

ECLA EUROPEAN 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 ([N: moulding devices for producing toilet or cosmetic sticks [A45D40/16](#)]; working in the manner of metal B23; grinding, polishing B24; cutting B26D, B26F; making preforms [B29B11/00](#); making laminated products by combining previously unconnected layers which become one product whose layers will remain together [B32B37/00-B32B41/00](#)) [C1003]

Notes [C2010.03]

1.

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 [B29C73/00](#);
- component parts, details, accessories or auxiliary operations which are applicable to more than one moulding technique a reclassified in groups [B29C31/00](#) to [B29C37/00](#);
- 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 [B29C39/00](#) to [B29C71/00](#).

Guide heading: Component parts, details or accessories; Auxiliary operations

Note

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

B29C31/00

Handling, e.g. feeding of the material to be shaped, [N: 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 [B29C37/00B](#); storage of prepregs or SMC after impregnation or during ageing [B29C70/54](#); baling of rubber [B29B15/02](#); in general B65G)] [C0901]

B29C31/00B

- [N: Handling tubes, e.g. transferring between shaping stations, loading on mandrels]

B29C31/00C

- [N: Arrangements for converting the motion of a material which is continuously fed to a working station in a stepwise motion] [N9501]

B29C31/00M

- [N: Handling moulds, e.g. between a mould store and a moulding machine (movable moulds [B29C33/34](#); for injection moulding [B29C45/17H](#))] [C9501]

B29C31/00P

- [N: Handling preformed parts, e.g. inserts ([B29C37/00B2B](#) takes precedence; for injection moulding [B29C45/14B](#); for blow moulding [B29C49/24B](#); for thermoforming [B29C51/16C](#))]

- B29C31/02 . Dispensing from vessels, e.g. hoppers [N: (into a mould cavity [B29C31/04](#); large containers characterised by discharge means [B65D88/28](#), [B65D88/54](#))] [C9501]
 - B29C31/04 . Feeding [N: of the material to be moulded], e.g. into a mould cavity ([N: [B29C39/08](#) takes precedence; using a material distribution system to two or more fixed injection moulds [B29C45/12B](#)]; to presses in general [B30B15/30](#)) [C9708]
 - B29C31/04C . . [N: using filling or dispensing heads placed in closed moulds or in contact with mould walls ([B29C45/27](#) takes precedence)] [N9501]
 - B29C31/04D . . [N: using dispensing heads, e.g. extruders, placed over or apart from the moulds (positioning extruded preforms on conveyers [B29C31/08B](#))] [N9501]
 - B29C31/04D2 . . . [N: with moving heads for distributing liquid or viscous material into the moulds] [N9501]
 - B29C31/04D2B [N: moving along predetermined circuits or distributing the material according to predetermined patterns] [N9501]
 - B29C31/04D3 . . . [N: combined with moving moulds ([B29C31/04D2](#), [B29C31/04D4](#) take precedence)] [N9501] [C9604]
 - B29C31/04D4 . . . [N: 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] [N9501]
 - B29C31/06 . . in measured doses, [N: e.g. by weighting (feeding mixers with measured doses [B01F15/02B7](#), [B01F15/04H5](#), [B29B7/24](#), [B29B7/60B](#); in general [G01F](#))] [C9604]
 - B29C31/06B . . . [N: using stationary volumetric measuring chambers] [N9604]
 - B29C31/06B2 [N: of the piston type] [N9604]
 - B29C31/06C . . . [N: using volumetric measuring chambers moving between a charging station and a discharge station] [N9604]
 - B29C31/06C2 [N: using feed frames, e.g. for dry material] [N9604]
 - B29C31/06C3 [N: of the piston type] [N9604]
 - B29C31/08 . . of preforms [N: 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 ([B29C31/06C2](#), [B29C37/00B2B](#), [B29C43/08B](#) take precedence)] [C9812]
- [N: **Note**
Documents describing feeding preforms, e.g. parisons, tubes, sheets in connection with shaping techniques described in groups [B29C49/00](#) to [B29C65/00](#) are not classified in group [B29C31/08](#), but in the relevant groups of these techniques]
- B29C31/08B . . . [N: combined with positioning the preforms according to predetermined patterns, e.g. positioning extruded preforms on conveyers ([B29C70/30](#) takes precedence; for building tyres [B29D30/08](#))] [N9501] [C0901]
 - B29C31/10 . . of several materials

B29C33/00 Moulds or cores; Details thereof or accessories therefor

- B29C33/00B . [N: thin-walled moulds]
- B29C33/00B2 . . [N: Lost moulds, e.g. staying on the moulded object (flexible bags without particular shape filled with expandable material [B29C44/18C](#); single use mandrels for winding and forming [B29C53/82B2](#))] [C9603]
- B29C33/00C . [N: Multi-cavity moulds ([B29C33/30B](#) takes precedence)]

- B29C33/00C2 . . [N: with deep narrow cavities, e.g. for making piles (non-woven pile fabrics [D04H11/00](#))]
- B29C33/00D . [N: constructed for making articles provided with holes]
 - [N: **Note**
 - If the hole is made by cutting means associated with the mould, see the relevant moulding technique
 -]
- B29C33/00E . [N: with sealing means or the like (seals on envelopes used in tyre retreading [B29D30/54B](#); for injection moulding footwear [B29D35/00B2D](#))] [M1106]
- B29C33/00E2 . . [N: for sealing off parts of inserts projecting into the mould cavity]
- B29C33/00F . [N: characterised by the location of the parting line of the mould parts]
- B29C33/00H . [N: with incorporated overflow cavities (in particular in injection moulds [B29C45/26M](#))] [C9503]
- B29C33/00J . [N: characterised by the configuration of the material feeding channel (sprue channels for injection moulding [B29C45/27](#))]
- B29C33/00J2 . . [N: with a subdivided channel for feeding the material to a plurality of locations]
- B29C33/00J3 . . [N: with a configuration promoting turbulency, e.g. for after-mixing in the mould]
- B29C33/00K . [N: characterised by the configuration of the mould filling gate (mixing chambers situated in the mould opening [B29B7/74M](#)); accessories for connecting the mould filling gate with the filling spout]
- B29C33/00L . [N: Electrical or fluid connection systems therefor] [N0011]
- B29C33/00M . [N: Multi-face stack moulds] [N1111]
- B29C33/02 . with incorporated heating or cooling means
- B29C33/02B . . [N: in rolls, calenders or drums]
- B29C33/04 . . using liquids, gas or steam [N: (tyre moulds with incorporated heating or cooling means using liquids, gas or steam [B29D30/06B](#))] [C0710]
- B29C33/04B . . . [N: in rolls calenders or drums]
- B29C33/04C . . . [N: using gas] [N0710]
- B29C33/04D . . . [N: using steam] [N0710]
- B29C33/06 . . using radiation, [N: e.g. electro-magnetic waves, induction heating]
- B29C33/06B . . . [N: in rolls, calenders or drums]
- B29C33/08 . . for dielectric heating
- B29C33/08B . . . [N: using rolls, calenders or drums]
- B29C33/10 . with incorporated venting means
- B29C33/12 . with incorporated means for positioning inserts, e.g. labels [N: (positioning reinforcements [B29C70/54A](#))] [C0901]
- B29C33/12B . . [N: for centering the inserts]
- B29C33/12B2 . . . [N: using centering means forming part of the insert]

- B29C33/14 . . against the mould wall
- B29C33/16 . . . using magnetic means
- B29C33/18 . . . using vacuum

- B29C33/20 . Opening, closing or clamping
- B29C33/20B . . [N: 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 [B29C45/64](#))]
- B29C33/22 . . by rectilinear movement
- B29C33/24 . . . using hydraulic or pneumatic means
- B29C33/26 . . by pivotal movement
- B29C33/28 . . . using hydraulic or pneumatic means

- B29C33/30 . Mounting, exchanging or centering [N: (moulds, mould parts or cores; [B29C33/48B](#) takes precedence)]
- B29C33/30B . . [N: Modular mould systems (MMS), i.e. moulds built up by stacking mould elements, e.g. plates, blocks, rods ([B29C33/00M](#) takes precedence)] [C1111]
- B29C33/30B2 . . . [N: Assembling a large number of mould elements to constitute one cavity]
- B29C33/30C . . [N: centering mould parts or halves, e.g. during mounting]
- B29C33/30C2 . . . [N: centering cores]
- B29C33/30D . . [N: Mounting of moulds or mould support plates (handling of moulds [B29C31/00M](#); mounting of moulds for injection moulding [B29C45/17C](#))] [C0011]
- B29C33/30E . . [N: Exchangeable mould parts, e.g. cassette moulds, mould inserts (moulds with exchangeable mould parts for injection moulding [B29C45/26N](#); mounting of exchangeable mould inserts for injection moulding [B29C45/26N2](#))] [N0011]
- B29C33/30F . . [N: Mould plates mounted on frames; Mounting the mould plates; Frame constructions therefor (shaping plates for making moulds [B29C33/38M](#); thin walled moulds [B29C33/00B](#))]
- B29C33/30G . . [N: Adjustable moulds (for injection moulding [B29C45/37C](#))] [N0011]
- B29C33/32 . . using magnetic means

- B29C33/34 . movable, e.g. to or from the moulding station
- B29C33/36 . . continuously movable [N: in one direction, e.g. in a closed circuit ([B29C49/00C2](#) takes precedence)] [C9503]

- B29C33/38 . characterised by the material or the manufacturing process ([B29C33/44](#) takes precedence; manufacture of moulds or parts thereof from metal [B22](#), [B23](#))
- B29C33/38B . . [N: Resin-bonded materials, e.g. inorganic particles]
- B29C33/38C . . [N: Porous moulds (adapted for vacuum forming [B29C51/36B](#))]
- B29C33/38D . . [N: composed of particles enclosed in a bag]
- B29C33/38E . . [N: Moulds made of at least two different materials having different thermal conductivities] [N9710]
- B29C33/38F . . [N: Designing moulds, e.g. using CAD-CAM] [N0212]
- B29C33/38M . . [N: Manufacturing moulds, e.g. shaping the mould surface by machining]
- B29C33/38M2 . . . [N: by making impressions of one or more parts of models, e.g. shaped articles and including possible subsequent assembly of the parts]
- B29C33/38M2C [N: used as masters for making successive impressions]
- B29C33/38M2C2 [N: the mould parts being co-operating impressions]

- B29C33/38M2P [N: Preparation of the model, e.g. by assembling parts]
- B29C33/40 . . Plastics, e.g. foam, rubber
- B29C33/40B . . . [N: Elastomers, e.g. rubber ([B29C33/50](#) takes precedence)]
- B29C33/42 . characterised by the shape of the moulding surface, e.g. ribs, grooves [[C9807](#)]
- B29C33/42C . . [N: Moulding surfaces provided with means for marking or patterning (for injection moulding [B29C45/37B](#))] [[N9807](#)]
- B29C33/42C2 . . . [N: For altering indicia, e.g. data, numbers (for injection moulding [B29C45/37B2](#))] [[N0011](#)]
- B29C33/44 . with means for , or specially constructed to facilitate, the removal of articles, e.g. of undercut articles
- B29C33/44B . . [N: with mechanical ejector or drive means therefor]
- B29C33/44B2 . . . [N: for stripping articles from a mould core, e.g. using stripper plates]
- B29C33/44B2B [N: and using a rotating movement to unscrew articles (in particular in injection moulds [B29C45/26F2](#))] [[C9503](#)]
- B29C33/44C . . [N: destructible ([B29C33/52](#) takes precedence; in particular used in injection moulding [B29C45/44F](#))] [[C9503](#)]
- B29C33/46 . . using fluid pressure
- B29C33/48 . . with means for collapsing or disassembling
- B29C33/48B . . . [N: cores or mandrels (collapsible mandrels for shaping tube ends [B29C57/02](#); collapsible mandrels for winding and joining [B29C53/82B3](#))]
- B29C33/50 . . . elastic [N: or flexible (for isostatic pressing [B29C43/36D](#))] [[C9508](#)]
- B29C33/50B [N: cores or mandrels, e.g. inflatable ([B29C33/00B2](#) takes precedence; for winding and joining [B29C53/82B3](#); for supporting articles during joining [B29C66/634](#); flexible cores for vulcanizing tyres [B29D30/06B11](#))] [[C1201](#)]
- B29C33/52 . . soluble or fusible [N: (in particular used in injection moulding [B29C45/44F](#))] [[C9503](#)]
- B29C33/54 . . made of powdered or granular material
- B29C33/56 . Coatings, [N: e.g. enamelled, galvanised]; Releasing, lubricating or separating agents [N: (in-mould coating [B29C37/00C2](#); using or applying separating agents [B29C37/00H](#))]
- B29C33/56B . . [N: Consisting of shell-like structures supported by backing material]
- B29C33/58 . . Applying the releasing agents
- B29C33/60 . . Releasing, lubricating or separating agents [N: in general [C10M](#)]
- B29C33/62 . . . based on polymers or oligomers
- B29C33/64 Silicone
- B29C33/66 Cellulose; Derivatives thereof
- B29C33/68 . . Release sheets
- B29C33/70 . Maintenance
- B29C33/72 . . Cleaning [N: extruder parts [B29C47/08X](#); in general [B08B7/00](#)] [[C1203](#)]
- B29C33/72B . . . [N: Compositions for cleaning moulds]
- B29C33/74 . . Repairing
- B29C33/76 . Cores ([B29C33/02](#) to [B29C33/70](#), [N: [B29C41/40](#), [B29C53/74](#), [B29C53/82](#)] take precedence) [[C9503](#)]

- B29C35/00** Heating, cooling or curing, e.g. crosslinking, vulcanising; Apparatus therefor (moulds with incorporated heating or cooling means [B29C33/02](#); [N: thermal after-treatment of shaped articles [B29C71/02](#)]; curing devices for plastic dental prostheses [A61C13/14](#); before moulding [B29B13/00](#); Chemical aspects [C08J3/00](#))
- [B29C35/00A](#) . [N: Component parts, details or accessories; Auxiliary operations]
- [B29C35/00B](#) . [N: Tempering units for temperature control of moulds or cores, e.g. comprising heat exchangers, controlled valves, temperature-controlled circuits for fluids ([B29C35/02R2](#) takes precedence)]
- [B29C35/02](#) . Heating or curing, e.g. crosslinking, vulcanising [N: during moulding, e.g. in a mould] (coldvulcanisation [B29C35/18](#); [N: vulcanising tyres, presses therefor [B29D30/06B](#)])
- [B29C35/02B](#) . . [N: the curing continuing after removal from the mould ([B29C35/02C2](#) takes precedence)]
- [B29C35/02C](#) . . [N: using pressure vessels, e.g. autoclaves, vulcanising pans ([B29C35/06B](#) takes precedence)] [C9810]
- [B29C35/02C2](#) . . . [N: the curing continuing after removal from the mould]
- [B29C35/02C3](#) . . . [N: Presses provided with pressure vessels, e.g. steam chambers] [N9812]
- [B29C35/02D](#) . . [N: using fluidised bed]
- [B29C35/02D2](#) . . . [N: for articles of indefinite length]
- [B29C35/02E](#) . . [N: using friction]
- [B29C35/02F](#) . . [N: using ultrasonic or sonic vibrations] [C9611]
- [B29C35/02K](#) . . [N: Local curing (for repairing [B29C73/34](#))]
- [B29C35/02L](#) . . [N: using lost heating elements, i.e. heating means incorporated and remaining in the formed article (for preforms with internal stresses [B29C61/06B3](#); joining using lost heating elements [B29C65/34](#); making electrically conductive articles [B29C70/88A](#))] [C0901]
- [B29C35/02M](#) . . [N: Apparatus with continuous transport of the material to be cured ([B29C35/02D2](#), [B29C35/06](#), [B29C35/10](#), [B29C35/14](#) take precedence)]
- [B29C35/02R](#) . . [N: 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 [B01J19/00B](#))]
- [B29C35/02R2](#) . . . [N: using tempering units for temperature control of moulds or cores]
- [B29C35/04](#) . . using liquids, gas or steam
- [B29C35/04B](#) . . . [N: using liquids] [N0212]
- [B29C35/04C](#) . . . [N: using gas or flames] [N0212]
- [B29C35/04D](#) . . . [N: using steam or damp] [N0212]
- [B29C35/06](#) . . . for articles of indefinite length
- [B29C35/06B](#) [N: in long tubular vessels] [N9810]
- [B29C35/08](#) . . by wave energy or particle radiation [N: ([B29C67/00R](#), [B29C71/04](#) take precedence)] [C1003]
- [B29C35/08B](#) . . . [N: using electromagnetic radiation] [N0212]
- [B29C35/08C](#) . . . [N: using particle radiation] [N0212]
- [B29C35/08M](#) . . . [N: using transparent moulds] [N9604]
- [B29C35/08M2](#) [N: provided with masks or diaphragms] [N9604]

- B29C35/10 . . . for articles of indefinite length
- B29C35/12 . . Dielectric heating
- B29C35/14 . . . for articles of indefinite length
- B29C35/16 . Cooling [N: (cooling extruded material [B29C47/88C](#); cooling preforms for blow moulding [B29C49/64B3](#); cooling blown articles [B29C49/66](#); cooling tyres during post cure inflation [B29D30/06B5B](#))] [C9812]
- B29C35/18 . Cold vulcanisation

- B29C37/00** **Component parts, details, accessories or auxiliary operations, not covered by group [B29C33/00](#) or [B29C35/00](#)**

- B29C37/00B . [N: Discharging moulded articles from the mould (constructions for removing the articles [B29C33/44](#))]
- B29C37/00B2 . . [N: using means operable from outside the mould for moving between mould parts, e.g. robots]
- B29C37/00B2B . . . [N: combined with means for loading preforms to be moulded or inserts, e.g. preformed layers] [N9812]
- B29C37/00B3 . . [N: by flexibly or permanently deforming undercut portions of the articles]
- B29C37/00B4 . . [N: by stripping articles from mould cores]
- B29C37/00B4B . . . [N: and using a rotating movement to unscrew articles (in particular used in injection moulding [B29C45/17U](#))] [C9503]

- B29C37/00C . [N: 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 [B29C70/68](#); applying fluent material to surfaces in general B05)] [C0901]
- B29C37/00C2 . . [N: In-mould coating, e.g. by introducing the coating material into the mould after forming the article]
- B29C37/00C2B . . . [N: the coating being applied upon the mould surface before introducing the moulding compound , e.g. applying a gelcoat ([B29C44/14](#) and [B29C44/32](#) take precedence)] [C0901]

- B29C37/00D . [N: Compensating volume or shape change during moulding, in general] [C9611]

- B29C37/00F . [N: Moulding articles characterised by the shape of the surface, e.g. ribs, high polish (mould construction therefor [B29C33/42](#); surface shaping of articles [B29C59/00](#); by incorporating filler in or near the surface [B29C70/64](#))] [C0901]
- B29C37/00F2 . . [N: Moulding single grooves or ribs, e.g. tear lines (folding lines [B29C53/06](#))] [N9801]

- B29C37/00G . [N: Degassing moulding material or draining off gas during moulding (venting means in moulds [B29C33/10](#))]
- B29C37/00G2 . . [N: of reinforced material]

- B29C37/00H . [N: Using separating agents during or after moulding; Applying separating agents on preforms or articles, e.g. to prevent sticking to each other (separating agents [B29C33/60](#))]
- B29C37/00H2 . . [N: Dusting machines]
- B29C37/00H3 . . [N: using release sheets] [N9810]

- B29C37/00K . [N: Measures or configurations for obtaining anchoring effects in the contact areas between layers ([surface shaping B29C59/00](#); [B29C66/02 takes precedence](#))] [C1201]
- B29C37/00K2 . . [N: Mechanical anchoring ([B29C66/303 takes precedence](#))] [C1201]
- B29C37/00K2B . . . [N: by means of openings in the layers ([joining through openings B29C66/304](#))] [C1201]
- B29C37/00L . [N: 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] [N9810]
- B29C37/00P . [N: Drying moulded articles or half products, e.g. preforms, during or after moulding or cooling] [N9812]
- B29C37/00S . [N: Trouble-shooting during starting or stopping moulding or shaping apparatus ([B29C66/872 takes precedence](#))] [M1204]
- B29C37/02 . Deburring or deflashing ([by grinding or polishing B24B](#)) [N: ([thermal deburring in general B23D79/00B](#))]
- B29C37/04 . . of welded articles, e.g. deburring or deflashing in combination with welding [N: ([shaping the burr B29C66/32](#))] [C1201]

Note

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

Guide heading: Particular shaping techniques, e.g. moulding, joining; Apparatus therefor [N1001]

B29C39/00 **Shaping by casting, i.e. introducing the moulding material into a mould or between confining surfaces without significant moulding pressure; Apparatus therefor** ([B29C41/00 takes precedence](#))

- B29C39/00B . [N: characterised by the choice of material]
- [N: **Notes**
[C1201]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
]
- B29C39/00B2 . . [N: Monomers or prepolymers ([by reaction injection moulding B29C67/24D](#))]
- B29C39/02 . for making articles of definite length, i.e. discrete articles
- B29C39/02B . . [N: by casting in several steps]
- B29C39/02B2 . . . [N: for making multicoloured articles]
- B29C39/02B3 . . . [N: for making multilayered articles]
- B29C39/02C . . [N: characterised by the shape of the surface]
- B29C39/02D . . [N: having an axis of symmetry]
- B29C39/04 . . using movable moulds ([B29C41/02 takes precedence](#)) [N: not applied]
- B29C39/06 . . . continuously movable, e.g. along a production line
- B29C39/08 . . Introducing the material into the mould by centrifugal force

- B29C39/10 . . incorporating preformed parts or layers, e.g. casting around inserts or for coating articles [N: (coating a surface by casting in general [B05D1/30](#), 39/12B2 takes precedence)]
- B29C39/12 . . Making multilayered or multicoloured articles [N: ([B29C39/02B](#) takes precedence)]
- B29C39/12B . . . [N: Making multilayered articles]
- B29C39/12B2 [N: by casting between two preformed layers, e.g. deformable layers (between two glass layers [B32B17/10L16B2](#))]

- B29C39/14 . . for making articles of indefinite length [N: (by depositing material on a substrate and stripping off the shaped article [B29C41/24](#))]
- B29C39/14B . . [N: by casting in several steps]
- B29C39/14B2 . . . [N: for making multicoloured articles]
- B29C39/14B3 . . . [N: for making multilayered articles]
- B29C39/14C . . [N: characterised by the shape of the surface]
- B29C39/16 . . between endless belts
- B29C39/18 . . incorporating preformed parts or layers, e.g. casting around inserts or for coating articles [N: ([B29C39/20B2](#) takes precedence)]
- B29C39/20 . . Making multilayered or multicoloured articles [N: ([B29C39/14B](#) takes precedence)]
- B29C39/20B . . . [N: Making multilayered articles]
- B29C39/20B2 [N: by casting between two preformed layers, e.g. deformable layers]

- B29C39/22 . . Component parts, details or accessories; Auxiliary operations
- B29C39/24 . . Feeding the material into the mould
- B29C39/26 . . Moulds or cores
- B29C39/26B . . . [N: comprising two large plates positioned at a small distance from each other, e.g. for making panels]
- B29C39/28 . . . with means to avoid flashes [N: ([B29C39/30](#) takes precedence)]
- B29C39/30 . . . with means for cutting the article
- B29C39/32 . . . with joints or the like for making the mould impervious
- B29C39/34 . . . for undercut articles
- B29C39/36 . . Removing moulded articles
- B29C39/38 . . Heating or cooling
- B29C39/40 . . Compensating volume change, e.g. retraction [N: (in general [B29C37/00D](#))]
- B29C39/40B . . . [N: by applying pressure to the casting composition]
- B29C39/42 . . Casting under special conditions, e.g. vacuum
- B29C39/44 . . Measuring, controlling or regulating

- B29C41/00** . . **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 [B29C43/00](#); [N: by lay-up of reinforcement of substantial or continuous length [B29C70/30](#)]) [C0901]**
- B29C41/00B . . [N: characterised by the choice of material]

[N: **Notes**

[C1201]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]

- B29C41/00C . [N: using an electrostatic field for applying the material]
- B29C41/02 . for making articles of definite length, i.e. discrete articles
- B29C41/02B . . [N: having hollow walls]
- B29C41/04 . . Rotational or centrifugal casting, i.e. coating the inside of a mould by rotating the mould
- B29C41/04B . . . [N: by rotating a mould around its axis of symmetry (for concrete [B28B21/30](#))]
- B29C41/04B2 [N: the axis being placed vertically, e.g. spin casting]
- B29C41/04B3 [N: the mould cavity lying totally outside the axis, e.g. toroidal moulds]
- B29C41/06 . . . about two or more axes
- B29C41/08 . . Coating a former, core or other substrate by spraying or fluidisation, e.g. spraying powder [N: (spray-up of reinforcing fibres [B29C70/30A](#))] [C0901]
- B29C41/08B . . . [N: by rotating the former around its axis of symmetry]
- B29C41/10 . . . by fluidisation
- B29C41/12 . . Spreading-out the material on a substrate [N: e.g. on the surface of a liquid]
- B29C41/14 . . Dipping a core [N: ([B29C41/10](#) takes precedence)]
- B29C41/16 . . Slip casting, i.e. applying a slip or slurry on a perforated or porous or absorbent surface with the liquid being drained away
- B29C41/18 . . Slush casting, i.e. pouring moulding material into a hollow mould with excess material being poured off
- B29C41/20 . . incorporating preformed parts or layers, e.g. moulding inserts or for coating articles
- B29C41/22 . . Making multilayered or multicoloured articles
- B29C41/24 . for making articles of indefinite length
- B29C41/26 . . by depositing flowable material on a rotating drum
- B29C41/26B . . . [N: on the inside of the drum]
- B29C41/28 . . by depositing flowable material on an endless belt
- B29C41/30 . . incorporating preformed parts or layers, e.g. moulding around inserts or for coating articles
- B29C41/32 . . Making multilayered or multicoloured articles
- B29C41/34 . Component parts, details or accessories; Auxiliary operations
- B29C41/36 . . Feeding the material on to the mould, core or other substrate
- B29C41/36B . . . [N: Construction of spray-up equipment e.g. spray-up guns (spraying apparatus in general [B05B](#))]
- B29C41/38 . . Moulds, cores or other substrates
- B29C41/38B . . . [N: with means for cutting the article]
- B29C41/38C . . . [N: for undercut articles]
- B29C41/40 . . . Cores
- B29C41/42 . . Removing articles from moulds, cores or other substrates [N: ([B29C33/44B2](#) and

- [B29C37/00B4](#) take precedence]
- B29C41/44 . . . Articles of indefinite length
- B29C41/46 . . Heating or cooling
- B29C41/48 . . Compensating volume change, e.g. retraction
- B29C41/50 . . Shaping under special conditions, e.g. vacuum
- B29C41/52 . . Measuring, controlling or regulating
- B29C43/00** **Compression moulding, i.e. applying external pressure to flow the moulding material; Apparatus therefor** ([N: by liberation of internal stresses [B29C61/00C](#)]; shaping or impregnating by compression composites comprising reinforcements other than fibres of short length [B29C70/12](#)]; presses in general B30B) [C9604] [C0901]
- B29C43/00B . [N: characterised by the choice of material]
- [N: **Notes**
[C1201] 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
]
- B29C43/00C . [N: Pressing and sintering powders, granules or fibres]
- B29C43/02 . of articles of definite length, i.e. discrete articles [N: ([B29C35/02C](#) takes precedence)] [C9812]
- B29C43/02B . . [N: characterised by the shape of the surface]
- B29C43/02D . . [N: having an axis of symmetry ([B29C43/10B](#) takes precedence)] [C9704]
- B29C43/04 . . using movable moulds
- B29C43/06 . . . continuously movable [N: in one direction, e.g. mounted on chains, belts]
- B29C43/08 with circular movement [N: e.g. mounted on rolls, turntables]
- B29C43/08B [N: and material fed in a continuous form, e.g. as a band] [N9604]
- B29C43/10 . . Isostatic pressing, i.e. using non-rigid pressure-exerting members against rigid parts or dies [N: (in general [B30B11/00B](#))]
- B29C43/10B . . . [N: using rigid mould parts specially adapted for moulding articles having an axis of symmetry]
- B29C43/10B2 [N: the mould cavity lying totally outside the axis of symmetry e.g. toroidal moulds]
- B29C43/12 . . . using bags surrounding the moulding material [N: or using membranes contacting the moulding material ([B29C70/44](#) takes precedence; flexible cores for vulcanizing tyres [B29D30/06B11](#))] [C0908]
- B29C43/14 . . in several steps
- B29C43/14B . . . [N: for making multicoloured articles]
- B29C43/14C . . . [N: for making multilayered articles]
- B29C43/16 . . Forging
- B29C43/18 . . incorporating preformed parts or layers, e.g. compression moulding around inserts or for coating articles [N: ([B29C43/20B2](#) takes precedence)]
- B29C43/18B . . . [N: 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] [N9704]

- B29C43/18B2 [N: shaped by the compression of the material during moulding] [N9704]
- B29C43/20 . . Making multilayered or multicoloured articles [N: ([B29C43/14](#) takes precedence)]
- B29C43/20B . . . [N: Making multilayered articles]
- B29C43/20B2 [N: by pressing the material between two preformed layers, e.g. deformable layers]

- B29C43/22 . . of articles of indefinite length [N: (for articles with reinforcements of substantial or continuous length [B29C70/50](#))] [C0901]
- B29C43/22B . . [N: characterised by the shape of the surface]
- B29C43/22C . . [N: having a profiled section, e.g. tubes, rods]
- B29C43/22C2 . . . [N: having a corrugated section]
- B29C43/22D . . [N: using endless belts feeding the material between non-rotating pressure members e.g. vibrating pressure members]

- B29C43/24 . . Calendering
- B29C43/24B . . . [N: Adjusting calender parameters, e.g. bank quantity] [N9611]
- B29C43/26 . . in several steps ([B29C43/30](#) takes precedence [N: not applied])
- B29C43/26B . . . [N: for making multilayered articles]
- B29C43/28 . . incorporating preformed parts or layers, e.g. compression moulding around inserts or for coating articles
- B29C43/30 . . Making multilayered or multicoloured articles [N: ([B29C43/26](#) takes precedence)]
- B29C43/30B . . . [N: Making multilayered articles]

- B29C43/32 . . Component parts, details or accessories; Auxiliary operations
- B29C43/34 . . Feeding the material to the mould or the compression means [N: ([B29C43/08B](#) takes precedence)] [C9604]
- B29C43/36 . . Moulds for making articles of definite length, i.e. discrete articles
- B29C43/36B . . . [N: with sealing means or the like]
- B29C43/36C . . . [N: with pressing members independently movable of the parts for opening or closing the mould, e.g. movable pistons (transfer moulding [B29C45/02](#); injection-compression moulding [B29C45/56C](#))] [C9604]
- B29C43/36D . . . [N: Bags, bleeder sheets or cauls for isostatic pressing (flexible cores for vulcanizing tyres [B29D30/06B11](#))] [C0908]
- B29C43/36R . . . [N: comprising rollers or belts cooperating with non-rotating mould parts] [N9704]
- B29C43/38 . . . with means to avoid flashes [N: ([B29C43/40](#) takes precedence)] [C9704]
- B29C43/40 . . . with means for cutting the article
- B29C43/42 . . . for undercut articles
- B29C43/44 . . Compression means for making articles of indefinite length
- B29C43/46 . . . Rollers
- B29C43/48 . . . Endless belts
- B29C43/50 . . Removing moulded articles
- B29C43/52 . . Heating or cooling
- B29C43/54 . . Compensating volume change, e.g. retraction
- B29C43/56 . . Compression moulding under special conditions, e.g. vacuum
- B29C43/58 . . Measuring, controlling or regulating [N: (for bank adjustment in calendering [B29C43/24B](#))] [C9611]

- B29C44/00** **Shaping by internal pressure generated in the material, e.g. swelling, foaming; [N: Producing porous or cellular expanded plastics articles] [N9504]**
- [N: **WARNING**
[N9504]Group [B29C44/00](#) and subgroups are not complete, see also [B29C67/22](#) and subgroups
]
- B29C44/00B** . [N: Avoiding skin formation; Making foams with porous surfaces] [N9705]
- B29C44/02** . for articles of definite length, i.e. discrete articles [N9504]
- B29C44/02B** . . [N: Foaming unrestricted by cavity walls, e.g. without using moulds or using only internal cores] [N9705]
- B29C44/02C** . . [N: Foaming in open moulds, followed by closing the moulds] [N9705]
- B29C44/02D** . . [N: the foaming continuing or beginning when the mould is opened] [N1112]
- B29C44/04** . . consisting of at least two parts of chemically or physically different materials, e.g. having different densities [N9504]
- B29C44/04A** . . . [N: by regulating the temperature of the mould or parts thereof, e.g. cold mould walls inhibiting foaming of an outer layer] [N9504]
- B29C44/04B** . . . [N: by regulating the pressure of the material during or after filling of the mould, e.g. by local venting] [N9504]
- B29C44/04C** . . . [N: by density separation] [N9504] [C1112]
- B29C44/04C2** [N: using a rotating mould] [N1112]
- B29C44/04C4** [N: using flotation] [N1112]
- B29C44/04E** . . . [N: by increasing the density locally by compressing part of the foam while still in the mould] [N9504]
- B29C44/04F** . . . [N: by joining the different materials using compression moulding before the foaming step] [N1112]
- B29C44/04K** . . . [N: by having different chemical compositions in different places, e.g. having different concentrations of foaming agent, feeding one composition after the other] [N9504]
- B29C44/04K2** [N: provided with physical separators between the different materials, e.g. separating layers, mould walls] [N9504]
- B29C44/04K4** [N: by pouring more than one composition into an open mould] [N1112]
- B29C44/04L** . . . [N: by having different solubility of the foaming agent] [N1112]
- B29C44/04M** . . . [N: Devices for feeding the different materials] [N9504]
- B29C44/06** . . . Making multilayered articles [N: ([B29C44/04A](#) - [B29C44/04M](#) take precedence)] [N9504]
- B29C44/06B** [N: comprising at least one barrier layer] [N9603]
- B29C44/08** . . using several expanding [N: or moulding] steps [N9504] [C0006]
- B29C44/08B** . . . [N: Increasing the size of the cavity after a first part has foamed, e.g. substituting one mould part with another] [N9504]
- B29C44/08B2** [N: and feeding more material into the enlarged cavity] [N9504]
- B29C44/10** . . Applying counter-pressure during expanding [N9504]
- B29C44/10B** . . . [N: the counterpressure being exerted by a fluid] [N9603]
- B29C44/12** . . Incorporating or moulding on preformed parts, e.g. inserts, reinforcements [N9504]
- B29C44/12B** . . . [N: and giving the material during expanding the shape of a particular article to

