using electron radiation e.g. beta-rays}
- B29C 2035/0883 {using neutron radiation}

- B29C 35/0888 . . . {using transparant moulds}
- B29C 35/0894 {provided with masks or diaphragms}
- B29C 35/10 . . . for articles of indefinite length
- B29C 35/12 . . Dielectric heating
- B29C 35/14 . . . for articles of indefinite length
- B29C 35/16 . Cooling {(cooling extruded material [B29C 47/8815](#); cooling preforms for blow moulding [B29C 49/6427](#); cooling blown articles [B29C 49/66](#); cooling tyres during post cure inflation [B29D 30/0643](#))}
- B29C 2035/1608 . . {using Peltier-effect}
- B29C 2035/1616 . . {using liquids}
- B29C 2035/1625 . . . {other than water}
- B29C 2035/1633 {oil}
- B29C 2035/1641 {mercury}
- B29C 2035/165 {liquified gases}
- B29C 2035/1658 . . {using gas}
- B29C 2035/1666 . . . {dried air}
- B29C 2035/1675 . . . {other than air}
- B29C 2035/1683 {inert gas}
- B29C 2035/1691 . . {using gas-liquid mixtures}
- B29C 35/18 . Cold vulcanisation

B29C 37/00 **Component parts, details, accessories or auxiliary operations, not covered by group [B29C 33/00](#) or [B29C 35/00](#)**

- B29C 37/0003 . {Discharging moulded articles from the mould (constructions for removing the articles [B29C 33/44](#))}
- B29C 37/0007 . . {using means operable from outside the mould for moving between mould parts, e.g. robots}
- B29C 37/001 . . . {combined with means for loading preforms to be moulded or inserts, e.g. preformed layers}
- B29C 37/0014 . . {by flexibly or permanently deforming undercut portions of the articles}
- B29C 37/0017 . . {by stripping articles from mould cores}
- B29C 37/0021 . . . {and using a rotating movement to unscrew articles (in particular used in injection moulding [B29C 45/178](#))}
- B29C 37/0025 . {Applying surface layers, e.g. coatings, decorative layers, printed layers, to articles during shaping, e.g. in-mould printing (moulding on preformed layers as inserts [B29C 70/68](#); applying fluent material to surfaces in general [B05](#))}
- B29C 37/0028 . . {In-mould coating, e.g. by introducing the coating material into the mould after forming the article}
- B29C 37/0032 . . . {the coating being applied upon the mould surface before introducing the moulding compound , e.g. applying a gelcoat ([B29C 44/14](#) and [B29C 44/32](#) take precedence)}
- B29C 2037/0035 . . . {the coating being applied as liquid, gel, paste or the like}
- B29C 2037/0039 . . . {the coating being applied in powder or particle form}
- B29C 2037/0042 . . . {the coating being applied in solid sheet form, e.g. as meltable sheet}

- B29C 2037/0046 . . . {In-mould printing, in-mould transfer printing}
- B29C 37/005 . {Compensating volume or shape change during moulding, in general}
- B29C 37/0053 . {Moulding articles characterised by the shape of the surface, e.g. ribs, high polish (mould construction therefor [B29C 33/42](#); surface shaping of articles [B29C 59/00](#); by incorporating filler in or near the surface [B29C 70/64](#))}
- B29C 37/0057 . . {Moulding single grooves or ribs, e.g. tear lines (folding lines [B29C 53/06](#))}
- B29C 37/006 . {Degassing moulding material or draining off gas during moulding (venting means in moulds [B29C 33/10](#))}
- B29C 37/0064 . . {of reinforced material}
- B29C 37/0067 . {Using separating agents during or after moulding; Applying separating agents on preforms or articles, e.g. to prevent sticking to each other (separating agents [B29C 33/60](#))}
- B29C 37/0071 . . {Dusting machines}
- B29C 37/0075 . . {using release sheets}
- B29C 37/0078 . {Measures or configurations for obtaining anchoring effects in the contact areas between layers (surface shaping [B29C 59/00](#); [B29C 66/02](#) takes precedence)}
- B29C 37/0082 . . {Mechanical anchoring ([B29C 66/303](#) takes precedence)}
- B29C 37/0085 . . . {by means of openings in the layers (joining through openings [B29C 66/304](#))}
- B29C 37/0089 . {Sealing devices placed between articles and treatment installations during moulding or shaping, e.g. sealing off the entrance or exit of ovens or irradiation rooms, connections between rooms at different pressures}
- B29C 37/0092 . {Drying moulded articles or half products, e.g. preforms, during or after moulding or cooling}
- B29C 37/0096 . {Trouble-shooting during starting or stopping moulding or shaping apparatus ([B29C 66/872](#) takes precedence)}
- B29C 37/02 . Deburring or deflashing (by grinding or polishing [B24B](#) {; thermal deburring in general [B23D 79/005](#))}
- B29C 37/04 . . of welded articles, e.g. deburring or deflashing in combination with welding {(shaping the burr [B29C 66/32](#))}

NOTE

Attention is drawn to Note (3) following the subclass title.

- B29C 2037/80 . {Identifying, e.g. coding, dating, marking, numbering}
- B29C 2037/90 . {Measuring, controlling or regulating}
- B29C 2037/903 . . {by means of a computer}
- B29C 2037/906 . . {using visualisation means or linked accessories, e.g. screens, printers}
- B29C 2037/92 . {Lubricating}
- B29C 2037/94 . {Safety devices}
- B29C 2037/96 . {Filters}

Particular shaping techniques, e.g. moulding, joining; Apparatus therefor

- B29C 39/00** **Shaping by casting, i.e. introducing the moulding material into a mould or between confining surfaces without significant moulding pressure; Apparatus therefor ([B29C 41/00](#) takes precedence)**
- B29C 39/003** . {characterised by the choice of material}
- NOTE**
- When classifying in this group, it is desirable to add the indexing codes of subclass [B29K](#) to identify the moulding materials and their properties. Documents concerning the choice of moulding materials having a particular influence on the moulding technique should be classified in this group if of interest
- B29C 39/006** . . {Monomers or prepolymers (by reaction injection moulding [B29C 67/246](#))}
- B29C 39/02** . for making articles of definite length, i.e. discrete articles
- B29C 39/021** . . {by casting in several steps}
- B29C 39/023** . . . {for making multicoloured articles}
- B29C 39/025** . . . {for making multilayered articles}
- B29C 39/026** . . {characterised by the shape of the surface}
- B29C 39/028** . . {having an axis of symmetry}
- B29C 39/04** . . using movable moulds ([B29C 41/02](#) takes precedence) {not applied}
- B29C 39/06** . . . continuously movable, e.g. along a production line
- B29C 39/08** . . . Introducing the material into the mould by centrifugal force
- B29C 39/10** . . incorporating preformed parts or layers, e.g. casting around inserts or for coating articles {(coating a surface by casting in general [B05D 1/30](#), [B29C 39/126](#) takes precedence)}
- B29C 39/12** . . Making multilayered or multicoloured articles {([B29C 39/021](#) takes precedence)}
- B29C 39/123** . . . {Making multilayered articles}
- B29C 39/126** {by casting between two preformed layers, e.g. deformable layers (between two glass layers [B32B 17/10917](#))}
- B29C 39/14** . for making articles of indefinite length {(by depositing material on a substrate and stripping off the shaped article [B29C 41/24](#))}
- B29C 39/142** . . {by casting in several steps}
- B29C 39/144** . . . {for making multicoloured articles}
- B29C 39/146** . . . {for making multilayered articles}
- B29C 39/148** . . {characterised by the shape of the surface}
- B29C 39/16** . . between endless belts
- B29C 39/18** . . incorporating preformed parts or layers, e.g. casting around inserts or for coating articles {([B29C 39/206](#) takes precedence)}
- B29C 39/20** . . Making multilayered or multicoloured articles {([B29C 39/142](#) takes precedence)}
- B29C 39/203** . . . {Making multilayered articles}

- B29C 39/206 {by casting between two preformed layers, e.g. deformable layers}
- B29C 39/22 . Component parts, details or accessories; Auxiliary operations
- B29C 39/24 . . Feeding the material into the mould
- B29C 39/26 . . Moulds or cores
- B29C 39/265 . . . {comprising two large plates positioned at a small distance from each other, e.g. for making panels}
- B29C 39/28 . . . with means to avoid flashes {(B29C 39/30 takes precedence)}
- B29C 39/30 . . . with means for cutting the article
- B29C 39/32 . . . with joints or the like for making the mould impervious
- B29C 39/34 . . . for undercut articles
- B29C 39/36 . . Removing moulded articles
- B29C 39/38 . . Heating or cooling
- B29C 39/40 . . Compensating volume change, e.g. retraction {(in general B29C 37/005)}
- B29C 39/405 . . . {by applying pressure to the casting composition}
- B29C 39/42 . . Casting under special conditions, e.g. vacuum
- B29C 39/44 . . Measuring, controlling or regulating

B29C 41/00 **Shaping by coating a mould, core or other substrate, i.e. by depositing material and stripping-off the shaped article; Apparatus therefor** (with compacting pressure B29C 43/00; {by lay-up of reinforcement of substantial or continuous length B29C 70/30})

- B29C 41/003 . {characterised by the choice of material}

NOTE

When classifying in this group, it is desirable to add the indexing codes of subclass B29K to identify the moulding materials and their properties. Documents concerning the choice of moulding materials having a particular influence on the moulding technique should be classified in this group if of interest

- B29C 41/006 . {using an electrostatic field for applying the material}
- B29C 41/02 . for making articles of definite length, i.e. discrete articles
- B29C 41/025 . . {having hollow walls}
- B29C 41/04 . . Rotational or centrifugal casting, i.e. coating the inside of a mould by rotating the mould
- B29C 41/042 . . . {by rotating a mould around its axis of symmetry (for concrete B28B 21/30)}
- B29C 41/045 {the axis being placed vertically, e.g. spin casting}
- B29C 41/047 {the mould cavity lying totally outside the axis, e.g. toroidal moulds}
- B29C 41/06 . . . about two or more axes
- B29C 41/08 . . Coating a former, core or other substrate by spraying or fluidisation, e.g. spraying powder {(spray-up of reinforcing fibres B29C 70/305)}
- B29C 41/085 . . . {by rotating the former around its axis of symmetry}
- B29C 41/10 . . . by fluidisation
- B29C 41/12 . . Spreading-out the material on a substrate {e.g. on the surface of a liquid}

- B29C 41/14 . . Dipping a core {(B29C 41/10 takes precedence)}
- B29C 41/16 . . Slip casting, i.e. applying a slip or slurry on a perforated or porous or absorbent surface with the liquid being drained away
- B29C 41/18 . . Slush casting, i.e. pouring moulding material into a hollow mould with excess material being poured off
- B29C 41/20 . . incorporating preformed parts or layers, e.g. moulding inserts or for coating articles
- B29C 41/22 . . Making multilayered or multicoloured articles
- B29C 41/24 . for making articles of indefinite length
- B29C 41/26 . . by depositing flowable material on a rotating drum
- B29C 41/265 . . . {on the inside of the drum}
- B29C 41/28 . . by depositing flowable material on an endless belt
- B29C 41/30 . . incorporating preformed parts or layers, e.g. moulding around inserts or for coating articles
- B29C 41/32 . . Making multilayered or multicoloured articles
- B29C 41/34 . Component parts, details or accessories; Auxiliary operations
- B29C 41/36 . . Feeding the material on to the mould, core or other substrate
- B29C 41/365 . . . {Construction of spray-up equipment e.g. spray-up guns (spraying apparatus in general B05B)}
- B29C 41/38 . . Moulds, cores or other substrates
- B29C 41/383 . . . {with means for cutting the article}
- B29C 41/386 . . . {for undercut articles}
- B29C 41/40 . . . Cores
- B29C 41/42 . . Removing articles from moulds, cores or other substrates {(B29C 33/444 and B29C 37/0017 take precedence)}
- B29C 41/44 . . . Articles of indefinite length
- B29C 41/46 . . Heating or cooling
- B29C 41/48 . . Compensating volume change, e.g. retraction
- B29C 41/50 . . Shaping under special conditions, e.g. vacuum
- B29C 41/52 . . Measuring, controlling or regulating

- B29C 43/00** **Compression moulding, i.e. applying external pressure to flow the moulding material; Apparatus therefor** ({by liberation of internal stresses B29C 61/006} ; shaping or impregnating by compression composites comprising reinforcements other than fibres of short length [B29C 70/12]; presses in general B30B)
- B29C 43/003 . {characterised by the choice of material}
- NOTE**

When classifying in this group, it is desirable to add the indexing codes of subclass B29K to identify the moulding materials and their properties. Documents concerning the choice of moulding materials having a particular influence on the moulding technique should be classified in this group if of interest
- B29C 43/006 . {Pressing and sintering powders, granules or fibres}

- B29C 43/02 . of articles of definite length, i.e. discrete articles {(B29C 35/0227 takes precedence)}
- B29C 43/021 . . {characterised by the shape of the surface}
- B29C 2043/022 . . . {having locally depressed lines, e.g. hinges (single grooves B29C 37/0057; folding lines B29C 53/06; parting line of the mould parts B29C 33/005)}
- B29C 2043/023 . . . {having a plurality of grooves}
- B29C 2043/024 {forming a threaded surface}
- B29C 2043/025 {forming a micro structure, i.e. fine patterning}
- B29C 2043/026 . . . {having functional projections, e.g. fasteners}
- B29C 43/027 . . {having an axis of symmetry (B29C 43/102 takes precedence)}
- B29C 2043/028 . . . {using radial compression}
- B29C 2043/029 . . . {using axial compression along a longitudinal axis}
- B29C 43/04 . . using movable moulds
- B29C 2043/043 . . . {rotating on their own axis without linear displacement}
- B29C 2043/046 . . . {travelling between different stations, e.g. feeding, moulding, curing stations}
- B29C 43/06 . . . continuously movable {in one direction, e.g. mounted on chains, belts}
- B29C 43/08 with circular movement {e.g. mounted on rolls, turntables}
- B29C 43/085 {and material fed in a continuous form, e.g. as a band}
- B29C 43/10 . . Isostatic pressing, i.e. using non-rigid pressure-exerting members against rigid parts or dies {(in general B30B 11/001)}
- B29C 43/102 . . . {using rigid mould parts specially adapted for moulding articles having an axis of symmetry}
- B29C 43/104 {the mould cavity lying totally outside the axis of symmetry e.g. toroidal moulds}
- B29C 2043/106 . . . {using powder material}
- B29C 2043/108 . . . {using deformable metals, e.g. flowable metals, low melting point eutectic metals, liquified metals}
- B29C 43/12 . . . using bags surrounding the moulding material {or using membranes contacting the moulding material (B29C 70/44 takes precedence; flexible cores for vulcanizing tyres B29D 30/0654)}
- B29C 43/14 . . in several steps
- B29C 2043/141 . . . {for making single layer articles (for indefinite articles B29C 43/26)}
- B29C 2043/142 {by moving a single mould or the article progressively, i.e. portionwise}
- B29C 2043/143 {stepwise in a vertical direction, i.e. each time modifying the thickness}
- B29C 2043/144 {using different moulds, i.e. the layer is compressed in consecutive steps by using different moulds for each portion of the article}
- B29C 43/145 . . . {for making multicoloured articles}
- B29C 43/146 . . . {for making multilayered articles}
- B29C 2043/147 {by compressing after the laying of further material}
- B29C 2043/148 {using different moulds}
- B29C 43/16 . . Forging

- B29C 43/18 . . incorporating preformed parts or layers, e.g. compression moulding around inserts or for coating articles {(B29C 43/206 takes precedence)}
- B29C 2043/181 . . . {encapsulated (outsert moulding B29C 70/74)}
- B29C 2043/182 {completely (completely encapsulating inserts B29C 70/70)}
- B29C 43/183 . . . {the preformed layer being a lining, e.g. shaped in the mould before compression moulding, or a preformed shell adapted to the shape of the mould}
- B29C 43/184 {shaped by the compression of the material during moulding}
- B29C 2043/185 . . . {using adhesives (joining using adhesives B29C 65/48)}
- B29C 2043/186 {hot-melt or heat activated adhesives (applying molten plastics B29C 65/40; joining using adhesives B29C 65/48)}
- B29C 2043/187 {pressure activated or pressure sensitive adhesives}
- B29C 2043/188 {thermosetting adhesives, e.g. polyurethane adhesives (joining by heating B29C 65/02)}
- B29C 2043/189 . . . {the parts being joined}
- B29C 43/20 . . Making multilayered or multicoloured articles {(B29C 43/14 takes precedence)}
- B29C 43/203 . . . {Making multilayered articles}
- B29C 43/206 {by pressing the material between two preformed layers, e.g. deformable layers}
- B29C 43/22 . . of articles of indefinite length {(for articles with reinforcements of substantial or continuous length B29C 70/50)}
- B29C 43/222 . . {characterised by the shape of the surface}
- B29C 43/224 . . {having a profiled section, e.g. tubes, rods}
- B29C 43/226 . . . {having a corrugated section}
- B29C 43/228 . . {using endless belts feeding the material between non-rotating pressure members e.g. vibrating pressure members}
- B29C 43/24 . . Calendering
- B29C 43/245 . . . {Adjusting calender parameters, e.g. bank quantity}
- B29C 43/26 . . in several steps (B29C 43/30 takes precedence {not applied})
- B29C 43/265 . . . {for making multilayered articles}
- B29C 43/28 . . incorporating preformed parts or layers, e.g. compression moulding around inserts or for coating articles
- B29C 43/30 . . Making multilayered or multicoloured articles {(B29C 43/26 takes precedence)}
- B29C 43/305 . . . {Making multilayered articles}
- B29C 43/32 . . Component parts, details or accessories; Auxiliary operations
- B29C 2043/3205 . . {particular pressure exerting means for making definite articles (B29C 43/36 takes precedence)}
- B29C 2043/3211 . . . {magnets}
- B29C 2043/3216 . . . {deformable nets, meshes, lattices or fabrics, e.g. tubular ones}
- B29C 2043/3222 . . . {pressurized gas, e.g. air}
- B29C 2043/3227 {inside the material, e.g. gas injection compression moulding}

- B29C 2043/3233 {exerting pressure on mould parts}
- B29C 2043/3238 . . . {pressurized liquid acting directly or indirectly on the material to be formed}
- B29C 2043/3244 . . . {retraction of an expanded member}
- B29C 2043/325 . . . {screws}
- B29C 2043/3255 . . . {springs}
- B29C 2043/3261 . . . {thermal expansion}
- B29C 2043/3266 . . . {vibrating tool means}
- B29C 2043/3272 . . {driving means}
- B29C 2043/3277 . . . {for rotatable supports, e.g. carousels, drums}
- B29C 2043/3283 . . . {for moving moulds or mould parts}
- B29C 2043/3288 {using cam drives}
- B29C 2043/3294 {using screw drives}
- B29C 43/34 . . Feeding the material to the mould or the compression means {(B29C 43/085 takes precedence)}
- B29C 2043/3405 . . . {using carrying means}
- B29C 2043/3411 {mounted onto arms, e.g. grippers, fingers, clamping frame, suction means}
- B29C 2043/3416 {conveyor belts}
- B29C 2043/3422 {rollers}
- B29C 2043/3427 {hopper, vessel, chute, tube, conveying screw, for material in discrete form, e.g. particles, powder, fibres (dispensing from vessels B29C 31/02)}
- B29C 2043/3433 . . . {using dispensing heads, e.g. extruders, placed over or apart from the moulds (feeding using dispensing heads B29C 31/042; applying fluent material for coatings B05D 1/26; extrusion coating B05D 1/265)}
- B29C 2043/3438 {moving during dispensing over the moulds, e.g. laying up (feeding using moving dispensing heads B29C 31/044; applying fluent material for coatings B05D 1/26; extrusion coating B05D 1/265)}
- B29C 2043/3444 . . . {using pressurizing feeding means located into the mold, e.g. plungers, pistons (injection-compression moulding B29C 45/561)}
- B29C 2043/345 . . . {using gas, e.g. air, to transport non liquid material}
- B29C 2043/3455 {for particles, powder, fibres, e.g. fluidized or sprayed}
- B29C 2043/3461 {for foils, sheets, gobs, e.g. floated}
- B29C 2043/3466 . . . {using rotating supports, e.g. turntables, drums (in general B29C 31/065; turntables as movable moulds B29C 43/08; feeding materials to moulding presses B30B 15/302; transfer turntables B65G 47/80)}
- B29C 2043/3472 {using star wheels comprising arms (transfer stars B65G 47/84)}
- B29C 2043/3477 . . . {centrally fed, e.g. feeding the material in the center of the mold turntables (turntables as movable moulds B29C 43/08)}
- B29C 2043/3483 . . . {using band or film carriers}
- B29C 2043/3488 . . . {uniformly distributed into the mould}
- B29C 2043/3494 {using vibrating means}
- B29C 43/36 . . Moulds for making articles of definite length, i.e. discrete articles

- B29C 2043/3602 . . . {with means for positioning, fastening or clamping the material to be formed or preforms inside the mould (moulds with incorporated means for positioning inserts [B29C 33/14](#); positioning articles in the mould for injection moulding [B29C 45/14065](#))}
- B29C 2043/3605 {vacuum}
- B29C 43/3607 . . . {with sealing means or the like}
- B29C 43/361 . . . {with pressing members independently movable of the parts for opening or closing the mould, e.g. movable pistons (transfer moulding [B29C 45/02](#); injection-compression moulding [B29C 45/561](#))}
- B29C 2043/3613 {applying pressure locally}
- B29C 2043/3615 {forming elements, e.g. mandrels, rams, stampers, pistons, plungers, punching devices (ram pressing [B30B 11/02](#), [B30B 11/04](#); forming pockets in sheets [B65B 47/04](#); moulding lenses [B29D 11/00413](#))}
- B29C 2043/3618 {plurality of counteracting elements}
- B29C 2043/3621 {a plurality of individual elements acting on the material in the same or different directions, e.g. making tubular T-joints, profiles}
- B29C 2043/3623 {coupled on a support, e.g. plate}
- B29C 2043/3626 {multi-part rams, plungers or mandrels}
- B29C 2043/3628 {moving inside a barrel or container like sleeve}
- B29C 2043/3631 {moving in a frame for pressing and stretching; material being subjected to compressing stretching}
- B29C 2043/3634 {having specific surface shape, e.g. grooves, projections, corrugations}
- B29C 2043/3636 {ultrasonically or sonically vibrating, e.g. sonotrodes}
- B29C 2043/3639 {hand operated (forming pockets or receptacles in or from sheets, blanks, or webs [B65B 47/04](#))}
- B29C 43/3642 . . . {Bags, bleeder sheets or cauls for isostatic pressing (flexible cores for vulcanizing tyres [B29D 30/0654](#))}
- B29C 2043/3644 {vacuum bags and related details e.g. fixing, clamping (vacuum bagging [B29C 70/44](#); flexible pressing means [B30B 5/02](#); membrane press [B30B 9/22](#); applying pressure through membranes [B29C 51/28](#); bladders for making tires [B29D 30/0601](#); vacuum laminating [B32B 37/1018](#))}
- B29C 2043/3647 {membranes, diaphragms (vacuum bagging [B29C 70/44](#); applying pressure through membranes [B29C 51/28](#); bladders for making tires [B29D 30/0601](#); vacuum laminating [B32B 37/1018](#); flexible pressing means [B30B 5/02](#); membrane press [B30B 9/22](#))}
- B29C 2043/3649 {infatable bladders using gas or fluid and related details (vacuum bagging [B29C 70/44](#); flexible moulds [B29C 33/50](#); flexible pressing means [B30B 5/02](#); membrane press [B30B 9/22](#); deep drawing membranes [B29C 51/28](#); bladders for making tires [B29D 30/0601](#); vacuum laminating [B32B 37/1018](#))}
- B29C 2043/3652 {elastic moulds or mould parts, e.g. cores, inserts (isostatic pressing [B29C 43/10](#); moulds in elastomer [B29C 33/405](#); plastic cores [B29C 33/50](#))}
- B29C 2043/3655 {pressure transmitters, e.g. caul plates, pressure pads}

B29C 2043/3657	. . . .	{additional materials, e.g. permeable bleeder or breather sheets, cloths, blankets}
B29C 2043/366	. . .	{plates pressurized by an actuator, e.g. ram drive, screw, vulcanizing presses}
B29C 2043/3663	. . . .	{confined in a chamber}
B29C 2043/3665	. . .	{cores or inserts, e.g. pins, mandrels, sliders}
B29C 2043/3668	. . . .	{destructible or fusible (moulds for making articles with holes B29C 33/0033 ; lost moulds B29C 33/0016 ; fusible cores B29C 33/52 ; making porous articles B22F 3/11)}
B29C 2043/3671	. . .	{preforms constituting part of the cavity mould wall}
B29C 2043/3673	. . . .	{preform constituting a mould half}
B29C 2043/3676	. . .	{moulds mounted on rotating supporting constructions}
B29C 2043/3678	. . . .	{on cylindrical supports with moulds or mould cavities provided on the periphery (rollers for making indefinite articles B29C 43/46 ; turntables presses B30B 11/08 , roller presses B30B 11/006)}
B29C 2043/3681	. . . . .	{opening and closing axially, i.e. parallel to the rotation axis}
B29C 2043/3684	. . . . .	{opening/closing or acting radially, i.e. vertical to the rotation axis}
B29C 2043/3686	. . . . .	{opening and closing tangential to the rotation, i.e. vertical to the rotation axis and vertical to the radius}
B29C 2043/3689	. . . .	{on a support table, flat disk-like tables having moulds on the periphery (press rams on turntables B30B 11/08 , B30B 9/042)}
B29C 2043/3692	. . . . .	{cooperating with non rotating parts}
B29C 2043/3694	. . . .	{on rotating star wheels}
B29C 43/3697	. . .	{comprising rollers or belts cooperating with non-rotating mould parts}
B29C 43/38	. . .	with means to avoid flashes {(B29C 43/40 takes precedence)}
B29C 43/40	. . .	with means for cutting the article
B29C 2043/403	. . . .	{knife blades}
B29C 2043/406	. . . .	{laser cutting means}
B29C 43/42	. . .	for undercut articles
B29C 2043/425	. . . .	{mould parts or sliders being movable independently from the mould halves for making undercut portions (collapsible cores or mandrels B29C 33/485)}
B29C 43/44	. .	Compression means for making articles of indefinite length
B29C 43/46	. . .	Rollers
B29C 2043/461	. . . .	{the rollers having specific surface features}
B29C 2043/462	. . . . .	{smooth surface}
B29C 2043/463	. . . . .	{corrugated, patterned or embossed surface}
B29C 2043/464	. . . . .	{having projections or knives, e.g. for cutting-out or for forming local depressions}
B29C 2043/465	. . . . .	{having one or more cavities e.g. for forming distinct products}
B29C 2043/466	. . . .	{the rollers having specific shape, e.g. non cylindrical rollers, conical rollers}
B29C 2043/467	. . . .	{plurality of rollers arranged in a specific manner in relation to each other (calender configuration B29C 43/24)}

- B29C 2043/468 {take-off rollers, i.e. arranged adjacent a material feeding device (calendering [B29C 43/24](#))}
- B29C 43/48 Endless belts
- B29C 2043/483 {cooperating with a second endless belt, i.e. double band presses}
- B29C 2043/486 {cooperating with rollers or drums}
- B29C 43/50 Removing moulded articles
- B29C 2043/5007 {using cores, i.e. the cores forming part of the mould cavity}
- B29C 2043/5015 {having undercuts or being threaded (using a rotating movement to unscrew articles [B29C 33/446](#))}
- B29C 2043/5023 {moving away (collapsible cores or mandrels [B29C 33/485](#))}
- B29C 2043/503 {using ejector pins, rods}
- B29C 2043/5038 {having an annular or tubular shape}
- B29C 2043/5046 {using vacuum}
- B29C 2043/5053 {using pressurised gas, e.g. air}
- B29C 2043/5061 {using means movable from outside the mould between mould parts}
- B29C 2043/5069 {take-off members or carriers for the moulded articles, e.g. grippers}
- B29C 2043/5076 {using belts}
- B29C 2043/5084 {using rotary devices, e.g. turntables, carousels (blow moulding machines [B29C 49/36](#), [B29C 49/4205](#))}
- B29C 2043/5092 {using vibrations means}
- B29C 43/52 Heating or cooling
- B29C 2043/522 {selectively heating a part of the mould to achieve partial heating, differential heating}
- B29C 2043/525 {at predetermined points for local melting, curing or bonding}
- B29C 2043/527 {selectively cooling, e.g. locally, on the surface of the material}
- B29C 43/54 Compensating volume change, e.g. retraction
- B29C 43/56 Compression moulding under special conditions, e.g. vacuum
- B29C 2043/561 {under vacuum conditions (vacuum laminating [B32B 37/1018](#))}
- B29C 2043/562 {combined with isostatic pressure, e.g. pressurising fluids, gases}
- B29C 2043/563 {combined with mechanical pressure, i.e. mould plates, rams, stampers}
- B29C 2043/565 {in a clean sterile environment, e.g. to avoid contamination}
- B29C 2043/566 {in a specific gas atmosphere, with or without pressure}
- B29C 2043/567 {in a liquid, i.e. the moulded parts being embedded in liquid}
- B29C 2043/568 {in a magnetic or electric field}
- B29C 43/58 Measuring, controlling or regulating {(for bank adjustment in calendering [B29C 43/245](#))}
- B29C 2043/5808 {pressure or compressing force}
- B29C 2043/5816 {temperature}
- B29C 2043/5825 {dimensions or shape, e.g. size, thickness}
- B29C 2043/5833 {movement of moulds or mould parts, e.g. opening or closing, actuating}

- B29C 2043/5841 {for accomodating variation in mould spacing or cavity volume during moulding ([compensating shrinkage B29C 43/54](#))}
- B29C 2043/585 . . . {detecting defects, e.g. foreign matter between the moulds, inaccurate position, breakage}
- B29C 2043/5858 {for preventing tilting of movable mould plate during closing or clamping}
- B29C 2043/5866 . . . {ejection of moulded articles}
- B29C 2043/5875 . . . {the material feed to the moulds or mould parts, e.g. controlling feed flow, velocity, weight, doses}
- B29C 2043/5883 {ensuring cavity filling, e.g. providing overflow means}
- B29C 2043/5891 . . . {using imaging devices, e.g. cameras}

B29C 44/00 **Shaping by internal pressure generated in the material, e.g. swelling, foaming; {Producing porous or cellular expanded plastics articles}**

WARNING

Group [B29C 44/00](#) and subgroups are not complete, see also [B29C 67/22](#) and subgroups

- B29C 44/005 . {Avoiding skin formation; Making foams with porous surfaces}
- B29C 44/02 . for articles of definite length, i.e. discrete articles
- B29C 44/022 . . {Foaming unrestricted by cavity walls, e.g. without using moulds or using only internal cores}
- B29C 44/025 . . {Foaming in open moulds, followed by closing the moulds}
- B29C 44/027 . . {the foaming continuing or beginning when the mould is opened}
- B29C 44/04 . . consisting of at least two parts of chemically or physically different materials, e.g. having different densities
- B29C 44/0407 . . . {by regulating the temperature of the mould or parts thereof, e.g. cold mould walls inhibiting foaming of an outer layer}
- B29C 44/0415 . . . {by regulating the pressure of the material during or after filling of the mould, e.g. by local venting}
- B29C 44/0423 . . . {by density separation}
- B29C 44/043 {using a rotating mould}
- B29C 44/0438 {using flotation}
- B29C 44/0446 . . . {by increasing the density locally by compressing part of the foam while still in the mould}
- B29C 44/0453 . . . {by joining the different materials using compression moulding before the foaming step}
- B29C 44/0461 . . . {by having different chemical compositions in different places, e.g. having different concentrations of foaming agent, feeding one composition after the other}
- B29C 44/0469 {provided with physical separators between the different materials, e.g. separating layers, mould walls}
- B29C 44/0476 {by pouring more than one composition into an open mould}
- B29C 44/0484 . . . {by having different solubility of the foaming agent}
- B29C 44/0492 . . . {Devices for feeding the different materials}

- B29C 44/06 . . . Making multilayered articles {(B29C 44/0407 - B29C 44/0492 take precedence)}
- B29C 44/065 {comprising at least one barrier layer}
- B29C 44/08 . . using several expanding {or moulding} steps
- B29C 44/083 . . . {Increasing the size of the cavity after a first part has foamed, e.g. substituting one mould part with another}
- B29C 44/086 {and feeding more material into the enlarged cavity}
- B29C 44/10 . . Applying counter-pressure during expanding
- B29C 44/105 . . . {the counterpressure being exerted by a fluid}
- B29C 44/12 . . Incorporating or moulding on preformed parts, e.g. inserts, reinforcements
- B29C 44/1204 . . . {and giving the material during expanding the shape of a particular article to be supported, e.g. a human body-part}
- B29C 44/1209 . . . {by impregnating a preformed part, e.g. a porous lining}
- B29C 44/1214 . . . {Anchoring by foaming into a preformed part, e.g. by penetrating through holes (anchoring by moulding in general B29C 37/0078; outsert moulding B29C 45/14344, B29C 70/74)}
- B29C 44/1219 . . . {Foaming between a movable mould part and the preformed part}
- B29C 44/1223 . . . {Joining preformed parts which have previously been filled with foam}
- B29C 44/1228 . . . {Joining preformed parts by the expanding material}
- B29C 44/1233 {the preformed parts being supported during expanding}
- B29C 44/1238 {and having flexible and solid areas}
- B29C 44/1242 {the preformed parts being concentric (B29C 44/1233 takes precedence)}
- B29C 44/1247 {comprising dams or sealing arrangements}
- B29C 44/1252 . . . {Removing portions of the preformed parts after the moulding step}
- B29C 44/1257 . . . {Joining a preformed part and a lining, e.g. around the edges}
- B29C 44/1261 . . . {Avoiding impregnation of a preformed part}
- B29C 44/1266 . . . {the preformed part being completely encapsulated, e.g. for packaging purposes or as reinforcement}
- B29C 44/1271 . . . {the preformed parts being partially covered}
- B29C 44/1276 . . . {the preformed parts being three dimensional structures which are wholly or partially penetrated by the foam}
- B29C 44/128 . . . {Internally reinforcing constructional elements, e.g. beams}
- B29C 44/1285 . . . {the preformed part being foamed}
- B29C 44/129 . . . {Enhancing adhesion to the preformed part using an interlayer}
- B29C 44/1295 . . . {Foaming around pipe joints}
- B29C 44/14 . . . the preformed part being a lining {(B29C 44/1209 takes precedence)}
- B29C 44/141 {Hiding joints in the lining}
- B29C 44/143 {Means for positioning the lining in the mould (in general B29C 33/12)}
- B29C 44/145 {the lining being a laminate}
- B29C 44/146 {Shaping the lining before foaming}

- B29C 44/148 {Applying the foaming resin, moulding the lining or the like, with the lining turned inside out}
- B29C 44/16 shaped by the expansion of the material
- B29C 44/18 . . . Filling preformed cavities {(B29C 44/1204 takes precedence)}
- B29C 44/181 {Filling unsupported soft shells having a particular shape}
- B29C 44/182 {Filling flexible bags not having a particular shape}
- B29C 44/183 {the components being kept apart in different containers within the bag, and mixed upon rupture of the containers (B29C 44/184 takes precedence)}
- B29C 44/184 {and inserting the bags into preformed cavities}
- B29C 44/185 {Starting the expansion after rupturing or dissolving the bag}
- B29C 44/186 {Filling multiple cavities (B29C 44/181, B29C 44/182 and B29C 44/188 takes precedence)}
- B29C 44/187 {Filling faulty voids in the foam}
- B29C 44/188 {Sealing off parts of the cavities}
- B29C 44/20 . . for articles of indefinite length
- B29C 44/203 . . {Expanding the moulding material in a vertical channel}
- B29C 44/206 . . {Using expandable particles or beads as starting material}
- B29C 44/22 . . consisting of at least two parts of chemically or physically different materials, e.g. having different densities
- B29C 44/24 . . . Making multilayered articles
- B29C 44/26 . . using several expanding steps
- B29C 44/28 . . Expanding the moulding material on continuous moving surfaces {without restricting the upwards growth of the foam}
- B29C 44/285 . . . {Rising trough lateral side members e.g. following the foam expansion}
- B29C 44/30 . . Expanding the moulding material between endless belts or rollers {(B29C 44/203 takes precedence)}
- B29C 44/302 . . . {Expanding the moulding material in flexible endless moulds}
- B29C 44/304 . . . {Adjusting the belt or roller pressure}
- B29C 44/306 . . . {Longitudinally shaping, e.g. the belt}
- B29C 44/308 . . . {Thickness separators and side seals}
- B29C 44/32 . . Incorporating or moulding on preformed parts, e.g. linings, inserts, reinforcements
- B29C 44/322 . . . {the preformed parts being elongated inserts, e.g. cables}
- B29C 44/324 {the preformed parts being tubular or folded to a tubular shape}
- B29C 44/326 . . . {Joining the preformed parts, e.g. to make flat or profiled sandwich laminates}
- B29C 44/328 . . . {the foamable components being mixed in the nip between the preformed parts}
- B29C 44/34 . . Auxiliary operations
- B29C 44/3403 . . {Foaming under special conditions, e.g. in sub-atmospheric pressure, in or on a liquid}
- B29C 44/3407 . . . {Vacuum extrusion using underwater barometric leg}

- B29C 44/3411 . . {Relieving stresses}
- B29C 44/3415 . . {Heating or cooling}
- B29C 44/3419 . . . {Quick cooling}
- B29C 44/3423 . . . {by using a heated or cooled preformed part, e.g. in the mould}
- B29C 44/3426 . . . {Heating by introducing steam in the mould}
- B29C 44/343 {by using pipes to direct the steam inside the mould}
- B29C 44/3434 {by using a sheet, grid, etc. to distribute the steam in the mould}
- B29C 44/3438 . . {Bursting the cell walls by a sudden pressure release}
- B29C 44/3442 . . {Mixing, kneading or conveying the foamable material ([mixing plastics B29B 7/00](#); [mixing in general B01F](#))}
- B29C 44/3446 . . . {Feeding the blowing agent}
- B29C 44/3449 {through the screw}
- B29C 44/3453 {Feeding the blowing agent to solid plastic material}
- B29C 44/3457 {Feeding the blowing agent in solid form to the plastic material}
- B29C 44/3461 . . {Making or treating expandable particles}
- B29C 44/3465 . . . {by compressing particles in vacuum, followed by expansion in normal pressure}
- B29C 44/3469 . . {Cell or pore nucleation}
- B29C 44/3473 . . . {by shearing forces}
- B29C 44/3476 . . . {by e.g. compression stress}
- B29C 44/348 . . . {by regulating the temperature and/or the pressure, e.g. suppression of foaming until the pressure is rapidly decreased}
- B29C 44/3484 . . {Stopping the foaming reaction until the material is heated or re-heated}
- B29C 44/3488 . . {Vulcanizing the material before foaming}
- B29C 44/3492 . . {Expanding without a foaming agent}
- B29C 44/3496 . . . {The foam being compressed and later released to expand ([B29C 44/3465 takes precedence](#))}
- B29C 44/35 . . {Component parts; Details or accessories}
- B29C 44/351 . . . {Means for preventing foam to leak out from the foaming device during foaming}
- B29C 44/352 . . . {Means for giving the foam different characteristics in different directions}
- B29C 44/353 . . . {Means for guiding the foaming in e.g. a particular direction}
- B29C 44/354 . . . {Means to prevent or reduce the effect of shrinking of the foamed article}
- B29C 44/355 . . . {Characteristics of the foam, e.g. having particular surface properties or structure}
- B29C 44/356 {having a porous surface}
- B29C 44/357 {Auxetic foams, i.e. material with negative Poisson ratio; anti rubber; dilatational; re-entrant}
- B29C 44/358 {Foamed of foamable fibres}
- B29C 44/36 . . Feeding the material to be shaped ([B29C 44/0492 takes precedence](#))
- B29C 44/362 . . . {Regulating the feed w.r.t. the foam layer thickness}
- B29C 44/365 . . . {using elongate feed conduits provided with throttle devices}

- B29C 44/367 . . . {using spray nozzles}
- B29C 44/38 . . . into a closed space, i.e. to make articles of definite length {(B29C 44/365 and B29C 44/367 take precedence)}
- B29C 44/381 {Spreading the foamable material in the mould by pressing the mould halves together}
- B29C 44/383 {using spreading devices mounted in the mould, in front of the feed opening}
- B29C 44/385 {using manifolds or channels directing the flow in the mould}
- B29C 44/386 {using a movable, elongate nozzle, e.g. to reach deep into the mould}
- B29C 44/388 {into moving moulds}
- B29C 44/40 by gravity, e.g. by casting
- B29C 44/42 using pressure difference, e.g. by injection, by vacuum
- B29C 44/421 {by plastizising the material into a shot cavity and injecting using a plunger}
- B29C 44/422 {by injecting by forward movement of the plastizising screw}
- B29C 44/424 {Details of machines}
- B29C 44/425 {Valve or nozzle constructions; Details of injection devices}
- B29C 44/427 {having several injection gates}
- B29C 44/428 {Mould constructions; Mould supporting equipment}
- B29C 44/44 {in solid form}
- B29C 44/445 {in the form of expandable granules, particles or beads}
- B29C 44/46 . . . into an open space or onto moving surfaces, i.e. to make articles of indefinite length {(B29C 44/365, B29C 44/367 take precedence)}
- B29C 44/461 {dispensing apparatus, e.g. dispensing foaming resin over the whole width of the moving surface}
- B29C 44/462 {provided with pre-foaming devices}
- B29C 44/464 {using centrifugal force}
- B29C 44/465 {with adjustable die gap}
- B29C 44/467 {Foam spreading or levelling devices}
- B29C 44/468 {in a plurality of parallel streams which unite during the foaming}
- B29C 44/48 by gravity, e.g. casting onto, or between, moving surfaces {(B29C 44/468 takes precedence)}
- B29C 44/485 {the material being spread in the nip of two cooperating rollers}
- B29C 44/50 using pressure difference, e.g. by extrusion, by spraying {(B29C 44/468 takes precedence)}
- B29C 44/52 between moving surfaces
- B29C 44/54 in the form of expandable particles or beads
- B29C 44/56 . . . After-treatment of articles, e.g. for altering the shape
- B29C 44/5609 . . . {Purging of residual gas, e.g. noxious or explosive blowing agents}
- B29C 44/5618 . . . {Impregnating foam articles}
- B29C 44/5627 . . . {by mechanical deformation, e.g. crushing, embossing, stretching}

- B29C 44/5636 {with the addition of heat}
- B29C 44/5645 {Differential deformation by differential heating}
- B29C 44/5654 {Subdividing foamed articles to obtain particular surface properties, e.g. on multiple modules}
- B29C 44/5663 {by perforating the foam, e.g. to open the cells}
- B29C 44/5672 {by stretching the foam, e.g. to open the cells}
- B29C 44/5681 . . . {Covering the foamed object with e.g. a lining}
- B29C 44/569 . . . {Shaping and joining components with different densities or hardness}
- B29C 44/58 . . Moulds
- B29C 44/581 . . . {Closure devices for pour holes}
- B29C 44/582 . . . {for making undercut articles}
- B29C 44/583 . . . {for making articles with cavities}
- B29C 44/585 . . . {with adjustable size of the mould cavity}
- B29C 44/586 . . . {with a cavity increasing in size during foaming}
- B29C 44/587 . . . {with a membrane, e.g. for pressure control}
- B29C 44/588 . . . {with means for venting, e.g. releasing foaming gas}
- B29C 44/60 . . Measuring, controlling or regulating
- B29C 44/605 . . . {Calibration following a shaping operation, e.g. extrusion}

B29C 45/00 **Injection moulding, i.e. forcing the required volume of moulding material through a nozzle into a closed mould; Apparatus therefor** ([injection blow-moulding B29C 49/06](#))

- B29C 45/0001 . {characterised by the choice of material}

NOTE

When classifying in this group, it is desirable to add the indexing codes of subclass [B29K](#) to identify the moulding materials and their properties. Documents concerning the choice of moulding materials having a particular influence on the moulding technique should be classified in this group if of interest

- B29C 45/0003 . {of successively moulded portions rigidly joined to each other}
- B29C 45/0005 . {using fibre reinforcements}
- B29C 2045/0006 . . {the fibres being oriented in a direction perpendicular to the flow direction of the moulding material into the mould}
- B29C 2045/0008 . . {the fibres being oriented randomly}
- B29C 2045/001 . . {Bulk moulding compounds [BMC]}
- B29C 2045/0012 . . {Skin layers without fibres or with little fibres}
- B29C 45/0013 . {using fillers dispersed in the moulding material, e.g. metal particles}
- B29C 2045/0015 . . {Non-uniform dispersion of fillers}
- B29C 45/0017 . {moulding interconnected elements which are movable with respect to one another, e.g. chains or hinges}
- B29C 2045/0018 . . {moulding containers with handle e.g. buckets}
- B29C 2045/002 . . {using shrinkage}

