

CPC COOPERATIVE PATENT CLASSIFICATION

C CHEMISTRY; METALLURGY

(NOTES omitted)

CHEMISTRY

C03 GLASS; MINERAL OR SLAG WOOL {(organic glasses [C08](#); metallic glasses, amorphous metals [B22F](#), [C22C](#))}

C03C CHEMICAL COMPOSITION OF GLASSES, GLAZES, OR VITREOUS ENAMELS; SURFACE TREATMENT OF GLASS; SURFACE TREATMENT OF FIBRES OR FILAMENTS MADE FROM GLASS, MINERALS OR SLAGS; JOINING GLASS TO GLASS OR OTHER MATERIALS

NOTES

1. This subclass covers compositions of polycrystalline fibres
2. This subclass does not cover the preparation of single-crystal fibres, which is covered by subclass [C30B](#)

WARNING

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

C03C 6/00	covered by	C03C 1/00
C03C 6/02-C03C 6/10	covered by	
C03C 10/02 - C03C 10/14	covered by	C03C 10/00
C03C 13/02	covered by	C03C 13/00
C03C 27/12	covered by	B32B 17/00

Chemical composition of glasses, glazes, or vitreous enamels

3/04 . containing silica

NOTE

In groups [C03C 1/00](#) - [C03C 14/00](#), in the absence of an indication to the contrary, classification is made in the last appropriate place.

NOTE

If silica is specified as being present in a percent range covered by two of the groups [C03C 3/06](#), [C03C 3/062](#) or [C03C 3/076](#), classification is made in both groups. If the range is covered by the three groups, classification is made in group [C03C 3/04](#) itself.

1/00 Ingredients generally applicable to manufacture of glasses, glazes, or vitreous enamels

- 1/002 . {Use of waste materials, e.g. slags}
- 1/004 . {Refining agents ([refining C03B 5/225](#))}
- 1/006 . {to produce glass through wet route}
- 1/008 . . {for the production of films or coatings}
- 1/02 . Pretreated ingredients
- 1/022 . . {Purification of silica sand or other minerals}
- 1/024 . . {Chemical treatment of cullet or glass fibres}
- 1/026 . . {Pelletisation or prereacting of powdered raw materials ([apparatus or methods C03B 1/02](#))}
- 1/028 . . {Ingredients allowing introduction of lead or other easily volatile or dusty compounds}
- 1/04 . Opacifiers, e.g. fluorides or phosphates; Pigments
- 1/06 . . to produce non-uniformly pigmented, e.g. speckled, marbled, or veined products
- 1/08 . to produce crackled effects
- 1/10 . to produce uniformly-coloured transparent products
- 1/105 . . {by the addition of colorants to the forehearth of the glass melting furnace}

3/00 Glass compositions

- 3/045 . . {Silicon oxycarbide, oxynitride or oxycarbonitride glasses}
- 3/06 . . with more than 90% silica by weight, e.g. quartz {([C03C 3/045](#) takes precedence)}
- 3/061 . . . {by leaching a soluble phase and consolidating}
- 3/062 . . with less than 40% silica by weight
- 3/064 . . . containing boron
- 3/066 containing zinc
- 3/068 containing rare earths
- 3/07 . . . containing lead
- 3/072 containing boron
- 3/074 containing zinc
- 3/0745 {containing more than 50% lead oxide, by weight}
- 3/076 . . with 40% to 90% silica, by weight {([C03C 3/045](#) takes precedence)}
- 3/078 . . . containing an oxide of a divalent metal, e.g. an oxide of zinc
- 3/083 . . . containing aluminium oxide or an iron compound
- 3/085 containing an oxide of a divalent metal

