SECTION C — CHEMISTRY; METALLURGY

C23 COATING METALLIC MATERIAL; COATING MATERIAL WITH METALLIC MATERIAL; CHEMICAL SURFACE TREATMENT; DIFFUSION TREATMENT OF METALLIC MATERIAL; COATING BY VACUUM EVAPORATION, BY SPUTTERING, BY ION IMPLANTATION OR BY CHEMICAL VAPOUR DEPOSITION, IN GENERAL; INHIBITING CORROSION OF METALLIC MATERIAL OR INCRUSTATION IN GENERAL

C23C COATING METALLIC MATERIAL; COATING MATERIAL WITH METALLIC MATERIAL; SURFACE TREATMENT OF METALLIC MATERIAL BY DIFFUSION INTO THE SURFACE, BY CHEMICAL CONVERSION OR SUBSTITUTION; COATING BY VACUUM EVAPORATION, BY SPUTTERING, BY ION IMPLANTATION OR BY CHEMICAL VAPOUR DEPOSITION, IN GENERAL (applying liquids or other fluent materials to surfaces in general B05; making metal-coated products by extrusion B21C 23/22; covering with metal by connecting pre-existing layers to articles, see the relevant places, e.g. B21D 39/00, B23K; working of metal by the action of a high concentration of electric current on a workpiece using an electrode B23H; metallising of glass C03C; metallising mortars, concrete, artificial stone, ceramics or natural stone C04B 41/00; paints, varnishes, lacquers C09D; enamelling of, or applying a vitreous layer to, metals C23D; inhibiting corrosion of metallic material or incrustation in general C23F; treating metal surfaces or coating of metals by electrolysis or electrophoresis C25D, C25F; single-crystal film growth C30B; by metallising textiles D06M 11/83; decorating textiles by locally metallising D06Q 1/04; details of scanning-probe apparatus, in general G01Q; manufacture of semiconductor devices H01L; manufacture of printed circuits H05K) **[4]**

Note(s) [4]

In this subclass, an operation is considered as pretreatment or after-treatment when it is specially adapted for, but quite distinct from, the coating process concerned and constitutes an independent operation. If an operation results in the formation of a permanent sub- or upper layer, it is not considered as pretreatment or after-treatment and is classified as a multi-coating process.

Subclass index

Coating by applying the coating material in the molten state [4]

2/00 Hot-dipping or immersion processes for applying the coating material in the molten state without affecting the shape; Apparatus therefor [4, 2006.01]

2/02 • Pretreatment of the material to be coated, e.g. for coating on selected surface areas (C23C 2/30 takes precedence) **[4, 2006.01]**

2/04 • characterised by the coating material **[4, 2006.01]**

2/06 • • Zinc or cadmium or alloys based thereon **[4, 2006.01]**

2/08 • • Tin or alloys based thereon **[4, 2006.01]**

2/10 • • Lead or alloys based thereon **[4, 2006.01]**

2/12 • • Aluminium or alloys based thereon **[4, 2006.01]**

2/14 • Removing excess of molten coatings; Controlling or regulating the coating thickness (controlling or regulating thickness in general G05D 5/02) **[4, 2006.01]**

2/16 • • using fluids under pressure, e.g. air knives **[4, 2006.01]**

2/18 • • • Removing excess of molten coatings from elongated material **[4, 2006.01]**

2/20 • • • • Strips; Plates **[4, 2006.01]**

2/22 • • by rubbing, e.g. using knives **[4, 2006.01]**

2/24 • • using magnetic or electric fields **[4, 2006.01]**

2/26 • After-treatment (C23C 2/14 takes precedence) **[4, 2006.01]**

2/28 • • Thermal after-treatment, e.g. treatment in oil bath **[4, 2006.01]**

2/30 • Fluxes or coverings on molten baths (C23C 2/22 takes precedence) **[4, 2006.01]**

2/32 • using vibratory energy applied to the bath or substrate (C23C 2/14 takes precedence) **[4, 2006.01]**

2/34 • characterised by the shape of the material to be treated (C23C 2/14 takes precedence) **[4, 2006.01]**

2/36 • • Elongated material **[4, 2006.01]**

2/38 • • • Wires; Tubes **[4, 2006.01]**
2/40 • • • Plates; Strips **[4, 2006.01]**

