CPC COOPERATIVE PATENT CLASSIFICATION

C CHEMISTRY; METALLURGY

(NOTES omitted)

CHEMISTRY

C03 GLASS; MINERAL OR SLAG WOOL

C03B MANUFACTURE, SHAPING, OR SUPPLEMENTARY PROCESSES

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

C03B 8/00	covered by	C03B 19/00, C03B 37/00
C03B 8/02	covered by	C03B 19/1065, C03B 19/12, C03B 37/011, C03B 37/016
C03B 8/04	covered by	C03B 19/106, C03B 19/14, C03B 37/014

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Melting the raw material

1/00 **Preparing the batches** (chemical compositions C03C)

1/02 . Compacting the glass batches, e.g. pelletising

3/00 **Charging the melting furnaces**

3/005 . {using screw feeders}

3/02 . combined with preheating, premelting or pretreating the glass-making ingredients, pellets or cullet

3/023 . . {Preheating}

3/026 . . {by charging the ingredients into a flame, through a burner or equivalent heating means used to heat the melting furnace}

5/00 **Melting in furnaces; Furnaces so far as specially adapted for glass manufacture**

5/005 . {of glass-forming waste materials (disposal or transformation of solid waste in general B09B; treatment of radioactive waste G21F 9/00)}

5/02 . in electric furnaces {, e.g. by dielectric heating (electric heating in general H05B)}

5/021 . . {by induction heating}

5/023 . . {by microwave heating}

5/025 . . {by arc discharge or plasma heating}

5/027 . . by passing an electric current between electrodes immersed in the glass bath, i.e. by direct resistance heating

5/0272 . . . {Pot furnaces}

5/0275 . . . {Shaft furnaces (C03B 5/0277 takes precedence)}

5/0277 . . . {Rotary furnaces}

5/03 . . . Tank furnaces

5/031 . . . . {Cold top tank furnaces}

5/033 . . by using resistance heaters above or in the glass bath, i.e. by indirect resistance heating

5/0332 . . . {Tank furnaces}

5/0334 . . . {Pot furnaces; Core furnaces}

5/0336 . . . {Shaft furnaces (C03B 5/0338 takes precedence)}

5/0338 . . . {Rotary furnaces}

5/04 . in tank furnaces {(C03B 5/02 takes precedence)}

5/05 . . Discontinuously-working tank furnaces, e.g. day tanks

5/06 . in pot furnaces {(C03B 5/02 takes precedence)}

5/08 . . Glass-melting pots

5/10 . in combined tank furnaces and pots {(C03B 5/02 takes precedence)}

5/12 . in shaft furnaces {(C03B 5/02 takes precedence)}

5/14 . in revolving cylindrical furnaces {(C03B 5/02 takes precedence)}

5/16 . Special features of the melting process; Auxiliary means specially adapted for glass-melting furnaces

5/163 . . {Electrochemical treatments, e.g. to prevent bubbling or to create bubbles (C03B 5/1672, C03B 5/185 take precedence)}

5/167 . . Means for preventing damage to equipment, e.g. by molten glass, hot gases, batches (C03B 5/20, C03B 5/42 take precedence)

5/1672 . . . {Use of materials therefor}

5/1675 . . . . {Platinum group metals}

5/1677 . . . {by use of electrochemically protection means, e.g. passivation of electrodes}

5/173 . . Apparatus for changing the composition of the molten glass in glass furnaces, e.g. for colouring the molten glass (chemical aspects C03C)

5/18 . . Stirring devices; Homogenisation {(mixing in general B01F)}

5/182 . . . by moving the molten glass along fixed elements, e.g. deflectors, weirs, baffle plates

5/183 . . . using thermal means, e.g. for creating convection currents

5/185 . . . . Electric means

5/187 . . . with moving elements

5/1875 . . . . {of the screw or pump-action type}

5/193 . . . using gas, e.g. bubblers

5/20 . . Bridges, shoes, throats, or other devices for withholding dirt, foam, or batch

5/202 . . . {Devices for blowing onto the melt surface, e.g. high momentum burners}
5/205 . . . {Mechanical means for skimming or scraping the melt surface}
5/207 . . . {Foraminous or mesh screens, e.g. submerged sieves}
5/225 . . Refining (C03B 5/18 takes precedence {; Refining agents C03C 1/004})
5/2252 . . . {under reduced pressure, e.g. with vacuum refiners}
5/2255 . . . {by centrifuging}
5/2257 . . . {by thin-layer fining}
5/23 . . Cooling the molten glass (C03B 5/18, C03B 5/225 take precedence)
5/235 . . Heating the glass (C03B 5/02, C03B 5/18, C03B 5/225 take precedence)

NOTE

Devices for withholding dirt, foam, or batch are also classified in C03B 5/202

5/2353 . . . {by combustion with pure oxygen or oxygen-enriched air, e.g. using oxy-fuel burners or oxygen lances}
5/2356 . . . {Submerged heating, e.g. by using heat pipes, hot gas or submerged combustion burners (bubblers C03B 5/193)}
5/237 . . . Regenerators or recuperators specially adapted for glass-melting furnaces
5/2375 . . . . {Regenerator brick design (brick shapes in general F27D 1/042); Use of materials therefor; Brick stacking arrangements}
5/24 . . Automatically regulating the melting process
5/245 . . . {Regulating the melt or batch level, depth or thickness}
5/26 . . Outlets {, e.g. drains, siphons}; Overflows {, e.g. for supplying the float tank, tweels}
5/262 . . . {Drains, i.e. means to dump glass melt or remove unwanted materials}
5/265 . . . {Overflows; Lips; Tweels}
5/267 . . . . {specially adapted for supplying the float tank}
5/28 . . Siphons
5/42 . . Details of construction of furnace walls, e.g. to prevent corrosion; Use of materials for furnace walls
5/425 . . . Preventing corrosion or erosion (C03B 5/44 takes precedence)
5/43 . . . Use of materials for furnace walls, e.g. fire-bricks
5/435 . . . Heating arrangements for furnace walls
5/44 . . . Cooling arrangements for furnace walls

7/00 Distributors for the molten glass; Means for taking-off charges of molten glass; Producing the gob {, e.g. controlling the gob shape, weight or delivery tact}

7/005 . {Controlling, regulating or measuring}
7/01 . Means for taking-off charges of molten glass {(C03B 7/08, C03B 7/14 - C03B 7/22 take precedence)}
7/02 . Forehearths, i.e. feeder channels
7/04 . . Revolving forehearths
7/06 . . Means for thermal conditioning or controlling the temperature of the glass
7/065 . . . {by combustion with pure oxygen or oxygen-enriched air}
7/07 . . . Electric means
7/08 . Feeder spouts, e.g. gob feeders
7/082 . . Pneumatic feeders
7/084 . . Tube mechanisms
7/086 . . Plunger mechanisms
7/088 . . Outlets, e.g. orifice rings
7/09 . . Spout blocks
7/092 . . Stirring devices; Homogenisation (C03B 5/18 takes precedence)
7/094 . . Means for heating, cooling or insulation
7/096 . . . for heating
7/098 . . . . electric
7/10 . Cutting-off {or severing} the glass flow with the aid of knives or scissors {or non-contacting cutting means, e.g. a gas jet}; Construction of the blades used
7/11 . . Construction of the blades
7/12 . . Cutting-off {or severing} a free-hanging glass stream {, e.g. by the combination of gravity and surface tension forces}
7/14 . Transferring molten glass or gobs to glass blowing or pressing machines (C03B 7/18 - C03B 7/22 take precedence)
7/16 . . using deflector chutes
7/18 . Suction feeders
7/20 . Scoop feeders
7/22 . Gathering-devices in the form of rods or pipes

Shaping of glass (manufacture of fibres C03B 37/00)

9/00 Blowing glass; Production of hollow glass articles

9/02 . with the mouth; Auxiliary means therefor
9/03 . . Blow pipes
9/04 . . Making hollow glass articles with feet or projections
9/06 . . Making hollow glass articles with double walls, e.g. vacuum flasks
9/08 . Finish-blowing with compressed air of blanks blown with the mouth
9/10 . Blowing glass cylinders for sheet manufacture
9/12 . starting from a ribbon of glass; Ribbon machines
9/13 . in gob feeder machines (C03B 9/28, C03B 9/29 take precedence)
9/14 . . in "blow" machines or in "blow-and-blow" machines (C03B 9/193, C03B 9/20 take precedence)
9/145 . . . {Details of machines without turn-over moulds}
9/16 . . . in machines with turn-over moulds
9/165 . . . . {Details of such machines, e.g. guide funnels, turn-over mechanisms (C03B 9/18 takes precedence)}
9/18 . . . . Rotary-table machines
9/185 . . . . . {having at least two rotary tables}
9/19 . . . . . having only one rotary table
9/193 . . in "press-and-blow" machines
9/1932 . . . {Details of such machines, e.g. plungers or plunger mechanisms for the press-and-blow machine, cooling of plungers (C03B 9/195 takes precedence)}
9/1934 . . . . {Mechanical displacement means of the plunger}