- B29C 2045/0022 . . {using deformation of injected material to obtain interconnection}
- B29C 2045/0024 . . {using a mould core with a blind hole wherein the hinge shaft is moulded}
- B29C 45/0025 . {Preventing defects on the moulded article, e.g. weld lines, shrinkage marks (preventing defects on the preformed parts or layers [B29C 45/14836](#))}
- B29C 2045/0027 . . {Gate or gate mark locations}
- B29C 2045/0029 . . . {gates on the central optical axis of lenses}
- B29C 2045/0031 . . {Movable mould wall parts in contact with weld lines e.g. rotating pins for stirring the weld line}
- B29C 2045/0032 . . {sequential injection from multiple gates, e.g. to avoid weld lines}
- B29C 2045/0034 . . {Mould parting lines}
- B29C 2045/0036 . . {Submerged or recessed burrs}
- B29C 2045/0037 . . {Moulding articles or parts thereof without parting line}
- B29C 2045/0039 . . {intermixing the injected material front at the weld line, e.g. by applying vibrations to the melt front ([B29C 2045/0031](#) takes precedence)}
- B29C 2045/0041 . . {preventing initial material from entering the mould cavity}
- B29C 2045/0043 . . {preventing shrinkage by reducing the wall thickness of the moulded article}
- B29C 2045/0044 . . {expelling moulding material outside the mould cavity at the weld line location (moulds with overflow cavities [B29C 45/2669](#))}
- B29C 45/0046 . {Details relating to the filling pattern or flow paths or flow characteristics of moulding material in the mould cavity}
- B29C 2045/0048 . . {Laminar flow}
- B29C 2045/0049 . . {the injected material flowing against a mould cavity protruding part}
- B29C 2045/0051 . . {Flow adjustment by throttles}
- B29C 45/0053 . {combined with a final operation, e.g. shaping ([injection-compression moulding B29C 45/561](#))}
- B29C 45/0055 . . {Shaping}
- B29C 2045/0056 . . . {folding back undercut forming parts, e.g. tabs of closures}
- B29C 2045/0058 . . . {removing material}
- B29C 45/006 . . {Joining parts moulded in separate cavities}
- B29C 45/0062 . . . {Joined by injection moulding}
- B29C 2045/0063 . . . {facing before assembling, i.e. bringing the parts opposite to each other before assembling}
- B29C 2045/0065 . . . {the parts being interconnected before assembling by a breaking or shearing point}
- B29C 2045/0067 . . . {interposing an insert between the parts to be assembled}
- B29C 2045/0068 . . . {using axially aligned and separated mould cavities}
- B29C 2045/007 . . . {assembling a container and a handle}
- B29C 2045/0072 . . . {the parts to be joined being moulded in a stack mould ([stack moulds in general B29C 45/32](#))}
- B29C 2045/0074 . . . {inserting a heating tool inside the mould}
- B29C 2045/0075 . . {curing or polymerising by irradiation}
- B29C 2045/0077 . . {removing burrs or flashes ([in general B29C 37/02](#))}

- B29C 2045/0079 . . {applying a coating or covering}
- B29C 45/0081 . {of objects with parts connected by a thin section, e.g. hinge, tear line}
- B29C 45/0082 . {Reciprocating the moulding material inside the mould cavity, e.g. push-pull injection moulding}
- B29C 45/0084 . {General arrangement or lay-out of plants ([B29C 45/1468](#) takes precedence)}
- B29C 2045/0086 . {Runner trees, i.e. several articles connected by a runner}
- B29C 2045/0087 . {making hollow articles using a floating core movable in the mould cavity by fluid pressure and expelling molten excess material}
- B29C 2045/0089 . {successive filling of parts of a mould cavity, i.e. one cavity part being filled before another part is filled ([sequential filling to prevent weld lines B29C 2045/0032](#))}
- B29C 2045/0091 . {Pellets or granules, e.g. their structure, composition, length, height, width}
- B29C 2045/0093 . {of articles provided with an attaching element}
- B29C 2045/0094 . {injection moulding of small-sized articles e.g. micro articles, ultra thin articles}
- B29C 2045/0096 . {drying the moulding material before injection e.g. by heating}
- B29C 2045/0098 . {shearing of the moulding material e.g. for obtaining molecular orientation or reducing the viscosity ([B29C 45/0082](#) takes precedence)}
- B29C 45/02 . Transfer moulding, i.e. transferring the required volume of moulding material by a plunger from a "shot" cavity into a mould cavity
- B29C 45/021 . . {Plunger drives; Pressure equalizing means for a plurality of transfer plungers}
- B29C 2045/022 . . {Stationary transfer plungers}
- B29C 2045/024 . . {Transfer plungers and pots with an oblong cross section}
- B29C 2045/025 . . {with the transfer plunger surface forming a part of the mould cavity wall at the end of the plunger transfer movement}
- B29C 2045/027 . . {heat insulated cold transfer moulding}
- B29C 2045/028 . . . {using auxiliary curing or setting means}
- B29C 45/03 . Injection moulding apparatus ([transfer moulding B29C 45/02](#))
- B29C 2045/033 . . {horizontal injection units mounted on a mould half carrying plate}
- B29C 45/036 . . {Injection pistols}
- B29C 45/04 . . using movable moulds {or mould halves} ([B29C 45/08](#) takes precedence)
- B29C 45/0408 . . . {involving at least a linear movement ([B29C 45/0433](#) takes precedence)}
- B29C 45/0416 {co-operating with fixed mould halves}
- B29C 2045/0425 {Book moulds, i.e. a mould half can be opened and closed like a book with regard to the other mould half, the mould halves being connected by a hinge}
- B29C 45/0433 . . . {mounted on a conveyor belt or chain}
- B29C 45/0441 . . . {involving a rotational movement ([B29C 45/06](#) takes precedence)}
- B29C 45/045 {mounted on the circumference of a rotating support having a rotating axis perpendicular to the mould opening, closing or clamping direction}
- B29C 2045/0458 {Drive means for the rotating support}
- B29C 2045/0466 . . . {the axial movement of the mould being linked to the rotation of the mould or mould half}

- B29C 2045/0475 . . . {continuously movable moulds}
- B29C 2045/0483 . . . {pivotally mounted mould halves ([B29C 2045/0425](#) takes precedence)}
- B29C 2045/0491 . . . {both mould halves being shifted to the injection unit for obtaining nozzle touch}
- B29C 45/06 . . . {mounted} on a turntable {i.e. on a rotating support having a rotating axis parallel to the mould opening, closing or clamping direction}
- B29C 45/062 {carrying mould halves co-operating with fixed mould halves}
- B29C 2045/065 {continuously rotating turntables}
- B29C 2045/067 {one mould being openable during clamping of the other moulds}
- B29C 45/07 . . . using movable injection units
- B29C 2045/073 . . . {pivotable horizontal injection unit with a nozzle pushed against a mould half}
- B29C 45/076 . . . {cooperating with two or more moulds}
- B29C 45/08 . . . moving with the mould during the injection operation
- B29C 45/10 . . . using moulds or injection units usable in different arrangements or combinations to each other
- B29C 45/12 . . . using two or more fixed moulds, e.g. in tandem {([B29C 45/076](#) takes precedence)}
- B29C 45/125 . . . {using a material distributing system}
- B29C 45/13 . . . using two or more injection units co-operating with a single mould
- B29C 2045/135 . . . {selectively injecting different materials in the same mould for making different articles in the same mould}
- B29C 45/14 . . . incorporating preformed parts or layers, e.g. injection moulding around inserts or for coating articles {([B29C 45/1671](#) takes precedence)}
- B29C 45/14008 . . . {Inserting articles into the mould ([B29C 45/14827](#) takes precedence)}
- B29C 45/14016 . . . {Intermittently feeding endless articles, e.g. transfer films, to the mould ([B29C 45/14262](#) takes precedence)}
- B29C 45/14024 {and punching or cutting a portion from the endless articles during mould closing}
- B29C 45/14032 . . . {Transferring the inserts from a storage space inside the mould to the mould cavity}
- B29C 2045/1404 . . . {feeding inserts cut out from an endless sheet outside the mould}
- B29C 2045/14049 . . . {feeding inserts by a swing arm}
- B29C 2045/14057 . . . {feeding inserts wrapped on a core}
- B29C 45/14065 . . . {Positioning or centering articles in the mould}
- B29C 45/14073 . . . {using means being retractable during injection}
- B29C 2045/14081 {centering means retracted by the injection pressure}
- B29C 2045/1409 {using control means for retraction of the centering means}
- B29C 2045/14098 . . . {fixing or clamping inserts having variable dimensions}
- B29C 2045/14106 . . . {using electrostatic attraction or static electricity}
- B29C 2045/14114 . . . {using an adhesive}
- B29C 2045/14122 . . . {using fixed mould wall projections for centering the insert}
- B29C 2045/14131 . . . {using positioning or centering means forming part of the insert}

B29C 2045/14139	. . .	{positioning inserts having a part extending into a positioning cavity outside the mould cavity}
B29C 2045/14147	. . .	{using pins or needles penetrating through the insert}
B29C 2045/14155	. . .	{using vacuum or suction}
B29C 2045/14163	. . .	{using springs being part of the positioning means}
B29C 2045/14172	. . .	{using light to define the position of the insert}
B29C 45/1418	. .	{the inserts being deformed or preformed, e.g. by the injection pressure}
B29C 2045/14188	. . .	{trimming the article in the mould}
B29C 45/14196	. . .	{the inserts being positioned around an edge of the injected part}
B29C 2045/14204	. . . .	{the edges formed by an intermediate mould part}
B29C 2045/14213	. . .	{deforming by gas or fluid pressure in the mould cavity}
B29C 45/14221	. . .	{by tools, e.g. cutting means}
B29C 2045/14229	. . . .	{deforming wire-like articles}
B29C 2045/14237	. . .	{the inserts being deformed or preformed outside the mould or mould cavity}
B29C 2045/14245	. . . .	{using deforming or preforming means outside the mould cavity}
B29C 2045/14254	. . . .	{deforming or preforming endless articles outside the mould}
B29C 45/14262	. . .	{Clamping or tensioning means for the insert}
B29C 2045/1427	. . . .	{controlling the slip of the insert}
B29C 2045/14278	. . . .	{controlling the tension of the insert}
B29C 2045/14286	. . .	{means for heating the insert}
B29C 2045/14295	. . . .	{the heating means being used for feeding the insert into the mould}
B29C 2045/14303	. . .	{progressively transferring the insert from one mould wall to the other mould wall of the mould cavity}
B29C 45/14311	. .	{using means for bonding the coating to the articles (B29C 45/14795 takes precedence)}
B29C 2045/14319	. . .	{bonding by a fusion bond}
B29C 2045/14327	. . .	{anchoring by forcing the material to pass through a hole in the article}
B29C 45/14336	. .	{Coating a portion of the article, e.g. the edge of the article (B29C 45/14573 and B29C 45/14598 take precedence)}
B29C 45/14344	. . .	{Moulding in or through a hole in the article, e.g. outsert moulding}
B29C 2045/14352	. . . .	{injecting into blind holes}
B29C 2045/1436	. . . .	{coating hollow articles having holes passing through the wall}
B29C 2045/14368	. . . .	{holes with means for anchoring the injected material}
B29C 45/14377	. . .	{using an additional insert, e.g. a fastening element}
B29C 45/14385	. . .	{Coating a portion of a bundle of inserts, e.g. making brushes}
B29C 2045/14393	. . . .	{preventing leakage of injected material into tuft insertion holes of the mould}
B29C 2045/14401	. . . .	{using a hot gas for forming a knob on the tuft end}
B29C 45/14409	. . .	{Coating profiles or strips by injecting end or corner or intermediate parts}
B29C 45/14418	. . .	{Sealing means between mould and article}

B29C 45/14426	. . .	{Coating the end of wire-like or rod-like or cable-like or blade-like or belt-like articles}
B29C 45/14434	. . .	{Coating brittle material, e.g. glass (B29C 45/14377 , B29C 45/14418 take precedence)}
B29C 2045/14442	. . .	{injecting a grill or grid on the insert}
B29C 2045/1445	. . .	{injecting a part onto a blow moulded object}
B29C 2045/14459	. . .	{injecting seal elements}
B29C 45/14467	. .	{Joining articles or parts of a single article (B29C 45/14377 , B29C 45/14385 , B29C 45/14581 , B29C 45/14614 and B29C 45/006 take precedence)}
B29C 45/14475	. . .	{Joining juxtaposed parts of a single article, e.g. edges of a folded container blank}
B29C 2045/14483	. . . .	{overlapping edges of the juxtaposed parts}
B29C 45/14491	. . .	{Injecting material between coaxial articles, e.g. between a core and an outside sleeve for making a roll}
B29C 2045/145	. . . .	{making rolls}
B29C 45/14508	. . .	{Joining juxtaposed sheet-like articles, e.g. for making trim panels}
B29C 2045/14516	. . . .	{the transition area of juxtaposed parts being hidden in a groove of the moulded article}
B29C 2045/14524	. . .	{making hollow articles}
B29C 2045/14532	. . .	{injecting between two sheets}
B29C 2045/1454	. . .	{injecting between inserts not being in contact with each other}
B29C 45/14549	. .	{Coating rod-like, wire-like or belt-like articles (B29C 45/14426 takes precedence)}
B29C 2045/14557	. . .	{coating spliced fibres or cables, e.g. optical fiber splices or junctions}
B29C 45/14565	. . .	{at spaced locations, e.g. coaxial-cable wires}
B29C 45/14573	. . . .	{Coating the edge of the article, e.g. for slide-fasteners}
B29C 45/14581	. . . .	{Coating the cross-over points of articles in the form of a network}
B29C 45/1459	. .	{Coating annular articles}
B29C 45/14598	. .	{Coating tubular articles}
B29C 2045/14606	. . .	{Mould cavity sealing means}
B29C 45/14614	. . .	{Joining tubular articles}
B29C 45/14622	. . .	{Lining the inner or outer surface of tubular articles}
B29C 45/14631	. .	{Coating reinforcements (fibre reinforcements B29C 45/0005)}
B29C 45/14639	. .	{for obtaining an insulating effect, e.g. for electrical components}
B29C 45/14647	. . .	{Making flat card-like articles with an incorporated IC or chip module, e.g. IC or chip cards}
B29C 45/14655	. . .	{connected to or mounted on a carrier, e.g. lead frame}
B29C 2045/14663	. . . .	{the mould cavity walls being lined with a film, e.g. release film}
B29C 2045/14672	. . . .	{moulding with different depths of the upper and lower mould cavity}
B29C 45/1468	. . . .	{Plants therefor}
B29C 45/14688	. .	{Coating articles provided with a decoration}
B29C 2045/14696	. . .	{transparent decorated inserts}

B29C 2045/14704	. . .	{ink decorations}
B29C 2045/14713	. . .	{decorations in contact with injected material}
B29C 2045/14721	. . .	{decorations transferred by diffusion or sublimation}
B29C 2045/14729	. . .	{decorations not in contact with injected material}
B29C 2045/14737	. . .	{decorations printed on the insert by a digital imaging technique}
B29C 2045/14745	. . .	{in-line printing}
B29C 45/14754	. .	{being in movable or releasable engagement with the coating, e.g. bearing assemblies}
B29C 2045/14762	. . .	{using shrinkage}
B29C 2045/1477	. . .	{Removable inserts, e.g. the insert being peeled off after moulding}
B29C 45/14778	. .	{the article consisting of a material with particular properties, e.g. porous, brittle}
B29C 45/14786	. . .	{Fibrous material or fibre containing material, e.g. fibre mats or fibre reinforced material}
B29C 45/14795	. . .	{Porous or permeable material, e.g. foam}
B29C 2045/14803	. . . .	{the injected material entering minute pores}
B29C 45/14811	. . .	{Multilayered articles (B29C 45/14827 takes precedence)}
B29C 45/14819	. .	{the inserts being completely encapsulated}
B29C 45/14827	. .	{using a transfer foil detachable from the insert}
B29C 45/14836	. .	{Preventing damage of inserts during injection, e.g. collapse of hollow inserts, breakage (B29C 45/14434 takes precedence)}
B29C 2045/14844	. . .	{Layers protecting the insert from injected material}
B29C 2045/14852	. .	{incorporating articles with a data carrier, e.g. chips (memory cards, chip cards B29L 2017/006)}
B29C 2045/1486	. .	{Details, accessories and auxiliary operations}
B29C 2045/14868	. . .	{Pretreatment of the insert, e.g. etching, cleaning}
B29C 2045/14877	. . . .	{preheating or precooling the insert for non-deforming purposes}
B29C 2045/14885	. . . .	{by plasma treatment}
B29C 2045/14893	. . .	{Preventing defects relating to shrinkage of inserts or coating material}
B29C 2045/14901	. . .	{Coating a sheet-like insert smaller than the dimensions of the adjacent mould wall}
B29C 2045/14909	. . . .	{the edge of the sheet-like insert being hidden e.g. in a groove or protruding into the injected material}
B29C 2045/14918	. . . .	{in-mould-labelling}
B29C 2045/14926	. . . .	{multiple labels in the same cavity}
B29C 2045/14934	. . .	{Preventing penetration of injected material between insert and adjacent mould wall (sealing means between mould and article B29C 45/14418)}
B29C 2045/14942	. . .	{Floating inserts, e.g. injecting simultaneously onto both sides of an insert through a pair of opposed gates}
B29C 2045/1495	. . .	{Coating undercut inserts}
B29C 2045/14959	. . .	{Flashing the injected material to the outside of the mould cavity for any purpose}
B29C 2045/14967	. . .	{Injecting through an opening of the insert}

- B29C 2045/14975 {the injection nozzle penetrating through the insert}
- B29C 2045/14983 . . . {Bursting or breakthrough of the insert by the injection pressure}
- B29C 2045/14991 . . . {Submerged burrs e.g. using protruding mould parts forming a cavity in which the burr on the insert is formed for preventing surface defects}
- B29C 45/16 . Making multilayered or multicoloured articles {(B29C 45/0062 takes precedence; feeding colouring materials into the injection unit B29C 45/1816)}
- B29C 2045/1601 . . {the injected materials not being adhered or bonded to each other (B29C 45/0017 takes precedence)}
- B29C 45/1603 . . {Multi-way nozzles specially adapted therefor}
- B29C 45/1604 . . . {using a valve urged by the injection pressure}
- B29C 45/1606 . . . {using a rotatable valve}
- B29C 45/1607 . . . {having at least three different ways}
- B29C 2045/1609 . . . {having independent heating or cooling means for each way}
- B29C 2045/161 . . . {using a hollow needle valve through which one material is injected}
- B29C 2045/1612 . . . {using needle valves with at least four positions}
- B29C 2045/1614 . . . {side-by-side flow of materials in the same channel}
- B29C 45/1615 . . {The materials being injected at different moulding stations}
- B29C 2045/1617 . . . {using stack moulds}
- B29C 45/1618 . . . {using an auxiliary treatment station, e.g. for cooling or ejecting (B29C 45/1628 takes precedence)}
- B29C 45/162 . . . {using means, e.g. mould parts, for transferring an injected part between moulding stations}
- B29C 2045/1621 {the transfer means operating independently from the injection mould cavity i.e. during injection the transfer means are completely outside the mould cavity}
- B29C 2045/1623 {transfer by a slidable element forming a part of both cavities}
- B29C 45/1625 . . . {Injecting parison-like articles}
- B29C 2045/1626 {using a cooling station}
- B29C 45/1628 . . . {using a mould carrier rotatable about an axis perpendicular to the opening and closing axis of the moulding stations}
- B29C 2045/1629 {turrets with incorporated ejection means}
- B29C 2045/1631 {turrets fixed with regard to the machine frame}
- B29C 2045/1632 {injection units supported by a movable mould plate}
- B29C 45/1634 . . {with a non-uniform dispersion of the moulding material in the article, e.g. resulting in a marble effect}
- B29C 45/1635 . . {using displaceable mould parts, e.g. retractable partition between adjacent mould cavities}
- B29C 2045/1637 . . . {the first injected part and the movable mould part being movable together}
- B29C 45/1639 . . . {Removable partitions between adjacent mould cavity portions}
- B29C 45/164 . . {The moulding materials being injected simultaneously}
- B29C 45/1642 . . {having a "sandwich" structure (B29C 45/1603 takes precedence)}
- B29C 45/1643 . . . {from at least three different materials or with at least four layers}

- B29C 45/1645 . . . {Injecting skin and core materials from the same injection cylinder, e.g. mono-sandwich moulding}
- B29C 45/1646 . . . {Injecting parison-like articles ([B29C 45/1643](#) takes precedence)}
- B29C 2045/1648 {the parison core layer being a barrier material}
- B29C 2045/165 {the parison core layer comprising recycled or scrap material}
- B29C 2045/1651 . . . {Independent injection runners or nozzles}
- B29C 2045/1653 . . . {using a core injection nozzle penetrating through the skin or into the mould cavity}
- B29C 2045/1654 . . . {whereby the core material is penetrating through the skin}
- B29C 2045/1656 . . . {Injecting the skin material through the central passage of the multiway nozzle}
- B29C 45/1657 . . {using means for adhering or bonding the layers or parts to each other ([mechanical anchoring B29C 37/0082](#))}
- B29C 2045/1659 . . . {Fusion bonds}
- B29C 2045/166 . . . {Roughened surface bonds}
- B29C 2045/1662 {plasma roughened surface bonds}
- B29C 2045/1664 . . . {Chemical bonds}
- B29C 2045/1665 . . . {Shrinkage bonds}
- B29C 2045/1667 . . . {Deformation bonds}
- B29C 2045/1668 . . . {Penetration bonds}
- B29C 2045/167 . . {injecting the second layer through the first layer}
- B29C 45/1671 . . {with an insert}
- B29C 2045/1673 . . . {injecting the first layer, then feeding the insert, then injecting the second layer}
- B29C 45/1675 . . {using exchangeable mould halves}
- B29C 45/1676 . . {using a soft material and a rigid material, e.g. making articles with a sealing part}
- B29C 2045/1678 . . . {first moulding the soft material}
- B29C 45/1679 . . {applying surface layers onto injection-moulded substrates inside the mould cavity, e.g. in-mould coating [IMC] ([applying surface layers after ejection B29C 45/0053](#))}
- B29C 2045/1681 . . {one layer penetrating at one or more areas through another layer}
- B29C 2045/1682 . . {preventing defects}
- B29C 45/1684 . . {Injecting parison-like articles ([B29C 45/1625](#), [B29C 45/1643](#) and [B29C 45/1646](#) take precedence)}
- B29C 2045/1685 . . {mounting of the additional injection unit}
- B29C 2045/1687 . . {preventing leakage of second injected material from the mould cavity}
- B29C 2045/1689 . . {injecting layers having identical injection cycle times}
- B29C 2045/169 . . {injecting electrical circuits e.g. one layer being made of conductive material}
- B29C 2045/1692 . . {one layer comprising fibres}
- B29C 2045/1693 . . {shaping the first molding material before injecting the second molding material, e.g. by cutting, folding}
- B29C 2045/1695 . . {injecting ceramic powder layers and plastic material layers}

- B29C 2045/1696 . . {injecting metallic layers and plastic material layers}
- B29C 2045/1698 . . {multicoloured articles moulded in one step (non-uniform dispersion of colours [B29C 45/1634](#))}
- B29C 45/17 . Component parts, details or accessories; Auxiliary operations
- B29C 45/1701 . . {using a particular environment during moulding, e.g. moisture-free or dust-free}
- B29C 2045/1702 . . . {dissolving or absorbing a fluid in the plastic material}
- B29C 45/1703 . . {Introducing an auxiliary fluid into the mould ([B29C 45/1701](#) takes precedence)}
- B29C 45/1704 . . . {the fluid being introduced into the interior of the injected material which is still in a molten state, e.g. for producing hollow articles ([B29C 45/1732](#) and [B29C 45/1734](#) take precedence; injection blow-moulding [B29C 49/06](#))}
- B29C 45/1705 {using movable mould parts}
- B29C 45/1706 {using particular fluids or fluid generating substances}
- B29C 2045/1707 {using a liquid e.g. water}
- B29C 2045/1708 {removing the liquid from the hollow}
- B29C 2045/1709 {using a cooling fluid}
- B29C 2045/171 {using an evaporating substance}
- B29C 45/1711 {and removing excess material from the mould cavity by the introduced fluid, e.g. to an overflow cavity}
- B29C 2045/1712 {plastic material flowing back into the injection unit}
- B29C 2045/1713 {using several overflow cavities}
- B29C 2045/1714 {overflow cavities provided with heating means}
- B29C 2045/1715 {Filled hollows}
- B29C 2045/1717 {Temperature controlled mould parts to control the location or configuration of the hollow}
- B29C 2045/1718 {sealing or closing the fluid injection opening}
- B29C 2045/1719 {making tubular articles}
- B29C 2045/172 {making roof racks for vehicles or parts thereof}
- B29C 2045/1721 {making wheels}
- B29C 2045/1722 {injecting fluids containing plastic material}
- B29C 2045/1723 {using fibre reinforcements}
- B29C 2045/1724 {hollows used as conduits}
- B29C 2045/1725 {making hollow seals}
- B29C 2045/1726 {moving the fluid through the hollow using a fluid inlet and a fluid outlet}
- B29C 2045/1727 {using short shots of moulding material}
- B29C 2045/1728 {injecting fluid from an end of the mould cavity and in the longitudinal direction thereof}
- B29C 2045/1729 {fluid venting means}
- B29C 2045/173 {using a plurality of fluid injection nozzles}
- B29C 2045/1731 {vacuum or underpressure for forming the hollow}

B29C 45/1732	. . .	{Control circuits therefor}
B29C 45/1734	. . .	{Nozzles therefor}
B29C 45/1735	. . . .	{Nozzles for introducing the fluid through the mould gate, e.g. incorporated in the injection nozzle}
B29C 45/1736	. . . .	{provided with small holes permitting the flow of gas therethrough, e.g. using a porous element of sintered material (B29C 45/1735 takes precedence)}
B29C 2045/1737	. . . .	{Pin-in-sleeve devices}
B29C 2045/1738	. . . .	{using a valve mounted in movable valve sleeve}
B29C 2045/1739	. . . .	{controlling the temperature or heat-transfer in fluid injection nozzles}
B29C 45/174	. . .	{Applying a pressurised fluid to the outer surface of the injected material inside the mould cavity, e.g. for preventing shrinkage marks}
B29C 2045/1741	. . . .	{Seals preventing pressurized fluid to escape from the mould cavity (mould seals B29C 45/2608)}
B29C 45/1742	. .	{Mounting of moulds; Mould supports (mounting of exchangeable mould inserts B29C 45/2675)}
B29C 45/1743	. . .	{using mounting means projecting from the back side of the mould or from the front side of the mould support}
B29C 45/1744	. . .	{Mould support platens}
B29C 2045/1745	. . .	{using vacuum means}
B29C 2045/1746	. . .	{using magnetic means}
B29C 45/1747	. .	{Tie-rod connections}
B29C 45/1748	. .	{Retractable tie-rods}
B29C 2045/175	. . .	{using the movable mould plate for extracting a tie rod}
B29C 45/1751	. .	{Adjustment means allowing the use of moulds of different thicknesses}
B29C 2045/1752	. . .	{using the mould clamping means for displacing the rear platen}
B29C 45/1753	. .	{Cleaning or purging, e.g. of the injection unit (B29C 45/24 takes precedence)}
B29C 2045/1754	. . .	{purging cooling channels}
B29C 45/1755	. . .	{Means for receiving or discharging purged material; Purge shields}
B29C 45/1756	. .	{Handling of moulds or mould parts, e.g. mould exchanging means (moulds per se B29C 45/26)}
B29C 2045/1757	. . .	{common exchange means for several injection machines}
B29C 2045/1758	. . .	{exchanging stampers}
B29C 45/1759	. .	{Removing sprues from sprue-channels}
B29C 45/176	. .	{Exchanging the injection unit or parts thereof}
B29C 45/1761	. .	{Means for guiding movable mould supports or injection units on the machine base or frame; Machine bases or frames (B29C 45/1747 takes precedence)}
B29C 2045/1762	. . .	{compensating frame distortion proportional to the mould clamping force}
B29C 2045/1763	. . .	{preventing distortion of the machine part guiding the movable mould}
B29C 2045/1764	. . .	{Guiding means between the movable mould plate and tie rods}
B29C 2045/1765	. . .	{Machine bases}

B29C 2045/1767	. . . . {connecting means for machine base parts}
B29C 2045/1768	. . . {constructions of C-shaped frame elements}
B29C 45/1769	. . {Handling of moulded articles or runners, e.g. sorting, stacking, grinding of runners}
B29C 2045/177	. . . {stacking moulded articles}
B29C 45/1771	. . . {Means for guiding or orienting articles while dropped from the mould, e.g. guide rails or skirts}
B29C 2045/1772	. . . . {sorting different articles}
B29C 45/1773	. . {Means for adjusting or displacing the injection unit into different positions, e.g. for co-operating with different moulds (B29C 45/1781 takes precedence)}
B29C 45/1774	. . {Display units or mountings therefor; Switch cabinets}
B29C 45/1775	. . {Connecting parts, e.g. injection screws, ejectors, to drive means}
B29C 2045/1776	. . . {magnetic connecting means}
B29C 45/1777	. . {Nozzle touch mechanism}
B29C 2045/1778	. . . {separate drive means for moving and producing the touch force}
B29C 2045/1779	. . . {using chains or the like as drive transmission means for the movement of the injection unit}
B29C 45/178	. . {Means disposed outside the mould for unscrewing threaded articles, e.g. chuck devices (moulds with incorporated unscrewing drive means B29C 45/262)}
B29C 45/1781	. . {Aligning injection nozzles with the mould sprue bush}
B29C 45/1782	. . {Mounting or clamping means for heating elements or thermocouples}
B29C 2045/1784	. . {Component parts, details or accessories not otherwise provided for; Auxiliary operations not otherwise provided for}
B29C 2045/1785	. . . {Movement of a part, e.g. opening or closing movement of the mould, generating fluid pressure in a built-in fluid pressure generator}
B29C 2045/1786	. . . {Electric wire or cable guides e.g. for manifolds}
B29C 2045/1787	. . . {Mould parts driven by pressure of injected material (B29C 2045/14081 takes precedence)}
B29C 2045/1788	. . . {Preventing tilting of movable mould plate during closing or clamping}
B29C 2045/1789	. . . . {using weight compensating means for the movable mould half}
B29C 2045/179	. . . {Frames or machine parts made of concrete}
B29C 2045/1791	. . . {Means for spacing or distancing mould supporting plates e.g. for mould exchange}
B29C 2045/1792	. . . {Machine parts driven by an electric motor, e.g. electric servomotor}
B29C 2045/1793	. . . . {by an electric linear motor (linear motors in general H02K 41/02)}
B29C 2045/1794	. . . . {by a rotor or directly coupled electric motor e.g. using a tubular shaft motor (for driving axially movable screws B29C 2045/5024)}
B29C 2045/1795	. . . {Means for detecting resin leakage or drooling from the injection nozzle}
B29C 2045/1796	. . . {Moulds carrying mould related information or codes, e.g. bar codes, counters}

- B29C 2045/1797 . . . {Machine parts provided with a shroud or cover or shield, e.g. for preventing oil or dust scattering (used as safety device [B29C 45/84](#); for guiding or orienting ejected articles [B29C 45/1771](#); for obtaining a particular moulding environment [B29C 45/1701](#); for obtaining a vacuum environment [B29C 45/34](#))}
- B29C 2045/1798 . . . {Using spring tension to drive movable machine parts}
- B29C 45/18 . . . Feeding the material into the injection moulding apparatus, {i.e. feeding the non-plastified material into the injection unit}
- B29C 45/1808 . . . {Feeding measured doses}
- B29C 45/1816 . . . {Feeding auxiliary material, e.g. colouring material}
- B29C 2045/1825 {feeding auxiliary material for either skin or core of the injected article}
- B29C 2045/1833 {recycling sprues or runners}
- B29C 2045/1841 {into runner channel or runner nozzle}
- B29C 2045/185 {controlling the amount of auxiliary material}
- B29C 45/1858 . . . {Changing the kind or the source of material, e.g. using a plurality of hoppers}
- B29C 45/1866 . . . {Feeding multiple materials ([B29C 45/1816](#) takes precedence)}
- B29C 2045/1875 . . . {Hoppers connected to a feed screw}
- B29C 2045/1883 . . . {directly injecting moulding material from the chemical production plant into the mould without granulating}
- B29C 2045/1891 . . . {Means for detecting presence or level of raw material inside feeding ducts, e.g. level sensors inside hoppers}
- B29C 45/20 . . . Injection nozzles {([B29C 45/1603](#) takes precedence)}
- B29C 2045/202 {Laterally adjustable nozzle or nozzle tip mountings}
- B29C 2045/205 {Elongated nozzle openings}
- B29C 2045/207 {Preventing stringing of the moulding material}
- B29C 45/22 . . . Multiple nozzle systems
- B29C 45/23 . . . Feed stopping equipment
- B29C 45/231 {Needle valve systems therefor}
- B29C 45/232 {comprising closing means disposed outside the nozzle}
- B29C 45/234 {Valves opened by the pressure of the moulding material ([B29C 45/231](#) takes precedence)}
- B29C 2045/235 {axially movable inclined or orthogonal valves}
- B29C 2045/237 {two or more cooperating valve elements}
- B29C 2045/238 {Injection nozzles extending into the sprue channel or vice versa}
- B29C 45/24 . . . Cleaning equipment
- B29C 45/26 . . . Moulds
- B29C 45/2602 . . . {Mould construction elements}
- B29C 2045/2604 {Latching means for successive opening or closing of mould plates}
- B29C 45/2606 {Guiding or centering means}
- B29C 45/2608 . . . {Mould seals}
- B29C 45/261 . . . {having tubular mould cavities}

B29C 45/2612	. . . .	{for manufacturing tubular articles with an annular groove}
B29C 45/2614	. . . .	{for manufacturing bent tubular articles using an undercut forming mould core}
B29C 45/2616	. . .	{having annular mould cavities}
B29C 45/2618	. . .	{having screw-threaded mould walls}
B29C 45/262	. . . .	{provided with unscrewing drive means (unscrewing means outside the mould B29C 45/178)}
B29C 45/2622	. . . .	{for moulding interrupted screw threads}
B29C 45/2624	. . .	{provided with a multiplicity of wall-like cavities connected to a common cavity, e.g. for battery cases}
B29C 45/2626	. . .	{provided with a multiplicity of narrow cavities connected to a common cavity, e.g. for brushes, combs}
B29C 45/2628	. . .	{with mould parts forming holes in or through the moulded article, e.g. for bearing cages}
B29C 45/263	. . .	{with mould wall parts provided with fine grooves or impressions, e.g. for record discs}
B29C 45/2632	. . . .	{Stampers; Mountings thereof}
B29C 2045/2634	. . . . .	{mounting layers between stamper and mould or on the rear surface of the stamper}
B29C 2045/2636	. . . . .	{insulating layers}
B29C 2045/2638	. . . . .	{Magnetic means for mounting stampers}
B29C 2045/264	. . . . .	{Holders retaining the inner periphery of the stamper}
B29C 45/2642	. . . .	{Heating or cooling means therefor}
B29C 2045/2644	. . . . .	{for the outer peripheral ring}
B29C 2045/2646	. . . .	{Means for adjusting the axial dimension of the mould cavity}
B29C 2045/2648	. . . .	{Outer peripheral ring constructions}
B29C 2045/2651	. . . .	{using a plurality of mould cavities}
B29C 2045/2653	. . . .	{using two stampers}
B29C 2045/2655	. . . .	{Means for adjusting the radial dimension of the mould cavity}
B29C 2045/2657	. . . .	{Drive means for the outer peripheral ring}
B29C 2045/2659	. . . .	{for making substrates for laminated disks}
B29C 2045/2661	. . . .	{The thickness of the mould cavity being changeable in radial direction (B29C 2045/2667 takes precedence)}
B29C 2045/2663	. . . .	{Maintaining the axial dimension of the mould cavity during injection}
B29C 2045/2665	. . . .	{using vacuum means for holding the disc on one of the mould walls during opening of the mould}
B29C 2045/2667	. . . .	{Particular inner or outer peripheral portions of the substrate}
B29C 45/2669	. . .	{with means for removing excess material, e.g. with overflow cavities (B29C 45/1711 takes precedence)}
B29C 2045/2671	. . . .	{Resin exit gates or bleeder passages}
B29C 45/2673	. . .	{with exchangeable mould parts, e.g. cassette moulds (B29C 45/1756 takes precedence)}
B29C 45/2675	. . . .	{Mounting of exchangeable mould inserts}

B29C 2045/2677	. . . .	{The exchangeable mould parts being combinable or rearrangeable in different ways}
B29C 2045/2679	. . . .	{Simultaneously producing different products}
B29C 45/2681	. . .	{with rotatable mould parts}
B29C 2045/2683	. . .	{Plurality of independent mould cavities in a single mould}
B29C 2045/2685	. . . .	{filled with different materials}
B29C 2045/2687	. . . .	{controlling the filling thereof (B29C 2045/2691 takes precedence)}
B29C 2045/2689	. . . .	{separate independent mould halves mounted on one plate}
B29C 2045/2691	. . . .	{sequentially filled}
B29C 2045/2693	. . .	{Mould cores with a built-in injection nozzle}
B29C 2045/2695	. . .	{injecting articles with varying wall thickness e.g. for making a tear line}
B29C 2045/2697	. . .	{Deformed geometry of the cavity}
B29C 45/27	. . .	Sprue channels {Runner channels or runner nozzles}
B29C 45/2701	. . . .	{Details not specific to hot or cold runner channels (B29C 45/2725 takes precedence)}
B29C 45/2703	. . . . .	{Means for controlling the runner flow, e.g. runner switches, adjustable runners or gates}
B29C 45/2704	. . . . .	{Controlling the filling rates or the filling times of two or more mould cavities by controlling the cross section or the length of the runners or the gates}
B29C 2045/2706	. . . . .	{rotatable sprue bushings or runner channels for controlling runner flow in one cavity}
B29C 45/2708	. . . . .	{Gates (B29C 45/2703 takes precedence)}
B29C 2045/2709	. . . . .	{with a plurality of mould cavity inlets in close proximity}
B29C 45/2711	. . . . .	{Gate inserts}
B29C 2045/2712	. . . . .	{Serial gates for moulding articles in successively filled serial mould cavities}
B29C 2045/2714	. . . . .	{elongated e.g. film-like, annular}
B29C 2045/2716	. . . . .	{The gate axis being perpendicular to main injection axis, e.g. injecting into side walls of a container}
B29C 2045/2717	. . . . .	{Reconfigurable runner channels}
B29C 2045/2719	. . . . .	{Fixing or locking of nozzles or sprue bushings in the mould}
B29C 2045/272	. . . . .	{Part of the nozzle, bushing or runner in contact with the injected material being made from ceramic material}
B29C 2045/2722	. . . . .	{Nozzles or runner channels provided with a pressure sensor}
B29C 2045/2724	. . . . .	{Preventing stringing of the moulding material}
B29C 45/2725	. . . .	{Manifolds}
B29C 45/2727	. . . . .	{Modular manifolds; Connections between spaced manifold elements}
B29C 2045/2729	. . . . .	{with thermal expansion}
B29C 2045/273	. . . . .	{stacked manifolds}
B29C 2045/2732	. . . . .	{sealing means between them}
B29C 2045/2733	. . . . .	{Inserts, plugs, bushings}

B29C 45/2735	. . . .	{for non-coaxial gates, e.g. for edge gates}
B29C 45/2737	. . . .	{Heating or cooling means therefor (B29C 45/7331 takes precedence)}
B29C 45/2738	. . . . .	{specially adapted for manifolds}
B29C 2045/274	. . . . .	{Thermocouples or heat sensors}
B29C 2045/2741	. . . . .	{Plurality of independent thermocouples or heat sensors}
B29C 2045/2743	. . . . .	{Electrical heating element constructions}
B29C 2045/2745	. . . . .	{Film-like electrical heaters}
B29C 2045/2746	. . . . .	{Multilayered electrical heaters}
B29C 2045/2748	. . . . .	{Insulating layers covering the electrical heating element}
B29C 2045/275	. . . . .	{Planar heating or cooling elements}
B29C 2045/2751	. . . . .	{Electrical power supply connections}
B29C 2045/2753	. . . . .	{Heating means and cooling means, e.g. heating the runner nozzle and cooling the nozzle tip}
B29C 2045/2754	. . . . .	{Plurality of independent heating or cooling means, e.g. independently controlling the heating of several zones of the nozzle, (B29C 2045/2753 takes precedence)}
B29C 45/2756	. . . . .	{Cold runner channels}
B29C 45/2758	. . . . .	{Means for preventing drooling by decompression of the moulding material}
B29C 2045/2759	. . . . .	{Nozzle centering or guiding means}
B29C 2045/2761	. . . . .	{Seals between nozzle and mould or gate}
B29C 2045/2762	. . . . .	{Seals between nozzle and manifold}
B29C 2045/2764	. . . . .	{Limited contact between nozzle and mould}
B29C 2045/2766	. . . . .	{Heat insulation between nozzle and mould}
B29C 2045/2767	. . . . .	{the heat insulation being provided with an axial opening being part of the melt flow channel}
B29C 2045/2769	. . . . .	{Insulating layer of injected material}
B29C 2045/277	. . . . .	{Spacer means or pressure pads between manifold and mould plates}
B29C 2045/2772	. . . . .	{Means for fixing the nozzle to the manifold}
B29C 2045/2774	. . . . .	{The nozzle head or the collar portion and central portion being made of different parts or materials}
B29C 2045/2775	. . . . .	{Nozzles or parts thereof being mountable or exchangeable from the front side of the mould half}
B29C 2045/2777	. . . . .	{Means for controlling heat flow or temperature distribution in the nozzle}
B29C 2045/2779	. . . . .	{Nozzles with a plurality of outlets}
B29C 45/278	. . . . .	{Nozzle tips (B29C 45/2735 takes precedence)}
B29C 2045/2782	. . . . .	{Nozzle tips metallurgically bonded to the nozzle body}
B29C 2045/2783	. . . . .	{Nozzle tips with a non-axial outlet opening of the melt channel}
B29C 2045/2785	. . . . .	{Nozzle tips with high thermal conductivity}
B29C 2045/2787	. . . . .	{Nozzle tips made of at least 2 different materials}

B29C 2045/2788	. . . .	{Nozzles having a polygonal cross section}
B29C 2045/279	. . . .	{Controlling the flow of material of two or more nozzles or gates to a single mould cavity}
B29C 2045/2791	. . . .	{Alignment means between nozzle and manifold}
B29C 2045/2793	. . . .	{Means for providing access to the runner system}
B29C 2045/2795	. . . .	{Insulated runners}
B29C 2045/2796	. . . .	{Axially movable nozzles or nozzle tips}
B29C 2045/2798	. . . .	{for compensating thermal expansion}
B29C 45/28	. . . .	Closure devices therefor
B29C 45/2803	. . . .	{comprising a member with an opening or the injection nozzle movable into or out of alignment with the sprue channel or mould gate}
B29C 45/2806	. . . .	{consisting of needle valve systems (B29C 45/2896 takes precedence)}
B29C 45/281	. . . .	{Drive means therefor}
B29C 2045/2813	. . . .	{Common drive means for several needle valves}
B29C 2045/2817	. . . .	{Several valve pin drive cylinders connected to the fluid distributor}
B29C 2045/282	. . . .	{Needle valves driven by screw and nut means}
B29C 2045/2824	. . . .	{Needle valves driven by an electric motor}
B29C 2045/2827	. . . .	{Needle valves driven by an annular piston mounted around the nozzle}
B29C 2045/2831	. . . .	{Needle valves driven by a cam}
B29C 2045/2834	. . . .	{Needle valves driven by a lever}
B29C 2045/2837	. . . .	{Needle valves driven by rack and pinion}
B29C 2045/2841	. . . .	{Needle valves driven by a plurality of coaxial pistons}
B29C 2045/2844	. . . .	{Needle valves driven by racks only}
B29C 2045/2848	. . . .	{having an adjustable stroke length}
B29C 2045/2851	. . . .	{Lateral movement between drive piston and needle valve}
B29C 2045/2855	. . . .	{intersecting the nozzle or runner channel}
B29C 2045/2858	. . . .	{Materials or coatings therefor}
B29C 2045/2862	. . . .	{being tubular}
B29C 2045/2865	. . . .	{having position detecting means}
B29C 2045/2868	. . . .	{with an incorporated heat pipe}
B29C 2045/2872	. . . .	{with at least three positions, e.g. two different open positions to control the melt flow}
B29C 2045/2875	. . . .	{Preventing rotation of the needle valve}
B29C 2045/2879	. . . .	{Back flow of material into nozzle channel}
B29C 2045/2882	. . . .	{closing by a movement in the counterflow direction}
B29C 2045/2886	. . . .	{closing at a distance from the gate}
B29C 2045/2889	. . . .	{Sealing guide bushings therefor}
B29C 2045/2893	. . . .	{Multiple coaxial needle valves}

