

ECLA EUROPEAN CLASSIFICATION

- B22D** **CASTING OF METALS; CASTING OF OTHER SUBSTANCES BY THE SAME PROCESSES OR DEVICES (shaping of plastics or substances in a plastic state B29C; metallurgical processing, selection of substances to be added to metal C21, C22).**
- B22D1/00** **Treatment of fused masses in the ladle or the supply runners before casting [N: (for continuous casting [B22D11/10](#); metallurgical processing, e.g. refining of iron or other metal C21, C22, C25C)] [C1204]**
- [B22D1/00G](#) . [N: Treatment with gases ([C21C7/072](#), [C22B9/05](#) take precedence)]
- [B22D1/00G1](#) . . [N: Injection assemblies therefor (features relating to gas injection, provided on closures of the sliding gate type [B22D41/42](#); provided on pouring nozzles [B22D41/58](#); provided on closures of the stopper-rod type [B22D41/18F](#))]
- [B22D1/00S](#) . [N: Treatment of the fused masses in the supply runners ([B22D1/00G](#), [B22D1/00G1](#) take precedence)]
- B22D2/00** **Arrangement of indicating or measuring devices, e.g. for temperature or viscosity of the fused mass.**
- [B22D2/00A](#) . [N: for the slag appearance in a molten metal stream]
- [B22D2/00L](#) . [N: for the level of the molten metal ([B22D11/18A](#) and [B22D11/20A](#) take precedence; level indicators in general [G01F23](#))]
- [B22D2/00S](#) . [N: for the thickness of a frozen shell ([B22D11/18B](#) and [B22D11/20B](#) take precedence)]
- [B22D2/00T](#) . [N: for the temperature of the molten metal (measuring temperature in general [G01K](#))]
- [B22D2/00V](#) . [N: for the viscosity of the molten metal (measuring viscosity in general [G01N11](#))]
- Guide heading:** **Casting of pigs, i.e. metal castings suitable for subsequently melting; similar casting**
- B22D3/00** **Pig or like casting (equipment for conveying molten metal [B22D35/00](#))**
- [B22D3/02](#) . Moulding of beds
- B22D5/00** **Machines or plants for pig or like casting**
- [B22D5/00A](#) . [N: Devices for stacking pigs; Pigforms to be stacked]
- [B22D5/02](#) . with rotary casting tables
- [B22D5/04](#) . with endless casting conveyers

Guide heading: **Casting of ingots, i.e. metal castings suitable for subsequently rolling or forging****B22D7/00** **Casting ingots, [N: e.g. from ferrous metals] (equipment for conveying molten metal [B22D35/00](#)).**

- B22D7/00A . [N: from non-ferrous metals]
- B22D7/02 . Casting compound ingots of two or more different metals in the molten state, i.e. integrally cast
- B22D7/04 . Casting hollow ingots
- B22D7/06 . Ingot moulds or their manufacture
- B22D7/06A . . [N: Stools for ingot moulds]
- B22D7/06C . . [N: Cooling the ingot moulds]
- B22D7/06R . . [N: Manufacturing, repairing or reinforcing ingot moulds]
- B22D7/06R1 . . . [N: characterised by the materials used therefor]
- B22D7/08 . . Divided ingot moulds
- B22D7/10 . . Hot tops therefor [N: heating the top discard of ingots [B22D27/06](#)] 06]
- B22D7/10A . . . [N: from refractorial material only]
- B22D7/10B . . . [N: from exothermic material only]
- B22D7/10C . . . [N: Configuration of hot tops]
- B22D7/10D . . . [N: Devices for making or fixing hot tops]
- B22D7/12 . Appurtenances, e.g. for sintering, for preventing splashing

B22D9/00 **Machines or plants for casting ingots**

- B22D9/00A . [N: for top casting]
- B22D9/00B . [N: for bottom casting]

Guide heading: **Particular casting processes; Machines or apparatus therefor****B22D11/00** **Continuous casting of metals, i.e. casting in indefinite lengths (metal drawing, metal extruding [B21C](#))**

- B22D11/00A . [N: of specific alloys] [N0309]
- B22D11/00A1 . . [N: Stainless steels] [N0309]
- B22D11/00A2 . . [N: Aluminium alloys] [N0309]
- B22D11/00A3 . . [N: Copper alloys] [N0309]
- B22D11/00B . [N: of wire (casting on wire [B22D19/14](#))]
- B22D11/00C . [N: of tubes]