9/1936 . . . . {Hydraulic or pneumatic displacement means of the plunger}
9/1938 . . . . {Electrical means for the displacement of the plunger}
9/195 . . . Rotary-table machines
9/1955 . . . . {having at least two rotary tables}
9/197 . . . Construction of the blank mould
9/20 . in "vacuum blowing" or in "vacuum-and-blow" machines
9/22 . . Rotary-table machines
9/225 . . . {having at least two rotary tables}
9/24 . . Construction of the blank mould
9/28 . in machines of the endless-chain type (C03B 9/12 takes precedence)
9/29 . Paste mould machines (C03B 9/28 takes precedence)
9/292 . . {Details of such machines (C03B 9/295 takes precedence)}
9/295 . . Rotary-table machines
9/2955 . . . {having at least two rotary tables}
9/30 . Details of blowing glass (for blowing with the mouth C03B 9/02); Use of materials for the moulds
9/31 . . Blowing laminated glass articles or glass with enclosures, e.g. wires, bubbles
9/32 . . Giving special shapes to parts of hollow glass articles
9/325 . . . Forming screw-threads or lips at the mouth of hollow glass articles; Neck moulds
9/33 . . . Making hollow glass articles with feet or projections; Moulds therefor
9/335 . . . Forming bottoms to blown hollow glass articles; Bottom moulds
9/34 . . Glass-blowing moulds not otherwise provided for
9/342 . . . {Neck moulds (C03B 9/325 takes precedence)}
9/344 . . . {Bottom moulds (C03B 9/335 takes precedence)}
9/347 . . . Construction of the blank or blow mould
9/353 . . . Mould holders {; Mould opening and closing mechanisms}
9/3532 . . . . {Mechanisms for holders of half moulds moving by rotation about a common vertical axis}
9/3535 . . . . . {with the half moulds parallel upon opening and closing}
9/3537 . . . . {Mechanisms for holders of half moulds moving by linear translation}
9/36 . . Blow heads; Supplying, ejecting or controlling the air
9/3609 . . . {Selection or characteristics of the blowing medium, e.g. gas composition, moisture content, cryogenic state}
9/3618 . . . {Means for holding or transferring the blow head}
9/3627 . . . {Means for general supply or distribution of the air to the blow heads}
9/3636 . . . . {Manifolds or regulating devices, e.g. valves}
9/3645 . . . {Details thereof relating to plungers}
9/3654 . . . {Details thereof relating to neck forming}
9/3663 . . . {Details thereof relating to internal blowing of the hollow glass}
9/3672 . . . . {using a tube}
9/3681 . . . . . {Movable tubes}
9/369 . . . {Details thereof relating to bottom forming}
9/38 . . Means for cooling, heating, or insulating glass-blowing machines {or for cooling the glass moulded by the machine}
9/3808 . . . {Selection or characteristics of the cooling, heating or insulating medium, e.g. gas composition, moisture content, cryogenic state}
9/3816 . . . {Means for general supply, distribution or control of the medium to the mould, e.g. sensors, circuits, distribution networks}
9/3825 . . . {Details thereof relating to plungers}
9/3833 . . . {Details thereof relating to neck moulds}
9/3841 . . . {Details thereof relating to direct cooling, heating or insulating of the moulded glass}
9/385 . . . . {using a tube for cooling or heating the inside, e.g. blowheads}
9/3858 . . . . . {Movable tubes}
9/3866 . . . {Details thereof relating to bottom moulds, e.g. baffles}
9/3875 . . . {Details thereof relating to the side-wall, body or main part of the moulds}
9/3883 . . . . {Air delivery thereto, e.g. plenum, piping}
9/3891 . . . {Manifolds or regulating devices, e.g. valves, injectors}
9/40 . . Gearing or controlling mechanisms specially adapted for glass-blowing machines
9/403 . . . {Hydraulic or pneumatic systems}
9/406 . . . . {Manifolds or regulating devices, e.g. valves}
9/41 . . . Electric or electronic systems (in general G05B 19/00)
9/42 . . Means for fusing, burning-off, or edge-melting combined with glass-blowing machines (uniting glass pieces by fusing C03B 23/20)
9/44 . . Means for discharging combined with glass-blowing machines, e.g. take-outs
9/447 . . . Means for the removal of glass articles from the blow-mould, e.g. take-outs
9/453 . . . Means for pushing newly formed glass articles onto a conveyor, e.g. sweep-out mechanisms; Dead-plate mechanisms
9/4535 . . . . {Dead-plate mechanisms}
9/46 . . Means for cutting the hot glass in glass-blowing machines (burning-off C03B 9/42)
9/48 . . Use of materials for the moulds

11/00 **Pressing {molten} glass {or performed glass reheated to equivalent low viscosity without blowing** (shaping molten glass by a press-blow process C03B 9/00, e.g. C03B 9/193; re-forming shaped glass C03B 23/00; re-heating the performed glass C03B 29/00; transporting the performed or pressed glass during its manufacture C03B 35/00)**}**

11/005 . {Pressing under special atmospheres, e.g. inert, reactive, vacuum, clean}
11/02 . in machines with rotary tables
11/04 . in machines with moulds fed by suction
11/05 . in machines with reciprocating moulds
11/06 . Construction of plunger or mould
11/07 . . Suction moulds
11/08 . . for making solid articles, e.g. lenses
11/082 . . . {having profiled, patterned or microstructured surfaces}

11/084 . . . {material composition or material properties of press dies therefor}
11/086 . . . . {of coated dies (use of materials as release or lubricating compositions C03B 40/02)}
11/088 . . . {Flat discs}
11/10 . . for making hollow {or semi-hollow} articles
11/12 . Cooling, heating, or insulating the plunger, the mould, or the glass-pressing machine; {cooling or heating of the glass in the mould}(C03B 9/38 takes precedence)
11/122 . . {Heating}
11/125 . . {Cooling}
11/127 . . . {of hollow or semi-hollow articles or their moulds}
11/14 . {Pressing laminated glass articles or glass} with metal inserts {or enclosures, e.g. wires, bubbles, coloured parts}
11/16 . Gearing or controlling mechanisms specially adapted for glass presses

13/00 Rolling {molten} glass {, i.e. where the molten glass is shaped by rolling (re-forming shaped glass by rolling C03B 23/004, C03B 23/033, C03B 23/055)**}**
13/01 . Rolling profiled glass articles {, e.g. with I, L, T cross-sectional profiles}
13/02 . Rolling non-patterned sheets discontinuously
13/04 . Rolling non-patterned sheets continuously
13/06 . Rolling corrugated sheets {, e.g. with undulating waving form}
13/08 . Rolling patterned sheets {, e.g. sheets having a surface pattern}
13/10 . Rolling multi-layer sheets {, e.g. sheets having a coloured glass layer}
13/12 . Rolling glass with enclosures, e.g. wire, {bubbles, fibres, particles} or asbestos
13/14 . Rolling other articles {, i.e. not covered by C03B 13/01 - C03B 13/12, e.g. channeled articles, briquette-shaped articles}
13/16 . Construction of the glass rollers
13/18 . Auxiliary means for rolling glass, e.g. sheet supports, gripping devices, hand-ladles, means for moving glass pots
13/183 . . {Receiving tables or roller beds for the rolled plateglass}
13/186 . . {Pot gripping devices}

15/00 Drawing glass upwardly from the melt
15/02 . Drawing glass sheets
15/04 . . from the free surface of the melt
15/06 . . from a debiteuse
15/08 . . by means of bars below the surface of the melt
15/10 . . multi-layer glass sheets or glass sheets coated with coloured layers
15/12 . . Construction of the annealing tower
15/14 . Drawing tubes, cylinders, or rods from the melt
15/16 . . Drawing tubes, cylinders or rods, coated with coloured layers
15/18 . Means for laying-down and conveying combined with the drawing of glass sheets, tubes or rods