B29C 45/2896	. . . . .	{extending in or through the mould cavity, e.g. valves mounted opposite the sprue channel}
B29C 45/30	. . . . .	Flow control means disposed within the sprue channel, e.g. "torpedo" construction
B29C 2045/302	. . . . .	{Torpedoes in the sprue channel for heating the melt of cross-linkable material}
B29C 2045/304	. . . . .	{Adjustable torpedoes}
B29C 2045/306	. . . . .	{Movable torpedoes}
B29C 2045/308	. . . . .	{Mixing or stirring devices}
B29C 45/32	. . . . .	having several axially spaced mould cavities, {i.e. for making several separated articles}
B29C 45/322	. . . . .	{Runner systems for distributing the moulding material to the stacked mould cavities}
B29C 2045/324	. . . . .	{Linked ejection means}
B29C 2045/326	. . . . .	{Supporting means for the central mould plate}
B29C 2045/328	. . . . .	{having a movable mould plate between two fixed mould plates}
B29C 45/33	. . . . .	having transversely, e.g. radially, movable mould parts
B29C 45/332	. . . . .	{Mountings or guides therefor; Drives therefor}
B29C 2045/334	. . . . .	{several transversely movable mould parts driven by a single drive means}
B29C 2045/336	. . . . .	{Cam drives}
B29C 2045/338	. . . . .	{Mould parts with combined axial and transversal movements}
B29C 45/34	. . . . .	having venting means
B29C 45/345	. . . . .	{using a porous mould wall or a part thereof, e.g. made of sintered metal}
B29C 45/36	. . . . .	having means for locating or centering cores
B29C 2045/363	. . . . .	{using a movable core or core part}
B29C 2045/366	. . . . .	{using retractable pins}
B29C 45/37	. . . . .	Mould cavity walls, {i.e. the inner surface forming the mould cavity, e.g. linings}
B29C 45/372	. . . . .	{provided with means for marking or patterning, e.g. numbering articles}
B29C 45/374	. . . . .	{for displaying altering indicia, e.g. data, numbers}
B29C 45/376	. . . . .	{adjustable (B29C 45/374 takes precedence)}
B29C 2045/378	. . . . .	{built by a stack of modular elements}
B29C 45/38	. . . . .	Cutting-off equipment for sprues or ingates
B29C 45/382	. . . . .	{disposed outside the mould}
B29C 2045/384	. . . . .	{cutting the sprue by a plunger movable into the runner channel}
B29C 2045/386	. . . . .	{returning the cutted sprue into the injection nozzle}
B29C 2045/388	. . . . .	{Locking pins for retaining the sprue}
B29C 45/40	. . . . .	Removing or ejecting moulded articles
B29C 45/4005	. . . . .	{Ejector constructions; Ejector operating mechanisms (B29C 45/44 takes precedence)}

B29C 45/401	. . . .	{Ejector pin constructions or mountings}
B29C 2045/4015	. . . . .	{Ejector pins provided with sealing means}
B29C 2045/4021	. . . . .	{Adjustable ejector pins}
B29C 2045/4026	. . . . .	{Ejectors with internal cooling}
B29C 2045/4031	. . . . .	{driven by a lever}
B29C 2045/4036	. . . . .	{driven by a screw and nut mechanism}
B29C 2045/4042	. . . . .	{driven by rack and pinion means}
B29C 2045/4047	. . . . .	{driven by a crank or eccentric}
B29C 2045/4052	. . . . .	{Ejector boxes}
B29C 2045/4057	. . . .	{the ejecting surface being large with regard to the surface of the article}
B29C 2045/4063	. . . .	{preventing damage to articles caused by the ejector}
B29C 2045/4068	. . . .	{using an auxiliary mould part carrying the moulded article and removing it from the mould}
B29C 2045/4073	. . . .	{Ejection devices located outside the injection moulding machine}
B29C 2045/4078	. . . .	{using stripping means}
B29C 2045/4084	. . . .	{Progressive ejection}
B29C 2045/4089	. . . .	{Hollow articles retained in the female mould during mould opening}
B29C 2045/4094	. . . .	{Ejectors located on the fixed mould half}
B29C 45/42	. . . .	using means movable from outside the mould between mould parts, {e.g. robots}
B29C 45/4208	. . . . .	{and driven by the movable mould part}
B29C 2045/4216	. . . . .	{releasable drive connections between the robot and the movable mould}
B29C 45/4225	. . . . .	{Take-off members or carriers for the moulded articles, e.g. grippers}
B29C 2045/4233	. . . . .	{loading or holding moulded articles in take-off member by fluid ejection}
B29C 2045/4241	. . . . .	{Auxiliary means for removing moulded articles from the robot}
B29C 2045/425	. . . . .	{Single device for unloading moulded articles and loading inserts into the mould}
B29C 2045/4258	. . . . .	{Article removing means movable into a closed mould}
B29C 2045/4266	. . . . .	{Robot grippers movable along three orthogonal axes}
B29C 2045/4275	. . . . .	{Related movements between the robot gripper and the movable mould or ejector}
B29C 2045/4283	. . . . .	{Means for coupling robots to the injection moulding machine}
B29C 2045/4291	. . . . .	{Robots mounted on a tie rod}
B29C 45/43	. . . .	using fluid under pressure
B29C 45/435	. . . . .	{introduced between a mould core and a hollow resilient undercut article, e.g. bellows}
B29C 45/44	. . . .	for undercut articles
B29C 45/4407	. . . . .	{by flexible movement of undercut portions of the articles}
B29C 2045/4414	. . . . .	{Flexible undercut parts divided into segments}
B29C 45/4421	. . . . .	{using expansible or collapsible cores}

B29C 2045/4428	. . . . .	{driven by the moulded article during ejection thereof}
B29C 45/4435	. . . . .	{using inclined, tiltable or flexible undercut forming elements driven by the ejector means}
B29C 2045/4442	. . . . .	{Flexible undercut forming elements}
B29C 2045/445	. . . . .	{using the movable undercut forming element for ejection of the moulded article}
B29C 45/4457	. . . . .	{using fusible, soluble or destructible cores}
B29C 2045/4464	. . . . .	{injecting the core and the undercut article in separate cavities}
B29C 45/4471	. . . . .	{using flexible or pivotable undercut forming elements (B29C 45/4435 takes precedence)}
B29C 45/4478	. . . . .	{using non-rigid undercut forming elements, e.g. elastic or resilient}
B29C 2045/4485	. . . . .	{the undercut forming mould part being rotatable into the space made available by the translation movement of another mould part}
B29C 2045/4492	. . . . .	{preventing damage or deformation of undercut articles during ejection}
B29C 45/46	. .	Means for plasticising or homogenising the moulding material or forcing it into the mould {(combined with mould opening, closing or clamping devices B29C 45/70)}
B29C 45/461	. . .	{Injection of measured doses}
B29C 45/462	. . .	{Injection of preformed charges of material}
B29C 45/463	. . . . .	{using packaged or wrapped charges}
B29C 45/464	. . .	{using a rotating plasticising or injection disc}
B29C 2045/465	. . .	{using pumps for injecting the material into the mould}
B29C 2045/466	. . .	{supplying the injection unit directly by a compounder}
B29C 2045/467	. . .	{injecting material into the mould by sudden expansion of compressed material in the injection unit}
B29C 2045/468	. . .	{using a fluid as directly acting injection means}
B29C 45/47	. . .	using screws (B29C 45/54 takes precedence)
B29C 45/48	. . . . .	Plasticising screw and injection screw {comprising two separate screws}
B29C 45/50	. . . . .	Axially movable screw
B29C 2045/5004	. . . . .	{the forward screw end provided with an injection ram}
B29C 45/5008	. . . . .	{Drive means therefor}
B29C 2045/5012	. . . . .	{screws axially driven by a toggle mechanism}
B29C 2045/5016	. . . . .	{screws axially driven by a lever mechanism}
B29C 2045/502	. . . . .	{screws axially driven by a crank or eccentric mechanism}
B29C 2045/5024	. . . . .	{screws rotated by the coaxial rotor of an electric motor}
B29C 2045/5028	. . . . .	{screws axially driven by the coaxial rotor of an electric motor}
B29C 2045/5032	. . . . .	{using means for detecting injection or back pressures}
B29C 2045/5036	. . . . .	{back pressure obtaining means}
B29C 2045/504	. . . . .	{electric motors for rotary and axial movement of the screw being coaxial with the screw}
B29C 2045/5044	. . . . .	{screws axially driven by rack and pinion means}

B29C 2045/5048	. . . . .	{screws axially driven and rotated by a drive shaft having a screw threaded part and spline part}
B29C 2045/5052	. . . . .	{screws axially driven by a rotatable nut cooperating with a fixed screw shaft}
B29C 2045/5056	. . . . .	{screws axially driven by a rotatable screw shaft cooperating with a fixed nut}
B29C 2045/506	. . . . .	{using a hydraulic transmission between drive motor and the axially movable screw}
B29C 2045/5064	. . . . .	{coupling means between rotation motor and rectilinear drive motor}
B29C 2045/5068	. . . . .	{mechanical drive means in series with hydraulic drive means for axially movable screw}
B29C 2045/5072	. . . . .	{using a drive screw comprising screw parts having opposite thread directions}
B29C 2045/5076	. . . . .	{using a single drive motor for rotary and for axial movements of the screw}
B29C 2045/508	. . . . .	{idle or dead stroke elements between injection screw and drive means}
B29C 2045/5084	. . . . .	{screws axially driven by roller elements}
B29C 2045/5088	. . . . .	{screws axially and rotatably driven by a piston}
B29C 45/5092	. . . . .	{Intrusion moulding, i.e. the screw rotates during injection}
B29C 2045/5096	. . . . .	{decompression of the moulding material by retraction or opposite rotation of the screw}
B29C 45/52	. . . . .	Non-return devices
B29C 2045/522	. . . . .	{Spring biased check rings}
B29C 2045/524	. . . . .	{Flexible valves}
B29C 2045/526	. . . . .	{Abrasion resistant means in the screw head or non-return device}
B29C 2045/528	. . . . .	{Mixing means forming part of or in close proximity to the non-return valve}
B29C 45/53	. . . . .	using injection ram or piston
B29C 45/531	. . . . .	{Drive means therefor}
B29C 45/532	. . . . .	{using a hollow injection ram co-operating with a coaxial screw}
B29C 2045/533	. . . . .	{using a continuously rotating plasticising screw}
B29C 45/535	. . . . .	{using two or more cooperating injection rams, e.g. coaxially or alternately operating rams}
B29C 2045/536	. . . . .	{rotatable injection plungers}
B29C 2045/537	. . . . .	{the injection plunger cooperating with a coaxial hollow transfer plunger}
B29C 2045/538	. . . . .	{the plunger being part of the mould cavity wall after injection}
B29C 45/54	. . . . .	and plasticising screw {(B29C 45/532 takes precedence)}
B29C 45/541	. . . . .	{using a hollow plasticising screw co-operating with a coaxial injection ram}
B29C 45/542	. . . . .	{using an accumulator between plasticising and injection unit, e.g. for a continuously operating plasticising screw}

B29C 45/544	. . . . .	{the plasticising unit being connected to a transfer chamber in the injection unit at the upstream side of the injection piston}
B29C 2045/545	. . . . .	{alternately operating injection plungers}
B29C 2045/547	. . . . .	{continuously rotating plasticising screw cooperating with a single injection plunger (B29C 45/542 takes precedence)}
B29C 2045/548	. . . . .	{Reciprocating plasticising screws}
B29C 45/56	. . .	using mould parts movable during or after injection, e.g. injection-compression moulding {(B29C 45/1705 and B29C 45/572 take precedence)}
B29C 45/5605	. . . . .	{Rotatable mould parts}
B29C 45/561	. . . . .	{Injection-compression moulding}
B29C 2045/5615	. . . . .	{Compression stroke, e.g. length thereof}
B29C 2045/562	. . . . .	{Velocity profiles of the compression stroke}
B29C 2045/5625	. . . . .	{Closing of the feed opening before or during compression}
B29C 2045/563	. . . . .	{Enlarging the mould cavity during injection}
B29C 2045/5635	. . . . .	{Mould integrated compression drive means}
B29C 2045/564	. . . . .	{Compression drive means acting independently from the mould closing and clamping means}
B29C 2045/5645	. . . . .	{Resilient compression means}
B29C 2045/565	. . . . .	{Closing of the mould during injection}
B29C 2045/5655	. . . . .	{using a screw mechanism as compression drive means}
B29C 2045/566	. . . . .	{Reducing compression pressure during cooling of the moulded material}
B29C 2045/5665	. . . . .	{Compression by transversely movable mould parts (transversely movable mould parts in general B29C 45/33)}
B29C 2045/567	. . . . .	{Expelling resin through the gate}
B29C 45/5675	. . . . .	{for making orifices in or through the moulded article}
B29C 45/568	. . . . .	{Applying vibrations to the mould parts}
B29C 2045/5685	. . . . .	{for eliminating internal voids in the moulding material}
B29C 2045/569	. . . . .	{using a mould part for decreasing and a mould part for increasing the volume of the mould cavity}
B29C 2045/5695	. . . . .	{using a movable mould part for continuously increasing the volume of the mould cavity to its final dimension during the whole injection step}
B29C 45/57	. . .	Exerting after-pressure on the moulding material {(B29C 45/174 takes precedence)}
B29C 45/572	. . . . .	{using movable mould wall or runner parts}
B29C 2045/575	. . . . .	{preventing backflow of moulding material to the injection means during after-pressure}
B29C 2045/577	. . . . .	{pushing the material in the runner channel until a pin or slider reaches the mould cavity wall}
B29C 45/58	. . .	Details
B29C 45/581	. . . . .	{Devices for influencing the material flow, e.g. "torpedo constructions" or mixing devices}
B29C 2045/583	. . . . .	{Mixing devices connected to drive means}

B29C 45/585	. . . .	{Vibration means for the injection unit or parts thereof}
B29C 45/586	. . . .	{Injection or transfer plungers}
B29C 2045/588	. . . . .	{Means for retaining sprues on the end surface of the plunger}
B29C 45/60	. . . .	Screws
B29C 2045/605	. . . . .	{comprising a zone or shape enhancing the degassing of the plastic material}
B29C 45/62	. . . .	Barrels or cylinders
B29C 2045/623	. . . . .	{Cylinders and inner linings having different thermal expansion coefficients}
B29C 2045/626	. . . . .	{Cylinders and inner linings having similar thermal expansion coefficients}
B29C 45/63	. . . .	Venting or degassing means
B29C 45/64	. .	Mould opening, closing or clamping devices {(combined with means for plasticising or homogenising B29C 45/70)}
B29C 45/641	. . .	{Clamping devices using means for straddling or interconnecting the mould halves, e.g. jaws, straps, latches}
B29C 2045/642	. . . .	{using coupling rods for clamping}
B29C 2045/644	. . .	{mould clamping by nozzle touch pressure}
B29C 2045/645	. . .	{using magnetic means}
B29C 2045/647	. . . .	{using magnetostriction}
B29C 2045/648	. . .	{Rack and pinion means for mould opening and closing a pair of mould halves}
B29C 45/66	. . .	mechanical
B29C 45/661	. . . .	{using a toggle mechanism for mould clamping}
B29C 2045/662	. . . . .	{using toggles directly connected or linked to the fixed platen and indirectly to the movable platen}
B29C 2045/664	. . . .	{using mould clamping means operating independently from the mould closing means}
B29C 2045/665	. . . .	{using a screw or screws having differently threaded parts arranged in series}
B29C 2045/667	. . . .	{Cam drive for mould closing or clamping}
B29C 2045/668	. . . .	{using tilting elements for obtaining mould clamping}
B29C 45/67	. . .	hydraulic
B29C 45/6707	. . . .	{without relative movement between the piston and the cylinder of the clamping device during the mould opening or closing movement}
B29C 45/6714	. . . . .	{using a separate element transmitting the mould clamping force from the clamping cylinder to the mould}
B29C 45/6721	. . . . .	{the separate element being displaceable with respect to the mould or the clamping cylinder}
B29C 45/6728	. . . . .	{the separate element consisting of coupling rods}
B29C 2045/6735	. . . . .	{Rotatable means coaxial with the coupling rod for locking the coupling rod to the mould platen}
B29C 2045/6742	. . . . .	{the coupling rods facilitating access between the mould halves}

B29C 2045/675	. . . . .	{Rotatable means coaxial with the tie rod for locking the movable platen to the tie rod, e.g. bayonet couplings using teeth or splines interrupted by longitudinal grooves}
B29C 2045/6757	. . . . .	{Hydraulic locking means}
B29C 45/6764	. . . . .	{using hydraulically connectable chambers of the clamping cylinder during the mould opening and closing movement}
B29C 45/6771	. . . . .	{the connection being provided within the clamping cylinder}
B29C 45/6778	. . . . .	{Stroke adjusting or limiting means}
B29C 2045/6785	. . . . .	{interconnecting two cylinders to supply fluid from one cylinder to the other during movement of the pistons}
B29C 2045/6792	. . . . .	{Combined pneumatic-hydraulic cylinders}
B29C 45/68	. . . . .	hydro-mechanical
B29C 45/681	. . . . .	{using a toggle mechanism as mould clamping device}
B29C 45/683	. . . . .	{using both a toggle mechanism as mould closing device and another mechanism as mould clamping device}
B29C 2045/685	. . . . .	{using mechanical drive means for mould closing to obtain the hydraulic clamping pressure}
B29C 2045/686	. . . . .	{using a screw and nut mechanism for mould closing and a mould clamping ram acting on another nut}
B29C 2045/688	. . . . .	{using tie rods as separate elements for clamping}
B29C 45/70	. . . . .	Means for plasticising or homogenising the moulding material or forcing it into the mould, combined with mould opening, closing or clamping devices
B29C 2045/703	. . . . .	{using clamping and injection pressures that are proportional to each other}
B29C 45/706	. . . . .	{using a single drive system providing both the mould closing and clamping pressure and also the injection pressure, e.g. using a fixed injection piston}
B29C 45/72	. . . . .	Heating or cooling
B29C 45/7207	. . . . .	{of the moulded articles}
B29C 2045/7214	. . . . .	{Preform carriers for cooling preforms}
B29C 2045/7221	. . . . .	{Means for ejecting the preforms}
B29C 2045/7228	. . . . .	{turret-like}
B29C 2045/7235	. . . . .	{Mechanical retaining means for preform ends}
B29C 2045/7242	. . . . .	{Alignment means for preforms}
B29C 2045/725	. . . . .	{Cooling circuits within the preform carriers}
B29C 2045/7257	. . . . .	{Cooling or heating pins with temperature adjustment enhancing surface structure}
B29C 2045/7264	. . . . .	{Cooling or heating the neck portion of preforms}
B29C 2045/7271	. . . . .	{Cooling of drive motors}
B29C 2045/7278	. . . . .	{Heating by friction of the moulding material}
B29C 2045/7285	. . . . .	{using hydraulic oil as tempering medium}
B29C 2045/7292	. . . . .	{Recovering waste heat}
B29C 45/73	. . . . .	of the mould {(B29C 45/2642 and B29C 45/2737 take precedence)}

B29C 45/7306	. . . .	{Control circuits therefor}
B29C 45/7312	. . . .	{Construction of heating or cooling fluid flow channels}
B29C 2045/7318	. . . . .	{multilayered fluid channel constructions}
B29C 2045/7325	. . . . .	{Mould cavity linings for covering fluid channels or provided therewith}
B29C 45/7331	. . . .	{Heat transfer elements, e.g. heat pipes}
B29C 45/7337	. . . .	{using gas or steam (B29C 45/7331 takes precedence)}
B29C 2045/7343	. . . .	{heating or cooling different mould parts at different temperatures}
B29C 2045/735	. . . .	{heating a mould part and cooling another mould part during moulding}
B29C 2045/7356	. . . .	{the temperature of the mould being near or higher than the melting temperature or glass transition temperature of the moulding material}
B29C 2045/7362	. . . .	{turbulent flow of heating or cooling fluid}
B29C 2045/7368	. . . .	{combining a heating or cooling fluid and non-fluid means}
B29C 2045/7375	. . . .	{heating a mould surface by a heated gas}
B29C 2045/7381	. . . . .	{heating by gas combustion}
B29C 2045/7387	. . . .	{jetting a cooling fluid onto the moulded article while still in the mould}
B29C 2045/7393	. . . .	{alternately heating and cooling}
B29C 45/74	. . .	of the injection unit
B29C 45/76	. .	Measuring, controlling or regulating {(measuring in general G01 ; controlling or regulating in general G05)}

NOTE

In groups [B29C 45/76](#) to [B29C 45/80](#) it is desirable to add the indexing codes of [B29C 2945/76](#) relating to measuring, controlling or regulating in injection moulding

B29C 2045/7606	. . .	{Controlling or regulating the display unit}
B29C 45/7613	. . .	{the termination of flow of material into the mould}
B29C 45/762	. . .	{the sequence of operations of an injection cycle}
B29C 45/7626	. . .	{the ejection or removal of moulded articles}
B29C 2045/7633	. . . .	{Take out or gripping means}
B29C 2045/764	. . . .	{detecting or preventing overload of an ejector (controlling overload in general G01L 5/0071)}
B29C 45/7646	. . .	{viscosity}
B29C 45/7653	. . .	{mould clamping forces}
B29C 45/766	. . .	{the setting or resetting of moulding conditions, e.g. before starting a cycle}
B29C 45/7666	. . .	{of power or energy, e.g. integral function of force}
B29C 2045/7673	. . . .	{Recovering energy or power from drive motors}
B29C 45/768	. . .	{Detecting defective moulding conditions (B29C 45/84 takes precedence)}
B29C 45/7686	. . .	{the ejected articles, e.g. weight control}

- B29C 45/7693 . . . {using rheological models of the material in the mould, e.g. finite elements method}
- B29C 45/77 . . . of velocity or pressure of moulding material
- B29C 2045/773 {Zero point correction}
- B29C 2045/776 {determining the switchover point to the holding pressure}
- B29C 45/78 . . . of temperature
- B29C 45/80 . . . of relative position of mould parts
- B29C 45/82 . . . Hydraulic {or pneumatic} circuits
- B29C 2045/822 {Pneumatic circuits}
- B29C 2045/824 {Accumulators}
- B29C 2045/826 {Plurality of hydraulic actuators driven by one hydraulic pump}
- B29C 2045/828 {Bidirectional pumps}
- B29C 45/83 . . Lubricating means
- B29C 2045/835 . . . {for ball screws or ball nuts}
- B29C 45/84 . . Safety devices {(B29C 45/7626 takes precedence)}
- B29C 45/842 . . . {Detection of insert defects, e.g. inaccurate position, breakage}
- B29C 45/844 . . . {Preventing damage caused by obstructions or foreign matter caught between mould halves during mould closing, e.g. moulded parts or runners}
- B29C 2045/846 . . . {Windable safety screens}
- B29C 2045/848 . . . {detecting or preventing overload of an injection plunger (controlling overload in general G01L 5/0071)}

B29C 47/00 **Extrusion moulding, i.e. expressing the moulding material through a die or nozzle which imparts the desired form; Apparatus therefor** (extrusion blow-moulding B29C 49/04; extrusion presses in general B30B 11/22)

- B29C 47/0002 . {Small extruders, e.g. handheld extruders or laboratory extruders}
- B29C 47/0004 . {characterised by the choice of material}

NOTE

When classifying in this group, it is desirable to add the indexing codes of subclass B29K to identify the moulding materials and their properties. Documents concerning the choice of moulding materials having a particular influence on the moulding technique should be classified in this group if of interest

- B29C 47/0007 . . {Extruding materials comprising incompatible ingredients}
- B29C 47/0009 . {characterised by the shape of the articles}
- B29C 47/0011 . . {Particle-shaped (making granules B29B 9/00)}
- B29C 47/0014 . . {Filamentary-shaped articles, e.g. strands (making granules in the form of filamentary material B29B 9/06)}
- B29C 47/0016 . . {Rod-shaped articles}
- B29C 47/0019 . . {Flat rigid articles, e.g. panels, plates}
- B29C 47/0021 . . {Flat flexible articles, e.g. sheets, foils or films}
- B29C 47/0023 . . {Hollow rigid articles having only one tubular passage}

- B29C 47/0026 . . {Hollow flexible articles, e.g. blown foils or films}
- B29C 47/0028 . . {Multi-passage hollow articles, e.g. having at least two holes, e.g. honeycomb articles}
- B29C 47/003 . . {Articles having cross-sectional irregularities, i.e. being non-flat or having cylindrical cross-sections perpendicular to the extrusion direction}
- B29C 47/0033 . . {Articles having longitudinal irregularities, i.e. the cross-section being non-constant in the extrusion direction}
- B29C 47/0035 . . {Curved articles}
- B29C 47/0038 . {Combined shaping operations}
- B29C 47/004 . . {Extrusion moulding combined with compression moulding (compression moulding in general [B29C 43/00](#))}
- B29C 47/0042 . . {Extrusion moulding combined with shaping by internal pressure generated in the material, e.g. foaming (shaping by internal pressure generated in the material, e.g. foaming, in general [B29C 44/00](#))}
- B29C 47/0045 . . {Extrusion moulding in several steps, i.e. components merging outside the die ([B29C 47/02](#) takes precedence)}
- B29C 47/0047 . . . {producing flat articles having components brought in contact outside the extrusion die}
- B29C 47/005 . . . {producing hollow articles having components brought in contact outside the extrusion die}
- B29C 47/0052 {using a plurality of extrusion dies}
- B29C 47/0054 . . {Extrusion moulding combined with blow-moulding or thermoforming (blow-moulding in general [B29C 49/00](#); thermoforming in general [B29C 51/00](#))}
- B29C 47/0057 . . {Extrusion moulding combined with shaping by orienting, stretching or shrinking, e.g. film blowing ([B29C 47/0054](#) takes precedence; shaping by stretching in general [B29C 55/00](#); shaping by liberation of internal stresses in general [B29C 61/00](#))}
- B29C 47/0059 . . {Extrusion moulding combined with shaping by flattening, folding or bending (bending, folding or flattening in general [B29C 53/00](#))}
- B29C 47/0061 . . {Extrusion moulding combined with surface shaping (surface shaping in general [B29C 59/00](#))}
- B29C 47/0064 . . {Extrusion moulding combined with joining, lining or laminating (joining in general [B29C 65/00](#); lining in general [B29C 63/00](#); laminating in general [B32B 37/00](#))}
- B29C 47/0066 . . {Extrusion moulding combined with cutting}
- B29C 47/0069 . . {Extrusion moulding combined with printing or marking}
- B29C 47/0071 . {extruding under particular conditions, e.g. in particular environments or using vacuum or vibrations}
- B29C 47/0073 . . {extruding in a clean room}
- B29C 47/0076 . . {using force fields, e.g. gravity or electrical fields ([B29C 47/887](#) takes precedence)}
- B29C 47/0078 . . {at a location before or in the feed unit, e.g. influencing the material in the hopper}
- B29C 47/008 . . {at the plasticising zone}
- B29C 47/0083 . . {at a venting zone}
- B29C 47/0085 . . {in the die}

- B29C 47/0088 . . {after the die nozzle}
- B29C 47/009 . . . {at the die nozzle exit zone}
- B29C 47/0092 . . . {at a calibration zone}
- B29C 47/0095 . . . {at a conveyor}
- B29C 47/0097 . . . {at a storing zone}
- B29C 47/02 . incorporating preformed parts or layers, e.g. extrusion moulding around inserts or for coating articles
- B29C 47/021 . . {Coating hollow articles}
- B29C 47/022 . . . {Coating the interior of hollow articles}
- B29C 47/023 . . . {Coating the inner and outer surfaces of hollow reinforcement}
- B29C 47/025 . . {Coating non-hollow articles}
- B29C 47/026 . . . {partially}
- B29C 47/027 . . {Simultaneous coating of more than one article}
- B29C 47/028 . . {Coating discontinuous element or linked elements}
- B29C 47/04 . of multilayered {or multi-component, e.g. co-extruded layers or components} or multicoloured articles {or coloured articles}{ (adapter blocks [B29C 47/56](#))}
- B29C 47/043 . . {Coloured articles}
- B29C 47/046 . . . {comprising a multi-coloured single component, e.g. striated, marbled or wood-like patterned}
- B29C 47/06 . . Multilayered articles {or multi-component articles}
- B29C 47/061 . . . {comprising six or more components, i.e. each component being counted once for each time it is present, e.g. in a layer}
- B29C 47/062 . . . {with components adjacent to each other, i.e. components merging at their short sides}
- B29C 47/064 {in the form of a thin strip, e.g. in the form of a helical pattern or mark lines}
- B29C 47/065 . . . {with components in layered configuration, i.e. components merging at their long sides}
- B29C 47/067 . . . {using means for adhering the layers or components, e.g. using tie layers, irregularities or undercuts}
- B29C 47/068 . . . {using means for avoiding adhering the layers or components, e.g. articles comprising peelable layers}
- B29C 47/08 . Component parts, details or accessories; Auxiliary operations
- B29C 47/0801 . . {Drive or actuation means; Transmission means; Screw supporting means}
- B29C 47/0803 . . . {Shaft or screw supports, e.g. bearings}
- B29C 47/0805 . . . {Direct drives or gear boxes}
- B29C 47/0806 . . . {Drive or actuation means for non-plasticising purposes, e.g. dosing unit}
- B29C 47/0808 . . {Sealing means}
- B29C 47/081 . . . {for filters}
- B29C 47/0811 . . {Flow control means, i.e. adjustable parts, e.g. valves ([throttling of flow B29C 47/0871](#))}
- B29C 47/0813 . . . {in the feeding, melting, plasticising or pumping zone, e.g. screw, barrel, gear-pump or ram}

- B29C 47/0815 . . . {provided in or in the proximity of filter devices}
- B29C 47/0816 . . . {provided in or in the proximity of dies ([B29C 47/124](#), [B29C 47/16](#), [B29C 47/22](#) take precedence)}
- B29C 47/0818 . . {Exchangeable extruder parts ([B29C 47/681](#) takes precedence)}
- B29C 47/082 . . . {Mounting and handling of the screw}
- B29C 47/0822 . . . {Mounting and handling of the die}
- B29C 47/0823 . . . {Mounting and handling of the hopper or feeder}
- B29C 47/0825 . . . {Screw parts}
- B29C 47/0827 . . . {Barrel parts}
- B29C 47/0828 . . . {Die parts}
- B29C 47/083 . . . {Hopper or feeder parts}
- B29C 47/0832 . . . {Inserts}
- B29C 47/0833 {for screws}
- B29C 47/0835 {for barrels}
- B29C 47/0837 {for dies}
- B29C 47/0838 . . {General arrangement or layout of plants}
- B29C 47/084 . . . {for extruding parallel streams of material, e.g. several separate parallel streams of extruded material forming separate articles ([B29C 47/30](#), [B29C 47/0045](#) take precedence)}
- B29C 47/0842 . . {Extruder machines or parts thereof characterised by the material or by their manufacturing process ([B29C 47/0818](#) take precedence; making of dies [B23P 15/24](#))}
- B29C 47/0844 . . . {Screws}
- B29C 47/0845 {Material therefor, e.g. coating or lining}
- B29C 47/0847 . . . {Barrels}
- B29C 47/0849 {Material therefor, e.g. coating or lining}
- B29C 47/085 . . . {Dies}
- B29C 47/0852 {Material therefor, e.g. coating or lining}
- B29C 47/0854 . . {Design of extruder parts, e.g. by modelling based on mathematical theories or experiments}
- B29C 47/0855 . . . {by modelling material flow, e.g. melt interaction with screw and barrel}
- B29C 47/0857 {in the plasticising zone}
- B29C 47/0859 {in the die zone}
- B29C 47/0861 . . . {of intermeshing screws}
- B29C 47/0862 . . . {by modelling of mechanical strength}
- B29C 47/0864 . . {Machine bases, support structures or frames}
- B29C 47/0866 . . {Means for allowing relative movements between the apparatus parts, e.g. for twisting the extruded article or for moving the die along a surface to be coated}
- B29C 47/0867 . . . {allowing small relative movement, e.g. adjustments for aligning the apparatus parts or for compensating for thermal expansion}
- B29C 47/0869 . . {Intermediate treatments, e.g. relaxation, annealing or decompression step for the melt ([B29C 47/76](#) takes precedence)}

- B29C 47/0871 . . {Throttling of the flow, e.g. for cooperating with plasticising elements or for degassing (flow control means [B29C 47/0811](#))}
- B29C 47/0872 . . {Extrusion in non-steady condition, e.g. start-up or shut-down}
- B29C 47/0874 . . . {Material change}
- B29C 47/0876 . . . {Intermittent extrusion}
- B29C 47/0877 . . {Cleaning, purging; Avoiding contamination for cleaning extruder parts}
- B29C 47/0879 . . . {of feeding units}
- B29C 47/0881 . . . {of plasticising units}
- B29C 47/0883 . . . {of dies}
- B29C 47/0884 . . . {of filters}
- B29C 47/0886 {using back flow}
- B29C 47/0888 {using scrapers}
- B29C 47/0889 . . . {of the extruded articles}
- B29C 47/0891 . . {Recovering or reusing of energy, materials or the like}
- B29C 47/0893 . . . {of energy}
- B29C 47/0894 . . . {of materials}
- B29C 47/0896 {of additives or processing aids}
- B29C 47/0898 . . {Storing of the manufactured articles, e.g. winding up or stacking}
- B29C 47/10 . . Feeding the material to the extruder
- B29C 47/1009 . . . {Raw material dosing}
- B29C 47/1018 . . . {Raw material pre-treatment while feeding (pre-treatment of the material to be shaped in general [B29B 15/00](#); handling of the material to be shaped in general [B29C 31/00](#); [B29C 47/78](#) takes precedence)}
- B29C 47/1027 . . . {in solid form, e.g. powder or granules}
- B29C 47/1036 {of preformed parts, e.g. inserts that are fed and transported generally uninfluenced through the extruder or fed directly to the die}
- B29C 47/1045 {of fibrous, filamentary or filling materials e.g. thin fibrous reinforcements or fillers}
- B29C 47/1054 {in band and/or in strip form, e.g. rubber strips}
- B29C 47/1063 . . . {in liquid form}
- B29C 47/1072 . . . {in gaseous form}
- B29C 47/1081 . . . {at several locations, e.g. using several hoppers or using a separate additive feeding}
- B29C 47/109 . . . {in a location other than through a barrel, e.g. through a screw}
- B29C 47/12 . . Extrusion nozzles or dies
- B29C 47/122 . . . {having reciprocating, oscillating or rotating parts}
- B29C 47/124 . . . {being adjustable, i.e. having adjustable exit sections}
- B29C 47/126 . . . {using dies or die parts movable in a closed circuit, e.g. mounted on movable endless support ([B29C 47/32](#) takes precedence)}
- B29C 47/128 . . . {specially adapted for bringing together components, e.g. melts within the die}
- B29C 47/14 . . . with broad opening, e.g. for sheets

B29C 47/145	. . . . {specially adapted for bringing together components, e.g. melts within the die}
B29C 47/16	. . . . {being} adjustable {i.e. having adjustable exit sections}
B29C 47/165	. . . . . {by positioning the die lips}
B29C 47/18	. . . . with die parts oscillating relative to each other
B29C 47/20	. . . with annular opening, e.g. for tubular articles
B29C 47/22	. . . . {being} adjustable {i.e. having adjustable exit sections}
B29C 47/225	. . . . . {with centering means}
B29C 47/24	. . . . with die parts rotatable relative to each other
B29C 47/26	. . . . Multiple annular extrusion nozzles {specially adapted for bringing together components, e.g. melts within the die}
B29C 47/261	. . . . . {the components merging one by one down streams in the die}
B29C 47/263	. . . . . . {using a layered die, e.g. stacked discs}
B29C 47/265	. . . . . . {using a die with concentric parts, e.g. rings, cylinders}
B29C 47/266	. . . . . {the components merging at a common location}
B29C 47/268	. . . . . . {using a die with concentric parts, e.g. rings, cylinders}
B29C 47/28	. . . . Cross-head annular extrusion nozzles
B29C 47/30	. . . Multi-port extrusion nozzles {(for making granules in the form of filamentary material B29B 9/06)}
B29C 47/32	. . . Roller-extrusion nozzles
B29C 47/34	. . Conveyers for extruded material {(B29C 47/0898 takes precedence)}
B29C 47/36	. . Means for plasticising or homogenising the moulding material or forcing it through the nozzle or die
B29C 47/361	. . . {with the barrel or with a part thereof rotating}
B29C 47/362	. . . {using static mixing devices}
B29C 47/363	. . . {using non-actuated dynamic mixing devices}
B29C 47/364	. . . {using gear pumps}
B29C 47/365	. . . {Multi stage plasticisers, homogenisers or feeders (multi stage plasticisers using at least two screws in the same barrel B29C 47/50)}
B29C 47/366	. . . . {using a first screw extruder and a second screw extruder}
B29C 47/367	. . . . {using a screw extruder and a gear pump}
B29C 47/368	. . . . {using a screw extruder and a ram or piston}
B29C 47/369	. . . . {Partial multi-stage}
B29C 47/38	. . . using screws {surrounded by a cooperating barrel}
B29C 47/385	. . . . {using a single screw}
B29C 47/40	. . . . using at least two {parallel} intermeshing screws {or at least two parallel non-intermeshing screws}
B29C 47/402	. . . . . {the screws having intermeshing parts}
B29C 47/404	. . . . . {the screws having non-intermeshing parts}
B29C 47/406	. . . . . {using non-identical or non-mirrored screws}
B29C 47/408	. . . . . {using more than two screws (B29C 47/42 takes precedence)}
B29C 47/42	. . . . . using sub-screws, e.g. planetary screws

- B29C 47/44 using axially movable screws {in relation to the barrel}
- B29C 47/46 using screws extruding in opposite directions {e.g. separate screws arranged after each other and feeding in opposite directions}
- B29C 47/48 using screws arranged coaxially, one within the other
- B29C 47/50 using at least two screws {in the same barrel}, one after the other, e.g. multi stage plasticisers
- B29C 47/52 using rollers or discs
- B29C 47/522 {using rollers}
- B29C 47/525 {using single rollers, e.g. provided with protrusions, closely surrounded by a housing with movement of the material in the axial direction}
- B29C 47/527 {Cavity transfer mixing devices, i.e. a roller and surrounding barrel both provided with cavities; Barrels and rollers therefor}
- B29C 47/54 using press rams or pistons {or accumulators}
- B29C 47/56 using more than one extruder to feed one die
- B29C 47/58 Details
- B29C 47/585 {Extruder feed section}
- B29C 47/60 Screws {(screws characterized by the material or by their manufacturing process B29C 47/0844)}
- B29C 47/6006 {Hollow screws, i.e. comprising flow passage inside the screws}
- B29C 47/6012 {having varying outer diameter, e.g. screws with a conical part}
- B29C 47/6018 {having varying channel depth}
- B29C 47/6025 {having variable channel pitch}
- B29C 47/6031 {having forward feeding elements}
- B29C 47/6037 {having reverse feeding elements}
- B29C 47/6043 {having grooves or cavities}
- B29C 47/605 {having projections with a short length in the screw direction, e.g. pins}
- B29C 47/6056 {having kneading disc like elements, e.g. staggered discontinuous elements with a generally oval cross section}
- B29C 47/6062 {having shear ring like elements, i.e. with a generally circular cross section}
- B29C 47/6068 {having gears, i.e. interacting with the flow}
- B29C 47/6075 {characterised by thread details, i.e. by the special shape of a single thread, e.g. by irregularities within one thread}
- B29C 47/6081 {characterised by valley details, i.e. by the special shape of a single valley, e.g. by irregularities within one valley}
- B29C 47/6087 {characterised by the length of the screw or of a section}
- B29C 47/6093 {having parts without mixing elements, e.g. having cylinder shaped sections}
- B29C 47/62 having more than one screw-thread {, i.e. the screw cross section showing at least two threads}
- B29C 47/622 {the neighbouring threads and channels having identical configurations}

B29C 47/625	. . . . .	{the neighbouring threads or channels having different configurations, e.g. one flight having constantly a smaller diameter or height than the neighbouring flight}
B29C 47/627	. . . . .	{being multi-flight and having three or more flights}
B29C 47/64	. . . . .	having incorporated mixing devices {(B29C 47/6006 to B29C 47/627 take precedence)}
B29C 47/66	. . . . .	Barrels or cylinders
B29C 47/661	. . . . .	{for single screws}
B29C 47/662	. . . . .	{for twin screws}
B29C 47/663	. . . . .	{for more than two screws}
B29C 47/664	. . . . .	{having adaptable feed or discharge locations, e.g. for varying the amount of kneading by changing hopper position or discharge exit}
B29C 47/665	. . . . .	{with irregular inner surfaces}
B29C 47/666	. . . . .	{having grooves or cavities}
B29C 47/667	. . . . .	{having projections with a short length in the barrel direction, e.g. pins}
B29C 47/668	. . . . .	{having threads}
B29C 47/68	. . . . .	Filters; {Screens}
B29C 47/681	. . . . .	{Filtering devices with at least two parallel filters to be used alternately; Movable filters and changing mechanisms therefor}
B29C 47/682	. . . . .	{the filters being fitted on a single rectilinearly reciprocating slide (B29C 47/685 takes precedence)}
B29C 47/683	. . . . .	{the filters being fitted on a rotatable or pivotable disc or on the circumference of a rotatable or pivotable cylinder}
B29C 47/684	. . . . .	{Continuously rotating cylindrical filters}
B29C 47/685	. . . . .	{the filters being in the form of a continuous web displaceable to utilise adjacent areas consecutively}
B29C 47/686	. . . . .	{Substantially flat filters mounted at the end of an extruder screw and perpendicular to its axis (B29C 47/681 takes precedence)}
B29C 47/687	. . . . .	{Cylindrical or conical filters (B29C 47/681 takes precedence)}
B29C 47/688	. . . . .	{surrounding a rotating screw}
B29C 47/70	. . . . .	Flow dividers
B29C 47/702	. . . . .	{comprising means for dividing, distributing and recombining melt flows}
B29C 47/705	. . . . .	{in the die zone, e.g. to create flow homogeneity}
B29C 47/707	. . . . .	{component or layer multiplying}
B29C 47/72	. . . . .	Feed-back means
B29C 47/725	. . . . .	{for plasticising or homogenising devices}
B29C 47/74	. . . . .	By-pass means
B29C 47/745	. . . . .	{for plasticising or homogenising devices}
B29C 47/76	. . . . .	Venting, {drying} or degassing means
B29C 47/761	. . . . .	{the vented material being in liquid form}
B29C 47/762	. . . . .	{Vapour stripping}

B29C 47/763	. . . . . {Vent constructions, e.g. venting means avoiding melt escape}
B29C 47/765	. . . . . {in the extruder apparatus}
B29C 47/766	. . . . . {in screw extruders}
B29C 47/767	. . . . . {through a degassing opening of a barrel}
B29C 47/768	. . . . . {outside the apparatus, e.g. after the die}
B29C 47/78	. . Heating or cooling the material to be extruded or the stream of extruded material {or of a preformed part}
B29C 47/782	. . . {of a preformed part, e.g. a core before entering a die or before entering a barrel}
B29C 47/784	. . . {at a location before the plasticising zone, e.g. of the material in the hopper}
B29C 47/786	. . . . {heating}
B29C 47/788	. . . . {cooling}
B29C 47/80	. . . at plasticising zone {, e.g. from the feed section until the die entrance}
B29C 47/802	. . . . {heating}
B29C 47/805	. . . . {cooling}
B29C 47/807	. . . . {characterised by differential heating or cooling}
B29C 47/82	. . . . Heating {or cooling} the cylinders
B29C 47/822	. . . . . {heating}
B29C 47/825	. . . . . {cooling}
B29C 47/827	. . . . . {characterised by differential heating or cooling}
B29C 47/84	. . . . Heating {or cooling} the screws
B29C 47/842	. . . . . {heating}
B29C 47/845	. . . . . {cooling}
B29C 47/847	. . . . . {characterised by differential heating or cooling}
B29C 47/86	. . . at nozzle zone
B29C 47/862	. . . . {heating}
B29C 47/864	. . . . {cooling}
B29C 47/866	. . . . {characterised by differential heating or cooling}
B29C 47/868	. . . . . {in the direction of the stream of the material}
B29C 47/88	. . . Heating or cooling the stream of extruded material

NOTE

{Attention is drawn to Note (3) following the subclass title}

B29C 47/8805	. . . . {Heating}
B29C 47/881	. . . . . {of hollow articles}
B29C 47/8815	. . . . {cooling}
B29C 47/882	. . . . . {of hollow articles}
B29C 47/8825	. . . . . {of tubular films}
B29C 47/883	. . . . . {internally}
B29C 47/8835	. . . . . {externally}

- B29C 47/884 {of flat articles, e.g. using specially adapted supporting means}
- B29C 47/8845 {cooling drums}
- B29C 47/885 {Endless cooling belts}
- B29C 47/8855 {with means for improving the adhesion to the supporting means}
- B29C 47/886 {Pressure rollers}
- B29C 47/8865 {using vacuum}
- B29C 47/887 {Electrostatic pinning}
- B29C 47/8875 {by applying pressurised gas to the surface of the flat article}
- B29C 47/888 {by interposing a fluid layer between the supporting means and the flat article}
- B29C 47/8885 {characterized by differential heating or cooling}
- B29C 47/889 {in the direction of the stream of the material}
- B29C 47/8895 {using a bath, e.g. extruding into an open bath to coagulate or cool the material}
- B29C 47/90 with calibration or sizing
- B29C 47/901 {of hollow bodies}
- B29C 47/902 {internally}
- B29C 47/903 {externally}
- B29C 47/904 {using dry calibration, i.e. no quenching tank, e.g. with water spray for cooling or lubrication}
- B29C 47/905 {using wet calibration, i.e. in a quenching tank}
- B29C 47/906 {using roller calibration}
- B29C 47/907 {using adjustable calibrators; e.g. the dimensions of the calibrator being changeable}
- B29C 47/908 {characterised by calibrator surface, e.g. structure or holes for lubrication, cooling or venting}
- B29C 47/92 . . . Measuring, controlling or regulating

NOTE

When classifying in group [B29C 47/92](#) it is desirable to add the indexing codes of [B29C 2947/00](#) relating to measuring, controlling or regulating in extrusion moulding

- B29C 47/94 . . . Lubricating {, e.g. adding lubrication to the melt}
- B29C 47/96 . . . Safety devices
- B29C 47/965 . . . {Personnel safety, e.g. safety for the operator}

B29C 49/00 **Blow-moulding, i.e. blowing a preform or parison to a desired shape within a mould; Apparatus therefor** {(extrusion moulding of tubular films [B29C 47/0026](#); enlarging tube ends using pressure difference [B29C 57/08](#))}

- B29C 49/0005 . . {characterised by the choice of material}

NOTE

When classifying in this group, it is desirable to add the indexing codes of subclass [B29K](#) to identify the moulding materials and their properties.

