

**CPC****COOPERATIVE PATENT CLASSIFICATION****B22C****FOUNDRY MOULDING** (moulding refractory materials in general [B28B](#))**NOTE**

This subclass covers:

- the making of moulds for casting metals or of other refractory moulds;
- selection or preparation of materials therefor;
- the necessary patterns, processes, machines, accessory devices or tools.

**WARNING**

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

|                             |                                |                                       |
|-----------------------------|--------------------------------|---------------------------------------|
| <a href="#">B22C 3/02</a>   | covered by                     | <a href="#">B22C 3/00</a>             |
| <a href="#">B22C 5/13</a>   | covered by                     | <a href="#">B22C 5/12</a>             |
| <a href="#">B22C 7/05</a>   | covered by                     | <a href="#">B22C 7/04</a>             |
| <a href="#">B22C 9/11</a>   | covered by                     | <a href="#">B22C 9/10</a>             |
| <a href="#">B22C 9/14</a>   | covered by                     | <a href="#">B22C 9/12</a>             |
| <a href="#">B22C 9/16</a>   | covered by                     | <a href="#">B22C 9/12</a>             |
| <a href="#">B22C 15/264</a> | to <a href="#">B22C 15/276</a> | covered by <a href="#">B22C 15/23</a> |
| <a href="#">B22C 19/01</a>  | covered by                     | <a href="#">B22C 19/00</a>            |

**B22C 1/00**

**Compositions of refractory mould or core materials; Grain structures thereof (refractory materials in general [C04B 35/00](#)); Chemical or physical features in the formation or manufacture of moulds**

- |                            |   |
|----------------------------|---|
| <a href="#">B22C 1/02</a>  | <ul style="list-style-type: none"> <li>• characterised by additives for special purposes, e.g. indicators, break-down additives</li> </ul>  |
| <a href="#">B22C 1/04</a>  | <ul style="list-style-type: none"> <li>• . for protection of the casting, e.g. against decarbonisation</li> </ul>   |
| <a href="#">B22C 1/06</a>  | <ul style="list-style-type: none"> <li>• . . for casting extremely oxidisable metals</li> </ul>   |
| <a href="#">B22C 1/08</a>  | <ul style="list-style-type: none"> <li>• . for decreasing shrinkage of the mould, e.g. for investment casting</li> </ul>  |
| <a href="#">B22C 1/10</a>  | <ul style="list-style-type: none"> <li>• . for influencing the hardening tendency of the mould material (<a href="#">influencing the hardening tendency of the binding agent only <a href="#">B22C 1/16</a></a>)</li> </ul> |
| <a href="#">B22C 1/12</a>  | <ul style="list-style-type: none"> <li>• . for manufacturing permanent moulds or cores</li> </ul>   |
| <a href="#">B22C 1/14</a>  | <ul style="list-style-type: none"> <li>• . for separating the pattern from the mould</li> </ul>   |
| <a href="#">B22C 1/16</a>  | <ul style="list-style-type: none"> <li>• characterised by the use of binding agents; Mixtures of binding agents</li> </ul>  |
| <a href="#">B22C 1/162</a> | <ul style="list-style-type: none"> <li>• . {use of a gaseous treating agent for hardening the binder}</li> </ul>  |
| <a href="#">B22C 1/165</a> | <ul style="list-style-type: none"> <li>• . {in the manufacture of multilayered shell moulds}</li> </ul>   |
| <a href="#">B22C 1/167</a> | <ul style="list-style-type: none"> <li>• . {Mixtures of inorganic and organic binding agents}</li> </ul>  |
| <a href="#">B22C 1/18</a>  | <ul style="list-style-type: none"> <li>• . of inorganic agents {(<a href="#">B22C 1/162</a> takes precedence)}</li> </ul>   |
| <a href="#">B22C 1/181</a> | <ul style="list-style-type: none"> <li>• . . {Cements, oxides or clays}</li> </ul>  |
| <a href="#">B22C 1/183</a> | <ul style="list-style-type: none"> <li>• . . {Sols, colloids or hydroxide gels}</li> </ul>  |
| <a href="#">B22C 1/185</a> | <ul style="list-style-type: none"> <li>• . . {containing phosphates, phosphoric acids or its derivatives}</li> </ul>  |
| <a href="#">B22C 1/186</a> | <ul style="list-style-type: none"> <li>• . . {containing ammonium or metal silicates, silica sols}</li> </ul>   |