- B22D11/00D . [N: of composite ingots, i.e. two or more molten metals of different compositions being used to integrally cast the ingots ([casting of composite ingots in definite lengths B22D7/02](#))]
- B22D11/00E . [N: of clad ingots, i.e. the molten metal being cast against a continuous strip forming part of the cast product]
- B22D11/00P . [N: of work of special cross-section, e.g. I-beams, U-profiles] [N9609]
- B22D11/01 . without moulds, e.g. on molten surfaces
- B22D11/01A . . [N: using magnetic field for conformation, i.e. the metal is not in contact with a mould]
- B22D11/04 . into open-ended moulds ([B22D11/06](#), [B22D11/07](#) take precedence; plants for continuous casting, e.g. for upwardly drawing the strand [B22D11/14](#)) [C0309]
- B22D11/04G . . [N: Moulds provided with a feed head] [N0309]
- B22D11/04M . . [N: Multiple moulds]
- B22D11/04N . . [N: Rotating moulds]
- B22D11/04P . . [N: Moulds with special profile]
- B22D11/04T . . [N: Moulds for casting thin slabs] [N9503]
- B22D11/041 . . for vertical casting ([B22D11/043](#), [B22D11/049](#) to [B22D11/059](#) take precedence) [N0309]
- B22D11/043 . . Curved moulds ([B22D11/049](#) to [B22D11/059](#) take precedence) [N0309]
- B22D11/045 . . for horizontal casting ([B22D11/049](#) to [B22D11/059](#) take precedence) [N0309]
- B22D11/045B . . . [N: Bidirectional horizontal casting] [N0309]
- B22D11/047 . . . Means for joining tundish to mould [N0309]
- B22D11/047B [N: characterised by use of a break ring] [N0309]
- B22D11/049 . . for direct chill casting, e.g. electromagnetic casting [N0309]
- B22D11/05 . . into moulds having adjustable walls [N0309]
- B22D11/051 . . into moulds having oscillating walls [N0309]
- B22D11/053 . . Means for oscillating the moulds [N0309]
- B22D11/053E . . . [N: in a horizontal plane] [N0309]
- B22D11/055 . . Cooling the moulds ([N: [B22D11/04](#) takes precedence]) [N0309]
- B22D11/057 . . Manufacturing or calibrating the moulds [N0309]
- B22D11/059 . . Mould materials or platings [N0309]
- B22D11/06 . into moulds with travelling walls, e.g. with rolls, plates, belts, caterpillars
- B22D11/06A . . [N: formed by a casting wheel and belt, e.g. Properzi-process]
- B22D11/06B . . [N: formed by two belts, e.g. Hazelett-process]
- B22D11/06C . . [N: formed by caterpillars]
- B22D11/06D . . [N: formed by a single casting wheel, e.g. for casting amorphous metal strips or wires]
- B22D11/06D1 . . . [N: the casting wheel being immersed in a molten metal bath, and drawing out upwardly the casting strip]
- B22D11/06D2 . . . [N: the casting wheel having its axis vertical and a casting strip formed in a peripheral groove of the wheel]

- B22D11/06D3 . . . [N: the metal being cast on the inside surface of the casting wheel]
- B22D11/06E . . [N: formed by two casting wheels]
- B22D11/06E1 . . . [N: the two casting wheels being immersed in a molten metal bath and drawing out upwardly the casting strip]
- B22D11/06F . . [N: formed by more than two casting wheels]
- B22D11/06G . . [N: formed by a travelling straight surface, e.g. through-like moulds, a belt]
- B22D11/06H . . [N: formed by a casting wheel and a co-operating shoe]
- B22D11/06L . . [N: Accessories therefor]
- B22D11/06L1 . . . [N: for supplying molten metal (supplying molten metal to open-ended moulds [B22D11/10](#))] [C1204]
- B22D11/06L1A [N: Nozzles (nozzles used in open-ended moulds [B22D41/50](#))] [C9605]
- B22D11/06L1B [N: Sealing means for the nozzle between the travelling surfaces]
- B22D11/06L2 . . . [N: Casting surfaces]
- B22D11/06L2A [N: Casting wheels ([B22D11/06L5A](#) takes precedence)]
- B22D11/06L2B [N: Casting belts ([B22D11/06L5B](#) takes precedence)]
- B22D11/06L2C [N: Caterpillars ([B22D11/06L5C](#) takes precedence)]
- B22D11/06L2D [N: Side dams ([B22D11/06L5D](#) takes precedence)]
- B22D11/06L2D1 [N: having electromagnetic confining means] [N9602]
- B22D11/06L3 . . . [N: for treating the casting surfaces, e.g. calibrating, cleaning, dressing, preheating]
- B22D11/06L3D [N: for dressing, coating or lubricating]
- B22D11/06L3H [N: for heating or drying]
- B22D11/06L3M [N: for machining]
- B22D11/06L4 . . . [N: for guiding, supporting or tensioning the casting belts]
- B22D11/06L5 . . . [N: for cooling the cast product during its passage through the mould surfaces (cooling open-ended moulds [B22D11/04](#); secondary cooling [B22D11/124](#))]
- B22D11/06L5A [N: by cooling the casting wheel]
- B22D11/06L5B [N: by cooling the casting belts ([B22D11/06L4](#) takes precedence)]
- B22D11/06L5C [N: by cooling the caterpillars]
- B22D11/06L5D [N: by cooling the side dams]
- B22D11/06L7 . . . [N: for peeling-off or removing the cast product]
- B22D11/06L9 . . . [N: for casting in a protected atmosphere]