3/087	. . . . . containing calcium oxide, e.g. common sheet or container glass	4/0071	. {for laserable glass}
3/089	. . . containing boron	4/0078	. {for glass for dosimeters}
3/091	. . . . . containing aluminium	4/0085	. {for UV-transmitting glass}
3/093	. . . . . containing zinc or zirconium	4/0092	. {for glass with improved high visible transmittance, e.g. extra-clear glass}
3/095	. . . containing rare earths	4/02	. for coloured glass
3/097	. . . containing phosphorus, niobium or tantalum	4/04	. for photosensitive glass
3/102	. . . containing lead	4/06	. . for phototropic or photochromic glass
3/105	. . . . . containing aluminium	4/065	. . . {for silver-halide free photochromic glass}
3/108	. . . . . containing boron	4/08	. for glass selectively absorbing radiation of specified wave lengths
3/11	. . . containing halogen or nitrogen	4/082	. . {for infra-red absorbing glass}
3/111	. . . . . {containing nitrogen}	4/085	. . {for ultra-violet absorbing glass}
3/112	. . . . . containing fluorine	4/087	. . {for X-rays absorbing glass}
3/115	. . . . . containing boron	4/10	. for infra-red transmitting glass
3/118	. . . . . containing aluminium	4/12	. for luminescent glass; for fluorescent glass
3/12	. Silica-free oxide glass compositions	4/14	. for electro-conductive glass
3/122	. . {containing oxides of As, Sb, Bi, Mo, W, V, Te as glass formers}	4/16	. for dielectric glass
3/125	. . {containing aluminium as glass former}	4/18	. for ion-sensitive glass
3/127	. . {containing TiO ₂ as glass former}	4/20	. for chemical resistant glass
3/14	. . containing boron	8/00	Enamels; Glazes (cold glazes for ceramics (C04B 41/48)); Fusion seal compositions being frit compositions having non-frit additions
3/142	. . . {containing lead}	8/02	. Frit compositions, i.e. in a powdered or comminuted form
3/145	. . . containing aluminium or beryllium	8/04	. . containing zinc
3/15	. . . containing rare earths	8/06	. . containing halogen
3/155	. . . . . containing zirconium, titanium, tantalum or niobium	8/08	. . containing phosphorus
3/16	. . containing phosphorus	8/10	. . containing lead
3/17	. . . containing aluminium or beryllium	8/12	. . . containing titanium or zirconium
3/19	. . . containing boron	8/14	. Glass frit mixtures having non-frit additions, e.g. opacifiers, colorants, mill-additions
3/21	. . . containing titanium, zirconium, vanadium, tungsten or molybdenum	8/16	. . with vehicle or suspending agents, e.g. slip
3/23	. . containing halogen and at least one oxide, e.g. oxide of boron	8/18	. . containing free metals
3/247	. . . containing fluorine and phosphorus	8/20	. . containing titanium compounds; containing zirconium compounds
3/253	. . containing germanium	8/22	. containing two or more distinct frits having different compositions
3/32	. Non-oxide glass compositions, e.g. binary or ternary halides, sulfides or nitrides of germanium, selenium or tellurium	8/24	. Fusion seal compositions being frit compositions having non-frit additions, i.e. for use as seals between dissimilar materials, e.g. glass and metal; Glass solders
3/321	. . {Chalcogenide glasses, e.g. containing S, Se, Te}	8/245	. . {containing more than 50% lead oxide, by weight}
3/323	. . . {containing halogen, e.g. chalcogen halide glasses}	10/00	Devitrified glass ceramics, i.e. glass ceramics having a crystalline phase dispersed in a glassy phase and constituting at least 50% by weight of the total composition
3/325	. . {Fluoride glasses}	10/0009	. {containing silica as main constituent}
3/326	. . . {containing beryllium}	10/0018	. {containing SiO ₂ , Al ₂ O ₃ and monovalent metal oxide as main constituents}
3/328	. . {Nitride glasses}	10/0027	. . {containing SiO ₂ , Al ₂ O ₃ , Li ₂ O as main constituents}
4/00	Compositions for glass with special properties	10/0036	. {containing SiO ₂ , Al ₂ O ₃ and a divalent metal oxide as main constituents}
	NOTE	10/0045	. . {containing SiO ₂ , Al ₂ O ₃ and MgO as main constituents}
	When classifying in group C03C 4/00, classification is also made in the appropriate groups of group C03C 3/00 according to the glass composition.	10/0054	. {containing PbO, SnO ₂ , B ₂ O ₃ }
4/0007	. {for biologically-compatible glass}	10/0063	. {containing waste materials, e.g. slags}
4/0014	. . {Biodegradable glass}	10/0072	. {having a ferro-electric crystal phase}
4/0021	. . {for dental use}	10/0081	. {having a magnetic crystal phase}
4/0028	. {for crystal glass, e.g. lead-free crystal glass}	10/009	. {having a superconducting crystal phase}
4/0035	. {for soluble glass for controlled release of a compound incorporated in said glass}		
4/0042	. {for glass comprising or including particular isotopes}		
4/005	. {for opaline glass}		
4/0057	. {for ultrasonic delay lines glass}		
4/0064	. {for self-destructing glass (C03C 4/0014 takes precedence)}		