4/00 Coating by spraying the coating material in the molten state, e.g. by flame, plasma or electric discharge (build-up welding B23K, e.g. B23K 5/18, B23K 9/04) **[4, 2006.01, 2016.01]**
4/01 • Selective coating, e.g. pattern coating, without pre-treatment of the material to be coated **[2016.01]**
4/02 • Pretreatment of the material to be coated, e.g. for coating on selected surface areas **[4, 2006.01]**
4/04 • characterised by the coating material **[4, 2006.01]**
4/06 • • Metallic material **[4, 2006.01, 2016.01]**
4/067 • • • containing free particles of non-metal elements, e.g. carbon, silicon, boron, phosphorus or arsenic **[2016.01]**
4/073 • • • containing MCrAl or MCrAlY alloys, where M is nickel, cobalt or iron, with or without non-metal elements **[2016.01]**
4/08 • • • containing only metal elements (C23C 4/073 takes precedence) **[4, 2006.01, 2016.01]**
4/10 • • Oxides, borides, carbides, nitrides or silicides; Mixtures thereof **[4, 2006.01, 2016.01]**
4/11 • • • Oxides **[2016.01]**
4/12 • characterised by the method of spraying **[4, 2006.01, 2016.01]**

Note(s) [2016.01]

In this group, multi-aspect classification is applied, so that subject matter characterised by aspects covered by more than one of its subgroups should be classified in each of those subgroups.

4/123 • • Spraying molten metal **[2016.01]**
4/126 • • Detonation spraying **[2016.01]**
4/129 • • Flame spraying **[2016.01]**
4/131 • • Wire arc spraying **[2016.01]**
4/134 • • Plasma spraying **[2016.01]**
4/137 • • Spraying in vacuum or in an inert atmosphere **[2016.01]**
4/14 • • for coating elongate material **[4, 2006.01, 2016.01]**
4/16 • • • Wires; Tubes **[4, 2006.01, 2016.01]**
4/18 • After-treatment **[4, 2006.01]**

6/00 Coating by casting molten material on the substrate [4, 2006.01]

Solid state diffusion into metallic material surfaces [4]

8/00 Solid state diffusion of only non-metal elements into metallic material surfaces (diffusion of silicon C23C 10/00)**; Chemical surface treatment of metallic material by reaction of the surface with a reactive gas, leaving reaction products of surface material in the coating, e.g. conversion coatings, passivation of metals** (C23C 14/00 takes precedence) **[4, 2006.01]**
8/02 • Pretreatment of the material to be coated (C23C 8/04 takes precedence) **[4, 2006.01]**
8/04 • Treatment of selected surface areas, e.g. using masks **[4, 2006.01]**
8/06 • using gases **[4, 2006.01]**
8/08 • • only one element being applied **[4, 2006.01]**
8/10 • • • Oxidising **[4, 2006.01]**
8/12 • • • • using elemental oxygen or ozone **[4, 2006.01]**
8/14 • • • • • Oxidising of ferrous surfaces **[4, 2006.01]**
8/16 • • • • using oxygen-containing compounds, e.g. H_2O, CO_2 **[4, 2006.01]**
8/18 • • • • • Oxidising of ferrous surfaces **[4, 2006.01]**
8/20 • • • Carburising **[4, 2006.01]**
8/22 • • • • of ferrous surfaces **[4, 2006.01]**
8/24 • • • Nitriding **[4, 2006.01]**
8/26 • • • • of ferrous surfaces **[4, 2006.01]**
8/28 • • more than one element being applied in one step **[4, 2006.01]**
8/30 • • • Carbo-nitriding **[4, 2006.01]**
8/32 • • • • of ferrous surfaces **[4, 2006.01]**
8/34 • • more than one element being applied in more than one step **[4, 2006.01]**
8/36 • • using ionised gases, e.g. ionitriding (discharge tubes with provision for introducing objects or material to be exposed to the discharge H01J 37/00) **[4, 2006.01]**
8/38 • • • Treatment of ferrous surfaces **[4, 2006.01]**
8/40 • using liquids, e.g. salt baths, liquid suspensions **[4, 2006.01]**
8/42 • • only one element being applied **[4, 2006.01]**
8/44 • • • Carburising **[4, 2006.01]**
8/46 • • • • of ferrous surfaces **[4, 2006.01]**
8/48 • • • Nitriding **[4, 2006.01]**
8/50 • • • • of ferrous surfaces **[4, 2006.01]**
8/52 • • more than one element being applied in one step **[4, 2006.01]**
8/54 • • • Carbo-nitriding **[4, 2006.01]**
8/56 • • • • of ferrous surfaces **[4, 2006.01]**
8/58 • • more than one element being applied in more than one step **[4, 2006.01]**
8/60 • using solids, e.g. powders, pastes (using liquid suspensions of solids C23C 8/40) **[4, 2006.01]**
8/62 • • only one element being applied **[4, 2006.01]**
8/64 • • • Carburising **[4, 2006.01]**
8/66 • • • • of ferrous surfaces **[4, 2006.01]**
8/68 • • • Boronising **[4, 2006.01]**
8/70 • • • • of ferrous surfaces **[4, 2006.01]**
8/72 • • more than one element being applied in one step **[4, 2006.01]**
8/74 • • • Carbo-nitriding **[4, 2006.01]**
8/76 • • • • of ferrous surfaces **[4, 2006.01]**
8/78 • • more than one element being applied in more than one step **[4, 2006.01]**
8/80 • After-treatment **[4, 2006.01]**