- be supported, e.g. a human body-part] [N9603]
- B29C44/12C . . . [N: by impregnating a preformed part, e.g. a porous lining] [N9603]
- B29C44/12D . . . [N: Anchoring by foaming into a preformed part, e.g. by penetrating through holes (**anchoring by moulding in general B29C37/00K; outsert moulding B29C45/14F2, B29C70/74**)] [N9603] [C0901]
- B29C44/12E . . . [N: Foaming between a movable mould part and the preformed part] [N9603]
- B29C44/12F . . . [N: Joining preformed parts which have previously been filled with foam] [N9604] [C9605]
- B29C44/12G . . . [N: Joining preformed parts by the expanding material] [N9605]
- B29C44/12G2 [N: the preformed parts being supported during expanding] [N9605]
- B29C44/12G2B [N: and having flexible and solid areas] [N9605]
- B29C44/12G4 [N: the preformed parts being concentric (**B29C44/12G2 takes precedence**)] [N9605]
- B29C44/12G4B [N: comprising dams or sealing arrangements] [N9605]
- B29C44/12H . . . [N: Removing portions of the preformed parts after the moulding step] [N9604]
- B29C44/12J . . . [N: Joining a preformed part and a lining, e.g. around the edges] [N9805]
- B29C44/12K . . . [N: Avoiding impregnation of a preformed part] [N9805]
- B29C44/12L . . . [N: the preformed part being completely encapsulated, e.g. for packaging purposes or as reinforcement] [N0006]
- B29C44/12M . . . [N: the preformed parts being partially covered] [N0006]
- B29C44/12P . . . [N: the preformed parts being three dimensional structures which are wholly or partially penetrated by the foam] [N0006]
- B29C44/12Q . . . [N: Internally reinforcing constructional elements, e.g. beams] [N1112]
- B29C44/12R . . . [N: the preformed part being foamed] [N1112]
- B29C44/12S . . . [N: Enhancing adhesion to the preformed part using an interlayer] [N1112]
- B29C44/12T . . . [N: Foaming around pipe joints] [N1112]
- B29C44/14 . . . the preformed part being a lining [N: (**B29C44/12C takes precedence**)] [N9504] [C9603]
- B29C44/14B [N: Hiding joints in the lining] [N9603]
- B29C44/14C [N: Means for positioning the lining in the mould (**in general B29C33/12**)] [N9603]
- B29C44/14D [N: the lining being a laminate] [C9604]
- B29C44/14E [N: Shaping the lining before foaming] [N9605]
- B29C44/14F [N: Applying the foaming resin, moulding the lining or the like, with the lining turned inside out] [N1112]
- B29C44/16 shaped by the expansion of the material [N9504]
- B29C44/18 Filling preformed cavities [N: (**B29C44/12B takes precedence**)] [N9504] [C9603]
- B29C44/18B [N: Filling unsupported soft shells having a particular shape] [N9603]
- B29C44/18C [N: Filling flexible bags not having a particular shape] [N9603]
- B29C44/18C2 [N: the components being kept apart in different containers within the bag, and mixed upon rupture of the containers (**B29C44/18C4 takes precedence**)] [N9603]
- B29C44/18C4 [N: and inserting the bags into preformed cavities] [N9603]
- B29C44/18C4B [N: Starting the expansion after rupturing or dissolving the bag] [N9603]
- B29C44/18D [N: Filling multiple cavities (**B29C44/18B, B29C44/18C and B29C44/18G**)]

- takes precedence)] [N9603]
- B29C44/18F [N: Filling faulty voids in the foam] [N1112]
- B29C44/18G [N: Sealing off parts of the cavities] [N9603]

- B29C44/20 . for articles of indefinite length [N9504]
- B29C44/20B . . [N: Expanding the moulding material in a vertical channel] [N9608]
- B29C44/20C . . [N: Using expandable particles or beads as starting material] [N9704]
- B29C44/22 . . consisting of at least two parts of chemically or physically different materials, e.g. having different densities [N9504]
- B29C44/24 . . . Making multilayered articles [N9504]
- B29C44/26 . . using several expanding steps [N9504]
- B29C44/28 . . Expanding the moulding material on continuous moving surfaces [N: without restricting the upwards growth of the foam] [N9504] [C9608]
- B29C44/28B . . . [N: Rising trough lateral side members e.g. following the foam expansion] [N1112]
- B29C44/30 . . Expanding the moulding material between endless belts or rollers [N: ([B29C44/20B](#) takes precedence)] [N9504] [C9608]
- B29C44/30B . . . [N: Expanding the moulding material in flexible endless moulds] [N9608]
- B29C44/30C . . . [N: Adjusting the belt or roller pressure] [N0103]
- B29C44/30D . . . [N: Longitudinally shaping, e.g. the belt] [N0103]
- B29C44/30E . . . [N: Thickness separators and side seals] [N1112]
- B29C44/32 . . Incorporating or moulding on preformed parts, e.g. linings, inserts, reinforcements [N9504]
- B29C44/32B . . . [N: the preformed parts being elongated inserts, e.g. cables] [N9703]
- B29C44/32B2 [N: the preformed parts being tubular or folded to a tubular shape] [N0311]
- B29C44/32C . . . [N: Joining the preformed parts, e.g. to make flat or profiled sandwich laminates] [N0103]
- B29C44/32D . . . [N: the foamable components being mixed in the nip between the preformed parts] [N0103]

- B29C44/34 . Auxiliary operations [N9504] [C1112]
- B29C44/34B . . [N: Foaming under special conditions, e.g. in sub-atmospheric pressure, in or on a liquid] [N9504]
- B29C44/34B2 . . . [N: Vacuum extrusion using underwater barometric leg] [N1112]
- B29C44/34C . . [N: Relieving stresses] [N9603]
- B29C44/34D . . [N: Heating or cooling] [N9603]
- B29C44/34D2 . . . [N: Quick cooling] [N9603]
- B29C44/34D3 . . . [N: by using a heated or cooled preformed part, e.g. in the mould] [N1112]
- B29C44/34D4 . . . [N: Heating by introducing steam in the mould] [N1112]
- B29C44/34D4B [N: by using pipes to direct the steam inside the mould] [N1112]
- B29C44/34D4C [N: by using a sheet, grid, etc. to distribute the steam in the mould] [N1112]
- B29C44/34E . . [N: Bursting the cell walls by a sudden pressure release] [N9705]
- B29C44/34F . . [N: Mixing, kneading or conveying the foamable material (mixing plastics B29B7; mixing in general B01F)] [N9603] [C1112]
- B29C44/34F2 . . . [N: Feeding the blowing agent] [N9603]
- B29C44/34F2B [N: through the screw] [N1112]

- B29C44/34F2C [N: Feeding the blowing agent to solid plastic material] [N1112]
- B29C44/34F2D [N: Feeding the blowing agent in solid form to the plastic material] [N1112]
- B29C44/34H . . [N: Making or treating expandable particles] [N9605]
- B29C44/34H2 . . . [N: by compressing particles in vacuum, followed by expansion in normal pressure] [N1112]
- B29C44/34J . . [N: Cell or pore nucleation] [N0006]
- B29C44/34J2 . . . [N: by shearing forces] [N0006]
- B29C44/34J4 . . . [N: by e.g. compression stress] [N0006]
- B29C44/34J6 . . . [N: by regulating the temperature and/or the pressure, e.g. suppression of foaming until the pressure is rapidly decreased] [N0006]
- B29C44/34K . . [N: Stopping the foaming reaction until the material is heated or re-heated] [N1112]
- B29C44/34L . . [N: Vulcanizing the material before foaming] [N1112]
- B29C44/34M . . [N: Expanding without a foaming agent] [N1112]
- B29C44/34M2 . . . [N: The foam being compressed and later released to expand ([B29C44/34H2](#) takes precedence)] [N1112]
- B29C44/35 . . [N: Component parts; Details or accessories] [N1112]
- B29C44/35B . . . [N: Means for preventing foam to leak out from the foaming device during foaming] [N1112]
- B29C44/35C . . . [N: Means for giving the foam different characteristics in different directions] [N1112]
- B29C44/35D . . . [N: Means for guiding the foaming in e.g. a particular direction] [N1112]
- B29C44/35E . . . [N: Means to prevent or reduce the effect of shrinking of the foamed article] [N1112]
- B29C44/35F . . . [N: Characteristics of the foam, e.g. having particular surface properties or structure] [N1112]
- B29C44/35F2 [N: having a porous surface] [N1112]
- B29C44/35F4 [N: Auxetic foams, i.e. material with negative Poisson ratio; anti rubber; dilatational; re-entrant] [N1112]
- B29C44/35F5 [N: Foamed of foamable fibres] [N1112]
- B29C44/36 . . Feeding the material to be shaped [N: ([B29C44/04M](#) takes precedence)] [N9504]
- B29C44/36B . . . [N: Regulating the feed w.r.t. the foam layer thickness] [N1112]
- B29C44/36D . . . [N: using elongate feed conduits provided with throttle devices] [N9504]
- B29C44/36G . . . [N: using spray nozzles] [N9504]
- B29C44/38 . . . into a closed space, i.e. to make articles of definite length [N: ([B29C44/36D](#) and [B29C44/36G](#) take precedence)] [N9504]
- B29C44/38A [N: Spreading the foamable material in the mould by pressing the mould halves together] [N1112]
- B29C44/38B [N: using spreading devices mounted in the mould, in front of the feed opening] [N9504]
- B29C44/38C [N: using manifolds or channels directing the flow in the mould] [N9504]
- B29C44/38C2 [N: using a movable, elongate nozzle, e.g. to reach deep into the mould] [N9504]
- B29C44/38D [N: into moving moulds] [N9504]
- B29C44/40 by gravity, e.g. by casting [N9504]
- B29C44/42 using pressure difference, e.g. by injection, by vacuum [N9504]
- B29C44/42C [N: by plastizising the material into a shot cavity and injecting using a

		plunger] [N9504]
B29C44/42D	. . . . .	[N: by injecting by forward movement of the plastizing screw] [N9504]
B29C44/42E	. . . . .	[N: Details of machines] [N9504]
B29C44/42E2	. . . . .	[N: Valve or nozzle constructions; Details of injection devices] [N9504]
B29C44/42E2B	. . . . .	{7 dots} [N: having several injection gates] [N9504]
B29C44/42H	. . . . .	[N: Mould constructions; Mould supporting equipment] [N9504]
B29C44/44	. . . . .	[N: in solid form] [N9504] [C1112]
B29C44/44B	. . . . .	[N: in the form of expandable granules, particles or beads] [N1202]
B29C44/46	. . . . .	into an open space or onto moving surfaces, i.e. to make articles of indefinite length [N: (B29C44/36D , B29C44/36G take precedence)] [N9504]
B29C44/46B	. . . . .	[N: dispensing apparatus, e.g. dispensing foaming resin over the whole width of the moving surface] [N9504]
B29C44/46B2	. . . . .	[N: provided with pre-foaming devices] [N9504]
B29C44/46B3	. . . . .	[N: using centrifugal force] [N9504]
B29C44/46B4	. . . . .	[N: with adjustable die gap] [N1112]
B29C44/46C	. . . . .	[N: Foam spreading or levelling devices] [N9608]
B29C44/46D	. . . . .	[N: in a plurality of parallel streams which unite during the foaming] [N9608]
B29C44/48	. . . . .	by gravity, e.g. casting onto, or between, moving surfaces [N: (B29C44/46D takes precedence)] [N9504] [C9608]
B29C44/48B	. . . . .	[N: the material being spread in the nip of two cooperating rollers] [N9504]
B29C44/50	. . . . .	using pressure difference, e.g. by extrusion, by spraying [N: (B29C44/46D takes precedence)] [N9504] [C9608]
B29C44/52	. . . . .	between moving surfaces [N9504]
B29C44/54	. . . . .	in the form of expandable particles or beads [N9504]
B29C44/56	. . . . .	After-treatment of articles, e.g. for altering the shape [N9504]
B29C44/56B	. . . . .	[N: Purging of residual gas, e.g. noxious or explosive blowing agents] [N9504]
B29C44/56D	. . . . .	[N: Impregnating foam articles] [N9504] [C9603]
B29C44/56F	. . . . .	[N: by mechanical deformation, e.g. crushing, embossing, stretching] [N9504]
B29C44/56F2	. . . . .	[N: with the addition of heat] [N9504]
B29C44/56F2B	. . . . .	[N: Differential deformation by differential heating] [N1112]
B29C44/56F3	. . . . .	[N: Subdividing foamed articles to obtain particular surface properties, e.g. on multiple modules] [N9603]
B29C44/56F4	. . . . .	[N: by perforating the foam, e.g. to open the cells] [N9504]
B29C44/56F5	. . . . .	[N: by stretching the foam, e.g. to open the cells] [N1112]
B29C44/56G	. . . . .	[N: Covering the foamed object with e.g. a lining] [N1112]
B29C44/56H	. . . . .	[N: Shaping and joining components with different densities or hardness] [N9504]
B29C44/58	. . . . .	Moulds [N9504]
B29C44/58B	. . . . .	[N: Closure devices for pour holes] [N9504]
B29C44/58C	. . . . .	[N: for making undercut articles] [N9603]
B29C44/58D	. . . . .	[N: for making articles with cavities] [N9705]
B29C44/58E	. . . . .	[N: with adjustable size of the mould cavity] [N9705]
B29C44/58F	. . . . .	[N: with a cavity increasing in size during foaming] [N9705]

- B29C44/58G . . . [N: with a membrane, e.g. for pressure control] [N1112]
- B29C44/58H . . . [N: with means for venting, e.g. releasing foaming gas] [N1112]
- B29C44/60 . . Measuring, controlling or regulating [N9504]
- B29C44/60B . . . [N: Calibration following a shaping operation, e.g. extrusion] [N1112]

- B29C45/00** **Injection moulding, i.e. forcing the required volume of moulding material through a nozzle into a closed mould; Apparatus therefor** ([injection blow-moulding B29C49/06](#))

- B29C45/00B . [N: characterised by the choice of material]
 - [N: **Notes**
 - [C1201] 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
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- B29C45/00C . [N: of successively moulded portions rigidly joined to each other] [C9604]
- B29C45/00D . [N: using fibre reinforcements]
- B29C45/00E . [N: using fillers dispersed in the moulding material, e.g. metal particles]
- B29C45/00F . [N: moulding interconnected elements which are movable with respect to one another, e.g. chains or hinges] [M1202]
- B29C45/00G . [N: Preventing defects on the moulded article, e.g. weld lines, shrinkage marks ([preventing defects on the preformed parts or layers B29C45/14U](#))] [C0311]
- B29C45/00H . [N: Details relating to the filling pattern or flow paths or flow characteristics of moulding material in the mould cavity]
- B29C45/00J . [N: combined with a final operation, e.g. shaping ([injection-compression moulding B29C45/56C](#))]
- B29C45/00J2 . . [N: Shaping] [N9702]
- B29C45/00J3 . . [N: Joining parts moulded in separate cavities] [N0307]
- B29C45/00J3B . . . [N: Joined by injection moulding] [N0307]

- B29C45/00K . [N: of objects with parts connected by a thin section, e.g. hinge, tear line]

- B29C45/00L . [N: Reciprocating the moulding material inside the mould cavity, e.g. push-pull injection moulding] [N9802]

- B29C45/00P . [N: General arrangement or lay-out of plants ([B29C45/14M3P takes precedence](#))] [C9801]

- B29C45/02 . Transfer moulding, i.e. transferring the required volume of moulding material by a plunger from a "shot" cavity into a mould cavity
- B29C45/02D . . [N: Plunger drives; Pressure equalizing means for a plurality of transfer plungers] [N9703]

- B29C45/03 . Injection moulding apparatus ([transfer moulding B29C45/02](#))

- B29C45/03B . . [N: Injection pistols]
- B29C45/04 . . using movable moulds [N: or mould halves] ([B29C45/08](#) takes precedence) [C0806]
- B29C45/04B . . . [N: involving at least a linear movement ([B29C45/04C](#) takes precedence)] [C0806]
- B29C45/04B2 [N: co-operating with fixed mould halves] [N0806]
- B29C45/04C . . . [N: mounted on a conveyor belt or chain] [C0806]
- B29C45/04D . . . [N: involving a rotational movement ([B29C45/06](#) takes precedence)] [C0806]
- B29C45/04D2 [N: mounted on the circumference of a rotating support having a rotating axis perpendicular to the mould opening, closing or clamping direction] [N0806]
- B29C45/06 . . . [N: mounted] on a turntable [N: i.e. on a rotating support having a rotating axis parallel to the mould opening, closing or clamping direction] [C0806]
- B29C45/06B [N: carrying mould halves co-operating with fixed mould halves] [C0806]
- B29C45/07 . . using movable injection units
- B29C45/07B . . . [N: cooperating with two or more moulds] [N9603]
- B29C45/08 . . . moving with the mould during the injection operation
- B29C45/10 . . using moulds or injection units usable in different arrangements or combinations to each other
- B29C45/12 . . using two or more fixed moulds, e.g. in tandem [N: ([B29C45/07B](#) takes precedence)] [C9603]
- B29C45/12B . . . [N: using a material distributing system]
- B29C45/13 . . using two or more injection units co-operating with a single mould
- B29C45/14 . . incorporating preformed parts or layers, e.g. injection moulding around inserts or for coating articles [N: ([B29C45/16J](#) takes precedence)] [C9604]
- B29C45/14B . . [N: Inserting articles into the mould ([B29C45/14T](#) takes precedence)]
- B29C45/14B2 . . . [N: Intermittently feeding endless articles, e.g. transfer films, to the mould ([B29C45/14D6](#) takes precedence)] [C9710]
- B29C45/14B2B [N: and punching or cutting a portion from the endless articles during mould closing]
- B29C45/14B3 . . . [N: Transferring the inserts from a storage space inside the mould to the mould cavity] [N9608]
- B29C45/14C . . [N: Positioning or centering articles in the mould][C0106]
- B29C45/14C2 . . . [N: using means being retractable during injection]
- B29C45/14D . . [N: the inserts being deformed or preformed, e.g. by the injection pressure] [C9508]
- B29C45/14D2 . . . [N: the inserts being positioned around an edge of the injected part] [N9503] [C9508]
- B29C45/14D4 . . . [N: by tools, e.g. cutting means] [N9703]
- B29C45/14D6 . . . [N: Clamping or tensioning means for the insert] [N9710]
- B29C45/14E . . [N: using means for bonding the coating to the articles ([B29C45/14Q3](#) takes precedence)] [C0307]
- B29C45/14F . . [N: Coating a portion of the article, e.g. the edge of the article ([B29C45/14H2B](#) and [B29C45/14K](#) take precedence)] [C9610]
- B29C45/14F2 . . . [N: Moulding in or through a hole in the article, e.g. outsert moulding]
- B29C45/14F3 . . . [N: using an additional insert, e.g. a fastening element] [N9509]
- B29C45/14F4 . . . [N: Coating a portion of a bundle of inserts, e.g. making brushes] [N9509]

- B29C45/14F5 . . . [N: Coating profiles or strips by injecting end or corner or intermediate parts] [N9702]
- B29C45/14F6 . . . [N: Sealing means between mould and article] [N9809]
- B29C45/14F7 . . . [N: Coating the end of wire-like or rod-like or cable-like or blade-like or belt-like articles] [N9904]
- B29C45/14F8 . . . [N: Coating brittle material, e.g. glass ([B29C45/14F3](#), [B29C45/14F6](#) take precedence)] [N0004]
- B29C45/14G . . . [N: Joining articles or parts of a single article ([B29C45/14F3](#), [B29C45/14F4](#), [B29C45/14H2C](#), [B29C45/14K2](#) and [B29C45/00J3](#) take precedence)] [C0311]
- B29C45/14G2 . . . [N: Joining juxtaposed parts of a single article, e.g. edges of a folded container blank] [N9810]
- B29C45/14G3 . . . [N: Injecting material between coaxial articles, e.g. between a core and an outside sleeve for making a roll] [N9906]
- B29C45/14G4 . . . [N: Joining juxtaposed sheet-like articles, e.g. for making trim panels] [N9911]
- B29C45/14H . . . [N: Coating rod-like, wire-like or belt-like articles ([B29C45/14F7](#) takes precedence)] [C9904]
- B29C45/14H2 . . . [N: at spaced locations, e.g. coaxial-cable wires] [C9603]
- B29C45/14H2B [N: Coating the edge of the article, e.g. for slide-fasteners]
- B29C45/14H2C [N: Coating the cross-over points of articles in the form of a network]
- B29C45/14J . . . [N: Coating annular articles] [N9603]
- B29C45/14K . . . [N: Coating tubular articles]
- B29C45/14K2 . . . [N: Joining tubular articles] [N9710]
- B29C45/14K3 . . . [N: Lining the inner or outer surface of tubular articles] [N0106]
- B29C45/14L . . . [N: Coating reinforcements (**fibres reinforcements** [B29C45/00D](#))]
- B29C45/14M . . . [N: for obtaining an insulating effect, e.g. for electrical components] [C9504]
- B29C45/14M2 . . . [N: Making flat card-like articles with an incorporated IC or chip module, e.g. IC or chip cards] [N9504] [C9608]
- B29C45/14M3 . . . [N: connected to or mounted on a carrier, e.g. lead frame] [N9608]
- B29C45/14M3P [N: Plants therefor] [N9801]
- B29C45/14N . . . [N: Coating articles provided with a decoration] [C9708]
- B29C45/14P . . . [N: being in movable or releasable engagement with the coating, e.g. bearing assemblies] [C0312]
- B29C45/14Q . . . [N: the article consisting of a material with particular properties, e.g. porous, brittle] [C9409]
- B29C45/14Q2 . . . [N: Fibrous material or fibre containing material, e.g. fibre mats or fibre reinforced material] [C9603]
- B29C45/14Q3 . . . [N: Porous or permeable material, e.g. foam] [N9508]
- B29C45/14Q4 . . . [N: Multilayered articles ([B29C45/14T](#) takes precedence)] [N9409] [C9601]
- B29C45/14R . . . [N: the inserts being completely encapsulated]
- B29C45/14T . . . [N: using a transfer foil detachable from the insert]
- B29C45/14U . . . [N: Preventing damage of inserts during injection, e.g. collapse of hollow inserts, breakage ([B29C45/14F8](#) takes precedence)] [N0311]
- B29C45/16 . . . Making multilayered or multicoloured articles [N: ([B29C45/00J3B](#) takes precedence; **feeding colouring materials into the injection unit** [B29C45/18C](#))] [M1202]
- B29C45/16B . . . [N: Multi-way nozzles specially adapted therefor]

- B29C45/16B2 . . . [N: using a valve urged by the injection pressure] [N9701]
- B29C45/16B3 . . . [N: using a rotatable valve] [N9909]
- B29C45/16B4 . . . [N: having at least three different ways] [N0007]
- B29C45/16C . . . [N: The materials being injected at different moulding stations]
- B29C45/16C2 . . . [N: using an auxiliary treatment station, e.g. for cooling or ejecting
([B29C45/16C5](#) takes precedence)] [N9509] [C9912]
- B29C45/16C3 . . . [N: using means, e.g. mould parts, for transferring an injected part between
moulding stations] [N9603]
- B29C45/16C4 . . . [N: Injecting parison-like articles] [N9812]
- B29C45/16C5 . . . [N: using a mould carrier rotatable about an axis perpendicular to the opening
and closing axis of the moulding stations] [N9812]
- B29C45/16D . . . [N: with a non-uniform dispersion of the moulding material in the article, e.g.
resulting in a marble effect]
- B29C45/16E . . . [N: using displaceable mould parts, e.g. retractable partition between adjacent
mould cavities]
- B29C45/16E2 . . . [N: Removable partitions between adjacent mould cavity portions] [N9706]
- B29C45/16F . . . [N: The moulding materials being injected simultaneously]
- B29C45/16G . . . [N: having a "sandwich" structure ([B29C45/16B](#) takes precedence)]
- B29C45/16G2 . . . [N: from at least three different materials or with at least four layers] [N9409]
- B29C45/16G3 . . . [N: Injecting skin and core materials from the same injection cylinder, e.g.
mono-sandwich moulding] [N9601]
- B29C45/16G4 . . . [N: Injecting parison-like articles ([B29C45/16G2](#) takes precedence)] [N9712]
- B29C45/16H . . . [N: using means for adhering or bonding the layers or parts to each other
(mechanical anchoring [B29C37/00K2](#))] [C9910]
- B29C45/16J . . . [N: with an insert]
- B29C45/16K . . . [N: using exchangeable mould halves] [N9503]
- B29C45/16L . . . [N: using a soft material and a rigid material, e.g. making articles with a sealing
part] [N9508]
- B29C45/16M . . . [N: applying surface layers onto injection-moulded substrates inside the mould
cavity, e.g. in-mould coating (IMC) (applying surface layers after ejection
[B29C45/00J](#))] [N0406]
- B29C45/16P . . . [N: Injecting parison-like articles ([B29C45/16C4](#), [B29C45/16G2](#) and [B29C45/16G4](#)
take precedence)] [N9812]
- B29C45/17 . . . Component parts, details or accessories; Auxiliary operations
- B29C45/17A . . . [N: using a particular environment during moulding, e.g. moisture-free or dust-free]
[N9601] [C9611]
- B29C45/17B . . . [N: Introducing an auxiliary fluid into the mould ([B29C45/17A](#) takes precedence)]
[C9601]
- B29C45/17B2 . . . [N: the fluid being introduced into the interior of the injected material which is
still in a molten state, e.g. for producing hollow articles ([B29C45/17B3](#) and
[B29C45/17B4](#) take precedence; injection blow-moulding [B29C49/06](#))]
- B29C45/17B2B . . . [N: using movable mould parts] [N9503]
- B29C45/17B2C . . . [N: using particular fluids or fluid generating substances] [N9606]
- B29C45/17B2E . . . [N: and removing excess material from the mould cavity by the introduced
fluid, e.g. to an overflow cavity] [N9701]
- B29C45/17B3 . . . [N: Control circuits therefor]

- B29C45/17B4 . . . [N: Nozzles therefor]
- B29C45/17B4B [N: Nozzles for introducing the fluid through the mould gate, e.g. incorporated in the injection nozzle] [N9608] [C9704]
- B29C45/17B4C [N: provided with small holes permitting the flow of gas therethrough, e.g. using a porous element of sintered material ([B29C45/17B4B](#) takes precedence)] [N9908]
- B29C45/17B5 . . . [N: Applying a pressurised fluid to the outer surface of the injected material inside the mould cavity, e.g. for preventing shrinkage marks][N9409]
- B29C45/17C . . [N: Mounting of moulds; Mould supports ([mounting of exchangeable mould inserts B29C45/26N2](#))] [C0404]
- B29C45/17C2 . . . [N: using mounting means projecting from the back side of the mould or from the front side of the mould support]
- B29C45/17C4 . . . [N: Mould support platens] [N9610]
- B29C45/17D . . [N: Tie-rod connections]
- B29C45/17E . . [N: Retractable tie-rods]
- B29C45/17F . . [N: Adjustment means allowing the use of moulds of different thicknesses]
- B29C45/17G . . [N: Cleaning or purging, e.g. of the injection unit ([B29C45/24](#) takes precedence)]
- B29C45/17G2 . . . [N: Means for receiving or discharging purged material; Purge shields] [N9503]
- B29C45/17H . . [N: Handling of moulds or mould parts, e.g. mould exchanging means ([moulds per se B29C45/26](#))] [C0307]
- B29C45/17K . . [N: Removing sprues from sprue-channels]
- B29C45/17L . . [N: Exchanging the injection unit or parts thereof]
- B29C45/17M . . [N: Means for guiding movable mould supports or injection units on the machine base or frame; Machine bases or frames ([B29C45/17D](#) takes precedence)]
- B29C45/17N . . [N: Handling of moulded articles or runners, e.g. sorting, stacking, grinding of runners]
- B29C45/17N2 . . . [N: Means for guiding or orienting articles while dropped from the mould, e.g. guide rails or skirts] [N0006]
- B29C45/17P . . [N: Means for adjusting or displacing the injection unit into different positions, e.g. for co-operating with different moulds ([B29C45/17V](#) takes precedence)] [C0504]
- B29C45/17R . . [N: Display units or mountings therefor; Switch cabinets] [N9503]
- B29C45/17S . . [N: Connecting parts, e.g. injection screws, ejectors, to drive means]
- B29C45/17T . . [N: Nozzle touch mechanism]
- B29C45/17U . . [N: Means disposed outside the mould for unscrewing threaded articles, e.g. chuck devices ([moulds with incorporated unscrewing drive means B29C45/26F2](#))] [N9503]
- B29C45/17V . . [N: Aligning injection nozzles with the mould sprue bush] [N0504]
- B29C45/17W . . [N: Mounting or clamping means for heating elements or thermocouples] [N9601]
- B29C45/18 . . Feeding the material into the injection moulding apparatus, [N: i.e. feeding the non-plastified material into the injection unit]
- B29C45/18B . . . [N: Feeding measured doses]
- B29C45/18C . . . [N: Feeding auxiliary material, e.g. colouring material]
- B29C45/18D . . . [N: Changing the kind or the source of material, e.g. using a plurality of hoppers] [N9504] [C9601]
- B29C45/18E . . . [N: Feeding multiple materials ([B29C45/18C](#) takes precedence)] [N0011]
- B29C45/20 . . Injection nozzles [N: ([B29C45/16B](#) takes precedence)]
- B29C45/22 . . . Multiple nozzle systems

B29C45/23	. . .	Feed stopping equipment
B29C45/23B	. . . .	[N: Needle valve systems therefor]
B29C45/23C	. . . .	[N: comprising closing means disposed outside the nozzle] [N9503]
B29C45/23D	. . . .	[N: Valves opened by the pressure of the moulding material (B29C45/23B takes precedence)] [N9811]
B29C45/24	. . .	Cleaning equipment
B29C45/26	. .	Moulds
B29C45/26B	. . . .	[N: Mould construction elements]
B29C45/26B2	. . . .	[N: Guiding or centering means] [N9703]
B29C45/26C	. . . .	[N: Mould seals]
B29C45/26D	. . . .	[N: having tubular mould cavities]
B29C45/26D2	. . . .	[N: for manufacturing tubular articles with an annular groove] [N9912]
B29C45/26D4	. . . .	[N: for manufacturing bent tubular articles using an undercut forming mould core] [N0102]
B29C45/26E	. . . .	[N: having annular mould cavities]
B29C45/26F	. . . .	[N: having screw-threaded mould walls]
B29C45/26F2	. . . .	[N: provided with unscrewing drive means (unscrewing means outside the mould B29C45/17U)] [N9503]
B29C45/26F4	. . . .	[N: for moulding interrupted screw threads] [N9811]
B29C45/26G	. . . .	[N: provided with a multiplicity of wall-like cavities connected to a common cavity, e.g. for battery cases]
B29C45/26H	. . . .	[N: provided with a multiplicity of narrow cavities connected to a common cavity, e.g. for brushes, combs][C9604]
B29C45/26K	. . . .	[N: with mould parts forming holes in or through the moulded article, e.g. for bearing cages] [C9701]
B29C45/26L	. . . .	[N: with mould wall parts provided with fine grooves or impressions, e.g. for record discs]
B29C45/26L2	. . . .	[N: Stampers; Mountings thereof] [N9702]
B29C45/26L3	. . . .	[N: Heating or cooling means therefor] [N9712]
B29C45/26M	. . . .	[N: with means for removing excess material, e.g. with overflow cavities (B29C45/17B2E takes precedence)] [N9503] [C9701]
B29C45/26N	. . . .	[N: with exchangeable mould parts, e.g. cassette moulds (B29C45/17H takes precedence)] [N9604] [C0406]
B29C45/26N2	. . . .	[N: Mounting of exchangeable mould inserts][N0404]
B29C45/26P	. . . .	[N: with rotatable mould parts] [N1111]
B29C45/27	. . .	Sprue channels [N: Runner channels or runner nozzles] [C9910]
B29C45/27B	. . . .	[N: Details not specific to hot or cold runner channels (B29C45/27C takes precedence)] [C9701]
B29C45/27B2	. . . . .	[N: Means for controlling the runner flow, e.g. runner switches, adjustable runners or gates] [N9601]
B29C45/27B2B	. . . . .	[N: 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] [N0104]
B29C45/27B3	. . . . .	[N: Gates (B29C45/27B2 takes precedence)] [N9701] [C9708]
B29C45/27B3B	. . . . .	[N: Gate inserts] [N0710]
B29C45/27C	. . . .	[N: Manifolds] [C9703]

B29C45/27C2	. . . . .	[N: Modular manifolds; Connections between spaced manifold elements] [N9710]
B29C45/27D	. . . . .	[N: for non-coaxial gates, e.g. for edge gates]
B29C45/27E	. . . . .	[N: Heating or cooling means therefor (B29C45/73D takes precedence)] [C0010]
B29C45/27E2	. . . . .	[N: specially adapted for manifolds] [N9902]
B29C45/27F	. . . . .	[N: Cold runner channels] [N9604]
B29C45/27G	. . . . .	[N: Means for preventing drooling by decompression of the moulding material] [N0009]
B29C45/27T	. . . . .	[N: Nozzle tips (B29C45/27D takes precedence)] [N9706]
B29C45/28	. . . . .	Closure devices therefor
B29C45/28B	. . . . .	[N: comprising a member with an opening or the injection nozzle movable into or out of alignment with the sprue channel or mould gate] [C9906]
B29C45/28C	. . . . .	[N: consisting of needle valve systems (B29C45/28D takes precedence)] [C9503]
B29C45/28C2	. . . . .	[N: Drive means therefor] [N9503]
B29C45/28D	. . . . .	[N: extending in or through the mould cavity, e.g. valves mounted opposite the sprue channel] [N9409]
B29C45/30	. . . . .	Flow control means disposed within the sprue channel, e.g. "torpedo" construction
B29C45/32	. . . . .	having several axially spaced mould cavities, [N: i.e. for making several separated articles]
B29C45/32B	. . . . .	[N: Runner systems for distributing the moulding material to the stacked mould cavities] [N0012]
B29C45/33	. . . . .	having transversely, e.g. radially, movable mould parts
B29C45/33B	. . . . .	[N: Mountings or guides therefor; Drives therefor]
B29C45/34	. . . . .	having venting means
B29C45/34B	. . . . .	[N: using a porous mould wall or a part thereof, e.g. made of sintered metal] [N9902]
B29C45/36	. . . . .	having means for locating or centering cores
B29C45/37	. . . . .	Mould cavity walls, [N: i.e. the inner surface forming the mould cavity, e.g. linings] [C9710]
B29C45/37B	. . . . .	[N: provided with means for marking or patterning, e.g. numbering articles]
B29C45/37B2	. . . . .	[N: for displaying altering indicia, e.g. data, numbers] [N9503]
B29C45/37C	. . . . .	[N: adjustable (B29C45/37B2 takes precedence)] [N9710]
B29C45/38	. . . . .	Cutting-off equipment for sprues or ingates
B29C45/38B	. . . . .	[N: disposed outside the mould] [N9610]
B29C45/40	. . . . .	Removing or ejecting moulded articles
B29C45/40B	. . . . .	[N: Ejector constructions; Ejector operating mechanisms (B29C45/44 takes precedence)] [C9704]
B29C45/40B2	. . . . .	[N: Ejector pin constructions or mountings] [N9601]
B29C45/42	. . . . .	using means movable from outside the mould between mould parts, [N: e.g. robots] [M1202]
B29C45/42B	. . . . .	[N: and driven by the movable mould part]
B29C45/42C	. . . . .	[N: Take-off members or carriers for the moulded articles, e.g. grippers] [N9608]