10/16	. Halogen containing crystalline phase	17/004	. . . {Coating the inside}
11/00	Multi-cellular glass {; Porous or hollow glass or glass particles}	17/005	. . . {Coating the outside}
11/002	. {Hollow glass particles}	17/006	. {with materials of composite character}
11/005	. {obtained by leaching after a phase separation step}	17/007	. . {containing a dispersed phase, e.g. particles, fibres or flakes, in a continuous phase}
11/007	. {Foam glass, e.g. obtained by incorporating a blowing agent and heating}	17/008	. . {comprising a mixture of materials covered by two or more of the groups C03C 17/02 , C03C 17/06 , C03C 17/22 and C03C 17/28 }
12/00	Powdered glass (C03C 8/02 takes precedence); Bead compositions	17/009	. . . {Mixtures of organic and inorganic materials, e.g. ormosils and ormocers}
12/02	. Reflective beads	17/02	. with glass (C03C 17/34 , C03C 17/44 take precedence)
13/00	Fibre or filament compositions (manufacture of fibres or filaments C03B 37/00)	17/04	. . by fritting glass powder
13/001	. {Alkali-resistant fibres}	17/06	. with metals (C03C 17/34 , C03C 17/44 take precedence)
13/002	. . {containing zirconium}	17/09	. . by deposition from the vapour phase
13/003	. {Conducting or semi-conducting fibres}	17/10	. . by deposition from the liquid phase
13/005	. {obtained by leaching of a soluble phase and consolidation}	17/22	. with other inorganic material (C03C 17/34 , C03C 17/44 take precedence)
13/006	. {Glass-ceramics fibres}	17/225	. . {Nitrides}
13/007	. . {containing zirconium}	17/23	. . Oxides (C03C 17/02 takes precedence)
13/008	. {Polycrystalline optical fibres}	17/245	. . . by deposition from the vapour phase
13/04	. Fibre optics, e.g. core and clad fibre compositions (light guides G02B 6/00)	17/2453	. . . . {Coating containing SnO ₂ }
13/041	. . {Non-oxide glass compositions}	17/2456	. . . . {Coating containing TiO ₂ }
13/042	. . . {Fluoride glass compositions}	17/25	. . . by deposition from the liquid phase
13/043	. . . {Chalcogenide glass compositions}	17/253	. . . . {Coating containing SnO ₂ }
13/044	. . . . {containing halogen, e.g. chalcohalide glass compositions}	17/256	. . . . {Coating containing TiO ₂ }
13/045	. . {Silica-containing oxide glass compositions}	17/27	. . . by oxidation of a coating previously applied
13/046	. . . {Multicomponent glass compositions}	17/28	. with organic material (C03C 17/34 , C03C 17/44 take precedence)
13/047	. . . {containing deuterium}	17/30	. . with silicon-containing compounds
13/048	. . {Silica-free oxide glass compositions}	17/32	. . with synthetic or natural resins (C03C 17/30 takes precedence)
13/06	. Mineral fibres, e.g. slag wool, mineral wool, rock wool	17/322	. . . {Polyurethanes or polyisocyanates}
14/00	Glass compositions containing a non-glass component, e.g. compositions containing fibres, filaments, whiskers, platelets, or the like, dispersed in a glass matrix (devitrified glass ceramics C03C 10/00)	17/324	. . . {Polyesters}
14/002	. {the non-glass component being in the form of fibres, filaments, yarns, felts or woven material}	17/326	. . . {Epoxy resins}
14/004	. {the non-glass component being in the form of particles or flakes}	17/328	. . . {Polyolefins}
14/006	. {the non-glass component being in the form of microcrystallites, e.g. of optically or electrically active material}	17/34	. with at least two coatings having different compositions (C03C 17/44 takes precedence)
14/008	. {the non-glass component being in molecular form}	17/3405	. . {with at least two coatings of organic materials (C03C 17/36 , C03C 17/42 take precedence)}
<u>Surface treatment of glass; Surface treatment of fibres or filaments from glass, minerals or slags</u>		17/3411	. . {with at least two coatings of inorganic materials (C03C 17/36 , C03C 17/42 take precedence)}
15/00	Surface treatment of glass, not in the form of fibres or filaments, by etching (etching or surface-brightening compositions, in general C09K 13/00)	17/3417	. . . {all coatings being oxide coatings}
15/02	. for making a smooth surface	17/3423	. . . {at least one of the coatings comprising a suboxide}
15/025	. . {for polishing crystal glass, i.e. lead glass}	17/3429	. . . {at least one of the coatings being a non-oxide coating}
17/00	Surface treatment of glass, not in the form of fibres or filaments, by coating (optical coatings of optical elements G02B 1/10)	17/3435	. . . . {comprising a nitride, oxynitride, boronitride or carbonitride}
17/001	. {General methods for coating; Devices therefor}	17/3441	. . . . {comprising carbon, a carbide or oxycarbide}
17/002	. . {for flat glass, e.g. float glass}	17/3447	. . . . {comprising a halide}
17/003	. . {for hollow ware, e.g. containers}	17/3452	. . . . {comprising a fluoride}
		17/3458	. . . . {comprising a chloride}
		17/3464	. . . . {comprising a chalcogenide}
		17/347	. . . . {comprising a sulfide or oxysulfide}
		17/3476	. . . . {comprising a selenide or telluride}
		17/3482	. . . . {comprising silicon, hydrogenated silicon or a silicide}
		17/3488	. . . . {comprising a boride or phosphide}
		17/3494	. . . . {comprising other salts, e.g. sulfate, phosphate}