10/00 Solid state diffusion of only metal elements or silicon into metallic material surfaces [4, 2006.01]
10/02 • Pretreatment of the material to be coated (C23C 10/04 takes precedence) **[4, 2006.01]**
10/04 • Diffusion into selected surface areas, e.g. using masks **[4, 2006.01]**
10/06 • using gases **[4, 2006.01]**
10/08 • • only one element being diffused **[4, 2006.01]**
10/10 • • • Chromising **[4, 2006.01]**
10/12 • • • • of ferrous surfaces **[4, 2006.01]**
10/14 • • more than one element being diffused in one step **[4, 2006.01]**
10/16 • • more than one element being diffused in more than one step **[4, 2006.01]**
10/18 • using liquids, e.g. salt baths, liquid suspensions **[4, 2006.01]**
10/20 • • only one element being diffused **[4, 2006.01]**
10/22 • • • Metal melt containing the element to be diffused **[4, 2006.01]**

10/24 • • • Salt bath containing the element to be diffused **[4, 2006.01]**
10/26 • • more than one element being diffused **[4, 2006.01]**
10/28 • using solids, e.g. powders, pastes **[4, 2006.01]**
10/30 • • using a layer of powder or paste on the surface (using liquid suspensions of solids C23C 10/18) **[4, 2006.01]**
10/32 • • • Chromising **[4, 2006.01]**
10/34 • • Embedding in a powder mixture, i.e. pack cementation **[4, 2006.01]**
10/36 • • • only one element being diffused **[4, 2006.01]**
10/38 • • • • Chromising **[4, 2006.01]**
10/40 • • • • • of ferrous surfaces **[4, 2006.01]**
10/42 • • • • • • in the presence of volatile transport additives, e.g. halogenated substances **[4, 2006.01]**
10/44 • • • • Siliconising **[4, 2006.01]**
10/46 • • • • • of ferrous surfaces **[4, 2006.01]**
10/48 • • • • Aluminising **[4, 2006.01]**
10/50 • • • • • of ferrous surfaces **[4, 2006.01]**
10/52 • • • more than one element being diffused in one step **[4, 2006.01]**
10/54 • • • • Diffusion of at least chromium **[4, 2006.01]**
10/56 • • • • • and at least aluminium **[4, 2006.01]**
10/58 • • • more than one element being diffused in more than one step **[4, 2006.01]**
10/60 • After-treatment **[4, 2006.01]**

12/00 Solid state diffusion of at least one non-metal element other than silicon and at least one metal element or silicon into metallic material surfaces [4, 2006.01]
12/02 • Diffusion in one step **[4, 2006.01]**

Coating by vacuum evaporation, by sputtering or by ion implantation [4]

14/00 Coating by vacuum evaporation, by sputtering or by ion implantation of the coating forming material (discharge tubes with provision for introducing objects or material to be exposed to the discharge H01J 37/00) **[4, 2006.01]**