- B22D11/07 . Lubricating the moulds

- B22D11/08 . Accessories for starting the casting procedure
- B22D11/08A . . [N: Starter bars]
- B22D11/08A1 . . . [N: Starter bar head; Means for connecting or detaching starter bars and ingots]
- B22D11/08E . . [N: Means for storing or introducing the starter bars in the moulds]
- B22D11/08F . . [N: Means for connecting cast ingots of different sizes or compositions]
- B22D11/08G . . [N: Means for sealing the starter bar head in the moulds]

- B22D11/10 . Supplying or treating molten metal ([B22D41/00](#) takes precedence) [C0309]
- B22D11/103 . . Distributing the molten metal, e.g. using runners, floats, distributors [N0309]

- B22D11/106 . . Shielding the molten jet ([N: [B22D41/50](#) takes precedence]) [N0309]
- B22D11/108 . . Feeding additives, powders, or the like [N0309]
- B22D11/11 . . Treating the molten metal [N0309]
- B22D11/111 . . . by using protecting powders [N0309]
- B22D11/112 . . . by accelerated cooling [N0309]
- B22D11/113 . . . by vacuum treating [N0309]
- B22D11/114 . . . by using agitating or vibrating means ([B22D11/117](#) takes precedence) [N0309]
- B22D11/115 by using magnetic fields [N0309]
- B22D11/116 . . . Refining the metal [N0309]
- B22D11/117 by treating with gases ([B22D11/118](#), [B22D11/119](#) take precedence) [N0309]
- B22D11/118 by circulating the metal under, over or around weirs ([B22D11/119](#) takes precedence) [N0309]
- B22D11/119 by filtering [N0309]

- B22D11/12 . . Accessories for subsequent treating or working cast stock in situ (rolling immediately subsequent to continuous casting [B21B1/46](#), [B22D13/22](#))
- B22D11/12A . . [N: for plastic shaping of strands (rolling mills [B21B1/46](#))]
- B22D11/12D . . [N: for heating or insulating strands]
- B22D11/12E . . [N: using magnetic fields]
- B22D11/12H . . [N: for straightening strands]
- B22D11/12M . . [N: for marking strands]
- B22D11/124 . . for cooling
- B22D11/124B . . . [N: by transporting the cast stock through a liquid medium bath or a fluidized bed] [N0205]
- B22D11/124G . . . [N: by using cooling grids or cooling plates] [N0205]
- B22D11/124M . . . [N: using specific cooling agents] [N0205]
- B22D11/124N . . . [N: Nozzles; Spray heads] [N0205]
- B22D11/124R . . . [N: Means for removing cooling agent from the surface of the cast stock] [N0205]
- B22D11/126 . . for cutting
- B22D11/126D . . . [N: having auxiliary devices for deburring] [N0309]
- B22D11/128 . . for removing
- B22D11/128A . . . [N: Vertical removing]
- B22D11/128B . . . [N: Vertical casting and curving the cast stock to the horizontal]
- B22D11/128C . . . [N: Horizontal removing]
- B22D11/128D . . . [N: Segment changing devices for supporting or guiding frames]
- B22D11/128R . . . [N: Rolls; Lubricating, cooling or heating rolls while in use]
- B22D11/128W . . . [N: Walking bar members] [N9602]

- B22D11/14 . . Plants for continuous casting
- B22D11/14A . . [N: for vertical casting]
- B22D11/14B . . [N: for curved casting]
- B22D11/14C . . [N: for horizontal casting]
- B22D11/14D . . [N: with a rotating mould]

- B22D11/14E . . [N: for upward casting] [C9602]
- B22D11/14K . . [N: for inclined casting] [N9602]
- B22D11/14M . . [N: Multi-strand plants]
- B22D11/14S . . [N: Safety arrangements] [N0011]