B29C 49/0005

(continued)

Documents concerning the choice of moulding materials having a particular influence on the moulding technique should be classified in this group if of interest

- B29C 2049/001 . . {The material comprising particles or additives to induce special properties in the preform}
- B29C 49/0015 . {for making articles of indefinite length, e.g. corrugated tubes}
- B29C 49/0021 . . {using moulds or mould parts movable in a closed path, e.g. mounted on movable endless supports}
- B29C 49/0026 . . . {using independent mould parts, i.e. the mould parts not being interconnected, e.g. for speeding up the transfer of the moulds to the beginning of the moulding area}
- B29C 49/0031 . {for making articles having hollow walls}
- B29C 2049/0036 . . {by ballooning the parison in an open mould}
- B29C 49/0042 . {without using a mould}
- B29C 49/0047 . {Sheet blow-moulding, i.e. using at least two parallel sheets or a folded sheet as a preform}
- B29C 2049/0052 . . {using a folded sheet as a preform}
- B29C 2049/0057 . . {using two parallel sheets as a preform}
- B29C 2049/0063 . . {whereby the folded sheets or the two parallel sheets are separated from each other at least at one place, e.g. to allow inserting of a blowing means}
- B29C 2049/0068 . . {Means for avoiding the sheets to stick together before or during the blow moulding operation}
- B29C 49/0073 . {characterised by the parison configuration, e.g. nestable ([B29C 49/22](#) takes precedence)}
- B29C 49/0078 . . {Parisons having internal or external ribs}
- B29C 49/0084 . . . {the internal ribs being connected to the opposite wall, e.g. forming an internal separating wall}
- B29C 2049/0089 . . {the parison being a tube, e.g. a tube which has to be reheated before blow moulding}
- B29C 2049/0094 . {Blow moulding plants, e.g. using at least two blow moulding apparatuses at the same time}
- B29C 49/02 . Combined blow-moulding and manufacture of the preform or the parison
- B29C 2049/021 . . {the preform or parison being made out of several parts, e.g. by welding or gluing parts together}
- B29C 49/022 . . {the parison being partly injected and partly extruded}
- B29C 2049/023 . . {using inherent heat of the preform, i.e. 1 step blow moulding}
- B29C 2049/024 . . {not using inherent heat of the preform, i.e. 2 step blow moulding}
- B29C 2049/025 . . {the preform or parison being made of powder}
- B29C 2049/026 . . {Coating a preform or parison, e.g. with reinforcing material}
- B29C 2049/027 . . . {on the inside}
- B29C 2049/028 . . {Compression blow-moulding}
- B29C 49/04 . . Extrusion blow-moulding
- B29C 49/041 . . . {using an accumulator head}
- B29C 2049/042 {disclosing the push out speed}

B29C 2049/044	. . .	{extruding the material continuously}
B29C 2049/045	. . . .	{with means to move the extruder head up and down, e.g. to continue extruding the next parison while blow moulding the previous parison in the blow mould}
B29C 2049/047	. . .	{extruding the material discontinuously}
B29C 2049/048	. . .	{extruding several parisons parallel to each other at the same time}
B29C 49/06	. .	Injection blow-moulding {(introducing a fluid into the interior of the injected material which is still in a molten state B29C 45/1704)}
B29C 49/061	. . .	{with parison holding means displaceable between injection and blow stations}
B29C 49/062	. . . .	{following an arcuate path, e.g. rotary or oscillating-type}
B29C 49/063	. . . .	{with the parison axis held in the plane of rotation}
B29C 49/064	. . . .	{following a rectilinear path, e.g. shuttle-type}
B29C 2049/065	. . .	{Means to compensate or avoid the shrinking of the preforms, e.g. in the injection mould or outside the injection mould.}
B29C 2049/066	. . .	{One injection moulding station supplies several blow moulding stations with preforms}
B29C 2049/067	. . .	{Several injection moulding stations supply one blow moulding station with preforms}
B29C 2049/068	. . .	{Moving the injection mould cavity and blow mould cavity to the geometrically fixed injection core mould}
B29C 2049/069	. . .	{using a porous core}
B29C 49/08	. .	Biaxial stretching during blow-moulding {with or without prestretching}
B29C 49/085	. .	{without prestretching}
B29C 49/10	. .	using mechanical means {for prestretching}
B29C 49/12	. . .	Stretching rods
B29C 2049/1204	. . . .	{Means for fixing the stretching rod to the driving means, e.g. clamping means or bayonet connections}
B29C 2049/1209	. . . .	{rotating during stretching of the preform}
B29C 2049/1214	. . . .	{Using at least two stretching rods for stretching different parts of the preform}
B29C 2049/1219	. . . .	{Using additional means to clamp the preform bottom while stretching the preform}
B29C 2049/1223	. . . .	{Stretching rod configuration, e.g. geometry; Stretching rod material}
B29C 2049/1228	. . . .	{the stretching rod comprises at least one opening on the surface through which compressed air is blown into the preform to expand the same}
B29C 2049/1233	. . . .	{the opening being at the end where it touches the preform, e.g. to avoid direct contact between the preform and the stretching rod}
B29C 2049/1238	. . . .	{Geometry of the stretching rod, e.g. specific stretching rod end shape}
B29C 2049/1242	. . . .	{Material for parts or the whole stretching rod e.g. heat insulating material}
B29C 2049/1247	. . . .	{to stretch heated tubes}

- B29C 2049/1252 {Drive means therefore}
- B29C 2049/1257 {Pneumatic}
- B29C 2049/1261 {Hydraulic}
- B29C 2049/1266 {Mechanical}
- B29C 2049/1271 {being a cam mechanism}
- B29C 2049/1276 {adaptable to different sized stretching rods}
- B29C 2049/128 {being a toggle mechanism}
- B29C 2049/1285 {being a spindle nut mechanism}
- B29C 2049/129 {Electric direct drives, e.g. linear motors}
- B29C 2049/1295 {Magnetic}
- B29C 49/14 . . . Clamps
- B29C 49/16 . . using pressure difference {for prestretching}, e.g. pre-blowing {(B29C 49/649 takes precedence)}
- B29C 2049/165 . . . {pre-blowing without using a mould}
- B29C 49/18 . . using several blowing steps (B29C 49/16 takes precedence)
- B29C 49/185 . . {in different mould cavities}
- B29C 49/20 . . of articles having inserts or reinforcements; {Handling of inserts or reinforcements}
- B29C 2049/2004 . . {with a specific location of the inserts or reinforcements in or on the final article}
- B29C 2049/2008 . . . {Inside}
- B29C 2049/2013 {Connecting opposite walls, e.g. baffles in a fuel tank}
- B29C 2049/2017 . . . {Outside}
- B29C 2049/2021 . . {Particular inserts}
- B29C 2049/2026 . . . {Neck portions}
- B29C 2049/203 . . . {Carpets}
- B29C 2049/2034 . . . {Attachments, e.g. hooks to hold or hang the blown article}
- B29C 2049/2039 {Handles, e.g. handles or grips on bottles}
- B29C 2049/2043 . . . {comprising threads, e.g. screws or nuts}
- B29C 2049/2047 . . . {Tubular inserts, e.g. tubes}
- B29C 2049/2052 . . . {having means to avoid that the preform or parison gets into contact with parts of the insert}
- B29C 2049/2056 . . . {being constructed in such a way that opposite preform or parison walls do not touch each other during extrusion or mould closing}
- B29C 2049/206 . . . {being constructed in such a way that the joining between the insert and the preform or parison is avoided}
- B29C 2049/2065 . . . {for reinforcing specific areas of the final blow moulded article}
- B29C 2049/2069 . . . {being injection moulded, e.g. in the same mould before or after blow moulding}
- B29C 2049/2073 . . {Means for feeding the inserts into the mould, preform or parison, e.g. grippers}
- B29C 2049/2078 . . . {being retractable during or after blow moulding}

- B29C 2049/2082 . . . {Feeding the insert and the preform at the same time, e.g. using the same feeding means for the insert and the preform}
- B29C 2049/2086 . . {Means for verifying the position of insert}
- B29C 2049/2091 . . {Means for avoiding cooling of the inserts where the inserts touch the preform or the mould}
- B29C 2049/2095 . . {Means for heating the inserts}
- B29C 49/22 . using multilayered preforms or parisons
- B29C 49/221 . . {at least one layer being injected (injection moulding of multilayered parisons [B29C 45/1643](#), [B29C 45/1646](#))}
- B29C 2049/222 . . {only parts of the preforms or parisons are layered}
- B29C 2049/224 . . . {neck portion}
- B29C 2049/225 . . . {body portion}
- B29C 2049/227 . . {with particular bonding between the layers}
- B29C 2049/228 . . {at least one layer has a variable thickness}
- B29C 49/24 . Lining or labelling
- B29C 2049/2402 . . {lining articles}
- B29C 2049/2404 . . . {on their inside surface, e.g. the inside of a bottle or box}
- B29C 2049/2406 {the lining being used to line a previously coated mould}
- B29C 49/2408 . . {Inserting labels or films into blow-moulds, e.g. in-mould-labellers}
- B29C 2049/241 . . {In-mould labelling}
- B29C 2049/2412 . . . {the label being on the outside surface of the blow moulded article, e.g. bottle with a label on its outside surface}
- B29C 2049/2414 . . {Particular linings or labels, e.g. specific geometry, multilayered; Pretreatment thereof}
- B29C 2049/2416 . . . {Specific shapes or geometries}
- B29C 2049/2418 {Double folded labels}
- B29C 2049/242 {Labels have round edges}
- B29C 2049/2422 {Cylindrical labels}
- B29C 2049/2425 {Perforated labels}
- B29C 2049/2427 {Corrugated or embossed labels}
- B29C 2049/2429 . . . {Multilayered labels}
- B29C 2049/2431 . . . {Pretreatment or preshaping of labels}
- B29C 2049/2433 {Applying glue}
- B29C 2049/2435 {in a specific pattern}
- B29C 2049/2437 {Cutting}
- B29C 2049/2439 {by means in the mould cavity}
- B29C 2049/2441 {Preshaping while in the mould cavity}
- B29C 2049/2443 . . {Means for inserting the linings or labels into the mould}
- B29C 2049/2445 . . . {holding the labels or linings by magnetic force}
- B29C 2049/2447 . . . {holding the labels or linings by electrostatic force}
- B29C 2049/2449 . . . {holding the labels or linings by vacuum}

- B29C 2049/2452 . . . {being a transfer foil}
- B29C 2049/2454 . . . {for placing labels at the same time in two opposite mould cavities}
- B29C 2049/2456 . . . {and removing with the same means the final article}
- B29C 2049/2458 . . . {Driving means}
- B29C 2049/246 {Cams}
- B29C 2049/2462 {Conveyor belt}
- B29C 2049/2464 . . {Means for positioning labels (Moulds with incorporated means for positioning inserts in general [B29C 33/12](#))}
- B29C 2049/2466 . . . {using electrostatic force}
- B29C 2049/2468 . . . {using magnetic force}
- B29C 2049/247 . . . {using needles}
- B29C 2049/2472 . . . {using vacuum}
- B29C 2049/2474 . . . {using adhesive}
- B29C 2049/2477 . . {Deforming linings or the labels during blow moulding}
- B29C 2049/2479 . . {Label or lining movements}
- B29C 2049/2481 . . . {vertical only}
- B29C 2049/2483 . . . {horizontal only}
- B29C 2049/2485 . . . {multidirectional}
- B29C 2049/2487 . . . {comprising a rotary movement}
- B29C 2049/2489 . . {Folding the label around the edges of the final blow moulded article, e.g. via mould closing or via additional means}
- B29C 2049/2491 . . {Label materials}
- B29C 2049/2493 . . . {using identical material for the label and the preform}
- B29C 2049/2495 . . . {using different material for the label and the preform}
- B29C 2049/2497 . . . {Labels comprising data carriers or detection means, e.g. chips, RFIDs, antennas}
- B29C 49/26 . . inner lining of tubes
- B29C 49/28 . Blow-moulding apparatus
- B29C 2049/283 . . {configured to easily exchange modules, e.g. heating or feeding module}
- B29C 2049/286 . . {using several moulds whereby at least one mould is different from a plurality of identical moulds in at least one feature, e.g. size or shape}
- B29C 49/30 . . having movable moulds or mould parts
- B29C 49/32 . . . moving "to and fro"
- B29C 2049/325 {by using guide rails}
- B29C 49/34 the mould parts moving "hand-over-hand"
- B29C 49/36 . . . rotatable about one axis
- B29C 49/38 . . . mounted on movable endless supports {([B29C 49/0021](#) takes precedence)}
- B29C 49/40 on co-operating drums
- B29C 49/42 . Component parts, details or accessories; Auxiliary operations
- B29C 49/4205 . . {Handling means, e.g. transfer, loading or discharging means (handling of inserts or reinforcements [B29C 49/20](#); handling of labels [B29C 49/2408](#))}

B29C 49/421	. . . {for blown articles}
B29C 49/4215	. . . {for increasing the space between preforms, e.g. in order to perform the blow moulding step}
B29C 2049/4221	. . . {for transferring at least two preforms to the mould}
B29C 2049/4226	. . . {for orienting preforms in the mould, e.g. depending on their heat profile}
B29C 2049/4231	. . . {for aligning disorderly arranged preforms}
B29C 49/4236	. . {Drive means}
B29C 49/4242	. . {Means for deforming the parison prior to the blowing operation (B29C 49/08 takes precedence)}
B29C 49/4247	. . . {Spreading or extending means}
B29C 49/4252	. . {Auxiliary operations prior to the blow moulding operation, e.g. cutting (B29C 49/64 , B29C 49/76 , B29C 49/78 take precedence)}
B29C 2049/4257	. . . {Means for heating the mould cavity surface from the side of the cavity, e.g. putting an external heating member between the mould halves}
B29C 2049/4263	. . . . {using flames}
B29C 49/4268	. . {Auxiliary operations during the blow moulding operation (B29C 49/64 , B29C 49/76 , B29C 49/78 take precedence)}
B29C 49/4273	. . {Auxiliary operations after the blow moulding operation (B29C 49/64 , B29C 49/70 , B29C 49/72 , B29C 49/76 , B29C 49/78 take precedence)}
B29C 49/4278	. . . {Cutting, rearranging and joining the cut parts}
B29C 49/4284	. . {Means for recycling or reusing auxiliaries or materials, e.g. blowing fluids or energy}
B29C 49/4289	. . {Valve constructions or configurations, e.g. arranged to reduce blowing fluid consumption}
B29C 2049/4294	. . {Sealing means, i.e. for avoiding blowing air to escape}
B29C 49/44	. . for applying pressure through the walls of an inflated bag
B29C 2049/445	. . . {having wall areas with different elasticity}
B29C 49/46	. . characterised by using a particular environment or blow fluids other than air
B29C 2049/4602	. . . {Blowing fluids}
B29C 2049/4605	. . . . {containing an inert gas, e.g. helium}
B29C 2049/4608	. . . . . {Nitrogen}
B29C 2049/4611	. . . . . {containing a reactive gas}
B29C 2049/4614	. . . . . {Chlorine}
B29C 2049/4617	. . . . . {Fluor}
B29C 2049/462	. . . . . {Oxygen}
B29C 2049/4623	. . . . . {the gas containing sulfur, e.g. sulfur trioxide}
B29C 2049/4626	. . . . . {containing carbon dioxide}
B29C 2049/4629	. . . . . {containing a polar gas}
B29C 2049/4632	. . . . . {being filtered air}
B29C 2049/4635	. . . . . {being sterile}
B29C 2049/4638	. . . . . {being a hot gas, i.e. gas with a temperature higher than ambient temperature}

B29C 2049/4641	. . . .	{being a cooled gas, i.e. gas with a temperature lower than ambient temperature}
B29C 2049/4644	. . . .	{created by evaporating material, e.g. solid powder}
B29C 2049/4647	. . . .	{created by an explosive gas mixture}
B29C 2049/465	. . . .	{being incompressible}
B29C 2049/4652	. . . .	. {hot liquids}
B29C 2049/4655	. . . .	. {water}
B29C 2049/4658	. . . .	. {oil}
B29C 2049/4661	. . . .	. {solid media, e.g. powder (B29C 2049/4644 takes precedence)}
B29C 2049/4664	. . . .	. {staying in the final article}
B29C 2049/4667	. . . .	. {being foamable}
B29C 2049/467	. . . .	. {created by thermal expansion of enclosed amount of gas, e.g. heating enclosed air in preforms or parisons}
B29C 2049/4673	. . .	{Particular environments}
B29C 2049/4676	. . . .	. {being dry air to surround or flush parts of the blow moulding apparatus, e.g. blow mould, preforms or parisons}
B29C 2049/4679	. . . .	. {being sterile gas to surround or flush parts of the blow moulding apparatus, e.g. blowing means, preforms or parisons}
B29C 2049/4682	. . . .	. {surrounding or flushing preforms or parisons, e.g. flushing the inside of extruded parisons}
B29C 2049/4685	. . . .	. {after blow moulding}
B29C 2049/4688	. . . .	. {using reactive gas}
B29C 2049/4691	. . . .	. {using steam during blow moulding, e.g. to expand foamable beads}
B29C 2049/4694	. . . .	. {purging or cleaning the blow moulding apparatus or parts of it, e.g. cleaning blow moulds (cleaning moulds in general B29C 33/72)}
B29C 2049/4697	. . . .	. {Clean room}
B29C 49/48	. .	Moulds
B29C 49/4802	. . .	. {with means for locally compressing part(s) of the parison in the main blowing cavity}
B29C 2049/4805	. . . .	. {by closing the mould halves}
B29C 2049/4807	. . . .	. {by movable mould parts in the mould halves}
B29C 2049/481	. . . .	. {the movable mould parts moving outwardly, e.g. the mould size being increased due to the movement of the movable mould parts}
B29C 2049/4812	. . . .	. {and welding opposite wall parts of the parisons or preforms to each other}
B29C 49/4815	. . . .	. {by means of movable mould parts}
B29C 49/4817	. . .	. {with means for closing off parison ends}
B29C 49/482	. . .	. {with means for moulding parts of the parisons in an auxiliary cavity, e.g. moulding a handle}
B29C 49/4823	. . .	. {with incorporated heating or cooling means}
B29C 2049/4825	. . . .	. {for cooling moulds or mould parts (B29C 2049/5889 takes precedence)}

B29C 2049/4828	. . . . .	{for cooling mould parts}
B29C 2049/483	. . . . .	{in different areas of the mould at different temperatures, e.g. neck, shoulder or bottom}
B29C 2049/4833	. . . . .	{the cooling means being connected to an external heat exchanger}
B29C 2049/4835	. . . . .	{releasing the blowing fluid via the cooling channels of the moulds}
B29C 2049/4838	. . . . .	{for heating moulds or mould parts}
B29C 2049/4841	. . . . .	{for heating mould parts}
B29C 2049/4843	. . . . .	{for heating the bottom, e.g. heating the bottom part independently}
B29C 2049/4846	. . . . .	{in different areas of the mould at different temperatures, e.g. neck, shoulder or bottom}
B29C 2049/4848	. . . . .	{Bottom}
B29C 2049/4851	. . . . .	{Side walls}
B29C 2049/4853	. . . . .	{having additional means for improving heat transfer between the mould cavity and the parisons or preforms (in general B29C 33/30)}
B29C 2049/4856	. . . . .	{Mounting, exchanging or centering moulds or parts thereof (B29C 2049/5893 takes precedence; in general B29C 33/30)}
B29C 2049/4858	. . . . .	{Exchanging mould parts, e.g. for changing the mould size or geometry for making different products in the same mould}
B29C 2049/4861	. . . . .	{Neck portions of bottle producing moulds}
B29C 2049/4864	. . . . .	{Fixed by a special construction to the mould half carriers, e.g. using insulating material between the mould and the mould half carrier}
B29C 2049/4866	. . . . .	{center the moulds with the mould half carriers}
B29C 2049/4869	. . . . .	{containing more than one mould cavity}
B29C 2049/4871	. . . . .	{having different sizes or shapes mould cavities, e.g. for producing different sized bottles with the same mould}
B29C 2049/4874	. . . . .	{Moulds made of at least two different materials, e.g. a hard material and a soft material, materials having different thermal conductivities}
B29C 2049/4876	. . . . .	{one material being heat insulating material}
B29C 2049/4879	. . . . .	{defined by special mould configurations}
B29C 2049/4882	. . . . .	{Having a special mould cavity geometry}
B29C 2049/4884	. . . . .	{Mould halves are made of one piece}
B29C 2049/4887	. . . . .	{Mould halves consisting of an independent neck and main part}
B29C 2049/4889	. . . . .	{Mould halves consisting of an independent neck, main and bottom part}
B29C 2049/4892	. . . . .	{Mould halves consisting of an independent main and bottom part}
B29C 2049/4894	. . . . .	{With at least a part of the mould cavity formed by a cylindrical mould}
B29C 2049/4897	. . . . .	{characterised by the manufacturing process (in general B29C 33/38)}
B29C 49/50	. . . . .	having cutting or deflashing means
B29C 2049/503	. . . . .	{being independently movable during the mould closing}
B29C 2049/506	. . . . .	{being heated}
B29C 49/52	. . . . .	having decorating or printing means

B29C 49/54	. . .	for undercut articles
B29C 49/541	. . . .	{having a recessed undersurface}
B29C 2049/542	. . . .	{having means to facilitate the removal of the blow moulded articles (in general B29C 33/44)}
B29C 2049/543	. . . . .	{at the neck portion}
B29C 2049/545	. . . . .	{by rotationally actuating an auxiliary mould part while the mould is still in a closed position}
B29C 2049/546	. . . . .	{by translatorily actuating an auxiliary mould part while the mould is still in a closed position}
B29C 2049/547	. . . . .	{which are self actuated during the removing of the blow moulded articles, e.g. the means are spring loaded or flexible}
B29C 2049/548	. . . . .	{the movement of the mould parts during opening of the mould are interlinked}
B29C 49/56	. .	Opening, closing or clamping means
B29C 2049/563	. . .	{Clamping means}
B29C 2049/566	. . .	{Locking means}
B29C 49/58	. .	Blowing means {(B29C 45/1734 takes precedence)}
B29C 2049/5803	. . .	{Constructional features}
B29C 2049/5806	. . . .	{Means for fixing the blowing means with the mould}
B29C 2049/581	. . . . .	{Mechanical, e.g. fingers or toothed wheels}
B29C 2049/5813	. . . . .	{Hydraulic}
B29C 2049/5817	. . . . .	{Pneumatic}
B29C 2049/582	. . . . .	{Magnetic, e.g. permanent magnets}
B29C 2049/5824	. . . . .	{Electromagnetic means, e.g. electromagnets}
B29C 2049/5827	. . . . .	{Blowing means not touching the preform}
B29C 2049/5831	. . . . .	{Diaphragms or bellows protecting the blowing means against contamination}
B29C 2049/5834	. . . . .	{Lost blowing means}
B29C 2049/5837	. . . . .	{Plural independent blowing means}
B29C 2049/5841	. . . . .	{Plural independent blowing paths}
B29C 2049/5844	. . . . .	{Compacting means, e.g. to compact the neck portion of the blown article with the blowing means}
B29C 2049/5848	. . . . .	{Cutting means, e.g. to cut parts of the preform or parison with the blowing means}
B29C 2049/5851	. . . . .	{Means to avoid clogging of the blowing paths}
B29C 2049/5855	. . . . .	{allowing injecting additional cooling medium during the blowing operation, e.g. water droplets}
B29C 2049/5858	. . . . .	{Connecting means, e.g. to allow connection of fluid supply lines to the blowing means}
B29C 2049/5862	. . . .	{Drive means therefore}
B29C 2049/5865	. . . . .	{Pneumatic}
B29C 2049/5868	. . . . .	{Hydraulic}
B29C 2049/5872	. . . . .	{Mechanical}

B29C 2049/5875	. . . .	{Electric direct drives, e.g. linear electric motor}
B29C 2049/5879	. . . .	{Magnetic means, e.g. permanent magnets}
B29C 2049/5882	. . . . .	{Electromagnetic means, e.g. electromagnets}
B29C 2049/5886	. . .	{for introducing from below into the extruded parison, e.g. for reducing contamination of the preforms or parisons}
B29C 2049/5889	. . .	{being cooled}
B29C 2049/5893	. . .	{Mounting, exchanging or centering blowing means}
B29C 2049/5896	. . . .	{Centering means therefore}
B29C 49/60	. . .	Blow-needles
B29C 2049/6009	. . . .	{Constructional features}
B29C 2049/6018	. . . . .	{related to the air outlet}
B29C 2049/6027	. . . . .	{Having several air outlets e.g. for directing the blowing fluid in different directions}
B29C 2049/6036	. . . . .	{the air outlet being located distant from the end of the needle}
B29C 2049/6045	. . . . .	{The air outlet being open and closable}
B29C 2049/6054	. . . .	{Means for avoiding blowing fluid leakage between the blow needle and parisons or preforms}
B29C 2049/6063	. . . .	{having means which facilitate the puncturing of the parison}
B29C 2049/6072	. . . .	{being movable, e.g. blow needles move to pierce the parison}
B29C 2049/6081	. . . . .	{being rotatable}
B29C 2049/609	. . . .	{being at least two}
B29C 49/62	. .	Venting means
B29C 2049/622	. . .	{Air gaps between closed mould halves}
B29C 2049/625	. . . .	{by using spacing means between the mould halves}
B29C 2049/627	. . .	{Vacuum means}
B29C 49/64	. .	Heating or cooling preforms, parisons or blown articles
B29C 49/6409	. . .	{Thermal conditioning of preforms (B29C 49/68 takes precedence)}
B29C 49/6418	. . . .	{by reheating cold preforms in a single stage (B29C 49/6436 takes precedence)}
B29C 49/6427	. . . .	{by cooling hot or molten preforms in a single stage (B29C 49/6436 takes precedence)}
B29C 49/6436	. . . .	{producing a temperature differential}
B29C 49/6445	. . . . .	{through the preform length}
B29C 49/6454	. . . . .	{along the preform thickness}
B29C 49/6463	. . . .	{Mandrels or cores specially adapted for heating or cooling preforms}
B29C 49/6472	. . .	{in several stages (B29C 49/6409 takes precedence)}
B29C 49/6481	. . . .	{using several mould cavities for each article}
B29C 49/649	. . . .	{at least one stage being a heating stage used for shrinking of a preform prior to a subsequent blowing stage}
B29C 49/66	. . .	Cooling by refrigerant introduced into the blown article
B29C 2049/6607	. . . .	{Flushing blown articles}
B29C 2049/6615	. . . . .	{and exhausting through the blowing means}

- B29C 2049/6623 {and exhausting through an opening in the blown article}
- B29C 2049/663 {against ambient pressure}
- B29C 2049/6638 {against a pressure higher than ambient pressure}
- B29C 2049/6646 {while keeping the final blowing pressure in the article}
- B29C 2049/6653 {the refrigerant being other than cooled air}
- B29C 2049/6661 {the refrigerant being water}
- B29C 2049/6669 {the refrigerant being gas with water droplets}
- B29C 2049/6676 {the refrigerant being oriented towards special areas of the blown article}
- B29C 2049/6684 {Neck area}
- B29C 2049/6692 {Bottom area}
- B29C 49/68 . . . Ovens specially adapted for heating preforms or parisons
- B29C 49/70 . . . Removing or ejecting blown articles from the mould
- B29C 2049/701 . . . {Ejecting means}
- B29C 2049/702 {Air pressure}
- B29C 2049/704 {Pins}
- B29C 2049/705 {Driving means therefore}
- B29C 2049/707 {Hydraulic}
- B29C 2049/708 {Pneumatic}
- B29C 49/72 . . . Deflashing outside the mould
- B29C 2049/725 . . . {Means for removing the deflashed parts from the deflashing area, e.g. burrs being removed from the deflashing area by a conveyor}
- B29C 49/74 . . . Deflashing the neck portion
- B29C 49/76 . . . Neck calibration
- B29C 49/78 . . . Measuring, controlling or regulating
- B29C 49/783 . . . {the blowing pressure}
- B29C 49/786 . . . {the temperature}
- B29C 49/80 . . . Testing, e.g. for leaks

B29C 51/00 Shaping by thermoforming, {i.e. shaping sheets or sheet like preforms after heating}, e.g. shaping sheets in matched moulds or by deep-drawing; Apparatus therefor {(blow moulding of tubular preforms [B29C 49/00](#), deforming of tubular or hollow preforms [B29C 67/0014](#))}

- B29C 51/002 . . {characterised by the choice of material}

NOTE

When classifying in this group, it is desirable to add the indexing codes of subclass [B29K](#) to identify the moulding materials and their properties. Documents concerning the choice of moulding materials having a particular influence on the moulding technique should be classified in this group if of interest

- B29C 51/004
 - . . {Textile or other fibrous material made from plastics fibres (combined with plastic layers [B29C 51/145](#); compression moulding of reinforced plastic articles in matched moulds [B29C 70/46](#); using pressure difference [B29C 70/44](#))}
- B29C 51/006
 - . {for making articles having hollow walls}
- B29C 51/008
 - . {without using a mould, e.g. ballooning (as prestretching step [B29C 51/06](#))}
- B29C 51/02
 - . Combined thermoforming and manufacture of the preform
- B29C 51/04
 - . Combined thermoforming and prestretching, e.g. biaxial stretching
- B29C 51/06
 - . . using pressure difference {for prestretching}
- B29C 51/08
 - . Deep drawing or matched-mould forming, i.e. using mechanical means only
- B29C 51/082
 - . . {by shaping between complementary mould parts}
- B29C 51/085
 - . . . {with at least one of the shaping surfaces being made of resilient material, e.g. rubber}
- B29C 51/087
 - . . . {with at least one of the mould parts comprising independently movable sections ([B29C 51/32](#) and [B29C 51/34](#) take precedence)}
- B29C 51/10
 - . Forming by pressure difference, e.g. vacuum
- B29C 51/105
 - . . {Twin sheet thermoforming, i.e. deforming two parallel opposing sheets or foils at the same time by using one common mould cavity and without welding them together during thermoforming ([B29C 51/267](#), [B29C 49/0047](#) take precedence)}
- B29C 51/12
 - . of articles having inserts or reinforcements
- B29C 51/14
 - . using multilayered preforms or sheets
- B29C 51/145
 - . . {having at least one layer of textile or fibrous material combined with at least one plastics layer}
- B29C 51/16
 - . Lining or labelling
- B29C 51/162
 - . . {of deep containers or boxes}
- B29C 51/165
 - . . {combined with the feeding or the shaping of the lining or the labels (by injection moulding [B29C 45/14008](#), [B29C 45/1418](#))}
- B29C 51/167
 - . . . {of a continuous strip}
- B29C 51/18
 - . Thermoforming apparatus
- B29C 51/20
 - . . having movable moulds or mould parts
- B29C 51/22
 - . . . rotatable about an axis
- B29C 51/225
 - {mounted on a vacuum drum (for surface shaping [B29C 59/06](#))}
- B29C 51/24
 - . . . mounted on movable endless supports
- B29C 51/26
 - . Component parts, details or accessories; Auxiliary operations
- B29C 51/261
 - . . {Handling means, e.g. transfer means, feeding means ([B29C 51/44](#) takes precedence)}
- B29C 51/262
 - . . . {Clamping means for the sheets, e.g. clamping frames}
- B29C 51/263
 - . . {characterised by using a particular environment, e.g. sterile}
- B29C 51/264
 - . . {Auxiliary operations prior to the thermoforming operation, e.g. cutting ([B29C 51/42](#), [B29C 51/46](#) take precedence)}
- B29C 51/265
 - . . {Auxiliary operations during the thermoforming operation ([B29C 51/42](#), [B29C 51/46](#) take precedence)}

- B29C 51/266 . . {Auxiliary operations after the thermoforming operation ([B29C 51/42](#), [B29C 51/44](#), [B29C 51/46](#) take precedence)}
- B29C 51/267 . . . {Two sheets being thermoformed in separate mould parts and joined together while still in the mould ([B29C 49/0047](#) takes precedence)}
- B29C 51/268 . . . {Cutting, rearranging and joining the cut parts}
- B29C 51/28 . . for applying pressure through the wall of an inflated bag or diaphragm
- B29C 51/30 . . Moulds
- B29C 51/303 . . . {with sealing means or the like}
- B29C 51/306 . . . {with means for forming a rim (combined with cutting [B29C 51/325](#); rim rolling per se [B29C 53/34](#))}
- B29C 51/32 . . . having cutting means
- B29C 51/325 {combined with means for forming a rim}
- B29C 51/34 . . . for undercut articles
- B29C 51/343 {having recessed undersurfaces}
- B29C 51/346 {specially adapted to facilitate the destacking of nestable containers}
- B29C 51/36 . . . specially adapted for vacuum forming {, Manufacture thereof}
- B29C 51/365 {Porous moulds}
- B29C 51/38 . . . Opening, closing or clamping means
- B29C 51/40 . . . Venting means
- B29C 51/42 . . Heating or cooling
- B29C 51/421 . . . {of preforms, specially adapted for thermoforming (preheating sheets in general [B29B 13/023](#); [B29C 51/427](#) takes precedence)}
- B29C 51/422 {to produce a temperature differential ([B29C 51/426](#) takes precedence)}
- B29C 51/423 {through the thickness of the preform}
- B29C 51/424 {using a heated fluid}
- B29C 51/425 {using movable heating devices}
- B29C 51/426 . . . {Producing specific thermal regimes during thermoforming to obtain particular properties}
- B29C 51/427 . . . {Cooling of the material with a fluid blast}
- B29C 51/428 . . . {of moulds or mould parts}
- B29C 51/44 . . Removing or ejecting moulded articles
- B29C 51/445 . . . {from a support after moulding, e.g. by cutting}
- B29C 51/46 . . Measuring, controlling or regulating

B29C 53/00 Shaping by bending, folding, twisting, straightening or flattening; Apparatus therefor ([B29C 61/10](#) takes precedence)

- B29C 53/005 . {characterised by the choice of material ([B29C 53/36](#) and [B29C 53/56](#) take precedence)}

NOTE

When classifying in this group, it is desirable to add the indexing codes of subclass [B29K](#) to identify the moulding materials and their properties. Documents concerning the choice of moulding materials having a

B29C 53/005

(continued)

particular influence on the moulding technique should be classified in this group if of interest

- B29C 53/02 . Bending or folding ([B29C 53/22](#), [B29C 53/34](#), [B29C 53/36](#), [B29C 53/56](#) take precedence)
- B29C 53/025 . . {using a folding bag}
- B29C 53/04 . . of plates or sheets {(B29C 63/04 takes precedence; bending or folding paper [B31F 1/0003](#); folding films [B65H 45/00](#))}
- B29C 53/043 . . . {using rolls or endless belts}
- B29C 53/046 . . . {using centrifugal force}
- B29C 53/06 . . . Forming folding lines by pressing or scoring
- B29C 53/063 {combined with folding}
- B29C 53/066 {and joining the sides of the folding line, e.g. "Abkantschweissen"}
- B29C 53/08 . . of tubes {or other profiled members}
- B29C 53/083 . . . {bending longitudinally, i.e. modifying the curvature of the tube axis}
- B29C 53/086 . . . {bending radially, i.e. deformig the cross-section of the tube}
- B29C 53/10 . . of blown tubular films, e.g. gusseting {(flattening blown films during extrusion moulding [B29C 47/0009](#))}
- B29C 53/12 . . helically, e.g. for making springs {(for textile fibres [D02G 1/00](#))}
- B29C 53/14 . Twisting {(for textile fibres [D01H](#))}
- B29C 53/16 . Straightening or flattening
- B29C 53/18 . . of plates or sheets
- B29C 53/20 . . of tubes
- B29C 53/22 . Corrugating
- B29C 53/24 . . of plates or sheets
- B29C 53/26 . . . parallel with direction of feed
- B29C 53/265 {using rolls or endless bands}
- B29C 53/28 . . . transverse to direction of feed
- B29C 53/285 {using rolls or endless bands}
- B29C 53/30 . . of tubes (by blow-moulding [B29C 49/00](#))
- B29C 53/305 . . . {using a cording process}
- B29C 53/32 . Coiling ([B29C 53/56](#) takes precedence)
- B29C 53/34 . Rim rolling (of tube ends [B29C 57/12](#))
- B29C 53/36 . Bending and joining, e.g. for making hollow articles ([B29C 53/56](#) takes precedence; from paper [B31C](#), {[B31F](#)})
- B29C 2053/362 . . {for making hems}
- B29C 2053/365 . . . {provided with a string}
- B29C 2053/367 . . . {provided with a strip}
- B29C 53/38 . . by bending sheets or strips at right angles to the longitudinal axis of the article being formed and joining the edges
- B29C 53/382 . . . {using laminated sheets}
- B29C 53/385 . . . {using several sheets to form the circumference}

- B29C 53/387 . . . {the joining being done from the inside}
- B29C 53/40 . . . for articles of definite length, i.e. discrete articles
- B29C 53/42 using internal forming surfaces, e.g. mandrels
- B29C 53/44 rotatable about the axis of the article
- B29C 53/46 using external forming surfaces, e.g. sleeves
- B29C 53/48 . . . for articles of indefinite length, i.e. bending a strip progressively
- B29C 53/50 using internal forming surfaces, e.g. mandrels
- B29C 53/52 using external forming surfaces, e.g. sleeves
- B29C 53/54 Guiding, aligning or shaping edges
- B29C 53/56 . Winding and joining, e.g. winding spirally {(winding in general [B65H](#))}
- B29C 53/562 . . {spirally}
- B29C 53/564 . . {for making non-tubular articles (for winding of reinforced articles having a non-circular cross-section followed by compression [B29C 70/347](#))}
- B29C 53/566 . . {for making tubular articles followed by compression}
- B29C 53/568 . . {without using a forming surface}
- B29C 53/58 . . helically
- B29C 53/581 . . . {using sheets or strips consisting principally of plastics material (using profiled sheets or strips [B29C 53/78](#))}
- B29C 53/582 {comprising reinforcements, e.g. wires, threads}
- B29C 53/583 {for making tubular articles with particular features}
- B29C 53/584 {having a non-circular cross-section}
- B29C 53/585 {the cross-section varying along their axis, e.g. tapered, with ribs, or threads, with socket-ends}
- B29C 53/586 {having corrugations}
- B29C 53/587 {having a non-uniform wall-structure, e.g. with inserts, perforations, locally concentrated reinforcements}
- B29C 53/588 {having a non-linear axis e.g. elbows, toroids}
- B29C 53/60 . . . using internal forming surfaces, e.g. mandrels
- B29C 53/602 {for tubular articles having closed or nearly closed ends, e.g. vessels, tanks, containers}
- B29C 53/605 {by polar winding}
- B29C 53/607 {having driving means for advancing the wound articles, e.g. belts, rolls ([B29C 53/74](#) takes precedence)}
- B29C 53/62 rotatable about the winding axis
- B29C 53/64 and moving axially
- B29C 53/66 with axially movable winding feed member {e.g. lathe type winding}
- B29C 53/665 {Coordinating the movements of the winding feed member and the mandrel}
- B29C 53/68 with rotatable winding feed member
- B29C 53/70 and moving axially
- B29C 53/72 . . . using external forming surfaces

- B29C 53/74 . . . using a forming surface in the shape of an endless belt which is recycled after the forming operation
- B29C 53/76 . . . about more than one axis, {e.g. T-pieces, balls}
- B29C 53/78 . . . using profiled sheets or strips
- B29C 53/785 {with reinforcements}
- B29C 53/80 . Component parts, details or accessories; Auxiliary operations
- B29C 53/8008 . . {specially adapted for winding and joining}
- B29C 53/8016 . . . {Storing, feeding or applying winding materials, e.g. reels, thread guides, tensioners}
- B29C 2053/8025 {tensioning}
- B29C 2053/8033 {fixing the trailing edge of winding materials}
- B29C 53/8041 . . . {Measuring, controlling or regulating (B29C 53/665 takes precedence)}
- B29C 53/805 . . . {Applying axial reinforcements}
- B29C 53/8058 {continuously}
- B29C 53/8066 . . . {Impregnating (impregnating as pretreatment B29B 15/10)}
- B29C 53/8075 {on the forming surfaces}
- B29C 53/8083 . . . {Improving bonding of wound materials or layers}
- B29C 53/8091 . . . {Cutting the ends, surface finishing}
- B29C 53/82 . . Cores or mandrels
- B29C 53/821 . . . {Mandrels especially adapted for winding and joining}
- B29C 53/822 {Single use mandrels, e.g. destructible, becoming part of the wound articles (B29C 53/825 takes precedence)}
- B29C 53/824 {collapsible, e.g. elastic or inflatable; with removable parts, e.g. for regular shaped, straight tubular articles (B29C 53/825 takes precedence)}
- B29C 53/825 {for continuous winding}
- B29C 53/827 {formed by several elements rotating about their own axes}
- B29C 53/828 {Arrangements comprising a plurality of cores or mandrels, e.g. to increase production speed (B29C 53/827 takes precedence)}
- B29C 53/84 . . Heating or cooling
- B29C 53/845 . . . {especially adapted for winding and joining}

B29C 55/00 Shaping by stretching, e.g. drawing through a die; Apparatus therefor (B29C 61/08 takes precedence)

- B29C 55/005 . {characterised by the choice of materials}

NOTE

When classifying in this group, it is desirable to add the indexing codes of subclass [B29K](#) to identify the moulding materials and their properties. Documents concerning the choice of moulding materials having a particular influence on the moulding technique should be classified in this group if of interest

- B29C 55/02 . of plates or sheets
- B29C 55/023 . . {using multilayered plates or sheets}

- B29C 55/026 . . . {of preformed plates or sheets coated with a solution, a dispersion or a melt of thermoplastic material}
- B29C 55/04 . . uniaxial, e.g. oblique
- B29C 55/045 . . . {in a direction which is not parallel or transverse to the direction of feed e.g. oblique}
- B29C 55/06 . . . parallel with the direction of feed
- B29C 55/065 {in several stretching steps}
- B29C 55/08 . . . transverse to the direction of feed
- B29C 55/085 {in several stretching steps}
- B29C 55/10 . . multiaxial
- B29C 55/12 . . . biaxial
- B29C 55/14 successively
- B29C 55/143 {firstly parallel to the direction of feed and then transversely thereto}
- B29C 55/146 {firstly transversely to the direction of feed and then parallel thereto}
- B29C 55/16 simultaneously
- B29C 55/165 {Apparatus therefor}
- B29C 55/18 . . by squeezing between surfaces, e.g. rollers
- B29C 55/20 . . Edge clamps
- B29C 55/22 . of tubes {(B29C 61/08 takes precedence)}
- B29C 55/24 . . radial
- B29C 55/26 . . biaxial
- B29C 55/28 . of blown tubular films, e.g. by inflation {(extrusion moulding of tubular films B29C 47/0009)}
- B29C 55/285 . . {by using internal mechanical means}
- B29C 55/30 . Drawing through a die {(pultrusion B29C 70/52)}
- B29C 57/00 Shaping of tube ends, e.g. flanging, belling, closing; Apparatus therefor, {e.g. collapsible mandrels}**
- B29C 57/005 . {the end of an internal lining (fixing the end of the lining B29C 63/346)}
- B29C 57/02 . Belling or enlarging, e.g. combined with forming a groove
- B29C 57/025 . . {combined with the introduction of a sealing ring, e.g. using the sealing element as forming element}
- B29C 57/04 . . using mechanical means {(B29C 57/025 takes precedence)}
- B29C 57/045 . . . {rotating}
- B29C 57/06 . . . elastically deformable
- B29C 57/08 . . using pressure difference
- B29C 57/10 . Closing
- B29C 57/12 . Rim rolling
- B29C 57/125 . . {using tools with helical grooves}