14/02 • Pretreatment of the material to be coated (C23C 14/04 takes precedence) **[4, 2006.01]**
14/04 • Coating on selected surface areas, e.g. using masks **[4, 2006.01]**
14/06 • characterised by the coating material (C23C 14/04 takes precedence) **[4, 2006.01]**
14/08 • • Oxides (C23C 14/10 takes precedence) **[4, 2006.01]**
14/10 • • Glass or silica **[4, 2006.01]**
14/12 • • Organic material **[4, 2006.01]**
14/14 • • Metallic material, boron or silicon **[4, 2006.01]**
14/16 • • • on metallic substrates or on substrates of boron or silicon **[4, 2006.01]**
14/18 • • • on other inorganic substrates **[4, 2006.01]**
14/20 • • • on organic substrates **[4, 2006.01]**
14/22 • characterised by the process of coating **[4, 2006.01]**
14/24 • • Vacuum evaporation **[4, 2006.01]**
14/26 • • • by resistance or inductive heating of the source **[4, 2006.01]**
14/28 • • • by wave energy or particle radiation (C23C 14/32-C23C 14/48 take precedence) **[4, 2006.01]**
14/30 • • • • by electron bombardment **[4, 2006.01]**
14/32 • • • by explosion; by evaporation and subsequent ionisation of the vapours (C23C 14/34-C23C 14/48 take precedence) **[4, 2006.01]**
14/34 • • Sputtering **[4, 2006.01]**
14/35 • • • by application of a magnetic field, e.g. magnetron sputtering **[5, 2006.01]**
14/36 • • • Diode sputtering (C23C 14/35 takes precedence) **[4, 5, 2006.01]**
14/38 • • • • by direct current glow discharge **[4, 2006.01]**
14/40 • • • • with alternating current discharge, e.g. high-frequency discharge **[4, 2006.01]**
14/42 • • • Triode sputtering (C23C 14/35 takes precedence) **[4, 5, 2006.01]**
14/44 • • • • by application of high frequencies and additional direct voltages **[4, 2006.01]**
14/46 • • • by ion beam produced by an external ion source (C23C 14/40 takes precedence) **[4, 2006.01]**
14/48 • • Ion implantation **[4, 2006.01]**
14/50 • • Substrate holders **[4, 2006.01]**
14/52 • • Means for observation of the coating process **[4, 2006.01]**
14/54 • • Controlling or regulating the coating process (controlling or regulating in general G05) **[4, 2006.01]**
14/56 • • Apparatus specially adapted for continuous coating; Arrangements for maintaining the vacuum, e.g. vacuum locks **[4, 2006.01]**
14/58 • After-treatment **[4, 2006.01]**

Chemical deposition or plating by decomposition; Contact plating [4]

16/00 Chemical coating by decomposition of gaseous compounds, without leaving reaction products of surface material in the coating, i.e. chemical vapour deposition (CVD) processes (reactive sputtering or vacuum evaporation C23C 14/00) **[4, 2006.01]**
16/01 • on temporary substrates, e.g. on substrates subsequently removed by etching **[7, 2006.01]**
16/02 • Pretreatment of the material to be coated (C23C 16/04 takes precedence) **[4, 2006.01]**
16/04 • Coating on selected surface areas, e.g. using masks **[4, 2006.01]**
16/06 • characterised by the deposition of metallic material **[4, 2006.01]**
16/08 • • from metal halides **[4, 2006.01]**
16/10 • • • Deposition of chromium only **[4, 2006.01]**
16/12 • • • Deposition of aluminium only **[4, 2006.01]**
16/14 • • • Deposition of only one other metal element **[4, 2006.01]**
16/16 • • from metal carbonyl compounds **[4, 2006.01]**
16/18 • • from metallo-organic compounds **[4, 2006.01]**
16/20 • • • Deposition of aluminium only **[4, 2006.01]**
16/22 • characterised by the deposition of inorganic material, other than metallic material **[4, 2006.01]**
16/24 • • Deposition of silicon only **[4, 2006.01]**
16/26 • • Deposition of carbon only **[4, 2006.01]**
16/27 • • • Diamond only **[7, 2006.01]**
16/28 • • Deposition of only one other non-metal element **[4, 2006.01]**
16/30 • • Deposition of compounds, mixtures or solid solutions, e.g. borides, carbides, nitrides **[4, 2006.01]**
16/32 • • • Carbides **[4, 2006.01]**
16/34 • • • Nitrides **[4, 2006.01]**