- B22D11/16 . Controlling or regulating processes or operations
- B22D11/16A . . [N: for automatic starting the casting process] [N0011]
- B22D11/16C . . [N: for cutting cast stock] [N9503]
- B22D11/16P . . [N: for the supply of casting powder] [N9503]
- B22D11/16S . . [N: for mould oscillation] [N9503]
- B22D11/16T . . [N: for adjusting the mould size or mould taper] [N9503]
- B22D11/18 . . for pouring ([B22D11/20](#) takes precedence)
- B22D11/18A . . . [N: responsive to molten metal level or slag level]
- B22D11/18A1 [N: by measuring temperature]
- B22D11/18A2 [N: by measuring molten metal weight]
- B22D11/18A3 [N: by using optical means]
- B22D11/18A4 [N: by using electric, magnetic, sonic or ultrasonic means]
- B22D11/18A5 [N: by using X-rays or nuclear radiation]
- B22D11/18B . . . [N: responsive to thickness of solidified shell]
- B22D11/20 . . for removing cast stock
- B22D11/20A . . . [N: responsive to molten metal level or slag level]
- B22D11/20A1 [N: by measuring temperature]
- B22D11/20A2 [N: by measuring molten metal weight]
- B22D11/20A3 [N: by using optical means]
- B22D11/20A4 [N: by using electric, magnetic, sonic or ultrasonic means]
- B22D11/20A5 [N: by using X-rays or nuclear radiation]
- B22D11/20B . . . [N: responsive to thickness of solidified shell]
- B22D11/20G . . . [N: for aligning the guide rolls]
- B22D11/22 . . for cooling cast stock or mould
- B22D11/22A . . . [N: for secondary cooling]

B22D13/00 Centrifugal casting; Casting by using centrifugal force

- B22D13/02 . of elongated solid or hollow bodies, e.g. pipes, in moulds rotating around their longitudinal axis
- B22D13/02H . . [N: the longitudinal axis being horizontal] [N9605]
- B22D13/02V . . [N: the longitudinal axis being vertical] [N9605]

- B22D13/04 . of shallow solid or hollow bodies, e.g. wheels or rings, in moulds rotating around their axis of symmetry

- B22D13/06 . of solid or hollow bodies in moulds rotating around an axis arranged outside the mould
- B22D13/06A . . [N: for dentistry or jewellery]
- B22D13/06B . . [N: several moulds being disposed in a circle]

- B22D13/08 . in which a stationary mould is fed from a rotating mass of liquid metal
- B22D13/10 . Accessories for centrifugal casting apparatus, e.g. moulds, linings therefor, means for feeding molten metal, cleansing moulds, removing castings ([making or lining moulds B22C](#))
- B22D13/10A . . [N: Moulds]
- B22D13/10A1 . . . [N: Linings for moulds ([making or lining moulds B22C](#))]
- B22D13/10A2 . . . [N: Cores]
- B22D13/10A3 . . . [N: Cooling for moulds or cores]
- B22D13/10B . . [N: Means for feeding molten metal]
- B22D13/10C . . [N: Removing of casting]
- B22D13/12 . Controlling, supervising, specially adapted to centrifugal casting, e.g. for safety reasons ([controlling or regulating in general G05](#))
- B22D15/00 Casting using a mould or core of which a part significant to the process is of high thermal conductivity, e.g. chill casting; Moulds or accessories specially adapted therefor**
- B22D15/00R . [N: of rolls, wheels or the like ([B22D19/16 takes precedence](#))] [N9606]
- B22D15/02 . of cylinders, pistons, bearing shells or like thin-walled objects
- B22D15/04 . Machines or apparatus for chill casting ([N: [B22D15/00R](#)], [B22D15/02 take precedence](#)) [C9606]
- B22D17/00 Pressure die casting or injection die casting, i.e. casting in which the metal is forced into a mould under high pressure**
- B22D17/00C . [N: using movable moulds ([for plastics B29C45/04](#))]
- B22D17/00D . [N: using two or more fixed moulds ([for plastics B29C45/12](#))]
- B22D17/00S . [N: Semi-solid pressure die casting] [N0011]
- B22D17/02 . Hot chamber machines, i.e. with heated press chamber in which metal is melted
- B22D17/04 . . Plunger machines
- B22D17/06 . . air injection machines
- B22D17/08 . Cold chamber machines, i.e. with unheated press chamber into which molten metal is ladled
- B22D17/10 . . with horizontal press motion
- B22D17/12 . . with vertical press motion
- B22D17/14 . Machines with evacuated die cavity
- B22D17/14A . . [N: Venting means therefor ([for permanent moulds B22C9/06E](#))]
- B22D17/16 . specially adapted for casting slide fasteners or elements therefor