B29C 59/00 **Surface shaping {of articles} e.g. embossing; Apparatus therefor** {(in-mould printing [B29C 37/0025](#); by using liquids [B29C 71/0009](#); by using gases without chemical reaction [B29C 71/009](#); for decorating in general [B44](#); abrasive blasting [B24C](#); chemical aspects [C08J 7/00](#))}

[B29C 59/002](#) . {Component parts, details or accessories; Auxiliary operations}

[B29C 59/005](#) . {characterised by the choice of material}

NOTE

Documents in which moulding materials are mentioned are indexed using indexing codes of subclass [B29K](#). However, when, for example, documents concerning the choice of moulding material having a particular influence on the moulding technique cannot be satisfactorily indexed, the documents may be classified in this group if of interest

[B29C 59/007](#) . {Forming single grooves or ribs, e.g. tear lines, weak spots (by moulding [B29C 37/0057](#); folding lines [B29C 53/06](#); in metal articles [B21D 17/00](#); by cutting [B26D 3/08](#))}

[B29C 59/02](#) . by mechanical means, e.g. pressing {([B29C 59/007](#) takes precedence; embossing expanded porous articles [B29C 44/5627](#))}

[B29C 59/021](#) . . {of profiled articles, e.g. hollow or tubular articles, beams}

[B29C 59/022](#) . . {characterised by the disposition or the configuration, e.g. dimensions, of the embossments or the shaping tools therefor}

[B29C 2059/023](#) . . . {Micro embossing}

[B29C 59/025](#) . . . {Fibrous surfaces with piles or similar fibres substantially perpendicular to the surface}

[B29C 59/026](#) . . {of layered or coated substantially flat surfaces}

[B29C 2059/027](#) . . {Grinding; Polishing}

[B29C 2059/028](#) . . {Incorporating particles by impact in the surface, e.g. using fluid jets or explosive forces to implant particles}

[B29C 59/04](#) . . using rollers or endless belts

[B29C 59/043](#) . . . {for profiled articles}

[B29C 59/046](#) . . . {for layered or coated substantially flat surfaces}

[B29C 59/06](#) . . using vacuum drums {(for thermoforming [B29C 51/225](#))}

[B29C 59/08](#) . by flame treatment; {using hot gases}

[B29C 59/085](#) . . {of profiled articles e.g. hollow or tubular articles}

[B29C 59/10](#) . by electric discharge treatment (electrodes [H01T](#))

[B29C 59/103](#) . . {of profiled articles, e.g. hollow or tubular articles}

[B29C 59/106](#) . . {the electrodes being placed on the same side of the material to be treated}

[B29C 59/12](#) . . in an environment other than air

[B29C 59/14](#) . by plasma treatment (in general [H05H](#) ; plasma tubes per se [H01J](#))

[B29C 59/142](#) . . {of profiled articles, e.g. hollow or tubular articles}

[B29C 2059/145](#) . . {Atmospheric plasma}

[B29C 2059/147](#) . . {Low pressure plasma; Glow discharge plasma}

[B29C 59/16](#) . by wave energy or particle radiation, {e.g. infra-red heating ([B29C 59/007](#) takes precedence)}

- B29C 59/165 . . {of profiled articles e.g. hollow or tubular articles}
- B29C 59/18 . by liberation of internal stresses, e.g. plastic memory

- B29C 61/00** **Shaping by liberation of internal stresses; Making preforms having internal stresses; Apparatus therefor** (for surface shaping [B29C 59/18](#); for lining articles [B29C 63/38](#); for joining preformed parts [B29C 65/66](#) ; for packaging [B65B 53/00](#); connecting arrangements or other fittings for plastics pipes using shrink-down material [F16L 47/22](#), electrical connections insulated using heat shrinking insulating sleeves [H01R 4/72](#); cable junctions protected by sleeves [H02G 15/18](#))
- B29C 61/003 . {characterised by the choice of material}
 - NOTE**
 - When classifying in this group, it is desirable to add the indexing codes of subclass [B29K](#) to identify the moulding materials and their properties. Documents concerning the choice of moulding materials having a particular influence on the moulding technique should be classified in this group if of interest
- B29C 61/006 . {the force created by the liberation of the internal stresses being used for compression moulding or for pressing preformed material}
- B29C 61/02 . Thermal shrinking
- B29C 61/025 . . {for the production of hollow or tubular articles}
- B29C 61/04 . Thermal expansion
- B29C 61/06 . Making preforms having internal stresses, e.g. plastic memory
- B29C 61/0608 . . {characterised by the configuration or structure of the preforms}
- B29C 61/0616 . . . {layered or partially layered preforms, e.g. preforms with layers of adhesive or sealing compositions ([B29C 61/0625](#) and [B29C 61/065](#) take precedence)}
- B29C 61/0625 . . . {Preforms comprising incorporated or associated heating means}
- B29C 61/0633 . . . {Preforms comprising reinforcing elements ([B29C 61/0625](#) takes precedence)}
- B29C 61/0641 . . . {Clips for dividing preforms or forming branch-offs (clips in general [F16B 2/20](#))}
- B29C 61/065 . . . {Preforms held in a stressed condition by means of a removable support; Supports therefor}
- B29C 61/0658 . . . {consisting of fibrous plastics material, e.g. woven}
- B29C 61/0666 . . . {comprising means indicating that the shrinking temperature is reached}
- B29C 2061/0675 {the means being a material exuding outside the preform when the temperature is reached}
- B29C 2061/0683 {the means being a thermochromic painting or coating}
- B29C 2061/0691 {the means being protrusions on the preform surface disappearing when the temperature is reached}
- B29C 61/08 . . by stretching tubes {(in general [B29C 55/22](#), [B29C 55/28](#))}
- B29C 61/10 . . by bending plates or sheets {(in general [B29C 53/36](#))}

- B29C 63/00** **Lining or sheathing, i.e. applying preformed layers or sheathing of plastics; Apparatus therefor** ([B29C 73/00](#) takes precedence; by blowing [B29C 49/00](#); by thermoforming [B29C 51/00](#))

- B29C 63/0004 . {Component parts, details or accessories; Auxiliary operations}
 - B29C 2063/0008 . . {Registering, centering the lining material on the substrate}
 - B29C 63/0013 . . {Removing old coatings}
 - B29C 63/0017 . {characterised by the choice of the material}
- NOTE**
- When classifying in this group, it is desirable to add the indexing codes of subclass [B29K](#) to identify the moulding materials and their properties. Documents concerning the choice of moulding materials having a particular influence on the moulding technique should be classified in this group if of interest
- B29C 63/0021 . . {with coherent impregnated reinforcing layers}
 - B29C 63/0026 . {an edge face with strip material, e.g. a panel edge (securing a veneer strip to a panel edge [B27D 5/003](#))}
 - B29C 63/003 . . {continuously}
 - B29C 63/0034 . . {the strip material being folded}
 - B29C 63/0039 . . . {continuously}
 - B29C 63/0043 . {Fixing the layers by electrostatic charges, by the use of structured surfaces or by mechanical means}
 - B29C 63/0047 . {Preventing air-inclusions}
 - B29C 63/0052 . {Testing, e.g. testing for the presence of pinholes}
 - B29C 63/0056 . {Provisional sheathings}
 - B29C 2063/006 . {of surfaces having irregularities or roughness}
 - B29C 63/0065 . {Heat treatment}
 - B29C 63/0069 . . {of tubular articles}
 - B29C 63/0073 . {of non-flat surfaces e.g. curved, profiled ([B29C 63/042](#) takes precedence)}
 - B29C 63/0078 . . {having local protrusions e.g. rivet heads}
 - B29C 63/0082 . {Finishing the edges of holes or perforations in the lined product}
 - B29C 63/0086 . . {and removing the portion of the lining covering the holes}
 - B29C 63/0091 . {in particular atmospheres}
 - B29C 63/0095 . {using a provisional carrier}
 - B29C 63/02 . using sheet or web-like material ([B29C 63/26](#) {and [B29C 63/38](#)} take precedence)
 - B29C 2063/021 . . {characterized by the junction of material sections}
 - B29C 2063/022 . . . {the junction being located in a groove}
 - B29C 63/024 . . {the sheet or web-like material being supported by a moving carriage}
 - B29C 63/025 . . {applied by a die matching with the profile of the surface of resilient articles, e.g. cushions, seat pads}
 - B29C 2063/027 . . {applied by a squeegee}
 - B29C 2063/028 . . {applied by a fluid jet}
 - B29C 63/04 . . by folding, winding, bending or the like
 - B29C 63/042 . . . {of L- or Z- shaped surfaces, e.g. for counter-tops}
 - B29C 63/044 . . . {continuously ([B29C 63/065](#), [B29C 63/105](#) take precedence)}

- B29C 63/046 . . . {using a folding shoulder}
- B29C 63/048 . . . {specially adapted for articles having local protrusions, e.g. tubes having a bead weld}
- B29C 63/06 . . . around tubular articles
- B29C 63/065 {continuously}
- B29C 63/08 . . . by winding helically
- B29C 63/10 around tubular articles
- B29C 63/105 {continuously}
- B29C 63/12 . . . by winding spirally
- B29C 63/14 around tubular articles
- B29C 63/145 {the tubular articles being mounted on transfer means}
- B29C 63/16 . . applied by "rubber" bag or diaphragm
- B29C 63/18 . using tubular layers or sheathings ([B29C 63/26](#) {and [B29C 63/38](#)} take precedence; {placing tubular labels around rigid containers [B65C 3/065](#)})
- B29C 63/182 . . {applied by a "rubber" bag or diaphragm}
- B29C 63/185 . . {by turning inside-out or by derolling}
- B29C 63/187 . . {by removing a shirred or pleated hose from a support}
- B29C 63/20 . . using pressure difference, e.g. vacuum
- B29C 63/22 . using layers or sheathings having a shape adapted to the shape of the article ([B29C 63/26](#) {and [B29C 63/38](#)} take precedence)
- B29C 63/24 . using threads
- B29C 63/26 . Lining or sheathing of internal surfaces ([B29C 63/38](#) takes precedence)
- B29C 63/28 . . applied by "rubber" bag or diaphragm
- B29C 63/30 . . using sheet or web-like material
- B29C 63/32 . . . by winding helically
- B29C 63/34 . . using tubular layers or sheathings
- B29C 63/341 . . . {pressed against the wall by mechanical means}
- B29C 63/343 . . . {the tubular sheathing having a deformed non-circular cross-section prior to introduction}
- B29C 63/345 . . . {whilst rotating the article}
- B29C 63/346 . . . {Fixing the end of the lining (shaping tube ends [B29C 57/005](#))}
- B29C 2063/348 . . . {combined with reducing the diameter of the substrate to be lined}
- B29C 63/36 . . . being turned inside out {(for plastic tubes in general [B29C 67/0018](#))}
- B29C 63/38 . by liberation of internal stresses
- B29C 63/40 . . using sheet or web-like material
- B29C 63/42 . . using tubular layers or sheathings
- B29C 63/423 . . . {specially applied to the mass-production of externally coated articles, e.g. bottles}
- B29C 63/426 {in combination with the in situ shaping of the external tubular layer}
- B29C 63/44 . . the shape of the layers or sheathings being adapted to the shape of the articles
- B29C 63/46 . . of internal surfaces

- B29C 63/48 . Preparation of the surfaces
- B29C 63/481 . . {mechanically}
- B29C 2063/483 . . {by applying a liquid}
- B29C 2063/485 . . . {the liquid being an adhesive}
- B29C 63/486 . . {of metal surfaces ([B29C 63/481](#) takes precedence)}
- B29C 2063/488 . . {providing the surface with fixing elements on which the plastic liner is bonded}

B29C 65/00 **Joining {or sealing} of preformed parts, {e.g. welding of plastics materials}; Apparatus therefor** ({general aspects of processes or apparatus for joining preformed parts [B29C 66/00](#); using porous material formed by internal pressure generated therein for joining preformed parts [B29C 44/1228](#), [B29C 44/326](#); } for making boxes, cartons, envelopes or bags [B31B](#); for sealing or securing package folds or closures [B65B 51/00](#); joining constructional elements in general [F16B](#); splicing of light guides [G02B 6/255](#))

WARNING

Groups [B29C 65/00](#) to [B29C 65/70](#) are not complete, mainly for documents published before the year 1995, pending reclassification; see also [B29C 65/74](#) and its subgroups

- B29C 65/002 . {Joining methods not otherwise provided for}
- B29C 65/004 . . {Cold joining}
- B29C 65/006 . . {Diffusion joining (measures for intermixing the material of the joint interlayer [B29C 66/341](#))}
- B29C 65/008 . . {making use of electrostatic charges (holding means using electrostatic forces to hold at least one of the parts to be joined [B29C 65/7852](#))}
- B29C 65/02 . by heating, with or without pressure

WARNING

Group [B29C 65/02](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/48](#) and its subgroups

- B29C 65/022 . . {Particular heating or welding methods not otherwise provided for}
- B29C 65/024 . . . {making use of combustible material, i.e. the combustible material is in contact with the material to be joined}
- B29C 65/026 . . . {making use of hot liquids, i.e. the liquid is in direct contact with the material to be joined}
- B29C 65/028 . . . {making use of inherent heat, i.e. the heat for the joining comes from the moulding process of one of the parts to be joined}
- B29C 65/04 . . Dielectric heating, e.g. high-frequency welding {i.e. radio frequency welding of plastic materials having dielectric properties, e.g. PVC}
- B29C 65/06 . . using friction, e.g. spin welding {(non-plastics elements to plastic elements [B29C 65/645](#))}

WARNING

Subgroups of [B29C 65/06](#) are not complete, pending a reorganisation; see also this group and its subgroups

- B29C 65/0609 . . . {characterised by the movement of the parts to be joined ([B29C 65/0672](#) takes precedence)}
- B29C 65/0618 {Linear}
- B29C 65/0627 {Angular, i.e. torsional ([B29C 65/082](#) takes precedence)}
- B29C 65/0636 {Orbital}
- B29C 65/0645 {Circular}
- B29C 65/0654 {Elliptical}
- B29C 65/0663 {Other specific orbital movements not provided for in [B29C 65/0645](#) to [B29C 65/0654](#), e.g. Lissajous}
- B29C 65/0672 . . . {Spin welding}
- B29C 65/0681 . . . {created by a tool}
- B29C 65/069 . . . {the welding tool cooperating with specially formed features of at least one of the parts to be joined, e.g. cooperating with holes or ribs of at least one of the parts to be joined}
- B29C 65/08 . . using ultrasonic vibrations {(non-plastics element to plastics elements [B29C 65/645](#))}

WARNING

Subgroups of [B29C 65/08](#) are not complete pending reclassification; see also this group and its other subgroups

- B29C 65/081 . . . {having a component of vibration not perpendicular to the welding surface}
- B29C 65/082 {Angular, i.e. torsional ultrasonic welding}
- B29C 65/083 {using a rotary sonotrode or a rotary anvil}
- B29C 65/085 {using a rotary sonotrode}
- B29C 65/086 {using a rotary anvil}
- B29C 65/087 {using both a rotary sonotrode and a rotary anvil}
- B29C 65/088 . . . {using several cooperating sonotrodes, i.e. interacting with each other, e.g. for realising the same joint}
- B29C 65/10 . . using hot gases {(e.g. combustion gases) or flames coming in contact with at least one of the parts to be joined}
- B29C 65/103 . . . {direct heating both surfaces to be joined}

WARNING

Not complete, pending a reorganisation; see also [B29C 65/10](#) and [B29C 65/106](#)

- B29C 65/106 . . . {using flames coming in contact with at least one of the parts to be joined}
- B29C 65/12 . . . and welding bar
- B29C 65/125 {characterised by the composition of the welding bar}

WARNING

Not complete, pending a reorganisation; see also [B29C 65/12](#)

- B29C 65/14 . . . using wave energy {, i.e. [electromagnetic radiation](#),} or particle radiation
{(using mechanical waves [B29C 65/06](#); using ultrasonic waves [B29C 65/08](#);
pressing means transparent to electromagnetic radiation [B29C 66/81267](#))}

WARNING

Subgroups [B29C 65/1403](#) to [B29C 65/1496](#) are not complete pending a reorganisation; see also this group and its subgroups

- B29C 65/1403 . . . {characterised by the type of electromagnetic or particle radiation
([B29C 65/1603](#) takes precedence)}
- B29C 65/1406 {Ultraviolet [UV] radiation}
- B29C 65/1409 {Visible light radiation}
- B29C 65/1412 {Infrared [IR] radiation}
- B29C 65/1416 {Near-infrared radiation [NIR]}
- B29C 65/1419 {Mid-infrared radiation [MIR]}
- B29C 65/1422 {Far-infrared radiation [FIR]}
- B29C 65/1425 {Micro-wave radiation}
- B29C 65/1429 . . . {characterised by the way of heating the interface ([B29C 65/1629](#) takes
precedence)}
- B29C 65/1432 {direct heating of the surfaces to be joined}
- B29C 65/1435 {at least passing through one of the parts to be joined, i.e.
transmission welding}
- B29C 65/1438 {focusing the wave energy or particle radiation on the interface}
- B29C 65/1441 {making use of a reflector on the opposite side, e.g. a polished
mandrel or a mirror ([pressing means reflective to electromagnetic
radiation B29C 66/81268](#))}
- B29C 65/1445 {heating both sides of the joint}
- B29C 65/1448 {radiating the edges of the parts to be joined, e.g. for curing a layer of
adhesive placed between two flat parts to be joined, e.g. for making
CDs or DVDs}
- B29C 65/1451 {radiating the edges of holes or perforations}
- B29C 65/1454 {scanning at least one of the parts to be joined}
- B29C 65/1458 {once, i.e. contour welding}
- B29C 65/1461 {repeatedly, i.e. quasi-simultaneous welding}
- B29C 65/1464 {making use of several radiators}
- B29C 65/1467 {at the same time, i.e. simultaneous welding}
- B29C 65/1477 . . . {making use of an absorber or impact modifier ([B29C 65/1677](#) takes
precedence)}
- B29C 65/148 {placed at the interface}
- B29C 65/1483 {coated on the article}
- B29C 65/1487 {making use of light guides ([B29C 65/1687](#) takes precedence)}
- B29C 65/149 {being a part of the joined article}
- B29C 65/1493 {in the form of a cavity}
- B29C 65/1496 {making use of masks ([B29C 65/1696](#) takes precedence)}

B29C 65/16 . . . Laser beams

WARNING

Subgroups of [B29C 65/16](#) are not complete, pending a reorganisation; see also this group and its subgroups

- B29C 65/1603 {characterised by the type of electromagnetic radiation}
- B29C 65/1606 {Ultraviolet [UV] radiation, e.g. by ultraviolet excimer lasers}
- B29C 65/1609 {Visible light radiation, e.g. by visible light lasers}
- B29C 65/1612 {Infrared [IR] radiation, e.g. by infrared lasers}
- B29C 65/1616 {Near infrared radiation [NIR], e.g. by YAG lasers}
- B29C 65/1619 {Mid infrared radiation [MIR], e.g. by CO or CO₂ lasers}
- B29C 65/1622 {Far infrared radiation [FIR], e.g. by FIR lasers}
- B29C 65/1629 {characterised by the way of heating the interface}
- B29C 65/1632 {direct heating the surfaces to be joined}
- B29C 65/1635 {at least passing through one of the parts to be joined, i.e. laser transmission welding}
- B29C 65/1638 {focusing the laser beam on the interface}
- B29C 65/1641 {making use of a reflector on the opposite side, e.g. a polished mandrel or a mirror ([pressing means reflective to electromagnetic radiation B29C 66/81268](#))}
- B29C 65/1645 {heating both sides of the joint e.g. by using two lasers or a split beam}
- B29C 65/1648 {radiating the edges of the parts to be joined}
- B29C 65/1651 {radiating the edges of holes or perforations}
- B29C 65/1654 {scanning at least one of the parts to be joined}
- B29C 65/1658 {scanning once, e.g. contour laser welding}
- B29C 65/1661 {scanning repeatedly, e.g. quasi-simultaneous laser welding}
- B29C 65/1664 {making use of several radiators}
- B29C 65/1667 {at the same time, i.e. simultaneous laser welding}
- B29C 65/167 {using laser diodes}
- B29C 65/1674 {making use of laser diodes ([B29C 65/167 takes precedence](#))}
- B29C 65/1677 {making use of an absorber or impact modifier}
- B29C 65/168 {placed at the interface}
- B29C 65/1683 {coated on the article}
- B29C 65/1687 {making use of light guides}
- B29C 65/169 {being a part of the joined article}
- B29C 65/1693 {in the form of a cavity}
- B29C 65/1696 {making use of masks}
- B29C 65/18 . . . using heated tools
- B29C 65/20 . . . with direct contact, e.g. using "mirror"

WARNING

B29C 65/20

(continued)

Subgroups of [B29C 65/20](#) are not complete, pending a reorganisation; see also this group and [B29C 65/2046](#)

- [B29C 65/2007](#) {characterised by the type of welding mirror}
- [B29C 65/2015](#) {being a single welding mirror comprising several separate heating surfaces in different planes, e.g. said heating surfaces having different temperatures}
- [B29C 65/2023](#) {said welding mirror comprising several sectors}
- [B29C 65/203](#) {being several single mirrors, e.g. not mounted on the same tool}
- [B29C 65/2038](#) {being a wire}
- [B29C 65/2046](#) {using a welding mirror which also cuts the parts to be joined, e.g. for sterile welding}
- [B29C 65/2053](#) {characterised by special ways of bringing the welding mirrors into position}
- [B29C 65/2061](#) {by sliding}
- [B29C 65/2069](#) {with an angle with respect to the plane comprising the parts to be joined}
- [B29C 65/2076](#) {perpendicularly to the plane comprising the parts to be joined}
- [B29C 65/2084](#) {by pivoting}
- [B29C 65/2092](#) {and involving the use of a facer}
- [B29C 65/22](#) . . . Heated wire {resistive ribbon, resistive band or resistive strip ([electrical insulating support therefor B29C 66/81871](#))}

WARNING

Subgroups of [B29C 65/22](#) are not complete, pending reclassification; see also this group

- [B29C 65/221](#) {characterised by the type of heated wire, resistive ribbon, band or strip ([Specific electrical or thermal properties also to be classified in B29C 66/81262 or B29C 66/81261](#))}
- [B29C 65/222](#) {comprising at least a single heated wire}
- [B29C 65/223](#) {comprising several heated wires}
- [B29C 65/224](#) {being a resistive ribbon, a resistive band or a resistive strip}
- [B29C 65/225](#) {being a coating or being printed, e.g. being applied as a paint or forming a printed circuit}
- [B29C 65/226](#) {characterised by the cross-section of said heated wire, resistive ribbon, resistive band or resistive strip, e.g. being triangular}
- [B29C 65/227](#) {said cross-section being hollow}
- [B29C 65/228](#) {characterised by the means for electrically connecting the ends of said heated wire, resistive ribbon, resistive band or resistive strip}
- [B29C 65/229](#) {characterised by the means for tensioning said heated wire, resistive ribbon, resistive band or resistive strip ([means for compensating for the thermal expansion of welding jaws in general B29C 66/8185](#))}
- [B29C 65/24](#) . . . characterised by the means for heating the tool {(by impulse heating [B29C 65/38](#))}

NOTES

B29C 65/24

(continued)

1. Classification is made in groups [B29C 65/24](#) to [B29C 65/32](#) only if the details or adaptations of the heating means are of interest.
2. When classifying in this group, heated tools are additionally classified in groups [B29C 65/18](#), [B29C 65/20](#) or [B29C 65/22](#)

B29C 65/242

- {the heat transfer being achieved by contact, i.e. a heated tool being brought into contact with the welding tool and afterwards withdrawn from it}

WARNINGNot complete, pending a reorganisation; see also [B29C 65/24](#)**B29C 65/245**

- {the heat transfer being achieved contactless, e.g. by radiation ([B29C 65/32](#) takes precedence)}

WARNINGNot complete, pending a reorganisation; see also [B29C 65/24](#)**B29C 65/247**

- {the heat resulting from a chemical reaction}

WARNINGNot complete, pending a reorganisation; see also [B29C 65/24](#)**B29C 65/26**

- Hot fluid

B29C 65/28

- Flame or combustible material

B29C 65/30

- Electrical means {([B29C 65/38](#) takes precedence)}

B29C 65/305

- {involving the use of cartridge heaters}

WARNINGNot complete, pending a reorganisation; see also [B29C 65/18](#) to [B29C 65/2092](#)**B29C 65/32**

- Induction

B29C 65/34

- . . using heated elements which remain in the joint, e.g. "verlorenes Schweisselement"

WARNINGSubgroups [B29C 65/3404](#) to [B29C 65/3472](#) are not complete, pending a reorganisation; see also [B29C 65/34](#)**B29C 65/3404**

- . . . {characterised by the type of heated elements which remain in the joint ([B29C 65/3604](#) takes precedence)}

B29C 65/3408

- {comprising single particles, e.g. fillers or discontinuous fibre-reinforcements}

B29C 65/3412

- {comprising fillers}

B29C 65/3416

- {comprising discontinuous fibre-reinforcements}

B29C 65/342

- {comprising at least a single wire, e.g. in the form of a winding}

B29C 65/3424

- {said at least a single wire having the form of a coil spring}

B29C 65/3428

- {said at least a single wire having a waveform, e.g. a sinusoidal form}

B29C 65/3432	. . . . .	{comprising several wires, e.g. in the form of several independent windings (B29C 65/3436 , B29C 65/344 take precedence)}
B29C 65/3436	. . . . .	{comprising independent continuous fibre-reinforcements}
B29C 65/344	. . . . .	{being a woven or non-woven fabric or being a mesh}
B29C 65/3444	. . . . .	{being a ribbon, band or strip}
B29C 65/3448	. . . . .	{said ribbon, band or strip being perforated}
B29C 65/3452	. . . . .	{forming a sleeve, e.g. a wrap-around sleeve}
B29C 65/3456	. . . . .	{being a layer of a multilayer part to be joined, e.g. for joining plastic-metal laminates}
B29C 65/346	. . . . .	{being a coating or being printed, e.g. being applied as a paint or forming a printed circuit}
B29C 65/3464	. . . . .	{characterised by the cross-section of said heated elements which remain in the joint or by the cross-section of their coating, e.g. being triangular}
B29C 65/3468	. . . . .	{characterised by the means for supplying heat to said heated elements which remain in the joint, e.g. special electrical connectors of windings (B29C 65/3668 takes precedence)}
B29C 65/3472	. . . . .	{characterised by the composition of the heated elements which remain in the joint (B29C 65/3672 takes precedence)}
B29C 65/3476	. . . . .	{being metallic}
B29C 65/348	. . . . .	{with a polymer coating}
B29C 65/3484	. . . . .	{being non-metallic}
B29C 65/3488	. . . . .	{being an electrically conductive polymer}
B29C 65/3492	. . . . .	{being carbon}
B29C 65/3496	. . . . .	{with a coating, e.g. a metallic or a carbon coating}
B29C 65/36	. . . . .	heated by induction

WARNING

Subgroups of [B29C 65/36](#) are not complete, pending a reorganisation; see also [B29C 65/36](#)

B29C 65/3604	. . . . .	{characterised by the type of elements heated by induction which remain in the joint}
B29C 65/3608	. . . . .	{comprising single particles, e.g. fillers or discontinuous fibre-reinforcements}
B29C 65/3612	. . . . .	{comprising fillers}
B29C 65/3616	. . . . .	{comprising discontinuous fibre-reinforcements}
B29C 65/362	. . . . .	{comprising at least a single wire, e.g. in the form of a winding}
B29C 65/3624	. . . . .	{said at least a single wire having the form of a coil spring}
B29C 65/3628	. . . . .	{said at least a single wire having a waveform, e.g. a sinusoidal form}
B29C 65/3632	. . . . .	{comprising several wires, e.g. in the form of several independent windings (B29C 65/364 takes precedence)}
B29C 65/3636	. . . . .	{comprising independent continuous fibre-reinforcements}
B29C 65/364	. . . . .	{being a woven or non-woven fabric or being a mesh}

- B29C 65/3644 {being a ribbon, band or strip}
- B29C 65/3648 {said strip being perforated}
- B29C 65/3652 {forming a sleeve, e.g. a wrap-around sleeve}
- B29C 65/3656 {being a layer of a multilayer part to be joined, e.g. for joining plastic-metal laminates}
- B29C 65/366 {being a coating or being printed, e.g. being applied as a paint or forming a printed circuit}
- B29C 65/3668 {characterised by the means for supplying heat to said heated elements which remain in the join, e.g. special induction coils}
- B29C 65/3672 {characterised by the composition of the elements heated by induction which remain in the joint}
- B29C 65/3676 {being metallic}
- B29C 65/368 {with a polymer coating}
- B29C 65/3684 {being non-metallic}
- B29C 65/3696 {with a coating}
- B29C 65/38 . . . Impulse heating

NOTE

When classifying in this group, heated tools are additionally classified in the relevant groups, e.g. [B29C 65/22](#)

- B29C 65/40 . . . Applying molten plastics, e.g. hot melt (using welding bar {combined with hot gases} [B29C 65/12](#); by moulding [B29C 65/70](#))
- B29C 65/405 . . . {characterised by the composition of the applied molten plastics ([B29C 65/425](#) takes precedence)}

WARNING

Not complete, pending a reorganisation; see also [B29C 65/40](#)

- B29C 65/42 . . . between pre-assembled parts {([B29C 65/605](#) takes precedence)}
- B29C 65/425 {characterised by the composition of the molten plastics applied between pre-assembled parts}

WARNING

Not complete, pending a reorganisation; see also [B29C 65/42](#)

- B29C 65/44 . . . Joining a heated non plastics element to a plastics element

NOTE

When classifying in this group, compositions of the non-plastics element are additionally classified in the relevant groups, i.e. in [B29C 66/74](#) and subgroups

- B29C 65/46 . . . heated by induction

NOTE

When classifying in this group, compositions of the non-plastics element are additionally classified in the relevant groups, i.e. in [B29C 66/74](#) and subgroups

- B29C 65/48
- using adhesives {, i.e. using supplementary joining material} (heat-activated {to be additionally classified in} [B29C 65/02](#) {and subgroups}; {applying molten plastics, e.g.} hot melts {to be additionally classified in} [B29C 65/40](#); non-mechanical parts of adhesive processes, in general [C09J 5/00](#)); {solvent bonding}

NOTE

When classifying in this group, heat-activated adhesives are further classified in group [B29C 65/02](#). When classifying in this group, applying molten plastics is further classified in group [B29C 65/40](#).

WARNING

Subgroups [B29C 65/4805](#) to [B29C 65/4895](#) are not complete, pending a reorganisation; see also this group and [B29C 65/4895](#)

- B29C 65/4805
- • {characterised by the type of adhesives}
- B29C 65/481
- • • {Non-reactive adhesives, e.g. physically hardening adhesives}
- B29C 65/4815
- • • • {Hot melt adhesives, e.g. thermoplastic adhesives}
- B29C 65/482
- • • • {Drying adhesives, e.g. solvent based adhesives}
- B29C 65/4825
- • • • {Pressure sensitive adhesives}
- B29C 65/483
- • • {Reactive adhesives, e.g. chemically curing adhesives}
- B29C 65/4835
- • • • {Heat curing adhesives}
- B29C 65/484
- • • • {Moisture curing adhesives}
- B29C 65/4845
- • • • {Radiation curing adhesives, e.g. UV light curing adhesives}
- B29C 65/485
- • • • {Multi-component adhesives, i.e. chemically curing as a result of the mixing of said multi-components}
- B29C 65/4855
- • {characterised by their physical properties, e.g. being electrically-conductive}
- B29C 65/486
- • {characterised by their physical form being non-liquid, e.g. in the form of granules or powders ([B29C 65/50](#) takes precedence)}
- B29C 65/4865
- • {containing additives ([C09J 11/00](#) and subgroups take precedence)}
- B29C 65/487
- • • {characterised by their shape, e.g. being fibres or being spherical}
- B29C 65/4875
- • • • {being spherical, e.g. particles or powders}
- B29C 65/488
- • • • {being longitudinal, e.g. fibres}
- B29C 65/4885
- • • {characterised by their composition being non-plastics}
- B29C 65/489
- • • • {being metals}
- B29C 65/4895
- • {Solvent bonding, i.e. the surfaces of the parts to be joined being treated with solvents, swelling or softening agents, without adhesives}
- B29C 65/50
- • using adhesive tape {e.g. thermoplastic tape; using threads or the like ([B29C 65/3444](#) takes precedence)}
- B29C 65/5007
- • • {characterised by the structure of said adhesive tape, threads or the like}

WARNING

Group [B29C 65/5007](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/50](#) and its subgroups

- B29C 65/5014
- • • • {being fibre-reinforced ([B29C 65/5028](#) takes precedence)}
- B29C 65/5021
- • • • {being multi-layered}

- B29C 65/5028 {being textile in woven or non-woven form}
- B29C 65/5035 {being in thread form, i.e. in the form of a single filament, e.g. in the form of a single coated filament}
- B29C 65/5042 {covering both elements to be joined}
- B29C 65/505 {and placed in a recess formed in the parts to be joined, e.g. in order to obtain a continuous surface}
- B29C 65/5057 {positioned between the surfaces to be joined ([B29C 65/5035](#) takes precedence)}
- B29C 65/5064 {of particular form, e.g. being C-shaped, T-shaped}

WARNING

Subgroups of [B29C 65/5064](#) are not complete, pending a reorganisation; see also this group

- B29C 65/5071 {and being composed by one single element}
- B29C 65/5078 {and being composed by several elements}
- B29C 65/5085 {and comprising grooves, e.g. being E-shaped, H-shaped}
- B29C 65/5092 {characterised by the tape handling mechanisms, e.g. using vacuum}

WARNING

Not complete, pending a reorganisation; see also [B29C 65/50](#) and its subgroups

- B29C 65/52 . . {characterised by the way of} applying the adhesive {([B29C 65/50](#) takes precedence; apparatus for applying liquids in general [B05C](#); processes for applying liquids in general [B05D](#))}

WARNING

Subgroups [B29C 65/521](#) to [B29C 65/528](#) are not complete, pending a reorganisation; see also this group

- B29C 65/521 . . . {by spin coating}
- B29C 65/522 . . . {by spraying, e.g. by flame spraying}
- B29C 65/523 . . . {by dipping}
- B29C 65/524 . . . {by applying the adhesive from an outlet device in contact with, or almost in contact with, the surface of the part to be joined}
- B29C 65/525 {by extrusion coating}
- B29C 65/526 . . . {by printing or by transfer from the surfaces of elements carrying the adhesive, e.g. using brushes, pads, rollers, stencils or silk screens}
- B29C 65/527 . . . {by gravity only, e.g. by pouring}
- B29C 65/528 . . . {by CVD or by PVD, i.e. by chemical vapour deposition or by physical vapour deposition}
- B29C 65/54 . . . between pre-assembled parts

WARNING

Subgroups of [B29C 65/54](#) are not complete, pending a reorganisation; see also this group

- B29C 65/542 {by injection}

- B29C 65/544 {by suction}
- B29C 65/546 {by gravity, e.g. by pouring}
- B29C 65/548 {by capillarity}
- B29C 65/56 . using mechanical means {or mechanical connections, e.g. form-fits}

WARNING

Subgroups [B29C 65/561](#) to [B29C 65/568](#) are not complete, pending a reorganisation; see also this group and its subgroups

- B29C 65/561 . . {using screw-threads being integral at least to one of the parts to be joined}
- B29C 65/562 . . {using extra joining elements, i.e. which are not integral with the parts to be joined ([using plastic snap elements B29C 65/58](#); [using plastic rivets B29C 65/601](#))}
- B29C 65/564 . . . {hidden in the joint, e.g. dowels or Z-pins ([B29C 65/603](#) takes precedence)}
- B29C 65/565 . . {involving interference fits, e.g. force-fits or press-fits ([B29C 65/66](#) takes precedence)}
- B29C 65/567 . . {using a tamping or a swaging operation, i.e. at least partially deforming the edge or the rim of a first part to be joined to clamp a second part to be joined}
- B29C 65/568 . . . {using a swaging operation, i.e. totally deforming the edge or the rim of a first part to be joined to clamp a second part to be joined}
- B29C 65/58 . . Snap connection
- B29C 65/60 . . Riveting {or staking}

WARNING

Subgroups of [B29C 65/60](#) are not complete, pending a reorganisation; see also this group

- B29C 65/601 . . . {using extra riveting elements, i.e. the rivets being non-integral with the parts to be joined}
- B29C 65/602 {using hollow rivets ([B29C 65/607](#) takes precedence)}
- B29C 65/603 {the rivets being pushed in blind holes}
- B29C 65/604 {in both parts}
- B29C 65/605 {the rivets being molded in place, e.g. by injection}
- B29C 65/606 {the rivets being integral with one of the parts to be joined, i.e. staking}
- B29C 65/607 {the integral rivets being hollow}
- B29C 65/608 {the integral rivets being pushed in blind holes}
- B29C 65/609 {the integral rivets being plunge-formed}
- B29C 65/62 . . Stitching
- B29C 65/64 . . Joining a non-plastics element to a plastics element, e.g. by force ([B29C 65/44](#) takes precedence)

NOTE

When classifying in this group, compositions of the non-plastics element are additionally classified in the relevant groups, i.e. in [B29C 66/74](#) and subgroups

B29C 65/645 . . . {using friction or ultrasonic vibrations}

NOTE

When classifying in this group, compositions of the non-plastics element are additionally classified in the relevant groups, i.e. in [B29C 66/74](#) and subgroups

B29C 65/66 . by liberation of internal stresses, e.g. shrinking of one of the parts to be joined

B29C 65/665 . . {using shrinking during cooling}

B29C 65/68 . . using auxiliary shrinkable elements

B29C 65/70 . by moulding (using a particular moulding technique, see the relevant technique {e.g. by injection [B29C 45/14467](#)})

NOTE

This group covers only techniques involving the use of a mould

B29C 65/72 . by combined operations {or combined techniques}, e.g. welding and stitching

B29C 65/74 . by welding and severing, {or by joining and severing, the severing being performed in the area to be joined, next to the area to be joined, in the joint area or next to the joint area}

NOTE

When classifying in this group, joining techniques are additionally classified in the relevant groups, e.g. in [B29C 65/02](#) and subgroups

B29C 65/741 . . {characterised by the relationships between the joining step and the severing step (cutting as mechanical pre-treatment [B29C 66/02241](#); cutting as thermal pre-treatment [B29C 66/0246](#); cutting as mechanical after-treatment [B29C 66/0326](#); cutting as thermal after-treatment [B29C 66/0346](#))}

B29C 65/7411 . . . {characterised by the temperature relationship between the joining step and the severing step}

B29C 65/7412 {the joining step and the severing step being performed at different temperatures}

B29C 65/7415 . . . {characterised by the pressure relationship between the joining step and the severing step}

B29C 65/7416 {the joining step and the severing step being performed at different pressures}

B29C 65/7419 . . . {characterised by the time relationship between the joining step and the severing step, said joining step and said severing step being performed by the same tool but at different times}

B29C 65/743 . . {using the same tool for both joining and severing, said tool being monobloc or formed by several parts mounted together and forming a monobloc ([B29C 65/2046](#) takes precedence)}

B29C 65/7433 . . . {the tool being a wire}

B29C 65/7435 . . . {the tool being a roller}

B29C 65/7437 . . . {the tool being a perforating tool (perforating as mechanical pre-treatment [B29C 66/02242](#))}

B29C 65/7439 . . . {for continuously and longitudinally welding and severing webs ([B29C 65/7435](#) takes precedence)}

B29C 65/7441 . . . {for making welds and cuts of other than simple rectilinear form}

- B29C 65/7443 . . . {by means of ultrasonic vibrations}
- B29C 65/745 . . {using a single unit having both a severing tool and a welding tool}
- B29C 65/7451 . . . {the severing tool and the welding tool being movable with respect to one-another}
- B29C 65/7453 . . . {the severing tool being a wire}
- B29C 65/7455 . . . {the unit being a roller}
- B29C 65/7457 . . . {comprising a perforating tool}
- B29C 65/7459 . . . {for continuously and longitudinally welding and severing webs (B29C 65/7455 takes precedence)}
- B29C 65/7461 . . . {for making welds and cuts of other than simple rectilinear form}
- B29C 65/747 . . {using other than mechanical means}
- B29C 65/7471 . . . {using a fluid, e.g. hot gases}
- B29C 65/7473 . . . {using radiation, e.g. laser, for simultaneously welding and severing}
- B29C 65/749 . . {Removing scrap (deburring welded articles B29C 37/04)}
- B29C 65/76 . Making non-permanent or releasable joints
- B29C 65/78 . Means for handling the parts to be joined, e.g. for making containers or hollow articles {e.g. means for handling sheets, plates, web-like materials, tubular articles, hollow articles or elements to be joined therewith; Means for discharging the joined articles from the joining apparatus}

WARNING

Subgroups of B29C 65/78 are not complete, pending a reorganisation; see also this group and its subgroups and B29C 65/20 and its subgroups

- B29C 65/7802 . . {Positioning the parts to be joined, e.g. aligning, indexing or centring}
- B29C 65/7805 . . . {the parts to be joined comprising positioning features}
- B29C 65/7808 {in the form of holes or slots (B29C 65/7814 takes precedence; holding or clamping means cooperating with specially formed features of at least one of the parts to be joined B29C 65/7844)}
- B29C 65/7811 {for centring purposes}
- B29C 65/7814 {in the form of inter-cooperating positioning features (holding or clamping means cooperating with specially formed features of at least one of the parts to be joined B29C 65/7844), e.g. tenons and mortises (tenon and mortise joints B29C 66/126; tongue and groove joints B29C 66/124)}
- B29C 65/7817 {in the form of positioning marks}
- B29C 65/782 . . . {by setting the gap between the parts to be joined (controlling or regulating the gap between the joining tools B29C 66/92611)}
- B29C 65/7823 {by using distance pieces, i.e. by using spacers positioned between the parts to be joined and forming a part of the joint}
- B29C 65/7826 {said distance pieces being non-integral with the parts to be joined, e.g. particles}
- B29C 65/7829 {said distance pieces being integral with at least one of the parts to be joined}
- B29C 65/7832 . . . {by setting the overlap between the parts to be joined, e.g. the overlap between sheets, plates or web-like materials}

- B29C 65/7835 . . . {by using stops ([B29C 65/7823](#), [B29C 66/92651](#) take precedence; tongue and groove joints [B29C 66/124](#); tenon and mortise joints [B29C 66/126](#))}
- B29C 65/7838 . . . {from the inside, e.g. of tubular or hollow articles ([B29C 66/3242](#) takes precedence)}
- B29C 65/7841 . . {Holding or clamping means for handling purposes (clamping means for the purpose of applying pressure on the parts to be joined, in the area to be joined [B29C 66/81](#); work holders in general [B25B](#); devices for holding or positioning work for welding metal [B23K 37/04](#))}
- B29C 65/7844 . . . {cooperating with specially formed features of at least one of the parts to be joined, e.g. cooperating with holes or ribs of at least one of the parts to be joined (parts to be joined comprising holes or slots for the purpose of positioning said parts [B29C 65/7808](#); parts to be joined comprising inter-cooperating positioning features [B29C 65/7814](#); welding using friction, the welding tool cooperating with specially formed features of at least one of the parts to be joined, e.g. cooperating with holes or ribs of at least one of the parts to be joined [B29C 65/069](#))}
- B29C 65/7847 . . . {using vacuum to hold at least one of the parts to be joined (vacuum work holders in general [B25B 11/005](#))}
- B29C 65/785 . . . {using magnetic forces to hold at least one of the parts to be joined (magnetic work holders in general [B25B 11/002](#))}
- B29C 65/7852 . . . {using electrostatic forces to hold at least one of the parts to be joined}
- B29C 65/7855 . . {Provisory fixing}
- B29C 65/7858 . . {characterised by the feeding movement of the parts to be joined}
- B29C 65/7861 . . . {In-line machines, i.e. feeding, joining and discharging are in one production line ([B29C 65/7879](#), [B29C 65/7888](#) take precedence)}
- B29C 65/7864 {using a feeding table which moves to and fro (oscillating around an axis [B29C 65/7876](#))}
- B29C 65/7867 {using carriers, provided with holding means, said carriers moving in a closed path}
- B29C 65/787 {using conveyer belts or conveyer chains ([B29C 66/83421](#), [B29C 66/83521](#), [B29C 66/83531](#) take precedence)}
- B29C 65/7873 {using cooperating conveyer belts or cooperating conveyer chains ([B29C 66/83423](#), [B29C 66/83523](#), [B29C 66/83533](#) take precedence)}
- B29C 65/7876 . . . {oscillating around an axis ([B29C 65/7888](#) takes precedence)}
- B29C 65/7879 . . . {said parts to be joined moving in a closed path, e.g. a rectangular path ([B29C 65/7888](#) takes precedence)}
- B29C 65/7882 {said parts to be joined moving in a circular path}
- B29C 65/7885 {Rotary turret joining machines, i.e. having several joining tools moving around an axis}