16/36 • • • Carbo-nitrides **[4, 2006.01]**
16/38 • • • Borides **[4, 2006.01]**
16/40 • • • Oxides **[4, 2006.01]**
16/42 • • • Silicides **[4, 2006.01]**
16/44 • characterised by the method of coating (C23C 16/04 takes precedence) **[4, 2006.01]**
16/442 • • using fluidised bed processes **[7, 2006.01]**
16/448 • • characterised by the method used for generating reactive gas streams, e.g. by evaporation or sublimation of precursor materials **[7, 2006.01]**
16/452 • • • by activating reactive gas streams before introduction into the reaction chamber, e.g. by ionization or by addition of reactive species **[7, 2006.01]**
16/453 • • passing the reaction gases through burners or torches, e.g. atmospheric pressure CVD (C23C 16/513 takes precedence; for flame or plasma spraying of coating material in the molten state C23C 4/00) **[7, 2006.01]**
16/455 • • characterised by the method used for introducing gases into the reaction chamber or for modifying gas flows in the reaction chamber **[7, 2006.01]**
16/458 • • characterised by the method used for supporting substrates in the reaction chamber **[7, 2006.01]**
16/46 • • characterised by the method used for heating the substrate (C23C 16/48, C23C 16/50 take precedence) **[4, 2006.01]**
16/48 • • by irradiation, e.g. photolysis, radiolysis, particle radiation **[4, 2006.01]**
16/50 • • using electric discharges **[4, 2006.01]**
16/503 • • • using dc or ac discharges **[7, 2006.01]**
16/505 • • • using radio frequency discharges **[7, 2006.01]**
16/507 • • • • using external electrodes, e.g. in tunnel type reactors **[7, 2006.01]**
16/509 • • • • using internal electrodes **[7, 2006.01]**
16/511 • • • using microwave discharges **[7, 2006.01]**
16/513 • • • using plasma jets **[7, 2006.01]**
16/515 • • • using pulsed discharges **[7, 2006.01]**
16/517 • • • using a combination of discharges covered by two or more of groups C23C 16/503-C23C 16/515 **[7, 2006.01]**
16/52 • • Controlling or regulating the coating process (controlling or regulating in general G05) **[4, 2006.01]**
16/54 • • Apparatus specially adapted for continuous coating **[4, 2006.01]**
16/56 • After-treatment **[4, 2006.01]**

18/00 Chemical coating by decomposition of either liquid compounds or solutions of the coating forming compounds, without leaving reaction products of surface material in the coating (chemical surface reaction C23C 8/00, C23C 22/00)**; Contact plating [4, 2006.01]**

Note(s) [4]

This group covers also suspensions containing reactive liquids and non-reactive solid particles.

18/02 • by thermal decomposition **[4, 2006.01]**
18/04 • • Pretreatment of the material to be coated (C23C 18/06 takes precedence) **[4, 2006.01]**
18/06 • • Coating on selected surface areas, e.g. using masks **[4, 2006.01]**
18/08 • • characterised by the deposition of metallic material **[4, 2006.01]**
18/10 • • • Deposition of aluminium only **[4, 2006.01]**
18/12 • • characterised by the deposition of inorganic material other than metallic material **[4, 2006.01]**
18/14 • Decomposition by irradiation, e.g. photolysis, particle radiation **[4, 2006.01]**
18/16 • by reduction or substitution, i.e. electroless plating (C23C 18/54 takes precedence) **[4, 2006.01]**
18/18 • • Pretreatment of the material to be coated **[4, 2006.01]**
18/20 • • • of organic surfaces, e.g. resins **[4, 2006.01]**
18/22 • • • • Roughening, e.g. by etching **[4, 2006.01]**
18/24 • • • • • using acid aqueous solutions **[4, 2006.01]**
18/26 • • • • • using organic liquids **[4, 2006.01]**
18/28 • • • • Sensitising or activating **[4, 2006.01]**
18/30 • • • • • Activating **[4, 2006.01]**
18/31 • • Coating with metals **[5, 2006.01]**
18/32 • • • Coating with one of iron, cobalt or nickel; Coating with mixtures of phosphorus or boron with one of these metals **[4, 5, 2006.01]**
18/34 • • • • using reducing agents **[4, 5, 2006.01]**
18/36 • • • • • using hypophosphites **[4, 5, 2006.01]**
18/38 • • • Coating with copper **[4, 5, 2006.01]**
18/40 • • • • using reducing agents **[4, 5, 2006.01]**
18/42 • • • Coating with noble metals **[4, 5, 2006.01]**
18/44 • • • • using reducing agents **[4, 5, 2006.01]**
18/48 • • Coating with alloys **[4, 5, 2006.01]**
18/50 • • • with alloys based on iron, cobalt or nickel (C23C 18/32 takes precedence) **[4, 5, 2006.01]**
18/52 • • using reducing agents for coating with metallic material not provided for in a single one of groups C23C 18/32-C23C 18/50 **[4, 2006.01]**
18/54 • Contact plating, i.e. electroless electrochemical plating **[4, 2006.01]**