- 17/36 . . . at least one coating being a metal
- 17/3602 . . . {the metal being present as a layer}
- 17/3605 {Coatings of the type glass/metal/inorganic compound}
- 17/3607 {Coatings of the type glass/inorganic compound/metal}
- 17/361 {Coatings of the type glass/metal/inorganic compound/metal/inorganic compound/other}
- 17/3613 {Coatings of type glass/inorganic compound/metal/inorganic compound/metal/other}
- 17/3615 {Coatings of the type glass/metal/other inorganic layers, at least one layer being non-metallic}
- 17/3618 {Coatings of type glass/inorganic compound/other inorganic layers, at least one layer being metallic}
- 17/3621 {one layer at least containing a fluoride}
- 17/3623 {one layer at least containing a chloride, bromide or iodide}
- 17/3626 {one layer at least containing a nitride, oxynitride, boronitride or carbonitride}
- 17/3628 {one layer at least containing a sulfide}
- 17/3631 {one layer at least containing a selenide or telluride}
- 17/3634 {one layer at least containing carbon, a carbide or oxycarbide}
- 17/3636 {one layer at least containing silicon, hydrogenated silicon or a silicide}
- 17/3639 {Multilayers containing at least two functional metal layers}
- 17/3642 {the multilayer coating containing a metal layer}
- 17/3644 {the metal being silver}
- 17/3647 {in combination with other metals, silver being more than 50%}
- 17/3649 {made of metals other than silver}
- 17/3652 {the coating stack containing at least one sacrificial layer to protect the metal from oxidation}
- 17/3655 {the multilayer coating containing at least one conducting layer}
- 17/3657 {the multilayer coating having optical properties}
- 17/366 {Low-emissivity or solar control coatings}
- 17/3663 {specially adapted for use as mirrors}
- 17/3665 {specially adapted for use as photomask}
- 17/3668 {the multilayer coating having electrical properties}
- 17/3671 {specially adapted for use as electrodes}
- 17/3673 {specially adapted for use in heating devices for rear window of vehicles}
- 17/3676 {specially adapted for use as electromagnetic shield}
- 17/3678 {specially adapted for use in solar cells}
- 17/3681 {the multilayer coating being used in glazing, e.g. windows or windscreens}
- 17/3684 {the multilayer coating being used for decoration purposes}
- 17/3686 {the multilayer coating being used for ovens}
- 17/3689 {one oxide layer being obtained by oxidation of a metallic layer}
- 17/3692 {one metallic layer being obtained by reduction of an oxide layer}
- 17/3694 {one layer having a composition gradient through its thickness}
- 17/3697 {one metallic layer at least being obtained by electroless plating}
- 17/38 at least one coating being a coating of an organic material
- 17/40 all coatings being metal coatings
- 17/42 . . . at least one coating of an organic material and at least one non-metal coating
- 17/44 . Lustring
- 19/00** **Surface treatment of glass, not in the form of fibres or filaments, by mechanical means (sand-blasting, grinding, or polishing glass B24)**
- 21/00** **Treatment of glass, not in the form of fibres or filaments, by diffusing ions or metals in the surface**
- 21/001 . {in liquid phase, e.g. molten salts, solutions}
- 21/002 . . {to perform ion-exchange between alkali ions (C03C 21/005 takes precedence)}
- 21/003 . . . {under application of an electrical potential difference}
- 21/005 . . {to introduce in the glass such metals or metallic ions as Ag, Cu}
- 21/006 . . {to perform an exchange of the type $Xn^{+} \rightarrow nH^{+}$ }
- 21/007 . {in gaseous phase}
- 21/008 . {in solid phase, e.g. using pastes, powders}
- 23/00** **Other surface treatment of glass not in the form of fibres or filaments**
- 23/0005 . {by irradiation}
- 23/001 . . {by infra-red light}
- 23/0015 . . {by visible light}
- 23/002 . . {by ultra-violet light}
- 23/0025 . . {by a laser beam}
- 23/003 . . {by X-rays}
- 23/0035 . . {by gamma-rays}
- 23/004 . . {by electrons, protons or alpha-particles}
- 23/0045 . . {by neutrons}
- 23/005 . . {by atoms}
- 23/0055 . . {by ion implantation}
- 23/006 . . {by plasma or corona discharge}
- 23/0065 . . {by microwave radiation}
- 23/007 . {by thermal treatment}
- 23/0075 . {Cleaning of glass (specially adapted to plate glass B08B 11/00)}
- 23/008 . {comprising a lixiviation step}
- 23/0085 . {Drying; Dehydroxylation}
- 23/009 . {Poling glass}
- 23/0095 . {Solution impregnating; Solution doping; Molecular stuffing, e.g. of porous glass (in manufacture of preforms C03B 37/012)}
- 25/00** **Surface treatment of fibres or filaments made from glass, minerals or slags**

NOTES

1. In groups C03C 25/24 - C03C 25/48, the last place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the last appropriate place.
2. A coating composition, i.e. a mixture of two or more constituents, is classified in the last of groups

C03C 25/00

(continued)

[C03C 25/25](#) - [C03C 25/42](#) that provides for at least one of these constituents.