WARNING[B29C 65/0672](#)

- B29C 65/7888 . . . {Means for handling of moving sheets or webs}
- B29C 65/7891 {of discontinuously moving sheets or webs}
- B29C 65/7894 {of continuously moving sheets or webs}

- B29C 65/7897 . . {Means for discharging the joined articles from the joining apparatus (B29C 66/005 takes precedence; discharging moulded articles from moulds B29C 37/0003)}
- B29C 65/80 . . Rotatable transfer means {for loading or unloading purposes, i.e. turret transfer means (B29C 65/7879 takes precedence; in-line machines using carriers, provided with holding means, said carriers moving in a closed path B29C 65/7867; in-line machines using conveyer belts or conveyer chains B29C 65/787)}
- B29C 65/82 . Testing the joint
 - WARNING**
 - Subgroups of B29C 65/82 are not complete, pending a reorganisation; see also this group
- B29C 65/8207 . . {by mechanical methods}
- B29C 65/8215 . . . {Tensile tests}
- B29C 65/8223 . . . {Peel tests}
- B29C 65/823 . . . {Bend tests}
- B29C 65/8238 . . . {Impact tests}
- B29C 65/8246 . . . {Pressure tests, e.g. hydrostatic pressure tests}
- B29C 65/8253 . . {by the use of waves or particle radiation, e.g. visual examination, scanning electron microscopy, or X-rays (B29C 65/8292 takes precedence)}
- B29C 65/8261 . . {by the use of thermal means}
- B29C 65/8269 . . {by the use of electric or magnetic means}
- B29C 65/8276 . . . {by the use of electric means}
- B29C 65/8284 . . . {by the use of magnetic means}
- B29C 65/8292 . . {by the use of ultrasonic, sonic or infrasonic waves}
- B29C 66/00** **{General aspects of processes or apparatus for joining preformed parts (means for handling the parts to be joined B29C 65/78; testing the joint B29C 65/82)}**
- B29C 66/001 . {Joining in special atmospheres}
 - WARNING**
 - Subgroups of B29C 66/001 are not complete, pending a reorganisation; see also this group
- B29C 66/0012 . . {characterised by the type of environment}
- B29C 66/0014 . . . {Gaseous environments}
- B29C 66/00141 {Protective gases}
- B29C 66/00143 {Active gases}
- B29C 66/00145 {Vacuum, e.g. partial vacuum}
- B29C 66/0016 . . . {Liquid environments, i.e. the parts to be joined being submerged in a liquid}
- B29C 66/0018 . . . {being sterile}
- B29C 66/002 . {Removing toxic gases}

- B29C 66/003 . {Protecting areas of the parts to be joined from overheating ([B29C 66/348](#), [B29C 66/8744](#) take precedence)}
- B29C 66/004 . {Preventing sticking together, e.g. of some areas of the parts to be joined}
- B29C 66/0042 . . {of the joining tool and the parts to be joined ([B29C 66/0046](#) takes precedence; joining tool characterized by its composition [B29C 66/8122](#); joining tool characterized by its microstructure [B29C 66/8124](#))}
- B29C 66/0044 . . . {using a separating sheet, e.g. fixed on the joining tool}
- B29C 66/00441 {movable, e.g. mounted on reels}
- B29C 66/0046 . . {by the use of a lubricant, e.g. fluid, powder}

WARNING

Group [B29C 66/0046](#) and subgroups are not complete, pending a reorganisation; see also [B29C 66/004](#) and its subgroups

- B29C 66/00461 . . . {being liquid, e.g. oil based}
- B29C 66/00463 . . . {being solid, e.g. a powder}
- B29C 66/005 . {Detaching the article from the joining tool}
- B29C 66/006 . {Preventing damaging, e.g. of the parts to be joined ([B29C 66/003](#), [B29C 66/004](#), [B29C 66/348](#) take precedence)}

WARNING

Group [B29C 66/006](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/00](#) and subgroups

- B29C 66/0062 . . {of the joining tool, e.g. avoiding wear of the joining tool}
- B29C 66/01 . {General aspects dealing with the joint area or with the area to be joined ([B29C 65/76](#), [B29C 65/82](#) take precedence)}
- B29C 66/02 . . {Preparation of the material, in the area to be joined, prior to joining or welding ([B29C 66/32](#) takes precedence)}
- B29C 66/022 . . . {Mechanical pre-treatments, e.g. reshaping}

WARNING

Subgroups of [B29C 66/022](#) are not complete, pending a reorganisation; see also this group

- B29C 66/0222 {without removal of material, e.g. cleaning by air blowing or using brushes}
- B29C 66/0224 {with removal of material}
- B29C 66/02241 {Cutting, e.g. by using waterjets, or sawing ([using heat B29C 66/0246](#); cutting-off or cutting-out a part of a strip-like or sheet-like material, transferring that part and fixing it to an article [B29C 69/005](#))}
- B29C 66/02242 {Perforating or boring}
- B29C 66/02245 {Abrading, e.g. grinding, sanding, sandblasting or scraping}
- B29C 66/024 . . . {Thermal pre-treatments}

WARNING

Subgroups of [B29C 66/024](#) are not complete, pending a reorganisation; see also this group

- B29C 66/0242 {Heating, or preheating, e.g. drying ([B29C 66/3464](#) takes precedence)}
- B29C 66/0244 {Cooling}
- B29C 66/0246 {Cutting or perforating, e.g. burning away by using a laser or using hot air (simultaneously welding and severing using a fluid [B29C 65/7471](#); simultaneously welding and severing using radiation [B29C 65/7473](#); cutting-off or cutting-out a part of a strip-like or sheet-like material, transferring that part and fixing it to an article [B29C 69/005](#))}
- B29C 66/026 . . . {Chemical pre-treatments ([B29C 66/028](#) takes precedence)}
- WARNING**
- Not complete, pending a reorganisation; see also [B29C 66/02](#)
- B29C 66/028 . . . {Non-mechanical surface pre-treatments, i.e. by flame treatment, electric discharge treatment, plasma treatment, wave energy or particle radiation ([B29C 65/14](#) takes precedence; non-mechanical surface treatment of plastics in general [B29C 59/08](#) to [B29C 59/16](#))}
- WARNING**
- Not complete, pending a reorganisation; see also [B29C 66/02](#)
- B29C 66/03 . . {After-treatments in the joint area ([B29C 66/3262](#) takes precedence)}
- B29C 66/032 . . . {Mechanical after-treatments (deburring welded articles [B29C 37/04](#))}
- B29C 66/0322 {Post-pressing without reshaping, i.e. keeping the joint under pressure after joining}
- B29C 66/0324 {Reforming or reshaping the joint, e.g. folding over (reshaping the burr [B29C 66/326](#))}
- B29C 66/03241 {Flattening}
- B29C 66/03242 {of sheets being positioned in abutment, e.g. after folding open of an overlap joint}
- B29C 66/0326 {Cutting, e.g. by using waterjets, or perforating (using heat [B29C 66/0346](#))}
- WARNING**
- Not complete, pending a reorganisation; see also [B29C 66/032](#)
- B29C 66/034 . . . {Thermal after-treatments}
- B29C 66/0342 {Cooling, e.g. transporting through welding and cooling zone}
- B29C 66/0344 {Annealing}
- WARNING**
- Not complete, pending a reorganisation; see also [B29C 66/034](#)
- B29C 66/0346 {Cutting or perforating, e.g. burning away by using a laser or using hot air (simultaneously joining and severing using a fluid [B29C 65/7471](#); simultaneously welding and severing using radiation [B29C 65/7473](#))}
- WARNING**
- Not complete, pending a reorganisation; see also [B29C 66/034](#)
- B29C 66/038 . . . {Covering the joint by a coating material}

- B29C 66/0382 {the coating material being in liquid or paste form (joining by applying molten plastics [B29C 65/40](#))}
- B29C 66/0384 {the coating material being in tape, strip or band form (joining using adhesive tapes covering both elements to be joined [B29C 65/5042](#))}
- B29C 66/05 . . {Particular design of joint configurations}

NOTE

In this group the possible supplementary joining material, e.g. adhesive or adhesive tape, is not taken into account for the joint configuration. The use of supplementary joining material, e.g. adhesive or adhesive tape, has to be additionally classified as such, e.g. in [B29C 65/48](#) and subgroups or [B29C 65/50](#) and subgroups

WARNING

Group [B29C 66/05](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/00](#) and its subgroups

- B29C 66/10 . . . {particular design of the joint cross-sections}

NOTE

The scope of the subgroups is defined by the drawings in the Definitions

- B29C 66/11 {Joint cross-sections comprising a single joint-segment, i.e. one of the parts to be joined comprising a single joint-segment in the joint cross-section ([B29C 66/12](#) and subgroups take precedence)}
- B29C 66/112 {Single lapped joints}
- B29C 66/1122 {Single lap to lap joints, i.e. overlap joints ([B29C 66/45](#), [B29C 66/472](#), [B29C 66/52272](#) take precedence)}
- B29C 66/114 {Single butt joints}
- B29C 66/1142 {Single butt to butt joints}
- B29C 66/116 {Single bevelled joints, i.e. one of the parts to be joined being bevelled in the joint area}
- B29C 66/1162 {Single bevel to bevel joints, e.g. mitre joints}
- B29C 66/118 {Single monotone curved joints}
- B29C 66/1182 {the joint being C-shaped}
- B29C 66/12 {Joint cross-sections combining only two joint-segments; Tongue and groove joints; Tenon and mortise joints; Stepped joint cross-sections}
- B29C 66/122 {Joint cross-sections combining only two joint-segments, i.e. one of the parts to be joined comprising only two joint-segments in the joint cross-section ([B29C 66/124](#) takes precedence)}
- B29C 66/1222 {comprising at least a lapped joint-segment}
- B29C 66/12221 {the two joint-segments being lapped}
- B29C 66/1224 {comprising at least a butt joint-segment}
- B29C 66/12241 {the two joint-segments being butt}
- B29C 66/1226 {comprising at least one bevelled joint-segment}
- B29C 66/12261 {the two joint-segments being bevelled, e.g. the two joint-segments forming a V}

B29C 66/1228	. . . . .	{comprising at least one monotone curved joint-segment}
B29C 66/12281	. . . . .	{the two joint-segments being monotone curved}
B29C 66/124	. . . . .	{Tongue and groove joints}
B29C 66/1242	. . . . .	{comprising interlocking undercuts}
B29C 66/12421	. . . . .	{Teardrop-like, waterdrop-like or mushroom-like interlocking undercuts}
B29C 66/12423	. . . . .	{Dovetailed interlocking undercuts}
B29C 66/12425	. . . . .	{Other specific interlocking undercuts not provided for in B29C 66/12421 to B29C 66/12423 }
B29C 66/1244	. . . . .	{characterised by the male part, i.e. the part comprising the tongue}
B29C 66/12441	. . . . .	{being a single wall}
B29C 66/12443	. . . . .	{having the tongue substantially in the middle}
B29C 66/12445	. . . . .	{having the tongue on the side}
B29C 66/12449	. . . . .	{being asymmetric (B29C 66/12445 takes precedence)}
B29C 66/1246	. . . . .	{characterised by the female part, i.e. the part comprising the groove}
B29C 66/12461	. . . . .	{being rounded, i.e. U-shaped or C-shaped}
B29C 66/12463	. . . . .	{being tapered}
B29C 66/12464	. . . . .	{being V-shaped}
B29C 66/12469	. . . . .	{being asymmetric}
B29C 66/1248	. . . . .	{Interpenetrating groove joints (Interpenetrating fingered joints B29C 66/139)}
B29C 66/126	. . . . .	{Tenon and mortise joints (tenons and mortises for positioning purposes B29C 65/7814)}
B29C 66/128	. . . . .	{Stepped joint cross-sections}
B29C 66/1282	. . . . .	{comprising at least one overlap joint-segment}
B29C 66/12821	. . . . .	{comprising at least two overlap joint-segments}
B29C 66/12822	. . . . .	{comprising at least three overlap joint-segments}
B29C 66/1284	. . . . .	{comprising at least one butt joint-segment}
B29C 66/12841	. . . . .	{comprising at least two butt joint-segments}
B29C 66/12842	. . . . .	{comprising at least three butt joint-segments}
B29C 66/1286	. . . . .	{comprising at least one bevelled joint-segment}
B29C 66/12861	. . . . .	{comprising at least two bevelled joint-segments}
B29C 66/12862	. . . . .	{comprising at least three bevelled joint-segments}
B29C 66/1288	. . . . .	{comprising at least one monotone curved joint-segment}
B29C 66/12881	. . . . .	{comprising at least two monotone curved joint-segments}
B29C 66/12882	. . . . .	{comprising at least three monotone curved joint-segments}
B29C 66/13	. . . . .	{Single flanged joints; Fin-type joints; Single hem joints; Edge joints; Interpenetrating fingered joints; Other specific particular designs of joint cross-sections not provided for in groups B29C 66/11 to B29C 66/12 }

B29C 66/131	. . . . .	{Single flanged joints, i.e. one of the parts to be joined being rigid and flanged in the joint area}
B29C 66/1312	. . . . .	{Single flange to flange joints, the parts to be joined being rigid (the parts to be joined being flexible B29C 66/133)}
B29C 66/133	. . . . .	{Fin-type joints, the parts to be joined being flexible (the parts to be joined being rigid B29C 66/1312)}
B29C 66/135	. . . . .	{Single hemmed joints, i.e. one of the parts to be joined being hemmed in the joint area}
B29C 66/1352	. . . . .	{Single hem to hem joints}
B29C 66/137	. . . . .	{Beaded-edge joints or bead seals (for sealing or securing package folds or closures B65B 51/24)}
B29C 66/139	. . . . .	{Interpenetrating fingered joints}
B29C 66/14	. . . . .	{the joint having the same thickness as the thickness of the parts to be joined (B29C 66/1142 takes precedence)}
B29C 66/20	. . .	{particular design of the joint lines, e.g. of the weld lines}

NOTE

The scope of the subgroups is defined by the drawings in the Definitions

B29C 66/21	. . . . .	{said joint lines being formed by a single dot or dash or by several dots or dashes, i.e. spot joining or spot welding}
B29C 66/22	. . . . .	{said joint lines being in the form of recurring patterns (B29C 66/234 takes precedence)}
B29C 66/221	. . . . .	{being in the form of a sinusoidal wave (B29C 66/2272 takes precedence)}
B29C 66/223	. . . . .	{being in the form of a triangle wave or of a sawtooth wave, e.g. zigzagged}
B29C 66/225	. . . . .	{being castellated, e.g. in the form of a square wave or of a rectangular wave (B29C 66/2276 takes precedence)}
B29C 66/227	. . . . .	{being in the form of repetitive interlocking undercuts, e.g. in the form of puzzle cuts (tongue and groove joints or tenon and mortise joints comprising interlocking undercuts B29C 66/1242)}
B29C 66/2272	. . . . .	{Teardrop-like, waterdrop-like or mushroom-like interlocking undercuts (tongue and groove joints or tenon and mortise joints comprising teardrop-like, waterdrop-like or mushroom-like interlocking undercuts B29C 66/12421)}
B29C 66/2274	. . . . .	{Dovetailed interlocking undercuts (tongue and groove joints or tenon and mortise joints comprising dovetailed interlocking undercuts B29C 66/12423)}
B29C 66/2276	. . . . .	{Other specific local geometries of interlocking undercuts not provided for in B29C 66/2272 to B29C 66/2274 (tongue and groove joints or tenon and mortise joints comprising other specific interlocking undercuts B29C 66/12425)}
B29C 66/229	. . . . .	{Other specific patterns not provided for in B29C 66/221 to B29C 66/227 }
B29C 66/23	. . . . .	{said joint lines being multiple and parallel or being in the form of tessellations}

B29C 66/232	. . . . .	{said joint lines being multiple and parallel, i.e. the joint being formed by several parallel joint lines}
B29C 66/234	. . . . .	{said joint lines being in the form of tessellations}
B29C 66/24	. . . . .	{said joint lines being closed or non-straight}
B29C 66/242	. . . . .	{said joint lines being closed, i.e. forming closed contours}
B29C 66/2422	. . . . .	{being circular, oval or elliptical}
B29C 66/24221	. . . . .	{being circular (B29C 66/51 takes precedence)}
B29C 66/24223	. . . . .	{being oval}
B29C 66/24225	. . . . .	{being elliptical}
B29C 66/2424	. . . . .	{being a closed polygonal chain}
B29C 66/24241	. . . . .	{forming a triangle}
B29C 66/24243	. . . . .	{forming a quadrilateral}
B29C 66/24244	. . . . .	{forming a rectangle}
B29C 66/24245	. . . . .	{forming a square}
B29C 66/24249	. . . . .	{forming a specific polygon not provided for in B29C 66/24241 to B29C 66/24243 }
B29C 66/244	. . . . .	{said joint lines being non-straight, e.g. forming non-closed contours}
B29C 66/2442	. . . . .	{in the form of a single arc of circle}
B29C 66/246	. . . . .	{said joint lines forming figures, e.g. animals, flowers, hearts}
B29C 66/301	. . .	{Three-dimensional joints, i.e. the joined area being substantially non-flat (B29C 66/5223 , B29C 66/5224 , B29C 66/5225 take precedence)}
B29C 66/302	. . .	{the area to be joined comprising melt initiators}
B29C 66/3022	. . . . .	{said melt initiators being integral with at least one of the parts to be joined}
B29C 66/30221	. . . . .	{said melt initiators being point-like}
B29C 66/30223	. . . . .	{said melt initiators being rib-like}
B29C 66/3024	. . . . .	{said melt initiators being non-integral with the parts to be joined}
B29C 66/303	. . .	{the joint involving an anchoring effect (B29C 66/341 , B29C 65/56 and subgroups take precedence)}
B29C 66/3032	. . . . .	{making use of protusions or cavities belonging to at least one of the parts to be joined (B29C 66/3034 takes precedence)}
B29C 66/30321	. . . . .	{making use of protusions belonging to at least one of the parts to be joined}
B29C 66/30322	. . . . .	{in the form of rugosity}
B29C 66/30325	. . . . .	{making use of cavities belonging to at least one of the parts to be joined}
B29C 66/30326	. . . . .	{in the form of porosity}
B29C 66/3034	. . . . .	{making use of additional elements, e.g. meshes}
B29C 66/30341	. . . . .	{non-integral with the parts to be joined, e.g. making use of extra elements (B29C 65/562 takes precedence)}
B29C 66/304	. . .	{Joining through openings in an intermediate part of the article (B29C 66/3034 takes precedence)}

- B29C 66/305 . . . {Decorative or coloured joints (optical properties of the material of the parts to be joined [B29C 66/733](#))}
 - B29C 66/306 . . . {Applying a mark during joining}
 - B29C 66/3062 {in the form of letters or numbers}
 - B29C 66/30621 {in the form of letters}
 - B29C 66/30623 {in the form of numbers}
 - B29C 66/32 . . {Measures for keeping the burr form under control; Avoiding burr formation; Shaping the burr ([deburring welded articles B29C 37/04](#))}
 - B29C 66/322 . . . {Providing cavities in the joined article to collect the burr}
 - B29C 66/324 . . . {Avoiding burr formation}
 - B29C 66/3242 {on the inside of a tubular or hollow article}
 - B29C 66/326 . . . {Shaping the burr, e.g. by the joining tool}
 - B29C 66/3262 {as after-treatment, e.g. by a separate tool}
 - B29C 66/328 . . . {Leaving the burrs unchanged for providing particular properties to the joint, e.g. as decorative effect}
 - B29C 66/3282 {for reinforcing the joint}
 - B29C 66/3284 {for weakening the joint}
 - B29C 66/341 . . {Measures for intermixing the material of the joint interlayer}
 - B29C 66/342 . . {Preventing air-inclusions}
 - B29C 66/343 . . {Making tension-free or wrinkle-free joints}
 - B29C 66/3432 . . . {by holding the material loose or tension-free during joining}
 - B29C 66/344 . . {Stretching or tensioning the joint area during joining}
 - B29C 66/345 . . {Progressively making the joint, e.g. starting from the middle ([B29C 66/8341](#), [B29C 65/12](#), [B29C 65/14](#), [B29C 65/16](#) take precedence)}
 - B29C 66/3452 . . . {Making complete joints by combining partial joints}
 - B29C 66/346 . . {Making joints having variable thicknesses in the joint area, e.g. by using jaws having an adapted configuration}
 - B29C 66/3462 . . . {by differentially heating the zones of different thickness}
 - B29C 66/3464 . . . {by preheating}
 - B29C 66/347 . . {using particular temperature distributions or gradients; using particular heat distributions or gradients}
 - B29C 66/3472 . . . {in the plane of the joint, e.g. along the joint line in the plane of the joint or perpendicular to the joint line in the plane of the joint}
 - B29C 66/3474 . . . {perpendicular to the plane of the joint}
 - B29C 66/348 . . {Avoiding melting or weakening of the zone directly next to the joint area, e.g. by cooling}
 - B29C 66/349 . . {Cooling the welding zone on the welding spot}
- WARNING**
- Subgroups of [B29C 66/349](#) are not complete, pending a reorganisation; see also this group
- B29C 66/3492 . . . {by means placed on the side opposed to the welding tool}
 - B29C 66/3494 . . . {while keeping the welding zone under pressure}

- B29C 66/40 . {General aspects of joining substantially flat articles, e.g. plates, sheets or web-like materials; Making flat seams in tubular or hollow articles; Joining single elements to substantially flat surfaces}
- WARNING**
- Group [B29C 66/40](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/00](#) and its subgroups
- B29C 66/41 . . {Joining substantially flat articles ([B29C 66/47](#) and subgroups take precedence); Making flat seams in tubular or hollow articles ([B29C 66/51](#) and subgroups take precedence)}
- B29C 66/43 . . . {Joining a relatively small portion of the surface of said articles ([B29C 66/45](#) takes precedence)}
- B29C 66/431 {Joining the articles to themselves ([B29C 66/4322](#) and [B29C 66/4332](#) take precedence)}
- B29C 66/4312 {for making flat seams in tubular or hollow articles, e.g. transversal seams}
- B29C 66/43121 {Closing the ends of tubular or hollow single articles, e.g. closing the ends of bags (closing tube ends [B29C 57/10](#))}
- B29C 66/43122 {Closing the top of gable top containers (gable top containers [B65D 5/067](#))}
- B29C 66/43123 {Closing the ends of squeeze tubes, e.g. for toothpaste or cosmetics (producing flexible squeeze tubes by combined operations [B29D 23/20](#); collapsible tubes [B65D 35/00](#))}
- B29C 66/43129 {said flat seams being transversal but non-orthogonal with respect to the tubular or hollow articles, i.e. oblique}
- B29C 66/432 {for making tubular articles or closed loops, e.g. by joining several sheets ([B29C 66/547](#) takes precedence; bending and joining sheets at right angles to the longitudinal axis of the article being formed and joining the edges [B29C 53/38](#)); for making hollow articles or hollow preforms}
- B29C 66/4322 {by joining a single sheet to itself ([B29C 66/4332](#) takes precedence)}
- B29C 66/4324 {for making closed loops, e.g. belts}
- B29C 66/4326 {for making hollow articles or hollow-preforms, e.g. half-shells}
- B29C 66/4329 {the joint lines being transversal but non-orthogonal with respect to the axis of said tubular articles, i.e. being oblique}
- B29C 66/433 {Casing-in, i.e. enclosing an element between two sheets by an outlined seam (for bookbinding [B42C 11/06](#); for packaging [B65B](#); by laminating [B32B 37/00](#); enclosing tubular articles between substantially flat elements [B29C 66/53261](#))}
- B29C 66/4332 {by folding a sheet over}
- B29C 66/434 {Joining substantially flat articles for forming corner connections, fork connections or cross connections}
- B29C 66/4342 {Joining substantially flat articles for forming corner connections, e.g. for making V-shaped pieces}
- B29C 66/43421 {with a right angle, e.g. for making L-shaped pieces}
- B29C 66/4344 {Joining substantially flat articles for forming fork connections, e.g. for making Y-shaped pieces}

- B29C 66/43441 {with two right angles, e.g. for making T-shaped pieces, H-shaped pieces}
 - B29C 66/4346 {Joining substantially flat articles for forming cross connections, e.g. for making X-shaped pieces}
 - B29C 66/43461 {with four right angles, e.g. for making +-shaped pieces}
 - B29C 66/435 {Making large sheets by joining smaller ones or strips together}
 - B29C 66/436 {Joining sheets for making articles comprising cushioning or padding materials, the weld being performed through the cushioning material, e.g. car seats (joining through openings [B29C 66/304](#))}
 - B29C 66/437 {Joining plastics plates for making venetian blinds (making venetian blinds in general [E06B 9/266](#))}
 - B29C 66/438 {Joining sheets for making hollow-walled, channelled structures or multi-tubular articles}
- WARNING**
- Not complete, pending a reorganisation; see also [B29C 66/439](#)
- B29C 66/439 {Joining sheets for making inflated articles without using a mould}
- WARNING**
- Not complete, pending a reorganisation; see also [B29C 66/438](#)
- B29C 66/45 {Joining of substantially the whole surface of the articles (methods or apparatus for laminating [B32B 37/00](#))}
 - B29C 66/452 {the article having a disc form, e.g. making CDs or DVDs}
 - B29C 66/47 {Joining single elements to sheets, plates or other substantially flat surfaces ([B29C 66/5326](#) takes precedence)}
 - B29C 66/472 {said single elements being substantially flat}
 - B29C 66/4722 {Fixing strips to surfaces other than edge faces (fixing strips to edge faces [B29C 63/0026](#))}
 - B29C 66/4724 {said single elements being appliques, e.g. in the form of a text or drawing}
 - B29C 66/474 {said single elements being substantially non-flat}
 - B29C 66/4742 {said single elements being spouts}
 - B29C 66/47421 {said spouts comprising flanges}
 - B29C 66/49 {Internally supporting the, e.g. tubular, article during joining ([B29C 66/63](#) takes precedence)}
 - B29C 66/492 {using a fluid}
 - B29C 66/494 {using an inflatable core}
 - B29C 66/496 {using a support which remains in the joined object}
 - B29C 66/50 {General aspects of joining tubular articles; General aspects of joining long products, i.e. bars or profiled elements; General aspects of joining single elements to tubular articles, hollow articles or bars; General aspects of joining several hollow-preforms to form hollow or tubular articles}

WARNING

B29C 66/50

(continued)

Group [B29C 66/50](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/00](#) and its subgroups

- B29C 66/51 . . {Joining tubular articles, profiled elements or bars; Joining single elements to tubular articles, hollow articles or bars; Joining several hollow-preforms to form hollow or tubular articles}
- B29C 66/52 . . . {Joining tubular articles, bars or profiled elements}
- B29C 66/522 {Joining tubular articles ([B29C 66/53241](#) takes precedence)}
- B29C 66/5221 {for forming coaxial connections, i.e. the tubular articles to be joined forming a zero angle relative to each other}
- B29C 66/52211 {for making endless tubular articles, e.g. endless inner tubes}
- B29C 66/5223 {for forming corner connections or elbows, e.g. for making V-shaped pieces}
- B29C 66/52231 {with a right angle, e.g. for making L-shaped pieces}
- B29C 66/5224 {for forming fork-shaped connections, e.g. for making Y-shaped pieces}
- B29C 66/52241 {with two right angles, e.g. for making T-shaped pieces}
- B29C 66/5225 {for forming cross-shaped connections, e.g. for making X-shaped pieces}
- B29C 66/52251 {with four right angles, e.g. for making +-shaped pieces}
- B29C 66/5227 {for forming multi-tubular articles by longitudinally joining elementary tubular articles wall-to-wall (e.g. joining the wall of a first tubular article to the wall of a second tubular article) or for forming multilayer tubular articles}
- B29C 66/52271 {one tubular article being placed inside the other}
- B29C 66/52272 {concentrically, e.g. for forming multilayer tubular articles}
- B29C 66/5229 {involving the use of a socket}
- B29C 66/52291 {said socket comprising a stop}
- B29C 66/52292 {said stop being internal}
- B29C 66/52293 {said stop being external}
- B29C 66/52294 {said stop being heated}
- B29C 66/52295 {said socket comprising reinforcements}
- B29C 66/52296 {said socket comprising sealing elements, e.g. gaskets}
- B29C 66/52297 {said socket comprising slip-off prevention means ([B29C 66/52296](#) takes precedence)}
- B29C 66/52298 {said socket being composed by several elements}
- B29C 66/524 {Joining profiled elements}
- B29C 66/5241 {for forming coaxial connections, i.e. the profiled elements to be joined forming a zero angle relative to each other}
- B29C 66/5243 {for forming corner connections, e.g. for making window frames or V-shaped pieces ([Welded corner joints for window frames E06B 3/9604](#))}
- B29C 66/52431 {with a right angle, e.g. for making L-shaped pieces}
- B29C 66/5244 {for forming fork-shaped connections, e.g. for making window frames or Y-shaped pieces}

B29C 66/52441	. . . . .	{with two right angles, e.g. for making T-shaped pieces}
B29C 66/5245	. . . . .	{for forming cross-shaped connections, e.g. for making window frames or X-shaped pieces}
B29C 66/52451	. . . . .	{with four right angles, e.g. for making +-shaped pieces}
B29C 66/526	. . . . .	{Joining bars}
B29C 66/5261	. . . . .	{for forming coaxial connections, i.e. the bars to be joined forming a zero angle relative to each other}
B29C 66/5263	. . . . .	{for forming corner connections, e.g. for making V-shaped pieces}
B29C 66/52631	. . . . .	{with a right angle, e.g. for making L-shaped pieces}
B29C 66/5264	. . . . .	{for forming fork-shaped connections, e.g. for making Y-shaped pieces}
B29C 66/52641	. . . . .	{with two right angles, e.g. for making T-shaped pieces}
B29C 66/5265	. . . . .	{for forming cross-shaped connections, e.g. for making X-shaped pieces}
B29C 66/52651	. . . . .	{with four right angles, e.g. for making +-shaped pieces}
B29C 66/5268	. . . . .	{characterised by their solid cross sections being non-circular, e.g. being elliptical, square or rectangular}
B29C 66/53	. . .	{Joining single elements to tubular articles, hollow articles or bars}
B29C 66/532	. . . . .	{Joining single elements to the wall of tubular articles, hollow articles or bars}
B29C 66/5324	. . . . .	{said single elements being substantially annular, i.e. of finite length (B29C 66/5326 takes precedence)}
B29C 66/53241	. . . . .	{said articles being tubular and said substantially annular single elements being of finite length relative to the infinite length of said tubular articles (Making T-shaped pieces by joining tubular articles B29C 66/52241)}
B29C 66/53242	. . . . .	{said single elements being spouts, e.g. joining spouts to tubes}
B29C 66/53243	. . . . .	{said spouts comprising flanges}
B29C 66/53245	. . . . .	{said articles being hollow}
B29C 66/53246	. . . . .	{said single elements being spouts, e.g. joining spouts to containers}
B29C 66/53247	. . . . .	{said spouts comprising flanges}
B29C 66/5326	. . . . .	{said single elements being substantially flat}
B29C 66/53261	. . . . .	{Enclosing tubular articles between substantially flat elements}
B29C 66/53262	. . . . .	{Enclosing spouts between the walls of bags, e.g. of medical bags}
B29C 66/53263	. . . . .	{said spouts comprising wings, e.g. said spouts being of ship-like or canoe-like form to avoid leaks in the corners}
B29C 66/534	. . . . .	{Joining single elements to open ends of tubular or hollow articles or to the ends of bars}
B29C 66/5342	. . . . .	{a substantially flat extra element being placed between and clamped by the joined single elements and the end of said tubular or hollow articles}

B29C 66/53421	. . . . .	{said substantially flat extra element being flexible, e.g. a membrane (B29C 66/53425 takes precedence)}
B29C 66/53423	. . . . .	{said substantially flat extra element being rigid, e.g. a plate (B29C 66/53425 takes precedence)}
B29C 66/53425	. . . . .	{said substantially flat extra element being perforated, e.g. a screen}
B29C 66/5344	. . . . .	{said single elements being substantially annular, i.e. of finite length, e.g. joining flanges to tube ends (B29C 66/5346 takes precedence)}
B29C 66/5346	. . . . .	{said single elements being substantially flat}
B29C 66/53461	. . . . .	{joining substantially flat covers and/or substantially flat bottoms to open ends of container bodies}
B29C 66/53462	. . . . .	{joining substantially flat covers and substantially flat bottoms to open ends of container bodies}
B29C 66/53465	. . . . .	{said single flat elements being provided with holes facing the tube ends, e.g. for making heat-exchangers}
B29C 66/536	. . . . .	{Joining substantially flat single elements to hollow articles to form tubular articles}
B29C 66/54	. . . . .	{Joining several hollow-preforms, e.g. half-shells, to form hollow articles, e.g. for making balls, containers; Joining several hollow-preforms, e.g. half-cylinders, to form tubular articles}
B29C 66/541	. . . . .	{a substantially flat extra element being placed between and clamped by the joined hollow-preforms}
B29C 66/5412	. . . . .	{said substantially flat extra element being flexible, e.g. a membrane (B29C 66/5416 takes precedence)}
B29C 66/5414	. . . . .	{said substantially flat extra element being rigid, e.g. a plate (B29C 66/5416 takes precedence)}
B29C 66/5416	. . . . .	{said substantially flat extra element being perforated, e.g. a screen}
B29C 66/542	. . . . .	{joining hollow covers or hollow bottoms to open ends of container bodies}
B29C 66/543	. . . . .	{joining more than two hollow-preforms to form said hollow articles}
B29C 66/5432	. . . . .	{joining hollow covers and hollow bottoms to open ends of container bodies}
B29C 66/545	. . . . .	{one hollow-preform being placed inside the other}
B29C 66/5452	. . . . .	{joining hollow bottoms to bottom of bottles}
B29C 66/547	. . . . .	{Joining several hollow-preforms, e.g. half-cylinders, to form tubular articles, e.g. endless tubes}
B29C 66/5472	. . . . .	{for making elbows or V-shaped pieces}
B29C 66/54721	. . . . .	{for making L-shaped pieces}
B29C 66/5474	. . . . .	{for making fork-shaped pieces, i.e. with 3 branches, e.g. Y-shaped pieces}
B29C 66/54741	. . . . .	{for making T-shaped pieces}
B29C 66/5476	. . . . .	{for making cross-shaped pieces, e.g. with 4 branches, e.g. X-shaped pieces}
B29C 66/54761	. . . . .	{for making +-shaped pieces}

- B29C 66/549 {said hollow-preforms being interconnected during their moulding process, e.g. by a hinge}
- B29C 66/55 . . . {sealing elements being incorporated into the joints, e.g. gaskets ([B29C 66/52296](#) takes precedence)}
- B29C 66/61 . . {Joining from or joining on the inside (for making tubes by bending sheets and joining from the inside [B29C 53/387](#))}
- B29C 66/612 . . . {Making circumferential joints}
- B29C 66/63 . . {Internally supporting the article during joining ([B29C 66/49](#) takes precedence)}
- B29C 66/632 . . . {using a fluid}
- B29C 66/634 . . . {using an inflatable core}
- B29C 66/636 . . . {using a support which remains in the joined object}
- B29C 66/65 . . {with a relative motion between the article and the welding tool ([B29C 65/10](#), [B29C 65/12](#) take precedence)}
- B29C 66/652 . . . {moving the welding tool around the fixed article}
- B29C 66/69 . {General aspects of joining filaments (bundling articles [B65B 13/00](#); interconnecting successive lengths of material [B65H 69/00](#))}
- B29C 66/70 . {characterised by the composition, physical properties or the structure of the material of the parts to be joined; Joining with non-plastics material (chemical aspects [C08J 5/12](#), [C09J](#))}

WARNING

Group [B29C 66/70](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/00](#) and its subgroups

- B29C 66/71 . . {characterised by the composition of the plastics material of the parts to be joined (welding bar compositions [B29C 65/125](#))}

WARNING

Group [B29C 66/71](#) and subgroups are not complete, pending a reorganisation

- B29C 66/712 . . . {the composition of one of the parts to be joined being different from the composition of the other part}
- B29C 66/72 . . {characterised by the structure of the material of the parts to be joined}
- B29C 66/721 . . . {Fibre-reinforced materials ([B29C 66/729](#) takes precedence)}

WARNING

Subgroups of [B29C 66/721](#) are not complete, pending a reorganisation; see also this group

- B29C 66/7212 {characterised by the composition of the fibres}

WARNING

Not complete, pending a reorganisation

- B29C 66/7214 {characterised by the length of the fibres}
- B29C 66/72141 {Fibres of continuous length}
- B29C 66/72143 {Fibres of discontinuous lengths}

B29C 66/723	. . .	{being multi-layered (B29C 66/7292 , B29C 66/72941 take precedence)}
B29C 66/7232	. . . .	{comprising a non-plastics layer}
B29C 66/72321	. . . . .	{consisting of metals or their alloys}
B29C 66/72322	. . . . .	{consisting of elements other than metals, e.g. boron}
B29C 66/72323	. . . . .	{Carbon}
B29C 66/72324	. . . . .	{consisting of inorganic materials not provided for in B29C 66/72321 to B29C 66/72322 }
B29C 66/72325	. . . . .	{Ceramics}
B29C 66/72326	. . . . .	{Glass}
B29C 66/72327	. . . . .	{consisting of natural products or their composites, not provided for in B29C 66/72321 to B29C 66/72324 }
B29C 66/72328	. . . . .	{Paper}
B29C 66/72329	. . . . .	{Wood}
B29C 66/7234	. . . .	{comprising a barrier layer}
B29C 66/72341	. . . . .	{for gases}
B29C 66/72343	. . . . .	{for liquids}
B29C 66/725	. . .	{being hollow-walled or honeycombs}
B29C 66/7252	. . . .	{hollow-walled}
B29C 66/72521	. . . . .	{comprising corrugated cores}
B29C 66/72523	. . . . .	{multi-channelled or multi-tubular (B29C 66/438 , B29C 66/5227 take precedence)}
B29C 66/72525	. . . . .	{comprising honeycomb cores}
B29C 66/7254	. . . .	{honeycomb structures}
B29C 66/727	. . .	{being porous, e.g. foam}
B29C 66/729	. . .	{Textile or other fibrous material made from plastics}
B29C 66/7292	. . . .	{coated (B29C 66/72941 takes precedence)}
B29C 66/7294	. . . .	{Non woven mats, e.g. felt}
B29C 66/72941	. . . . .	{coated}
B29C 66/73	. .	{characterised by the intensive physical properties of the material of the parts to be joined, by the optical properties of the material of the parts to be joined, by the extensive physical properties of the parts to be joined, by the state of the material of the parts to be joined or by the material of the parts to be joined being a thermoplastic or a thermoset}
B29C 66/731	. . .	{characterised by the intensive physical properties of the material of the parts to be joined}
B29C 66/7311	. . . .	{Thermal properties}
B29C 66/73111	. . . . .	{Thermal expansion coefficient}
B29C 66/73112	. . . . .	{of different thermal expansion coefficient, i.e. the thermal expansion coefficient of one of the parts to be joined being different from the thermal expansion coefficient of the other part}
B29C 66/73113	. . . . .	{Thermal conductivity}

B29C 66/73114	. . . . .	{of different thermal conductivity, i.e. the thermal conductivity of one of the parts to be joined being different from the thermal conductivity of the other part}
B29C 66/73115	. . . . .	{Melting point}
B29C 66/73116	. . . . .	{of different melting point, i.e. the melting point of one of the parts to be joined being different from the melting point of the other part}
B29C 66/73117	. . . . .	{T _g , i.e. glass transition temperature}
B29C 66/73118	. . . . .	{of different glass transition temperature, i.e. the glass transition temperature of one of the parts to be joined being different from the glass transition temperature of the other part}
B29C 66/7312	. . . . .	{Rheological properties}
B29C 66/73121	. . . . .	{Viscosity}
B29C 66/73122	. . . . .	{of different viscosity, i.e. the viscosity of one of the parts to be joined being different from the viscosity of the other part}
B29C 66/7313	. . . . .	{Density}
B29C 66/73132	. . . . .	{of different density, i.e. the density of one of the parts to be joined being different from the density of the other part}
B29C 66/7314	. . . . .	{Electrical and dielectric properties}
B29C 66/73141	. . . . .	{Electrical conductivity}
B29C 66/73143	. . . . .	{Dielectric properties}
B29C 66/7315	. . . . .	{Mechanical properties}
B29C 66/73151	. . . . .	{Hardness}
B29C 66/73152	. . . . .	{of different hardness, i.e. the hardness of one of the parts to be joined being different from the hardness of the other part}
B29C 66/7316	. . . . .	{Surface properties}
B29C 66/73161	. . . . .	{Roughness or rugosity}
B29C 66/73162	. . . . .	{of different roughness or rugosity, i.e. the roughness or rugosity of the surface of one of the parts to be joined being different from the roughness or rugosity of the surface of the other part}
B29C 66/7317	. . . . .	{Hydrophilicity or hydrophobicity}
B29C 66/73171	. . . . .	{Hydrophilicity}
B29C 66/73172	. . . . .	{of different hydrophilicity, i.e. the hydrophilicity of one of the parts to be joined being different from the hydrophilicity of the other part}
B29C 66/73175	. . . . .	{Hydrophobicity}
B29C 66/73176	. . . . .	{of different hydrophobicity, i.e. the hydrophobicity of one of the parts to be joined being different from the hydrophobicity of the other part}
B29C 66/7318	. . . . .	{Permeability to gases or liquids}
B29C 66/73181	. . . . .	{permeable}
B29C 66/73182	. . . . .	{to gases}
B29C 66/73183	. . . . .	{to liquids}
B29C 66/73185	. . . . .	{non-permeable}

B29C 66/73186	. . . . .	{to gases}
B29C 66/73187	. . . . .	{to liquids}
B29C 66/733	. . .	{characterised by the optical properties of the material of the parts to be joined, e.g. fluorescence, phosphorescence}
B29C 66/7332	. . . . .	{at least one of the parts to be joined being coloured}
B29C 66/73321	. . . . .	{both parts to be joined being coloured}
B29C 66/73322	. . . . .	{both parts to be joined having a different colour}
B29C 66/7334	. . . . .	{at least one of the parts to be joined being glossy or matt, reflective or refractive}
B29C 66/73341	. . . . .	{at least one of the parts to be joined being glossy or reflective}
B29C 66/73343	. . . . .	{at least one of the parts to be joined being matt or refractive}
B29C 66/7336	. . . . .	{at least one of the parts to be joined being opaque, transparent or translucent to visible light}
B29C 66/73361	. . . . .	{at least one of the parts to be joined being opaque to visible light}
B29C 66/73362	. . . . .	{both parts to be joined being opaque to visible light}
B29C 66/73365	. . . . .	{at least one of the parts to be joined being transparent or translucent to visible light}
B29C 66/73366	. . . . .	{both parts to be joined being transparent or translucent to visible light}
B29C 66/7338	. . . . .	{at least one of the parts to be joined being polarising}
B29C 66/735	. . .	{characterised by the extensive physical properties of the parts to be joined}
B29C 66/7352	. . . . .	{Thickness, e.g. very thin}
B29C 66/73521	. . . . .	{of different thickness, i.e. the thickness of one of the parts to be joined being different from the thickness of the other part}
B29C 66/737	. . .	{characterised by the state of the material of the parts to be joined}
B29C 66/7371	. . . . .	{oriented or heat-shrinkable}
B29C 66/73711	. . . . .	{oriented}
B29C 66/73712	. . . . .	{mono-axially}
B29C 66/73713	. . . . .	{bi-axially or multi-axially}
B29C 66/73715	. . . . .	{heat-shrinkable}
B29C 66/7373	. . . . .	{Joining soiled or oxidised materials}
B29C 66/7375	. . . . .	{uncured, partially cured or fully cured}
B29C 66/73751	. . . . .	{the to-be-joined area of at least one of the parts to be joined being uncured, i.e. non cross-linked, non vulcanized}
B29C 66/73752	. . . . .	{the to-be-joined areas of both parts to be joined being uncured}
B29C 66/73753	. . . . .	{the to-be-joined area of at least one of the parts to be joined being partially cured, i.e. partially cross-linked, partially vulcanized}
B29C 66/73754	. . . . .	{the to-be-joined areas of both parts to be joined being partially cured}
B29C 66/73755	. . . . .	{the to-be-joined area of at least one of the parts to be joined being fully cured, i.e. fully cross-linked, fully vulcanized}