20/00 Chemical coating by decomposition of either solid compounds or suspensions of the coating forming compounds, without leaving reaction products of surface material in the coating (chemical surface reaction C23C 8/00, C23C 22/00) **[4, 2006.01]**

Note(s) [4]

This group covers also suspensions containing non-reactive liquids and reactive solid particles.

20/02 • Coating with metallic material **[4, 2006.01]**
20/04 • • with metals **[4, 2006.01]**
20/06 • Coating with inorganic material, other than metallic material **[4, 2006.01]**
20/08 • • with compounds, mixtures or solid solutions, e.g. borides, carbides, nitrides **[4, 2006.01]**

22/00 Chemical surface treatment of metallic material by reaction of the surface with a reactive liquid, leaving reaction products of surface material in the coating, e.g. conversion coatings, passivation of metals (wash primers C09D 5/12) **[4, 2006.01]**

Note(s) [4]

1. This group covers also suspensions containing reactive liquids and non-reactive solid particles.
2. Rejuvenating of the bath is classified in the appropriate place for the specific bath composition.

Note(s) [4]

In groups C23C 22/02-C23C 22/86, 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.

22/02 • using non-aqueous solutions **[4, 2006.01]**
22/03 • • containing phosphorus compounds **[4, 2006.01]**
22/04 • • containing hexavalent chromium compounds **[4, 2006.01]**
22/05 • using aqueous solutions **[5, 2006.01]**
22/06 • • using aqueous acidic solutions with pH < 6 **[4, 5, 2006.01]**
22/07 • • • containing phosphates **[4, 5, 2006.01]**
22/08 • • • • Orthophosphates **[4, 5, 2006.01]**
22/10 • • • • • containing oxidants **[4, 5, 2006.01]**
22/12 • • • • • containing zinc cations **[4, 5, 2006.01]**
22/13 • • • • • • containing also nitrate or nitrite anions **[4, 5, 2006.01]**
22/14 • • • • • • containing also chlorate anions **[4, 5, 2006.01]**
22/16 • • • • • • containing also peroxy-compounds **[4, 5, 2006.01]**
22/17 • • • • • • containing also organic acids **[4, 5, 2006.01]**
22/18 • • • • • containing manganese cations **[4, 5, 2006.01]**
22/20 • • • • • containing aluminium cations **[4, 5, 2006.01]**
22/22 • • • • • containing alkaline earth metal cations **[4, 5, 2006.01]**
22/23 • • • • Condensed phosphates **[4, 5, 2006.01]**
22/24 • • • containing hexavalent chromium compounds **[4, 5, 2006.01]**
22/26 • • • • containing also organic compounds **[4, 5, 2006.01]**
22/27 • • • • • Acids **[4, 5, 2006.01]**
22/28 • • • • • Macromolecular compounds **[4, 5, 2006.01]**
22/30 • • • • containing also trivalent chromium **[4, 5, 2006.01]**
22/32 • • • • containing also pulverulent metals **[4, 5, 2006.01]**
22/33 • • • • containing also phosphates **[4, 5, 2006.01]**
22/34 • • • containing fluorides or complex fluorides **[4, 5, 2006.01]**
22/36 • • • • containing also phosphates **[4, 5, 2006.01]**
22/37 • • • • containing also hexavalent chromium compounds **[4, 5, 2006.01]**
22/38 • • • • • containing also phosphates **[4, 5, 2006.01]**
22/40 • • • containing molybdates, tungstates or vanadates **[4, 5, 2006.01]**
22/42 • • • • containing also phosphates **[4, 5, 2006.01]**
22/43 • • • • containing also hexavalent chromium compounds **[4, 5, 2006.01]**
22/44 • • • • containing also fluorides or complex fluorides **[4, 5, 2006.01]**
22/46 • • • containing oxalates **[4, 5, 2006.01]**
22/47 • • • • containing also phosphates **[4, 5, 2006.01]**