- B29C45/43 . . . using fluid under pressure
- B29C45/43B [N: introduced between a mould core and a hollow resilient undercut article, e.g. bellows] [N9904]
- B29C45/44 . . . for undercut articles
- B29C45/44B [N: by flexible movement of undercut portions of the articles]
- B29C45/44C [N: using expansible or collapsible cores]
- B29C45/44D [N: using inclined, tiltable or flexible undercut forming elements driven by the ejector means] [N9608] [C9801]
- B29C45/44F [N: using fusible, soluble or destructible cores] [N9503]
- B29C45/44G [N: using flexible or pivotable undercut forming elements ([B29C45/44D](#) takes precedence)] [N9801]
- B29C45/44H [N: using non-rigid undercut forming elements, e.g. elastic or resilient] [N9801]
- B29C45/46 . . Means for plasticising or homogenising the moulding material or forcing it into the mould [N: ([combined with mould opening, closing or clamping devices B29C45/70](#))]
- B29C45/46B [N: Injection of measured doses]
- B29C45/46C [N: Injection of preformed charges of material]
- B29C45/46C2 [N: using packaged or wrapped charges] [N9902]
- B29C45/46D [N: using a rotating plasticising or injection disc] [N9409]
- B29C45/47 . . . using screws ([B29C45/54](#) takes precedence)
- B29C45/48 Plasticising screw and injection screw [N: comprising two separate screws]
- B29C45/50 Axially movable screw
- B29C45/50B [N: Drive means therefor]
- B29C45/50C [N: Intrusion moulding, i.e. the screw rotates during injection]
- B29C45/52 Non-return devices
- B29C45/53 . . . using injection ram or piston
- B29C45/53B [N: Drive means therefor]
- B29C45/53C [N: using a hollow injection ram co-operating with a coaxial screw]
- B29C45/53D [N: using two or more cooperating injection rams, e.g. coaxially or alternately operating rams] [N9706]
- B29C45/54 and plasticising screw [N: ([B29C45/53C](#) takes precedence)]
- B29C45/54B [N: using a hollow plasticising screw co-operating with a coaxial injection ram]
- B29C45/54C [N: using an accumulator between plasticising and injection unit, e.g. for a continuously operating plasticising screw] [N9902]
- B29C45/54D [N: the plasticising unit being connected to a transfer chamber in the injection unit at the upstream side of the injection piston] [N0103]
- B29C45/56 . . . using mould parts movable during or after injection, e.g. injection-compression moulding [N: ([B29C45/17B2B](#) and [B29C45/57B](#) take precedence)] [C9503]
- B29C45/56B [N: Rotatable mould parts]
- B29C45/56C [N: Injection-compression moulding]
- B29C45/56D [N: for making orifices in or through the moulded article]
- B29C45/56E [N: Applying vibrations to the mould parts]
- B29C45/57 . . . Exerting after-pressure on the moulding material [N: ([B29C45/17B5](#) takes precedence)] [C9409]

- B29C45/57B [N: using movable mould wall or runner parts] [N9503]
- B29C45/58 Details
- B29C45/58B [N: Devices for influencing the material flow, e.g. "torpedo constructions" or mixing devices]
- B29C45/58C [N: Vibration means for the injection unit or parts thereof] [N9503]
- B29C45/58D [N: Injection or transfer plungers] [N9712]
- B29C45/60 Screws
- B29C45/62 Barrels or cylinders
- B29C45/63 Venting or degassing means
- B29C45/64 Mould opening, closing or clamping devices [N: (combined with means for plasticising or homogenising [B29C45/70](#))] [C9802]
- B29C45/64B [N: Clamping devices using means for straddling or interconnecting the mould halves, e.g. jaws, straps, latches] [N9802]
- B29C45/66 mechanical [C9802]
- B29C45/66B [N: using a toggle mechanism for mould clamping] [N9910]
- B29C45/67 hydraulic
- B29C45/67B [N: without relative movement between the piston and the cylinder of the clamping device during the mould opening or closing movement]
- B29C45/67B2 [N: using a separate element transmitting the mould clamping force from the clamping cylinder to the mould]
- B29C45/67B2B [N: the separate element being displaceable with respect to the mould or the clamping cylinder]
- B29C45/67B2C [N: the separate element consisting of coupling rods]
- B29C45/67C [N: using hydraulically connectable chambers of the clamping cylinder during the mould opening and closing movement]
- B29C45/67C2 [N: the connection being provided within the clamping cylinder]
- B29C45/67D [N: Stroke adjusting or limiting means]
- B29C45/68 hydro-mechanical
- B29C45/68B [N: using a toggle mechanism as mould clamping device]
- B29C45/68C [N: using both a toggle mechanism as mould closing device and another mechanism as mould clamping device]
- B29C45/70 Means for plasticising or homogenising the moulding material or forcing it into the mould, combined with mould opening, closing or clamping devices
- B29C45/70B [N: 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]
- B29C45/72 Heating or cooling
- B29C45/72B [N: of the moulded articles]
- B29C45/73 of the mould [N: ([B29C45/26L3](#) and [B29C45/27E](#) take precedence)] [C9712]
- B29C45/73B [N: Control circuits therefor]
- B29C45/73C [N: Construction of heating or cooling fluid flow channels] [N9508]
- B29C45/73D [N: Heat transfer elements, e.g. heat pipes] [N0010]
- B29C45/73E [N: using gas or steam ([B29C45/73D](#) takes precedence)] [N0710]
- B29C45/74 of the injection unit
- B29C45/76 Measuring, controlling or regulating [N: (measuring in general G01; controlling or regulating in general G05)] [C1012]

[N: Notes

[N1012]

In groups [B29C45/76](#) to [B29C45/80](#) it is desirable to add the indexing codes of [L29C945/76](#) relating to measuring, controlling or regulating in injection moulding]

- B29C45/76B . . . [N: the termination of flow of material into the mould]
- B29C45/76C . . . [N: the sequence of operations of an injection cycle]
- B29C45/76D . . . [N: the ejection or removal of moulded articles] [C0210]
- B29C45/76E . . . [N: viscosity]
- B29C45/76F . . . [N: mould clamping forces]
- B29C45/76G . . . [N: the setting or resetting of moulding conditions, e.g. before starting a cycle]
- B29C45/76H . . . [N: of power or energy, e.g. integral function of force]
- B29C45/76J . . . [N: Detecting defective moulding conditions ([B29C45/84](#) takes precedence)] [C0210]
- B29C45/76K . . . [N: the ejected articles, e.g. weight control] [N0210]
- B29C45/76R . . . [N: using rheological models of the material in the mould, e.g. finite elements method]
- B29C45/77 . . . of velocity or pressure of moulding material
- B29C45/78 . . . of temperature
- B29C45/80 . . . of relative position of mould parts
- B29C45/82 . . . Hydraulic [N: or pneumatic] circuits [C0106]
- B29C45/83 . . . Lubricating means
- B29C45/84 . . . Safety devices [N: ([B29C45/76D](#) takes precedence)] [C0210]
- B29C45/84B . . . [N: Detection of insert defects, e.g. inaccurate position, breakage] [N9706]
- B29C45/84C . . . [N: Preventing damage caused by obstructions or foreign matter caught between mould halves during mould closing, e.g. moulded parts or runners] [N9904]

B29C47/00 Extrusion moulding, i.e. expressing the moulding material through a die or nozzle which imparts the desired form; Apparatus therefor ([extrusion blow-moulding B29C49/04](#); [extrusion presses in general B30B11/22](#))

- B29C47/00A . [N: Small extruders, e.g. handheld extruders or laboratory extruders] [N1203]
- B29C47/00B . [N: characterised by the choice of material]

[N: Notes

[C1201] 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]

- B29C47/00B1 . . [N: Extruding materials comprising incompatible ingredients] [N1203]
- B29C47/00J . [N: characterised by the shape of the articles] [N1203]
- B29C47/00J1 . . [N: Particle-shaped ([making granules B29B9/00](#))] [N1203]
- B29C47/00J2 . . [N: Filamentary-shaped articles, e.g. strands ([making granules in the form of filamentary material B29B9/06](#))] [N1203] [C1208]

- B29C47/00J3 . . [N: Rod-shaped articles] [N1203]
- B29C47/00J4 . . [N: Flat rigid articles, e.g. panels, plates] [N1203]
- B29C47/00J5 . . [N: Flat flexible articles, e.g. sheets, foils or films] [N1203]
- B29C47/00J6 . . [N: Hollow rigid articles having only one tubular passage] [N1203]
- B29C47/00J7 . . [N: Hollow flexible articles, e.g. blown foils or films] [N1203]
- B29C47/00J8 . . [N: Multi-passage hollow articles, e.g. having at least two holes, e.g. honeycomb articles] [N1203]
- B29C47/00J9 . . [N: Articles having cross-sectional irregularities, i.e. being non-flat or having cylindrical cross-sections perpendicular to the extrusion direction] [N1203]
- B29C47/00J10 . . [N: Articles having longitudinal irregularities, i.e. the cross-section being non-constant in the extrusion direction] [N1203]
- B29C47/00J11 . . [N: Curved articles] [N1203]

- B29C47/00L . [N: Combined shaping operations] [N1203]
- B29C47/00L4 . . [N: Extrusion moulding combined with compression moulding (**compression moulding in general [B29C43/00](#)**)] [N1203]
- B29C47/00L5 . . [N: 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 [B29C44/00](#)**)] [N1203]
- B29C47/00L6 . . [N: Extrusion moulding in several steps, i.e. components merging outside the die (**[B29C47/55](#) takes precedence**)] [N1203]
- B29C47/00L6A . . . [N: producing flat articles having components brought in contact outside the extrusion die] [N1203]
- B29C47/00L6B . . . [N: producing hollow articles having components brought in contact outside the extrusion die] [N1203]
- B29C47/00L6B2 [N: using a plurality of extrusion dies] [N1203]
- B29C47/00L7 . . [N: Extrusion moulding combined with blow-moulding or thermoforming (**blow-moulding in general [B29C49/00](#); thermoforming in general [B29C51/00](#)**)] [N1203]
- B29C47/00L8 . . [N: Extrusion moulding combined with shaping by orienting, stretching or shrinking, e.g. film blowing (**[B29C47/00L7](#) takes precedence**) (**shaping by stretching in general [B29C55/00](#); shaping by liberation of internal stresses in general [B29C61/00](#)**)] [N1203]
- B29C47/00L9 . . [N: Extrusion moulding combined with shaping by flattening, folding or bending (**bending, folding or flattening in general [B29C53/00](#)**)] [N1203]
- B29C47/00L10 . . [N: Extrusion moulding combined with surface shaping (**surface shaping in general [B29C59/00](#)**)] [N1203]
- B29C47/00L11 . . [N: Extrusion moulding combined with joining, lining or laminating (**joining in general [B29C65/00](#); lining in general [B29C63/00](#); laminating in general [B32B37/00](#)**)] [N1203]
- B29C47/00L12 . . [N: Extrusion moulding combined with cutting] [N1203]
- B29C47/00L13 . . [N: Extrusion moulding combined with printing or marking] [N1203]

- B29C47/00M . [N: extruding under particular conditions, e.g. in particular environments or using vacuum or vibrations] [C1203]
- B29C47/00M2 . . [N: extruding in a clean room] [N1203]
- B29C47/00M4 . . [N: using force fields, e.g. gravity or electrical fields (**[B29C47/88C4D6](#) takes precedence**)] [N1203]
- B29C47/00M6 . . [N: at a location before or in the feed unit, e.g. influencing the material in the

- hopper] [N1203]
- B29C47/00M8 . . [N: at the plasticising zone] [N1203]
- B29C47/00M10 . . [N: at a venting zone] [N1203]
- B29C47/00M12 . . [N: in the die] [N1203]
- B29C47/00M14 . . [N: after the die nozzle] [N1203]
- B29C47/00M14B . . . [N: at the die nozzle exit zone] [N1203]
- B29C47/00M14D . . . [N: at a calibration zone] [N1203]
- B29C47/00M14F . . . [N: at a conveyor] [N1203]
- B29C47/00M14H . . . [N: at a storing zone] [N1203]

- B29C47/02 . incorporating preformed parts or layers, e.g. extrusion moulding around inserts or for coating articles
- B29C47/02B . . [N: Coating hollow articles] [C1203]
- B29C47/02B2 . . . [N: Coating the interior of hollow articles]
- B29C47/02B4 . . . [N: Coating the inner and outer surfaces of hollow reinforcement]
- B29C47/02C . . [N: Coating non-hollow articles] [C1203]
- B29C47/02C2 . . . [N: partially]
- B29C47/02D . . [N: Simultaneous coating of more than one article]
- B29C47/02E . . [N: Coating discontinuous element or linked elements]

- B29C47/04 . of multilayered [N: or multi-component, e.g. co-extruded layers or components] or multicoloured articles [N: or coloured articles] [N: (adapter blocks [B29C47/56](#))] [C1203]
- B29C47/04A . . [N: Coloured articles] [N1203]
- B29C47/04A2 . . . [N: comprising a multi-coloured single component, e.g. striated, marbled or wood-like patterned] [N1203]
- B29C47/06 . . Multilayered articles [N: or multi-component articles] [C1203]
- B29C47/06N . . . [N: comprising six or more components, i.e. each component being counted once for each time it is present, e.g. in a layer] [N1203]
- B29C47/06O . . . [N: with components adjacent to each other, i.e. components merging at their short sides] [N1203]
- B29C47/06O1 [N: in the form of a thin strip, e.g. in the form of a helical pattern or mark lines] [N1203]
- B29C47/06P . . . [N: with components in layered configuration, i.e. components merging at their long sides] [N1203]
- B29C47/06Q . . . [N: using means for adhering the layers or components, e.g. using tie layers, irregularities or undercuts] [N1203]
- B29C47/06R . . . [N: using means for avoiding adhering the layers or components, e.g. articles comprising peelable layers] [N1203]

- B29C47/08 . Component parts, details or accessories; Auxiliary operations
- B29C47/08D . . [N: Drive or actuation means; Transmission means; Screw supporting means] [C1203]
- B29C47/08D2 . . . [N: Shaft or screw supports, e.g. bearings] [N1203]
- B29C47/08D4 . . . [N: Direct drives or gear boxes] [N1203]
- B29C47/08D6 . . . [N: Drive or actuation means for non-plasticising purposes, e.g. dosing unit] [N1203]

- B29C47/08F . . [N: Sealing means]
- B29C47/08F2 . . . [N: for filters] [N1203]
- B29C47/08I . . [N: Flow control means, i.e. adjustable parts, e.g. valves (**throttling of flow B29C47/08V**)] [N1203]
- B29C47/08I2 . . . [N: in the feeding, melting, plasticising or pumping zone, e.g. screw, barrel, gear-pump or ram] [N1203]
- B29C47/08I4 . . . [N: provided in or in the proximity of filter devices] [N1203]
- B29C47/08I6 . . . [N: provided in or in the proximity of dies (**B29C47/12C, B29C47/16, B29C47/22 take precedence**)] [N1203]
- B29C47/08K . . [N: Exchangeable extruder parts (**B29C47/68B takes precedence**)] [N1203]
- B29C47/08K2 . . . [N: Mounting and handling of the screw] [N1203]
- B29C47/08K4 . . . [N: Mounting and handling of the die] [N1203]
- B29C47/08K6 . . . [N: Mounting and handling of the hopper or feeder] [N1203]
- B29C47/08K8 . . . [N: Screw parts] [N1203]
- B29C47/08K10 . . . [N: Barrel parts] [N1203]
- B29C47/08K12 . . . [N: Die parts] [N1203]
- B29C47/08K14 . . . [N: Hopper or feeder parts] [N1203]
- B29C47/08K16 . . . [N: Inserts] [N1203]
- B29C47/08K16B [N: for screws] [N1203]
- B29C47/08K16D [N: for barrels] [N1203]
- B29C47/08K16F [N: for dies] [N1203]
- B29C47/08L . . [N: General arrangement or layout of plants] [N1203]
- B29C47/08L2 . . . [N: for extruding parallel streams of material, e.g. several separate parallel streams of extruded material forming separate articles (**B29C47/30, B29C47/00L6 take precedence**)] [N1203]
- B29C47/08O . . [N: Extruder machines or parts thereof characterised by the material or by their manufacturing process (**B29C47/08K take precedence; making of dies B23P15/24**)] [N1203]
- B29C47/08O2 . . . [N: Screws] [N1203]
- B29C47/08O2B [N: Material therefor, e.g. coating or lining] [N1203]
- B29C47/08O4 . . . [N: Barrels] [N1203]
- B29C47/08O4B [N: Material therefor, e.g. coating or lining] [N1203]
- B29C47/08O6 . . . [N: Dies] [N1203]
- B29C47/08O6B [N: Material therefor, e.g. coating or lining] [N1203]
- B29C47/08P . . [N: Design of extruder parts, e.g. by modelling based on mathematical theories or experiments] [N1203]
- B29C47/08P2 . . . [N: by modelling material flow, e.g. melt interaction with screw and barrel] [N1203]
- B29C47/08P2B [N: in the plasticising zone] [N1203]
- B29C47/08P2D [N: in the die zone] [N1203]
- B29C47/08P4 . . . [N: of intermeshing screws] [N1203]
- B29C47/08P6 . . . [N: by modelling of mechanical strength] [N1203]
- B29C47/08Q . . [N: Machine bases, support structures or frames] [N1203]
- B29C47/08R . . [N: 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]

- N1203]
- B29C47/08R2 . . . [N: allowing small relative movement, e.g. adjustments for aligning the apparatus parts or for compensating for thermal expansion] [N1203]
- B29C47/08U . . [N: Intermediate treatments, e.g. relaxation, annealing or decompression step for the melt ([B29C47/76](#) takes precedence)] [N1203]
- B29C47/08V . . [N: Throttling of the flow, e.g. for cooperating with plasticising elements or for degassing (flow control means [B29C47/08!](#))] [N1203]
- B29C47/08W . . [N: Extrusion in non-steady condition, e.g. start-up or shut-down] [N1203]
- B29C47/08W1 . . . [N: Material change] [N1203]
- B29C47/08W2 . . . [N: Intermittent extrusion] [N1203]
- B29C47/08X . . [N: Cleaning, purging; Avoiding contamination for cleaning extruder parts] [N1203]
- B29C47/08X2 . . . [N: of feeding units] [N1203]
- B29C47/08X4 . . . [N: of plasticising units] [N1203]
- B29C47/08X6 . . . [N: of dies] [N1203]
- B29C47/08X8 . . . [N: of filters] [N1203]
- B29C47/08X8B [N: using back flow] [N1203]
- B29C47/08X8D [N: using scrapers] [N1203]
- B29C47/08X10 . . . [N: of the extruded articles] [N1203]
- B29C47/08Y . . [N: Recovering or reusing of energy, materials or the like] [N1203]
- B29C47/08Y2 . . . [N: of energy] [N1203]
- B29C47/08Y4 . . . [N: of materials] [N1203]
- B29C47/08Y4B [N: of additives or processing aids] [N1203]
- B29C47/08Z . . [N: Storing of the manufactured articles, e.g. winding up or stacking] [N1203]
- B29C47/10 . . Feeding the material to the extruder
- B29C47/10F . . . Raw material dosing [N1203]
- B29C47/10H . . . Raw material pre-treatment while feeding (pre-treatment of the material to be shaped in general [B29B15/00](#); handling of the material to be shaped in general [B29C31/00](#); [B29C47/78](#) takes precedence) [N1203]
- B29C47/10J . . . [N: in solid form, e.g. powder or granules] [N1203]
- B29C47/10J2 [N: of preformed parts, e.g. inserts that are fed and transported generally uninfluenced through the extruder or fed directly to the die] [N1203]
- B29C47/10J4 [N: of fibrous, filamentary or filling materials e.g. thin fibrous reinforcements or fillers] [N1203]
- B29C47/10J6 [N: in band and/or in strip form, e.g. rubber strips] [N1203]
- B29C47/10L . . . [N: in liquid form] [N1203]
- B29C47/10N . . . [N: in gaseous form] [N1203]
- B29C47/10P . . . [N: at several locations, e.g. using several hoppers or using a separate additive feeding] [N1203]
- B29C47/10R . . . [N: in a location other than through a barrel, e.g. through a screw] [N1203]
- B29C47/12 . . Extrusion nozzles or dies
- B29C47/12A . . . [N: having reciprocating, oscillating or rotating parts] [N1203]
- B29C47/12C . . . [N: being adjustable, i.e. having adjustable exit sections] [C1203]
- B29C47/12D . . . [N: using dies or die parts movable in a closed circuit, e.g. mounted on movable endless support ([B29C47/32](#) takes precedence)]

- B29C47/12E . . . [N: specially adapted for bringing together components, e.g. melts within the die] [N1203]
- B29C47/14 . . . with broad opening, e.g. for sheets
- B29C47/14B [N: specially adapted for bringing together components, e.g. melts within the die] [N1203]
- B29C47/16 [N: being] adjustable [N: i.e. having adjustable exit sections] [C1203]
- B29C47/16B [N: by positioning the die lips] [N9510]
- B29C47/18 with die parts oscillating relative to each other
- B29C47/20 . . . with annular opening, e.g. for tubular articles
- B29C47/22 [N: being] adjustable [N: i.e. having adjustable exit sections] [C1203]
- B29C47/22B [N: with centering means]
- B29C47/24 with die parts rotatable relative to each other
- B29C47/26 Multiple annular extrusion nozzles [N: specially adapted for bringing together components, e.g. melts within the die] [C1203]
- B29C47/26D [N: the components merging one by one down streams in the die] [N1203]
- B29C47/26D2 [N: using a layered die, e.g. stacked discs] [N1203]
- B29C47/26D4 [N: using a die with concentric parts, e.g. rings, cylinders] [N1203]
- B29C47/26E [N: the components merging at a common location] [N1203]
- B29C47/26E2 [N: using a die with concentric parts, e.g. rings, cylinders] [N1203]
- B29C47/28 Cross-head annular extrusion nozzles
- B29C47/30 . . . Multi-port extrusion nozzles [N: (for making granules in the form of filamentary material [B29B9/06](#))]
- B29C47/32 . . . Roller-extrusion nozzles
- B29C47/34 . . Conveyers for extruded material [N: ([B29C47/08Z](#) takes precedence)] [C1203]
- B29C47/36 . . Means for plasticising or homogenising the moulding material or forcing it through the nozzle or die
- B29C47/36B . . . [N: with the barrel or with a part thereof rotating] [N9503]
- B29C47/36F . . . [N: using static mixing devices] [N9503]
- B29C47/36H . . . [N: using non-actuated dynamic mixing devices] [N1203]
- B29C47/36J . . . [N: using gear pumps] [N1203]
- B29C47/36L . . . [N: Multi stage plasticisers, homogenisers or feeders (multi stage plasticisers using at least two screws in the same barrel [B29C47/50](#))] [N1203]
- B29C47/36L2 [N: using a first screw extruder and a second screw extruder] [N1203]
- B29C47/36L4 [N: using a screw extruder and a gear pump] [N1203]
- B29C47/36L6 [N: using a screw extruder and a ram or piston] [N1203]
- B29C47/36L8 [N: Partial multi-stage] [N1203]
- B29C47/38 . . . using screws [N: surrounded by a cooperating barrel] [C1203]
- B29C47/38M [N: using a single screw] [N1203]
- B29C47/40 using at least two [N: parallel] intermeshing screws [N: or at least two parallel non-intermeshing screws] [C1203]
- B29C47/40E [N: the screws having intermeshing parts] [N1203]
- B29C47/40F [N: the screws having non-intermeshing parts] [N1203]
- B29C47/40G [N: using non-identical or non-mirrored screws] [N1203]

B29C47/40I	. . . . .	[N: using more than two screws (B29C47/42 takes precedence)] [N1203]
B29C47/42	. . . . .	using sub-screws, e.g. planetary screws
B29C47/44	. . . . .	using axially movable screws [N: in relation to the barrel] [C1203]
B29C47/46	. . . . .	using screws extruding in opposite directions [N: e.g. separate screws arranged after each other and feeding in opposite directions] [C1203]
B29C47/48	. . . . .	using screws arranged coaxially, one within the other
B29C47/50	. . . . .	using at least two screws [N: in the same barrel], one after the other, e.g. multi stage plasticisers [C1203]
B29C47/52	. . . . .	using rollers or discs
B29C47/52B	. . . . .	[N: using rollers]
B29C47/52B4	. . . . .	[N: using single rollers, e.g. provided with protrusions, closely surrounded by a housing with movement of the material in the axial direction] [N9503]
B29C47/52B4B	. . . . .	[N: Cavity transfer mixing devices, i.e. a roller and surrounding barrel both provided with cavities; Barrels and rollers therefor] [N9503]
B29C47/54	. . . . .	using press rams or pistons [N: or accumulators] [C1203]
B29C47/56	. . . . .	using more than one extruder to feed one die
B29C47/58	. . . . .	Details
B29C47/58B	. . . . .	[N: Extruder feed section]
B29C47/60	. . . . .	Screws [N: (screws characterized by the material or by their manufacturing process B29C47/08O2)] [C1203]
B29C47/60G	. . . . .	[N: Hollow screws, i.e. comprising flow passage inside the screws] [N1203]
B29C47/60H	. . . . .	[N: having varying outer diameter, e.g. screws with a conical part] [N1203]
B29C47/60I	. . . . .	[N: having varying channel depth] [N1203]
B29C47/60J	. . . . .	[N: having variable channel pitch] [N1203]
B29C47/60K	. . . . .	[N: having forward feeding elements] [N1203]
B29C47/60L	. . . . .	[N: having reverse feeding elements] [N1203]
B29C47/60M	. . . . .	[N: having grooves or cavities] [N1203]
B29C47/60N	. . . . .	[N: having projections with a short length in the screw direction, e.g. pins] [N1203]
B29C47/60O	. . . . .	[N: having kneading disc like elements, e.g. staggered discontinuous elements with a generally oval cross section] [N1203]
B29C47/60P	. . . . .	[N: having shear ring like elements, i.e. with a generally circular cross section] [N1203]
B29C47/60Q	. . . . .	[N: having gears, i.e. interacting with the flow] [N1203]
B29C47/60R	. . . . .	[N: characterised by thread details, i.e. by the special shape of a single thread, e.g. by irregularities within one thread] [N1203]
B29C47/60S	. . . . .	[N: characterised by valley details, i.e. by the special shape of a single valley, e.g. by irregularities within one valley] [N1203]
B29C47/60T	. . . . .	[N: characterised by the length of the screw or of a section] [N1203]
B29C47/60U	. . . . .	[N: having parts without mixing elements, e.g. having cylinder shaped sections] [N1203]
B29C47/62	. . . . .	having more than one screw-thread [N: , i.e. the screw cross section showing at least two threads] [C1203]
B29C47/62D	. . . . .	[N: the neighbouring threads and channels having identical configurations] [N1203]

B29C47/62E	. . . . .	[N: the neighbouring threads or channels having different configurations, e.g. one flight having constantly a smaller diameter or height than the neighbouring flight] [N1203]
B29C47/62F	. . . . .	[N: being multi-flight and having three or more flights] [N1203]
B29C47/64	. . . . .	having incorporated mixing devices [N: (B29C47/60G to B29C47/62F take precedence)] [C1203]
B29C47/66	. . . . .	Barrels or cylinders [C1203]
B29C47/66B	. . . . .	[N: for single screws] [N1203]
B29C47/66C	. . . . .	[N: for twin screws] [N9503] [C1203]
B29C47/66D	. . . . .	[N: for more than two screws] [N1203]
B29C47/66E	. . . . .	[N: having adaptable feed or discharge locations, e.g. for varying the amount of kneading by changing hopper position or discharge exit] [N1203]
B29C47/66G	. . . . .	[N: with irregular inner surfaces] [N1203]
B29C47/66G2	. . . . .	[N: having grooves or cavities] [N1203]
B29C47/66G4	. . . . .	[N: having projections with a short length in the barrel direction, e.g. pins] [N1203]
B29C47/66G6	. . . . .	[N: having threads] [N1203]
B29C47/68	. . . . .	Filters; [N: Screens]
B29C47/68B	. . . . .	[N: Filtering devices with at least two parallel filters to be used alternately; Movable filters and changing mechanisms therefor] [N9601]
B29C47/68B2	. . . . .	[N: the filters being fitted on a single rectilinearly reciprocating slide (B29C47/68B5 takes precedence)] [N9601]
B29C47/68B3	. . . . .	[N: the filters being fitted on a rotatable or pivotable disc or on the circumference of a rotatable or pivotable cylinder] [N9601]
B29C47/68B3B	. . . . .	{7 dots} [N: Continuously rotating cylindrical filters] [N9601]
B29C47/68B5	. . . . .	[N: the filters being in the form of a continuous web displaceable to utilise adjacent areas consecutively] [N9601]
B29C47/68C	. . . . .	[N: Substantially flat filters mounted at the end of an extruder screw and perpendicular to its axis (B29C47/68B takes precedence)] [N9601]
B29C47/68D	. . . . .	[N: Cylindrical or conical filters (B29C47/68B takes precedence)] [N9601]
B29C47/68D2	. . . . .	[N: surrounding a rotating screw] [N9601]
B29C47/70	. . . . .	Flow dividers
B29C47/70B	. . . . .	[N: comprising means for dividing, distributing and recombining melt flows]
B29C47/70B2	. . . . .	[N: in the die zone, e.g. to create flow homogeneity] [N1203]
B29C47/70B4	. . . . .	[N: component or layer multiplying] [N1203]
B29C47/72	. . . . .	Feed-back means
B29C47/72B	. . . . .	[N: for plasticising or homogenising devices] [N9605] [C1203]
B29C47/74	. . . . .	By-pass means
B29C47/74B	. . . . .	[N: for plasticising or homogenising devices] [N9605] [C1203]
B29C47/76	. . . . .	Venting, [N: drying] or degassing means [C9605]
B29C47/76N	. . . . .	[N: the vented material being in liquid form] [N1203]
B29C47/76O	. . . . .	[N: Vapour stripping] [N1203]
B29C47/76P	. . . . .	[N: Vent constructions, e.g. venting means avoiding melt escape] [N1203]
B29C47/76Q	. . . . .	[N: in the extruder apparatus] [N1203]

B29C47/76Q2	. . . . .	[N: in screw extruders] [N1203]
B29C47/76Q2B	. . . . .	{7 dots} [N: through a degassing opening of a barrel] [N1203]
B29C47/76R	. . . . .	[N: outside the apparatus, e.g. after the die] [N1203]
B29C47/78	. .	Heating or cooling the material to be extruded or the stream of extruded material [N: or of a preformed part] [C1203]
B29C47/78D	. . .	[N: of a preformed part, e.g. a core before entering a die or before entering a barrel] [N1203]
B29C47/78F	. . .	[N: at a location before the plasticising zone, e.g. of the material in the hopper] [N1203]
B29C47/78F2	. . . .	[N: heating] [N1203]
B29C47/78F4	. . . .	[N: cooling] [N1203]
B29C47/80	. . .	at plasticising zone [N: , e.g. from the feed section until the die entrance] [C1203]
B29C47/80B	. . . .	[N: heating] [N1203]
B29C47/80D	. . . .	[N: cooling] [N1203]
B29C47/80F	. . . .	[N: characterised by differential heating or cooling] [N1203]
B29C47/82	. . . .	Heating [N: or cooling] the cylinders
B29C47/82B	. . . . .	[N: heating] [N1203]
B29C47/82D	. . . . .	[N: cooling] [N1203]
B29C47/82F	. . . . .	[N: characterised by differential heating or cooling] [N1203]
B29C47/84	. . . .	Heating [N: or cooling] the screws
B29C47/84H	. . . . .	[N: heating] [N1203]
B29C47/84J	. . . . .	[N: cooling] [N1203]
B29C47/84L	. . . . .	[N: characterised by differential heating or cooling] [N1203]
B29C47/86	. . . .	at nozzle zone
B29C47/86B	. . . . .	[N: heating] [N1203]
B29C47/86D	. . . . .	[N: cooling] [N1203]
B29C47/86F	. . . . .	[N: characterised by differential heating or cooling] [N1203]
B29C47/86F2	. . . . .	[N: in the direction of the stream of the material] [N1203]
B29C47/88	. . .	Heating or cooling the stream of extruded material [N: Attention is drawn to Note (3) following the subclass title]
B29C47/88B	. . . . .	[N: Heating]
B29C47/88B2	. . . . .	[N: of hollow articles]
B29C47/88C	. . . . .	[N: cooling]
B29C47/88C2	. . . . .	[N: of hollow articles]
B29C47/88C2B	. . . . .	[N: of tubular films]
B29C47/88C2B2	. . . . .	{7 dots} [N: internally]
B29C47/88C2B4	. . . . .	{7 dots} [N: externally]
B29C47/88C4	. . . . .	[N: of flat articles, e.g. using specially adapted supporting means]
B29C47/88C4B	. . . . .	[N: cooling drums]
B29C47/88C4C	. . . . .	[N: Endless cooling belts]
B29C47/88C4D	. . . . .	[N: with means for improving the adhesion to the supporting means]
B29C47/88C4D2	. . . . .	{7 dots} [N: Pressure rollers]
B29C47/88C4D4	. . . . .	{7 dots} [N: using vacuum]

- B29C47/88C4D6 {7 dots} [N: Electrostatic pinning]
- B29C47/88C4D8 {7 dots} [N: by applying pressurised gas to the surface of the flat article]
- B29C47/88C4E [N: by interposing a fluid layer between the supporting means and the flat article]
- B29C47/88E [N: characterized by differential heating or cooling] [N1203]
- B29C47/88E2 [N: in the direction of the stream of the material] [N1203]
- B29C47/88G [N: using a bath, e.g. extruding into an open bath to coagulate or cool the material] [N1203]
- B29C47/90 with calibration or sizing
- B29C47/90B [N: of hollow bodies]
- B29C47/90B2 [N: internally]
- B29C47/90B3 [N: externally]
- B29C47/90D [N: using dry calibration, i.e. no quenching tank, e.g. with water spray for cooling or lubrication] [N1203]
- B29C47/90F [N: using wet calibration, i.e. in a quenching tank] [N1203]
- B29C47/90H [N: using roller calibration] [N1203]
- B29C47/90K [N: using adjustable calibrators; e.g. the dimensions of the calibrator being changeable] [N1203]
- B29C47/90M [N: characterised by calibrator surface, e.g. structure or holes for lubrication, cooling or venting] [N1203]
- B29C47/92 . . . Measuring, controlling or regulating [C1203]
 - [N: **Note** [C12.04]
 - When classifying in group [B29C47/92](#) it is desirable to add the indexing codes of [L29C947/00](#) relating to measuring, controlling or regulating in extrusion moulding]
- B29C47/94 . . . Lubricating [N: , e.g. adding lubrication to the melt] [C1203]
- B29C47/96 . . . Safety devices
- B29C47/96B [N: Personnel safety, e.g. safety for the operator] [N1203]

- B29C49/00** **Blow-moulding, i.e. blowing a preform or parison to a desired shape within a mould; Apparatus therefor** [N: (extrusion moulding of tubular films [B29C47/00J7](#); enlarging tube ends using pressure difference [B29C57/08](#))] [M1204]