3. When classifying in groups [C03C 25/24](#) - [C03C 25/42](#), any individual constituent, i.e. compound or ingredient of a coating composition, which is not identified by the classification according to Note (2), and which itself is determined to be novel and non-obvious, must also be classified in the last appropriate place in groups [C03C 25/24](#) - [C03C 25/42](#).
4. When classifying in groups [C03C 25/24](#) - [C03C 25/42](#), any individual constituent of a coating composition which is not identified by the classification according to Note (2) or (3), and which is considered to represent information of interest for search, may also be classified in groups [C03C 25/24](#) - [C03C 25/42](#). This can, for example, be the case when it is considered of interest to enable searching of coating compositions using a combination of classification symbols. Such non-obligatory classification should be given as "additional information".
5. When classifying in groups [C03C 25/1025](#) - [C03C 25/1095](#), the composition of the coatings must also be classified in one or more of groups [C03C 25/24](#) - [C03C 25/54](#), according to Notes (1) to (4).
6. When classifying in group [C03C 25/48](#), any individual coating which itself is determined to be novel and non-obvious must also be classified in groups [C03C 25/24](#) - [C03C 25/42](#), according to Notes (1) to (4).

- 25/002 . Thermal treatment
- 25/005 . by mechanical means
- 25/007 . Impregnation by solution; Solution doping or molecular stuffing of porous glass
- 25/10 . Coating
- 25/1025 . . to obtain fibres used for reinforcing cement-based products
- 25/103 . . . {Organic coatings}
- 25/1035 . . . {Inorganic coatings}
- 25/104 . . to obtain optical fibres
- 25/1045 . . . {with organic coatings or claddings}

(Frozen)

WARNING

Group [C03C 25/1045](#) is no longer used for the classification of documents as of January 1, 2018. The content of this group is being reclassified into groups [C03C 25/105](#), [C03C 25/106](#), and [C03C 25/1065](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 25/105 . . . Organic claddings

WARNING

Group [C03C 25/105](#) is incomplete pending reclassification of documents from group [C03C 25/1045](#).

Groups [C03C 25/1045](#) and [C03C 25/105](#) should be considered in order to perform a complete search.

- 25/1055 {Organic coatings}

(Frozen)

WARNING

Group [C03C 25/1055](#) is no longer used for the classification of documents as of January 1, 2018.

The content of this group is being reclassified into groups [C03C 25/106](#) and [C03C 25/1065](#).

Groups [C03C 25/1055](#), [C03C 25/106](#), and [C03C 25/1065](#) should be considered in order to perform a complete search

- 25/106 . . . Single coatings

WARNING

Group [C03C 25/106](#) is incomplete pending reclassification of documents from groups [C03C 25/1045](#) and [C03C 25/1055](#).

Groups [C03C 25/1045](#), [C03C 25/1055](#), and [C03C 25/106](#) should be considered in order to perform a complete search.

- 25/1061 {Inorganic coatings}

- 25/1062 {Carbon}

- 25/1063 {Metals}

- 25/1065 . . . Multiple coatings

WARNING

Group [C03C 25/106](#) is incomplete pending reclassification of documents from groups [C03C 25/1045](#) and [C03C 25/1055](#).

Groups [C03C 25/1045](#), [C03C 25/1055](#), and [C03C 25/1065](#) should be considered in order to perform a complete search.

- 25/1068 {Inorganic coatings}

- 25/109 {with at least one organic coating and at least one inorganic coating}

- 25/1095 . . to obtain coated fabrics

- 25/12 . . General methods of coating; Devices therefor

- 25/14 . . . Spraying

- 25/143 onto continuous fibres

WARNING

Group [C03C 25/143](#) is incomplete pending reclassification of documents from group [C03C 25/146](#).

Groups [C03C 25/146](#) and [C03C 25/143](#) should be considered in order to perform a complete search.

- 25/146 onto fibres in suspension in a gaseous medium ([C03C 25/143](#) takes precedence)

WARNING

Group [C03C 25/146](#) is impacted by reclassification into group [C03C 25/143](#).

Groups [C03C 25/146](#) and [C03C 25/143](#) should be considered in order to perform a complete search.