22/48 • • • not containing phosphates, hexavalent chromium compounds, fluorides or complex fluorides, molybdates, tungstates, vanadates or oxalates **[4, 5, 2006.01]**
22/50 • • • • Treatment of iron or alloys based thereon **[4, 5, 2006.01]**
22/52 • • • • Treatment of copper or alloys based thereon **[4, 5, 2006.01]**
22/53 • • • • Treatment of zinc or alloys based thereon **[4, 5, 2006.01]**
22/54 • • • • Treatment of refractory metals or alloys based thereon **[4, 5, 2006.01]**
22/56 • • • • Treatment of aluminium or alloys based thereon **[4, 5, 2006.01]**
22/57 • • • • Treatment of magnesium or alloys based thereon **[4, 5, 2006.01]**
22/58 • • • • Treatment of other metallic material **[4, 5, 2006.01]**
22/60 • • using alkaline aqueous solutions with pH > 8 **[4, 5, 2006.01]**
22/62 • • • Treatment of iron or alloys based thereon **[4, 5, 2006.01]**
22/63 • • • Treatment of copper or alloys based thereon **[4, 5, 2006.01]**
22/64 • • • Treatment of refractory metals or alloys based thereon **[4, 5, 2006.01]**
22/66 • • • Treatment of aluminium or alloys based thereon **[4, 5, 2006.01]**
22/67 • • • • with solutions containing hexavalent chromium **[4, 5, 2006.01]**
22/68 • • using aqueous solutions with pH between 6 and 8 **[4, 5, 2006.01]**
22/70 • using melts **[4, 2006.01]**
22/72 • • Treatment of iron or alloys based thereon **[4, 2006.01]**
22/73 • characterised by the process **[4, 2006.01]**
22/74 • • for obtaining burned-in conversion coatings **[4, 2006.01]**
22/76 • • Applying the liquid by spraying **[4, 2006.01]**
22/77 • • Controlling or regulating of the coating process (controlling or regulating in general G05) **[4, 2006.01]**
22/78 • Pretreatment of the material to be coated **[4, 2006.01]**
22/80 • • with solutions containing titanium or zirconium compounds **[4, 2006.01]**
22/82 • After-treatment **[4, 2006.01]**
22/83 • • Chemical after-treatment **[4, 2006.01]**
22/84 • • Dyeing **[4, 2006.01]**
22/86 • Regeneration of coating baths **[4, 2006.01]**

24/00 **Coating starting from inorganic powder** (spraying of the coating material in molten state C23C 4/00; solid state diffusion C23C 8/00-C23C 12/00; manufacture of composite layers, workpieces or articles by sintering metallic powder B22F 7/00; friction welding B23K 20/12) **[4, 2006.01]**
24/02 • by application of pressure only **[4, 2006.01]**
24/04 • • Impact or kinetic deposition of particles **[4, 2006.01]**
24/06 • • Compressing powdered coating material, e.g. by milling **[4, 2006.01]**
24/08 • by application of heat or pressure and heat (C23C 24/04 takes precedence) **[4, 2006.01]**
24/10 • • with intermediate formation of a liquid phase in the layer **[4, 2006.01]**

26/00 **Coating not provided for in groups C23C 2/00-C23C 24/00 [4, 2006.01]**
26/02 • applying molten material to the substrate (applying melts to surfaces, in general B05) **[4, 2006.01]**

28/00 Coating for obtaining at least two superposed coatings either by methods not provided for in a single one of main groups C23C 2/00-C23C 26/00, or by combinations of methods provided for in subclasses C23C and C25D [4, 2006.01]

28/02 • only coatings of metallic material **[4, 2006.01]**

28/04 • only coatings of inorganic non-metallic material **[4, 2006.01]**

30/00 Coating with metallic material characterised only by the composition of the metallic material, i.e. not characterised by the coating process (C23C 26/00, C23C 28/00 take precedence) **[4, 2006.01]**