- B29C49/00B . . . [N: characterised by the choice of material]
 - [N: **Notes**
 - [C1201] 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]

- B29C49/00C . . . [N: for making articles of indefinite length, e.g. corrugated tubes]
- B29C49/00C2 [N: using moulds or mould parts movable in a closed path, e.g. mounted on movable endless supports] [C1202]
- B29C49/00C2K [N: 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] [N1202]
- B29C49/00D . [N: for making articles having hollow walls]
- B29C49/00E . [N: without using a mould]
- B29C49/00F . [N: Sheet blow-moulding, i.e. using at least two parallel sheets or a folded sheet as a preform]
- B29C49/00G . [N: characterised by the parison configuration, e.g. nestable ([B29C49/22](#) takes precedence)] [C9712]
- B29C49/00G2 . . [N: Parisons having internal or external ribs] [N9706]
- B29C49/00G2B . . . [N: the internal ribs being connected to the opposite wall, e.g. forming an internal separating wall] [N1202]
- B29C49/02 . Combined blow-moulding and manufacture of the preform or the parison
- B29C49/02B . . [N: the parison being partly injected and partly extruded]
- B29C49/04 . . Extrusion blow-moulding
- B29C49/04B . . . [N: using an accumulator head] [N1202]
- B29C49/06 . . Injection blow-moulding [N: (introducing a fluid into the interior of the injected material which is still in a molten state [B29C45/17B2](#))]
- B29C49/06B . . . [N: with parison holding means displaceable between injection and blow stations]
- B29C49/06B2 [N: following an arcuate path, e.g. rotary or oscillating-type]
- B29C49/06B2B [N: with the parison axis held in the plane of rotation]
- B29C49/06B3 [N: following a rectilinear path, e.g. shuttle-type]
- B29C49/08 . Biaxial stretching during blow-moulding [N: with or without prestretching]
- B29C49/08B . . [N: without prestretching]
- B29C49/10 . . using mechanical means [N: for prestretching]
- B29C49/12 . . . Stretching rods
- B29C49/14 . . . Clamps
- B29C49/16 . . using pressure difference [N: for prestretching], e.g. pre-blowing [N: ([B29C49/64C4](#) takes precedence)] [C9706]
- B29C49/18 . using several blowing steps ([B29C49/16](#) takes precedence)
- B29C49/18B . . [N: in different mould cavities] [N1202]
- B29C49/20 . of articles having inserts or reinforcements; [N: Handling of inserts or reinforcements] [C1204]
- B29C49/22 . using multilayered preforms or parisons
- B29C49/22B . . [N: at least one layer being injected (injection moulding of multilayered parisons [B29C45/16G2](#), [B29C45/16G4](#))] [C9712]
- B29C49/24 . Lining or labelling
- B29C49/24B . . [N: Inserting labels or films into blow-moulds, e.g. in-mould-labellers]
- B29C49/26 . . inner lining of tubes

- B29C49/28 . Blow-moulding apparatus
- B29C49/30 . . having movable moulds or mould parts
- B29C49/32 . . . moving "to and fro"
- B29C49/34 the mould parts moving "hand-over-hand"
- B29C49/36 . . . rotatable about one axis
- B29C49/38 . . . mounted on movable endless supports [N: ([B29C49/00C2](#) takes precedence)]
- B29C49/40 on co-operating drums

- B29C49/42 . Component parts, details or accessories; Auxiliary operations
- B29C49/42B . . [N: Handling means, e.g. transfer, loading or discharging means (handling of inserts or reinforcements [B29C49/20](#); handling of labels [B29C49/24B](#))] [C1204]
- B29C49/42B2 . . . [N: for blown articles]
- B29C49/42B4 . . . [N: for increasing the space between preforms, e.g. in order to perform the blow moulding step] [N9706]
- B29C49/42C . . [N: Drive means]
- B29C49/42D . . [N: Means for deforming the parison prior to the blowing operation (49/08 takes precedence)]
- B29C49/42D2 . . . [N: Spreading or extending means]
- B29C49/42E . . [N: Auxiliary operations prior to the blow moulding operation, e.g. cutting ([B29C49/64](#), [B29C49/76](#), [B29C49/78](#) take precedence)] [N1202]
- B29C49/42F . . [N: Auxiliary operations during the blow moulding operation ([B29C49/64](#), [B29C49/76](#), [B29C49/78](#) take precedence)] [N1202]
- B29C49/42G . . [N: Auxiliary operations after the blow moulding operation ([B29C49/64](#), [B29C49/70](#), [B29C49/72](#), [B29C49/76](#), [B29C49/78](#) take precedence)] [N1202]
- B29C49/42G4 . . . [N: Cutting, rearranging and joining the cut parts] [N1202]
- B29C49/42H . . [N: Means for recycling or reusing auxiliaries or materials, e.g. blowing fluids or energy] [N1202]
- B29C49/42K . . [N: Valve constructions or configurations, e.g. arranged to reduce blowing fluid consumption] [N1202]
- B29C49/44 . . for applying pressure through the walls of an inflated bag
- B29C49/46 . . characterised by using a particular environment or blow fluids other than air
- B29C49/48 . . Moulds
- B29C49/48A . . . [N: with means for locally compressing part(s) of the parison in the main blowing cavity]
- B29C49/48A10 [N: by means of movable mould parts] [N1202]
- B29C49/48B . . . [N: with means for closing off parison ends]
- B29C49/48C . . . [N: with means for moulding parts of the parisons in an auxiliary cavity, e.g. moulding a handle]
- B29C49/48D . . . [N: with incorporated heating or cooling means]
- B29C49/50 . . . having cutting or deflashing means
- B29C49/52 . . . having decorating or printing means
- B29C49/54 . . . for undercut articles
- B29C49/54B [N: having a recessed undersurface]
- B29C49/56 . . Opening, closing or clamping means
- B29C49/58 . . Blowing means [N: ([B29C45/17B4](#) takes precedence)]

- B29C49/60 . . . Blow-needles
- B29C49/62 . . Venting means
- B29C49/64 . . Heating or cooling preforms, parisons or blown articles
- B29C49/64B . . . [N: Thermal conditioning of preforms ([B29C49/68](#) takes precedence)]
- B29C49/64B2 [N: by reheating cold preforms in a single stage ([B29C49/64B4](#) takes precedence)]
- B29C49/64B3 [N: by cooling hot or molten preforms in a single stage ([B29C49/64B4](#) takes precedence)]
- B29C49/64B4 [N: producing a temperature differential]
- B29C49/64B4B [N: through the preform length]
- B29C49/64B4C [N: along the preform thickness]
- B29C49/64B5 [N: Mandrels or cores specially adapted for heating or cooling preforms]
- B29C49/64C [N: in several stages ([B29C49/64B](#) takes precedence)]
- B29C49/64C2 [N: using several mould cavities for each article]
- B29C49/64C4 [N: at least one stage being a heating stage used for shrinking of a preform prior to a subsequent blowing stage] [C9810]
- B29C49/66 . . . Cooling by refrigerant introduced into the blown article
- B29C49/68 . . . Ovens specially adapted for heating preforms or parisons
- B29C49/70 . . Removing or ejecting blown articles from the mould
- B29C49/72 . . Deflashing outside the mould
- B29C49/74 . . . Deflashing the neck portion
- B29C49/76 . . Neck calibration
- B29C49/78 . . Measuring, controlling or regulating
- B29C49/78B . . . [N: the blowing pressure]
- B29C49/78D . . . [N: the temperature] [N1202]
- B29C49/80 . . . Testing, e.g. for leaks

- B29C51/00** **Shaping by thermoforming**, [N: i.e. shaping sheets or sheet like preforms after heating], e.g. shaping sheets in matched moulds or by deep-drawing; Apparatus therefor [N: (blow moulding of tubular preforms [B29C49/00](#), deforming of tubular or hollow preforms [B29C67/00E](#))] [C1202]

- B29C51/00B . [N: characterised by the choice of material]

- [N: **Notes**
[C1201] 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
]
- B29C51/00B2 . . [N: Textile or other fibrous material made from plastics fibres (combined with plastic layers [B29C51/14B](#); compression moulding of reinforced plastic articles in matched moulds [B29C70/46](#); using pressure difference [B29C70/44](#))] [C0901]
- B29C51/00C . [N: for making articles having hollow walls]
- B29C51/00D . [N: without using a mould, e.g. ballooning (as prestretching step 51/06)]

- B29C51/02 . Combined thermoforming and manufacture of the preform
- B29C51/04 . Combined thermoforming and prestretching, e.g. biaxial stretching
- B29C51/06 . . using pressure difference [N: for prestretching]
- B29C51/08 . Deep drawing or matched-mould forming, i.e. using mechanical means only
- B29C51/08B . . [N: by shaping between complementary mould parts]
- B29C51/08B2 . . . [N: with at least one of the shaping surfaces being made of resilient material, e.g. rubber]
- B29C51/08B3 . . . [N: with at least one of the mould parts comprising independently movable sections ([B29C51/32](#) and [B29C51/34](#) take precedence)]
- B29C51/10 . Forming by pressure difference, e.g. vacuum
- B29C51/10F . . [N: 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 ([B29C51/26M2](#), [B29C49/00F](#) take precedence)] [N1202]
- B29C51/12 . of articles having inserts or reinforcements
- B29C51/14 . using multilayered preforms or sheets
- B29C51/14B . . [N: having at least one layer of textile or fibrous material combined with at least one plastics layer]
- B29C51/16 . Lining or labelling
- B29C51/16B . . [N: of deep containers or boxes]
- B29C51/16C . . [N: combined with the feeding or the shaping of the lining or the labels (by injection moulding [B29C45/14B](#), [B29C45/14D](#))] [C9712]
- B29C51/16C2 . . . [N: of a continuous strip] [N9712]
- B29C51/18 . Thermoforming apparatus
- B29C51/20 . . having movable moulds or mould parts
- B29C51/22 . . . rotatable about an axis
- B29C51/22B [N: mounted on a vacuum drum (for surface shaping [B29C59/06](#))]
- B29C51/24 . . . mounted on movable endless supports
- B29C51/26 . Component parts, details or accessories; Auxiliary operations
- B29C51/26B . . [N: Handling means, e.g. transfer means, feeding means ([B29C51/44](#) takes precedence)] [C9601]
- B29C51/26B2 . . . [N: Clamping means for the sheets, e.g. clamping frames]
- B29C51/26D . . [N: characterised by using a particular environment, e.g. sterile]
- B29C51/26H . . [N: Auxiliary operations prior to the thermoforming operation, e.g. cutting ([B29C51/42](#), [B29C51/46](#) take precedence)] [N1202]
- B29C51/26K . . [N: Auxiliary operations during the thermoforming operation ([B29C51/42](#), [B29C51/46](#) take precedence)] [N1202]
- B29C51/26M . . [N: Auxiliary operations after the thermoforming operation ([B29C51/42](#), [B29C51/44](#), [B29C51/46](#) take precedence)] [N1202]
- B29C51/26M2 . . . [N: Two sheets being thermoformed in separate mould parts and joined

- together while still in the mould ([B29C49/00F](#) takes precedence)] [N1202]
- B29C51/26M4 . . . [N: Cutting, rearranging and joining the cut parts] [N1202]
- B29C51/28 . . for applying pressure through the wall of an inflated bag or diaphragm
- B29C51/30 . . Moulds
- B29C51/30B . . . [N: with sealing means or the like]
- B29C51/30C . . . [N: with means for forming a rim (combined with cutting [B29C51/32B](#); rim rolling per se [B29C53/34](#))]
- B29C51/32 . . . having cutting means
- B29C51/32B [N: combined with means for forming a rim]
- B29C51/34 . . . for undercut articles
- B29C51/34B [N: having recessed undersurfaces]
- B29C51/34C [N: specially adapted to facilitate the destacking of nestable containers]
- B29C51/36 . . . specially adapted for vacuum forming [N:, Manufacture thereof]
- B29C51/36B [N: Porous moulds]
- B29C51/38 . . . Opening, closing or clamping means
- B29C51/40 . . . Venting means
- B29C51/42 . . Heating or cooling
- B29C51/42B . . . [N: of preforms, specially adapted for thermoforming (preheating sheets in general [B29B13/02D](#); [B29C51/42D](#) takes precedence)]
- B29C51/42B2 [N: to produce a temperature differential ([B29C51/42C](#) takes precedence)]
- B29C51/42B2B [N: through the thickness of the preform]
- B29C51/42B3 [N: using a heated fluid]
- B29C51/42B4 [N: using movable heating devices]
- B29C51/42C . . . [N: Producing specific thermal regimes during thermoforming to obtain particular properties]
- B29C51/42D . . . [N: Cooling of the material with a fluid blast]
- B29C51/42E . . . [N: of moulds or mould parts]
- B29C51/44 . . Removing or ejecting moulded articles
- B29C51/44B . . . [N: from a support after moulding, e.g. by cutting]
- B29C51/46 . . Measuring, controlling or regulating

B29C53/00**Shaping by bending, folding, twisting, straightening or flattening; Apparatus therefor ([B29C61/10](#) takes precedence)**

- B29C53/00B . [N: characterised by the choice of material ([B29C53/36B](#) and [B29C53/56](#) take precedence)]
- [N: **Notes**
[C1201]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
]
- B29C53/02 . Bending or folding ([B29C53/22](#), [B29C53/34](#), [B29C53/36](#), [B29C53/56](#) take precedence)

- B29C53/02B . . [N: using a folding bag]
- B29C53/04 . . of plates or sheets [N: ([B29C63/04](#) takes precedence; bending or folding paper [B31F1/00A](#); folding films [B65H45/00](#))]
- B29C53/04B . . . [N: using rolls or endless belts]
- B29C53/04C . . . [N: using centrifugal force]
- B29C53/06 . . . Forming folding lines by pressing or scoring
- B29C53/06B [N: combined with folding]
- B29C53/06B2 [N: and joining the sides of the folding line, e.g. "Abkantschweissen"]
- B29C53/08 . . of tubes [N: or other profiled members]
- B29C53/08B . . . [N: bending longitudinally, i.e. modifying the curvature of the tube axis] [C1202]
- B29C53/08C . . . [N: bending radially, i.e. deforming the cross-section of the tube] [N1202]
- B29C53/10 . . of blown tubular films, e.g. gusseting [N: (flattening blown films during extrusion moulding [B29C47/00J](#))] [C1203]
- B29C53/12 . . helically, e.g. for making springs [N: (for textile fibres [D02G 1/00](#))]
- B29C53/14 . Twisting [N: (for textile fibres [D01H](#))]
- B29C53/16 . Straightening or flattening
- B29C53/18 . . of plates or sheets
- B29C53/20 . . of tubes
- B29C53/22 . Corrugating
- B29C53/24 . . of plates or sheets
- B29C53/26 . . . parallel with direction of feed
- B29C53/26B [N: using rolls or endless bands]
- B29C53/28 . . . transverse to direction of feed
- B29C53/28B [N: using rolls or endless bands]
- B29C53/30 . . of tubes (by blow-moulding [B29C49/00](#))
- B29C53/30B . . . [N: using a cording process]
- B29C53/32 . Coiling ([B29C53/56](#) takes precedence)
- B29C53/34 . Rim rolling (of tube ends [B29C57/12](#))
- B29C53/36 . Bending and joining, e.g. for making hollow articles ([B29C53/56](#) takes precedence; from paper [B31C](#), [N: [B31F](#)]) [C9411]
- B29C53/38 . . by bending sheets or strips at right angles to the longitudinal axis of the article being formed and joining the edges
- B29C53/38B . . . [N: using laminated sheets]
- B29C53/38C . . . [N: using several sheets to form the circumference]
- B29C53/38J . . . [N: the joining being done from the inside] [N9411]
- B29C53/40 . . . for articles of definite length, i.e. discrete articles
- B29C53/42 using internal forming surfaces, e.g. mandrels
- B29C53/44 rotatable about the axis of the article
- B29C53/46 using external forming surfaces, e.g. sleeves
- B29C53/48 . . . for articles of indefinite length, i.e. bending a strip progressively

- B29C53/50 using internal forming surfaces, e.g. mandrels
- B29C53/52 using external forming surfaces, e.g. sleeves
- B29C53/54 Guiding, aligning or shaping edges

- B29C53/56 . Winding and joining, e.g. winding spirally [N: winding in general [B65H](#)]
- B29C53/56B . . [N: spirally]
- B29C53/56C . . [N: for making non-tubular articles (for winding of reinforced articles having a non-circular cross-section followed by compression [B29C70/34C](#))] [C0204]
- B29C53/56D . . [N: for making tubular articles followed by compression]
- B29C53/56E . . [N: without using a forming surface]
- B29C53/58 . . helically
- B29C53/58B . . . [N: using sheets or strips consisting principally of plastics material (using profiled sheets or strips [B29C53/78](#))]
- B29C53/58B2 [N: comprising reinforcements, e.g. wires, threads]
- B29C53/58C [N: for making tubular articles with particular features]
- B29C53/58C2 [N: having a non-circular cross-section]
- B29C53/58C3 [N: the cross-section varying along their axis, e.g. tapered, with ribs, or threads, with socket-ends]
- B29C53/58C3B [N: having corrugations]
- B29C53/58C4 [N: having a non-uniform wall-structure, e.g. with inserts, perforations, locally concentrated reinforcements]
- B29C53/58C5 [N: having a non-linear axis e.g. elbows, toroids]
- B29C53/60 using internal forming surfaces, e.g. mandrels
- B29C53/60B [N: for tubular articles having closed or nearly closed ends, e.g. vessels, tanks, containers]
- B29C53/60B2 [N: by polar winding]
- B29C53/60C [N: having driving means for advancing the wound articles, e.g. belts, rolls ([B29C53/74](#) takes precedence)]
- B29C53/62 rotatable about the winding axis
- B29C53/64 and moving axially
- B29C53/66 with axially movable winding feed member [N: e.g. lathe type winding]
- B29C53/66B [N: Coordinating the movements of the winding feed member and the mandrel]
- B29C53/68 with rotatable winding feed member
- B29C53/70 and moving axially
- B29C53/72 using external forming surfaces
- B29C53/74 using a forming surface in the shape of an endless belt which is recycled after the forming operation
- B29C53/76 about more than one axis, [N: e.g. T-pieces, balls]
- B29C53/78 using profiled sheets or strips
- B29C53/78B [N: with reinforcements]

- B29C53/80 . Component parts, details or accessories; Auxiliary operations
- B29C53/80B . . [N: specially adapted for winding and joining]
- B29C53/80B2 . . . [N: Storing, feeding or applying winding materials, e.g. reels, thread guides, tensioners]

- B29C53/80B4 . . . [N: Measuring, controlling or regulating ([B29C53/66B](#) takes precedence)]
- B29C53/80B6 . . . [N: Applying axial reinforcements]
- B29C53/80B6B [N: continuously]
- B29C53/80B8 . . . [N: Impregnating ([impregnating as pretreatment B29B15/10](#))]
- B29C53/80B8B [N: on the forming surfaces]
- B29C53/80B10 . . . [N: Improving bonding of wound materials or layers]
- B29C53/80B12 . . . [N: Cutting the ends, surface finishing]
- B29C53/82 . . Cores or mandrels
- B29C53/82B . . . [N: Mandrels especially adapted for winding and joining]
- B29C53/82B2 [N: Single use mandrels, e.g. destructible, becoming part of the wound articles ([B29C53/82B6](#) takes precedence)] [C9409]
- B29C53/82B3 [N: collapsible, e.g. elastic or inflatable; with removable parts, e.g. for regular shaped, straight tubular articles ([B29C53/82B6](#) takes precedence)] [C9409]
- B29C53/82B6 [N: for continuous winding]
- B29C53/82B6B [N: formed by several elements rotating about their own axes]
- B29C53/82B8 [N: Arrangements comprising a plurality of cores or mandrels, e.g. to increase production speed ([B29C53/82B6B](#) takes precedence)] [N9409]
- B29C53/84 . . Heating or cooling
- B29C53/84B . . . [N: especially adapted for winding and joining]

- B29C55/00** **Shaping by stretching, e.g. drawing through a die; Apparatus therefor ([B29C61/08](#) takes precedence)**

- B29C55/00B . . [N: characterised by the choice of materials]

- [N: **Notes**
[C1201]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
]

- B29C55/02 . . of plates or sheets
- B29C55/02B . . . [N: using multilayered plates or sheets]
- B29C55/02B2 [N: of preformed plates or sheets coated with a solution, a dispersion or a melt of thermoplastic material]
- B29C55/04 . . uniaxial, e.g. oblique
- B29C55/04B . . . [N: in a direction which is not parallel or transverse to the direction of feed e.g. oblique]
- B29C55/06 . . . parallel with the direction of feed
- B29C55/06B [N: in several stretching steps]
- B29C55/08 . . . transverse to the direction of feed
- B29C55/08B [N: in several stretching steps]
- B29C55/10 . . multiaxial
- B29C55/12 . . . biaxial
- B29C55/14 successively

- B29C55/14B [N: firstly parallel to the direction of feed and then transversely thereto]
- B29C55/14C [N: firstly transversely to the direction of feed and then parallel thereto]
- B29C55/16 simultaneously
- B29C55/16B [N: Apparatus therefor]
- B29C55/18 by squeezing between surfaces, e.g. rollers
- B29C55/20 Edge clamps

- B29C55/22 of tubes [N: ([B29C61/08](#) takes precedence)]
- B29C55/24 radial
- B29C55/26 biaxial

- B29C55/28 of blown tubular films, e.g. by inflation [N: ([extrusion moulding of tubular films B29C47/00J](#))] [C1203]
- B29C55/28B [N: by using internal mechanical means]
- B29C55/30 Drawing through a die [N: ([pultrusion B29C70/52](#))] [C0901]

- B29C57/00** **Shaping of tube ends, e.g. flanging, belling, closing; Apparatus therefor, [N: e.g. collapsible mandrels]**

- B29C57/00B [N: the end of an internal lining ([fixing the end of the lining B29C63/34G](#))]
- B29C57/02 Belling or enlarging, e.g. combined with forming a groove
- B29C57/02B [N: combined with the introduction of a sealing ring, e.g. using the sealing element as forming element]
- B29C57/04 using mechanical means [N: ([B29C57/02B](#) takes precedence)]
- B29C57/04B [N: rotating]
- B29C57/06 elastically deformable
- B29C57/08 using pressure difference

- B29C57/10 Closing

- B29C57/12 Rim rolling
- B29C57/12B [N: using tools with helical grooves]

- B29C59/00** **Surface shaping [N: of articles] e.g. embossing; Apparatus therefor [N: (in-mould printing [B29C37/00C](#); by using liquids [B29C71/00C](#); by using gases without chemical reaction [B29C71/00G](#); for decorating in general [B44](#); abrasive blasting [B24C](#); chemical aspects [C08J7/00](#))] [C9810]**

- B29C59/00A [N: Component parts, details or accessories; Auxiliary operations]
- B29C59/00B [N: characterised by the choice of material]

[N: Note]

Documents in which moulding materials are mentioned are indexed using indexing codes of subclass [L29C](#). 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
]

- B29C59/00G . [N: Forming single grooves or ribs, e.g. tear lines, weak spots (by moulding [B29C37/00F2](#); folding lines [B29C53/06](#); in metal articles [B21D17/00](#); by cutting [B26D3/08](#))] [N9801]
- B29C59/02 . by mechanical means, e.g. pressing [N: ([B29C59/00G](#) takes precedence; embossing expanded porous articles [B29C44/56F](#))] [C9801]
- B29C59/02B . . [N: of profiled articles, e.g. hollow or tubular articles, beams]
- B29C59/02C . . [N: characterised by the disposition or the configuration, e.g. dimensions, of the embossments or the shaping tools therefor] [N9707]
- B29C59/02C2 . . . [N: Fibrous surfaces with piles or similar fibres substantially perpendicular to the surface] [N9707]
- B29C59/02L . . [N: of layered or coated substantially flat surfaces] [N9801]
- B29C59/04 . . using rollers or endless belts
- B29C59/04B . . . [N: for profiled articles]
- B29C59/04L . . . [N: for layered or coated substantially flat surfaces] [N9801]
- B29C59/06 . . using vacuum drums [N: (for thermoforming [B29C51/22B](#))]
- B29C59/08 . by flame treatment; [N: using hot gases] [C9604]
- B29C59/08B . . [N: of profiled articles e.g. hollow or tubular articles]
- B29C59/10 . by electric discharge treatment (electrodes [H01T](#)) [C9501]
- B29C59/10B . . [N: of profiled articles, e.g. hollow or tubular articles]
- B29C59/10C . . [N: the electrodes being placed on the same side of the material to be treated]
- B29C59/12 . . in an environment other than air
- B29C59/14 . by plasma treatment (in general [H05H](#)) [N: (plasma tubes per se [H01J](#))]
- B29C59/14B . . [N: of profiled articles, e.g. hollow or tubular articles]
- B29C59/16 . by wave energy or particle radiation, [N: e.g. infra-red heating ([B29C59/00G](#) takes precedence)] [C9801]
- B29C59/16B . . [N: of profiled articles e.g. hollow or tubular articles]
- B29C59/18 . by liberation of internal stresses, e.g. plastic memory
- B29C61/00** **Shaping by liberation of internal stresses; Making preforms having internal stresses; Apparatus therefor** (for surface shaping [B29C59/18](#); for lining articles [B29C63/38](#); for joining preformed parts [B29C65/66](#)) [N: (for packaging [B65B53/00](#); connecting arrangements or other fittings for plastics pipes using shrink-down material [F16L47/22](#), electrical connections insulated using heat shrinking insulating sleeves [H01R4/72](#); cable junctions protected by sleeves [H02G15/18](#))] [C0901]
- B29C61/00B . [N: characterised by the choice of material]

[N: **Notes**

[C1201] 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]

- B29C61/00C . [N: the force created by the liberation of the internal stresses being used for compression moulding or for pressing preformed material]
- B29C61/02 . Thermal shrinking
- B29C61/02B . . [N: for the production of hollow or tubular articles]
- B29C61/04 . Thermal expansion
- B29C61/06 . Making preforms having internal stresses, e.g. plastic memory
- B29C61/06B . . [N: characterised by the configuration or structure of the preforms]
- B29C61/06B2 . . . [N: layered or partially layered preforms, e.g. preforms with layers of adhesive or sealing compositions ([B29C61/06B3](#) and [B29C61/06B6](#) take precedence)]
- B29C61/06B3 . . . [N: Preforms comprising incorporated or associated heating means]
- B29C61/06B4 . . . [N: Preforms comprising reinforcing elements ([B29C61/06B3](#) takes precedence)]
- B29C61/06B5 . . . [N: Clips for dividing preforms or forming branch-offs (clips in general [F16B2/20](#))]
- B29C61/06B6 . . . [N: Preforms held in a stressed condition by means of a removable support; Supports therefor]
- B29C61/06B7 . . . [N: consisting of fibrous plastics material, e.g. woven]
- B29C61/06B8 . . . [N: comprising means indicating that the shrinking temperature is reached] [N0006]
- B29C61/08 . . by stretching tubes [N: (in general [B29C55/22](#), [B29C55/28](#))]
- B29C61/10 . . by bending plates or sheets[N: in general[B29C53/36](#)]

B29C63/00 Lining or sheathing, i.e. applying preformed layers or sheathing of plastics; Apparatus therefor ([B29C73/00](#) takes precedence; by blowing [B29C49/00](#); by thermoforming [B29C51/00](#))

- B29C63/00A . [N: Component parts, details or accessories; Auxiliary operations]
- B29C63/00A2 . . [N: Removing old coatings]
- B29C63/00B . [N: characterised by the choice of the material]

[N: **Notes**

[C1201] 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]

- B29C63/00B2 . . [N: with coherent impregnated reinforcing layers]
- B29C63/00C . [N: an edge face with strip material, e.g. a panel edge (securing a veneer strip to a panel edge [B27D5/00B](#))]

- B29C63/00C2 . . [N: continuously]
- B29C63/00C4 . . [N: the strip material being folded]
- B29C63/00C4B . . . [N:continuously]

- B29C63/00D . [N: Fixing the layers by electrostatic charges, by the use of structured surfaces or by mechanical means]

- B29C63/00E . [N: Preventing air-inclusions]

- B29C63/00F . [N: Testing, e.g. testing for the presence of pinholes]

- B29C63/00G . [N: Provisional sheathings]

- B29C63/00T . [N: Heat treatment]
- B29C63/00T2 . . [N: of tubular articles]

- B29C63/00U . [N: of non-flat surfaces e.g. curved, profiled ([B29C63/04B](#) takes precedence)]
- B29C63/00U2 . . [N: having local protrusions e.g. rivet heads] [N1202]

- B29C63/00V . [N: Finishing the edges of holes or perforations in the lined product]
- B29C63/00V2 . . [N: and removing the portion of the lining covering the holes] [N0006]

- B29C63/00W . [N: in particular atmospheres]

- B29C63/00Z . [N: using a provisional carrier]

- B29C63/02 . using sheet or web-like material ([B29C63/26](#) [N: and [B29C63/38](#)] take precedence)
- B29C63/02B . . [N: the sheet or web-like material being supported by a moving carriage]
- B29C63/02C . . [N: applied by a die matching with the profile of the surface of resilient articles, e.g. cushions, seat pads] [N9708]

- B29C63/04 . . by folding, winding, bending or the like
- B29C63/04B . . . [N: of L- or Z- shaped surfaces, e.g. for counter-tops]
- B29C63/04D . . . [N: continuously ([B29C63/06B](#), [B29C63/10B](#) take precedence)]
- B29C63/04E . . . [N: using a folding shoulder]
- B29C63/04F . . . [N: specially adapted for articles having local protrusions, e.g. tubes having a bead weld]

- B29C63/06 . . . around tubular articles
- B29C63/06B [N: continuously]
- B29C63/08 . . . by winding helically
- B29C63/10 around tubular articles
- B29C63/10B [N: continuously]
- B29C63/12 . . . by winding spirally
- B29C63/14 around tubular articles
- B29C63/14B [N: the tubular articles being mounted on transfer means]
- B29C63/16 . . applied by "rubber" bag or diaphragm

- B29C63/18 . using tubular layers or sheathings ([B29C63/26](#) [N: and [B29C63/38](#)] take precedence; [N: placing tubular labels around rigid containers [B65C3/06B](#)])

- B29C63/18B . . [N: applied by a "rubber" bag or diaphragm]
- B29C63/18C . . [N: by turning inside-out or by derolling]
- B29C63/18D . . [N: by removing a shirred or pleated hose from a support]
- B29C63/20 . . using pressure difference, e.g. vacuum

- B29C63/22 . using layers or sheathings having a shape adapted to the shape of the article
([B29C63/26](#) [N: and [B29C63/38](#)] take precedence)

- B29C63/24 . using threads

- B29C63/26 . Lining or sheathing of internal surfaces([B29C63/38](#)takes precedence)
- B29C63/28 . . applied by "rubber" bag or diaphragm
- B29C63/30 . . using sheet or web-like material
- B29C63/32 . . . by winding helically
- B29C63/34 . . using tubular layers or sheathings
- B29C63/34B . . . [N: pressed against the wall by mechanical means]
- B29C63/34D . . . [N: the tubular sheathing having a deformed non-circular cross-section prior to introduction]
- B29C63/34F . . . [N: whilst rotating the article]
- B29C63/34G . . . [N: Fixing the end of the lining (shaping tube ends [B29C57/00B](#))]
- B29C63/36 . . . being turned inside out [N: (for plastic tubes in general [B29C67/00E2](#))]

- B29C63/38 . by liberation of internal stresses
- B29C63/40 . . using sheet or web-like material
- B29C63/42 . . using tubular layers or sheathings
- B29C63/42B . . . [N: specially applied to the mass-production of externally coated articles, e.g. bottles]
- B29C63/42B2 [N: in combination with the in situ shaping of the external tubular layer]
- B29C63/44 . . the shape of the layers or sheathings being adapted to the shape of the articles
- B29C63/46 . . of internal surfaces

- B29C63/48 . Preparation of the surfaces
- B29C63/48B . . [N: mechanically]
- B29C63/48F . . [N: of metal surfaces ([B29C63/48B](#) takes precedence)]

B29C65/00

Joining [N: or sealing] **of preformed parts**, [N: e.g. welding of plastics materials];
Apparatus therefor ([N: general aspects of processes or apparatus for joining preformed parts [B29C66/00](#); using porous material formed by internal pressure generated therein for joining preformed parts [B29C44/12G](#), [B29C44/32C](#);) for making boxes, cartons, envelopes or bags [B31B](#); for sealing or securing package folds or closures [B65B51/00](#); joining constructional elements in general [F16B](#); splicing of light guides [G02B6/255](#)] [[C1201](#)]

[N: **WARNING**

[[N1203](#)]Groups [B29C65/00](#) to [B29C65/70](#) are not complete, mainly for documents published before the year 1995, pending reclassification; see also [B29C65/74](#) and its subgroups

]

- B29C65/00T . [N: Joining methods not otherwise provided for]
- B29C65/00T2 . . [N: Cold joining]
- B29C65/00T4 . . [N: Diffusion joining (measures for intermixing the material of the joint interlayer [B29C66/341](#)) [C1201]
- B29C65/00T6 . . [N: making use of electrostatic charges (holding means using electrostatic forces to hold at least one of the parts to be joined [B29C65/78F8](#))] [C1112]

- B29C65/02 . by heating, with or without pressure
 - [N: **WARNING**
 - [N1203] Group [B29C65/02](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/48](#) and its subgroups
 -]

- B29C65/02T . . [N: Particular heating or welding methods not otherwise provided for]
- B29C65/02T6 . . . [N: making use of combustible material, i.e. the combustible material is in contact with the material to be joined]
- B29C65/02T8 . . . [N: making use of hot liquids, i.e. the liquid is in direct contact with the material to be joined]
- B29C65/02T10 . . . [N: 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]
- B29C65/04 . . Dielectric heating, e.g. high-frequency welding [N: i.e. radio frequency welding of plastic materials having dielectric properties, e.g. PVC] [C1112]
- B29C65/06 . . using friction, e.g. spin welding [N: (non-plastics elements to plastic elements [B29C65/64B](#))]
 - [N: **WARNING**
 - [N1203]Subgroups of [B29C65/06](#) are not complete, pending a reorganisation; see also this group and its subgroups
 -]
- B29C65/06A . . . [N: characterised by the movement of the parts to be joined ([B29C65/06B](#) takes precedence)] [N1112]
- B29C65/06A2 [N: Linear] [N1112]
- B29C65/06A4 [N: Angular, i.e. torsional ([B29C65/08B2](#) takes precedence)] [N1112]
- B29C65/06A6 [N: Orbital] [N1112]
- B29C65/06A6B [N: Circular] [N1112]
- B29C65/06A6D [N: Elliptical] [N1112]
- B29C65/06A6F [N: Other specific orbital movements not provided for in [B29C65/06A6B](#) to [B29C65/06A6D](#), e.g. Lissajous] [N1112]
- B29C65/06B . . . [N: Spin welding]
- B29C65/06C . . . [N: created by a tool]
- B29C65/06Z . . . [N: 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] [N1112]
- B29C65/08 . . using ultrasonic vibrations [N: (non-plastics element to plastics elements [B29C65/64B](#))]
 - [N: **WARNING**
 - [N1203] Subgroups of [B29C65/08](#) are not complete pending reclassification; see also this group and its other subgroups
 -]