- 25/16 . . . Dipping

- 25/18 . . . Extrusion

- 25/20 . . . Contacting the fibres with applicators, e.g. rolls

- 25/22 . . . Deposition from the vapour phase

- 25/223 by chemical vapour deposition or pyrolysis
- 25/226 by sputtering
- 25/24 . . Coatings containing organic materials
- 25/25 . . . Non-macromolecular compounds
- 25/255 . . . Oils, waxes, fats or derivatives thereof
- 25/26 . . . Macromolecular compounds or prepolymers
- 25/27 Rubber latex
- 25/28 obtained by reactions involving only carbon-to-carbon unsaturated bonds
- 25/285 Acrylic resins
- 25/30 Polyolefins
- 25/305 Polyfluoroolefins
- 25/32 obtained otherwise than by reactions involving only carbon-to-carbon unsaturated bonds
- 25/321 Starch; Starch derivatives
- 25/323 Polyesters, e.g. alkyd resins
- 25/325 Polycarbonates
- 25/326 Polyureas; Polyurethanes
- 25/328 Polyamides
- 25/34 Condensation polymers of aldehydes, e.g. with phenols, ureas, melamines, amides or amines
- 25/36 Epoxy resins
- 25/38 . . . Organo-metal compounds
- 25/40 . . . Organo-silicon compounds
- 25/42 . . Coatings containing inorganic materials
- 25/44 . . . Carbon, e.g. graphite
- 25/46 . . . Metals
- 25/465 . . Coatings containing composite materials
- 25/47 . . . containing particles, fibres or flakes, e.g. in a continuous phase
- 25/475 . . . containing colouring agents
- 25/48 . . with two or more coatings having different compositions { (C03C 25/104 takes precedence) }
- 25/50 . . . Coatings containing organic materials only
- 25/52 . . . Coatings containing inorganic materials only
- 25/54 . . . Combinations of one or more coatings containing organic materials only with one or more coatings containing inorganic materials only
- 25/60 . . by diffusing ions or metals into the surface
- 25/601 . . in the liquid phase, e.g. using solutions or molten salts
- 25/602 . . . to perform ion-exchange between alkali ions (C03C 25/605 takes precedence)
- 25/603 under application of an electrical potential difference
- 25/605 . . . to introduce metals or metallic ions, e.g. silver or copper, into the glass
- 25/606 . . . {to perform an exchange of the type $Xn^{+} \rightarrow nH^{+}$ }
- 25/607 . . in the gaseous phase
- 25/608 . . in the solid phase, e.g. using pastes or powders
- 25/62 . . by application of electric or wave energy (for drying or dehydration C03C 25/64); by particle radiation or ion implantation
- 25/6206 . . Electromagnetic waves
- 25/6208 . . . Laser
- 25/621 . . . Microwaves
- 25/6213 . . . Infrared
- 25/622 . . . Visible light
- 25/6226 . . . Ultraviolet

- 25/624 . . . X-Rays
- 25/6246 . . . Gamma rays
- 25/626 . . Particle radiation or ion implantation
- 25/6266 . . . Electrons, protons or alpha particles
- 25/6273 . . . Neutrons
- 25/628 . . . Atoms
- 25/6286 . . . Ion implantation
- 25/6293 . . Plasma or corona discharge
- 25/64 . . Drying; Dehydration; Dehydroxylation
- 25/66 . . Chemical treatment, e.g. leaching, acid or alkali treatment (dehydroxylation C03C 25/64)
- 25/68 . . by etching
- 25/70 . . Cleaning, e.g. for reuse (C03C 25/62 -C03C 25/66 take precedence)

Joining glass to glass or to other materials (fusion seal compositions C03C 8/24)

NOTE

Layered products classified in groups C03C 27/00 or C03C 29/00 are also classified in subclass B32B.

- 27/00** **Joining pieces of glass to pieces of other inorganic material; Joining glass to glass other than by fusing (C03C 17/00 takes precedence; layered structures comprising at least one glass sheet B32B 17/00; wired glass C03B; joining glass to ceramics C04)**
- 27/005 . . {with compositions containing more than 50% lead oxide by weight}
- 27/02 . . by fusing glass directly to metal
- 27/04 . . Joining glass to metal by means of an interlayer
- 27/042 . . . {consisting of a combination of materials selected from glass, glass-ceramic or ceramic material with metals, metal oxides or metal salts}
- 27/044 . . . {of glass, glass-ceramic or ceramic material only}
- 27/046 . . . {of metals, metal oxides or metal salts only}
- 27/048 . . {consisting of an adhesive specially adapted for that purpose}
- 27/06 . . Joining glass to glass by processes other than fusing (fusing C03B 23/20; units for use as elements for closing wall or like openings and comprising two or more parallel glass panes in spaced relationship, the panes being permanently secured together E06B 3/66)
- 27/08 . . with the aid of intervening metal
- 27/10 . . with the aid of adhesive specially adapted for that purpose

29/00 **Joining metals with the aid of glass**

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- 2201/00** **Glass compositions**
 - 2201/02 . . Pure silica glass, e.g. pure fused quartz
 - 2201/06 . . Doped silica-based glasses
 - 2201/08 . . containing boron or halide
 - 2201/10 . . . containing boron (C03C 2201/14 takes precedence)
 - 2201/11 . . . containing chlorine
 - 2201/12 . . . containing fluorine (C03C 2201/14 takes precedence)
 - 2201/14 . . . containing boron and fluorine
 - 2201/20 . . . containing non-metals other than boron or halide