17/00 Forming {molten} glass by flowing-out, pushing-out, {extruding} or drawing downwardly or laterally from forming slits or by overflowing over lips
17/02 . Forming {molten} glass coated with coloured layers; {Forming molten glass of different compositions or layers; Forming molten glass comprising reinforcements or inserts}
17/025 . . {Tubes or rods}
17/04 . Forming tubes or rods by drawing from stationary or rotating tools or from forming nozzles
17/06 . Forming glass sheets
17/061 . . {by lateral drawing or extrusion}
17/062 . . . {combined with flowing onto a solid or gaseous support from which the sheet is drawn}
17/064 . . {by the overflow downdraw fusion process; Isopipes therefor}
17/065 . . {Forming profiled, patterned or corrugated sheets}
17/067 . . {combined with thermal conditioning of the sheets}
17/068 . . {Means for providing the drawing force, e.g. traction or draw rollers}

18/00 Shaping glass in contact with the surface of a liquid
18/02 . Forming sheets
18/04 . . Changing or regulating the dimensions of the molten glass ribbon
18/06 . . . using mechanical means, e.g. restrictor bars, edge rollers
18/08 . . . using gas
18/10 . . . using electric means
18/12 . . Making multilayer, coloured or armoured glass (chemical aspects C03C)
18/14 . . Changing the surface of the glass ribbon, e.g. roughening (by chemical methods C03C)
18/16 . . Construction of the float tank; Use of material for the float tank; Coating or protection of the tank wall
18/18 . . Controlling or regulating the temperature of the float bath; Composition or purification of the float bath
18/20 . . Composition of the atmosphere above the float bath; Treating or purifying the atmosphere above the float bath
18/22 . . . Controlling or regulating the temperature of the atmosphere above the float tank

19/00 Other methods of shaping glass (manufacture or treatment of flakes, fibres or filaments from softened glass, minerals or slags C03B 37/00)
19/01 . by progressive fusion {or sintering} of powdered glass onto a shaping substrate, i.e. accretion {, e.g. plasma oxidation deposition (making fibre preforms C03B 37/01291)}
19/02 . by casting {molten glass, e.g. injection moulding}
19/025 . . {by injection moulding, e.g. extrusion}
19/04 . by centrifuging {(C03B 19/095 takes precedence)}
19/06 . by sintering, {e.g. by cold isostatic pressing of powders and subsequent sintering, by hot pressing of powders, by sintering slurries or dispersions not undergoing a liquid phase reaction}
19/063 . . {by hot-pressing powders}
19/066 . . {for the production of quartz or fused silica articles (other processes specially adapted for the production of quartz or fused silica articles C03B 20/00)}

19/08 . by foaming
19/09 . by fusing powdered glass in a shaping mould
19/095 . . {by centrifuging, e.g. arc discharge in rotating mould (crucibles for crystal pulling in general C30B 15/10, C30B 35/002)}
19/10 . Forming beads
19/1005 . . {Forming solid beads (chemical aspects C03C 12/00)}
19/101 . . . {by casting molten glass into a mould or onto a wire}
19/1015 . . . {by using centrifugal force or by pouring molten glass onto a rotating cutting body, e.g. shredding}
19/102 . . . {by blowing a gas onto a stream of molten glass or onto particulate materials, e.g. pulverising}
19/1025 . . . . {Bead furnaces or burners}
19/103 . . . . . {Fluidised-bed furnaces}
19/1035 . . . {by pressing}
19/104 . . . {by rolling, e.g. using revolving cylinders, rotating discs, rolls}
19/1045 . . . {by bringing hot glass in contact with a liquid, e.g. shattering}
19/105 . . . . {the liquid being a molten metal or salt}
19/1055 . . . {by extruding, e.g. dripping molten glass in a gaseous atmosphere}
19/106 . . . {by chemical vapour deposition; by liquid phase reaction}
19/1065 . . . . {by liquid phase reactions, e.g. by means of a gel phase}
19/107 . . {Forming hollow beads (chemical aspects C03C 11/002)}
19/1075 . . . {by blowing, pressing, centrifuging, rolling or dripping}
19/108 . . {Forming porous, sintered or foamed beads (chemical aspects C03C 11/00)}
19/1085 . . . {by blowing, pressing, centrifuging, rolling or dripping}
19/109 . . {Glass-melting furnaces specially adapted for making beads}
19/1095 . . {Thermal after-treatment of beads, e.g. tempering, crystallisation, annealing}
19/12 . by liquid-phase reaction processes
19/14 . by gas- {or vapour-} phase reaction processes
19/1407 . . {Deposition reactors therefor}
19/1415 . . {Reactant delivery systems}
19/1423 . . . {Reactant deposition burners}
19/143 . . . . {Plasma vapour deposition}
19/1438 . . . {for delivering and depositing additional reactants as liquids or solutions, e.g. solution doping of the article or deposit}
19/1446 . . {Means for after-treatment or catching of worked reactant gases}
19/1453 . . {Thermal after-treatment of the shaped article, e.g. dehydrating, consolidating, sintering}
19/1461 . . . {for doping the shaped article with flourine}
19/1469 . . {Means for changing or stabilising the shape or form of the shaped article or deposit}
19/1476 . . {Means for heating during or immediately prior to deposition (C03B 19/1415 takes precedence)}
19/1484 . . {Means for supporting, rotating or translating the article being formed}
19/1492 . . . {Deposition substrates, e.g. targets}

20/00 Processes specially adapted for the production of quartz or fused silica articles {, not otherwise provided for (C03B 19/01, C03B 19/066, C03B 19/106, C03B 19/12, C03B 19/14, C03B 37/00 take precedence)}

21/00 Severing glass sheets, tubes or rods while still plastic

21/02 . by cutting (C03B 9/46 takes precedence)
21/04 . by punching out
21/06 . by flashing-off, burning-off or fusing (C03B 9/42 takes precedence)

23/00 Re-forming shaped glass (re-forming fibres or filaments C03B 37/14)

23/0006 . {by drawing (C03B 23/02, C03B 23/04, C03B 23/18 take precedence)}
23/0013 . {by pressing (C03B 21/04, C03B 23/02, C03B 23/04, C03B 23/18, C03B 23/26 take precedence)}
23/002 . . {Re-forming the rim portions}
23/0026 . {by gravity, e.g. sagging (C03B 23/02, C03B 23/04, C03B 23/18 take precedence)}
23/0033 . {by centrifuging (C03B 23/02, C03B 23/04, C03B 23/18 take precedence)}
23/004 . {by rolling (C03B 23/02, C03B 23/04, C03B 23/18 take precedence)}
23/0046 . . {Re-forming the rim portions}
23/0053 . . . {Hand tools therefor}
23/006 . {by fusing, e.g. for flame sealing (C03B 9/42, C03B 21/06, C03B 23/02, C03B 23/04, C03B 23/18, C03B 33/08 take precedence)}
23/0066 . {by bending (C03B 23/02, C03B 23/04, C03B 23/18 take precedence)}
23/0073 . {by blowing (C03B 23/02, C03B 23/04, C03B 23/18 take precedence)}
23/008 . . {Vacuum-blowing}
23/0086 . {Heating devices specially adapted for re-forming shaped glass articles in general, e.g. burners (C03B 23/02, C03B 23/04, C03B 23/18 take precedence)}
23/0093 . {Tools and machines specially adapted for re-forming shaped glass articles in general, e.g. chucks (C03B 23/0086, C03B 23/02, C03B 23/04, C03B 23/18 take precedence)}
23/02 . Re-forming glass sheets
23/023 . . by bending
23/0235 . . . {involving applying local or additional heating, cooling or insulating means}
23/025 . . . by gravity
23/0252 . . . . {by gravity only, e.g. sagging (C03B 23/035 takes precedence)}
23/0254 . . . . . {in a continuous way, e.g. gravity roll bending}
23/0256 . . . . {Gravity bending accelerated by applying mechanical forces, e.g. inertia, weights or local forces}
23/0258 . . . . {Gravity bending involving applying local or additional heating, cooling or insulating means}
23/027 . . . . with moulds having at least two upward pivotable mould sections
23/03 . . . by press-bending between shaping moulds
23/0302 . . . . {between opposing full-face shaping moulds}