- B29C65/08B . . . [N: having a component of vibration not perpendicular to the welding surface]
- B29C65/08B2 [N: Angular, i.e. torsional ultrasonic welding] [N1112]
- B29C65/08D . . . [N: using a rotary sonotrode or a rotary anvil] [N1112]
- B29C65/08D2 [N: using a rotary sonotrode] [N1112]
- B29C65/08D4 [N: using a rotary anvil] [N1112]
- B29C65/08D6 [N: using both a rotary sonotrode and a rotary anvil] [N1112]
- B29C65/08F . . . [N: using several cooperating sonotrodes, i.e. interacting with each other, e.g. for realising the same joint] [N1112] [C1201]
- B29C65/10 . . using hot gases [N: (e.g. combustion gases) or flames coming in contact with at least one of the parts to be joined] [C1112]
- B29C65/10A . . . [N: direct heating both surfaces to be joined] [N1201]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C65/10](#) and [B29C65/10B](#)
]
- B29C65/10B . . . [N: using flames coming in contact with at least one of the parts to be joined] [C1112]
- B29C65/12 . . . and welding bar
- B29C65/12B [N: characterised by the composition of the welding bar] [N1109]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C65/12](#)
]
- B29C65/14 . . using wave energy [N: , i.e. electromagnetic radiation,] or particle radiation [N: (using mechanical waves [B29C65/06](#); using ultrasonic waves [B29C65/08](#); pressing means transparent to electromagnetic radiation [B29C66/81267](#))] [C1112]
- [N: **WARNING**
[N1203]Subgroups [B29C65/14A](#) to [B29C65/14J](#) are not complete pending a reorganisation; see also this group and its subgroups
]
- B29C65/14A . . . [N: characterised by the type of electromagnetic or particle radiation ([B29C65/16A](#) takes precedence)] [N1112]
- B29C65/14A2 [N: Ultraviolet [UV] radiation] [N1112]
- B29C65/14A4 [N: Visible light radiation] [N1112]
- B29C65/14A6 [N: Infrared [IR] radiation] [N1112]
- B29C65/14A6B [N: Near-infrared radiation [NIR]] [N1112]
- B29C65/14A6D [N: Mid-infrared radiation [MIR]] [N1112]
- B29C65/14A6F [N: Far-infrared radiation [FIR]] [N1112]
- B29C65/14A8 [N: Micro-wave radiation] [N1112]
- B29C65/14D . . . [N: characterised by the way of heating the interface ([B29C65/16D](#) takes precedence)] [N1112]
- B29C65/14D2 [N: direct heating of the surfaces to be joined] [N1112]
- B29C65/14D4 [N: at least passing through one of the parts to be joined, i.e. transmission welding] [N1112]
- B29C65/14D4B [N: focusing the wave energy or particle radiation on the interface] [N1112]
- B29C65/14D4D [N: making use of a reflector on the opposite side, e.g. a polished

- mandrel or a mirror (pressing means reflective to electromagnetic radiation [B29C66/81268](#)) [N1112]
- B29C65/14D6 [N: heating both sides of the joint] [N1112]
- B29C65/14D7 [N: 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] [N1201]
- B29C65/14D7B [N: radiating the edges of holes or perforations] [N1201]
- B29C65/14D8 [N: scanning at least one of the parts to be joined] [N1112]
- B29C65/14D8B [N: once, i.e. contour welding] [N1112]
- B29C65/14D8D [N: repeatedly, i.e. quasi-simultaneous welding] [N1112]
- B29C65/14D10 [N: making use of several radiators] [N1112]
- B29C65/14D10B [N: at the same time, i.e. simultaneous welding] [N1112]
- B29C65/14F [N: making use of an absorber or impact modifier ([B29C65/16F](#) takes precedence)] [N1112]
- B29C65/14F2 [N: placed at the interface] [N1112]
- B29C65/14F4 [N: coated on the article] [N1112]
- B29C65/14H [N: making use of light guides ([B29C65/16H](#) takes precedence)] [N1112]
- B29C65/14H2 [N: being a part of the joined article] [N1112]
- B29C65/14H2B [N: in the form of a cavity] [N1112]
- B29C65/14J [N: making use of masks ([B29C65/16J](#) takes precedence)] [N1112]
- B29C65/16 Laser beams
- [N: **WARNING**
[N1203]Subgroups of [B29C65/16](#) are not complete, pending a reorganisation;
see also this group and its subgroups
]
- B29C65/16A [N: characterised by the type of electromagnetic radiation] [N1112]
- B29C65/16A2 [N: Ultraviolet [UV] radiation, e.g. by ultraviolet excimer lasers] [N1112]
- B29C65/16A4 [N: Visible light radiation, e.g. by visible light lasers] [N1112]
- B29C65/16A6 [N: Infrared [IR] radiation, e.g. by infrared lasers] [N1112]
- B29C65/16A6B [N: Near infrared radiation [NIR], e.g. by YAG lasers] [N1112]
- B29C65/16A6D [N: Mid infrared radiation [MIR], e.g. by CO or CO2 lasers] [N1112]
[C1203]
- B29C65/16A6F [N: Far infrared radiation [FIR], e.g. by FIR lasers] [N1112]
- B29C65/16D [N: characterised by the way of heating the interface] [N1112]
- B29C65/16D2 [N: direct heating the surfaces to be joined] [N1112]
- B29C65/16D4 [N: at least passing through one of the parts to be joined, i.e. laser transmission welding] [N1112]
- B29C65/16D4B [N: focusing the laser beam on the interface] [N1112]
- B29C65/16D4D [N: making use of a reflector on the opposite side, e.g. a polished mandrel or a mirror (pressing means reflective to electromagnetic radiation [B29C66/81268](#))] [N1112]
- B29C65/16D6 [N: heating both sides of the joint e.g. by using two lasers or a split beam] [N1112]
- B29C65/16D7 [N: radiating the edges of the parts to be joined] [N1201]
- B29C65/16D7B [N: radiating the edges of holes or perforations] [N1201]

B29C65/16D8	. . . . .	[N: scanning at least one of the parts to be joined] [N1112]
B29C65/16D8B	. . . . .	[N: scanning once, e.g. contour laser welding] [N1112] [C1203]
B29C65/16D8D	. . . . .	[N: scanning repeatedly, e.g. quasi-simultaneous laser welding] [N1112] [C1203]
B29C65/16D10	. . . . .	[N: making use of several radiators] [N1112]
B29C65/16D10B	. . . . .	[N: at the same time, i.e. simultaneous laser welding] [N1112]
B29C65/16D10B2	. . . . .	{7 dots} [N: using laser diodes] [N1112]
B29C65/16D12	. . . . .	[N: making use of laser diodes (B29C65/16D10B2 takes precedence)] [N1112]
B29C65/16F	. . . . .	[N: making use of an absorber or impact modifier] [N1112]
B29C65/16F2	. . . . .	[N: placed at the interface] [N1112]
B29C65/16F4	. . . . .	[N: coated on the article] [N1112]
B29C65/16H	. . . . .	[N: making use of light guides] [N1112]
B29C65/16H2	. . . . .	[N: being a part of the joined article] [N1112]
B29C65/16H2B	. . . . .	[N: in the form of a cavity] [N1112]
B29C65/16J	. . . . .	[N: making use of masks] [N1112]
B29C65/18	. . . . .	using heated tools
B29C65/20	. . . . .	with direct contact, e.g. using "mirror"

[N: **WARNING**

[N1203] Subgroups of [B29C65/20](#) are not complete, pending a reorganisation; see also this group and [B29C65/20D](#)

]

B29C65/20B	. . . . .	[N: characterised by the type of welding mirror] [N1111]
B29C65/20B2	. . . . .	[N: being a single welding mirror comprising several separate heating surfaces in different planes, e.g. said heating surfaces having different temperatures] [N1111]
B29C65/20B4	. . . . .	[N: said welding mirror comprising several sectors] [N1111]
B29C65/20B6	. . . . .	[N: being several single mirrors, e.g. not mounted on the same tool] [N1111] [C1201]
B29C65/20B8	. . . . .	[N: being a wire] [N1111]
B29C65/20D	. . . . .	[N: using a welding mirror which also cuts the parts to be joined, e.g. for sterile welding] [N1111]
B29C65/20F	. . . . .	[N: characterised by special ways of bringing the welding mirrors into position] [N1111]
B29C65/20F2	. . . . .	[N: by sliding] [N1111]
B29C65/20F2B	. . . . .	[N: with an angle with respect to the plane comprising the parts to be joined] [N1111]
B29C65/20F2B2	. . . . .	{7 dots} [N: perpendicularly to the plane comprising the parts to be joined] [N1111]
B29C65/20F4	. . . . .	[N: by pivoting] [N1111]
B29C65/20H	. . . . .	[N: and involving the use of a facer] [N1111]
B29C65/22	. . . . .	Heated wire [N: resistive ribbon, resistive band or resistive strip (electrical insulating support therefor B29C66/81871)] [C1112]

[N: **WARNING**

[N1203]Subgroups of [B29C65/22](#) are not complete, pending reclassification;

- see also this group
]
- B29C65/22B [N: characterised by the type of heated wire, resistive ribbon, band or strip (Specific electrical or thermal properties also to be classified in [B29C66/81262](#) or [B29C66/81261](#))] [N1112]
 - B29C65/22B2 [N: comprising at least a single heated wire] [N1112]
 - B29C65/22B2B [N: comprising several heated wires] [N1112]
 - B29C65/22B4 [N: being a resistive ribbon, a resistive band or a resistive strip] [N1112]
 - B29C65/22B6 [N: being a coating or being printed, e.g. being applied as a paint or forming a printed circuit] [N1112]
 - B29C65/22B8 [N: characterised by the cross-section of said heated wire, resistive ribbon, resistive band or resistive strip, e.g. being triangular] [N1112]
 - B29C65/22B8B [N: said cross-section being hollow] [N1112]
 - B29C65/22D [N: characterised by the means for electrically connecting the ends of said heated wire, resistive ribbon, resistive band or resistive strip] [N1112]
 - B29C65/22F [N: 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 [B29C66/8185](#))] [N1112]
 - B29C65/24 characterised by the means for heating the tool [N: (by impulse heating [B29C65/38](#))] [C1111]

Note

Classification is made in groups [B29C65/24](#) to [B29C65/32](#) only if the details or adaptations of the heating means are of interest.

[N: **Note** [C1111]

When classifying in this group, heated tools are additionally classified in groups [B29C65/18](#), [B29C65/20](#) or [B29C65/22](#)

-]
- B29C65/24B [N: 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] [N1111]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C65/24](#)
]
- B29C65/24D [N: the heat transfer being achieved contactless, e.g. by radiation ([B29C65/32](#) takes precedence)] [N1111]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C65/24](#)
]
- B29C65/24F [N: the heat resulting from a chemical reaction] [N1111]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C65/24](#)
]
- B29C65/26 Hot fluid
 - B29C65/28 Flame or combustible material
 - B29C65/30 [N: Electrical means ([B29C65/38](#) takes precedence)] [C1111]
 - B29C65/30B [N: involving the use of cartridge heaters] [N1201]

[N: **WARNING**

[N1203]Not complete, pending a reorganisation; see also [B29C65/18](#) to [B29C65/20H](#)

]

B29C65/32 Induction

B29C65/34 . . . using heated elements which remain in the joint, e.g. "verlorenes Schweisselement"

[N: **WARNING**

[N1203]Subgroups [B29C65/34B](#) to [B29C65/34F](#) are not complete, pending a reorganisation; see also [B29C65/34](#)

]

B29C65/34B . . . [N: characterised by the type of heated elements which remain in the joint ([B29C65/36B](#) takes precedence)] [N1112]

B29C65/34B2 [N: comprising single particles, e.g. fillers or discontinuous fibre-reinforcements] [N1112]

B29C65/34B2B [N: comprising fillers] [N1112]

B29C65/34B2D [N: comprising discontinuous fibre-reinforcements] [N1112]

B29C65/34B4 [N: comprising at least a single wire, e.g. in the form of a winding] [N1112]

B29C65/34B4B [N: said at least a single wire having the form of a coil spring] [N1112]

B29C65/34B4D [N: said at least a single wire having a waveform, e.g. a sinusoidal form] [N1112]

B29C65/34B4F [N: comprising several wires, e.g. in the form of several independent windings ([B29C65/34B6](#), [B29C65/34B8](#) take precedence)] [N1112]

B29C65/34B6 [N: comprising independent continuous fibre-reinforcements] [N1112]

B29C65/34B8 [N: being a woven or non-woven fabric or being a mesh] [N1112]

B29C65/34B10 [N: being a ribbon, band or strip] [N1112]

B29C65/34B10B [N: said ribbon, band or strip being perforated] [N1112]

B29C65/34B10D [N: forming a sleeve, e.g. a wrap-around sleeve] [N1112]

B29C65/34B12 [N: being a layer of a multilayer part to be joined, e.g. for joining plastic-metal laminates] [N1112]

B29C65/34B14 [N: being a coating or being printed, e.g. being applied as a paint or forming a printed circuit] [N1112]

B29C65/34B16 [N: 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] [N1112]

B29C65/34D . . . [N: characterised by the means for supplying heat to said heated elements which remain in the joint, e.g. special electrical connectors of windings ([B29C65/36D](#) takes precedence)] [N1112]

B29C65/34F . . . [N: characterised by the composition of the heated elements which remain in the joint ([B29C65/36F](#) takes precedence)] [N1112]

B29C65/34F2 [N: being metallic] [N1112]

B29C65/34F2F [N: with a polymer coating] [N1112]

B29C65/34F4 [N: being non-metallic] [N1112]

B29C65/34F4B [N: being an electrically conductive polymer] [N1112]

B29C65/34F4D [N: being carbon] [N1112]

B29C65/34F4F [N: with a coating, e.g. a metallic or a carbon coating] [N1112]

- B29C65/36 . . . heated by induction [C1112]
- [N: **WARNING**
[N1203]Subgroups of [B29C65/36](#) are not complete, pending a reorganisation;
see also [B29C65/36](#)
]
- B29C65/36B [N: characterised by the type of elements heated by induction which remain in the joint] [N1112]
- B29C65/36B2 [N: comprising single particles, e.g. fillers or discontinuous fibre-reinforcements] [N1112]
- B29C65/36B2B [N: comprising fillers] [N1112]
- B29C65/36B2D [N: comprising discontinuous fibre-reinforcements] [N1112]
- B29C65/36B4 [N: comprising at least a single wire, e.g. in the form of a winding] [N1112]
- B29C65/36B4B [N: said at least a single wire having the form of a coil spring] [N1112]
- B29C65/36B4D [N: said at least a single wire having a waveform, e.g. a sinusoidal form] [N1112]
- B29C65/36B4F [N: comprising several wires, e.g. in the form of several independent windings [B29C65/36B8](#) takes precedence)] [N1112]
- B29C65/36B6 [N: comprising independent continuous fibre-reinforcements] [N1112]
- B29C65/36B8 [N: being a woven or non-woven fabric or being a mesh] [N1112]
- B29C65/36B10 [N: being a ribbon, band or strip] [N1112]
- B29C65/36B10B [N: said strip being perforated] [N1112]
- B29C65/36B10D [N: forming a sleeve, e.g. a wrap-around sleeve] [N1112]
- B29C65/36B12 [N: being a layer of a multilayer part to be joined, e.g. for joining plastic-metal laminates] [N1112]
- B29C65/36B14 [N: being a coating or being printed, e.g. being applied as a paint or forming a printed circuit] [N1112]
- B29C65/36D [N: characterised by the means for supplying heat to said heated elements which remain in the join, e.g. special induction coils] [N1112]
- B29C65/36F [N: characterised by the composition of the elements heated by induction which remain in the joint] [N1112]
- B29C65/36F2 [N: being metallic] [N1112]
- B29C65/36F2F [N: with a polymer coating] [N1112]
- B29C65/36F4 [N: being non-metallic] [N1112]
- B29C65/36F4F [N: with a coating] [N1112]
- B29C65/38 . . . Impulse heating
- [N: **Note** [N1111]
When classifying in this group, heated tools are additionally classified in the relevant groups, e.g. [B29C65/22](#)
]
- B29C65/40 . . . Applying molten plastics, e.g. hot melt (using [welding bar](#) [N: combined with hot gases] [B29C65/12](#); by moulding [B29C65/70](#)) [C1112]
- B29C65/40B [N: characterised by the composition of the applied molten plastics ([B29C65/42B](#) takes precedence)] [N1111]
- [N: **WARNING**
[N1203] Not complete, pending a reorganisation; see also [B29C65/40](#)
]

- B29C65/42 . . . between pre-assembled parts [N: ([B29C65/60B6](#) takes precedence)] [C1111]
- B29C65/42B [N: characterised by the composition of the molten plastics applied between pre-assembled parts] [N1111]
- [N: **WARNING**
[N1203] Not complete, pending a reorganisation; see also [B29C65/42](#)
]
- B29C65/44 . . . Joining a heated non plastics element to a plastics element
- [N: **Notes**
[C1204] When classifying in this group, compositions of the non-plastics element are additionally classified in the relevant groups, i.e. in [B29C66/74](#) and subgroups
]
- B29C65/46 . . . heated by induction [C1201]
- [N: **Notes**
[C1204] When classifying in this group, compositions of the non-plastics element are additionally classified in the relevant groups, i.e. in [B29C66/74](#) and subgroups
]
- B29C65/48 . . . using adhesives [N: , i.e. using supplementary joining material] (heat-activated [N: to be additionally classified in] [B29C65/02](#) [N: and subgroups]; [N: applying molten plastics, e.g.] hot melts [N: to be additionally classified in] [B29C65/40](#); non-mechanical parts of adhesive processes, in general [C09J5/00](#)); [N: solvent bonding] [C1111][N: Note When classifying in this group, heat-activated adhesives are further classified in group [B29C65/02](#). When classifying in this group, applying molten plastics is further classified in group [B29C65/40](#).
- [N: **WARNING**
[N1203]Subgroups [B29C65/48B](#) to [B29C65/48S](#) are not complete, pending a reorganisation; see also this group and [B29C65/48S](#)
]
- B29C65/48B . . . [N: characterised by the type of adhesives] [N1111]
- B29C65/48B2 [N: Non-reactive adhesives, e.g. physically hardening adhesives] [N1111]
- B29C65/48B2B [N: Hot melt adhesives, e.g. thermoplastic adhesives] [N1111]
- B29C65/48B2D [N: Drying adhesives, e.g. solvent based adhesives] [N1111]
- B29C65/48B2F [N: Pressure sensitive adhesives] [N1111]
- B29C65/48B4 [N: Reactive adhesives, e.g. chemically curing adhesives] [N1111]
- B29C65/48B4B [N: Heat curing adhesives] [N1111]
- B29C65/48B4D [N: Moisture curing adhesives] [N1111]
- B29C65/48B4F [N: Radiation curing adhesives, e.g. UV light curing adhesives] [N1111]
- B29C65/48B4H [N: Multi-component adhesives, i.e. chemically curing as a result of the mixing of said multi-components] [N1111]
- B29C65/48D . . . [N: characterised by their physical properties, e.g. being electrically-conductive] [N1111]
- B29C65/48F . . . [N: characterised by their physical form being non-liquid, e.g. in the form of granules or powders ([B29C65/50](#) takes precedence)] [N1111]
- B29C65/48H . . . [N: containing additives ([C09J11/00](#) and subgroups take precedence)] [N1111]
- B29C65/48H2 [N: characterised by their shape, e.g. being fibres or being spherical] [N1111]
- B29C65/48H2B [N: being spherical, e.g. particles or powders] [N1111]

- B29C65/48H2D [N: being longitudinal, e.g. fibres] [N1111]
- B29C65/48H4 [N: characterised by their composition being non-plastics] [N1111]
- B29C65/48H4B [N: being metals] [N1111]
- B29C65/48S . . . [N: Solvent bonding, i.e. the surfaces of the parts to be joined being treated with solvents, swelling or softening agents, without adhesives] [C1111]
- B29C65/50 . . . using adhesive tape [N: e.g. thermoplastic tape; using threads or the like ([B29C65/34B10](#) takes precedence)] [C1112]
- B29C65/50A [N: characterised by the structure of said adhesive tape, threads or the like] [N1111] [C1112]
- [N: **WARNING**
[N1203] Group [B29C65/50A](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/50](#) and its subgroups
]
- B29C65/50A2 [N: being fibre-reinforced ([B29C65/50A6](#) takes precedence)] [N1111]
- B29C65/50A4 [N: being multi-layered] [N1111]
- B29C65/50A6 [N: being textile in woven or non-woven form] [N1111]
- B29C65/50A8 [N: being in thread form, i.e. in the form of a single filament, e.g. in the form of a single coated filament] [N1111]
- B29C65/50B [N: covering both elements to be joined] [C1111]
- B29C65/50B2 [N: and placed in a recess formed in the parts to be joined, e.g. in order to obtain a continuous surface] [N1111]
- B29C65/50C [N: positioned between the surfaces to be joined ([B29C65/50A8](#) takes precedence)]
- B29C65/50E [N: of particular form, e.g. being C-shaped, T-shaped] [C1111]
- [N: **WARNING**
[N1203]Subgroups of [B29C65/50E](#) are not complete, pending a reorganisation; see also this group
]
- B29C65/50E2 [N: and being composed by one single element] [N1111]
- B29C65/50E4 [N: and being composed by several elements] [N1111]
- B29C65/50E6 [N: and comprising grooves, e.g. being E-shaped, H-shaped] [N1111]
- B29C65/50M [N: characterised by the tape handling mechanisms, e.g. using vacuum] [N1201]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C65/50](#) and its subgroups
]
- B29C65/52 . . . [N: characterised by the way of applying the adhesive [N: ([B29C65/50](#) takes precedence; apparatus for applying liquids in general B05C; processes for applying liquids in general B05D)] [C1111]
- [N: **WARNING**
[N1203]Subgroups [B29C65/52B](#) to [B29C65/52N](#) are not complete, pending a reorganisation; see also this group
]
- B29C65/52B [N: by spin coating] [N1111]
- B29C65/52D [N: by spraying, e.g. by flame spraying] [N1111]

- B29C65/52F . . . [N: by dipping] [N1111]
 - B29C65/52H . . . [N: by applying the adhesive from an outlet device in contact with, or almost in contact with, the surface of the part to be joined] [N1111]
 - B29C65/52H2 [N: by extrusion coating] [N1111]
 - B29C65/52J [N: by printing or by transfer from the surfaces of elements carrying the adhesive, e.g. using brushes, pads, rollers, stencils or silk screens] [N1111]
 - B29C65/52L [N: by gravity only, e.g. by pouring] [N1111]
 - B29C65/52N [N: by CVD or by PVD, i.e. by chemical vapour deposition or by physical vapour deposition] [N1111]
 - B29C65/54 between pre-assembled parts
- [N: **WARNING**
[N1203]Subgroups of [B29C65/54](#) are not complete, pending a reorganisation; see also this group
]
- B29C65/54B [N: by injection] [N1111]
 - B29C65/54D [N: by suction] [N1111]
 - B29C65/54F [N: by gravity, e.g. by pouring] [N1111]
 - B29C65/54H [N: by capillarity] [N1111]
- B29C65/56 . . . using mechanical means [N: or mechanical connections, e.g. form-fits] [C1109]
- [N: **WARNING**
[N1203]Subgroups [B29C65/56B](#) to [B29C65/56J](#) are not complete, pending a reorganisation; see also this group and its subgroups
]
- B29C65/56B . . . [N: using screw-threads being integral at least to one of the parts to be joined] [N1109]
 - B29C65/56D . . . [N: using extra joining elements, i.e. which are not integral with the parts to be joined (**using plastic snap elements [B29C65/58](#); using plastic rivets [B29C65/60B](#)**)] [N1109]
 - B29C65/56D2 [N: hidden in the joint, e.g. dowels or Z-pins (**[B29C65/60B4](#) takes precedence**)] [N1109]
 - B29C65/56F . . . [N: involving interference fits, e.g. force-fits or press-fits (**[B29C65/66](#) takes precedence**)] [N1109]
 - B29C65/56H . . . [N: 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] [N1109] [C1205]
 - B29C65/56H2 [N: 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] [N1204]
 - B29C65/58 . . . Snap connection
 - B29C65/60 . . . Riveting [N: or staking] [C1109]
- [N: **WARNING**
[N1203]Subgroups of [B29C65/60](#) are not complete, pending a reorganisation; see also this group
]
- B29C65/60B [N: using extra riveting elements, i.e. the rivets being non-integral with the parts to be joined] [N1109]
 - B29C65/60B2 [N: using hollow rivets (**[B29C65/60D2](#) takes precedence**)] [N1109]

- B29C65/60B4 [N: the rivets being pushed in blind holes] [N1109]
 - B29C65/60B4B [N: in both parts] [N1109]
 - B29C65/60B6 [N: the rivets being molded in place, e.g. by injection] [N1109]
 - B29C65/60D [N: the rivets being integral with one of the parts to be joined, i.e. staking] [N1109]
 - B29C65/60D2 [N: the integral rivets being hollow] [N1109]
 - B29C65/60D3 [N: the integral rivets being pushed in blind holes] [N1204]
 - B29C65/60D4 [N: the integral rivets being plunge-formed] [N1109]
 - B29C65/62 Stitching
 - B29C65/64 Joining a non-plastics element to a plastics element, e.g. by force ([B29C65/44](#) takes precedence)
- [N: **Notes**
[N1201] When classifying in this group, compositions of the non-plastics element are additionally classified in the relevant groups, i.e. in [B29C66/74](#) and subgroups]
- B29C65/64B [N: using friction or ultrasonic vibrations]
- [N: **Notes**
[C1204] When classifying in this group, compositions of the non-plastics element are additionally classified in the relevant groups, i.e. in [B29C66/74](#) and subgroups]
- B29C65/66 by liberation of internal stresses, e.g. shrinking of one of the parts to be joined
 - B29C65/66B [N: using shrinking during cooling] [N9411]
 - B29C65/68 using auxiliary shrinkable elements
- B29C65/70 by moulding (using a particular moulding technique, see the relevant technique [N: e.g. by injection [B29C45/14G](#)]) [C1111]
- [N: **Notes** [N1111]
This group covers only techniques involving the use of a mould]
- B29C65/72 by combined operations [N: or combined techniques], e.g. welding and stitching [C1111]
- B29C65/74 by welding and severing, [N: 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] [C1111]
- [N: **Note** [N1111]
When classifying in this group, joining techniques are additionally classified in the relevant groups, e.g. in [B29C65/02](#) and subgroups]
- B29C65/741 [N: characterised by the relationships between the joining step and the severing step (cutting as mechanical pre-treatment B29C66/02241; cutting as thermal pre-treatment B29C66/0246; cutting as mechanical after-treatment B29C66/0326; cutting as thermal after-treatment B29C66/0346)] [N1204]
- B29C65/7411 [N: characterised by the temperature relationship between the joining step and the severing step] [N1204]

- B29C65/7412 [N: the joining step and the severing step being performed at different temperatures] [N1204]
- B29C65/7415 . . . [N: characterised by the pressure relationship between the joining step and the severing step] [N1204]
- B29C65/7416 [N: the joining step and the severing step being performed at different pressures] [N1204]
- B29C65/7419 . . . [N: 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] [N1204]
- B29C65/743 . . N: using the same tool for both joining and severing, said tool being monobloc or formed by several parts mounted together and forming a monobloc (B29C65/20D takes precedence)] [N1204]
- B29C65/7433 . . . [N: the tool being a wire] [N1204]
- B29C65/7435 . . . [N: the tool being a roller] [N1204]
- B29C65/7437 . . . [N: the tool being a perforating tool (perforating as mechanical pre-treatment B29C66/02242)] [N1204]
- B29C65/7439 . . . [N: for continuously and longitudinally welding and severing webs (B29C65/7435 takes precedence)] [N1204]
- B29C65/7441 . . . [N: for making welds and cuts of other than simple rectilinear form] [N1204]
- B29C65/7443 . . . [N: by means of ultrasonic vibrations] [N1204]
- B29C65/745 . . [N: using a single unit having both a severing tool and a welding tool] [N1204]
- B29C65/7451 . . . [N: the severing tool and the welding tool being movable with respect to one-another] [N1204]
- B29C65/7453 . . . [N: the severing tool being a wire] [N1204]
- B29C65/7455 . . . [N: the unit being a roller] [N1204]
- B29C65/7457 . . . [N: comprising a perforating tool] [N1204]
- B29C65/7459 . . . [N: for continuously and longitudinally welding and severing webs (B29C65/7455 takes precedence)] [N1204]
- B29C65/7461 . . . [N: for making welds and cuts of other than simple rectilinear form] [N1204]
- B29C65/747 . . [N: using other than mechanical means] [N1204]
- B29C65/7471 . . . [N: using a fluid, e.g. hot gases] [N1204]
- B29C65/7473 . . . [N: using radiation, e.g. laser, for simultaneously welding and severing] [N1204]
- B29C65/749 . . [N: Removing scrap (deburring welded articles B29C37/04)] [N1204]

- B29C65/76 . Making non-permanent or releasable joints

- B29C65/78 . Means for handling the parts to be joined, e.g. for making containers or hollow articles [N: 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] [C1112]

- [N: **WARNING**
[N1203]Subgroups of [B29C65/78](#) are not complete, pending a reorganisation; see also this group and its subgroups and [B29C65/20](#) and its subgroups
]

- B29C65/78D . . [N: Positioning the parts to be joined, e.g. aligning, indexing or centring] [N1112]
- B29C65/78D2 . . . [N: the parts to be joined comprising positioning features] [N1112]
- B29C65/78D2B [N: in the form of holes or slots ([B29C65/78D2D](#) takes precedence; holding or clamping means cooperating with specially formed features of at least one

- of the parts to be joined [B29C65/78F2](#)) [N1112]
- B29C65/78D2B2 [N: for centring purposes] [N1112]
- B29C65/78D2D [N: 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 [B29C65/78F2](#)), e.g. tenons and mortises (tenon and mortise joints [B29C66/126](#); tongue and groove joints [B29C66/124](#))] [N1112] [C1201]
- B29C65/78D2F [N: in the form of positioning marks] [N1112]
- B29C65/78D4 [N: by setting the gap between the parts to be joined (controlling or regulating the gap between the joining tools [B29C66/92611](#))] [N1112] [C1201]
- B29C65/78D4B [N: by using distance pieces, i.e. by using spacers positioned between the parts to be joined and forming a part of the joint] [N1112]
- B29C65/78D4B2 [N: said distance pieces being non-integral with the parts to be joined, e.g. particles] [N1112]
- B29C65/78D4B4 [N: said distance pieces being integral with at least one of the parts to be joined] [N1112]
- B29C65/78D5 [N: by setting the overlap between the parts to be joined, e.g. the overlap between sheets, plates or web-like materials] [N1201]
- B29C65/78D6 [N: by using stops ([B29C65/78D4B](#), [B29C66/92651](#) take precedence; tongue and groove joints [B29C66/124](#); tenon and mortise joints [B29C66/126](#))] [N1112]
- B29C65/78D10 [N: from the inside, e.g. of tubular or hollow articles ([B29C66/3242](#) takes precedence)] [N1112] [C1201]
- B29C65/78F [N: 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 [B29C66/81](#); work holders in general B25B; devices for holding or positioning work for welding metal [B23K37/04](#))] [N1112] [C1201]
- B29C65/78F2 [N: 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 [B29C65/78D2B](#); parts to be joined comprising inter-cooperating positioning features [B29C65/78D2D](#) (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 [B29C65/06Z](#))] [N1112]
- B29C65/78F4 [N: using vacuum to hold at least one of the parts to be joined (vacuum work holders in general [B25B11/00C](#))] [N1112]
- B29C65/78F6 [N: using magnetic forces to hold at least one of the parts to be joined (magnetic work holders in general [B25B11/00B](#))] [N1112]
- B29C65/78F8 [N: using electrostatic forces to hold at least one of the parts to be joined] [N1112]
- B29C65/78H [N: Provisory fixing] [N1112]
- B29C65/78M [N: characterised by the feeding movement of the parts to be joined] [C1203]
- B29C65/78M2 [N: In-line machines, i.e. feeding, joining and discharging are in one production line ([B29C65/78M6](#), [B29C65/78M10](#) take precedence)] [C1203]
- B29C65/78M2B [N: using a feeding table which moves to and fro (oscillating around an axis [B29C65/78M4](#))] [C1203]
- B29C65/78M2C [N: using carriers, provided with holding means, said carriers moving in a closed path] [C1203]
- B29C65/78M2D [N: using conveyer belts or conveyer chains ([B29C65/78M2E](#), [B29C66/83421](#), [B29C66/83521](#), [B29C66/83531](#) take precedence)] [C1203]
- B29C65/78M2D2 [N: using cooperating conveyer belts or cooperating conveyer chains ([B29C66/83423](#), [B29C66/83523](#), [B29C66/83533](#) take precedence)]

- N1203]
- B29C65/78M4 . . . [N: oscillating around an axis ([B29C65/78M10](#) takes precedence)] [C1201]
- B29C65/78M6 . . . [N: said parts to be joined moving in a closed path, e.g. a rectangular path ([B29C65/78M10](#) takes precedence)] [C1203]
- B29C65/78M6B [N: said parts to be joined moving in a circular path] [C1203]
- B29C65/78M6B2 [N: Rotary turret joining machines, i.e. having several joining tools moving around an axis] [C1203]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C65/06B](#)
]
- B29C65/78M10 . . . [N: Means for handling of moving sheets or webs] [N1112]
- B29C65/78M10B [N: of discontinuously moving sheets or webs] [N1112]
- B29C65/78M10D [N: of continuously moving sheets or webs] [N1112]
- B29C65/78N . . [N: Means for discharging the joined articles from the joining apparatus ([B29C66/005](#) takes precedence; discharging moulded articles from moulds [B29C37/00B](#))] [N1112] [C1201]
- B29C65/80 . . Rotatable transfer means [N: for loading or unloading purposes, i.e. turret transfer means ([B29C65/78M6](#) takes precedence; in-line machines using carriers, provided with holding means, said carriers moving in a closed path [B29C65/78M2C](#); in-line machines using conveyer belts or conveyer chains [B29C65/78M2D](#))] [C1203]
- B29C65/82 . Testing the joint
- [N: **WARNING**
[N1203]Subgroups of [B29C65/82](#) are not complete, pending a reorganisation; see also this group
]
- B29C65/82B . . [N: by mechanical methods] [N1108]
- B29C65/82B2 . . . [N: Tensile tests] [N1108]
- B29C65/82B4 . . . [N: Peel tests] [N1108]
- B29C65/82B6 . . . [N: Bend tests] [N1108]
- B29C65/82B8 . . . [N: Impact tests] [N1108]
- B29C65/82B10 . . . [N: Pressure tests, e.g. hydrostatic pressure tests] [N1108]
- B29C65/82D . . [N: by the use of waves or particle radiation, e.g. visual examination, scanning electron microscopy, or X-rays ([B29C65/82J](#) takes precedence)] [N1108]
- B29C65/82F . . [N: by the use of thermal means] [N1108]
- B29C65/82H . . [N: by the use of electric or magnetic means] [N1108]
- B29C65/82H2 . . . [N: by the use of electric means] [N1108]
- B29C65/82H4 . . . [N: by the use of magnetic means] [N1108]
- B29C65/82J . . [N: by the use of ultrasonic, sonic or infrasonic waves] [N1108]
- B29C66/00** [N: General aspects of processes or apparatus for joining preformed parts (means for handling the parts to be joined [B29C65/78](#); testing the joint [B29C65/82](#))] [N1201]
- [N: **WARNING**
[N1201] Groups [B29C66/00](#) - [B29C66/98](#) do not correspond to former or current IPC groups. Concordance ECLA : IPC for these groups is as follows: - [B29C66/00](#) - [B29C66/98](#) : [B29C65/00](#)
]