- B22D17/18 . Machines built up from units providing for different combinations
- B22D17/20 . Accessories: Details
- B22D17/20A . . [N: Methods or apparatus for cleaning or lubricating moulds]
- B22D17/20D . . [N: Means for forcing the molten metal into the die (for plastics [B29C45/46](#))]
- B22D17/20D1 . . . [N: Nozzles or shot sleeves]
- B22D17/20D2 . . . [N: Injection pistons ([B22D17/20D10](#) takes precedence; for plastics [B29C45/53](#))] [C0309]
- B22D17/20D4 . . . [N: Heating, cooling or lubricating the injection unit (for plastics [B29C45/74](#), [B29C45/83](#))]
- B22D17/20D6 . . . [N: with provisions for damping the pressure peak] [N0011]
- B22D17/20D10 . . . [N: using two or more cooperating injection pistons] [N0309]
- B22D17/20D14 . . . [N: using screws] [N0309]
- B22D17/20D18 . . . [N: Exerting after-pressure on the moulding material] [N0309]
- B22D17/20G . . [N: Cutting-off equipment for sprues or ingates (for plastics [B29C45/38](#))] [C0309]
- B22D17/20K . . [N: Manipulating or transferring devices for evacuating cast pieces]
- B22D17/20S . . [N: Safety devices (for plastics [B29C45/84](#))]
- B22D17/22 . . Dies (manufacture, see the appropriate class, e.g. [B23P15/24](#)); Die plates; Die supports; Cooling equipment for dies; Accessories for loosening and ejecting castings from dies
- B22D17/22B . . . [N: Selection of die materials (for permanent moulds [B22C9/06A](#))]
- B22D17/22D . . . [N: Cooling or heating equipment for dies (for permanent moulds [B22C9/06D](#); for plastics [B29C45/73](#))]
- B22D17/22E . . . [N: Die seals (for plastics [B29C45/26C](#))]
- B22D17/22G . . . [N: Equipment for loosening or ejecting castings from dies (for plastics [B29C45/40](#))]
- B22D17/22M . . . [N: having walls provided with means for marking or patterning] [N0309]
- B22D17/22N . . . [N: having screw-threaded die walls] [N0309]
- B22D17/22P . . . [N: having tubular die cavities] [N0309]
- B22D17/22S . . . [N: Sprue channels] [N0309]
- B22D17/22S4 [N: closure devices therefor] [N0309]
- B22D17/22T . . . [N: with exchangeable die part ([B22D17/22M](#) takes precedence)] [N0309]
- B22D17/24 . . . Accessories for locating and holding cores or inserts
- B22D17/26 . . Mechanisms or devices for locking or opening dies
- B22D17/26B . . . [N: mechanically]
- B22D17/26C . . . [N: hydraulically]
- B22D17/28 . . Melting pots
- B22D17/30 . . Accessories for supplying molten metal, e.g. in rations (supplying molten metal in ration in general [B22D39/00](#))
- B22D17/32 . . Controlling equipment
- B22D18/00** **Pressure casting; Vacuum casting** ([B22D17/00](#) takes precedence; treating the metal in the mould by using pressure or vacuum [B22D27/00](#))
- B22D18/02 . Pressure casting making use of mechanical pressure devices, e.g. cast-forging

[B22D18/04](#) takes precedence)

- B22D18/04 . Low pressure casting, i.e. making use of pressures up to a few bars to fill the mould
- B22D18/06 . Vacuum casting, i.e. making use of vacuum to fill the mould
- B22D18/08 . Controlling, supervising, e.g. for safety reasons ([controlling or regulating in general G05](#))

- B22D19/00** **Casting in, on, or around objects which form part of the product** ([B22D23/04](#) takes precedence; alumino-thermic welding [B23K23/00](#); coating by casting molten material on the substrate [C23C6/00](#))