2201/21	. . . containing molecular hydrogen	2204/00	Glasses, glazes or enamels with special properties
2201/22	. . . containing deuterium	2204/02	. Antibacterial glass, glaze or enamel
2201/23	. . . containing hydroxyl groups	2204/04	. Opaque glass, glaze or enamel
2201/24	. . . containing nitrogen, e.g. silicon oxy-nitride glasses	2204/06	. . opacified by gas
2201/26	. . . containing carbon	2204/08	. Glass having a rough surface
2201/28	. . . containing phosphorus	2205/00	Compositions applicable for the manufacture of vitreous enamels or glazes
2201/30	. . containing metals	2205/02	. for opaque enamels or glazes
2201/31	. . . containing germanium	2205/04	. for self-cleaning enamels or glazes
2201/32	. . . containing aluminium (C03C 2201/36 takes precedence)	2205/06	. for dental use
2201/34	. . . containing rare earth metals (C03C 2201/36 takes precedence)	2207/00	Compositions specially applicable for the manufacture of vitreous enamels
2201/3405	. . . . Scandium	2207/02	. containing ingredients for securing a good bond between the vitrified enamel and the metal
2201/3411	. . . . Yttrium	2207/04	. for steel
2201/3417	. . . . Lanthanum	2207/06	. for cast iron
2201/3423	. . . . Cerium	2207/08	. for light metals
2201/3429	. . . . Praseodymium	2207/10	. for copper, silver or gold
2201/3435	. . . . Neodymium	2209/00	Compositions specially applicable for the manufacture of vitreous glazes
2201/3441	. . . . Samarium	2209/02	. to produce non-uniformly coloured glazes
2201/3447	. . . . Europium	2213/00	Glass fibres or filaments
2201/3452	. . . . Gadolinium	2213/02	. Biodegradable glass fibres
2201/3458	. . . . Terbium	2213/04	. Dual fibres
2201/3464	. . . . Dysprosium	2214/00	Nature of the non-vitreous component
2201/347	. . . . Holmium	2214/02	. Fibres; Filaments; Yarns; Felts; Woven material
2201/3476	. . . . Erbium	2214/03	. . surface treated, e.g. coated
2201/3482	. . . . Thulium	2214/04	. Particles; Flakes
2201/3488	. . . . Ytterbium	2214/05	. . surface treated, e.g. coated
2201/3494	. . . . Lutetium	2214/06	. Whiskers ss
2201/36	. . . . containing rare earth metals and aluminium, e.g. Er-Al co-doped	2214/07	. . surface treated, e.g. coated
2201/40	. . . containing transition metals other than rare earth metals, e.g. Zr, Nb, Ta or Zn	2214/08	. Metals
2201/42	. . . . containing titanium	2214/10	. Superconducting materials
2201/50	. . . containing alkali metals	2214/12	. Polymers
2201/54	. . . containing beryllium, magnesium or alkaline earth metals	2214/14	. Waste material, e.g. to be disposed of
2201/58	. . . containing metals in non-oxide form, e.g. CdSe	2214/16	. Microcrystallites, e.g. of optically or electrically active material
2201/60	. containing organic material	2214/17	. in molecular form (for molecular composites)
2201/80	. containing bubbles or microbubbles, e.g. opaque quartz glass	2214/20	. Glass-ceramics matrix
2203/00	Production processes	2214/30	. Methods of making the composites
2203/10	. Melting processes	2214/32	. comprising a sol-gel process
2203/20	. Wet processes, e.g. sol-gel process	2214/34	. comprising an impregnation by molten glass step
2203/22	. . using colloidal silica sols	2217/00	Coatings on glass
2203/24	. . using alkali silicate solutions	2217/20	. Materials for coating a single layer on glass
2203/26	. . using alkoxides	2217/21	. . Oxides
2203/27	. . . the alkoxides containing other organic groups, e.g. alkyl groups	2217/211	. . . SnO ₂
2203/28	. . . . functional groups, e.g. vinyl, glycidyl	2217/212	. . . TiO ₂
2203/30	. . Additives	2217/213	. . . SiO ₂
2203/32	. . Catalysts	2217/214	. . . Al ₂ O ₃
2203/34	. . adding silica powder	2217/215	. . . In ₂ O ₃
2203/36	. . Gel impregnation	2217/216	. . . ZnO
2203/40	. Gas-phase processes	2217/217	. . . FeOx, CoOx, NiOx
2203/42	. . using silicon halides as starting materials	2217/218	. . . V ₂ O ₅ , Nb ₂ O ₅ , Ta ₂ O ₅
2203/44	. . . chlorine containing	2217/219	. . . CrOx, MoOx, WOx
2203/46	. . . fluorine containing	2217/22	. . . ZrO ₂
2203/50	. After-treatment	2217/228	. . . Other specific oxides
2203/52	. . Heat-treatment	2217/229	. . . Non-specific enumeration
2203/54	. . . in a dopant containing atmosphere	2217/23	. . . Mixtures