- B29C66/001 . [N: Joining in special atmospheres] [N1201]
 - [N: **WARNING**
[N1203]Subgroups of [B29C66/001](#) are not complete, pending a reorganisation; see also this group
]
- B29C66/0012 . . [N: characterised by the type of environment] [N1201]
- B29C66/0014 . . . [N: Gaseous environments] [N1201]
- B29C66/00141 [N: Protective gases] [N1201]
- B29C66/00143 [N: Active gases] [N1201]
- B29C66/00145 [N: Vacuum, e.g. partial vacuum] [N1201]
- B29C66/0016 . . . [N: Liquid environments, i.e. the parts to be joined being submerged in a liquid] [N1201]
- B29C66/0018 . . . [N: being sterile] [N1201]
- B29C66/002 . [N: Removing toxic gases] [N1201]
- B29C66/003 . [N: Protecting areas of the parts to be joined from overheating ([B29C66/348](#), [B29C66/8744](#) take precedence)] [N1201]
- B29C66/004 . [N: Preventing sticking together, e.g. of some areas of the parts to be joined] [N1201] [C1204]
- B29C66/0042 . . [N: of the joining tool and the parts to be joined ([B29C66/0046](#) takes precedence; joining tool characterized by its composition [B29C66/8122](#); joining tool characterized by its microstructure [B29C66/8124](#))] [N1201] [C1204]
- B29C66/0044 . . . [N: using a separating sheet, e.g. fixed on the joining tool] [N1201]
- B29C66/00441 [N: movable, e.g. mounted on reels] [N1201]
- B29C66/0046 . . [N: by the use of a lubricant, e.g. fluid, powder] [N1201]
 - [N: **WARNING**
[N1203]Group [B29C66/0046](#) and subgroups are not complete, pending a reorganisation; see also [B29C66/004](#) and its subgroups
]
- B29C66/00461 . . . [N: being liquid, e.g. oil based] [N1201]
- B29C66/00463 . . . [N: being solid, e.g. a powder] [N1201]
- B29C66/005 . [N: Detaching the article from the joining tool] [N1201]
- B29C66/006 . [N: Preventing damaging, e.g. of the parts to be joined ([B29C66/003](#), [B29C66/004](#), [B29C66/348](#) take precedence)] [N1201]
 - [N: **WARNING**
[N1203]Group [B29C66/006](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/00](#) and subgroups
]
- B29C66/0062 . . [N: of the joining tool, e.g. avoiding wear of the joining tool] [N1201]
- B29C66/01 . [N: General aspects dealing with the joint area or with the area to be joined ([B29C65/76](#), [B29C65/82](#) take precedence)] [N1201]

- B29C66/02 . . [N: Preparation of the material, in the area to be joined, prior to joining or welding ([B29C66/32](#) takes precedence)] [N1201]
- B29C66/022 . . . [N: Mechanical pre-treatments, e.g. reshaping] [N1201]
- [N: **WARNING**
[N1203]Subgroups of [B29C66/022](#) are not complete, pending a reorganisation; see also this group
]
- B29C66/0222 [N: without removal of material, e.g. cleaning by air blowing or using brushes] [N1201]
- B29C66/0224 [N: with removal of material] [N1201]
- B29C66/02241 [N: Cutting, e.g. by using waterjets, or sawing (using heat [B29C66/0246](#); cutting-off or cutting-out a part of a strip-like or sheet-like material, transferring that part and fixing it to an article [B29C69/00U](#))] [N1201]
- B29C66/02242 [N: Perforating or boring] [N1201]
- B29C66/02245 [N: Abrading, e.g. grinding, sanding, sandblasting or scraping] [N1201]
- B29C66/024 . . . [N: Thermal pre-treatments] [N1201]
- [N: **WARNING**
[N1203]Subgroups of [B29C66/024](#) are not complete, pending a reorganisation; see also this group
]
- B29C66/0242 [N: Heating, or preheating, e.g. drying ([B29C66/3464](#) takes precedence)] [N1201]
- B29C66/0244 [N: Cooling] [N1201]
- B29C66/0246 [N: Cutting or perforating, e.g. burning away by using a laser or using hot air (simultaneously welding and severing using a fluid [B29C65/7471](#); simultaneously welding and severing using radiation [B29C65/7473](#); cutting-off or cutting-out a part of a strip-like or sheet-like material, transferring that part and fixing it to an article [B29C69/00U](#))] [N1201] [C1205]
- B29C66/026 . . . [N: Chemical pre-treatments ([B29C66/028](#) takes precedence)] [N1201]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C66/02](#)
]
- B29C66/028 . . . [N: Non-mechanical surface pre-treatments, i.e. by flame treatment, electric discharge treatment, plasma treatment, wave energy or particle radiation ([B29C65/14](#) takes precedence; non-mechanical surface treatment of plastics in general [B29C59/08](#) to [B29C59/16](#))] [N1201]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C66/02](#)
]
- B29C66/03 . . [N: After-treatments in the joint area ([B29C66/3262](#) takes precedence)] [N1201]
- B29C66/032 . . . [N: Mechanical after-treatments ([deburring welded articles B29C37/04](#))] [N1201]
- B29C66/0322 [N: Post-pressing without reshaping, i.e. keeping the joint under pressure after joining] [N1201]
- B29C66/0324 [N: Reforming or reshaping the joint, e.g. folding over ([reshaping the burr B29C66/326](#))] [N1201]
- B29C66/03241 [N: Flattening] [N1201]
- B29C66/03242 [N: of sheets being positioned in abutment, e.g. after folding open of an overlap joint] [N1201]

- B29C66/0326 [N: Cutting, e.g. by using waterjets, or perforating (using heat [B29C66/0346](#))] [N1201]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C66/032](#)]
- B29C66/034 [N: Thermal after-treatments] [N1201]
- B29C66/0342 [N: Cooling, e.g. transporting through welding and cooling zone] [N1201]
- B29C66/0344 [N: Annealing] [N1201]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C66/034](#)]
- B29C66/0346 [N: Cutting or perforating, e.g. burning away by using a laser or using hot air (simultaneously joining and severing using a fluid [B29C65/7471](#); simultaneously welding and severing using radiation [B29C65/7473](#))] [N1201] [C1205]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C66/034](#)]
- B29C66/038 [N: Covering the joint by a coating material] [N1201]
- B29C66/0382 [N: the coating material being in liquid or paste form (joining by applying molten plastics [B29C65/40](#))] [N1201]
- B29C66/0384 [N: the coating material being in tape, strip or band form (joining using adhesive tapes covering both elements to be joined [B29C65/50B](#))] [N1201]
- B29C66/05 . . [N: Particular design of joint configurations] [N1201]
- [N: **WARNING**
[N1203]Group [B29C66/05](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/00](#) and its subgroups]
- [N: **Notes**
[N1201] 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 [B29C65/48](#) and subgroups or [B29C65/50](#) and subgroups]
- B29C66/10 . . . [N: particular design of the joint cross-sections] [N1201]
- [N: **Notes**
[N1201]The scope of the subgroups is defined by the drawings in the Definitions]
- B29C66/11 [N: 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 ([B29C66/12](#) and subgroups take precedence)] [N1201]
- B29C66/112 [N: Single lapped joints] [N1201]
- B29C66/1122 [N: Single lap to lap joints, i.e. overlap joints ([B29C66/45](#), [B29C66/472](#), [B29C66/52272](#) take precedence)] [N1201] [C1205]
- B29C66/114 [N: Single butt joints] [N1201]
- B29C66/1142 [N: Single butt to butt joints] [N1201]

B29C66/116	. . . . .	[N: Single bevelled joints, i.e. one of the parts to be joined being bevelled in the joint area] [N1201]
B29C66/1162	. . . . .	[N: Single bevel to bevel joints, e.g. mitre joints] [N1201]
B29C66/118	. . . . .	[N: Single monotone curved joints] [N1201]
B29C66/1182	. . . . .	[N: the joint being C-shaped] [N1201]
B29C66/12	. . . . .	[N: Joint cross-sections combining only two joint-segments; Tongue and groove joints; Tenon and mortise joints; Stepped joint cross-sections] [N1201]
B29C66/122	. . . . .	[N: 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 (B29C66/124 takes precedence)] [N1201]
B29C66/1222	. . . . .	[N: comprising at least a lapped joint-segment] [N1201]
B29C66/12221	. . . . .	{7 dots} [N: the two joint-segments being lapped] [N1201]
B29C66/1224	. . . . .	[N: comprising at least a butt joint-segment] [N1201]
B29C66/12241	. . . . .	{7 dots} [N: the two joint-segments being butt] [N1201]
B29C66/1226	. . . . .	[N: comprising at least one bevelled joint-segment] [N1201]
B29C66/12261	. . . . .	{7 dots} [N: the two joint-segments being bevelled, e.g. the two joint-segments forming a V] [N1201]
B29C66/1228	. . . . .	[N: comprising at least one monotone curved joint-segment] [N1201]
B29C66/12281	. . . . .	{7 dots} [N: the two joint-segments being monotone curved] [N1201]
B29C66/124	. . . . .	[N: Tongue and groove joints] [N1201]
B29C66/1242	. . . . .	[N: comprising interlocking undercuts] [N1201]
B29C66/12421	. . . . .	{7 dots} [N: Teardrop-like, waterdrop-like or mushroom-like interlocking undercuts] [N1201]
B29C66/12423	. . . . .	{7 dots} [N: Dovetailed interlocking undercuts] [N1201]
B29C66/12425	. . . . .	{7 dots} [N: Other specific interlocking undercuts not provided for in B29C66/12421 to B29C66/12423] [N1201]
B29C66/1244	. . . . .	[N: characterised by the male part, i.e. the part comprising the tongue] [N1201]
B29C66/12441	. . . . .	{7 dots} [N: being a single wall] [N1201]
B29C66/12443	. . . . .	{7 dots} [N: having the tongue substantially in the middle] [N1201]
B29C66/12445	. . . . .	{7 dots} [N: having the tongue on the side] [N1201]
B29C66/12449	. . . . .	{7 dots} [N: being asymmetric (B29C66/12445 takes precedence)] [N1201]
B29C66/1246	. . . . .	[N: characterised by the female part, i.e. the part comprising the groove] [N1201]
B29C66/12461	. . . . .	{7 dots} [N: being rounded, i.e. U-shaped or C-shaped] [N1201]
B29C66/12463	. . . . .	{7 dots} [N: being tapered] [N1201]
B29C66/12464	. . . . .	{8 dots} [N: being V-shaped] [N1201]
B29C66/12469	. . . . .	{7 dots} [N: being asymmetric] [N1201]
B29C66/1248	. . . . .	[N: Interpenetrating groove joints (Interpenetrating fingered joints B29C66/139)] [N1201]
B29C66/126	. . . . .	[N: Tenon and mortise joints (tenons and mortises for positioning purposes B29C65/78D2D)] [N1201]
B29C66/128	. . . . .	[N: Stepped joint cross-sections] [N1201]

B29C66/1282	. . . . .	[N: comprising at least one overlap joint-segment] [N1201]
B29C66/12821	. . . . .	{7 dots} [N: comprising at least two overlap joint-segments] [N1201]
B29C66/12822	. . . . .	{8 dots} [N: comprising at least three overlap joint-segments] [N1201]
B29C66/1284	. . . . .	[N: comprising at least one butt joint-segment] [N1201]
B29C66/12841	. . . . .	{7 dots} [N: comprising at least two butt joint-segments] [N1201]
B29C66/12842	. . . . .	{8 dots} [N: comprising at least three butt joint-segments] [N1201]
B29C66/1286	. . . . .	[N: comprising at least one bevelled joint-segment] [N1201]
B29C66/12861	. . . . .	{7 dots} [N: comprising at least two bevelled joint-segments] [N1201]
B29C66/12862	. . . . .	{8 dots} [N: comprising at least three bevelled joint-segments] [N1201]
B29C66/1288	. . . . .	[N: comprising at least one monotone curved joint-segment] [N1201]
B29C66/12881	. . . . .	{7 dots} [N: comprising at least two monotone curved joint-segments] [N1201]
B29C66/12882	. . . . .	{8 dots} [N: comprising at least three monotone curved joint-segments] [N1201]
B29C66/13	. . . . .	[N: 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 B29C66/11 to B29C66/12] [N1201]
B29C66/131	. . . . .	[N: Single flanged joints, i.e. one of the parts to be joined being rigid and flanged in the joint area] [N1201]
B29C66/1312	. . . . .	[N: Single flange to flange joints, the parts to be joined being rigid (the parts to be joined being flexible B29C66/133)] [N1201]
B29C66/133	. . . . .	[N: Fin-type joints, the parts to be joined being flexible (the parts to be joined being rigid B29C66/1312)] [N1201]
B29C66/135	. . . . .	[N: Single hemmed joints, i.e. one of the parts to be joined being hemmed in the joint area] [N1201]
B29C66/1352	. . . . .	[N: Single hem to hem joints] [N1201]
B29C66/137	. . . . .	[N: Beaded-edge joints or bead seals (for sealing or securing package folds or closures B65B51/24)] [N1201]
B29C66/139	. . . . .	[N: Interpenetrating fingered joints] [N1201]
B29C66/14	. . . . .	[N: the joint having the same thickness as the thickness of the parts to be joined (B29C66/1142 takes precedence)] [N1201]
B29C66/20	. . . . .	[N: particular design of the joint lines, e.g. of the weld lines] [N1201]
		[N: Notes
		[N1201]The scope of the subgroups is defined by the drawings in the Definitions]
B29C66/21	. . . . .	[N: said joint lines being formed by a single dot or dash or by several dots or dashes, i.e. spot joining or spot welding] [N1201]
B29C66/22	. . . . .	[N: said joint lines being in the form of recurring patterns (B29C66/234 takes precedence)] [N1201]
B29C66/221	. . . . .	[N: being in the form of a sinusoidal wave (B29C66/2272 takes precedence)] [N1201]
B29C66/223	. . . . .	[N: being in the form of a triangle wave or of a sawtooth wave, e.g. zigzagged] [N1201]

- B29C66/225 [N: being castellated, e.g. in the form of a square wave or of a rectangular wave ([B29C66/2276](#) takes precedence)] [N1201]
- B29C66/227 [N: 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 [B29C66/1242](#))] [N1201]
- B29C66/2272 [N: 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 [B29C66/12421](#))] [N1201]
- B29C66/2274 [N: Dovetailed interlocking undercuts (tongue and groove joints or tenon and mortise joints comprising dovetailed interlocking undercuts [B29C66/12423](#))] [N1201]
- B29C66/2276 [N: Other specific local geometries of interlocking undercuts not provided for in [B29C66/2272](#) to [B29C66/2274](#) (tongue and groove joints or tenon and mortise joints comprising other specific interlocking undercuts [B29C66/12425](#))] [N1201]
- B29C66/229 [N: Other specific patterns not provided for in [B29C66/221](#) to [B29C66/227](#)] [N1201]
- B29C66/23 [N: said joint lines being multiple and parallel or being in the form of tessellations] [N1201]
- B29C66/232 [N: said joint lines being multiple and parallel, i.e. the joint being formed by several parallel joint lines] [N1201]
- B29C66/234 [N: said joint lines being in the form of tessellations] [N1201]
- B29C66/24 [N: said joint lines being closed or non-straight] [N1201]
- B29C66/242 [N: said joint lines being closed, i.e. forming closed contours] [N1201]
- B29C66/2422 [N: being circular, oval or elliptical] [N1201]
- B29C66/24221 {7 dots} [N: being circular ([B29C66/51](#) takes precedence)] [N1201]
- B29C66/24223 {7 dots} [N: being oval] [N1201]
- B29C66/24225 {7 dots} [N: being elliptical] [N1201]
- B29C66/2424 [N: being a closed polygonal chain] [N1201]
- B29C66/24241 {7 dots} [N: forming a triangle] [N1201]
- B29C66/24243 {7 dots} [N: forming a quadrilateral] [N1201]
- B29C66/24244 {8 dots} [N: forming a rectangle] [N1201]
- B29C66/24245 {9 dots} [N: forming a square] [N1201]
- B29C66/24249 {7 dots} [N: forming a specific polygon not provided for in [B29C66/24241](#) to [B29C66/24243](#)] [N1201]
- B29C66/244 [N: said joint lines being non-straight, e.g. forming non-closed contours] [N1201]
- B29C66/2442 [N: in the form of a single arc of circle] [N1201]
- B29C66/246 [N: said joint lines forming figures, e.g. animals, flowers, hearts] [N1201]
- B29C66/301 [N: Three-dimensional joints, i.e. the joined area being substantially non-flat ([B29C66/5223](#), [B29C66/5224](#), [B29C66/5225](#) take precedence)] [N1201]
- B29C66/302 [N: the area to be joined comprising melt initiators] [N1201]
- B29C66/3022 [N: said melt initiators being integral with at least one of the parts to be joined] [N1201]
- B29C66/30221 [N: said melt initiators being point-like] [N1201]
- B29C66/30223 [N: said melt initiators being rib-like] [N1201]
- B29C66/3024 [N: said melt initiators being non-integral with the parts to be joined] [N1201]

- B29C66/303 . . . [N: the joint involving an anchoring effect ([B29C66/341](#), [B29C65/56](#) and subgroups take precedence)] [N1201]
- B29C66/3032 [N: making use of protusions or cavities belonging to at least one of the parts to be joined ([B29C66/3034](#) takes precedence)] [N1201]
- B29C66/30321 [N: making use of protusions belonging to at least one of the parts to be joined] [N1201]
- B29C66/30322 [N: in the form of rugosity] [N1201]
- B29C66/30325 [N: making use of cavities belonging to at least one of the parts to be joined] [N1201]
- B29C66/30326 [N: in the form of porosity] [N1201]
- B29C66/3034 [N: making use of additional elements, e.g. meshes] [N1201]
- B29C66/30341 [N: non-integral with the parts to be joined, e.g. making use of extra elements ([B29C65/56D](#) takes precedence)] [N1201]
- B29C66/304 [N: Joining through openings in an intermediate part of the article ([B29C66/3034](#) takes precedence)] [N1201]
- B29C66/305 [N: Decorative or coloured joints (optical properties of the material of the parts to be joined [B29C66/733](#))] [N1201]
- B29C66/306 [N: Applying a mark during joining] [N1201]
- B29C66/3062 [N: in the form of letters or numbers] [N1201]
- B29C66/30621 [N: in the form of letters] [N1201]
- B29C66/30623 [N: in the form of numbers] [N1201]
- B29C66/32 . . . [N: Measures for keeping the burr form under control; Avoiding burr formation; Shaping the burr ([deburring welded articles B29C37/04](#))] [N1201]
- B29C66/322 [N: Providing cavities in the joined article to collect the burr] [N1201]
- B29C66/324 [N: Avoiding burr formation] [N1201]
- B29C66/3242 [N: on the inside of a tubular or hollow article] [N1201]
- B29C66/326 [N: Shaping the burr, e.g. by the joining tool] [N1201]
- B29C66/3262 [N: as after-treatment, e.g. by a separate tool] [N1201]
- B29C66/328 [N: Leaving the burrs unchanged for providing particular properties to the joint, e.g. as decorative effect] [N1201]
- B29C66/3282 [N: for reinforcing the joint] [N1201]
- B29C66/3284 [N: for weakening the joint] [N1201]
- B29C66/341 . . . [N: Measures for intermixing the material of the joint interlayer] [N1201]
- B29C66/342 . . . [N: Preventing air-inclusions] [N1201]
- B29C66/343 . . . [N: Making tension-free or wrinkle-free joints] [N1201]
- B29C66/3432 [N: by holding the material loose or tension-free during joining] [N1201]
- B29C66/344 . . . [N: Stretching or tensioning the joint area during joining] [N1201]
- B29C66/345 . . . [N: Progressively making the joint, e.g. starting from the middle ([B29C66/8341](#), [B29C65/12](#), [B29C65/14](#), [B29C65/16](#) take precedence)] [N1201]
- B29C66/3452 [N: Making complete joints by combining partial joints] [N1201]
- B29C66/346 . . . [N: Making joints having variable thicknesses in the joint area, e.g. by using jaws having an adapted configuration] [N1201]
- B29C66/3462 [N: by differentially heating the zones of different thickness] [N1201]
- B29C66/3464 [N: by preheating] [N1201]
- B29C66/347 . . . [N: using particular temperature distributions or gradients; using particular heat distributions or gradients] [N1201]

- B29C66/3472 . . . [N: 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] [N1201]
- B29C66/3474 . . . [N: perpendicular to the plane of the joint] [N1201]
- B29C66/348 . . [N: Avoiding melting or weakening of the zone directly next to the joint area, e.g. by cooling] [N1201]
- B29C66/349 . . [N: Cooling the welding zone on the welding spot] [N1201]
- [N: **WARNING**
[N1203]Subgroups of [B29C66/349](#) are not complete, pending a reorganisation; see also this group
]
- B29C66/3492 . . . [N: by means placed on the side opposed to the welding tool] [N1201]
- B29C66/3494 . . . [N: while keeping the welding zone under pressure] [N1201]
- B29C66/40 . [N: 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] [N1201]
- [N: **WARNING**
[N1203]Group [B29C66/40](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/00](#) and its subgroups
]
- B29C66/41 . . [N: Joining substantially flat articles ([B29C66/47](#) and subgroups take precedence); Making flat seams in tubular or hollow articles ([B29C66/51](#) and subgroups take precedence)] [N1201]
- B29C66/43 . . . [N: Joining a relatively small portion of the surface of said articles ([B29C66/45](#) takes precedence)] [N1201]
- B29C66/431 [N: Joining the articles to themselves ([B29C66/4322](#) and [B29C66/4332](#) take precedence)] [N1201]
- B29C66/4312 [N: for making flat seams in tubular or hollow articles, e.g. transversal seams] [N1201]
- B29C66/43121 [N: Closing the ends of tubular or hollow single articles, e.g. closing the ends of bags ([closing tube ends B29C57/10](#))] [N1201]
- B29C66/43122 {7 dots} [N: Closing the top of gable top containers ([gable top containers B65D5/06D](#))] [N1201]
- B29C66/43123 {7 dots} [N: Closing the ends of squeeze tubes, e.g. for toothpaste or cosmetics ([producing flexible squeeze tubes by combined operations B29D23/20](#); [collapsible tubes B65D35/00](#))] [N1201]
- B29C66/43129 [N: said flat seams being transversal but non-orthogonal with respect to the tubular or hollow articles, i.e. oblique] [N1201]
- B29C66/432 [N: for making tubular articles or closed loops, e.g. by joining several sheets ([B29C66/547](#) takes precedence; [bending and joining sheets at right angles to the longitudinal axis of the article being formed and joining the edges B29C53/38](#)); for making hollow articles or hollow preforms] [N1201] [C1204]
- B29C66/4322 [N: by joining a single sheet to itself ([B29C66/4332](#) takes precedence)] [N1201]
- B29C66/4324 [N: for making closed loops, e.g. belts] [N1201]
- B29C66/4326 [N: for making hollow articles or hollow-preforms, e.g. half-shells] [N1204]
- B29C66/4329 [N: the joint lines being transversal but non-orthogonal with respect to the axis of said tubular articles, i.e. being oblique] [N1201]
- B29C66/433 [N: Casing-in, i.e. enclosing an element between two sheets by an outlined

- seam (for bookbinding [B42C11/06](#); for packaging B65B; by laminating B32B37; enclosing tubular articles between substantially flat elements [B29C66/53261](#)) [N1201]
- B29C66/4332 [N: by folding a sheet over] [N1201]
- B29C66/434 [N: Joining substantially flat articles for forming corner connections, fork connections or cross connections] [N1201]
- B29C66/4342 [N: Joining substantially flat articles for forming corner connections, e.g. for making V-shaped pieces] [N1201]
- B29C66/43421 [N: with a right angle, e.g. for making L-shaped pieces] [N1201]
- B29C66/4344 [N: Joining substantially flat articles for forming fork connections, e.g. for making Y-shaped pieces] [N1201]
- B29C66/43441 [N: with two right angles, e.g. for making T-shaped pieces, H-shaped pieces] [N1201]
- B29C66/4346 [N: Joining substantially flat articles for forming cross connections, e.g. for making X-shaped pieces] [N1201]
- B29C66/43461 [N: with four right angles, e.g. for making +-shaped pieces] [N1201]
- B29C66/435 [N: Making large sheets by joining smaller ones or strips together] [N1201]
- B29C66/436 [N: 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 [B29C66/304](#))] [N1201]
- B29C66/437 [N: Joining plastics plates for making venetian blinds (making venetian blinds in general [E06B9/266](#))] [N1201]
- B29C66/438 [N: Joining sheets for making hollow-walled, channelled structures or multi-tubular articles] [N1201]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C66/439](#)
]
- B29C66/439 [N: Joining sheets for making inflated articles without using a mould] [N1201]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29C66/438](#)
]
- B29C66/45 [N: Joining of substantially the whole surface of the articles (methods or apparatus for laminating [B32B37/00](#))] [N1201]
- B29C66/452 [N: the article having a disc form, e.g. making CDs or DVDs] [N1201]
- B29C66/47 [N: Joining single elements to sheets, plates or other substantially flat surfaces ([B29C66/5326](#) takes precedence)] [N1201]
- B29C66/472 [N: said single elements being substantially flat] [N1201]
- B29C66/4722 [N: Fixing strips to surfaces other than edge faces (fixing strips to edge faces [B29C63/00C](#))] [N1201]
- B29C66/4724 [N: said single elements being appliques, e.g. in the form of a text or drawing] [N1201]
- B29C66/474 [N: said single elements being substantially non-flat] [N1201]
- B29C66/4742 [N: said single elements being spouts] [N1201]
- B29C66/47421 [N: said spouts comprising flanges] [N1201]
- B29C66/49 [N: Internally supporting the, e.g. tubular, article during joining ([B29C66/63](#) takes precedence)] [N1201]
- B29C66/492 [N: using a fluid] [N1201]

- B29C66/494 . . . [N: using an inflatable core] [N1201]
- B29C66/496 . . . [N: using a support which remains in the joined object] [N1201]

- B29C66/50 . [N: 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] [N1201] [C1204]

- [N: **WARNING**
[N1203]Group [B29C66/50](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/00](#) and its subgroups
]

- B29C66/51 . . [N: 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] [N1201] [C1204]

- B29C66/52 . . . [N: Joining tubular articles, bars or profiled elements] [N1201]
- B29C66/522 [N: Joining tubular articles ([B29C66/53241](#) takes precedence)] [N1201]
- B29C66/5221 [N: for forming coaxial connections, i.e. the tubular articles to be joined forming a zero angle relative to each other] [N1201]
- B29C66/52211 [N: for making endless tubular articles, e.g. endless inner tubes] [N1201]
- B29C66/5223 [N: for forming corner connections or elbows, e.g. for making V-shaped pieces] [N1201]
- B29C66/52231 [N: with a right angle, e.g. for making L-shaped pieces] [N1201]
- B29C66/5224 [N: for forming fork-shaped connections, e.g. for making Y-shaped pieces] [N1201]
- B29C66/52241 [N: with two right angles, e.g. for making T-shaped pieces] [N1201]
- B29C66/5225 [N: for forming cross-shaped connections, e.g. for making X-shaped pieces] [N1201]
- B29C66/52251 [N: with four right angles, e.g. for making +-shaped pieces] [N1201]
- B29C66/5227 [N: 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] [N1201]

- B29C66/52271 [N: one tubular article being placed inside the other] [N1201]
- B29C66/52272 {7 dots} [N: concentrically, e.g. for forming multilayer tubular articles] [N1201]

- B29C66/5229 [N: involving the use of a socket] [N1201]
- B29C66/52291 [N: said socket comprising a stop] [N1201]
- B29C66/52292 {7 dots} [N: said stop being internal] [N1201]
- B29C66/52293 {7 dots} [N: said stop being external] [N1201]
- B29C66/52294 {7 dots} [N: said stop being heated] [N1201]
- B29C66/52295 [N: said socket comprising reinforcements] [N1201]
- B29C66/52296 [N: said socket comprising sealing elements, e.g. gaskets] [N1201]
- B29C66/52297 [N: said socket comprising slip-off prevention means ([B29C66/52296](#) takes precedence)] [N1201]
- B29C66/52298 [N: said socket being composed by several elements] [N1201]
- B29C66/524 [N: Joining profiled elements] [N1201]

B29C66/5241	. . . . .	[N: for forming coaxial connections, i.e. the profiled elements to be joined forming a zero angle relative to each other] [N1201]
B29C66/5243	. . . . .	[N: for forming corner connections, e.g. for making window frames or V-shaped pieces (Welded corner joints for window frames E06B3/96C)] [N1201]
B29C66/52431	. . . . .	[N: with a right angle, e.g. for making L-shaped pieces] [N1201]
B29C66/5244	. . . . .	[N: for forming fork-shaped connections, e.g. for making window frames or Y-shaped pieces] [N1201]
B29C66/52441	. . . . .	[N: with two right angles, e.g. for making T-shaped pieces] [N1201]
B29C66/5245	. . . . .	[N: for forming cross-shaped connections, e.g. for making window frames or X-shaped pieces] [N1201]
B29C66/52451	. . . . .	[N: with four right angles, e.g. for making +-shaped pieces] [N1201]
B29C66/526	. . . . .	[N: Joining bars] [N1201]
B29C66/5261	. . . . .	[N: for forming coaxial connections, i.e. the bars to be joined forming a zero angle relative to each other] [N1201]
B29C66/5263	. . . . .	[N: for forming corner connections, e.g. for making V-shaped pieces] [N1201]
B29C66/52631	. . . . .	[N: with a right angle, e.g. for making L-shaped pieces] [N1201]
B29C66/5264	. . . . .	[N: for forming fork-shaped connections, e.g. for making Y-shaped pieces] [N1201]
B29C66/52641	. . . . .	[N: with two right angles, e.g. for making T-shaped pieces] [N1201]
B29C66/5265	. . . . .	[N: for forming cross-shaped connections, e.g. for making X-shaped pieces] [N1201]
B29C66/52651	. . . . .	[N: with four right angles, e.g. for making +-shaped pieces] [N1201]
B29C66/5268	. . . . .	[N: characterised by their solid cross sections being non-circular, e.g. being elliptical, square or rectangular] [N1201]
B29C66/53	. . . . .	[N: Joining single elements to tubular articles, hollow articles or bars] [N1201]
B29C66/532	. . . . .	[N: Joining single elements to the wall of tubular articles, hollow articles or bars] [N1201]
B29C66/5324	. . . . .	[N: said single elements being substantially annular, i.e. of finite length (B29C66/5326 takes precedence)] [N1201]
B29C66/53241	. . . . .	[N: 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 B29C66/52241)] [N1201]
B29C66/53242	. . . . .	{7 dots} [N: said single elements being spouts, e.g. joining spouts to tubes] [N1201]
B29C66/53243	. . . . .	{8 dots} [N: said spouts comprising flanges] [N1201]
B29C66/53245	. . . . .	[N: said articles being hollow] [N1201]
B29C66/53246	. . . . .	{7 dots} [N: said single elements being spouts, e.g. joining spouts to containers] [N1201]
B29C66/53247	. . . . .	{8 dots} [N: said spouts comprising flanges] [N1201]
B29C66/5326	. . . . .	[N: said single elements being substantially flat] [N1201]
B29C66/53261	. . . . .	[N: Enclosing tubular articles between substantially flat elements] [N1201]
B29C66/53262	. . . . .	{7 dots} [N: Enclosing spouts between the walls of bags, e.g. of medical bags] [N1201]
B29C66/53263	. . . . .	{8 dots} [N: said spouts comprising wings, e.g. said spouts

- ng of ship-like or canoe-like form to avoid leaks in the corners]
[N1201]
- B29C66/534 [N: Joining single elements to open ends of tubular or hollow articles or to the ends of bars] [N1201] [C1204]
- B29C66/5342 [N: a substantially flat extra element being placed between and clamped by the joined single elements and the end of said tubular or hollow articles] [N1201]
- B29C66/53421 [N: said substantially flat extra element being flexible, e.g. a membrane ([B29C66/53425](#) takes precedence)] [N1201]
- B29C66/53423 [N: said substantially flat extra element being rigid, e.g. a plate ([B29C66/53425](#) takes precedence)] [N1201]
- B29C66/53425 [N: said substantially flat extra element being perforated, e.g. a screen] [N1201]
- B29C66/5344 [N: said single elements being substantially annular, i.e. of finite length, e.g. joining flanges to tube ends ([B29C66/5346](#) takes precedence)] [N1201]
- B29C66/5346 [N: said single elements being substantially flat] [N1201]
- B29C66/53461 [N: joining substantially flat covers and/or substantially flat bottoms to open ends of container bodies] [N1201] [C1203]
- B29C66/53462 {7 dots} [N: joining substantially flat covers and substantially flat bottoms to open ends of container bodies] [N1201] [C1203]
- B29C66/53465 [N: said single flat elements being provided with holes facing the tube ends, e.g. for making heat-exchangers] [N1201]
- B29C66/536 [N: Joining substantially flat single elements to hollow articles to form tubular articles] [N1201]
- B29C66/54 [N: 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] [N1201]
- B29C66/541 [N: a substantially flat extra element being placed between and clamped by the joined hollow-preforms] [N1201]
- B29C66/5412 [N: said substantially flat extra element being flexible, e.g. a membrane ([B29C66/5416](#) takes precedence)] [N1201]
- B29C66/5414 [N: said substantially flat extra element being rigid, e.g. a plate ([B29C66/5416](#) takes precedence)] [N1201]
- B29C66/5416 [N: said substantially flat extra element being perforated, e.g. a screen] [N1201]
- B29C66/542 [N: joining hollow covers or hollow bottoms to open ends of container bodies] [N1203]
- B29C66/543 [N: joining more than two hollow-preforms to form said hollow articles] [N1201]
- B29C66/5432 [N: joining hollow covers and hollow bottoms to open ends of container bodies] [N1203]
- B29C66/545 [N: one hollow-preform being placed inside the other] [N1201]
- B29C66/5452 [N: joining hollow bottoms to bottom of bottles] [N1203]
- B29C66/547 [N: Joining several hollow-preforms, e.g. half-cylinders, to form tubular articles, e.g. endless tubes] [N1201]
- B29C66/5472 [N: for making elbows or V-shaped pieces] [N1201]
- B29C66/54721 [N: for making L-shaped pieces] [N1201]
- B29C66/5474 [N: for making fork-shaped pieces, i.e. with 3 branches, e.g. Y-shaped