23/0305 . . . . {Press-bending accelerated by applying mechanical forces, e.g. inertia, weights or local forces}
23/0307 . . . . {Press-bending involving applying local or additional heating, cooling or insulating means}
23/031 . . . . the glass sheets being in a vertical position (C03B 23/033 takes precedence)
23/0315 . . . . . {and supported on the lower edge}
23/033 . . . . in a continuous way, e.g. roll forming {, or press-roll bending}
23/035 . . . using a gas cushion or by changing gas pressure, e.g. by applying vacuum {or blowing for supporting the glass while bending}
23/0352 . . . . {by suction or blowing out for providing the deformation force to bend the glass sheet}
23/0355 . . . . . {by blowing without suction directly on the glass sheet}
23/0357 . . . . . {by suction without blowing, e.g. with vacuum or by venturi effect}
23/037 . . by drawing
23/04 . Re-forming tubes or rods
23/043 . . Heating devices specially adapted for re-forming tubes or rods in general, e.g. burners
23/045 . . Tools or apparatus specially adapted for re-forming tubes or rods in general, e.g. glass lathes, chucks (C03B 23/043 takes precedence)
23/047 . . by drawing ({C03B 23/091} , C03B 37/025 takes precedence)
23/0473 . . . {for forming constrictions}
23/0476 . . . {onto a forming die, e.g. a mandrel or a wire}
23/049 . . by pressing (C03B 21/04 {, C03B 23/092}, C03B 23/26 take precedence)
23/0493 . . . {in a longitudinal direction, e.g. for upsetting or extrusion}
23/0496 . . . {for expanding in a radial way, e.g. by forcing a mandrel through a tube or rod}
23/051 . . by gravity, e.g. sagging {(C03B 23/093 takes precedence)}
23/053 . . by centrifuging ({C03B 23/094} , C03B 37/04 takes precedence)
23/055 . . by rolling {(C03B 23/095 takes precedence)}
23/057 . . by fusing, e.g. for flame sealing (C03B 9/42, C03B 21/06 {C03B 23/099} , C03B 33/08 take precedence)
23/06 . . by bending {(C03B 23/096 takes precedence)}
23/065 . . . {in only one plane, e.g. for making circular neon tubes}
23/07 . . by blowing, e.g. for making electric bulbs {(C03B 23/097 takes precedence)}
23/073 . . . {Vacuum-blowing}
23/076 . . . . {Shrinking the glass tube on to a mandrel}
23/08 . . to exact dimensions, e.g. calibrating
23/09 . . Reshaping the ends, e.g. as grooves, threads or mouths
23/091 . . . {by drawing}
23/092 . . . {by pressing}
23/093 . . . {by gravity, e.g. sagging}
23/094 . . . {by centrifuging}
23/095 . . . {by rolling}
23/096 . . . {by bending}
23/097 . . . {by blowing}
23/098 . . . . {Vacuum-blowing}
23/099 . . . {by fusing, e.g. flame sealing}
23/11 . . Reshaping by drawing without blowing, in combination with separating, e.g. for making ampoules
23/112 . . . {Apparatus for conveying the tubes or rods in a curved path around a vertical axis through one or more forming stations}
23/114 . . . . {Devices for feeding tubes or rods to these machines}
23/116 . . . {Apparatus for conveying the tubes or rods in a curved path around a horizontal axis through one or more forming stations}
23/118 . . . {Apparatus for conveying the tubes or rods in a horizontal or an inclined plane through one or more forming stations}
23/13 . . Reshaping combined with uniting or heat sealing, e.g. for making vacuum bottles
23/18 . Re-forming and sealing ampoules
23/20 . Uniting glass pieces by fusing without substantial reshaping
23/203 . . Uniting glass sheets (C03B 23/24 takes precedence)
23/207 . . Uniting glass rods, glass tubes, or hollow glassware (C03B 23/24 takes precedence)
23/213 . . . Joining projections or feet
23/217 . . . for the production of cathode ray tubes or similarly shaped tubes
23/22 . . Uniting glass lenses, e.g. forming bifocal lenses
23/24 . . Making hollow glass sheets or bricks
23/245 . . . {Hollow glass sheets}
23/26 . Punching reheated glass

After-treatment of glass products (of fibres C03B 37/10)

25/00 Annealing glass products
25/02 . in a discontinuous way
25/025 . . {Glass sheets}
25/04 . in a continuous way
25/06 . . with horizontal displacement of the glass products
25/08 . . . of glass sheets
25/087 . . . . being in a vertical position
25/093 . . . . being in a horizontal position on a fluid support, e.g. a gas or molten metal
25/10 . . with vertical displacement of the glass products
25/12 . . . of glass sheets

27/00 Tempering {or quenching} glass products
27/004 . by bringing the hot glass product in contact with a solid cooling surface, e.g. sand grains
27/008 . by using heat of sublimation of solid particles
27/012 . by heat treatment, e.g. for crystallisation; Heat treatment of glass products before tempering by cooling (C03B 27/008, C03B 27/016 take precedence)
27/016 . by absorbing heat radiated from the glass product
27/02 . using liquid
27/022 . . {the liquid being organic, e.g. an oil}
27/024 . . . {the liquid being sprayed on the object}
27/026 . . {the liquid being a liquid gas, e.g. a cryogenic liquid, liquid nitrogen}
27/028 . . {the liquid being water-based}
27/03 . . the liquid being a molten metal or a molten salt
27/035 . . . {the liquid being sprayed on the object}
27/04 . using gas

27/0404 . . {Nozzles, blow heads, blowing units or their arrangements, specially adapted for flat or bent glass sheets}
27/0408 . . . {being dismountable}
27/0413 . . {Stresses, e.g. patterns, values or formulae for flat or bent glass sheets}
27/0417 . . {Controlling or regulating for flat or bent glass sheets}
27/0422 . . {for flat or bent glass sheets starting in an horizontal position and ending in a non-horizontal position}
27/0426 . . . {for bent glass sheets}
27/0431 . . . . {the quench unit being adapted to the bend of the sheet (C03B 27/0435 takes precedence)}
27/0435 . . . . {the quench unit being variably adaptable to the bend of the sheet}
27/044 . . for flat or bent glass sheets being in a horizontal position
27/0442 . . . {for bent glass sheets}
27/0445 . . . . {the quench unit being adapted to the bend of the sheet (C03B 27/0447 takes precedence)}
27/0447 . . . . {the quench unit being variably adaptable to the bend of the sheet}
27/048 . . . on a gas cushion
27/052 . . for flat or bent glass sheets being in a vertical position
27/0522 . . . {Nozzles, blow heads, blowing units or their arrangements}
27/0524 . . . . {being dismountable}
27/0526 . . . {Stresses, e.g. patterns, values or formulae}
27/0528 . . . {Controlling or regulating}
27/056 . . . supported on the lower edge
27/06 . . for glass products other than flat or bent glass plates, e.g. hollow glassware, lenses
27/062 . . . {Nozzles or blow-heads, e.g. tubes}
27/065 . . . {Stresses, e.g. patterns, values or formulae}
27/067 . . . {Controlling or regulating}

29/00 Reheating glass products for softening or fusing their surfaces; Fire-polishing; Fusing of margins
29/02 . in a discontinuous way
29/025 . . {Glass sheets}
29/04 . in a continuous way
29/06 . . with horizontal displacement of the products
29/08 . . . Glass sheets
29/10 . . . . being in a vertical position
29/12 . . . . being in a horizontal position on a fluid support, e.g. a gas or molten metal
29/14 . . with vertical displacement of the products
29/16 . . . Glass sheets

31/00 Manufacture of rippled or crackled glass

32/00 Thermal after-treatment of glass products not provided for in groups {C03B 19/00} , C03B 25/00 - C03B 31/00 {or C03B 37/00}, e.g. crystallisation, eliminating gas inclusions or other impurities; {Hot-pressing vitrified, non-porous, shaped glass products}
32/005 . {Hot-pressing vitrified, non-porous, shaped glass products}
32/02 . Thermal crystallisation, e.g. for crystallising glass bodies into glass-ceramic articles {(C03B 27/012 takes precedence)}