B29C 66/73756	. . . . .	{the to-be-joined areas of both parts to be joined being fully cured}
B29C 66/7377	. . . . .	{amorphous, semi-crystalline or crystalline}
B29C 66/73771	. . . . .	{the to-be-joined area of at least one of the parts to be joined being amorphous}
B29C 66/73772	. . . . .	{the to-be-joined areas of both parts to be joined being amorphous}
B29C 66/73773	. . . . .	{the to-be-joined area of at least one of the parts to be joined being semi-crystalline}
B29C 66/73774	. . . . .	{the to-be-joined areas of both parts to be joined being semi-crystalline}
B29C 66/73775	. . . . .	{the to-be-joined area of at least one of the parts to be joined being crystalline}
B29C 66/73776	. . . . .	{the to-be-joined areas of both parts to be joined being crystalline}
B29C 66/7379	. . . . .	{degradable}
B29C 66/73791	. . . . .	{biodegradable}
B29C 66/73793	. . . . .	{soluble, e.g. water-soluble}
B29C 66/739	. . . . .	{characterised by the material of the parts to be joined being a thermoplastic or a thermoset}
B29C 66/7392	. . . . .	{characterised by the material of at least one of the parts being a thermoplastic}
B29C 66/73921	. . . . .	{characterised by the materials of both parts being thermoplastics}
B29C 66/7394	. . . . .	{characterised by the material of at least one of the parts being a thermoset}
B29C 66/73941	. . . . .	{characterised by the materials of both parts being thermosets}
B29C 66/74	. . . . .	{Joining plastics material to non-plastics material}

NOTE

When classifying in this group, joining techniques are additionally classified in the relevant groups, i.e. in [B29C 65/44](#) and subgroups or in [B29C 65/64](#) and subgroups

WARNING

Group [B29C 66/74](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/00](#) and its subgroups

B29C 66/742	. . . . .	{to metals or their alloys}
B29C 66/7422	. . . . .	{Aluminium or alloys of aluminium}
B29C 66/7424	. . . . .	{Lead or alloys of lead}
B29C 66/7426	. . . . .	{Tin or alloys of tin}
B29C 66/7428	. . . . .	{Transition metals or their alloys}
B29C 66/74281	. . . . .	{Copper or alloys of copper}
B29C 66/74283	. . . . .	{Iron or alloys of iron, e.g. steel}
B29C 66/74285	. . . . .	{Noble metals, e.g. silver, gold, platinum or their alloys}
B29C 66/744	. . . . .	{to elements other than metals}

- B29C 66/7442 {Boron}
- B29C 66/7444 {Carbon}
- B29C 66/746 . . . {to inorganic materials not provided for in groups [B29C 66/742](#) to [B29C 66/744](#)}
- B29C 66/7461 {Ceramics}
- B29C 66/74611 {Carbides; Nitrides}
- B29C 66/7463 {Concrete}
- B29C 66/7465 {Glass}
- B29C 66/7467 {Mica}
- B29C 66/7469 {Asbestos}
- B29C 66/748 . . . {to natural products or their composites, not provided for in groups [B29C 66/742](#) to [B29C 66/746](#)}
- B29C 66/7481 {Cork}
- B29C 66/7482 {Linoleum}
- B29C 66/7483 {Bone, horn, ivory}
- B29C 66/7484 {Leather}
- B29C 66/7485 {Natural fibres, e.g. wool, cotton}
- B29C 66/7486 {Paper, e.g. cardboard}
- B29C 66/7487 {Wood}
- B29C 66/80 . {General aspects of machine operations or constructions and parts thereof}

WARNING

Group [B29C 66/80](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/00](#) and its subgroups

- B29C 66/81 . . {General aspects of the pressing elements, i.e. the elements applying pressure on the parts to be joined in the area to be joined, e.g. the welding jaws or clamps (holding or clamping means for handling purposes [B29C 65/7841](#))}

WARNING

Group [B29C 66/81](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/00](#) and its subgroups

- B29C 66/812 . . . {characterised by the composition, by the structure, by the intensive physical properties or by the optical properties of the material constituting the pressing elements, e.g. constituting the welding jaws or clamps}
- B29C 66/8122 {characterised by the composition of the material constituting the pressing elements, e.g. constituting the welding jaws or clamps}

WARNING

Not complete, pending a reorganisation; see also [B29K 2801/00](#) to [B29K 2911/14](#)

- B29C 66/8124 {characterised by the structure of the material constituting the pressing elements, e.g. constituting the welding jaws or clamps}
- B29C 66/81241 {being porous or sintered}

B29C 66/8126	. . . .	{characterised by the intensive physical properties or by the optical properties of the material constituting the pressing elements, e.g. constituting the welding jaws or clamps}
B29C 66/81261	. . . . .	{Thermal properties, e.g. thermal conductivity, thermal expansion coefficient}
B29C 66/81262	. . . . .	{Electrical and dielectric properties, e.g. electrical conductivity}
B29C 66/81263	. . . . .	{Dielectric properties}
B29C 66/81264	. . . . .	{Mechanical properties, e.g. hardness}
B29C 66/81265	. . . . .	{Surface properties, e.g. surface roughness or rugosity}
B29C 66/81266	. . . . .	{Optical properties, e.g. transparency, reflectivity}
B29C 66/81267	. . . . .	{Transparent to electromagnetic radiation, e.g. to visible light}
B29C 66/81268	. . . . .	{Reflective to electromagnetic radiation, e.g. to visible light}
B29C 66/814	. . .	{characterised by the design of the pressing elements, e.g. of the welding jaws or clamps}
B29C 66/8141	. . . .	{characterised by the surface geometry of the part of the pressing elements, e.g. welding jaws or clamps, coming into contact with the parts to be joined}
B29C 66/81411	. . . . .	{characterised by its cross-section, e.g. transversal or longitudinal, being non-flat}
B29C 66/81413	. . . . .	{being non-symmetrical (B29C 66/81415 takes precedence)}
B29C 66/81415	. . . . .	{being bevelled}
B29C 66/81417	. . . . .	{being V-shaped}
B29C 66/81419	. . . . .	{and flat}
B29C 66/81421	. . . . .	{being convex or concave}
B29C 66/81422	. . . . .	{being convex}
B29C 66/81423	. . . . .	{being concave}
B29C 66/81425	. . . . .	{being stepped, e.g. comprising a shoulder}
B29C 66/81427	. . . . .	{comprising a single ridge, e.g. for making a weakening line; comprising a single tooth}
B29C 66/81429	. . . . .	{comprising a single tooth}
B29C 66/81431	. . . . .	{comprising a single cavity, e.g. a groove}
B29C 66/81433	. . . . .	{being toothed, i.e. comprising several teeth or pins (comprising a single tooth B29C 66/81429), or being patterned}
B29C 66/81435	. . . . .	{comprising several parallel ridges, e.g. for crimping (comprising a single ridge B29C 66/81427)}
B29C 66/8145	. . . .	{characterised by the constructional aspects of the pressing elements, e.g. of the welding jaws or clamps (B29C 66/816 and B29C 66/818 take precedence; adaptable for making articles or joints of different dimensions B29C 66/841)}
B29C 66/81451	. . . . .	{being adaptable to the surface of the joint (B29C 66/81453 , B29C 66/81455 , B29C 66/81457 , B29C 66/81459 , B29C 66/81461 take precedence)}
B29C 66/81453	. . . . .	{being made of flexible slats, flexible fins, flexible bristles or springs, e.g. coiled springs}

B29C 66/81455	. . . . .	{being a fluid inflatable bag or bladder, a diaphragm or a vacuum bag for applying isostatic pressure (inflatable element positioned between the joining tool and a backing-up part B29C 66/82421)}
B29C 66/81457	. . . . .	{comprising a block or layer of deformable material, e.g. sponge, foam, rubber (pressing elements supported or backed-up by resilient material B29C 66/8161)}
B29C 66/81459	. . . . .	{being a filled deformable bladder, e.g. bladder filled with oil, with granules or with a meltable solid material (B29C 66/81455 takes precedence)}
B29C 66/81461	. . . . .	{being multi-lamellar or segmented, i.e. comprising a plurality of strips, plates or stacked elements}
B29C 66/81463	. . . . .	{comprising a plurality of single pressing elements, e.g. a plurality of sonotrodes, or comprising a plurality of single counter-pressing elements, e.g. a plurality of anvils, said plurality of said single elements being suitable for making a single joint}
B29C 66/81465	. . . . .	{one placed behind the other in a single row in the feed direction}
B29C 66/81467	. . . . .	{arranged in an offset pattern}
B29C 66/81469	. . . . .	{one placed next to the other in a single line transverse to the feed direction, e.g. shoulder to shoulder sonotrodes}
B29C 66/81471	. . . . .	{being a wrap-around tape or band}
B29C 66/816	. . . . .	{characterised by the mounting of the pressing elements, e.g. of the welding jaws or clamps}
B29C 66/8161	. . . . .	{said pressing elements being supported or backed-up by springs or by resilient material}
B29C 66/81611	. . . . .	{by resilient material}
B29C 66/8163	. . . . .	{Self-aligning to the joining plane, e.g. mounted on a ball and socket}
B29C 66/8165	. . . . .	{Carrier plates for mounting joining tool parts, e.g. for re-arranging the tool parts to make other forms}
B29C 66/8167	. . . . .	{Quick change joining tools or surfaces}
B29C 66/8169	. . . . .	{the mounting of said pressing elements being laterally movable, e.g. adjustable (B29C 66/836 , B29C 66/841 , B29C 66/863 take precedence)}
B29C 66/818	. . . . .	{characterised by the cooling constructional aspects, or by the thermal or electrical insulating or conducting constructional aspects of the welding jaws or of the clamps (characterised by the heating means B29C 65/24); comprising means for compensating for the thermal expansion of the welding jaws or of the clamps}
B29C 66/8181	. . . . .	{characterised by the cooling constructional aspects}
B29C 66/81811	. . . . .	{of the welding jaws}
B29C 66/81812	. . . . .	{the welding jaws being cooled from the outside, e.g. by blowing a gas or spraying a liquid}
B29C 66/81815	. . . . .	{of the clamps}
B29C 66/8182	. . . . .	{characterised by the thermal insulating constructional aspects}
B29C 66/81821	. . . . .	{of the welding jaws}
B29C 66/81825	. . . . .	{of the clamps}

- B29C 66/8183 {characterised by the thermal conducting constructional aspects}
- B29C 66/81831 {of the welding jaws}
- B29C 66/81835 {of the clamps}
- B29C 66/8185 {comprising means for compensating for the thermal expansion of the welding jaws or of the clamps (means for tensioning resistive elements [B29C 65/229](#))}
- B29C 66/8187 {characterised by the electrical insulating constructional aspects}
- B29C 66/81871 {of the welding jaws}
- B29C 66/81875 {of the clamps}
- B29C 66/8188 {characterised by the electrical conducting constructional aspects}
- B29C 66/81881 {of the welding jaws}
- B29C 66/81885 {of the clamps}
- B29C 66/82 . . {Pressure application arrangements, e.g. transmission or actuating mechanisms for joining tools or clamps}

WARNING

Group [B29C 66/82](#) and subgroups are not complete, pending a reorganisation; see also [B29C 65/00](#) and its subgroups

- B29C 66/822 . . . {Transmission mechanisms}
- B29C 66/8221 {Scissor or lever mechanisms, i.e. involving a pivot point}
- B29C 66/8222 {Pinion or rack mechanisms}
- B29C 66/8223 {Worm or spindle mechanisms}
- B29C 66/8224 {Chain or sprocket drives}
- B29C 66/8225 {Crank mechanisms}
- B29C 66/8226 {Cam mechanisms; Wedges; Eccentric mechanisms}
- B29C 66/82261 {Wedges}
- B29C 66/82263 {Follower pin or roller cooperating with a groove}
- B29C 66/82265 {Eccentric mechanisms}
- B29C 66/8227 {using springs}
- B29C 66/824 . . . {Actuating mechanisms}
- B29C 66/8242 {Pneumatic or hydraulic drives (using fluid pressure directly acting on the parts to be joined [B29C 66/8266](#))}
- B29C 66/82421 {using an inflatable element positioned between the joining tool and a backing-up part}
- B29C 66/82423 {using vacuum (using vacuum directly acting on the parts to be joined [B29C 66/82661](#))}
- B29C 66/8244 {magnetically driven}
- B29C 66/8246 {Servomechanisms, e.g. servomotors}
- B29C 66/8248 {Pressure application by weights (by the own weight of the joining tool [B29C 66/8282](#))}
- B29C 66/826 . . . {without using a separate pressure application tool, e.g. the own weight of the parts to be joined ([B29C 65/66](#) takes precedence)}

- B29C 66/8262 {using "pressure means" which are associated with at least one of the parts to be joined and remain in or on it}
- B29C 66/8264 {using the thermal expansion of the parts to be joined}
- B29C 66/8266 {using fluid pressure directly acting on the parts to be joined}
- B29C 66/82661 {by means of vacuum}
- B29C 66/828 {Other pressure application arrangements}
- B29C 66/8282 {using the own weight of the joining tool}
- B29C 66/8284 {using the thermal expansion of the joining tool}
- B29C 66/8286 {Hand placed clamps ([Wrap-around tapes or bands B29C 66/81471](#))}
- B29C 66/83 . . {characterised by the movement of the joining or pressing tools}

WARNING

Group [B29C 66/83](#) and subgroups are not complete, pending a reorganisation; see also this group and its subgroups and [B29C 65/00](#) and its subgroups

- B29C 66/832 . . . {Reciprocating joining or pressing tools ([B29C 66/834](#) takes precedence)}
- B29C 66/8322 {Joining or pressing tools reciprocating along one axis}
- B29C 66/83221 {cooperating reciprocating tools, each tool reciprocating along one axis}
- B29C 66/8324 {Joining or pressing tools pivoting around one axis ([scissor or lever transmission mechanisms B29C 66/8221](#); tools self-aligning to the joining plane [B29C 66/8163](#))}
- B29C 66/83241 {cooperating pivoting tools}
- B29C 66/834 {moving with the parts to be joined}
- B29C 66/8341 {Roller, cylinder or drum types; Band or belt types; Ball types ([B29C 66/8351](#) takes precedence)}
- B29C 66/83411 {Roller, cylinder or drum types ([B29C 66/83431](#) takes precedence; rollers, cylinders or drums moving relative to and tangentially to the parts to be joined [B29C 66/8362](#))}
- B29C 66/83413 {cooperating rollers, cylinders or drums}
- B29C 66/83415 {the contact angle between said rollers, cylinders or drums and said parts to be joined being a non-zero angle ([B29C 66/83433](#) takes precedence)}
- B29C 66/83417 {said rollers, cylinders or drums being hollow}
- B29C 66/83421 {band or belt types ([B29C 66/83431](#) takes precedence)}
- B29C 66/83423 {cooperating bands or belts}
- B29C 66/83431 {rollers, cylinders or drums cooperating with bands or belts}
- B29C 66/83433 {the contact angle between said rollers, cylinders or drums and said bands or belts being a non-zero angle}
- B29C 66/83435 {said rollers, cylinders or drums being hollow}
- B29C 66/83441 {Ball types}
- B29C 66/8351 {Jaws mounted on rollers, cylinders, drums, bands, belts or chains; Flying jaws}
- B29C 66/83511 {jaws mounted on rollers, cylinders or drums}

B29C 66/83513	. . . . .	{cooperating jaws mounted on rollers, cylinders or drums and moving in a closed path}
B29C 66/83517	. . . . .	{said rollers, cylinders or drums being hollow}
B29C 66/83521	. . . . .	{jaws mounted on bands or belts}
B29C 66/83523	. . . . .	{Cooperating jaws mounted on cooperating bands or belts and moving in a closed path}
B29C 66/83531	. . . . .	{jaws mounted on chains}
B29C 66/83533	. . . . .	{Cooperating jaws mounted on cooperating chains and moving in a closed path}
B29C 66/83541	. . . . .	{flying jaws, e.g. jaws mounted on crank mechanisms or following a hand over hand movement}
B29C 66/83543	. . . . .	{cooperating flying jaws}
B29C 66/836	. . .	{Moving relative to and tangentially to the parts to be joined, e.g. transversely to the displacement of the parts to be joined, e.g. using a X-Y table (B29C 66/65 takes precedence)}
B29C 66/8362	. . . . .	{Rollers, cylinders or drums moving relative to and tangentially to the parts to be joined}
B29C 66/84	. .	{Specific machine types or machines suitable for specific applications}
B29C 66/841	. . .	{Machines or tools adaptable for making articles of different dimensions or shapes or for making joints of different dimensions}
B29C 66/8412	. . . . .	{of different length, width or height}
B29C 66/84121	. . . . .	{of different width}
B29C 66/84123	. . . . .	{of different height}
B29C 66/8414	. . . . .	{of different diameter}
B29C 66/8416	. . . . .	{of different thickness}
B29C 66/843	. . .	{Machines for making separate joints at the same time in different planes; Machines for making separate joints at the same time mounted in parallel or in series}
B29C 66/8432	. . . . .	{Machines for making separate joints at the same time mounted in parallel or in series}
B29C 66/845	. . .	{C-clamp type or sewing machine type}
B29C 66/847	. . .	{Drilling standard machine type}
B29C 66/849	. . .	{Packaging machines}
B29C 66/8491	. . . . .	{welding through a filled container, e.g. tube or bag}
B29C 66/851	. . .	{Bag or container making machines}
B29C 66/8511	. . . . .	{Bag making machines}
B29C 66/853	. . .	{Machines for changing web rolls or filaments, e.g. for joining a replacement web to an expiring web}
B29C 66/855	. . .	{Belt splicing machines}
B29C 66/857	. . .	{Medical tube welding machines}
B29C 66/861	. . .	{Hand-held tools}
B29C 66/8612	. . . . .	{Ironing tool type}
B29C 66/8614	. . . . .	{Tongs, pincers or scissors}

B29C 66/8616	. . . . {Pen or pencil like}
B29C 66/8618	. . . . {being battery operated}
B29C 66/863	. . . {Robotised, e.g. mounted on a robot arm}
B29C 66/865	. . . {Independently movable welding apparatus, e.g. on wheels}
B29C 66/8652	. . . . {being pushed by hand or being self-propelling}
B29C 66/86521	. . . . . {being self-propelling}
B29C 66/86523	. . . . . {the traction being made on the seam}
B29C 66/86531	. . . . . {being guided}
B29C 66/86533	. . . . . {by rails}
B29C 66/86535	. . . . . {by the edge of one of the parts to be joined or by a groove between the parts to be joined, e.g. using a roller}
B29C 66/87	. . {Auxiliary operations or devices}
B29C 66/872	. . . {Starting or stopping procedures}
B29C 66/874	. . . {Safety measures or devices}
B29C 66/8742	. . . . {for operators (B29C 66/002 takes precedence)}
B29C 66/8744	. . . . {Preventing overheating of the parts to be joined, e.g. if the machine stops or slows down}
B29C 66/87441	. . . . . {by lowering or shutting down the power supply}
B29C 66/87443	. . . . . {by withdrawing the heating tools}
B29C 66/87445	. . . . . {by introducing protection shields}
B29C 66/8746	. . . . {Detecting the absence of the articles to be joined}
B29C 66/8748	. . . . {involving the use of warnings}
B29C 66/876	. . . {Maintenance or cleaning}
B29C 66/8762	. . . . {Cleaning of the joining tools}
B29C 66/90	. {Measuring or controlling the joining process}

WARNING

Group [B29C 66/90](#) and subgroups are not complete, pending a reorganisation; see also this group and its subgroups

B29C 66/91	. . {by measuring or controlling the temperature, the heat or the thermal flux}
B29C 66/912	. . . {by measuring the temperature, the heat or the thermal flux}
B29C 66/9121	. . . . {by measuring the temperature}
B29C 66/91211	. . . . . {with special temperature measurement means or methods}
B29C 66/91212	. . . . . {involving measurement means being part of the welding jaws, e.g. integrated in the welding jaws}
B29C 66/91213	. . . . . {and measuring the electrical resistance of a resistive element belonging to said welding jaws, said element being e.g. a thermistor}
B29C 66/91214	. . . . . {by measuring the electrical resistance of a resistive element belonging to one of the parts to be welded, said element acting e.g. as a thermistor}
B29C 66/91216	. . . . . {enabling contactless temperature measurements, e.g. using a pyrometer}

B29C 66/91218	. . . . .	{using colour change, e.g. using separate colour indicators}
B29C 66/91221	. . . . .	{of the parts to be joined}
B29C 66/91231	. . . . .	{of the joining tool}
B29C 66/9131	. . . . .	{by measuring the heat or the thermal flux, i.e. the heat flux}
B29C 66/91311	. . . . .	{by measuring the heat generated by Joule heating or induction heating}
B29C 66/91313	. . . . .	{by measuring the voltage, i.e. the electric potential difference or electric tension}
B29C 66/91315	. . . . .	{by measuring the current intensity}
B29C 66/91317	. . . . .	{by measuring the electrical resistance}
B29C 66/914	. . . .	{by controlling or regulating the temperature, the heat or the thermal flux}
B29C 66/9141	. . . . .	{by controlling or regulating the temperature}
B29C 66/91411	. . . . .	{of the parts to be joined, e.g. the joining process taking the temperature of the parts to be joined into account}
B29C 66/91413	. . . . .	{the parts to be joined having different temperatures}
B29C 66/91421	. . . . .	{of the joining tools}
B29C 66/91423	. . . . .	{using joining tools having different temperature zones or using several joining tools with different temperatures}
B29C 66/91431	. . . . .	{the temperature being kept constant over time}
B29C 66/91441	. . . . .	{the temperature being non-constant over time}
B29C 66/91443	. . . . .	{following a temperature-time profile (B29C 65/38 takes precedence)}
B29C 66/91445	. . . . .	{by steps}
B29C 66/9161	. . . . .	{by controlling or regulating the heat or the thermal flux, i.e. the heat flux}
B29C 66/91631	. . . . .	{the heat or the thermal flux being kept constant over time}
B29C 66/91641	. . . . .	{the heat or the thermal flux being non-constant over time}
B29C 66/91643	. . . . .	{following a heat-time profile (B29C 65/38 takes precedence)}
B29C 66/91645	. . . . .	{by steps}
B29C 66/91651	. . . . .	{by controlling or regulating the heat generated by Joule heating or induction heating}
B29C 66/91653	. . . . .	{by controlling or regulating the voltage, i.e. the electric potential difference or electric tension}
B29C 66/91655	. . . . .	{by controlling or regulating the current intensity}
B29C 66/919	. . . .	{characterised by specific temperature, heat or thermal flux values or ranges (specific electrical resistance values B29C 66/81262)}
B29C 66/9192	. . . . .	{in explicit relation to another variable, e.g. temperature diagrams}
B29C 66/91921	. . . . .	{in explicit relation to another temperature, e.g. to the softening temperature or softening point, to the thermal degradation temperature or to the ambient temperature}
B29C 66/91931	. . . . .	{in explicit relation to the fusion temperature or melting point of the material of one of the parts to be joined}
B29C 66/91933	. . . . .	{higher than said fusion temperature}

B29C 66/91935	. . . . . {lower than said fusion temperature}
B29C 66/91941	. . . . . {in explicit relation to T _g , i.e. the glass transition temperature, of the material of one of the parts to be joined}
B29C 66/91943	. . . . . {higher than said glass transition temperature}
B29C 66/91945	. . . . . {lower than said glass transition temperature}
B29C 66/91951	. . . . . {in explicit relation to time, e.g. temperature-time diagrams}
B29C 66/92	. . {by measuring or controlling the pressure, the force, the mechanical power or the displacement of the joining tools}
B29C 66/922	. . . {by measuring the pressure, the force, the mechanical power or the displacement of the joining tools}
B29C 66/9221	. . . . {by measuring the pressure, the force or the mechanical power}
B29C 66/92211	. . . . . {with special measurement means or methods}
B29C 66/9231	. . . . {by measuring the displacement of the joining tools}
B29C 66/92311	. . . . . {with special measurement means or methods}
B29C 66/924	. . . {by controlling or regulating the pressure, the force, the mechanical power or the displacement of the joining tools}
B29C 66/9241	. . . . {by controlling or regulating the pressure, the force or the mechanical power}
B29C 66/92431	. . . . . {the pressure, the force or the mechanical power being kept constant over time (B29C 66/92613 takes precedence)}
B29C 66/92441	. . . . . {the pressure, the force or the mechanical power being non-constant over time}
B29C 66/92443	. . . . . {following a pressure-time profile}
B29C 66/92445	. . . . . {by steps}
B29C 66/92451	. . . . . {using joining tools having different pressure zones or using several joining tools with different pressures}
B29C 66/9261	. . . . {by controlling or regulating the displacement of the joining tools}
B29C 66/92611	. . . . . {by controlling or regulating the gap between the joining tools}
B29C 66/92613	. . . . . {the gap being kept constant over time}
B29C 66/92615	. . . . . {the gap being non-constant over time}
B29C 66/92651	. . . . . {by using stops}
B29C 66/92653	. . . . . {said stops being adjustable}
B29C 66/92655	. . . . . {by using several stops}
B29C 66/929	. . . {characterized by specific pressure, force, mechanical power or displacement values or ranges}
B29C 66/9292	. . . . {in explicit relation to another variable, e.g. pressure diagrams}
B29C 66/92921	. . . . . {in specific relation to time, e.g. pressure-time diagrams}
B29C 66/93	. . {by measuring or controlling the speed}
B29C 66/932	. . . {by measuring the speed}
B29C 66/9321	. . . . {with special speed measurement means or methods}
B29C 66/934	. . . {by controlling or regulating the speed}
B29C 66/93411	. . . . {the parts to be joined having different speeds}

B29C 66/93431	. . . . {the speed being kept constant over time}
B29C 66/93441	. . . . {the speed being non-constant over time}
B29C 66/93451	. . . . {by controlling or regulating the rotational speed, i.e. the speed of revolution}
B29C 66/939	. . . {characterised by specific speed values or ranges}
B29C 66/9392	. . . . {in explicit relation to another variable, e.g. speed diagrams}
B29C 66/94	. . {by measuring or controlling the time}
B29C 66/942	. . . {by measuring the time}
B29C 66/9421	. . . . {with special time measurement means or methods}
B29C 66/944	. . . {by controlling or regulating the time}
B29C 66/9441	. . . . {the time being controlled or regulated as a function of another parameter}
B29C 66/949	. . . {characterised by specific time values or ranges}
B29C 66/9492	. . . . {in explicit relation to another variable}
B29C 66/95	. . {by measuring or controlling specific variables not covered by groups B29C 66/91 to B29C 66/94 }
B29C 66/951	. . . {by measuring or controlling the vibration frequency and/or the vibration amplitude of vibrating joining tools, e.g. of ultrasonic welding tools}
B29C 66/9511	. . . . {by measuring their vibration frequency}
B29C 66/9512	. . . . {by controlling their vibration frequency}
B29C 66/9513	. . . . {characterised by specific vibration frequency values or ranges}
B29C 66/9515	. . . . {by measuring their vibration amplitude}
B29C 66/9516	. . . . {by controlling their vibration amplitude}
B29C 66/9517	. . . . {characterised by specific vibration amplitude values or ranges}
B29C 66/952	. . . {by measuring or controlling the wavelength}
B29C 66/953	. . . {by measuring or controlling the humidity}
B29C 66/9532	. . . . {of the parts to be joined, i.e. taking the humidity of the parts to be joined into account}
B29C 66/9534	. . . . {of the atmosphere, i.e. taking the ambient humidity into account}
B29C 66/954	. . . {by measuring or controlling the thickness of the parts to be joined}
B29C 66/959	. . . {characterised by specific values or ranges of said specific variables}
B29C 66/9592	. . . . {in explicit relation to another variable, e.g. X-Y diagrams}
B29C 66/96	. . {characterised by the method for implementing the controlling of the joining process}
B29C 66/961	. . . {involving a feedback loop mechanism, e.g. comparison with a desired value}
B29C 66/962	. . . {using proportional controllers, e.g. PID controllers [proportional–integral–derivative controllers]}
B29C 66/963	. . . {using stored or historical data sets, e.g. using expert systems}
B29C 66/964	. . . {involving trial and error}
B29C 66/965	. . . {using artificial neural networks}
B29C 66/966	. . . {using fuzzy logic}

- B29C 66/967 . . . {involving special data inputs or special data outputs, e.g. for monitoring purposes}
- B29C 66/9672 {involving special data inputs, e.g. involving barcodes, RFID tags}
- B29C 66/9674 {involving special data outputs, e.g. special data display means (B29C 66/8748 takes precedence)}
- B29C 66/97 . . {Checking completion of joining or correct joining by using indications on at least one of the joined parts}
- B29C 66/972 . . . {by extrusion of molten material}
- B29C 66/974 . . . {by checking the bead or burr form}
- B29C 66/976 . . . {by the use of an indicator pin, e.g. being integral with one of the parts to be joined}
- B29C 66/98 . . {Determining the joining area by using markings on at least one of the parts to be joined}

B29C 67/00 **Shaping techniques not covered by groups [B29C 39/00](#) to [B29C 65/00](#), [B29C 70/00](#) or [B29C 73/00](#)**

- B29C 67/0003 . {Moulding articles between moving mould surfaces, e.g. turning surfaces}
- B29C 67/0007 . {Manufacturing coloured articles not otherwise provided for, e.g. by colour change}
- B29C 67/0011 . {for shaping plates or sheets}
- B29C 67/0014 . {for shaping tubes or blown tubular films}
- B29C 67/0018 . . {Turning tubes inside out (for lining internal surfaces [B29C 63/36](#))}
- B29C 67/0022 . . {using an internal mandrel}
- B29C 67/0025 . . . {and pressure difference}
- B29C 67/0029 . {Cold deforming of thermoplastics material ([B29C 43/16](#), [B29C 59/00](#) take precedence)}
- B29C 67/0033 . {by shock-waves}
- B29C 67/0037 . {Forming articles from a moulding composition enclosed in a deformable bag (making moulds composed of particles enclosed in a bag [B29C 33/3821](#); from expandable material in flexible bags [B29C 44/182](#); with reinforcements placed in a covering element [B29C 70/542](#))}
- B29C 67/004 . {Closing perforations or small holes, e.g. using additional moulding material}
- B29C 67/0044 . {for shaping edges or extremities ([B29C 57/00](#) takes precedence)}
- B29C 67/0048 . {Local deformation of formed objects}
- B29C 67/0051 . {Rapid manufacturing and prototyping of 3D objects by additive depositing, agglomerating or laminating of plastics material, e.g. by stereolithography or selective laser sintering (stereolithographic techniques for making dental prostheses [A61C 13/0013](#); selective sintering of metallic powder [B22F 3/1055](#); from ceramic or cementitious material [B28B 1/00](#); photomechanical, e.g. photolithographic, production of textured or patterned surfaces [G03F 7/00](#); selective printers for printing on three-dimensional objects [B41J 3/4073](#))}

NOTE

Material and product properties are classified with the relevant indexing codes

- B29C 67/0055 . . {using only liquids or viscous materials, e.g. depositing a continuous bead of viscous material}
- B29C 67/0059 . . . {using individual droplets, e.g. from jetting heads}
- B29C 67/0062 . . . {using layers of liquid which are selectively solidified}
- B29C 67/0066 {by a concentrated source of energy, e.g. a scanning laser or a focused light source}
- B29C 67/007 {by a source of energy not covered by [B29C 67/0066](#), e.g. by global irradiation combined with a mask}
- B29C 67/0074 . . {using only solid materials e.g. laminating sheet material precut to local cross sections of the 3D object}
- B29C 67/0077 . . . {using layers of powder being selectively joined, e.g. by selective laser sintering or melting}
- B29C 67/0081 . . {using a combination of solid and liquid materials, e.g. a powder selectively bound by a liquid binder, catalyst, inhibitor or energy absorber}
- B29C 67/0085 . . {Apparatus components, details or accessories}
- B29C 67/0088 . . . {for control or data processing, e.g. algorithms}
- B29C 67/0092 . . . {Support structures for the 3D object during manufacture, e.g. using sacrificial material}
- B29C 67/0096 . . . {for cleaning or recycling}
- B29C 67/02 . Moulding by agglomerating {([B29C 67/0051](#), [B29C 67/20](#) take precedence)}
- B29C 67/04 . . Sintering {(sintering layers coated on a mould, core or substrate [B29C 41/00](#); } combined with compression [B29C 43/00](#); {selective sintering for rapid manufacturing or prototyping of 3D objects [B29C 67/0077](#))}
- B29C 67/06 . . Coagulating {(selective coagulating for rapid manufacturing or prototyping of 3D objects [B29C 67/0055](#))}
- B29C 67/08 . Screen moulding, e.g. forcing the moulding material through a perforated screen on to a moulding surface
- B29C 67/20 . for porous or cellular articles, e.g. of foam plastics, coarse-pored {(chemical aspects of working up macro-molecular substances to porous or cellular articles [C08J 9/00](#))}
- B29C 67/202 . . {comprising elimination of a solid or a liquid ingredient}
- B29C 67/205 . . {comprising surface fusion, and bonding of particles to form voids, e.g. sintering}
- B29C 67/207 . . {comprising impregnating expanded particles or fragments with a binder}
- B29C 67/22 . . by internal pressure generated in the material, e.g. swelling, foaming {not used}

WARNING

From 1st April 1995 on the groups [B29C 67/22](#) to [B29C 67/2295](#) are no longer used for the classification of new documents. Documents from the backlog of these groups are in the process of being systematically transferred to [B29C 44/00](#)

- B29C 67/2205 . . . {for articles of definite length, i.e. discrete articles (contains no documents)}
- B29C 67/221 {Applying counter pressure during foaming}

B29C 67/2215	. . . . {upon or incorporating preformed parts, e.g. linings, inserts, reinforcements}
B29C 67/222	. . . . {using expandable particles or beads as starting material}
B29C 67/2225	. . . . . {using high frequency heating (in general B29C 33/06)}
B29C 67/223	. . . {for articles of indefinite length (not used, see B29C 44/20)}
B29C 67/2235	. . . . {comprising extruding the compounds before foaming}
B29C 67/224	. . . . . {extruding the compound through a flat die (in general B29C 47/0009)}
B29C 67/2245	. . . . . {extruding the compound through an annular die (in general B29C 47/0009)}
B29C 67/225	. . . . {on preformed parts (not used, see B29C 44/32)}
B29C 67/2255	. . . . . {the preformed part being a lining, e.g. film, sheet, support lining}
B29C 67/226	. . . . . {Folding devices for the lining}
B29C 67/2265	. . . . . {the preformed parts being partially embedded (B29C 67/227 takes precedence)}
B29C 67/227	. . . . . {the preformed parts being three-dimensional structures (B29C 67/2255 takes precedence)}
B29C 67/2275	. . . . . {Filling the preformed spaces, cavities}
B29C 67/228	. . . {Component parts, details or accessories; auxiliary operations (not used, see B29C 44/34)}
B29C 67/2285	. . . . {Details of processes or apparatus for reducing environmental damage or for working-up compositions comprising inert blowing agents or biodegradable components}
B29C 67/229	. . . . {Dosing or filling a mould with expandable beads}
B29C 67/2295	. . . . {after treatment of shaped foamed articles, e.g. altering the shape}
B29C 67/24	. characterised by the choice of material
B29C 67/241	. . {Moulding wax}
B29C 67/242	. . {Moulding mineral aggregates bonded with resin, e.g. resin concrete (shaping ceramic compositions without binder or water-setting cementitious material B28B ; compositions per se C04B)}
B29C 67/243	. . . {for making articles of definite length}
B29C 67/244	. . . . {by vibrating the composition before or during moulding}
B29C 67/245	. . . {for making articles of indefinite length}
B29C 67/246	. . {Moulding high reactive monomers or prepolymers, e.g. by reaction injection moulding [RIM], liquid injection moulding [LIM] (casting monomers B29C 39/006 , mixing construction B29B 7/74)}
B29C 67/247	. . {Moulding polymers or prepolymers containing ingredients in a frangible packaging, e.g. microcapsules (expandable components kept in frangible containers within a flexible bag B29C 44/183)}
B29C 67/248	. . {Moulding mineral fibres or particles bonded with resin, e.g. for insulating or roofing board (articles from wood or lignocellulosic material with binding agents B27N ; mineral aggregates bonded with resin B29C 67/242 ; thermal insulation in general F16L 59/00)}
B29C 67/249	. . . {for making articles of indefinite length}

B29C 69/00 Combinations of shaping techniques not provided for in a single one of main groups [B29C 39/00](#) to [B29C 67/00](#), e.g. associations of moulding and joining techniques; Apparatus therefore {([B29C 47/0038](#) takes precedence)}

- [B29C 69/001](#) . {a shaping technique combined with cutting, e.g. in parts or slices combined with rearranging and joining the cut parts (for reinforced material [B29C 70/545](#); [B29C 49/4278](#), [B29C 51/268](#) take precedence)}
- [B29C 69/002](#) . . {Winding (cutting of individual length [B26D](#))}
- [B29C 69/003](#) . . . {and cutting longitudinally e.g. for making O-rings; chain links, insulation tubes}
- [B29C 69/004](#) . {making articles by joining parts moulded in separate cavities, said parts being in said separate cavities during said joining ([B29C 45/006](#), [B29C 51/267](#) take precedence)}
- [B29C 69/005](#) . {cutting-off or cutting-out a part of a strip-like or sheet-like material, transferring that part and fixing it to an article (if labeling see [B65C](#), in combination with box-making [B31B 1/90](#); labelling in general [B65C](#))}
- [B29C 69/006](#) . . {rotating transfer means}
- [B29C 69/007](#) . {Lining or sheathing in combination with forming the article to be lined}
- [B29C 69/008](#) . . {of tubular articles}
- [B29C 69/02](#) . of moulding techniques only
- [B29C 69/025](#) . . {Deforming articles in a simpler intermediate shape without internal stresses for packaging transporting or storage and reshaping and fixing the original configuration on the place of use (shaping by liberation of internal stresses [B29C 61/00](#))}

B29C 70/00 Shaping composites, i.e. plastics material comprising reinforcements, fillers or preformed parts, e.g. inserts (chemical aspects [C08](#), e.g. [C08J 5/00](#))

NOTE

In this group, the following terms or expressions are used with the meanings indicated:

- "reinforcement" means a structure in the form of fibres, wires, rods, bars, sections, plates or blocks, which improves the strength of an article;
- "filler" means a relatively inert substance in the form of particles, powder, beads, flakes or spheres, which improves the physical properties or increases the bulk or weight of an article;
- "preformed part" means a part made of any material, being completely shaped to have a determined form and which is not used as a reinforcement, e.g. wires or nets forced only into the surface of an article;
- "insert" means a preformed part incorporated in an article during moulding.

- [B29C 70/02](#) . comprising combinations of reinforcements, {e.g. non-specified reinforcements, fibrous reinforcing inserts} and fillers, {e.g. particulate fillers}, incorporated in matrix material, forming one or more layers and with or without non-reinforced or non-filled layers {(combinations of fibrous reinforcement only [B29C 70/04](#); combinations of fillers only [B29C 70/58](#); combinations with non reinforcing inserts, e.g. foam blocks, [B29C 70/68](#))}
- [B29C 70/021](#) . . {Combinations of fibrous reinforcement and non-fibrous material}
- [B29C 70/023](#) . . . {with reinforcing inserts}
- [B29C 70/025](#) . . . {with particular filler}

- B29C 70/026 . . {and with one or more layers of pure plastics material, e.g. foam layers (applying a non-preformed coating, e.g. a gel-coat [B29C 37/0025](#); with foam blocks [B29C 70/86](#))}
- B29C 70/028 . . {and with one or more layers of non-plastics material or non-specified material, e.g. supports}
- B29C 70/04 . comprising reinforcements only, e.g. self-reinforcing plastics
- B29C 70/06 . . Fibrous reinforcements only
- B29C 70/08 . . . comprising combinations of different forms of fibrous reinforcements incorporated in matrix material, forming one or more layers, and with or without non-reinforced layers
- B29C 70/081 {Combinations of fibres of continuous or substantial length and short fibres}
- B29C 70/083 {Combinations of continuous fibres or fibrous profiled structures oriented in one direction and reinforcements forming a two dimensional structure, e.g. mats ([B29D 24/00](#), [B29D 99/001](#) take precedence)}
- B29C 70/085 {the structure being deformed in a three dimensional configuration ([B29C 53/805](#) takes precedence)}
- B29C 70/086 {and with one or more layers of pure plastics material, e.g. foam layers (applying a non-preformed coating, e.g. a gel-coat, [B29C 37/0025](#); with foam blocks [B29C 70/86](#))}
- B29C 70/088 {and with one or more layers of non-plastics material or non-specified material, e.g. supports}
- B29C 70/10 . . . characterised by the structure of fibrous reinforcements, {e.g. hollow fibres}
- B29C 70/12 using fibres of short length, e.g. in the form of a mat {(non-woven fabrics per se [D04H 1/00](#))}
- B29C 70/14 oriented (oriented filler material [B29C 70/62](#))
- B29C 70/16 using fibres of substantial or continuous length {(non-woven fabrics per se [D04H 3/00](#))}
- B29C 70/18 in the form of a mat, e.g. sheet moulding compound [SMC]
- B29C 70/20 oriented in a single direction, e.g. roofing or other parallel fibres {([B29C 70/083](#), [B29C 70/226](#) take precedence)}
- B29C 70/202 {arranged in parallel planes or structures of fibres crossing at substantial angles, e.g. cross-moulding compound [XMC] ([B29C 70/207](#) takes precedence)}
- B29C 70/205 {the structure being shaped to form a three-dimensional configuration}
- B29C 70/207 {arranged in parallel planes of fibres crossing at substantial angles}
- B29C 70/22 oriented in at least two directions forming a two dimensional structure {(woven fabrics per se [D03D](#); knitted fabrics per se [D04D](#); braid per se [D04C](#))}
- B29C 70/222 {the structure being shaped to form a three dimensional configuration}
- B29C 70/224 {the structure being a net ([B29C 70/688](#) takes precedence)}

- B29C 70/226 {the structure comprising mainly parallel filaments interconnected by a small number of cross threads}
- B29C 70/228 {the structure being stacked in parallel layers with fibres of adjacent layers crossing at substantial angles}
- B29C 70/24 oriented in at least three directions forming a three dimensional structure
- B29C 70/26 . . Non-fibrous reinforcements only {(B29C 35/0272, B29C 61/0625, B29C 70/887 take precedence; combined with fibres B29C 70/023)}
- B29C 70/28 . . Shaping operations therefor

NOTES

1. This group covers:
 - the shaping of a coherent fibrous reinforcements which are pre-impregnated or without binder; or of non-coherent reinforcements of fibres in a mould or on a support;
 - the impregnation or introduction of a plastics matrix in reinforcements during shaping;
2. This group does not cover:
 - the moulding by a single technique of plastics matrix material mixed with and containing reinforcing fibres of short length, which is covered by the appropriate place for that technique;
 - the pretreatment, e.g. impregnation, of reinforcements per se, i.e. independently of their shaping, which is covered by group B29B 15/08

- B29C 70/30 . . . Shaping by lay-up, i.e. applying fibres, tape or broadsheet on a mould, former or core; Shaping by spray-up, i.e. spraying of fibres on a mould, former or core {(by winding and joining, e.g. filament winding B29C 53/56; for building tyres B29D 30/08)}
- B29C 70/305 {Spray-up of reinforcing fibres with or without matrix to form a non-coherent mat in or on a mould (B29C 41/365, B29C 70/32, B29C 70/34, B29C 70/502, B29C 70/508 take precedence; coating a former by spraying plastics B29C 41/08)}
- B29C 70/32 on a rotating mould, former or core
- B29C 70/323 {on the inner surface of a rotating mould}
- B29C 70/326 {by rotating the mould around its axis of symmetry}
- B29C 70/34 and shaping or impregnating by compression, [i.e. combined with compressing after the lay-up operation]
- B29C 70/342 {using isostatic pressure}
- B29C 70/345 {using matched moulds}
- B29C 70/347 {combined with compressing after the winding of lay-ups having a non-circular cross-section, e.g. flat spiral windings}
- B29C 70/36 and impregnating by casting, e.g. vacuum casting
- B29C 70/38 Automated lay-up, e.g. using robots, laying filaments according to predetermined patterns {(application heads for tyres B29D 30/28)}
- B29C 70/382 {Automated fiber placement [AFP]}
- B29C 70/384 {Fiber placement heads, e.g. component parts, details or accessories}
- B29C 70/386 {Automated tape laying [ATL]}

B29C 70/388	. . . . .	{Tape placement heads, e.g. component parts, details or accessories}
B29C 70/40	. . .	Shaping or impregnating by compression (B29C 70/34 takes precedence) {not applied}
B29C 70/42	. . . . .	for producing articles of definite length, i.e. discrete articles
B29C 70/44	. . . . .	using isostatic pressure, e.g. pressure difference-, vacuum bag-, autoclave- or expanding rubber-moulding
B29C 70/443	. . . . .	{and impregnating by vacuum or injection}
B29C 70/446	. . . . .	{Moulding structures having an axis of symmetry or at least one channel, e.g. tubular structures, frames}
B29C 70/46	. . . . .	using matched moulds, e.g. for deforming sheet moulding compound [SMC], prepregs
B29C 70/462	. . . . .	{Moulding structures having an axis of symmetry or at least one channel, e.g. tubular structures, frames}
B29C 70/465	. . . . .	{and impregnating by melting a solid material, e.g. sheets, powders of fibres}
B29C 70/467	. . . . .	{and impregnating the reinforcements during mould closing (B29C 70/465 takes precedence)}
B29C 70/48	. . . . .	and impregnating the reinforcements in the closed mould, e.g. resin transfer moulding [RTM], {e.g. by vacuum}
B29C 70/50	. . . . .	for producing articles of indefinite length, e.g. prepregs, sheet moulding compounds [SMC], cross moulding compounds [XMC]
B29C 70/502	. . . . .	{by first forming a mat composed of short fibres}
B29C 70/504	. . . . .	{using rollers or pressure bands (for corrugating B29C 53/22)}
B29C 70/506	. . . . .	{and impregnating by melting a solid material, e.g. sheet, powder, fibres (B29C 70/508 takes precedence)}
B29C 70/508	. . . . .	{and first forming a mat composed of short fibres}
B29C 70/52	. . . . .	Pultrusion, i.e. forming and compressing by continuously pulling through a die
B29C 70/521	. . . . .	{and impregnating the reinforcement before the die}
B29C 70/522	. . . . .	{the transport direction being vertical}
B29C 70/523	. . . . .	{and impregnating the reinforcement in the die}
B29C 70/524	. . . . .	{the transport direction being vertical}
B29C 70/525	. . . . .	{Component parts, details or accessories; Auxiliary operations}
B29C 70/526	. . . . .	{Pultrusion dies, e.g. dies with moving or rotating parts (B29C 70/523 takes precedence)}
B29C 70/527	. . . . .	{Pulling means}
B29C 70/528	. . . . .	{Heating or cooling}
B29C 70/54	. . .	Component parts, details or accessories; Auxiliary operations, {e.g. feeding or storage of prepregs or SMC after impregnation or during ageing (pretreatment, e.g. impregnation, of reinforcements B29B 15/08)}
B29C 70/541	. . . . .	{Positioning reinforcements in a mould, e.g. using clamping means for the reinforcement (positioning inserts in moulds B29C 33/12 ; lay-up on a mould B29C 70/30)}

- B29C 70/542 {Placing or positioning the reinforcement in a covering or packaging element before or during moulding, e.g. drawing in a sleeve}
- B29C 70/543 {Fixing the position or configuration of fibrous reinforcements before or during moulding (for non-woven fabrics [D04H 3/08](#))}
- B29C 70/545 {Perforating, cutting or machining during or after moulding}
- B29C 70/546 {Measures for feeding or distributing the matrix material in the reinforcing structure}
- B29C 70/547 {using channels or porous distribution layers incorporated in or associated with the product}
- B29C 70/548 {using distribution constructions, e.g. channels incorporated in or associated with the mould}
- B29C 70/56 Tensioning reinforcements before or during shaping
- B29C 70/58 . comprising fillers only, {e.g. particles, powder, beads, flakes, spheres ([B29C 70/025](#) takes precedence, agglomerating hollow spheres to produce synthetic foam [B29C 70/66](#); compounding ingredients per se [C08K](#))}

NOTE

Moulding of plastics matrix material mixed with fillers by a single technique is classified in the appropriate place for that technique.