2217/231	. . . . In ₂ O ₃ /SnO ₂
2217/232	. . . . CdO/SnO ₂
2217/24	. . . Doped oxides
2217/241	. . . . with halides
2217/242	. . . . with rare earth metals
2217/243	. . . . with S, Se, Te
2217/244	. . . . with Sb
2217/25	. . Metals
2217/251	. . . Al, Cu, Mg or noble metals
2217/252	. . . . Al
2217/253	. . . . Cu
2217/254	. . . . Noble metals
2217/255	. . . . . Au
2217/256	. . . . . Ag
2217/257	. . . Refractory metals
2217/258	. . . . Ti, Zr, Hf
2217/259	. . . . V, Nb, Ta
2217/26	. . . . Cr, Mo, W
2217/261	. . . Iron-group metals, i.e. Fe, Co or Ni
2217/262	. . . Light metals other than Al
2217/263	. . . Metals other than noble metals, Cu or Hg

NOTE

This code is only to be used in combination with [C03C](#) classification symbols having the +IDT notation.

2217/268	. . . Other specific metals
2217/269	. . . Non-specific enumeration
2217/27	. . . Mixtures of metals, alloys
2217/28	. . Other inorganic materials
2217/281	. . . Nitrides
2217/282	. . . Carbides, silicides
2217/283	. . . Borides, phosphides
2217/284	. . . Halides
2217/285	. . . . Fluorides
2217/286	. . . . Chlorides
2217/287	. . . Chalcogenides
2217/288	. . . . Sulfides
2217/289	. . . . Selenides, tellurides
2217/29	. . Mixtures
2217/40	. Coatings comprising at least one inhomogeneous layer
2217/42	. . consisting of particles only
2217/425	. . consisting of a porous layer
2217/43	. . consisting of a dispersed phase in a continuous phase
2217/44	. . . characterized by the composition of the continuous phase
2217/445	. . . . Organic continuous phases
2217/45	. . . . Inorganic continuous phases
2217/452	. . . . . Glass
2217/46	. . . characterized by the dispersed phase
2217/465	. . . . having a specific shape
2217/47	. . . . consisting of a specific material
2217/475	. . . . . Inorganic materials
2217/476	. . . . . Tin oxide or doped tin oxide
2217/477	. . . . . Titanium oxide
2217/478	. . . . . Silica
2217/479	. . . . . Metals
2217/48	. . . . having a specific function
2217/485	. . . . . Pigments

2217/70	. Properties of coatings
2217/71	. . Photocatalytic coatings
2217/72	. . Decorative coatings
2217/73	. . Anti-reflective coatings with specific characteristics
2217/732	. . . made of a single layer
2217/734	. . . comprising an alternation of high and low refractive indexes
2217/74	. . UV-absorbing coatings
2217/75	. . Hydrophilic and oleophilic coatings
2217/76	. . Hydrophobic and oleophobic coatings
2217/77	. . Coatings having a rough surface
2217/775	. . . to provide anti-slip characteristics
2217/78	. . Coatings specially designed to be durable, e.g. scratch-resistant
2217/90	. Other aspects of coatings
2217/91	. . Coatings containing at least one layer having a composition gradient through its thickness
2217/92	. . Coating of crystal glass
2217/93	. . Coatings containing a reinforcement comprising fibers or grids
2217/94	. . Transparent conductive oxide layers [TCO] being part of a multilayer coating
2217/944	. . . Layers comprising zinc oxide
2217/948	. . . Layers comprising indium tin oxide [ITO]
2218/00	Methods for coating glass
2218/10	. Deposition methods
2218/11	. . from solutions or suspensions
2218/111	. . . by dipping, immersion
2218/112	. . . by spraying
2218/113	. . . by sol-gel processes
2218/114	. . . by brushing, pouring or doctorblading
2218/115	. . . electro-enhanced deposition
2218/116	. . . by spin-coating, centrifugation
2218/117	. . . by ultrasonic methods
2218/118	. . . by roller-coating
2218/119	. . . by printing
2218/13	. . from melts
2218/15	. . from the vapour phase
2218/151	. . . by vacuum evaporation
2218/152	. . . by cvd
2218/1525	. . . . by atmospheric CVD
2218/153	. . . . by plasma-enhanced cvd
2218/154	. . . by sputtering
2218/155	. . . . by reactive sputtering
2218/156	. . . . by magnetron sputtering
2218/17	. . from a solid phase
2218/30	. Aspects of methods for coating glass not covered above
2218/31	. . Pre-treatment
2218/32	. . After-treatment
2218/322	. . . Oxidation
2218/324	. . . De-oxidation
2218/326	. . . Nitriding
2218/328	. . . Partly or completely removing a coating
2218/33	. . . . by etching
2218/335	. . Reverse coating
2218/34	. . Masking
2218/345	. . Surface crystallisation
2218/35	. . Exuding
2218/355	. . Temporary coating

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- 2218/36 . . Underside coating of a glass sheet
- 2218/365 . . Coating different sides of a glass substrate