33/00 Severing cooled glass (severing glass fibres C03B 37/16)
33/02 . Cutting or splitting sheet glass {or ribbons}; Apparatus or machines therefor (C03B 33/09 takes precedence; glass-cutting tools C03B 33/10)
33/0207 . . {the sheet being in a substantially vertical plane}
33/0215 . . {the ribbon being in a substantially vertical plane}
33/0222 . . {Scoring using a focussed radiation beam, e.g. laser}
33/023 . . the sheet {or ribbon} being in a horizontal position
33/0235 . . . {Ribbons}
33/027 . . . Scoring tool holders; Driving mechanisms therefor
33/03 . . . Glass cutting tables; Apparatus for transporting or handling sheet glass during the cutting or breaking operations
33/033 . . . Apparatus for opening score lines in glass sheets
33/037 . . . Controlling or regulating
33/04 . . Cutting or splitting in curves, especially for making spectacle lenses
33/06 . Cutting or splitting glass tubes, rods, or hollow products (C03B 33/09 takes precedence)
33/07 . Cutting armoured, {multi-layered, coated} or laminated, glass products
33/072 . . {Armoured glass, i.e. comprising reinforcement}
33/074 . . {Glass products comprising an outer layer or surface coating of non-glass material}
33/076 . . {Laminated glass comprising interlayers}
33/078 . . . {Polymeric interlayers}
33/08 . by fusing {, i.e. by melting through the glass}
33/082 . . {using a focussed radiation beam, e.g. laser (C03B 33/0855 takes precedence)}
33/085 . . Tubes, rods or hollow products
33/0855 . . . {using a focussed radiation beam, e.g. laser}
33/09 . by thermal shock
33/091 . . {using at least one focussed radiation beam, e.g. laser beam (C03B 33/0955 takes precedence)}
33/093 . . . {using two or more focussed radiation beams}
33/095 . . Tubes, rods or hollow products
33/0955 . . . {using a focussed radiation beam, e.g. laser}
33/10 . Glass-cutting tools, e.g. scoring tools
33/102 . . {involving a focussed radiation beam, e.g. lasers}
33/105 . . {Details of cutting or scoring means, e.g. tips}
33/107 . . . {Wheel design, e.g. materials, construction, shape}
33/12 . . Hand tools (wheel design C03B 33/107)
33/14 . . . specially adapted for cutting tubes, rods, or hollow products {(for cutting ampoules B67B 7/92)}

35/00 Transporting of glass products during their manufacture, {e.g. hot glass lenses, prisms}(conveying systems for fragile sheets, e.g. glass B65G 49/06)
35/005 . {Transporting hot solid glass products other than sheets or rods, e.g. lenses, prisms, by suction or floatation}
35/04 . Transporting of hot hollow {or semi-hollow} glass products (C03B 35/26 takes precedence)
35/06 . . Feeding of hot hollow glass products into annealing or heating kilns

35/062 . . . {using conveyors, e.g. chain- or roller conveyors, dead-plates}
35/064 . . . . {specially adapted as a lehr loader}
35/066 . . . . . {combined with article distributing means, e.g. pivoting deflectors, arresting fingers, stationary guides}
35/068 . . . {by gravitational force, e.g. via chutes}
35/08 . . . using rotary means directly acting on the products
35/085 . . . . {Transfer mechanisms of the "endless-chain" type}
35/10 . . . using reciprocating means directly acting on the products, e.g. pushers, stackers
35/12 . . . by picking-up and depositing
35/125 . . . . {Transfer mechanisms of the "rotary" type, e.g. "take-outs", "setting-over" mechanisms}
35/14 . Transporting hot glass sheets {or ribbons, e.g. by heat-resistant conveyor belts or bands}
35/142 . . {by travelling transporting tables}
35/145 . . {by top-side transfer or supporting devices, e.g. lifting or conveying using suction}
35/147 . . . {of the non-contact type}
35/16 . . by roller conveyors
35/161 . . . {specially adapted for bent sheets or ribbons (C03B 35/166 takes precedence)}
35/162 . . . {combined with means for thermal adjustment of the rollers, e.g. cooling (C03B 35/183 takes precedence)}
35/163 . . . {Drive means, clutches, gearing or drive speed control means}
35/164 . . . . {electric or electronicsystems therefor, e.g. for automatic control}
35/165 . . . {Supports or couplings for roller ends, e.g. trunions, gudgeons}
35/166 . . . {specially adapted for both flat and bent sheets or ribbons}
35/167 . . . {specially adapted for removing defect sheets, ribbons or parts thereof}
35/168 . . . {Means for cleaning the rollers}
35/18 . . . Construction of the conveyor rollers {; Materials, coatings or coverings thereof}
35/181 . . . . {Materials, coatings, loose coverings or sleeves thereof}
35/182 . . . . {specially adapted for bent sheets or ribbons (C03B 35/187 takes precedence)}
35/183 . . . . {specially adapted for thermal adjustment of the rollers, e.g. insulating, heating, cooling thereof}
35/184 . . . . . {Cooling}
35/185 . . . . {having a discontinuous surface for contacting the sheets or ribbons other than cloth or fabric, e.g. having protrusions or depressions, spirally wound cable, projecting discs or tires}

NOTE

{Disc rollers having a discontinuous surface are also classified in C03B 35/189.}

35/186 . . . . {End caps, end fixtures or roller end shape designs}
35/187 . . . . {Rollers specially adapted for both flat and bent sheets or ribbons, i.e. rollers of adjustable curvature}
35/188 . . . . {Rollers specially adapted for supplying a gas, e.g. porous or foraminous rollers with internal air supply}
35/189 . . . . {Disc rollers}

NOTE

{ Disc rollers having a discontinuous surface are also classified in C03B 35/185.}

35/20 . . by gripping tongs or supporting frames
35/202 . . . {by supporting frames (C03B 35/145 takes precedence)}
35/205 . . . . {the glass sheets being in a vertical position}
35/207 . . . . {Construction or design of supporting frames}
35/22 . . on a fluid support bed, e.g. on molten metal
35/24 . . . on a gas support bed
35/243 . . . . {having a non-planar surface, e.g. curved, for bent sheets}
35/246 . . . . {Transporting continuous glass ribbons}
35/26 . Transporting of glass tubes or rods

37/00 Manufacture or treatment of flakes, fibres, or filaments from softened glass, minerals, or slags

37/005 . Manufacture of flakes
37/01 . Manufacture of glass fibres or filaments
37/011 . . {starting from a liquid phase reaction process, e.g. through a gel phase}
37/012 . . Manufacture of preforms for drawing fibres or filaments
37/01202 . . . {Means for storing or carrying optical fibre preforms, e.g. containers}
37/01205 . . . {starting from tubes, rods, fibres or filaments (C03B 37/014 takes precedence)}
37/01208 . . . . {for making preforms of microstructured, photonic crystal or holey optical fibres}
37/01211 . . . . {by inserting one or more rods or tubes into a tube}
37/01214 . . . . . {for making preforms of multifibres, fibre bundles other than multiple core preforms}
37/01217 . . . . . {for making preforms of polarisation-maintaining optical fibres (polarisation-maintaining optical fibres per se G02B 6/105)}
37/0122 . . . . . {for making preforms of photonic crystal, microstructured or holey optical fibres}
37/01222 . . . . . {for making preforms of multiple core optical fibres (preforms of multifibres C03B 37/01214)}
37/01225 . . . . {Means for changing or stabilising the shape, e.g. diameter, of tubes or rods in general, e.g. collapsing}
37/01228 . . . . . {Removal of preform material (C03B 37/01251 takes precedence)}
37/01231 . . . . . {to form a longitudinal hole, e.g. by drilling}
37/01234 . . . . . {to form longitudinal grooves, e.g. by chamfering}
37/01237 . . . . . {to modify the diameter by heat-polishing, e.g. fire-polishing}
37/0124 . . . . . {Means for reducing the diameter of rods or tubes by drawing, e.g. for preform draw-down}