- pieces] [N1201]
- B29C66/54741 [N: for making T-shaped pieces] [N1201]
- B29C66/5476 [N: for making cross-shaped pieces, e.g. with 4 branches, e.g. X-shaped pieces] [N1201]
- B29C66/54761 [N: for making +-shaped pieces] [N1201]
- B29C66/549 [N: said hollow-preforms being interconnected during their moulding process, e.g. by a hinge] [N1201]
- B29C66/55 [N: sealing elements being incorporated into the joints, e.g. gaskets ([B29C66/52296](#) takes precedence)] [N1201]
- B29C66/61 [N: Joining from or joining on the inside (for making tubes by bending sheets and joining from the inside [B29C53/38J](#))] [N1201]
- B29C66/612 [N: Making circumferential joints] [N1201]
- B29C66/63 [N: Internally supporting the article during joining ([B29C66/49](#) takes precedence)] [N1201]
- B29C66/632 [N: using a fluid] [N1201]
- B29C66/634 [N: using an inflatable core] [N1201]
- B29C66/636 [N: using a support which remains in the joined object] [N1201]
- B29C66/65 [N: with a relative motion between the article and the welding tool ([B29C65/10](#), [B29C65/12](#) take precedence)] [N1201]
- B29C66/652 [N: moving the welding tool around the fixed article] [N1201]
- B29C66/69 [N: General aspects of joining filaments (bundling articles [B65B13/00](#); interconnecting successive lengths of material [B65H69/00](#))] [N1201]
- B29C66/70 [N: 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 [C08J5/12](#), [C09J](#))] [N1201] [C1204]
- [N: **WARNING**
[N1203]Group [B29C66/70](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/00](#) and its subgroups
]
- B29C66/71 [N: characterised by the composition of the plastics material of the parts to be joined (welding bar compositions [B29C65/12B](#))] [N1201]
- [N: **WARNING**
[N1203]Group [B29C66/71](#) and subgroups are not complete, pending a reorganisation; see also [B29K1/00](#) to [B29K95/00](#)
]
- B29C66/712 [N: the composition of one of the parts to be joined being different from the composition of the other part] [N1201]
- B29C66/72 [N: characterised by the structure of the material of the parts to be joined] [N1201] [C1204]
- B29C66/721 [N: Fibre-reinforced materials ([B29C66/729](#) takes precedence)] [N1201]
- [N: **WARNING**
[N1203]Subgroups of [B29C66/721](#) are not complete, pending a reorganisation; see also this group
]
- B29C66/7212 [N: characterised by the composition of the fibres] [N1201]

[N: **WARNING**

- [N1203]Not complete, pending a reorganisation; see also [B29K201/00](#) to [B29K311/14](#)]
- B29C66/7214 [N: characterised by the length of the fibres] [N1201]
- B29C66/72141 [N: Fibres of continuous length] [N1201]
- B29C66/72143 [N: Fibres of discontinuous lengths] [N1201]
- B29C66/723 [N: being multi-layered ([B29C66/7292](#), [B29C66/72941](#) take precedence)] [N1201]
- B29C66/7232 [N: comprising a non-plastics layer] [N1201]
- B29C66/72321 [N: consisting of metals or their alloys] [N1201]
- B29C66/72322 [N: consisting of elements other than metals, e.g. boron] [N1201]
- B29C66/72323 [N: Carbon] [N1201]
- B29C66/72324 [N: consisting of inorganic materials not provided for in [B29C66/72321](#) to [B29C66/72322](#)] [N1201]
- B29C66/72325 [N: Ceramics] [N1201]
- B29C66/72326 [N: Glass] [N1201]
- B29C66/72327 [N: consisting of natural products or their composites, not provided for in [B29C66/72321](#) to [B29C66/72324](#)] [N1201]
- B29C66/72328 [N: Paper] [N1201]
- B29C66/72329 [N: Wood] [N1201]
- B29C66/7234 [N: comprising a barrier layer] [N1201]
- B29C66/72341 [N: for gases] [N1201]
- B29C66/72343 [N: for liquids] [N1201]
- B29C66/725 [N: being hollow-walled or honeycombs] [N1201]
- B29C66/7252 [N: hollow-walled] [N1201]
- B29C66/72521 [N: comprising corrugated cores] [N1201]
- B29C66/72523 [N: multi-channelled or multi-tubular ([B29C66/438](#), [B29C66/5227](#) take precedence)] [N1201]
- B29C66/72525 [N: comprising honeycomb cores] [N1201]
- B29C66/7254 [N: honeycomb structures] [N1201]
- B29C66/727 [N: being porous, e.g. foam] [N1201]
- B29C66/729 [N: Textile or other fibrous material made from plastics] [N1201]
- B29C66/7292 [N: coated ([B29C66/72941](#) takes precedence)] [N1201]
- B29C66/7294 [N: Non woven mats, e.g. felt] [N1201]
- B29C66/72941 [N: coated] [N1201]
- B29C66/73 [N: 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] [N1201]
- B29C66/731 [N: characterised by the intensive physical properties of the material of the parts to be joined] [N1201]
- B29C66/7311 [N: Thermal properties] [N1201]
- B29C66/73111 [N: Thermal expansion coefficient] [N1201]
- B29C66/73112 [N: 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] [N1201]
B29C66/73113	. . . . .	[N: Thermal conductivity] [N1201]
B29C66/73114	. . . . .	[N: 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] [N1201]
B29C66/73115	. . . . .	[N: Melting point] [N1201]
B29C66/73116	. . . . .	[N: 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] [N1201]
B29C66/73117	. . . . .	[N: Tg, i.e. glass transition temperature] [N1201]
B29C66/73118	. . . . .	[N: 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] [N1201]
B29C66/7312	. . . . .	[N: Rheological properties] [N1201]
B29C66/73121	. . . . .	[N: Viscosity] [N1201]
B29C66/73122	. . . . .	[N: of different viscosity, i.e. the viscosity of one of the parts to be joined being different from the viscosity of the other part] [N1201]
B29C66/7313	. . . . .	[N: Density] [N1201]
B29C66/73132	. . . . .	[N: of different density, i.e. the density of one of the parts to be joined being different from the density of the other part] [N1201]
B29C66/7314	. . . . .	N: Electrical and dielectric properties] [N1201]
B29C66/73141	. . . . .	N: Electrical conductivity] [N1201]
B29C66/73143	. . . . .	N: Dielectric properties] [N1201]
B29C66/7315	. . . . .	[N: Mechanical properties] [N1201]
B29C66/73151	. . . . .	[N: Hardness] [N1201]
B29C66/73152	. . . . .	[N: of different hardness, i.e. the hardness of one of the parts to be joined being different from the hardness of the other part] [N1201]
B29C66/7316	. . . . .	[N: Surface properties] [N1201]
B29C66/73161	. . . . .	[N: Roughness or rugosity] [N1201]
B29C66/73162	. . . . .	[N: 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] [N1201]
B29C66/7317	. . . . .	[N: Hydrophilicity or hydrophobicity] [N1201]
B29C66/73171	. . . . .	[N: Hydrophilicity] [N1201]
B29C66/73172	. . . . .	[N: of different hydrophilicity, i.e. the hydrophilicity of one of the parts to be joined being different from the hydrophilicity of the other part] [N1201]
B29C66/73175	. . . . .	[N: Hydrophobicity] [N1201]
B29C66/73176	. . . . .	[N: of different hydrophobicity, i.e. the hydrophobicity of one of the parts to be joined being different from the hydrophobicity of the other part] [N1201]
B29C66/7318	. . . . .	[N: Permeability to gases or liquids] [N1201]
B29C66/73181	. . . . .	[N: permeable] [N1201]
B29C66/73182	. . . . .	[N: to gases] [N1201]
B29C66/73183	. . . . .	[N: to liquids] [N1201]
B29C66/73185	. . . . .	[N: non-permeable] [N1201]

B29C66/73186	. . . . .	[N: to gases] [N1201]
B29C66/73187	. . . . .	[N: to liquids] [N1201]
B29C66/733	. . .	[N: characterised by the optical properties of the material of the parts to be joined, e.g. fluorescence, phosphorescence] [N1201]
B29C66/7332	. . . . .	[N: at least one of the parts to be joined being coloured] [N1201]
B29C66/73321	. . . . .	[N: both parts to be joined being coloured] [N1201]
B29C66/73322	. . . . .	[N: both parts to be joined having a different colour] [N1201]
B29C66/7334	. . . . .	[N: at least one of the parts to be joined being glossy or matt, reflective or refractive] [N1201]
B29C66/73341	. . . . .	[N: at least one of the parts to be joined being glossy or reflective] [N1201]
B29C66/73343	. . . . .	[N: at least one of the parts to be joined being matt or refractive] [N1201]
B29C66/7336	. . . . .	[N: at least one of the parts to be joined being opaque, transparent or translucent to visible light] [N1201]
B29C66/73361	. . . . .	[N: at least one of the parts to be joined being opaque to visible light] [N1201]
B29C66/73362	. . . . .	[N: both parts to be joined being opaque to visible light] [N1201]
B29C66/73365	. . . . .	[N: at least one of the parts to be joined being transparent or translucent to visible light] [N1201]
B29C66/73366	. . . . .	[N: both parts to be joined being transparent or translucent to visible light] [N1201]
B29C66/7338	. . . . .	[N: at least one of the parts to be joined being polarising] [N1201]
B29C66/735	. . .	[N: characterised by the extensive physical properties of the parts to be joined] [N1201]
B29C66/7352	. . . . .	[N: Thickness, e.g. very thin] [N1201]
B29C66/73521	. . . . .	[N: of different thickness, i.e. the thickness of one of the parts to be joined being different from the thickness of the other part] [N1201]
B29C66/737	. . .	[N: characterised by the state of the material of the parts to be joined] [N1201]
B29C66/7371	. . . . .	[N: oriented or heat-shrinkable] [N1201]
B29C66/73711	. . . . .	[N: oriented] [N1201]
B29C66/73712	. . . . .	[N: mono-axially] [N1201]
B29C66/73713	. . . . .	[N: bi-axially or multi-axially] [N1201]
B29C66/73715	. . . . .	[N: heat-shrinkable] [N1201]
B29C66/7373	. . . . .	[N: Joining soiled or oxidised materials] [N1201]
B29C66/7375	. . . . .	[N: uncured, partially cured or fully cured] [N1201]
B29C66/73751	. . . . .	[N: the to-be-joined area of at least one of the parts to be joined being uncured, i.e. non cross-linked, non vulcanized] [N1201] [C1203]
B29C66/73752	. . . . .	[N: the to-be-joined areas of both parts to be joined being uncured] [N1201] [C1203]
B29C66/73753	. . . . .	[N: 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] [N1201] [C1203]
B29C66/73754	. . . . .	[N: the to-be-joined areas of both parts to be joined being partially cured] [N1201] [C1203]
B29C66/73755	. . . . .	[N: 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] [N1201] [C1203]
B29C66/73756	. . . . .	[N: the to-be-joined areas of both parts to be joined being fully cured]

- N1201] [C1203]
- B29C66/7377 [N: amorphous, semi-crystalline or crystalline] [N1201]
- B29C66/73771 [N: the to-be-joined area of at least one of the parts to be joined being amorphous] [N1201] [C1203]
- B29C66/73772 [N: the to-be-joined areas of both parts to be joined being amorphous] [N1201] [C1203]
- B29C66/73773 [N: the to-be-joined area of at least one of the parts to be joined being semi-crystalline] [N1201] [C1203]
- B29C66/73774 [N: the to-be-joined areas of both parts to be joined being semi-crystalline] [N1201] [C1203]
- B29C66/73775 [N: the to-be-joined area of at least one of the parts to be joined being crystalline] [N1201] [C1203]
- B29C66/73776 [N: the to-be-joined areas of both parts to be joined being crystalline] [N1201] [C1203]
- B29C66/7379 [N: degradable] [N1201]
- B29C66/73791 [N: biodegradable] [N1201]
- B29C66/73793 [N: soluble, e.g. water-soluble] [N1201]
- B29C66/739 [N: characterised by the material of the parts to be joined being a thermoplastic or a thermoset] [N1201]
- B29C66/7392 [N: characterised by the material of at least one of the parts being a thermoplastic] [N1201]
- B29C66/73921 [N: characterised by the materials of both parts being thermoplastics] [N1201]
- B29C66/7394 [N: characterised by the material of at least one of the parts being a thermoset] [N1201]
- B29C66/73941 [N: characterised by the materials of both parts being thermosets] [N1201]
- B29C66/74 . . . [N: Joining plastics material to non-plastics material] [N1201]
- [N: **WARNING**
[N1203] Group [B29C66/74](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/00](#) and its subgroups
]
- [N: **Notes**
[N1201]When classifying in this group, joining techniques are additionally classified in the relevant groups, i.e. in [B29C65/44](#) and subgroups or in [B29C65/64](#) and subgroups
]
- B29C66/742 [N: to metals or their alloys] [N1201]
- B29C66/7422 [N: Aluminium or alloys of aluminium] [N1201]
- B29C66/7424 [N: Lead or alloys of lead] [N1201]
- B29C66/7426 [N: Tin or alloys of tin] [N1201]
- B29C66/7428 [N: Transition metals or their alloys] [N1201]
- B29C66/74281 [N: Copper or alloys of copper] [N1201]
- B29C66/74283 [N: Iron or alloys of iron, e.g. steel] [N1201]
- B29C66/74285 [N: Noble metals, e.g. silver, gold, platinum or their alloys] [N1201]
- B29C66/744 [N: to elements other than metals] [N1201]

- B29C66/7442 [N: Boron] [N1201]
- B29C66/7444 [N: Carbon] [N1201]
- B29C66/746 [N: to inorganic materials not provided for in groups [B29C66/742](#) to [B29C66/744](#)] [N1201]
- B29C66/7461 [N: Ceramics] [N1201]
- B29C66/74611 [N: Carbides; Nitrides] [N1201]
- B29C66/7463 [N: Concrete] [N1201]
- B29C66/7465 [N: Glass] [N1201]
- B29C66/7467 [N: Mica] [N1201]
- B29C66/7469 [N: Asbestos] [N1201]
- B29C66/748 [N: to natural products or their composites, not provided for in groups [B29C66/742](#) to [B29C66/746](#)] [N1201]
- B29C66/7481 [N: Cork] [N1201]
- B29C66/7482 [N: Linoleum] [N1201]
- B29C66/7483 [N: Bone, horn, ivory] [N1201]
- B29C66/7484 [N: Leather] [N1201]
- B29C66/7485 [N: Natural fibres, e.g. wool, cotton] [N1201]
- B29C66/7486 [N: Paper, e.g. cardboard] [N1201]
- B29C66/7487 [N: Wood] [N1201]
- B29C66/80 [N: General aspects of machine operations or constructions and parts thereof] [N1201]
- [N: **WARNING**
[N1203]Group [B29C66/80](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/00](#) and its subgroups
]
- B29C66/81 [N: 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 [B29C65/78F](#)**)] [N1201]
- [N: **WARNING**
[N1203]Group [B29C66/81](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/00](#) and its subgroups
]
- B29C66/812 [N: 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] [N1201]
- B29C66/8122 [N: characterised by the composition of the material constituting the pressing elements, e.g. constituting the welding jaws or clamps] [N1201]
- [N: **WARNING**
[N1203]Not complete, pending a reorganisation; see also [B29K801/00](#) to [B29K911/14](#)
]
- B29C66/8124 [N: characterised by the structure of the material constituting the pressing elements, e.g. constituting the welding jaws or clamps] [N1201]
- B29C66/81241 [N: being porous or sintered] [N1201]
- B29C66/8126 [N: 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] [N1201]

B29C66/81261	. . . . .	[N: Thermal properties, e.g. thermal conductivity, thermal expansion coefficient] [N1201]
B29C66/81262	. . . . .	[N: Electrical and dielectric properties, e.g. electrical conductivity] [N1201]
B29C66/81263	. . . . .	[N: Dielectric properties] [N1201]
B29C66/81264	. . . . .	[N: Mechanical properties, e.g. hardness] [N1201]
B29C66/81265	. . . . .	[N: Surface properties, e.g. surface roughness or rugosity] [N1201]
B29C66/81266	. . . . .	[N: Optical properties, e.g. transparency, reflectivity] [N1201]
B29C66/81267	. . . . .	[N: Transparent to electromagnetic radiation, e.g. to visible light] [N1201]
B29C66/81268	. . . . .	[N: Reflective to electromagnetic radiation, e.g. to visible light] [N1201]
B29C66/814	. . .	[N: characterised by the design of the pressing elements, e.g. of the welding jaws or clamps] [N1201]
B29C66/8141	. . . . .	[N: 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] [N1201]
B29C66/81411	. . . . .	[N: characterised by its cross-section, e.g. transversal or longitudinal, being non-flat] [N1201]
B29C66/81413	. . . . .	[N: being non-symmetrical (B29C66/81415 takes precedence)] [N1201]
B29C66/81415	. . . . .	[N: being bevelled] [N1201]
B29C66/81417	. . . . .	{7 dots} [N: being V-shaped] [N1201]
B29C66/81419	. . . . .	{7 dots} [N: and flat] [N1201]
B29C66/81421	. . . . .	[N: being convex or concave] [N1201]
B29C66/81422	. . . . .	{7 dots} [N: being convex] [N1201]
B29C66/81423	. . . . .	{7 dots} [N: being concave] [N1201]
B29C66/81425	. . . . .	[N: being stepped, e.g. comprising a shoulder] [N1201]
B29C66/81427	. . . . .	[N: comprising a single ridge, e.g. for making a weakening line; comprising a single tooth] [N1201]
B29C66/81429	. . . . .	[N: comprising a single tooth] [N1201]
B29C66/81431	. . . . .	[N: comprising a single cavity, e.g. a groove] [N1201]
B29C66/81433	. . . . .	[N: being toothed, i.e. comprising several teeth or pins (comprising a single tooth B29C66/81429), or being patterned] [N1201]
B29C66/81435	. . . . .	[N: comprising several parallel ridges, e.g. for crimping (comprising a single ridge B29C66/81427)] [N1201]
B29C66/8145	. . . . .	[N: characterised by the constructional aspects of the pressing elements, e.g. of the welding jaws or clamps (B29C66/816 and B29C66/818 take precedence; adaptable for making articles or joints of different dimensions B29C66/841)] [N1201]
B29C66/81451	. . . . .	[N: being adaptable to the surface of the joint (B29C66/81453 , B29C66/81455 , B29C66/81457 , B29C66/81459 , B29C66/81461 take precedence)] [N1201]
B29C66/81453	. . . . .	[N: being made of flexible slats, flexible fins, flexible bristles or springs, e.g. coiled springs] [N1201]
B29C66/81455	. . . . .	[N: 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 B29C66/82421)] [N1201]

- B29C66/81457 [N: comprising a block or layer of deformable material, e.g. sponge, foam, rubber (**pressing elements supported or backed-up by resilient material [B29C66/8161](#)**)] [N1201]
- B29C66/81459 [N: being a filled deformable bladder, e.g. bladder filled with oil, with granules or with a meltable solid material (**[B29C66/81455](#) takes precedence**)] [N1201]
- B29C66/81461 [N: being multi-lamellar or segmented, i.e. comprising a plurality of strips, plates or stacked elements] [N1201]
- B29C66/81463 [N: 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] [N1201]
- B29C66/81465 [N: one placed behind the other in a single row in the feed direction] [N1201]
- B29C66/81467 [N: arranged in an offset pattern] [N1201]
- B29C66/81469 [N: one placed next to the other in a single line transverse to the feed direction, e.g. shoulder to shoulder sonotrodes] [N1201]
- B29C66/81471 [N: being a wrap-around tape or band] [N1201]
- B29C66/816 [N: characterised by the mounting of the pressing elements, e.g. of the welding jaws or clamps] [N1201]
- B29C66/8161 [N: said pressing elements being supported or backed-up by springs or by resilient material] [N1201]
- B29C66/81611 [N: by resilient material] [N1201]
- B29C66/8163 [N: Self-aligning to the joining plane, e.g. mounted on a ball and socket] [N1201]
- B29C66/8165 [N: Carrier plates for mounting joining tool parts, e.g. for re-arranging the tool parts to make other forms] [N1201]
- B29C66/8167 [N: Quick change joining tools or surfaces] [N1201]
- B29C66/8169 [N: the mounting of said pressing elements being laterally movable, e.g. adjustable (**[B29C66/836](#), [B29C66/841](#), [B29C66/863](#) take precedence**)] [N1201]
- B29C66/818 [N: 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 [B29C65/24](#)**); comprising means for compensating for the thermal expansion of the welding jaws or of the clamps] [N1201]
- B29C66/8181 [N: characterised by the cooling constructional aspects] [N1201]
- B29C66/81811 [N: of the welding jaws] [N1201]
- B29C66/81812 [N: the welding jaws being cooled from the outside, e.g. by blowing a gas or spraying a liquid] [N1201]
- B29C66/81815 [N: of the clamps] [N1201]
- B29C66/8182 [N: characterised by the thermal insulating constructional aspects] [N1201]
- B29C66/81821 [N: of the welding jaws] [N1201]
- B29C66/81825 [N: of the clamps] [N1201]
- B29C66/8183 [N: characterised by the thermal conducting constructional aspects] [N1201]
- B29C66/81831 [N: of the welding jaws] [N1201]
- B29C66/81835 [N: of the clamps] [N1201]

- B29C66/8185 [N: comprising means for compensating for the thermal expansion of the welding jaws or of the clamps (means for tensioning resistive elements [B29C65/22F](#))] [N1201]
- B29C66/8187 [N: characterised by the electrical insulating constructional aspects] [N1201]
- B29C66/81871 [N: of the welding jaws] [N1201]
- B29C66/81875 [N: of the clamps] [N1201]
- B29C66/8188 [N: characterised by the electrical conducting constructional aspects] [N1201]
- B29C66/81881 [N: of the welding jaws] [N1201]
- B29C66/81885 [N: of the clamps] [N1201]
- B29C66/82 . . [N: Pressure application arrangements, e.g. transmission or actuating mechanisms for joining tools or clamps] [N1201]
- [N: **WARNING**
[N1203]Group [B29C66/82](#) and subgroups are not complete, pending a reorganisation; see also [B29C65/00](#) and its subgroups
]
- B29C66/822 . . . [N: Transmission mechanisms] [N1201]
- B29C66/8221 [N: Scissor or lever mechanisms, i.e. involving a pivot point] [N1201]
- B29C66/8222 [N: Pinion or rack mechanisms] [N1201]
- B29C66/8223 [N: Worm or spindle mechanisms] [N1201]
- B29C66/8224 [N: Chain or sprocket drives] [N1201]
- B29C66/8225 [N: Crank mechanisms] [N1201]
- B29C66/8226 [N: Cam mechanisms; Wedges; Eccentric mechanisms] [N1201] [C1203]
- B29C66/82261 [N: Wedges] [N1201]
- B29C66/82263 [N: Follower pin or roller cooperating with a groove] [N1201]
- B29C66/82265 [N: Eccentric mechanisms] [N1203]
- B29C66/8227 [N: using springs] [N1201]
- B29C66/824 . . . [N: Actuating mechanisms] [N1201]
- B29C66/8242 [N: Pneumatic or hydraulic drives (using fluid pressure directly acting on the parts to be joined [B29C66/8266](#))] [N1201]
- B29C66/82421 [N: using an inflatable element positioned between the joining tool and a backing-up part] [N1201]
- B29C66/82423 [N: using vacuum (using vacuum directly acting on the parts to be joined [B29C66/82661](#))] [N1201]
- B29C66/8244 [N: magnetically driven] [N1201]
- B29C66/8246 [N: Servomechanisms, e.g. servomotors] [N1201]
- B29C66/8248 [N: Pressure application by weights (by the own weight of the joining tool [B29C66/8282](#))] [N1201]
- B29C66/826 . . . [N: without using a separate pressure application tool, e.g. the own weight of the parts to be joined ([B29C65/66](#) takes precedence)] [N1201]
- B29C66/8262 [N: using "pressure means" which are associated with at least one of the parts to be joined and remain in or on it] [N1201]
- B29C66/8264 [N: using the thermal expansion of the parts to be joined] [N1201]
- B29C66/8266 [N: using fluid pressure directly acting on the parts to be joined] [N1201]
- B29C66/82661 [N: by means of vacuum] [N1201]

- B29C66/828 . . . [N: Other pressure application arrangements] [N1201]
- B29C66/8282 [N: using the own weight of the joining tool] [N1201]
- B29C66/8284 [N: using the thermal expansion of the joining tool] [N1201]
- B29C66/8286 [N: Hand placed clamps (*Wrap-around tapes or bands* [B29C66/81471](#))] [N1201]
- B29C66/83 . . [N: characterised by the movement of the joining or pressing tools] [N1201]
- [N: **WARNING**
[N1203]Group [B29C66/83](#) and subgroups are not complete, pending a reorganisation; see also this group and its subgroups and [B29C65/00](#) and its subgroups
]
- B29C66/832 [N: Reciprocating joining or pressing tools ([B29C66/834](#) takes precedence)] [N1201]
- B29C66/8322 [N: Joining or pressing tools reciprocating along one axis] [N1201]
- B29C66/83221 [N: cooperating reciprocating tools, each tool reciprocating along one axis] [N1201]
- B29C66/8324 [N: Joining or pressing tools pivoting around one axis (*scissor or lever transmission mechanisms* [B29C66/8221](#); *tools self-aligning to the joining plane* [B29C66/8163](#))] [N1201]
- B29C66/83241 [N: cooperating pivoting tools] [N1201]
- B29C66/834 [N: moving with the parts to be joined] [N1201]
- B29C66/8341 [N: Roller, cylinder or drum types; Band or belt types; Ball types ([B29C66/8351](#) takes precedence)] [N1201]
- B29C66/83411 [N: Roller, cylinder or drum types ([B29C66/83431](#) takes precedence; *rollers, cylinders or drums moving relative to and tangentially to the parts to be joined* [B29C66/8362](#))] [N1201]
- B29C66/83413 [N: cooperating rollers, cylinders or drums] [N1201]
- B29C66/83415 [N: the contact angle between said rollers, cylinders or drums and said parts to be joined being a non-zero angle ([B29C66/83433](#) takes precedence)] [N1201]
- B29C66/83417 [N: said rollers, cylinders or drums being hollow] [N1201]
- B29C66/83421 [N: band or belt types ([B29C66/83431](#) takes precedence)] [N1201]
- B29C66/83423 [N: cooperating bands or belts] [N1201]
- B29C66/83431 [N: rollers, cylinders or drums cooperating with bands or belts] [N1201]
- B29C66/83433 [N: the contact angle between said rollers, cylinders or drums and said bands or belts being a non-zero angle] [N1201]
- B29C66/83435 [N: said rollers, cylinders or drums being hollow] [N1201]
- B29C66/83441 [N: Ball types] [N1201]
- B29C66/8351 [N: Jaws mounted on rollers, cylinders, drums, bands, belts or chains; Flying jaws] [N1201]
- B29C66/83511 [N: jaws mounted on rollers, cylinders or drums] [N1201]
- B29C66/83513 [N: cooperating jaws mounted on rollers, cylinders or drums and moving in a closed path] [N1201]
- B29C66/83517 [N: said rollers, cylinders or drums being hollow] [N1201]
- B29C66/83521 [N: jaws mounted on bands or belts] [N1201]
- B29C66/83523 [N: Cooperating jaws mounted on cooperating bands or belts and moving in a closed path] [N1201]

B29C66/83531	. . . . .	[N: jaws mounted on chains] [N1201]
B29C66/83533	. . . . .	[N: Cooperating jaws mounted on cooperating chains and moving in a closed path] [N1201]
B29C66/83541	. . . . .	[N: flying jaws, e.g. jaws mounted on crank mechanisms or following a hand over hand movement] [N1201]
B29C66/83543	. . . . .	[N: cooperating flying jaws] [N1201]
B29C66/836	. . . . .	[N: 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 (B29C66/65 takes precedence)] [N1201]
B29C66/8362	. . . . .	[N: Rollers, cylinders or drums moving relative to and tangentially to the parts to be joined] [N1201]
B29C66/84	. . . . .	[N: Specific machine types or machines suitable for specific applications] [N1201]
B29C66/841	. . . . .	[N: Machines or tools adaptable for making articles of different dimensions or shapes or for making joints of different dimensions] [N1201]
B29C66/8412	. . . . .	[N: of different length, width or height] [N1201]
B29C66/84121	. . . . .	[N: of different width] [N1201]
B29C66/84123	. . . . .	[N: of different height] [N1201]
B29C66/8414	. . . . .	[N: of different diameter] [N1201]
B29C66/8416	. . . . .	[N: of different thickness] [N1201]
B29C66/843	. . . . .	[N: 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] [N1201]
B29C66/8432	. . . . .	[N: Machines for making separate joints at the same time mounted in parallel or in series] [N1201]
B29C66/845	. . . . .	[N: C-clamp type or sewing machine type] [N1201]
B29C66/847	. . . . .	[N: Drilling standard machine type] [N1201]
B29C66/849	. . . . .	[N: Packaging machines] [N1201]
B29C66/8491	. . . . .	[N: welding through a filled container, e.g. tube or bag] [N1201]
B29C66/851	. . . . .	[N: Bag or container making machines] [N1201]
B29C66/8511	. . . . .	[N: Bag making machines] [N1201]
B29C66/853	. . . . .	[N: Machines for changing web rolls or filaments, e.g. for joining a replacement web to an expiring web] [N1201]
B29C66/855	. . . . .	[N: Belt splicing machines] [N1201]
B29C66/857	. . . . .	[N: Medical tube welding machines] [N1201]
B29C66/861	. . . . .	[N: Hand-held tools] [N1201]
B29C66/8612	. . . . .	[N: Ironing tool type] [N1201]
B29C66/8614	. . . . .	[N: Tongs, pincers or scissors] [N1201]
B29C66/8616	. . . . .	[N: Pen or pencil like] [N1201]
B29C66/8618	. . . . .	[N: being battery operated] [N1201]
B29C66/863	. . . . .	[N: Robotised, e.g. mounted on a robot arm] [N1201]
B29C66/865	. . . . .	[N: Independently movable welding apparatus, e.g. on wheels] [N1201]
B29C66/8652	. . . . .	[N: being pushed by hand or being self-propelling] [N1201]
B29C66/86521	. . . . .	[N: being self-propelling] [N1201]
B29C66/86523	. . . . .	[N: the traction being made on the seam] [N1201]
B29C66/86531	. . . . .	[N: being guided] [N1201]

- B29C66/86533 [N: by rails] [N1201]
- B29C66/86535 [N: 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] [N1201]
- B29C66/87 . . . [N: Auxiliary operations or devices] [N1201]
- B29C66/872 . . . [N: Starting or stopping procedures] [N1201]
- B29C66/874 . . . [N: Safety measures or devices] [N1201]
- B29C66/8742 [N: for operators ([B29C66/002](#) takes precedence)] [N1201]
- B29C66/8744 [N: Preventing overheating of the parts to be joined, e.g. if the machine stops or slows down] [N1201]
- B29C66/87441 [N: by lowering or shutting down the power supply] [N1201]
- B29C66/87443 [N: by withdrawing the heating tools] [N1201]
- B29C66/87445 [N: by introducing protection shields] [N1201]
- B29C66/8746 [N: Detecting the absence of the articles to be joined] [N1201]
- B29C66/8748 [N: involving the use of warnings] [N1201]
- B29C66/876 [N: Maintenance or cleaning] [N1201]
- B29C66/8762 [N: Cleaning of the joining tools] [N1201]

- B29C66/90 . . . [N: Measuring or controlling the joining process] [N1201]

- [N: **WARNING**
[N1203]Group [B29C66/90](#) and subgroups are not complete, pending a reorganisation; see also this group and its subgroups
]
- B29C66/91 . . . [N: by measuring or controlling the temperature, the heat or the thermal flux] [N1201]
- B29C66/912 [N: by measuring the temperature, the heat or the thermal flux] [N1201]
- B29C66/9121 [N: by measuring the temperature] [N1201]
- B29C66/91211 [N: with special temperature measurement means or methods] [N1201]
- B29C66/91212 [N: involving measurement means being part of the welding jaws, e.g. integrated in the welding jaws] [N1201]
- B29C66/91213 {7 dots} [N: and measuring the electrical resistance of a resistive element belonging to said welding jaws, said element being e.g. a thermistor] [N1201]
- B29C66/91214 [N: 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] [N1201]
- B29C66/91216 [N: enabling contactless temperature measurements, e.g. using a pyrometer] [N1201]
- B29C66/91218 [N: using colour change, e.g. using separate colour indicators] [N1201]
- B29C66/91221 [N: of the parts to be joined] [N1201]
- B29C66/91231 [N: of the joining tool] [N1201]
- B29C66/9131 [N: by measuring the heat or the thermal flux, i.e. the heat flux] [N1201]
- B29C66/91311 [N: by measuring the heat generated by Joule heating or induction heating] [N1201] [C1204]
- B29C66/91313 [N: by measuring the voltage, i.e. the electric potential difference or electric tension] [N1201]

B29C66/91315	. . . . .	[N: by measuring the current intensity] [N1201]
B29C66/91317	. . . . .	[N: by measuring the electrical resistance] [N1201]
B29C66/914	. . .	[N: by controlling or regulating the temperature, the heat or the thermal flux] [N1201]
B29C66/9141	. . . . .	[N: by controlling or regulating the temperature] [N1201]
B29C66/91411	. . . . .	[N: of the parts to be joined, e.g. the joining process taking the temperature of the parts to be joined into account] [N1201]
B29C66/91413	. . . . .	[N: the parts to be joined having different temperatures] [N1201]
B29C66/91421	. . . . .	[N: of the joining tools] [N1201]
B29C66/91423	. . . . .	[N: using joining tools having different temperature zones or using several joining tools with different temperatures] [N1201]
B29C66/91431	. . . . .	[N: the temperature being kept constant over time] [N1201]
B29C66/91441	. . . . .	[N: the temperature being non-constant over time] [N1201]
B29C66/91443	. . . . .	[N: following a temperature-time profile (B29C65/38 takes precedence)] [N1201]
B29C66/91445	. . . . .	{7 dots} [N: by steps] [N1201]
B29C66/9161	. . . . .	[N: by controlling or regulating the heat or the thermal flux, i.e. the heat flux] [N1201]
B29C66/91631	. . . . .	[N: the heat or the thermal flux being kept constant over time] [N1201]
B29C66/91641	. . . . .	[N: the heat or the thermal flux being non-constant over time] [N1201]
B29C66/91643	. . . . .	[N: following a heat-time profile (B29C65/38 takes precedence)] [N1201]
B29C66/91645	. . . . .	{7 dots} [N: by steps] [N1201]
B29C66/91651	. . . . .	[N: by controlling or regulating the heat generated by Joule heating or induction heating] [N1201] [C1204]
B29C66/91653	. . . . .	[N: by controlling or regulating the voltage, i.e. the electric potential difference or electric tension] [N1201]
B29C66/91655	. . . . .	[N: by controlling or regulating the current intensity] [N1201]
B29C66/919	. . .	[N: characterised by specific temperature, heat or thermal flux values or ranges (specific electrical resistance values B29C66/81262)] [N1201]
B29C66/9192	. . . . .	[N: in explicit relation to another variable, e.g. temperature diagrams] [N1201]
B29C66/91921	. . . . .	[N: 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] [N1201]
B29C66/91931	. . . . .	[N: in explicit relation to the fusion temperature or melting point of the material of one of the parts to be joined] [N1201]
B29C66/91933	. . . . .	{7 dots} [N: higher than said fusion temperature] [N1201]
B29C66/91935	. . . . .	{7 dots} [N: lower than said fusion temperature] [N1201]
B29C66/91941	. . . . .	[N: in explicit relation to T _g , i.e. the glass transition temperature, of the material of one of the parts to be joined] [N1201]
B29C66/91943	. . . . .	{7 dots} [N: higher than said glass transition temperature] [N1201]
B29C66/91945	. . . . .	{7 dots} [N: lower than said glass transition temperature] [N1201]
B29C66/91951	. . . . .	[N: in explicit relation to time, e.g. temperature-time diagrams] [N1201]
B29C66/92	. .	[N: by measuring or controlling the pressure, the force, the mechanical power or the displacement of the joining tools] [N1201]

