

CPC**COOPERATIVE PATENT CLASSIFICATION****C25D**

PROCESSES FOR THE ELECTROLYTIC OR ELECTROPHORETIC PRODUCTION OF COATINGS; ELECTROFORMING (decorating textiles by metallising [D06Q 1/04](#); manufacturing printed circuits by metal deposition [H05K 3/18](#)); **APPARATUS THEREFOR**

WARNING

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

- C25D 5/24 covered by [C25D 5/34](#)
- C25D 5/26 covered by [C25D 5/36](#)
- C25D 5/28 covered by [C25D 5/38](#)
- C25D 5/30 covered by [C25D 5/42](#), [C25D 5/44](#)
- C25D 5/32 covered by [C25D 5/46](#)
- C25D 13/06 covered by [C09D 5/44](#)
- C25D 13/08 covered by [C09D 5/4476](#)
- C25D 13/10 covered by [C09D 5/448](#)
- C25D 19/00 covered by [C25D 17/00](#)

C25D 1/00**Electroforming**

- C25D 1/003 . {3D structures, e.g. superposed patterned layers}
- C25D 1/006 . {Nanostructures, e.g. using aluminium anodic oxidation templates [AAO]}
- C25D 1/02 . Tubes; Rings; Hollow bodies
- C25D 1/04 . Wires; Strips; Foils
- C25D 1/06 . Wholly-metallic mirrors
- C25D 1/08 . Perforated or foraminous objects, e.g. sieves ([C25D 1/10](#) takes precedence)
- C25D 1/10 . Moulds; Masks; Masterforms {, e.g. mandrels, stampers}
- C25D 1/12 . by electrophoresis {(electrophoretic coating [C25D 13/00](#))}
- C25D 1/14 . . of inorganic material
- C25D 1/16 . . . Metals
- C25D 1/18 . . of organic material
- C25D 1/20 . Separation of the formed objects from the electrodes {with no destruction of said electrodes}
- C25D 1/22 . . Separating compounds

C25D 3/00**Electroplating: Baths therefor**

- C25D 3/02 . from solutions ([C25D 5/34](#) to [C25D 5/46](#) take precedence)
- C25D 3/04 . . of chromium
- C25D 3/06 . . . from solutions of trivalent chromium
- C25D 3/08 . . . Deposition of black chromium {, e.g. hexavalent chromium, CrVI}
- C25D 3/10 . . . characterised by the organic bath constituents used

C25D 3/12	. . of nickel or cobalt {(C25D 3/56 takes precedence)}
C25D 3/14	. . . from baths containing acetylenic or heterocyclic compounds
C25D 3/16 Acetylenic compounds
C25D 3/18 Heterocyclic compounds
C25D 3/20	. . of iron
C25D 3/22	. . of zinc
C25D 3/24	. . . from cyanide baths
C25D 3/26	. . of cadmium
C25D 3/28	. . . from cyanide baths
C25D 3/30	. . of tin
C25D 3/32	. . . characterised by the organic bath constituents used
C25D 3/34	. . of lead
C25D 3/36	. . . characterised by the organic bath constituents used
C25D 3/38	. . of copper
C25D 3/40	. . . from cyanide baths {, e.g. with Cu+}
C25D 3/42	. . of light metals
C25D 3/44	. . . Aluminium
C25D 3/46	. . of silver
C25D 3/48	. . of gold
C25D 3/50	. . of platinum group metals
C25D 3/52	. . . characterised by the organic bath constituents used
C25D 3/54	. . of metals not provided for in groups C25D 3/04 to C25D 3/50
C25D 3/56	. . of alloys
C25D 3/562	. . . {containing more than 50% by weight of iron or nickel or cobalt ; NiP, FeP, CoP (Phosphatising C25D 11/36)}
C25D 3/565	. . . {containing more than 50% by weight of zinc}
C25D 3/567	. . . {containing more than 50% by weight of platinum group metals}
C25D 3/58	. . . containing more than 50% by weight of copper
C25D 3/60	. . . containing more than 50% by weight of of tin {; SnP}
C25D 3/62	. . . containing more than 50% by weight of gold
C25D 3/64	. . . containing more than 50% by weight of silver
C25D 3/66	. from melts
C25D 3/665	. . {from ionic liquids}

WARNING

Group C25D 3/665 is not complete, pending reorganization, see also C25D 3/66]

C25D 5/00

Electroplating characterised by the process; Pretreatment or after-treatment of work-pieces