37/01242 . . . . . {Controlling or regulating the down-draw process}
37/01245 . . . . . {by drawing and collapsing}
37/01248 . . . . . {by collapsing without drawing}
37/01251 . . . . . {Reshaping the ends}
37/01254 . . . . . {by expanding radially, e.g. by forcing a mandrel through or axial pressing a tube or rod}
37/01257 . . . . . {Heating devices therefor}
37/0126 . . . . . {Means for supporting, rotating, translating the rod, tube or preform}
37/01262 . . . . {Depositing additional preform material as liquids or solutions, e.g. solution doping of preform tubes or rods}
37/01265 . . . {starting entirely or partially from molten glass, e.g. by dipping a preform in a melt}
37/01268 . . . . {by casting}
37/01271 . . . . {by centrifuging}
37/01274 . . . . {by extrusion or drawing}
37/01277 . . . . {by projecting or spraying the melt, e.g. as droplets, on a preform}
37/0128 . . . {starting from pulverulent glass}
37/01282 . . . . {by pressing or sintering, e.g. hot-pressing}
37/01285 . . . . {by centrifuging}
37/01288 . . . . {by extrusion, e.g. of glass powder and binder (moulding plastics around a core using a cross-head annular extrusion nozzle B29C 48/34; extrusion presses in general B30B 11/22)}
37/01291 . . . . {by progressive melting, e.g. melting glass powder during delivery to and adhering the so-formed melt to a target or preform, e.g. the Plasma Oxidation Deposition [POD] process}
37/01294 . . . . . {by delivering pulverulent glass to the deposition target or preform where the powder is progressively melted, e.g. accretion}
37/01297 . . . . . {by melting glass powder in a mould}
37/014 . . . made entirely or partially by chemical means {, e.g. vapour phase deposition of bulk porous glass either by outside vapour deposition [OVD], or by outside vapour phase oxidation [OVPO] or by vapour axial deposition [VAD] (C03C 17/02 takes precedence)}
37/01406 . . . . {Deposition reactors therefor}
37/01413 . . . . {Reactant delivery systems (C03B 37/01807 takes precedence; devices therefor in general B01D 1/00, B01J 4/00)}
37/0142 . . . . . {Reactant deposition burners}
37/01426 . . . . . {Plasma deposition burners or torches}
37/01433 . . . . . {for delivering and depositing additional reactants as liquids or solutions, e.g. for solution doping of the porous glass preform}
37/0144 . . . . {Means for after-treatment or catching of worked reactant gases (C03B 37/01846 takes precedence)}
37/01446 . . . . {Thermal after-treatment of preforms, e.g. dehydrating, consolidating, sintering (C03B 37/01853 takes precedence)}
37/01453 . . . . . {for doping the preform with flourine}
37/0146 . . . . . {Furnaces therefor, e.g. muffle tubes, furnace linings}
37/01466 . . . . {Means for changing or stabilising the diameter or form of tubes or rods (C03B 37/01861 takes precedence)}
37/01473 . . . . . {Collapsing}
37/0148 . . . . {Means for heating preforms during or immediately prior to deposition (C03B 37/0142, C03B 37/01876 take precedence)}
37/01486 . . . . {Means for supporting, rotating or translating the preforms being formed, e.g. lathes (C03B 37/01884 takes precedence)}
37/01493 . . . . . {Deposition substrates, e.g. targets, mandrels, start rods or tubes}
37/016 . . . . by a liquid phase reaction process, e.g. through a gel phase
37/018 . . . . by glass deposition on a glass substrate, e.g. by {inside-, modified-, plasma-, or plasma modified- chemical vapour deposition [ICVD, MCVD, PCVD, PMCVD], i.e. by thin layer coating on the inside or outside of a glass tube or on a glass rod}(C03B 37/016 takes precedence; {bulk deposition of porous glass by OVD or VAD C03B 37/014} ; surface treatment of glass by coating C03C 17/02)
37/01807 . . . . . {Reactant delivery systems, e.g. reactant deposition burners}
37/01815 . . . . . {Reactant deposition burners or deposition heating means}
37/01823 . . . . . {Plasma deposition burners or heating means}
37/0183 . . . . . {for plasma within a tube substrate}
37/01838 . . . . . {for delivering and depositing additional reactants as liquids or solutions, e.g. for solution doping of the deposited glass}
37/01846 . . . . . {Means for after-treatment or catching of worked reactant gases}
37/01853 . . . . . {Thermal after-treatment of preforms, e.g. dehydrating, consolidating, sintering}
37/01861 . . . . . {Means for changing or stabilising the diameter or form of tubes or rods}
37/01869 . . . . . {Collapsing}
37/01876 . . . . . {Means for heating tubes or rods during or immediately prior to deposition, e.g. electric resistance heaters (C03B 37/01815 takes precedence)}
37/01884 . . . . . {Means for supporting, rotating and translating tubes or rods being formed, e.g. lathes}
37/01892 . . . . . {Deposition substrates, e.g. tubes, mandrels}
37/02 . . by drawing or extruding, {e.g. direct drawing of molten glass from nozzles; Cooling fins therefor (C03B 37/04 takes precedence; sizing of the fibres C03C 25/00)}
37/0203 . . . {Cooling non-optical fibres drawn or extruded from bushings, nozzles or orifices}
37/0206 . . . . {by contacting of the fibres with liquid or mist}
37/0209 . . . . {by means of a solid heat sink, e.g. cooling fins}
37/0213 . . . . {by forced gas cooling, i.e. blowing or suction}

37/0216 . . . {Solving the problem of disruption of drawn fibre, e.g. breakage, start-up, shut-down procedures}
37/022 . . . from molten glass in which the resultant product consists of different sorts of glass or is characterised by shape, e.g. hollow fibres {, undulated fibres, fibres presenting a rough surface (C03B 37/025 takes precedence)}
37/023 . . . . Fibres composed of different sorts of glass, {e.g. glass optical fibres, made by the double crucible technique}
37/0235 . . . . . {Thermal treatment of the fibre during the drawing process, e.g. cooling (C03B 37/02718 takes precedence; coating C03C 25/10)}
37/025 . . . from reheated softened tubes, rods, fibres or filaments {, e.g. drawing fibres from preforms (draw-down of tubes, rods or preforms to reduced diameter preforms C03B 37/0124)}
37/0253 . . . . {Controlling or regulating (for glass fibre manufacture in general C03B 37/07)}
37/0256 . . . . {Drawing hollow fibres (C03B 37/02781 takes precedence)}
37/026 . . . . Drawing fibres reinforced with a metal wire {or with other non-glass material}
37/027 . . . . Fibres composed of different sorts of glass, {e.g. glass optical fibres}(C03B 37/0253, C03B 37/028 take precedence)
37/02709 . . . . . {Polarisation maintaining fibres, e.g. PM, PANDA, bi-refringent optical fibres}
37/02718 . . . . . {Thermal treatment of the fibre during the drawing process, e.g. cooling (coating C03C 25/10)}
37/02727 . . . . . {Annealing or re-heating}
37/02736 . . . . . {Means for supporting, rotating or feeding the tubes, rods, fibres or filaments to be drawn, e.g. fibre draw towers, preform alignment, butt-joining preforms or dummy parts during feeding (uniting rods or tubes C03B 23/207)}
37/02745 . . . . . {Fibres having rotational spin around the central longitudinal axis, e.g. alternating +/- spin to reduce polarisation mode dispersion}
37/02754 . . . . . {Solid fibres drawn from hollow preforms}
37/02763 . . . . . {Fibres having axial variations, e.g. axially varying diameter, material or optical properties (rotational spin C03B 37/02745)}
37/02772 . . . . . {shaping the preform lower end or bulb, e.g. pre-gobbing, controlling draw bulb shape, or preform draw start-up procedures}
37/02781 . . . . . {Hollow fibres, e.g. holey fibres}
37/0279 . . . . . {Photonic crystal fibres or microstructured optical fibres other than holey optical fibres}
37/028 . . . . Drawing fibre bundles, e.g. for making fibre bundles of multifibres {, image fibres; (drawing multicore or photonic crystal fibres C03B 37/027)}
37/029 . . . . Furnaces therefor
37/03 . . . Drawing means, e.g. drawing drums {; Traction or tensioning devices}
37/032 . . . . {for glass optical fibres}
37/035 . . . . having means for deflecting or stripping-off fibres {or for removing defective parts}
37/04 . . by using centrifugal force {, e.g. spinning through radial orifices; Construction of the spinner cups therefor (bonder application C03C 25/00)}
37/041 . . . {Transferring molten glass to the spinner}
37/042 . . . {starting from tubes, rods, fibres or filaments}
37/044 . . . {for producing fibres of at least two distinct glass compositions, e.g. bi-component fibres (conjugated artificial filaments or the like, e.g. with glass fibres, D01F 8/00)}
37/045 . . . {Construction of the spinner cups}
37/047 . . . {Selection of materials for the spinner cups}
37/048 . . . {Means for attenuating the spun fibres, e.g. blowers for spinner cups}
37/05 . . . by projecting {molten glass} on a rotating body having no radial orifices
37/055 . . . . {by projecting onto and spinning off the outer surface of the rotating body}
37/06 . . by blasting or blowing molten glass, e.g. for making staple fibres
37/065 . . . starting from tubes, rods, fibres or filaments
37/07 . Controlling or regulating ({C03B 37/0253 takes precedence } ; controlling or regulating in general G05)
37/075 . Manufacture of {non-optical} fibres or filaments consisting of different sorts of glass or characterised by shape, e.g. undulated fibres (C03B 37/022, C03B 37/027, C03B 37/028 take precedence; light guides G02B 6/00)
37/0753 . . {consisting of different sorts of glass, e.g. bi-component fibres}
37/0756 . . {Hollow fibres}
37/08 . Bushings {, e.g. construction, bushing reinforcement means}; Spinnerettes; Nozzles; Nozzle plates
37/0805 . . {Manufacturing, repairing, or other treatment of bushings, nozzles or bushing nozzle plates}
37/081 . . Indirect-melting bushings
37/083 . . Nozzles; Bushing nozzle plates (C03B 37/095 takes precedence)
37/085 . . Feeding devices therefor
37/09 . . electrically heated
37/091 . . . {Indirect-resistance heating}
37/092 . . . Direct-resistance heating
37/095 . . Use of materials therefor
37/10 . Non-chemical treatment (surface treatment of fibres or filaments made from glass, minerals or slags C03C 25/00)
37/12 . . of fibres or filaments during winding up
37/14 . . Re-forming fibres or filaments, {i.e. changing their shape}(C03B 37/025 takes precedence)
37/15 . . . with heat application, e.g. for making optical fibres (fusion-splicing of light guides G02B 6/255; treatment of light guides to shape optical elements {G02B 6/2835, G02B 6/2856})
37/16 . . Cutting or severing (light guides G02B 6/25)