|             |  |
|-------------|--|
| B22C 1/188  | . . . . {Alkali metal silicates}   |
| B22C 1/20   | . . of organic agents  |
| B22C 1/205  | . . . {of organic silicon or metal compounds, other organometallic compounds}  |
| B22C 1/22   | . . . of resins or rosins  |
| B22C 1/2206 | . . . . {obtained by reactions only involving carbon-to-carbon unsaturated bonds}  |
| B22C 1/2213 | . . . . . {Polyalkenes}  |
| B22C 1/222  | . . . . . {Polyacrylates}  |
| B22C 1/2226 | . . . . . {Polymers containing halogens}   |
| B22C 1/2233 | . . . . {obtained otherwise than by reactions only involving carbon-to-carbon unsaturated bonds}                                       |
| B22C 1/224  | . . . . . {Furan polymers ( <a href="#">B22C 1/2273</a> takes precedence)}   |
| B22C 1/2246 | . . . . . {Condensation polymers of aldehydes and ketones ( <a href="#">B22C 1/224</a> , <a href="#">B22C 1/2273</a> take precedence)} |
| B22C 1/2253 | . . . . . . {with phenols}   |
| B22C 1/226  | . . . . . {Polyepoxides}   |
| B22C 1/2266 | . . . . . {Polyesters; Polycarbonates}   |
| B22C 1/2273 | . . . . . {Polyurethanes; Polyisocyanates}   |
| B22C 1/228  | . . . . . {Polyamides}   |
| B22C 1/2286 | . . . . . {Polyethers}   |
| B22C 1/2293 | . . . . {Natural polymers ( <a href="#">B22C 1/24</a> , <a href="#">B22C 1/26</a> take precedence)}                                    |
| B22C 1/24   | . . . of oily or fatty substances; of distillation residues therefrom  |
| B22C 1/26   | . . . of carbohydrates; of distillation residues therefrom   |

**B22C 3/00**      **Selection of compositions for coating the surfaces of moulds, cores, or patterns**

**B22C 5/00**      **Machines or devices specially designed for dressing or handling the mould material so far as specially adapted for that purpose (of general applicability, see the relevant places, e.g. for material with water-setting properties [B28C](#))**

|             |   |
|-------------|---|
| B22C 5/02   | . Dressing by centrifuging essentially or additionally  |
| B22C 5/04   | . by grinding, blending, mixing, kneading, or stirring  |
| B22C 5/0404 | . . {Stirring by using vibrations while grinding}   |
| B22C 5/0409 | . . {Blending, mixing, kneading or stirring; Methods therefor ( <a href="#">B22C 5/0486</a> takes precedence)}  |
| B22C 5/0413 | . . . {Horizontal mixing and conveying units, e.g. the unit being rotatable about a vertical axis, or having a supplementary mixing house with a vertical axis at its end}  |
| B22C 5/0418 | . . . . {Details concerning the method}   |
| B22C 5/0422 | . . . {Devices having a fixed receptacle with rotating tools, some or all of these tools being rolls or balls loosely mounted on their axis or loose balls in contact with the side wall or the bottom of the receptacle, e.g. with aerating means; "Devices of the Muller type"} |
| B22C 5/0427 | . . . . {having only one vertical tool-driving shaft}   |

- B22C 5/0431 . . . . {having at least two vertical tool-driving shafts}
- B22C 5/0436 . . . . {having a horizontal tool-driving shaft}
- B22C 5/044 . . . {Devices having a vertical stirrer shaft in a fixed receptacle ([B22C 5/0422 takes precedence](#))}
- B22C 5/0445 . . . . {the material flowing continuously through the device}
- B22C 5/045 . . . {Devices having a horizontal stirrer shaft in a fixed receptacle ([B22C 5/0422 takes precedence](#))}
- B22C 5/0454 . . . {with bottom disc rotating about a vertical axis or with receptacle rotating about a vertical or steeply inclined axis, e.g. with fixed or driven tools, such as rolls}
- B22C 5/0459 . . . {with a receptacle rotating about a horizontal or slightly inclined axis, e.g. with fixed or rotating tools}
- B22C 5/0463 . . . {Plants}
- B22C 5/0468 . . . . {having feeding moulds, e.g. using gas}
- B22C 5/0472 . . . {Parts; Accessories; Controlling; Feeding; Discharging; Proportioning}
- B22C 5/0477 . . . {Mixing while transporting the mixture on an endless belt, e.g. with driven stirring elements}
- B22C 5/0481 . . . {using vibrations}
- B22C 5/0486 . . {Movable devices for cutting or mixing material laying on the ground}
- B22C 5/049 . . . {using rotating tools}
- B22C 5/0495 . . . . {combined with another operation, e.g. sieving, or with means for picking up material from the ground}
- B22C 5/06 . . by sieving or magnetic separating
- B22C 5/08 . . by sprinkling, cooling, or drying
- B22C 5/085 . . {Cooling or drying the sand together with the castings}
- B22C 5/10 . . by dust separating
- B22C 5/12 . . for filling flasks ([in combination with compacting B22C 15/20 to B22C 15/28](#))
- B22C 5/14 . . Equipment for storing or handling the dressed mould material, forming part of a plant for preparing such material
- B22C 5/16 . . with conveyers or other equipment for feeding the material
- B22C 5/18 . . Plants for preparing mould materials
- B22C 5/185 . . {comprising a wet reclamation step}
- B22C 7/00** **Patterns; Manufacture thereof so far as not provided for in other classes**
- B22C 7/005 . . {Adjustable, sectional, expandable or flexible patterns}
- B22C 7/02 . . Lost patterns
- B22C 7/023 . . {Patterns made from expanded plastic materials}
- B22C 7/026 . . . {by assembling preformed parts ([joining of plastics, in general B29C 65/00](#))}
- B22C 7/04 . . Pattern plates
- B22C 7/06 . . Core boxes
- B22C 7/062 . . {Sealing means}
- B22C 7/065 . . {Venting means}