- B22D19/00A . [N: Cylinders, pistons]
- B22D19/00A1 . . [N: cylinders with fins]
- B22D19/00A2 . . [N: pistons]
- B22D19/00B . [N: gears]
- B22D19/00C . [N: household utensils]
- B22D19/00D . [N: rotors, stators for electrical motors]
- B22D19/00E . [N: finned exchangers ([cylinders B22D19/00A1](#))]
- B22D19/00K . [N: for making objects with integrated channels]
- B22D19/00P . [N: pretreatment of the insert, e.g. for enhancing the bonding between insert and surrounding cast metal] [N0309]
- B22D19/00S . [N: for casting objects the members of which can be separated afterwards] [N0309]
- B22D19/02 . for making reinforced articles ([B22D19/14](#) takes precedence)
- B22D19/04 . for joining parts
- B22D19/04T . . [N: for joining tubes] [N9609]
- B22D19/06 . for manufacturing or repairing tools
- B22D19/08 . for building-up linings or coverings, e.g. of anti-frictional metal
- B22D19/08A . . [N: of anti-frictional metal] [N9606]
- B22D19/10 . Repairing defective or damaged objects by metal casting procedures ([by other procedures B23P6/04](#); ingot mould [B22D7/06](#); [B22D19/06](#) takes precedence)
- B22D19/12 . for making objects, e.g. hinges, with parts which are movable relatively to one another
- B22D19/14 . the objects being filamentary or particulate in form ([making alloys containing fibres or filaments by contacting the fibres or filaments with molten metal C22C47/08](#)) [C0209]
- B22D19/16 . for making compound objects cast of two or more different metals, e.g. for making rolls

for rolling mills ([casting compound ingots B22D7/02](#))

B22D21/00

Casting non-ferrous metals or metallic compounds so far as their metallurgical properties are of importance for the casting procedure; selection of compositions therefor [N: (non-ferrous ingots [B22D7/00A](#))]

- B22D21/00B . [N: Castings of light metals]
- B22D21/00B1 . . [N: with high melting point, e.g. Be 1280 degrees C, Ti 1725 degrees C]
- B22D21/00B2 . . [N: with low melting point, e.g. Al 659 degrees C, Mg 650 degrees C]
- B22D21/02 . Casting exceedingly oxidisable non-ferrous metals, e.g. in inert atmosphere ([use of inert atmosphere in casting metals in general B22D23/00](#); [apparatus for vacuum casting B22D27/16](#))
- B22D21/02A . . [N: Casting heavy metals, with exceedingly high melting points, i.e. more than 1600 degrees C, e.g. W 3380 degrees C, Ta 3000 degrees C, Mo 2620 degrees C, Zr 1860 degrees C, Cr 1765 degrees C, V 1715 degrees C]
- B22D21/02B . . [N: Casting heavy metals with high melting point, i.e. 1000 - 1600 degrees C, e.g. Co 1490 degrees C, Ni 1450 degrees C, Mn 1240 degrees C, Cu 1083 degrees C]
- B22D21/02C . . [N: Casting heavy metals with low melting point, i.e. less than 1000 degrees C, e.g. Zn 419 degrees C, Pb 327 degrees C, Sn 232 degrees C]
- B22D21/04 . . Casting aluminium or magnesium [N: no material; see [B22D21/00B2](#)]
- B22D21/06 . Casting non-ferrous metals with a high melting point, e.g. metallic carbides ([B22D21/02](#) takes precedence)

B22D23/00

Casting processes not provided for in groups [B22D1/00](#) to [B22D21/00](#) (making metallic powder by casting [B22F9/08](#); alumino-thermic welding [B23K23/00](#); remelting metals [C22B9/16](#))

- B22D23/00A . [N: Moulding by spraying metal on a surface]
- B22D23/00B . [N: Casting by filling the mould through rotation of the mould together with a molten metal holding recipient, about a common axis]
- B22D23/02 . Top casting
- B22D23/04 . Casting by dipping ([hot-dipping or immersion processes for applying coating material in the molten state without affecting the shape C23C2/00](#))
- B22D23/06 . Melting-down metal, e.g. metal particles, in the mould
- B22D23/10 . . Electroslag casting [N: ([electroslag remelting C22B9/18](#))]

B22D25/00

Special casting characterised by the nature of the product ([B22D15/02](#), [B22D17/16](#), [B22D19/00](#) take precedence; casting stereotype plates [B41D3/00](#))

- B22D25/00F . [N: Casting metal foams] [N0309]
- B22D25/02 . by its peculiarity of shape; of works of art [N: ([cylinders, pistons B22D15/02](#))]
- B22D25/02C . . [N: Casting chains or the like] [N9606]

- B22D25/02J . . [N: Casting jewelry articles ([B22D13/06A](#) takes precedence)] [N0309]
- B22D25/04 . . Casting metal electric battery plates or the like (manufacture thereof by multi-step processes [H01M4/82](#))
- B22D25/06 . by its physical properties ([B22D27/00](#) takes precedence)
- B22D25/08 . . by uniform hardness ([B22D15/00](#) takes precedence)