40/00 Preventing adhesion between glass and glass or between glass and the means used to shape it {, hold it or support it}

40/005 . {Fabrics, felts or loose covers}

40/02 . by lubrication; Use of materials as release or lubricating compositions
40/027 . . Apparatus for applying lubricants to glass shaping moulds or tools
40/033 . . Means for preventing adhesion between glass and glass
40/04 . using gas

2201/00 Type of glass produced
2201/01 . Antique glass imitations
2201/02 . Pure silica glass, e.g. pure fused quartz
2201/03 . . Impurity concentration specified
2201/04 . . . Hydroxyl ion (OH)
2201/06 . Doped silica-based glasses
2201/07 . . Impurity concentration specified
2201/075 . . . Hydroxyl ion (OH)
2201/08 . . doped with boron or fluorine or other refractive index decreasing dopant
2201/10 . . . doped with boron (C03B 2201/14 takes precedence)
2201/12 . . . doped with fluorine (C03B 2201/14 takes precedence)
2201/14 . . . doped with boron and fluorine
2201/20 . . doped with non-metals other than boron or fluorine
2201/21 . . . doped with molecular hydrogen
2201/22 . . . doped with deuterium
2201/23 . . . doped with hydroxyl groups
2201/24 . . . doped with nitrogen, e.g. silicon oxy-nitride glasses

NOTE

Codes C03B 2201/28, C03B 2201/31 and C03B 2201/32 for the common dopants P, Ge and Al respectively, are only used for features specific to such dopants and not for general cases, such as for increasing the refractive index of silica glass.

2201/28 . . . doped with phosphorus
2201/30 . . doped with metals, e.g. Ga, Sn, Sb, Pb or Bi
2201/31 . . . doped with germanium
2201/32 . . . doped with aluminium (C03B 2201/36 takes precedence)
2201/34 . . . doped with rare earth metals, i.e. with Sc, Y or lanthanides, e.g. for laser-amplifiers
2201/36 . . . . doped with rare earth metals and aluminium, e.g. Er-Al co-doped
2201/40 . . . doped with transition metals other than rare earth metals, e.g. Zr, Nb, Ta or Zn
2201/42 . . . . doped with titanium
2201/50 . . . doped with alkali metals
2201/54 . . . doped with beryllium, magnesium or alkaline earth metals
2201/58 . . . doped with metals in non-oxide form, e.g. CdSe
2201/60 . Silica-free oxide glasses
2201/62 . . containing boron
2201/70 . . containing phosphorus
2201/78 . . containing germanium
2201/80 . Non-oxide glasses or glass-type compositions
2201/82 . . Fluoride glasses, e.g. ZBLAN glass
2201/83 . . . Ionic or single crystal type, e.g. NaF, LiF, CaF_2
2201/84 . . Halide glasses other than fluoride glasses, i.e. Cl, Br or I glasses, e.g. AgCl-AgBr "glass"
2201/86 . . Chalcogenide glasses, i.e. S, Se or Te glasses
2201/88 . . Chalcohalide glasses, i.e. containing one or more of S, Se, Te and one or more of F, Cl, Br, I

2203/00 Fibre product details, e.g. structure, shape
2203/02 . External structure or shape details
2203/04 . . Polygonal outer cross-section, e.g. triangular, square
2203/06 . . Axial perturbations, e.g. twist, by torsion, undulating, crimped
2203/10 . Internal structure or shape details
2203/12 . . Non-circular or non-elliptical cross-section, e.g. planar core
2203/14 . . Non-solid, i.e. hollow products, e.g. hollow clad or with core-clad interface
2203/16 . . . Hollow core
2203/18 . . Axial perturbations, e.g. in refractive index or composition
2203/19 . . . Alternating positive/negative spins or twists
2203/20 . . . helical
2203/22 . . Radial profile of refractive index, composition or softening point
2203/222 . . . Mismatching viscosities or softening points of glass layers
2203/223 . . . Matching viscosities or softening points of glass layers
2203/224 . . . Mismatching coefficients of thermal expansion [CTE] of glass layers
2203/225 . . . Matching coefficients of thermal expansion [CTE] of glass layers
2203/23 . . . Double or multiple optical cladding profiles
2203/24 . . . Single mode [SM or monomode]
2203/26 . . . Parabolic or graded index [GRIN] core profile
2203/28 . . . Large core fibres, e.g. with a core diameter greater than 60 micrometers
2203/29 . . . Segmented core fibres
2203/30 . Polarisation maintaining [PM], i.e. birefringent products, e.g. with elliptical core, by use of stress rods, "PANDA" type fibres
2203/302 . . Non-circular core cross-sections
2203/31 . . by use of stress-imparting rods, e.g. by insertion
2203/32 . Eccentric core or cladding
2203/34 . Plural core other than bundles, e.g. double core
2203/36 . Dispersion modified fibres, e.g. wavelength or polarisation shifted, flattened or compensating fibres (DSF, DFF, DCF)
2203/40 . Multifibres or fibre bundles, e.g. for making image fibres
2203/42 . Photonic crystal fibres, e.g. fibres using the photonic bandgap PBG effect, microstructured or holey optical fibres

2205/00 Fibre drawing or extruding details
2205/02 . Upward drawing
2205/04 . Non-vertical drawing
2205/06 . Rotating the fibre fibre about its longitudinal axis
2205/07 . . Rotating the preform about its longitudinal axis
2205/08 . Sub-atmospheric pressure applied, e.g. vacuum
2205/09 . . to the outside of the preform or fibre
2205/10 . pressurised

2205/12 . Drawing solid optical fibre directly from a hollow preform
2205/13 . . from a hollow glass tube containing glass-forming material in particulate form, e.g. to form the core by melting the powder during drawing
2205/14 . . comprising collapse of an outer tube onto an inner central solid preform rod
2205/16 . . the drawn fibre consisting of circularly symmetric core and clad
2205/20 . Irradiation of the base fibre during drawing to modify waveguide properties
2205/30 . Means for continuous drawing from a preform
2205/32 . Simultaneous drawing of multiple preforms to separate multiple fibres
2205/40 . Monitoring or regulating the draw tension or draw rate
2205/42 . Drawing at high speed, i.e. > 10 m/s
2205/44 . Monotoring or regulating the preform feed rate
2205/45 . Monotoring or regulating the preform neck-down region with respect to position or shape
2205/46 . Monotoring or regulating the preform position with respect to the draw axis
2205/47 . Shaping the preform draw bulb before or during drawing
2205/50 . Cooling the drawn fibre using liquid coolant prior to coating, e.g. indirect cooling via cooling jacket
2205/51 . . using liquified or cryogenic gas
2205/52 . . by direct contact with liquid coolant, e.g. as spray, mist
2205/53 . . . by passage through liquid coolant bath
2205/54 . . . After-treatment to remove coolant attached to cooled fibre
2205/55 . Cooling or annealing the drawn fibre prior to coating using a series of coolers or heaters
2205/56 . Annealing or re-heating the drawn fibre prior to coating
2205/57 . Recovering, recycling or purifying the coolant, e.g. helium
2205/60 . Optical fibre draw furnaces
2205/61 . . Recovering, recycling or purifying the inert gas, e.g. helium
2205/62 . . Heating means for drawing
2205/63 . . . Ohmic resistance heaters, e.g. carbon or graphite resistance heaters
2205/64 . . . Induction furnaces, i.e. HF/RF coil, e.g. of the graphite or zirconia susceptor type
2205/66 . . . Microwave or similar electromagnetic wave heating, e.g. resonant cavity type
2205/67 . . . Laser heating
2205/68 . . . Hot gas, e.g. plasma, flame, burner
2205/69 . . . Auxiliary thermal treatment immediately prior to drawing, e.g. pre-heaters, laser-assisted resistance heaters
2205/70 . . Draw furnace insulation
2205/72 . . Controlling or measuring the draw furnace temperature
2205/74 . . Means for moving at least a part of the draw furnace, e.g. by rotation or vertical or horizontal movement
2205/80 . . Means for sealing the preform entry or upper end of the furnace
2205/81 . . . using gas
2205/82 . . Means for sealing the fibre exit or lower end of the furnace
2205/83 . . . using gas
2205/90 . . Manipulating the gas flow through the furnace other than by use of upper or lower seals, e.g. by modification of the core tube shape or by using baffles
2205/91 . . . by controlling the furnace gas flow rate into or out of the furnace
2205/92 . . . using means for gradually reducing the cross-section towards the outlet or around the preform draw end, e.g. tapered
2205/96 . . . using tangential feed approximately perpendicular to the draw axis
2205/98 . . . using annular gas inlet distributors