- B29C 70/585 . . {incorporation of light reflecting filler, e.g. lamellae to obtain pearlescent effect (partially embedding reflective elements into the surface of or support [B29D 11/00615](#))}
- B29C 70/60 . . comprising a combination of distinct filler types incorporated in matrix material, forming one or more layers, and with or without non-filled layers
- B29C 70/603 . . . {and with one or more layers of pure plastics material, e.g. foam layers (applying a non-preformed coating, e.g. a gel-coat [B29C 37/0025](#); with foam blocks [B29C 70/86](#))}
- B29C 70/606 . . . {and with one or more layers of non-plastics material or non-specified material, e.g. supports}
- B29C 70/62 . . the filler being oriented during moulding (for short fibres [B29C 70/14](#))
- B29C 70/64 . . the filler influencing the surface characteristics of the material, e.g. by concentrating near the surface or by incorporating in the surface by force
- B29C 70/66 . . the filler comprising hollow constituents, e.g. syntactic foam
- B29C 70/68 . by incorporating or moulding on preformed parts, e.g. inserts, layers, {e.g. foam blocks (mould constructions therefor [B29C 33/12](#); joining preformed parts by moulding [B29C 65/70](#))}

NOTE

This group does not cover:

- incorporating, or moulding on, preformed parts by a single technique, which is covered by the appropriate place for that technique;
- pretreatment of preformed parts per se, i.e. independently of their shaping, which is covered by group [B29B 15/00](#)

- B29C 70/681 . . {Component parts, details or accessories; Auxiliary operations}
- B29C 70/682 . . . {Preformed parts characterised by their structure, e.g. form}
- B29C 70/683 . . . {Pretreatment of the preformed part, e.g. insert}
- B29C 70/685 . . {by laminating inserts between two plastic films or plates}

- B29C 70/686 . . . {the inserts being sheets or documents, e.g. ID cards}
- B29C 70/687 . . . {the inserts being oriented, e.g. nets or meshes}
- B29C 70/688 . . {the inserts being meshes or lattices ([B29C 70/82](#), [B29C 70/683](#) take precedence)}
- B29C 70/70 . . Completely encapsulating inserts {([B29C 70/86](#) takes precedence)}
- B29C 70/72 . . Encapsulating inserts having non-encapsulated projections, e.g. extremities, terminal portions of electrical components {([B29C 70/742](#) takes precedence)}
- B29C 70/74 . . Moulding material on a relatively small portion of the preformed part, e.g. outsert moulding {([B29C 70/845](#) takes precedence)}
- B29C 70/742 . . . {Forming a hollow body around the preformed part}
- B29C 70/745 . . . {Filling cavities in the preformed part (for joining [B29C 70/84](#))}
- B29C 70/747 . . . {Applying material, e.g. foam, only in a limited number of places or in a pattern, e.g. to create a decorative effect}
- B29C 70/76 . . . Moulding on edges or extremities of the preformed part
- B29C 70/763 {the edges being disposed in a substantial flat plane}
- B29C 70/766 {on the end part of a tubular article}
- B29C 70/78 . . Moulding material on one side only of the preformed part
- B29C 70/80 . . . Moulding sealing material into closure members {(placing sealings in closures [B21D 51/46](#))}
- B29C 70/82 . . Forcing elongated elements, wires, nets or the like partially or completely in the surface of an article, e.g. by cutting and pressing (pressing beads or the like in a surface [B29C 70/64](#))
- B29C 70/84 . . by moulding material on preformed parts to be joined {(joining plastic parts by moulding [B29C 65/70](#))}
- B29C 70/845 . . . {by moulding material on a relative small portion of the preformed parts}
- B29C 70/86 . . Incorporated in coherent impregnated reinforcing layers, {e.g. by winding}
- B29C 70/865 . . . {completely encapsulated}
- B29C 70/88 . . characterised primarily by possessing specific properties, e.g. electrically conductive, locally reinforced
- B29C 70/882 . . {partly or totally electrically conductive, e.g. for EMI shielding (conductive floors or floor coverings [H05F 3/025](#); EMI shielding in general [H05K 9/00](#))}
- B29C 70/885 . . . {with incorporated metallic wires, nets, films or plates (as lost heating elements [B29C 35/0272](#), [B29C 61/0625](#))}
- B29C 70/887 . . {locally reinforced, e.g. by fillers (filler concentrated near the surface [B29C 70/64](#))}
- B29C 71/00** **After-treatment of articles without altering their shape; Apparatus therefor** ([B29C 73/00](#) takes precedence; surface shaping [B29C 59/00](#); {for joined or sealed parts [B29C 66/03](#); after-treatment specially adapted for vulcanising tyres [B29D 30/0633](#) ; chemical aspects [C08J 7/00](#))
- B29C 71/0009 . . {using liquids, e.g. solvents, swelling agents (spectacle cases, e.g. for cleaning contact lenses [A45C 11/04](#); disinfecting or sterilising contact lenses [A61L 12/00](#), using liquid substances [A61L 2/20](#); cleaning involving the use of liquid in general [B08B 3/00](#); for hydrating contact lenses [B29D 11/00067](#))}

- B29C 2071/0018 . . {Absorbing ingredients, e.g. drugs, flavourings, UV screeners, embedded in the articles}
- B29C 2071/0027 . . {Removing undesirable residual components, e.g. solvents, unreacted monomers (of material to be shaped [B29B 9/16](#), [B29B 13/00](#))}
- B29C 2071/0036 . . {Extracting, degassing, removing gases from moulded articles}
- B29C 2071/0045 . . {Washing using non-reactive liquids}
- B29C 2071/0054 . . {Supercritical fluid treatment, i.e. using a liquid in which distinct liquid and gas phases do not exist}
- B29C 71/0063 . {for changing crystallisation}
- B29C 71/0072 . {for changing orientation}
- B29C 71/0081 . {using an electric field, e. g. for electrostatic charging (electrostatic pinning of extruded material [B29C 47/887](#); fixing linings by electrostatic charges [B29C 63/0043](#))}
- B29C 71/009 . {using gases without chemical reaction ([C08J 7/12](#) takes precedence; in combination with blow-moulding [B29C 49/46](#); surface treatment using plasma [B29C 59/14](#), ionised gas [B29C 59/16](#))}
- B29C 71/02 . Thermal after-treatment {([B29C 71/0063](#) and [B29C 71/0072](#) take precedence)}
- B29C 2071/022 . . {Annealing}
- B29C 2071/025 . . {Quenching i.e. rapid cooling of an object}
- B29C 2071/027 . . {Tempering i.e. heating an object to a high temperature and quenching it}
- B29C 71/04 . by wave energy or particle radiation, {e.g. for curing or vulcanising preformed articles (during moulding, e.g. in a mould [B29C 35/08](#))}

B29C 73/00 **Repairing of articles made from plastics or substances in a plastic state, e.g. of articles shaped or produced by using techniques covered by this subclass or subclass [B29D](#) (retreading tyres [B29D 30/54](#); {linings for tyres acting locally [B60C5/145](#); } devices for covering leaks in pipes or hoses [F16L 55/16](#))**

WARNINGS

1. This group was introduced on 24 June, 1987
2. Documents from the backlog of [B60C21/00](#) - [B60C21/08B](#), [B60C 25/16](#) are in the process of being systematically transferred to [B29C 73/00](#)]

- B29C 73/02 . using liquid or paste-like material ([B29C 73/16](#) takes precedence)
- B29C 73/025 . . {fed under pressure}
- B29C 73/04 . using preformed elements
- B29C 73/06 . . using plugs sealing in the hole
- B29C 73/063 . . . {expandable}
- B29C 73/066 {by mechanical means provided on the plug}
- B29C 73/08 . . . Apparatus therefor, e.g. for inserting
- B29C 73/10 . . using patches sealing on the surface of the article ([B29C 73/14](#) takes precedence)
- B29C 73/105 . . . {provided with a centering element}
- B29C 73/12 . . . Apparatus therefor, e.g. for applying ([B29C 73/30](#) takes precedence)
- B29C 73/14 . . using elements composed of two parts joined together after having been placed one on each side of the article

- B29C 73/16 . Auto-repairing or self-sealing arrangement or agents (sealing compositions, see section C, e.g. [C09K 3/10](#) {; incorporating auto-repairing or self-sealing arrangements or agents on or into tyres [B29D 30/0685](#)})
- B29C 73/163 . . {Sealing compositions or agents, e.g. combined with propellant agents}
- B29C 73/166 . . {Devices or methods for introducing sealing compositions into articles}
- B29C 73/18 . . the article material itself being self-sealing, e.g. by compression
- B29C 73/20 . . . the article material only consisting in part of a deformable sealing material
- B29C 73/22 . . the article containing elements including a sealing composition, e.g. powder being liberated when the article is damaged
- B29C 73/24 . Apparatus or accessories not otherwise provided for
- B29C 73/245 . . {for removing the element having caused the damage}
- B29C 73/26 . . for mechanical pretreatment
- B29C 2073/262 . . . {for polishing, roughening, buffing or sanding the area to be repaired}
- B29C 2073/264 . . . {for cutting out or grooving the area to be repaired}
- B29C 2073/266 . . . {for cutting out an undercut for anchoring the repairing material}
- B29C 2073/268 . . . {for drilling holes in the area to be repaired}
- B29C 73/28 . . for clamping and stretching flexible material, e.g. inner tubes
- B29C 73/30 . . for local pressing or local heating
- B29C 73/305 . . . {specially adapted for toroidal articles, e.g. tyres ([B29C 73/325](#) takes precedence)}
- B29C 73/32 . . . using an elastic element, e.g. inflatable bag
- B29C 73/325 {specially adapted for toroidal articles, e.g. tyres}
- B29C 73/34 . . . for local heating

B29C 2791/00 Shaping characteristics in general

- B29C 2791/001 . Shaping in several steps
- B29C 2791/002 . Making articles of definite length, i.e. discrete articles ([B29C 53/40](#) takes precedence)
- B29C 2791/003 . Making articles of indefinite length ([B29C 53/48](#) takes precedence)
- B29C 2791/004 . Shaping under special conditions
- B29C 2791/005 . . Using a particular environment, e.g. sterile fluids other than air
- B29C 2791/006 . . Using vacuum
- B29C 2791/007 . . Using fluid under pressure
- B29C 2791/008 . . Using vibrations during moulding
- B29C 2791/009 . . Using laser (curing using laser [B29C 2035/0838](#), welding using laser beams [B29C 65/16](#))

Particular articles

NOTE

Parts of specified articles are indexed with the same indexing codes as the articles

B29C 2793/00 Shaping techniques involving a cutting or machining operation

- B29C 2793/0009 . Cutting out
- B29C 2793/0018 . . for making a hole
- B29C 2793/0027 . Cutting off
- B29C 2793/0036 . Slitting
- B29C 2793/0045 . Perforating
- B29C 2793/0054 . partially cutting through the material
- B29C 2793/0063 . Cutting longitudinally
- B29C 2793/0072 . combined with rearranging and joining the cut parts
- B29C 2793/0081 . before shaping
- B29C 2793/009 . after shaping

B29C 2795/00 Printing on articles made from plastics or substances in a plastic state

- B29C 2795/002 . before shaping
- B29C 2795/005 . during shaping
- B29C 2795/007 . after shaping

B29C 2945/00 Indexing scheme relating to injection moulding, i.e. forcing the required volume of moulding material through a nozzle into a closed mould

- B29C 2945/76 . Measuring, controlling or regulating
- B29C 2945/76003 . . Measured parameter (not used)
- B29C 2945/76006 . . . Pressure
- B29C 2945/7601 derivative, change thereof
- B29C 2945/76013 . . . Force
- B29C 2945/76016 derivative, change thereof
- B29C 2945/7602 . . . Torque
- B29C 2945/76023 derivative, change thereof
- B29C 2945/76026 . . . Energy, power
- B29C 2945/7603 Power
- B29C 2945/76033 . . . Electric current or voltage
- B29C 2945/76036 . . . Frequency
- B29C 2945/7604 . . . Temperature
- B29C 2945/76043 derivative, change thereof
- B29C 2945/76046 Heat flux, heat transfer
- B29C 2945/7605 . . . Viscosity
- B29C 2945/76053 derivative, change thereof
- B29C 2945/76056 . . . Flow rate
- B29C 2945/7606 derivative, change thereof
- B29C 2945/76063 MFI, MFR
- B29C 2945/76066 . . . Time
- B29C 2945/7607 start
- B29C 2945/76073 termination

B29C 2945/76076	. . . .	duration
B29C 2945/7608	. . . .	pause, wilful interruption
B29C 2945/76083	. . . .	Position
B29C 2945/76086	. . . .	Start position
B29C 2945/7609	. . . .	End position
B29C 2945/76093	. . . .	Angular position
B29C 2945/76096	. . . .	Distance
B29C 2945/761	. . . .	Dimensions, e.g. thickness
B29C 2945/76103	. . . .	shrinkage, dilation, dimensional change, warpage
B29C 2945/76107	. . . .	volume
B29C 2945/7611	. . . .	Velocity
B29C 2945/76113	. . . .	linear movement
B29C 2945/76117	. . . .	. derivative, change thereof
B29C 2945/7612	. . . .	rotational movement
B29C 2945/76123	. . . .	. derivative, change thereof
B29C 2945/76127	. . . .	Density
B29C 2945/7613	. . . .	Weight
B29C 2945/76133	. . . .	Crystallinity
B29C 2945/76137	. . . .	Degree of crosslinking, solidification
B29C 2945/7614	. . . .	Humidity, moisture
B29C 2945/76143	. . . .	Volatiles
B29C 2945/76147	. . . .	Contaminants
B29C 2945/7615	. . . .	Electrical properties
B29C 2945/76153	. . . .	Optical properties
B29C 2945/76157	. . . .	Magnetic properties
B29C 2945/7616	. . . .	Surface properties
B29C 2945/76163	. . . .	Errors, malfunctioning
B29C 2945/76167	. . . .	Presence, absence of objects
B29C 2945/7617	. . . .	Sequence, e.g. the order in which operations are conducted
B29C 2945/76173	. . . .	Others
B29C 2945/76177	. . . .	Location of measurement (not used)
B29C 2945/7618	. . . .	Injection unit
B29C 2945/76183	. . . .	. hopper
B29C 2945/76187	. . . .	. screw
B29C 2945/7619	. . . .	. barrel
B29C 2945/76193	. . . .	. . barrel-chamber
B29C 2945/76197	. . . .	. . . screw ante-chamber
B29C 2945/762	. . . .	. injection piston
B29C 2945/76204	. . . .	. injection piston cylinder
B29C 2945/76207	. . . .	. accumulators

B29C 2945/7621	. . . .	nozzle
B29C 2945/76214	. . . .	drive means
B29C 2945/76217	. . . .	nozzle-touch mechanism
B29C 2945/7622	. . . .	others
B29C 2945/76224	. . . .	Closure or clamping unit
B29C 2945/76227	. . . .	mould platen
B29C 2945/7623	. . . .	clamping or closing drive means
B29C 2945/76234	. . . .	tie-bars
B29C 2945/76237	. . . .	others
B29C 2945/7624	. . . .	Ejection unit
B29C 2945/76244	. . . .	ejectors
B29C 2945/76247	. . . . .	drive means thereof
B29C 2945/7625	. . . .	others
B29C 2945/76254	. . . .	Mould
B29C 2945/76257	. . . .	cavity
B29C 2945/7626	. . . . .	cavity walls
B29C 2945/76264	. . . . .	movable
B29C 2945/76267	. . . .	non-cavity forming parts
B29C 2945/7627	. . . . .	movable
B29C 2945/76274	. . . .	runners, nozzles
B29C 2945/76277	. . . . .	nozzles
B29C 2945/7628	. . . . .	manifolds
B29C 2945/76284	. . . .	others
B29C 2945/76287	. . . .	Moulding material
B29C 2945/7629	. . . .	Moulded articles
B29C 2945/76294	. . . .	Inserts
B29C 2945/76297	. . . .	Fluids
B29C 2945/76301	. . . .	auxiliary fluids introduced into the cavity
B29C 2945/76304	. . . .	temperature control fluids
B29C 2945/76307	. . . .	hydraulic fluids
B29C 2945/76311	. . . .	environment
B29C 2945/76314	. . . .	Auxiliary devices
B29C 2945/76317	. . . .	robots, grippers
B29C 2945/76321	. . . .	conveyors
B29C 2945/76324	. . . .	pre-treatment devices
B29C 2945/76327	. . . .	post-treatment devices
B29C 2945/76331	. . . .	raw material feeding devices
B29C 2945/76334	. . . .	auxiliary fluid supplying devices
B29C 2945/76337	. . . .	other auxiliary devices
B29C 2945/76341	. . . .	Others

B29C 2945/76344	. .	Phase or stage of measurement (not used)
B29C 2945/76347	. . .	Pre-treatment
B29C 2945/76351	. . .	Feeding
B29C 2945/76354	. . . .	raw materials
B29C 2945/76357	. . . .	inserts
B29C 2945/76361	. . . .	auxiliary fluids, e.g. gas, liquid
B29C 2945/76364	. . . .	others
B29C 2945/76367	. . .	Metering
B29C 2945/76371	. . .	Intrusion
B29C 2945/76374	. . .	Pre-compression prior to injection
B29C 2945/76377	. . .	De-compression after injection
B29C 2945/76381	. . .	Injection
B29C 2945/76384	. . .	Holding, dwelling
B29C 2945/76387	. . .	Mould closing
B29C 2945/76391	. . .	Mould clamping, compression of the cavity
B29C 2945/76394	. . .	Mould opening
B29C 2945/76397	. . .	Switch-over
B29C 2945/76401	. . . .	metering-injection
B29C 2945/76404	. . . .	injection-holding
B29C 2945/76408	. . . .	holding-metering
B29C 2945/76411	. . . .	others
B29C 2945/76414	. . .	Solidification, setting phase
B29C 2945/76418	. . .	Ejection
B29C 2945/76421	. . .	Removing or handling ejected articles
B29C 2945/76424	. . .	After-treatment
B29C 2945/76428	. . .	Purging
B29C 2945/76431	. . .	Calibration, e.g. zero-point correction
B29C 2945/76434	. . .	Parameter setting
B29C 2945/76438	. . .	Start up
B29C 2945/76441	. . .	Shut down
B29C 2945/76444	. . . .	in case of emergency
B29C 2945/76448	. . .	Others
B29C 2945/76451	. .	Measurement means (not used)
B29C 2945/76454	. . .	Electrical, e.g. thermocouples
B29C 2945/76458	. . . .	piezo-electric
B29C 2945/76461	. . .	Optical, e.g. laser
B29C 2945/76464	. . . .	cameras
B29C 2945/76468	. . .	Manual
B29C 2945/76471	. . .	Acoustic
B29C 2945/76474	. . .	Ultrasonic

B29C 2945/76478	. . .	Mechanical
B29C 2945/76481	. . .	Strain gauges
B29C 2945/76484	. . .	Fluid type
B29C 2945/76488	. . .	Magnetic, electro-magnetic
B29C 2945/76491	. . .	Others
B29C 2945/76494	. .	Controlled parameter (not used)
B29C 2945/76498	. . .	Pressure
B29C 2945/76501	. . . .	derivative, change thereof
B29C 2945/76505	. . .	Force
B29C 2945/76508	. . . .	derivative, change thereof
B29C 2945/76511	. . .	Torque
B29C 2945/76515	. . . .	derivative, change thereof
B29C 2945/76518	. . .	Energy, power
B29C 2945/76521	. . . .	power
B29C 2945/76525	. . .	Electric current or voltage
B29C 2945/76528	. . .	Frequency
B29C 2945/76531	. . .	Temperature
B29C 2945/76535	. . . .	derivative, change thereof
B29C 2945/76538	. . .	Viscosity
B29C 2945/76541	. . . .	derivative, change thereof
B29C 2945/76545	. . .	Flow rate
B29C 2945/76548	. . . .	derivative, change thereof
B29C 2945/76551	. . .	Time
B29C 2945/76555	. . . .	start
B29C 2945/76558	. . . .	termination
B29C 2945/76561	. . . .	duration
B29C 2945/76565	. . . .	pause, wilful interruption
B29C 2945/76568	. . .	Position
B29C 2945/76571	. . . .	start position
B29C 2945/76575	. . . .	end position
B29C 2945/76578	. . . .	angular position
B29C 2945/76581	. . . .	distance
B29C 2945/76585	. . .	Dimensions, e.g. thickness
B29C 2945/76588	. . . .	shrinkage, dilation, dimensional change, warpage
B29C 2945/76591	. . . .	volume
B29C 2945/76595	. . .	Velocity
B29C 2945/76598	. . . .	linear movement
B29C 2945/76602	. . . .	derivative, change thereof
B29C 2945/76605	. . . .	rotational movement
B29C 2945/76608	. . . .	derivative, change thereof

B29C 2945/76612	. . .	Density
B29C 2945/76615	. . .	Weight
B29C 2945/76618	. . .	Crystallinity
B29C 2945/76622	. . .	Degree of crosslinking, solidification
B29C 2945/76625	. . .	Humidity, moisture
B29C 2945/76628	. . .	Volatiles
B29C 2945/76632	. . .	Contaminants
B29C 2945/76635	. . .	Electrical properties
B29C 2945/76638	. . .	Optical properties
B29C 2945/76642	. . .	Magnetic properties
B29C 2945/76645	. . .	Surface properties
B29C 2945/76648	. . .	Sequence, e.g. the order in which operations are conducted
B29C 2945/76652	. . .	Others
B29C 2945/76655	. .	Location of control (not used)
B29C 2945/76658	. . .	Injection unit
B29C 2945/76662	. . . .	hopper
B29C 2945/76665	. . . .	screw
B29C 2945/76668	. . . .	barrel
B29C 2945/76672	. . . . .	barrel-chamber
B29C 2945/76675	. . . . .	screw ante-chamber
B29C 2945/76678	. . . .	injection piston
B29C 2945/76682	. . . .	injection piston cylinder
B29C 2945/76685	. . . .	accumulators
B29C 2945/76688	. . . .	nozzle
B29C 2945/76692	. . . .	drive means
B29C 2945/76695	. . . .	nozzle-touch mechanism
B29C 2945/76698	. . . .	others
B29C 2945/76702	. . .	Closure or clamping device
B29C 2945/76705	. . . .	mould platen
B29C 2945/76709	. . . .	clamping or closing drive means
B29C 2945/76712	. . . .	tie-bars
B29C 2945/76715	. . . .	others
B29C 2945/76719	. . .	Ejection unit
B29C 2945/76722	. . . .	ejectors
B29C 2945/76725	. . . . .	drive means thereof
B29C 2945/76729	. . . .	others
B29C 2945/76732	. . .	Mould
B29C 2945/76735	. . . .	cavity
B29C 2945/76739	. . . . .	cavity walls
B29C 2945/76742	. . . . .	movable

B29C 2945/76745	. . . .	non-cavity forming parts
B29C 2945/76749	. . . . .	movable
B29C 2945/76752	. . . .	runners, nozzles
B29C 2945/76755	. . . . .	nozzles
B29C 2945/76759	. . . . .	manifolds
B29C 2945/76762	. . . .	others
B29C 2945/76765	. . .	Moulding material
B29C 2945/76769	. . .	Moulded articles
B29C 2945/76772	. . .	Inserts
B29C 2945/76775	. . .	Fluids
B29C 2945/76779	. . . .	auxiliary fluids introduced into the cavity
B29C 2945/76782	. . . .	temperature control fluids
B29C 2945/76785	. . . .	hydraulic fluids
B29C 2945/76789	. . . .	environment
B29C 2945/76792	. . .	Auxiliary devices
B29C 2945/76795	. . . .	robots, grippers
B29C 2945/76799	. . . .	conveyors
B29C 2945/76802	. . . .	pre-treatment devices
B29C 2945/76806	. . . .	post-treatment devices
B29C 2945/76809	. . . .	raw material feeding devices
B29C 2945/76812	. . . .	Auxiliary fluid supplying devices
B29C 2945/76816	. . . .	others auxiliary devices
B29C 2945/76819	. . .	Others
B29C 2945/76822	. .	Phase or stage of control (not used)
B29C 2945/76826	. . .	Pre-treatment
B29C 2945/76829	. . .	Feeding
B29C 2945/76832	. . . .	raw materials
B29C 2945/76836	. . . .	inserts
B29C 2945/76839	. . . .	auxiliary fluids, e.g. gas, liquid
B29C 2945/76842	. . . .	others
B29C 2945/76846	. . .	Metering
B29C 2945/76849	. . .	Intrusion
B29C 2945/76852	. . .	Pre-compression prior to injection
B29C 2945/76856	. . .	De-compression after injection
B29C 2945/76859	. . .	Injection
B29C 2945/76862	. . .	Holding, dwelling
B29C 2945/76866	. . .	Mould closing
B29C 2945/76869	. . .	Mould clamping, compression of the cavity
B29C 2945/76872	. . .	Mould opening
B29C 2945/76876	. . .	Switch-over

B29C 2945/76879	. . . .	metering-injection
B29C 2945/76882	. . . .	injection-holding
B29C 2945/76886	. . . .	holding-metering
B29C 2945/76889	. . . .	others
B29C 2945/76892	. . .	Solidification, setting phase
B29C 2945/76896	. . .	Ejection
B29C 2945/76899	. . .	Removing or handling ejected articles
B29C 2945/76903	. . .	After-treatment
B29C 2945/76906	. . .	Purging
B29C 2945/76909	. . .	Calibration, e.g. zero-point correction
B29C 2945/76913	. . .	Parameter setting
B29C 2945/76916	. . .	Start up
B29C 2945/76919	. . .	Shut down
B29C 2945/76923	. . . .	in case of emergency
B29C 2945/76926	. . .	Others
B29C 2945/76929	. .	Controlling method (not used)
B29C 2945/76933	. . .	Open loop, i.e. the operating conditions are corrected immediately, during the same phase or cycle
B29C 2945/76936	. . .	Closed loop, i.e. the operating conditions are corrected in the next phase or cycle
B29C 2945/76939	. . .	Using stored or historical data sets
B29C 2945/76943	. . . .	compare with thresholds
B29C 2945/76946	. . . .	using an expert system, i.e. the system possesses a database in which human experience is stored, e.g. to help interfering the possible cause of a fault
B29C 2945/76949	. . . .	using a learning system, i.e. the system accumulates experience from previous occurrences, e.g. adaptive control
B29C 2945/76953	. . .	Distributed, i.e. several control units perform different tasks
B29C 2945/76956	. . .	Proportional
B29C 2945/76959	. . . .	and derivative, i.e. PD regulation
B29C 2945/76963	. . . . .	using a second derivative, e.g. determination of inflexion points
B29C 2945/76966	. . . .	and integral, i.e. PI regulation
B29C 2945/76969	. . . . .	derivative and integral, i.e. PID regulation
B29C 2945/76973	. . .	By counting
B29C 2945/76976	. . .	By trial and error, trial tests
B29C 2945/76979	. . .	Using a neural network
B29C 2945/76983	. . .	Using fuzzy logic
B29C 2945/76986	. . .	Interpolating
B29C 2945/76989	. . .	Extrapolating
B29C 2945/76993	. . .	Remote, e.g. LAN, wireless LAN
B29C 2945/76996	. . .	Others

B29C 2947/00**Indexing scheme relating to extrusion moulding**

- B29C 2947/92 . Measuring, controlling or regulating
- B29C 2947/92009 . . Measured parameter
- B29C 2947/92019 . . . Pressure
- B29C 2947/92028 . . . Force; Tension
- B29C 2947/92038 . . . Torque
- B29C 2947/92047 . . . Energy, power, electric current or voltage
- B29C 2947/92057 . . . Frequency
- B29C 2947/92066 . . . Time, e.g. start, termination, duration or interruption
- B29C 2947/92076 . . . Position, e.g. linear or angular
- B29C 2947/92085 . . . Velocity
- B29C 2947/92095 Angular velocity
- B29C 2947/92104 Flow or feed rate
- B29C 2947/92114 . . . Dimensions
- B29C 2947/92123 Diameter or circumference
- B29C 2947/92133 Width or height
- B29C 2947/92142 Length
- B29C 2947/92152 Thickness
- B29C 2947/92161 Volume or quantity
- B29C 2947/92171 Distortion, shrinkage, dilatation, swell or warpage
- B29C 2947/9218 . . . Weight
- B29C 2947/9219 . . . Density, e.g. per unit length or area
- B29C 2947/922 . . . Viscosity; Melt flow index [MFI]; Molecular weight
- B29C 2947/92209 . . . Temperature
- B29C 2947/92219 . . . Degree of crosslinking, solidification, crystallinity or homogeneity
- B29C 2947/92228 . . . Content, e.g. percentage of humidity, volatiles, contaminants or degassing
- B29C 2947/92238 . . . Electrical properties
- B29C 2947/92247 . . . Optical properties
- B29C 2947/92257 Colour
- B29C 2947/92266 . . . Mechanical properties
- B29C 2947/92276 . . . Magnetic properties
- B29C 2947/92285 . . . Surface properties
- B29C 2947/92295 . . . Errors or malfunctioning, e.g. for quality control
- B29C 2947/92304 . . . Presence or absence; Sequence; Counting
- B29C 2947/92314 . . . Particular value claimed
- B29C 2947/92323 . . Location or phase of measurement
- B29C 2947/92333 . . . Raw material handling or dosing, e.g. active hopper or feeding device
- B29C 2947/92342 . . . Raw material pre-treatment, e.g. drying or cleaning
- B29C 2947/92352 . . . Inserts

B29C 2947/92361	. . .	Extrusion unit
B29C 2947/92371	. . . .	Inlet shaft or slot, e.g. passive hopper; Injector, e.g. injector nozzle on barrel
B29C 2947/9238	. . . .	Feeding, melting, plasticising or pumping zones, e.g. the melt itself
B29C 2947/9239	. . . . .	Screw or gear
B29C 2947/924	. . . . .	Barrel or housing
B29C 2947/92409	. . . .	Die; Nozzle zone
B29C 2947/92419	. . . .	Degassing unit
B29C 2947/92428	. . .	Calibration, after-treatment, or cooling zone
B29C 2947/92438	. . .	Conveying, transporting or storage of articles
B29C 2947/92447	. . .	Moulded article
B29C 2947/92457	. . .	Drive section, e.g. gearbox, motor or drive fluids
B29C 2947/92466	. . .	Auxiliary unit, e.g. for external melt filtering, re-combining or transfer between units
B29C 2947/92476	. . .	Fluids, e.g. for temperature control or of environment
B29C 2947/92485	. . .	Start-up, shut-down or parameter setting phase; Emergency shut-down; Material change; Test or laboratory equipment or studies
B29C 2947/92495	. . .	Treatment of equipment, e.g. purging, cleaning, lubricating or filter exchange
B29C 2947/92504	. .	Controlled parameter
B29C 2947/92514	. . .	Pressure
B29C 2947/92523	. . .	Force; Tension
B29C 2947/92533	. . .	Torque
B29C 2947/92542	. . .	Energy, power, electric current or voltage
B29C 2947/92552	. . .	Frequency
B29C 2947/92561	. . .	Time, e.g. start, termination, duration or interruption
B29C 2947/92571	. . .	Position, e.g. linear or angular
B29C 2947/9258	. . .	Velocity
B29C 2947/9259	. . . .	Angular velocity
B29C 2947/926	. . . .	Flow or feed rate
B29C 2947/92609	. . .	Dimensions
B29C 2947/92619	. . . .	Diameter or circumference
B29C 2947/92628	. . . .	Width or height
B29C 2947/92638	. . . .	Length
B29C 2947/92647	. . . .	Thickness
B29C 2947/92657	. . . .	Volume or quantity
B29C 2947/92666	. . . .	Distortion, shrinkage, dilatation, swell or warpage
B29C 2947/92676	. . .	Weight
B29C 2947/92685	. . .	Density e.g. per unit length or area
B29C 2947/92695	. . .	Viscosity; Melt flow index [MFI]; Molecular weight
B29C 2947/92704	. . .	Temperature

B29C 2947/92714	. . .	Degree of crosslinking, solidification, crystallinity or homogeneity
B29C 2947/92723	. . .	Content, e.g. percentage of humidity, volatiles, contaminants or degassing
B29C 2947/92733	. . .	Electrical properties
B29C 2947/92742	. . .	Optical properties
B29C 2947/92752	. . . .	Colour
B29C 2947/92761	. . .	Mechanical properties
B29C 2947/92771	. . .	Magnetic properties
B29C 2947/9278	. . .	Surface properties
B29C 2947/9279	. . .	Errors or malfunctioning, e.g. for quality control
B29C 2947/928	. . .	Presence or absence; Sequence; Counting
B29C 2947/92809	. . .	Particular value claimed
B29C 2947/92819	. .	Location or phase of control
B29C 2947/92828	. . .	Raw material handling or dosing, e.g. active hopper or feeding device
B29C 2947/92838	. . .	Raw material pre-treatment, e.g. drying or cleaning
B29C 2947/92847	. . .	Inserts
B29C 2947/92857	. . .	Extrusion unit
B29C 2947/92866	. . . .	Inlet shaft or slot, e.g. passive hopper; Injector, e.g. injector nozzle on barrel
B29C 2947/92876	. . . .	Feeding, melting, plasticising or pumping zones, e.g. the melt itself
B29C 2947/92885	. . . . .	Screw or gear
B29C 2947/92895	. . . . .	Barrel or housing
B29C 2947/92904	. . . .	Die; Nozzle zone
B29C 2947/92914	. . . .	Degassing unit
B29C 2947/92923	. . .	Calibration, after-treatment or cooling zone
B29C 2947/92933	. . .	Conveying, transporting or storage of articles
B29C 2947/92942	. . .	Moulded article
B29C 2947/92952	. . .	Drive section, e.g. gearbox, motor or drive fluids
B29C 2947/92961	. . .	Auxiliary unit, e.g. for external melt filtering, re-combining or transfer between units
B29C 2947/92971	. . .	Fluids, e.g. for temperature control or of environment
B29C 2947/9298	. . .	Start-up, shut-down or parameter setting phase; Emergency shut-down; Material change; Test or laboratory equipment or studies
B29C 2947/9299	. . .	Treatment of equipment, e.g. purging, cleaning, lubricating or filter exchange
B29C 2949/00		Blow moulding, i.e. blowing a preform or parison to a desired shape within a mould
B29C 2949/78	. .	Measuring, controlling or regulating
B29C 2949/78008	. .	Measuring
B29C 2949/78016	. . .	Measured parameter
B29C 2949/78025	. . . .	Pressure

B29C 2949/78033	. . . .	Energy, power, electric current or voltage
B29C 2949/78042	. . . .	Time, e.g. start, termination, duration or interruption
B29C 2949/7805	. . . .	Position, e.g. start, end or actual position
B29C 2949/78058	. . . .	Velocity
B29C 2949/78067	. . . .	Dimension
B29C 2949/78075	. . . . .	Diameter
B29C 2949/78084	. . . . .	Length
B29C 2949/78092	. . . . .	Thickness
B29C 2949/781	. . . . .	of individual layers of multilayered objects
B29C 2949/78109	. . . .	Volume or quantity
B29C 2949/78117	. . . .	Dimensional change, e.g. distortion or shrinkage
B29C 2949/78126	. . . .	Weight
B29C 2949/78134	. . . .	Density, e.g. per unit length or area
B29C 2949/78142	. . . .	Viscosity
B29C 2949/78151	. . . .	Temperature
B29C 2949/78159	. . . .	Electrical properties
B29C 2949/78168	. . . .	Optical properties
B29C 2949/78176	. . . . .	Colour, e.g. transparency
B29C 2949/78184	. . . .	Mechanical properties
B29C 2949/78193	. . . .	Magnetic properties
B29C 2949/78201	. . . .	Surface properties
B29C 2949/7821	. . . .	Errors or malfunctioning
B29C 2949/78218	. . . .	Presence or absence, e.g. of preforms or parisons
B29C 2949/78226	. . . .	Location or phase of measurement
B29C 2949/78235	. . . .	Injection phase or unit
B29C 2949/78243	. . . .	Extrusion phase or unit
B29C 2949/78252	. . . . .	Die; Nozzle zone
B29C 2949/7826	. . . .	Handling phase or unit, e.g. feeding device
B29C 2949/78268	. . . . .	of blow moulded articles
B29C 2949/78277	. . . . .	of inserts
B29C 2949/78285	. . . . .	of labels
B29C 2949/78294	. . . .	Blow moulding phase
B29C 2949/78302	. . . .	Closure, opening or clamping phase or unit
B29C 2949/7831	. . . . .	during opening phase
B29C 2949/78319	. . . . .	during clamping phase
B29C 2949/78327	. . . .	Ejection phase or unit
B29C 2949/78336	. . . .	Mould
B29C 2949/78344	. . . . .	cavity
B29C 2949/78352	. . . . .	non cavity forming parts

B29C 2949/78361	. . . . .	core of the injection blow moulding machine, e.g. core transporting preform to blow moulding machine
B29C 2949/78369	. . . . .	Stretching phase or unit
B29C 2949/78378	. . . . .	Blowing means, pressurized phase
B29C 2949/78386	. . . . .	Preform or parison
B29C 2949/78394	. . . . .	Moulded articles
B29C 2949/78403	. . . . .	Inserts
B29C 2949/78411	. . . . .	Fluids
B29C 2949/7842	. . . . .	introduced into the preform, parison or blown article
B29C 2949/78428	. . . . .	for temperature control
B29C 2949/78436	. . . . .	Temperature control fluids, i.e. to regulate the temperature in the blow mould
B29C 2949/78445	. . . . .	Driving means, e.g. motor or drive fluids
B29C 2949/78453	. . . . .	Auxiliary phases or units
B29C 2949/78462	. . . . .	Pre-treatment phase or devices
B29C 2949/7847	. . . . .	Post-treatment phases or devices
B29C 2949/78478	. . . . .	Start-up, shut-down phase; Emergency shut down
B29C 2949/78487	. . . . .	Measurement means
B29C 2949/78495	. . . . .	Electrical, e.g. thermocouples
B29C 2949/78504	. . . . .	Optical, e.g. laser
B29C 2949/78512	. . . . .	Cameras
B29C 2949/78521	. . . . .	Controlling or regulating
B29C 2949/78529	. . . . .	Controlled parameter
B29C 2949/78537	. . . . .	Pressure
B29C 2949/78546	. . . . .	Energy, power, electric current or voltage
B29C 2949/78554	. . . . .	Time, e.g. start, termination, duration or interruption
B29C 2949/78563	. . . . .	Position, e.g. start, end or actual position
B29C 2949/78571	. . . . .	Velocity
B29C 2949/78579	. . . . .	Dimension
B29C 2949/78588	. . . . .	Diameter
B29C 2949/78596	. . . . .	Length
B29C 2949/78605	. . . . .	Thickness
B29C 2949/78613	. . . . .	of individual layers of multilayered objects
B29C 2949/78621	. . . . .	Volume or quantity
B29C 2949/7863	. . . . .	Dimensional change, e.g. distortion or shrinkage
B29C 2949/78638	. . . . .	Weight
B29C 2949/78647	. . . . .	Density, e.g. per unit length or area
B29C 2949/78655	. . . . .	Viscosity
B29C 2949/78663	. . . . .	Temperature
B29C 2949/78672	. . . . .	Electrical properties

B29C 2949/7868	. . . .	Optical properties
B29C 2949/78689	. . . . .	Colour, e.g. transparency
B29C 2949/78697	. . . .	Mechanical properties
B29C 2949/78705	. . . .	Magnetic properties
B29C 2949/78714	. . . .	Surface properties
B29C 2949/78722	. . . .	Errors or malfunctioning
B29C 2949/78731	. . . .	Presence or absence, e.g. of preforms or parisons
B29C 2949/78739	. . .	Location or phase of control
B29C 2949/78747	. . . .	Injection phase or unit
B29C 2949/78756	. . . .	Extrusion phase or unit
B29C 2949/78764	. . . . .	Die; Nozzle zone
B29C 2949/78773	. . . .	Handling phase or unit, e.g. feeding device
B29C 2949/78781	. . . . .	of blow moulded articles
B29C 2949/78789	. . . . .	of inserts
B29C 2949/78798	. . . . .	of labels
B29C 2949/78806	. . . .	Blow moulding phase
B29C 2949/78815	. . . .	Closure, opening or clamping phase or unit
B29C 2949/78823	. . . . .	during opening phase
B29C 2949/78831	. . . . .	during clamping phase
B29C 2949/7884	. . . .	Ejection phase or unit
B29C 2949/78848	. . . .	Mould
B29C 2949/78857	. . . . .	cavity
B29C 2949/78865	. . . . .	non cavity forming parts
B29C 2949/78873	. . . . .	core of the injection blow moulding machine, e.g. core transporting preform to blow moulding machine
B29C 2949/78882	. . . .	Stretching phase or unit
B29C 2949/7889	. . . .	Blowing means, pressurized phase
B29C 2949/78899	. . . .	Preform or parison
B29C 2949/78907	. . . .	Moulded articles
B29C 2949/78915	. . . .	Inserts
B29C 2949/78924	. . . .	Fluids
B29C 2949/78932	. . . . .	introduced into the preform, parison or blown article
B29C 2949/78941	. . . . .	for temperature control
B29C 2949/78949	. . . . .	Temperature control fluids, i.e. to regulate the temperature in the blow mould
B29C 2949/78957	. . . .	Driving means, e.g. motor or drive fluids
B29C 2949/78966	. . . .	Auxiliary phases or units
B29C 2949/78974	. . . . .	Pre-treatment phases or devices
B29C 2949/78983	. . . . .	Post-treatment phases or devices
B29C 2949/78991	. . . .	Start-up, shut-down phase; Emergency shut down