|                  |   |
|------------------|---|
| B22C 7/067       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Ejector elements}</li> </ul> </li> </ul>  |
| <b>B22C 9/00</b> | <b>Moulds or cores</b> (uniquely adapted to particular casting processes <a href="#">B22D</a> );<br><b>Moulding processes</b> (processes involving the use of particular moulding machines, <a href="#">see</a> the relevant groups for these machines) |
| B22C 9/02        | <ul style="list-style-type: none"> <li>Sand moulds or like moulds for shaped castings</li> </ul>  |
| B22C 9/03        | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>formed by vacuum-sealed moulding</li> </ul> </li> </ul>  |
| B22C 9/04        | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Use of lost patterns</li> </ul> </li> </ul>  |
| B22C 9/043       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Removing the consumable pattern}</li> </ul> </li> </ul> </li> </ul>   |
| B22C 9/046       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Use of patterns which are eliminated by the liquid metal in the mould}</li> </ul> </li> </ul> </li> </ul>                       |
| B22C 9/06        | <ul style="list-style-type: none"> <li>Permanent moulds for shaped castings (<a href="#">moulds for ingots B22D 7/06</a>)</li> </ul>  |
| B22C 9/061       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Materials which make up the mould}</li> </ul> </li> </ul>   |
| B22C 9/062       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Mechanisms for locking or opening moulds}</li> </ul> </li> </ul>  |
| B22C 9/064       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Locating means for cores}</li> </ul> </li> </ul>  |
| B22C 9/065       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Cooling or heating equipment for moulds}</li> </ul> </li> </ul>   |
| B22C 9/067       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Venting means for moulds}</li> </ul> </li> </ul>  |
| B22C 9/068       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Semi-permanent moulds}</li> </ul> </li> </ul>   |
| B22C 9/08        | <ul style="list-style-type: none"> <li>Features with respect to supply of molten metal, e.g. ingates, circular gates, skim gates</li> </ul>   |
| B22C 9/082       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Sprues, pouring cups}</li> </ul> </li> </ul>  |
| B22C 9/084       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Breaker cores}</li> </ul> </li> </ul>   |
| B22C 9/086       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Filters}</li> </ul> </li> </ul>   |
| B22C 9/088       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Feeder heads}</li> </ul> </li> </ul>  |
| B22C 9/10        | <ul style="list-style-type: none"> <li>Cores; Manufacture or installation of cores ({<a href="#">breaker cores B22C 9/084</a>})</li> </ul>  |
| B22C 9/101       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Permanent cores}</li> </ul> </li> </ul>   |
| B22C 9/103       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Multipart cores}</li> </ul> </li> </ul>   |
| B22C 9/105       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Salt cores}</li> </ul> </li> </ul>  |
| B22C 9/106       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Vented or reinforced cores}</li> </ul> </li> </ul>  |
| B22C 9/108       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Installation of cores}</li> </ul> </li> </ul>   |
| B22C 9/12        | <ul style="list-style-type: none"> <li>Treating moulds or cores, e.g. drying, hardening</li> </ul>  |
| B22C 9/123       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Gas-hardening}</li> </ul> </li> </ul>   |
| B22C 9/126       | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Hardening by freezing}</li> </ul> </li> </ul>   |
| B22C 9/18        | <ul style="list-style-type: none"> <li>Finishing</li> </ul>   |
| B22C 9/20        | <ul style="list-style-type: none"> <li>Stack moulds, i.e. arrangement of multiple moulds or flasks</li> </ul>   |
| B22C 9/22        | <ul style="list-style-type: none"> <li>Moulds for peculiarly-shaped castings</li> </ul>   |
| B22C 9/24        | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>for hollow articles</li> </ul> </li> </ul>   |
| B22C 9/26        | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>for ribbed tubes; for radiators</li> </ul> </li> </ul> </li> </ul>   |
| B22C 9/28        | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>for wheels, rolls, or rollers ({<a href="#">B22D 15/005</a> takes precedence})</li> </ul> </li> </ul>  |
| B22C 9/30        | <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>for chains</li> </ul> </li> </ul>  |