2207/00 Glass deposition burners
2207/02 . Elongated flat flame or slit-nozzle type
2207/04 . Multi-nested ports
2207/06 . . Concentric circular ports
2207/08 . . Recessed or protruding ports
2207/10 . . Split ports
2207/12 . . Nozzle or orifice plates
2207/14 . . Tapered or flared nozzles or ports angled to central burner axis
2207/16 . . Non-circular ports, e.g. square or oval
2207/18 . . Eccentric ports
2207/20 . Specific substances in specified ports, e.g. all gas flows specified
2207/22 . . Inert gas details
2207/24 . . Multiple flame type, e.g. double-concentric flame
2207/26 . . Multiple ports for glass precursor
2207/28 . . . for different glass precursors, reactants or modifiers
2207/30 . For glass precursor of non-standard type, e.g. solid SiH_3F
2207/32 . . Non-halide
2207/34 . . Liquid, e.g. mist or aerosol
2207/36 . Fuel or oxidant details, e.g. flow rate, flow rate ratio, fuel additives
2207/38 . . Fuel combinations or non-standard fuels, e.g. H_2+CH_4, ethane
2207/40 . Mechanical flame shields
2207/42 . Assembly details; Material or dimensions of burner; Manifolds or supports
2207/46 . Comprising performance enhancing means, e.g. electrostatic charge or built-in heater
2207/50 . Multiple burner arrangements
2207/52 . . Linear array of like burners
2207/54 . . combined with means for heating the deposit, e.g. non-deposition burner
2207/60 . Relationship between burner and deposit, e.g. position
2207/62 . . Distance
2207/64 . . Angle
2207/66 . . Relative motion
2207/70 . Control measures
2207/80 . Feeding the burner or the burner-heated deposition site
2207/81 . . Constructional details of the feed line, e.g. heating, insulation, material, manifolds, filters
2207/85 . . with vapour generated from liquid glass precursors, e.g. directly by heating the liquid
2207/86 . . . by bubbling a gas through the liquid
2207/87 . . . Controlling the temperature

2207/88 . . . Controlling the pressure
2207/89 . . . Controlling the liquid level in or supply to the tank
2207/90 . . with vapour generated from solid glass precursors, i.e. by sublimation

2211/00 Heating processes for glass melting in glass melting furnaces

2211/20 . Submerged gas heating
2211/22 . . by direct combustion in the melt
2211/23 . . . using oxygen, i.e. pure oxygen or oxygen-enriched air
2211/24 . . by direct contact of non-combusting hot gas in the melt
2211/25 . . by indirect heating, e.g. with heat pipes
2211/30 . introducing oxygen into the glass melting furnace separately from the fuel
2211/40 . using oxy-fuel burners
2211/60 . . oxy-fuel burner construction
2211/62 . . . flat-flame
2211/70 . Skull melting, i.e. melting or refining in cooled wall crucibles or within solidified glass crust, e.g. in continuous walled vessels
2211/71 . . within segmented wall vessels where the molten glass solidifies between and seals the gaps between wall segments

2215/00 Press-moulding glass

2215/02 . Press-mould materials
2215/03 . . defined by material properties or parameters, e.g. relative CTE of mould parts
2215/05 . . Press-mould die materials
2215/06 . . . Metals or alloys
2215/07 . . . Ceramic or cermets
2215/08 . . Coated press-mould dies
2215/10 . . . Die base materials
2215/11 . . . . Metals
2215/12 . . . . Ceramics or cermets, e.g. cemented WC, Al_2O_3 or TiC
2215/14 . . . Die top coat materials, e.g. materials for the glass-contacting layers
2215/16 . . . . Metals or alloys, e.g. Ni-P, Ni-B, amorphous metals
2215/17 . . . . . comprising one or more of the noble meals, i.e. Ag, Au, platinum group metals
2215/20 . . . . Oxide ceramics
2215/22 . . . . Non-oxide ceramics
2215/24 . . . . Carbon, e.g. diamond, graphite, amorphous carbon
2215/26 . . . . Mixtures of materials covered by more than one of the groups C03B 2215/16 - C03B 2215/24, e.g. C-SiC, Cr-Cr_2O_3, SIALON
2215/30 . . . Intermediate layers, e.g. graded zone of base/top material
2215/31 . . . . Two or more distinct intermediate layers or zones
2215/32 . . . . of metallic or silicon material
2215/34 . . . . of ceramic or cermet material, e.g. diamond-like carbon
2215/38 . . . . Mixed or graded material layers or zones
2215/40 . Product characteristics
2215/404 . . Products with identification marks
2215/406 . . Products comprising at least two different glasses
2215/41 . . Profiled surfaces
2215/412 . . . fine structured, e.g. fresnel lenses, prismatic reflectors, other sharp-edged surface profiles
2215/413 . . . optical fibre alignment, fixing or connecting members having V-grooves
2215/414 . . . Arrays of products, e.g. lenses
2215/44 . . Flat, parallel-faced disc or plate products
2215/45 . . Ring or doughnut disc products or their preforms
2215/46 . . Lenses, e.g. bi-convex
2215/47 . . . Bi-concave
2215/48 . . . Convex-concave
2215/49 . . . Complex forms not covered by groups C03B 2215/47 or C03B 2215/48
2215/50 . Structural details of the press-mould assembly
2215/60 . Aligning press die axes
2215/61 . Positioning the glass to be pressed with respect to the press dies or press axis
2215/62 . Vibration-assisted pressing
2215/63 . Pressing between porous dies supplied with gas, i.e. contactless pressing
2215/64 . Spinning, centrifuging or using g-force to distribute the glass
2215/65 . Means for releasing gas trapped between glass and press die
2215/66 . Means for providing special atmospheres, e.g. reduced pressure, inert gas, reducing gas, clean room
2215/67 . Pressing between dies rotating about the press axis
2215/68 . Means for parting the die from the pressed glass other than by cooling or use of a take-out
2215/69 . Controlling the pressure applied to the glass via the dies
2215/70 . Horizontal or inclined press axis
2215/71 . Injecting molten glass into the mould cavity
2215/72 . Barrel presses or equivalent, e.g. of the ring mould type
2215/73 . . with means to allow glass overflow in a direction perpendicular to the press axis
2215/74 . . . with means to trim off excess material
2215/76 . Pressing whereby some glass overflows unrestrained beyond the press mould in a direction perpendicular to the press axis
2215/77 . . with means to trim off excess material
2215/78 . Pressing together along two or more perpendicular axes
2215/79 . Uniting product and product holder during pressing, e.g. lens and lens holder
2215/80 . Simultaneous pressing of multiple products; Multiple parallel moulds
2215/86 . Linear series of multiple press moulds
2215/87 . . with change of transportation direction in the horizontal plane, e.g. rectangular or "U" shape serial transport

2225/00 Transporting hot glass sheets during their manufacture

2225/02 . Means for positioning, aligning or orientating the sheets during their travel, e.g. stops