- B22D27/00** **Treating the metal in the mould while it is molten or ductile** ([B22D7/12](#), [B22D11/10](#), [B22D43/00](#) take precedence); [N: Pressure or vacuum casting ([B22D17/00](#) takes precedence)]
- B22D27/00A . [N: by using inert gases]
- B22D27/00B . [N: by using reactive gases]
- B22D27/02 . Use of electric or magnetic effects [N: (for continuous casting [B22D11/01A](#), [B22D11/11](#))] [C1204]
- B22D27/04 . Influencing the temperature of the metal, e.g. by heating or cooling the mould
- B22D27/04A . . [N: Directionally solidified castings]
- B22D27/06 . . Heating the top discard of ingots (hot tops for ingot moulds [B22D7/10](#))
- B22D27/08 . Shaking, vibrating, or turning of moulds
- B22D27/09 . by using pressure
- B22D27/11 . . making use of mechanical pressing devices
- B22D27/13 . . making use of gas pressure
- B22D27/15 . by using vacuum
- B22D27/18 . Measures for using chemical processes for influencing the surface composition of castings, e.g. for increasing resistance to acid attack
- B22D27/20 . Measures not previously mentioned for influencing the grain structure or texture; Selection of compositions therefor

Guide heading: **Final measures after casting** ([cleaning of castings by sand-blasting B24C](#))

- B22D29/00** **Removing castings from moulds, not restricted to casting processes covered by a single main group; Removing cores; Handling ingots** [N: ([B22D13/10](#), [B22D11/124](#), [B22D17/00](#) take precedence)]
- B22D29/00A . [N: Removing cores]
- B22D29/00A1 . . [N: by leaching, washing or dissolving]
- B22D29/00A2 . . [N: using heat] [N0011]
- B22D29/00A3 . . [N: by vibrating or hammering] [N0011]
- B22D29/00A4 . . [N: by abrasive, water or air blasting] [N0011]
- B22D29/00A5 . . [N: by using explosive shock waves] [N0011]

- B22D29/00A5A . . . [N: in a liquid medium] [N0011]
- B22D29/02 . Vibratory apparatus specially designed for shaking out flasks
- B22D29/04 . Handling or stripping castings or ingots (grippers in general, [see the relevant subclasses, e.g. B66C](#))
- B22D29/06 . . Strippers actuated by fluid pressure
- B22D29/08 . . Strippers actuated mechanically

- B22D30/00** **Cooling castings, not restricted to casting processes covered by a single main group** (accessories for cooling cast stock in continuous casting of metals [B22D11/124](#); controlling or regulating processes or operations for cooling cast stock or mould in continuous casting of metals [B22D11/22](#); chill casting [B22D15/00](#))

- B22D31/00** **Cutting-off surplus material, e.g. gates; [N: Cleaning and working on castings ([B22D17/20G](#) takes precedence)]**
- B22D31/00A . [N: Cleaning, working on castings]
- B22D31/00A1 . . [N: Sealing or impregnating porous castings]
- B22D31/00A2 . . [N: Tumbling mills]

- Guide heading:** **Other equipment for casting** ([arrangement of indicating or measuring devices B22D2/00](#))

- B22D33/00** **Equipment for handling moulds**
- B22D33/00A . [N: Transporting flaskless moulds]
- B22D33/02 . Turning or transposing moulds
- B22D33/04 . Bringing together or separating moulds
- B22D33/06 . Burdening or relieving moulds

- B22D35/00** **Equipment for conveying molten metal into beds or moulds** ([B22D37/00](#) to [B22D41/00](#) take precedence; specially adapted to particular processes or machines, see the relevant groups)
- B22D35/02 . into beds
- B22D35/04 . into moulds, e.g. base plates, runners
- B22D35/04A . . [N: Runner base plates for bottom casting ingots]
- B22D35/06 . Heating or cooling equipment

- B22D37/00** **Controlling or regulating the pouring of molten metal from a casting melt-holding vessel** ([B22D39/00](#), [B22D41/00](#) take precedence; specially adapted to particular processes or machines, see the relevant groups of this subclass) [N: [B22D11/18](#) takes precedence] [C1204]

B22D37/00S . [N: Shielding the molten metal stream ([B22D11/106](#), [B22D41/50](#) take precedence)]
[C1204]

B22D39/00 **Equipment for supplying molten metal in rations (specially adapted to particular processes or machines, see the relevant groups of this subclass)**

B22D39/00A . [N: using electromagnetic field]

B22D39/00A1 . . [N: Electromagnetic conveyers]