- C25D 5/003
 - {Electroplating characterised by the use of gases, e.g. pressure influence (removal or gases or vapours, [C25D 21/04](#))}
 - WARNING**
 - Groups [C25D 5/003](#), [C25D 5/006](#) are not complete, pending reorganization, see also [C25D 5/00](#)
- C25D 5/006
 - {Electroplating with applied electromagnetic field, not locally , e.g. for plating magnetic layers}
- C25D 5/02
 - Electroplating of selected surface areas
- C25D 5/022
 - • {using masking means ([C25D 11/022](#) takes precedence)}
- C25D 5/024
 - • {using locally applied electromagnetic radiation e.g. lasers}
- C25D 5/026
 - • {using locally applied jets of electrolyte}
- C25D 5/028
 - • {one side electroplating , e.g. substrate conveyed in a bath with inhibited background plating}
- C25D 5/04
 - Electroplating with moving electrodes
- C25D 5/06
 - • Brush or pad plating {(electrodes for pad plating [C25D 17/14](#))}
- C25D 5/08
 - Electroplating with moving electrolyte {, characterised by electrolyte flow}, e.g. jet electroplating {(spraying of electrolyte on wires strip or foils [C25D 7/0642](#), means or devices for moving the electrolyte [C25D 21/10](#), [C25D 5/026](#) takes precedence)}
- C25D 5/10
 - Electroplating with more than one layer of the same or of different metals (for bearings [C25D 7/10](#))
- C25D 5/12
 - • at least one layer being of nickel or chromium
- C25D 5/14
 - • • two or more layers being of nickel or chromium, e.g. duplex or triplex layers
- C25D 5/16
 - Electroplating with layers of varying thickness {, e.g. rough surfaces}{; Hull cells}
- C25D 5/18
 - Electroplating using modulated, pulsed or reversing current
- C25D 5/20
 - Electroplating using ultrasonics {, vibrations}
- C25D 5/22
 - Electroplating combined with mechanical treatment during the deposition
- C25D 5/34
 - Pretreatment of metallic surfaces to be electroplated
- C25D 5/36
 - • of iron or steel
- C25D 5/38
 - • of refractory metals or nickel
- C25D 5/40
 - • • Nickel; Chromium
- C25D 5/42
 - • of light metals
- C25D 5/44
 - • • Aluminium
- C25D 5/46
 - • of actinides
- C25D 5/48
 - After-treatment of electroplated surfaces
- C25D 5/50
 - • by heat-treatment
- C25D 5/505
 - • • {of electroplated tin coatings, e.g. by melting}
- C25D 5/52
 - • by brightening or burnishing
- C25D 5/54
 - Electroplating {on} non-metallic surfaces {,e.g. on carbon or carbon composites} ([C25D 7/12](#) takes precedence)
- C25D 5/56
 - • on {thin or conductive} plastics {(coating metallic material [C23C](#))}

C25D 7/00**Electroplating characterised by the article coated**

C25D 7/001

- {Magnets}

WARNING

Groups [C25D 7/001-C25D 7/008](#) are not complete, pending reorganization, see also [C25D 7/00](#)

C25D 7/003

- {Threaded pieces, e.g. bolts, nuts}

C25D 7/005

- {Jewels or clockworks}

C25D 7/006

- {Nanoparticles}

C25D 7/008

- {Thermal barrier coatings}

C25D 7/02

- Slide fasteners

C25D 7/04

- Tubes; Rings; Hollow bodies

C25D 7/06

- Wires; Strips; Foils

C25D 7/0607

- • {Wires}

C25D 7/0614

- • {Strips or foils}

C25D 7/0621

- • • {In horizontal cells}

C25D 7/0628

- • • {In vertical cells}

C25D 7/0635

- • • {In radial cells}

C25D 7/0642

- • • {Anodes}

C25D 7/065

- • • {Diaphragms}

C25D 7/0657

- • • {Conducting rolls}

C25D 7/0664

- • • {Isolating rolls}

C25D 7/0671

- • • {Selective plating}

C25D 7/0678

- • • • {using masks}

C25D 7/0685

- • • {Spraying of electrolyte}

C25D 7/0692

- • • {Regulating the thickness of the coating}

C25D 7/08

- Mirrors; Reflectors

C25D 7/10

- Bearings

C25D 7/12

- Semiconductors

C25D 7/123

- • {coated first with a seed layer, e.g. for filling vias}

WARNING

Groups [C25D 7/123-C25D 7/126](#) are not complete, pending reorganization, see also [C25D 7/12](#)