**Moulding machines for making moulds or cores****B22C 11/00****Moulding machines characterised by the relative arrangement of the parts of same**

## B22C 11/02

- Machines in which the moulds are moved during a cycle of successive operations

## B22C 11/04

- . by a horizontal rotary table or carrier

## B22C 11/06

- . by a vertical rotary carrier

## B22C 11/08

- . by non-rotary conveying means, e.g. by travelling platforms

## B22C 11/10

- with one or more flasks forming part of the machine, from which only the sand moulds made by compacting are removed

## B22C 11/12

- Moulding machines able to travel

**B22C 13/00****Moulding machines for making moulds or cores of particular shapes**

## B22C 13/02

- equipped with templates, e.g. for sweeping operation

## B22C 13/04

- . with rotary templates, e.g. arranged on a pillar

## B22C 13/06

- . with non-rotary template and rotary flask

## B22C 13/08

- for shell moulds or shell cores

## B22C 13/085

- . {by investing a lost pattern}

## B22C 13/10

- for pipes or elongated hollow articles

## B22C 13/12

- for cores

## B22C 13/14

- . by sweeping, turning, or coating

## B22C 13/16

- . by pressing through a die

**B22C 15/00****Moulding machines characterised by the compacting mechanism; Accessories therefor**

## B22C 15/02

- Compacting by pressing devices only

## B22C 15/04

- . involving muscle power, e.g. hand-operated levers

## B22C 15/06

- . involving mechanical gearings, e.g. crank gears ([B22C 15/04 takes precedence](#))

## B22C 15/08

- . involving pneumatic or hydraulic mechanisms

## B22C 15/10

- Compacting by jarring devices only

## B22C 15/12

- . involving mechanical gearings

## B22C 15/14

- . involving pneumatic or hydraulic mechanisms

## B22C 15/16

- . . the machine having special provision for reducing shock to its frame

## B22C 15/18

- . . . by means of separate shock-absorbers

## B22C 15/20

- Compacting by centrifugal forces only, e.g. in sand slingers

## B22C 15/23

- Compacting by gas pressure or vacuum

## B22C 15/24

- . involving blowing devices in which the mould material is supplied in the form of loose particles

## B22C 15/245

- . . {Blowing tubes}

- B22C 15/26
  - . involving propulsion devices in which the mould material is supplied in the shape of a compacted column or the like
- B22C 15/28
  - Compacting by different means acting simultaneously or successively, e.g. preliminary blowing and finally pressing
- B22C 15/30
  - . by both pressing and jarring devices
- B22C 15/32
  - . . involving mechanical gearing only
- B22C 15/34
  - . . involving pneumatic or hydraulic mechanisms only

**B22C 17/00 Moulding machines characterised by the mechanism for separating the pattern from the mould or for turning over the flask or the pattern plate**

- B22C 17/02
  - Moulding machines with pin lifting arrangement
- B22C 17/04
  - Drop-plate moulding machines
- B22C 17/06
  - Moulding machines using stripping plates; Stripping plates
- B22C 17/08
  - Moulding machines with mechanisms to turn over the pattern plate on the mould around a horizontal axis
- B22C 17/10
  - . Turning-over pattern plate and flask only ([B22C 17/14 takes precedence](#))
- B22C 17/12
  - . Turning-over pattern plate, flask, and compacting device as a unit ([B22C 17/14 takes precedence](#))
- B22C 17/14
  - . arranged to one side of the mould table, so-called roll-over table moulding machines

**B22C 19/00 Components or accessories for moulding machines**

- B22C 19/02
  - Mould tables
- B22C 19/04
  - Controlling devices specially designed for moulding machines
- B22C 19/06
  - Devices for rapping or loosening the pattern

**B22C 21/00 Flasks; Accessories therefor ([stripping plates B22C 17/06](#))**

- B22C 21/01
  - for vacuum-sealed moulding
- B22C 21/02
  - Sectional flasks, i.e. with divided, articulated, or interchangeable side sections
- B22C 21/04
  - Upset frames; Bottom boards or mould boards ([pattern plates B22C 7/04](#))
- B22C 21/06
  - . Bottom boards or mould boards
- B22C 21/08
  - Clamping equipment
- B22C 21/10
  - Guiding equipment
- B22C 21/12
  - Accessories
- B22C 21/14
  - . for reinforcing or securing moulding materials or cores, e.g. gagers, chaplets, pins, bars

**B22C 23/00 Tools; Devices not mentioned before for moulding**

- B22C 23/02
  - Devices for coating moulds or cores

**B22C 25/00 Foundry moulding plants ([for preparing mould materials B22C 5/18](#); in combination with casting plants [B22D 47/02](#))**