- B29C66/922 . . . [N: by measuring the pressure, the force, the mechanical power or the displacement of the joining tools] [N1201]
- B29C66/9221 [N: by measuring the pressure, the force or the mechanical power] [N1201]
- B29C66/92211 [N: with special measurement means or methods] [N1201]
- B29C66/9231 [N: by measuring the displacement of the joining tools] [N1201]
- B29C66/92311 [N: with special measurement means or methods] [N1201]
- B29C66/924 . . . [N: by controlling or regulating the pressure, the force, the mechanical power or the displacement of the joining tools] [N1201]
- B29C66/9241 [N: by controlling or regulating the pressure, the force or the mechanical power] [N1201]
- B29C66/92431 [N: the pressure, the force or the mechanical power being kept constant over time ([B29C66/92613](#) takes precedence)] [N1201] [C1203]
- B29C66/92441 [N: the pressure, the force or the mechanical power being non-constant over time] [N1201] [C1203]
- B29C66/92443 [N: following a pressure-time profile] [N1201]
- B29C66/92445 {7 dots} [N: by steps] [N1201]
- B29C66/92451 [N: using joining tools having different pressure zones or using several joining tools with different pressures] [N1201]
- B29C66/9261 [N: by controlling or regulating the displacement of the joining tools] [N1201]
- B29C66/92611 [N: by controlling or regulating the gap between the joining tools] [N1201]
- B29C66/92613 [N: the gap being kept constant over time] [N1201]
- B29C66/92615 [N: the gap being non-constant over time] [N1201]
- B29C66/92651 [N: by using stops] [N1201]
- B29C66/92653 [N: said stops being adjustable] [N1201]
- B29C66/92655 [N: by using several stops] [N1201]
- B29C66/929 . . . [N: characterized by specific pressure, force, mechanical power or displacement values or ranges] [N1201] [C1204]
- B29C66/9292 [N: in explicit relation to another variable, e.g. pressure diagrams] [N1201]
- B29C66/92921 [N: in specific relation to time, e.g. pressure-time diagrams] [N1201]
- B29C66/93 . . . [N: by measuring or controlling the speed] [N1201]
- B29C66/932 [N: by measuring the speed] [N1201]
- B29C66/9321 [N: with special speed measurement means or methods] [N1201]
- B29C66/934 [N: by controlling or regulating the speed] [N1201]
- B29C66/93411 [N: the parts to be joined having different speeds] [N1204]
- B29C66/93431 [N: the speed being kept constant over time] [N1201]
- B29C66/93441 [N: the speed being non-constant over time] [N1201]
- B29C66/93451 [N: by controlling or regulating the rotational speed, i.e. the speed of revolution] [N1201]
- B29C66/939 [N: characterised by specific speed values or ranges] [N1201]
- B29C66/9392 [N: in explicit relation to another variable, e.g. speed diagrams] [N1201]
- B29C66/94 . . . [N: by measuring or controlling the time] [N1201]
- B29C66/942 [N: by measuring the time] [N1201]
- B29C66/9421 [N: with special time measurement means or methods] [N1201]
- B29C66/944 [N: by controlling or regulating the time] [N1201]

- B29C66/9441 [N: the time being controlled or regulated as a function of another parameter] [N1201]
- B29C66/949 [N: characterised by specific time values or ranges] [N1201]
- B29C66/9492 [N: in explicit relation to another variable] [N1201]
- B29C66/95 . . . [N: by measuring or controlling specific variables not covered by groups [B29C66/91](#) to [B29C66/94](#)] [N1201]
- B29C66/951 [N: by measuring or controlling the vibration frequency and/or the vibration amplitude of vibrating joining tools, e.g. of ultrasonic welding tools] [N1201]
- B29C66/9511 [N: by measuring their vibration frequency] [N1201]
- B29C66/9512 [N: by controlling their vibration frequency] [N1201]
- B29C66/9513 [N: characterised by specific vibration frequency values or ranges] [N1201]
- B29C66/9515 [N: by measuring their vibration amplitude] [N1201]
- B29C66/9516 [N: by controlling their vibration amplitude] [N1201]
- B29C66/9517 [N: characterised by specific vibration amplitude values or ranges] [N1201]
- B29C66/952 [N: by measuring or controlling the wavelength] [N1201]
- B29C66/953 [N: by measuring or controlling the humidity] [N1201]
- B29C66/9532 [N: of the parts to be joined, i.e. taking the humidity of the parts to be joined into account] [N1201]
- B29C66/9534 [N: of the atmosphere, i.e. taking the ambient humidity into account] [N1201]
- B29C66/954 [N: by measuring or controlling the thickness of the parts to be joined] [N1201]
- B29C66/959 [N: characterised by specific values or ranges of said specific variables] [N1201]
- B29C66/9592 [N: in explicit relation to another variable, e.g. X-Y diagrams] [N1201]
- B29C66/96 . . . [N: characterised by the method for implementing the controlling of the joining process] [N1201]
- B29C66/961 [N: involving a feedback loop mechanism, e.g. comparison with a desired value] [N1201]
- B29C66/962 [N: using proportional controllers, e.g. PID controllers (proportional–integral–derivative controllers)] [N1201]
- B29C66/963 [N: using stored or historical data sets, e.g. using expert systems] [N1201]
- B29C66/964 [N: involving trial and error] [N1201]
- B29C66/965 [N: using artificial neural networks] [N1201]
- B29C66/966 [N: using fuzzy logic] [N1201]
- B29C66/967 [N: involving special data inputs or special data outputs, e.g. for monitoring purposes] [N1201]
- B29C66/9672 [N: involving special data inputs, e.g. involving barcodes, RFID tags] [N1201]
- B29C66/9674 [N: involving special data outputs, e.g. special data display means ([B29C66/8748](#) takes precedence)] [N1201]
- B29C66/97 . . . [N: Checking completion of joining or correct joining by using indications on at least one of the joined parts] [N1201]
- B29C66/972 [N: by extrusion of molten material] [N1201]
- B29C66/974 [N: by checking the bead or burr form] [N1201]
- B29C66/976 [N: by the use of an indicator pin, e.g. being integral with one of the parts to be joined] [N1201]
- B29C66/98 . . . [N: Determining the joining area by using markings on at least one of the parts to be joined] [N1201]

B29C67/00

Shaping techniques not covered by groups [B29C39/00](#) to [B29C65/00](#), [B29C70/00](#) or

B29C73/00 [C1003]

- B29C67/00B . [N: Moulding articles between moving mould surfaces, e.g. turning surfaces]
 - B29C67/00C . [N: Manufacturing coloured articles not otherwise provided for, e.g. by colour change] [N9810]
 - B29C67/00D . [N: for shaping plates or sheets]
 - B29C67/00E . [N: for shaping tubes or blown tubular films]
 - B29C67/00E2 . . [N: Turning tubes inside out (for lining internal surfaces [B29C63/36](#))]
 - B29C67/00E4 . . [N: using an internal mandrel] [N1202]
 - B29C67/00E4B . . . [N: and pressure difference] [N1202]
 - B29C67/00F . [N: Cold deforming of thermoplastics material ([B29C43/16](#), [B29C59/00](#) take precedence)]
 - B29C67/00G . [N: by shock-waves]
 - B29C67/00H . [N: Forming articles from a moulding composition enclosed in a deformable bag (making moulds composed of particles enclosed in a bag [B29C33/38D](#); from expandable material in flexible bags [B29C44/18C](#); with reinforcements placed in a covering element [B29C70/54B](#))] [C0901]
 - B29C67/00J . [N: Closing perforations or small holes, e.g. using additional moulding material] [N9810]
 - B29C67/00K . [N: for shaping edges or extremities ([B29C57/00](#) takes precedence)]
 - B29C67/00M . [N: Local deformation of formed objects]
 - B29C67/00R . [N: 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 [A61C13/00C3E](#); selective sintering of metallic powder [B22F3/105S](#); from ceramic or cementitious material [B28B1/00](#); photomechanical, e.g. photolithographic, production of textured or patterned surfaces [G03F7/00](#); selective printers for printing on three-dimensional objects [B41J3/407D](#))] [N1003]
- [N: **Note** [N1003]
Material and product properties are classified with the relevant ICO codes
]
- B29C67/00R2 . . [N: using only liquids or viscous materials, e.g. depositing a continuous bead of viscous material] [N1003]
 - B29C67/00R2B . . . [N: using individual droplets, e.g. from jetting heads] [N1003]
 - B29C67/00R2D . . . [N: using layers of liquid which are selectively solidified] [N1003]
 - B29C67/00R2D2 [N: by a concentrated source of energy, e.g. a scanning laser or a focused light source] [N1003]
 - B29C67/00R2D4 [N: by a source of energy not covered by [B29C67/00R2D2](#), e.g. by global irradiation combined with a mask] [N1003]
 - B29C67/00R4 . . [N: using only solid materials e.g. laminating sheet material precut to local cross

- sections of the 3D object] [N1003]
- B29C67/00R4B . . . [N: using layers of powder being selectively joined, e.g. by selective laser sintering or melting] [N1003]
- B29C67/00R6 . . [N: using a combination of solid and liquid materials, e.g. a powder selectively bound by a liquid binder, catalyst, inhibitor or energy absorber] [N1003]
- B29C67/00R8 . . [N: Apparatus components, details or accessories] [N1003]
- B29C67/00R8B . . . [N: for control or data processing, e.g. algorithms] [N1003]
- B29C67/00R8D . . . [N: Support structures for the 3D object during manufacture, e.g. using sacrificial material] [N1003]
- B29C67/00R8F . . . [N: for cleaning or recycling] [N1003]
- B29C67/02 . Moulding by agglomerating [N: ([B29C67/00R](#), [B29C67/20](#) take precedence)] [C1002]
- B29C67/04 . . Sintering ([N: sintering layers coated on a mould, core or substrate [B29C41/00](#)]; combined with compression [B29C 43/00](#); [N: selective sintering for rapid manufacturing or prototyping of 3D objects [B29C67/00R4B](#)]) [C1003]
- B29C67/06 . . Coagulating [N: ([selective coagulating for rapid manufacturing or prototyping of 3D objects \[B29C67/00R2\]\(#\)](#))] [C1003]
- B29C67/08 . Screen moulding, e.g. forcing the moulding material through a perforated screen on to a moulding surface
- B29C67/20 . for porous or cellular articles, e.g. of foam plastics, coarse-pored [N:([chemical aspects of working up macro-molecular substances to porous or cellular articles \[C08J9/00\]\(#\)](#))]
- B29C67/20C . . [N: comprising elimination of a solid or a liquid ingredient]
- B29C67/20D . . [N: comprising surface fusion, and bonding of particles to form voids, e.g. sintering]
- B29C67/20E . . [N: comprising impregnating expanded particles or fragments with a binder]
- B29C67/22 . . [N: IPC5] by internal pressure generated in the material, e.g. swelling, foaming [N: not used] [C0509]
- [N: **WARNING**
From 1st April 1995 on the groups [B29C67/22](#) to [B29C67/22D11](#) 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 [B29C44/00](#)
]
- B29C67/22B . . . [N: for articles of definite length, i.e. discrete articles (contains no documents)] [C0509]
- B29C67/22B10 [N: Applying counter pressure during foaming]
- B29C67/22B12 [N: upon or incorporating preformed parts, e.g. linings, inserts, reinforcements]
- B29C67/22B14 [N: using expandable particles or beads as starting material]
- B29C67/22B14B [N: using high frequency heating ([in general \[B29C33/06\]\(#\)](#))]
- B29C67/22C [N: for articles of indefinite length ([not used, see \[B29C44/20\]\(#\)](#))]
- B29C67/22C4 [N: comprising extruding the compounds before foaming]
- B29C67/22C4D [N: extruding the compound through a flat die ([in general \[B29C47/00J\]\(#\)](#))] [C1203]
- B29C67/22C4F [N: extruding the compound through an annular die ([in general \[B29C47/00J\]\(#\)](#))] [C1203]
- B29C67/22C10 [N: on preformed parts ([not used, see \[B29C44/32\]\(#\)](#))] [N0109]
- B29C67/22C10B [N: the preformed part being a lining, e.g. film, sheet, support lining]

- B29C67/22C10B2 [N: Folding devices for the lining]
- B29C67/22C10D [N: the preformed parts being partially embedded ([B29C67/22C10F](#) takes precedence)] [C0901]
- B29C67/22C10F [N: the preformed parts being three-dimensional structures ([B29C67/22C10B](#) takes precedence)]
- B29C67/22C10H [N: Filling the preformed spaces, cavities]
- B29C67/22D [N: Component parts, details or accessories; auxiliary operations (not used, see [B29C44/34](#))]
- B29C67/22D1 [N: Details of processes or apparatus for reducing environmental damage or for working-up compositions comprising inert blowing agents or biodegradable components]
- B29C67/22D3 [N: Dosing or filling a mould with expandable beads]
- B29C67/22D6 [N: after treatment of shaped foamed articles, e.g. altering the shape]
- B29C67/24 characterised by the choice of material
- B29C67/24B [N: Moulding wax]
- B29C67/24C [N: 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](#))]
- B29C67/24C2 [N: for making articles of definite length]
- B29C67/24C2B [N: by vibrating the composition before or during moulding]
- B29C67/24C3 [N: for making articles of indefinite length]
- B29C67/24D [N: Moulding high reactive monomers or prepolymers, e.g. by reaction injection moulding (RIM), liquid injection moulding (LIM) (casting monomers [B29C39/00B2](#), mixing construction [B29B7/74](#))]
- B29C67/24E [N: Moulding polymers or prepolymers containing ingredients in a frangible packaging, e.g. microcapsules (expandable components kept in frangible containers within a flexible bag [B29C44/18C2](#))] [C9603]
- B29C67/24F [N: 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 [B29C67/24C](#); thermal insulation in general [F16L59/00](#))]
- B29C67/24F3 [N: for making articles of indefinite length]
- B29C69/00** [N: Combinations of shaping techniques not provided for in a single one of main groups [B29C39/00](#) to [B29C67/00](#), e.g. associations of moulding and joining techniques; Apparatus therefore ([B29C47/00L](#) takes precedence)] [C1203]
- B29C69/00B [N: a shaping technique combined with cutting, e.g. in parts or slices combined with rearranging and joining the cut parts (for reinforced material [B29C70/54D](#); [B29C49/42G4](#), [B29C51/26M4](#) take precedence)] [C1202]
- B29C69/00B8 [N: Winding (cutting of individual length [B26D](#))]
- B29C69/00B8B [N: and cutting longitudinally e.g. for making O-rings; chain links, insulation tubes]
- B29C69/00D [N: making articles by joining parts moulded in separate cavities, said parts being in said separate cavities during said joining ([B29C45/00J3](#), [B29C51/26M2](#) take precedence)] [C1202]

- B29C69/00U . [N: 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 [B31B1/90](#); labelling in general [B65C](#))] [C9701]
- B29C69/00U2 . . [N: rotating transfer means]
- B29C69/00V . [N: Lining or sheathing in combination with forming the article to be lined]
- B29C69/00V2 . . [N: of tubular articles] [N9501]
- B29C69/02 . of moulding techniques only
- B29C69/02B . . [N: 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 [B29C61/00](#))]

B29C70/00 **Shaping composites, i.e. plastics material comprising reinforcements, fillers or preformed parts, e.g. inserts** (chemical aspects [C08](#), e.g. [C08J5/00](#)) [N0103]

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.

- B29C70/02 . comprising combinations of reinforcements, [N: e.g. non-specified reinforcements, fibrous reinforcing inserts] and fillers, [N: e.g. particulate fillers], incorporated in matrix material, forming one or more layers and with or without non-reinforced or non-filled layers [(N: combinations of fibrous reinforcement only [B29C70/04](#); combinations of fillers only [B29C70/58](#); combinations with non reinforcing inserts, e.g. foam blocks, [B29C70/68](#))] [N0103]
- B29C70/02A . . [N: Combinations of fibrous reinforcement and non-fibrous material] [N0103]
- B29C70/02A2 . . . [N: with reinforcing inserts] [N0103]
- B29C70/02A4 . . . [N: with particular filler] [N0103]
- B29C70/02B . . [N: and with one or more layers of pure plastics material, e.g. foam layers (applying a non-preformed coating, e.g. a gel-coat [B29C37/00C](#); with foam blocks [B29C70/86](#))] [N0103]
- B29C70/02C . . [N: and with one or more layers of non-plastics material or non-specified material, e.g. supports] [N0103]
- B29C70/04 . comprising reinforcements only, e.g. self-reinforcing plastics [N0103]
- B29C70/06 . . Fibrous reinforcements only [N0103]
- B29C70/08 . . . comprising combinations of different forms of fibrous reinforcements incorporated in matrix material, forming one or more layers, and with or without

- non-reinforced layers [N0103]
- B29C70/08A [N: Combinations of fibres of continuous or substantial length and short fibres] [N0103]
- B29C70/08B [N: Combinations of continuous fibres or fibrous profiled structures oriented in one direction and reinforcements forming a two dimensional structure, e.g. mats ([B29D24/00](#), [B29D99/00C](#) take precedence)] [N0103] [M1106]
- B29C70/08B2 [N: the structure being deformed in a three dimensional configuration ([B29C53/80B6](#) takes precedence)] [N0103]
- B29C70/08C [N: and with one or more layers of pure plastics material, e.g. foam layers (applying a non-preformed coating, e.g. a gel-coat, [B29C37/00C](#); with foam blocks [B29C70/86](#))] [N0111]
- B29C70/08D [N: and with one or more layers of non-plastics material or non-specified material, e.g. supports] [N0103]
- B29C70/10 . . . characterised by the structure of fibrous reinforcements, [N: e.g. hollow fibres] [N0103]
- B29C70/12 using fibres of short length, e.g. in the form of a mat [N: (non-woven fabrics per se [D04H1/00](#))] [N0103]
- B29C70/14 oriented (oriented filler material [B29C70/62](#)) [N0103]
- B29C70/16 using fibres of substantial or continuous length [N: (non-woven fabrics per se [D04H3/00](#))] [N0103]
- B29C70/18 in the form of a mat, e.g. sheet moulding compound (SMC) [N0103]
- B29C70/20 oriented in a single direction, e.g. roofing or other parallel fibres [N: ([B29C70/08B](#), [B29C70/22C](#) take precedence)] [N0103]
- B29C70/20A [N: arranged in parallel planes or structures of fibres crossing at substantial angles, e.g. cross-moulding compound (XMC) ([B29C70/20B2](#) takes precedence)] [N0103]
- B29C70/20B [N: the structure being shaped to form a three-dimensional configuration] [N0103]
- B29C70/20B2 {7 dots} [N: arranged in parallel planes of fibres crossing at substantial angles] [N0103]
- B29C70/22 oriented in at least two directions forming a two dimensional structure [N: (woven fabrics per se [D03D](#); knitted fabrics per se [D04D](#); braid per se [D04C](#))] [N0103]
- B29C70/22A [N: the structure being shaped to form a three dimensional configuration] [N0103]
- B29C70/22B [N: the structure being a net ([B29C70/68C](#) takes precedence)] [N0103]
- B29C70/22C [N: the structure comprising mainly parallel filaments interconnected by a small number of cross threads] [N0103]
- B29C70/22D [N: the structure being stacked in parallel layers with fibres of adjacent layers crossing at substantial angles] [N0103]
- B29C70/24 oriented in at least three directions forming a three dimensional structure [N0103]
- B29C70/26 . . Non-fibrous reinforcements only [N: ([B29C35/02L](#), [B29C61/06B3](#), [B29C70/88B](#) take precedence; combined with fibres [B29C70/02A2](#))] [N0103]
- B29C70/28 . . Shaping operations therefor [N0103]

Notes

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;

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 [B29B15/08](#).

- [B29C70/30](#) 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 [N: (by winding and joining, e.g. filament winding [B29C53/56](#); for building tyres [B29D30/08](#))] [N0103]
- [B29C70/30A](#) [N: Spray-up of reinforcing fibres with or without matrix to form a non-coherent mat in or on a mould ([B29C41/36B](#), [B29C70/32](#), [B29C70/34](#), [B29C70/50A](#), [B29C70/50B4](#) take precedence; coating a former by spraying plastics [B29C41/08](#))] [N0103]
- [B29C70/32](#) on a rotating mould, former or core [N0103]
- [B29C70/32A](#) [N: on the inner surface of a rotating mould] [N0103]
- [B29C70/32A2](#) [N: by rotating the mould around its axis of symmetry] [N0103]
- [B29C70/34](#) and shaping or impregnating by compression, [i.e. combined with compressing after the lay-up operation] [N0103]
- [B29C70/34A](#) [N: using isostatic pressure] [N0204]
- [B29C70/34B](#) [N: using matched moulds] [N0204]
- [B29C70/34C](#) [N: combined with compressing after the winding of lay-ups having a non-circular cross-section, e.g. flat spiral windings] [N0204]
- [B29C70/36](#) and impregnating by casting, e.g. vacuum casting [N0103]
- [B29C70/38](#) Automated lay-up, e.g. using robots, laying filaments according to predetermined patterns [N: (application heads for tyres [B29D30/28](#))] [N0103]
- [B29C70/38B](#) [N: Automated fiber placement (AFP)] [N0902]
- [B29C70/38B2](#) [N: Fiber placement heads, e.g. component parts, details or accessories] [N0902]
- [B29C70/38D](#) [N: Automated tape laying (ATL)] [N0902]
- [B29C70/38D2](#) [N: Tape placement heads, e.g. component parts, details or accessories] [N0902]
- [B29C70/40](#) Shaping or impregnating by compression ([B29C70/34](#) takes precedence) [N: not applied] [N0103]
- [B29C70/42](#) for producing articles of definite length, i.e. discrete articles [N0103]
- [B29C70/44](#) using isostatic pressure, e.g. pressure difference-, vacuum bag-, autoclave- or expanding rubber-moulding [N0103]
- [B29C70/44A](#) [N: and impregnating by vacuum or injection] [N0103]
- [B29C70/44B](#) [N: Moulding structures having an axis of symmetry or at least one channel, e.g. tubular structures, frames] [N0103]
- [B29C70/46](#) using matched moulds, e.g. for deforming sheet moulding compound (SMC), prepregs [N0103]

- B29C70/46A [N: Moulding structures having an axis of symmetry or at least one channel, e.g. tubular structures, frames][N0103]
- B29C70/46B [N: and impregnating by melting a solid material, e.g. sheets, powders of fibres] [N0103]
- B29C70/46C [N: and impregnating the reinforcements during mould closing ([B29C70/46B](#) takes precedence)] [N0103]
- B29C70/48 and impregnating the reinforcements in the closed mould, e.g. resin transfer moulding (RTM), [N: e.g. by vacuum] [N0103]
- B29C70/50 for producing articles of indefinite length, e.g. prepregs, sheet moulding compounds (SMC), cross moulding compounds (XMC) [N0103]
- B29C70/50A [N: by first forming a mat composed of short fibres] [N0103]
- B29C70/50B [N: using rollers or pressure bands ([for corrugating B29C53/22](#))] [N0103]
- B29C70/50B2 [N: and impregnating by melting a solid material, e.g. sheet, powder, fibres ([B29C70/50B4](#) takes precedence)] [N0103]
- B29C70/50B4 [N: and first forming a mat composed of short fibres] [N0103]
- B29C70/52 Pultrusion, i.e. forming and compressing by continuously pulling through a die [N0103]
- B29C70/52A [N: and impregnating the reinforcement before the die] [N0103]
- B29C70/52A2 {7 dots} [N: the transport direction being vertical] [N0103]
- B29C70/52B [N: and impregnating the reinforcement in the die] [N0103]
- B29C70/52B2 {7 dots} [N: the transport direction being vertical] [N0103]
- B29C70/52C [N: Component parts, details or accessories; Auxiliary operations] [N0103]
- B29C70/52C2 {7 dots} [N: Pultrusion dies, e.g. dies with moving or rotating parts ([B29C70/52B](#) takes precedence)] [N0103]
- B29C70/52C4 {7 dots} [N: Pulling means] [N0103]
- B29C70/52C6 {7 dots} [N: Heating or cooling] [N0103]
- B29C70/54 Component parts, details or accessories; Auxiliary operations, [N: e.g. feeding or storage of prepregs or SMC after impregnation or during ageing ([pretreatment, e.g. impregnation, of reinforcements B29B15/08](#))] [N0103]
- B29C70/54A [N: Positioning reinforcements in a mould, e.g. using clamping means for the reinforcement (positioning inserts in moulds [B29C33/12](#); lay-up on a mould [B29C70/30](#))] [N0103]
- B29C70/54B [N: Placing or positioning the reinforcement in a covering or packaging element before or during moulding, e.g. drawing in a sleeve] [N0103]
- B29C70/54C [N: Fixing the position or configuration of fibrous reinforcements before or during moulding ([for non-woven fabrics D04H3/08](#))] [N0103]
- B29C70/54D [N: Perforating, cutting or machining during or after moulding] [N0103]
- B29C70/54E [N: Measures for feeding or distributing the matrix material in the reinforcing structure] [N0103]
- B29C70/54E2 [N: using channels or porous distribution layers incorporated in or associated with the product] [N0103]
- B29C70/54E4 [N: using distribution constructions, e.g. channels incorporated in or associated with the mould] [N0103]
- B29C70/56 Tensioning reinforcements before or during shaping [N0103]
- B29C70/58 comprising fillers only, [N: e.g. particles, powder, beads, flakes, spheres ([B29C70/02A4](#) takes precedence, agglomerating hollow spheres to produce synthetic foam [B29C70/66](#); 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.

- B29C70/58A . . [N: incorporation of light reflecting filler, e.g. lamellae to obtain pearlescent effect (partially embedding reflective elements into the surface of or support [B29D11/00E2](#))] [N0103]
- B29C70/60 . . comprising a combination of distinct filler types incorporated in matrix material, forming one or more layers, and with or without non-filled layers [N0103]
- B29C70/60B . . . [N: and with one or more layers of pure plastics material, e.g. foam layers (applying a non-preformed coating, e.g. a gel-coat [B29C37/00C](#); with foam blocks [B29C70/86](#))] [N0103]
- B29C70/60C . . . [N: and with one or more layers of non-plastics material or non-specified material, e.g. supports] [N0103]
- B29C70/62 . . the filler being oriented during moulding (for short fibres [B29C70/14](#)) [N0103]
- B29C70/64 . . the filler influencing the surface characteristics of the material, e.g. by concentrating near the surface or by incorporating in the surface by force [N0103]
- B29C70/66 . . the filler comprising hollow constituents, e.g. syntactic foam [N0103]
- B29C70/68 . . by incorporating or moulding on preformed parts, e.g. inserts, layers, [N: e.g. foam blocks (mould constructions therefor [B29C33/12](#); joining preformed parts by moulding [B29C65/70](#))] [N0103]

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 [B29B15/00](#).

- B29C70/68A . . [N: Component parts, details or accessories; Auxiliary operations] [N0103]
- B29C70/68A2 . . . [N: Preformed parts characterised by their structure, e.g. form] [N0103]
- B29C70/68A4 . . . [N: Pretreatment of the preformed part, e.g. insert] [N0103]
- B29C70/68B . . [N: by laminating inserts between two plastic films or plates] [N0103]
- B29C70/68B2 . . . [N: the inserts being sheets or documents, e.g. ID cards] [N0103]
- B29C70/68B4 . . . [N: the inserts being oriented, e.g. nets or meshes] [N0103]
- B29C70/68C . . [N: the inserts being meshes or lattices ([B29C70/82](#), [B29C70/68A4](#) take precedence)] [N0103]
- B29C70/70 . . Completely encapsulating inserts [N: ([B29C70/86](#) takes precedence)] [N0103]
- B29C70/72 . . Encapsulating inserts having non-encapsulated projections, e.g. extremities, terminal portions of electrical components [N: ([B29C70/74A](#) takes precedence)] [N0103]
- B29C70/74 . . Moulding material on a relatively small portion of the preformed part, e.g. outsert moulding [N: ([B29C70/84A](#) takes precedence)] [N0103]
- B29C70/74A . . . [N: Forming a hollow body around the preformed part] [N0103]
- B29C70/74B . . . [N: Filling cavities in the preformed part (for joining [B29C70/84](#))] [N0103]
- B29C70/74C . . . [N: Applying material, e.g. foam, only in a limited number of places or in a pattern, e.g. to create a decorative effect] [N0103]

- B29C70/76 . . . Moulding on edges or extremities of the preformed part [N0103]
- B29C70/76A [N: the edges being disposed in a substantial flat plane] [N0103]
- B29C70/76B [N: on the end part of a tubular article] [N0103]
- B29C70/78 . . Moulding material on one side only of the preformed part [N0103]
- B29C70/80 . . . Moulding sealing material into closure members [N: (placing sealings in closures [B21D51/46](#))] [N0103]
- B29C70/82 . . 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 [B29C70/64](#)) [N0103]
- B29C70/84 . . by moulding material on preformed parts to be joined [N: (joining plastic parts by moulding [B29C65/70](#))] [N0103]
- B29C70/84A . . . [N: by moulding material on a relative small portion of the preformed parts] [N0103]
- B29C70/86 . . Incorporated in coherent impregnated reinforcing layers, [N: e.g. by winding] [N0103]
- B29C70/86A . . . [N: completely encapsulated] [N0103]
- B29C70/88 . characterised primarily by possessing specific properties, e.g. electrically conductive, locally reinforced [N0103]
- B29C70/88A . . [N: partly or totally electrically conductive, e.g. for EMI shielding (conductive floors or floor coverings [H05F3/02B](#); EMI shielding in general [H05K9/00](#))] [N0103]
- B29C70/88A2 . . . [N: with incorporated metallic wires, nets, films or plates (as lost heating elements [B29C35/02L](#), [B29C61/06B3](#))] [N0103]
- B29C70/88B . . [N: locally reinforced, e.g. by fillers (filler concentrated near the surface [B29C70/64](#))] [N0103]

- B29C71/00** **After-treatment of articles without altering their shape; Apparatus therefor** ([B29C73/00](#) takes precedence; surface shaping [B29C59/00](#); [N: for joined or sealed parts [B29C66/03](#); after-treatment specially adapted for vulcanising tyres [B29D30/06B5](#)]; chemical aspects [C08J7/00](#)) [C1201]

- B29C71/00C . [N: using liquids, e.g. solvents, swelling agents (spectacle cases, e.g. for cleaning contact lenses [A45C11/04](#); disinfecting or sterilising contact lenses [A61L2/00C](#), using liquid substances [A61L2/20](#); cleaning involving the use of liquid in general [B08B3/00](#); for hydrating contact lenses [B29D11/00C4D](#))] [C9711]
- B29C71/00D . [N: for changing crystallisation]
- B29C71/00E . [N: for changing orientation]
- B29C71/00F . [N: using an electric field, e. g. for electrostatic charging (electrostatic pinning of extruded material [B29C47/88C4D6](#); fixing linings by electrostatic charges [B29C63/00D](#))] [N9501] [C9711]
- B29C71/00G . [N: using gases without chemical reaction ([C08J7/12](#) takes precedence; in combination with blow-moulding [B29C49/46](#); surface treatment using plasma [B29C59/14](#), ionised gas [B29C59/16](#))] [N9810]
- B29C71/02 . Thermal after-treatment [N: ([B29C71/00D](#) and [B29C71/00E](#) take precedence)]
- B29C71/04 . by wave energy or particle radiation, [N: e.g. for curing or vulcanising preformed articles (during moulding, e.g. in a mould [B29C35/08](#))] [C9501]

- B29C73/00** **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 [B29D30/54](#); [N: linings for tyres acting locally [B60C5/14B](#)]; devices for covering leaks in pipes or hoses [F16L55/16](#))**
- [N: **WARNING**
[C1110]
1. This group was introduced on 24 June, 1987
 2. Documents from the backlog of [B60C21/00-B60C21/08B](#), [B60C25/16](#) are in the process of being systematically transferred to [B29C73/00](#)
-]
- [B29C73/02](#) . using liquid or paste-like material ([B29C73/16](#) takes precedence)
- [B29C73/02B](#) . . [N: fed under pressure]
- [B29C73/04](#) . using preformed elements
- [B29C73/06](#) . . using plugs sealing in the hole
- [B29C73/06B](#) . . . [N: expandable]
- [B29C73/06B2](#) [N: by mechanical means provided on the plug]
- [B29C73/08](#) . . . Apparatus therefor, e.g. for inserting
- [B29C73/10](#) . . using patches sealing on the surface of the article ([B29C73/14](#) takes precedence)
- [B29C73/10B](#) . . . [N: provided with a centering element]
- [B29C73/12](#) . . . Apparatus therefor, e.g. for applying ([B29C73/30](#) takes precedence)
- [B29C73/14](#) . . using elements composed of two parts joined together after having been placed one on each side of the article
- [B29C73/16](#) . Auto-repairing or self-sealing arrangement or agents (sealing compositions, see section C, e.g. [C09K3/10](#)) [N: (incorporating auto-repairing or self-sealing arrangements or agents on or into tyres [B29D30/06Z3](#))] [C1112]
- [B29C73/16C](#) . . [N: Sealing compositions or agents, e.g. combined with propellant agents] [N9904]
- [B29C73/16D](#) . . [N: Devices or methods for introducing sealing compositions into articles] [N9904]
- [B29C73/18](#) . . the article material itself being self-sealing, e.g. by compression
- [B29C73/20](#) . . . the article material only consisting in part of a deformable sealing material
- [B29C73/22](#) . . the article containing elements including a sealing composition, e.g. powder being liberated when the article is damaged
- [B29C73/24](#) . Apparatus or accessories not otherwise provided for
- [B29C73/24B](#) . . [N: for removing the element having caused the damage]
- [B29C73/26](#) . . for mechanical pretreatment
- [B29C73/28](#) . . for clamping and stretching flexible material, e.g. inner tubes
- [B29C73/30](#) . . for local pressing or local heating
- [B29C73/30B](#) . . . [N: specially adapted for toroidal articles, e.g. tyres ([B29C73/32B](#) takes precedence)]
- [B29C73/32](#) . . . using an elastic element, e.g. inflatable bag
- [B29C73/32B](#) [N: specially adapted for toroidal articles, e.g. tyres]

B29C73/34 . . . for local heating