B22D39/02 . having means for controlling the amount of molten metal by volume

B22D39/02D . . [N: using a displacement member]

B22D39/02L . . [N: using a ladler]

B22D39/04 . having means for controlling the amount of molten metal by weight

B22D39/06 . having means for controlling the amount of molten metal by controlling the pressure above the molten metal

B22D41/00 **Casting melt-holding vessels, e.g. ladles, tundishes, cups or the like ([B22D39/00](#), [B22D43/00](#) take precedence)**

B22D41/00C . [N: devices for cleaning ladles (cleaning in general [B08B](#))]

B22D41/00P . [N: with impact pads] [N9602]

B22D41/005 . with heating or cooling means

B22D41/01 . . Heating means

B22D41/015 . . . with external heating, i.e. the heat source not being a part of the ladle

B22D41/02 . Linings

B22D41/02A . . [N: Apparatus used for making or repairing linings (equipment used for making or repairing converter linings [C21C5/44B](#))]

B22D41/02B . . [N: Apparatus used for fracturing and removing of linings]

B22D41/04 . tiltable

B22D41/05 . . Tea-pot spout ladles

B22D41/06 . Equipment for tilting

B22D41/08 . for bottom pouring ([B22D41/14](#), [B22D41/50](#) take precedence)

B22D41/12 . Travelling ladles or similar containers; Cars for ladles (casting cranes [B66C](#))

B22D41/13 . . Ladle turrets [N0309]

B22D41/14 . Closures

B22D41/16 . . stopper-rod type, i.e. a stopper-rod being positioned downwardly through the vessel and the metal therein, for selective registry with the pouring opening

B22D41/18 . . . Stopper-rods therefor

- B22D41/18C [N: with cooling means]
- B22D41/18F [N: with means for injecting a fluid into the melt]
- B22D41/20 Stopper-rod operating equipment
- B22D41/22 sliding-gate type, i.e. having a fixed plate and a movable plate in sliding contact with each other for selective registry of their openings
- B22D41/24 characterised by a rectilinearly movable plate ([B22D41/38](#) to [B22D41/42](#) take precedence)
- B22D41/26 characterised by a rotatively movable plate ([B22D41/38](#) to [B22D41/42](#) take precedence)
- B22D41/28 Plates therefor ([B22D41/38](#) to [B22D41/42](#) take precedence)
- B22D41/30 Manufacturing or repairing thereof
- B22D41/32 characterised by the materials used therefor
- B22D41/34 Supporting, fixing or centering means therefor
- B22D41/36 Treating the plates, e.g. lubricating, heating ([ladles, cups or the like with heating means B22D41/01](#))
- B22D41/38 Means for operating the sliding gate
- B22D41/40 Means for pressing the plates together
- B22D41/42 Features relating to gas injection
- B22D41/44 Consumable closure means, i.e. closure means being used only once
- B22D41/46 Refractory plugging masses
- B22D41/46D [N: Unplugging a vessel discharge port]
- B22D41/48 Meltable closures

- B22D41/50 Pouring-nozzles
- B22D41/50C [N: Connection arrangements; Sealing means therefor]
- B22D41/50E [N: Rings, inserts or other means preventing external nozzle erosion by the slag]
- B22D41/50R [N: giving a rotating motion to the issuing molten metal]
- B22D41/52 Manufacturing or repairing thereof
- B22D41/54 characterised by the materials used therefor
- B22D41/56 Means for supporting, manipulating or changing a pouring-nozzle
- B22D41/58 with gas injecting means
- B22D41/60 with heating or cooling means
- B22D41/62 with stirring or vibrating means

B22D43/00 Mechanical cleaning, e.g. skimming of molten metals

- B22D43/00R [N: Retaining slag during pouring molten metal]
- B22D43/00R1 [N: by using floating means]
- B22D43/00R2 [N: by using filtering means ([B22C9/08C](#) takes precedence)]

- B22D43/00S [N: Removing slag from a molten metal surface]
- B22D43/00S1 [N: by using scrapers]
- B22D43/00S2 [N: by suction]

B22D45/00 Equipment for casting, not otherwise provided for

- B22D45/00A . [N: Evacuation of fumes, dust or waste gases during manipulations in the foundry (during steel manufacture [C21C5/38](#); evacuation from furnaces [F27D17/00B](#))]
- B22D46/00 **Controlling, supervising, not restricted to casting covered by a single main group, e.g. for safety reasons** ([controlling or regulating in general G05](#))
- B22D47/00 **Casting plants**
- B22D47/02 . for both moulding and casting