C25D 7/126

- • {Semiconductors first coated with a seed layer for solar cells}

C25D 9/00

Electrolytic coating other than with metals ([C25D 11/00](#), [C25D 15/00](#) take precedence; electrophoretic coating [C25D 13/00](#))

C25D 9/02

- with organic materials

C25D 9/04

- with inorganic materials

C25D 9/06

- • by anodic processes

- C25D 9/08 . . . by cathodic processes
- C25D 9/10 on iron or steel
- C25D 9/12 on light metals

C25D 11/00**Electrolytic coating by surface reaction, i.e. forming conversion layers**

- C25D 11/005 . {Apparatus specially adapted for electrolytic conversion coating (apparatus in general for electrolytic coating [C25D 17/00](#))}

WARNING

Groups [C25D 11/005](#), [C25D 11/022-C25D 11/028](#), [C25D 11/045](#) are not complete, pending reorganization, see also [C25D 11/00](#)

- C25D 11/02 . Anodisation
- C25D 11/022 . . {Anodisation on selected surface areas}
- C25D 11/024 . . {Anodisation under pulsed or modulated current or potential}
- C25D 11/026 . . {Anodisation with spark discharge}
- C25D 11/028 . . {Borodising,, i.e. borides formed electrochemically}
- C25D 11/04 . . of aluminium or alloys based thereon
- C25D 11/045 . . . {for forming AAO templates}
- C25D 11/06 . . . characterised by the electrolytes used
- C25D 11/08 containing inorganic acids
- C25D 11/10 containing organic acids
- C25D 11/12 . . . Anodising more than once, e.g. in different baths
- C25D 11/14 . . . Producing integrally coloured layers
- C25D 11/16 . . . Pretreatment {, e.g. desmutting}
- C25D 11/18 . . . After-treatment, e.g. pore sealing ([lacquering B44D](#))
- C25D 11/20 Electrolytic after-treatment
- C25D 11/22 for colouring layers
- C25D 11/24 Chemical after-treatment
- C25D 11/243 {using organic dyestuffs}
- C25D 11/246 {for sealing layers}
- C25D 11/26 . . of refractory metals or alloys based thereon
- C25D 11/28 . . of actinides or alloys based thereon
- C25D 11/30 . . of magnesium or alloys based thereon
- C25D 11/32 . . of semiconducting materials
- C25D 11/34 . . of metals or alloys not provided for in groups [C25D 11/04](#) to [C25D 11/32](#)
- C25D 11/36 . Phosphatising {, e.g. NiP, CoP, FeP (bath solutions of NiP, CoP, FeP [C25D 3/562](#))}
- C25D 11/38 . Chromatising
- C25D 13/00** **Electrophoretic coating** ([C25D 15/00](#) takes precedence; apparatus for continuously conveying articles into baths [B65G](#), e.g. [B65G 49/00](#))
- C25D 13/02 . with inorganic material

C25D 13/04	<ul style="list-style-type: none"> with organic material
C25D 13/06	<ul style="list-style-type: none"> <ul style="list-style-type: none"> with polymers {(not used, see C09D 5/44)}
C25D 13/08	<ul style="list-style-type: none"> <ul style="list-style-type: none"> by polymerisation in situ of monomeric materials {(not used, see C09D 5/4476)}
C25D 13/10	<ul style="list-style-type: none"> characterised by the additives used {(not used, see C09D 5/448)}
C25D 13/12	<ul style="list-style-type: none"> characterised by the article coated
C25D 13/14	<ul style="list-style-type: none"> <ul style="list-style-type: none"> Tubes; Rings; Hollow bodies
C25D 13/16	<ul style="list-style-type: none"> <ul style="list-style-type: none"> Wires; Strips; Foils
C25D 13/18	<ul style="list-style-type: none"> using modulated, pulsed, or reversing current
C25D 13/20	<ul style="list-style-type: none"> Pre-treatment
C25D 13/22	<ul style="list-style-type: none"> Servicing or operating {apparatus or multistep processes}
C25D 13/24	<ul style="list-style-type: none"> <ul style="list-style-type: none"> Regeneration of process liquids
C25D 15/00	Electrolytic or electrophoretic production of coatings containing embedded materials, e.g. particles, whiskers, wires
C25D 15/02	<ul style="list-style-type: none"> Combined electrolytic and electrophoretic processes {with charged materials}
C25D 17/00	Constructional parts, or assemblies thereof, of cells for electrolytic coating (apparatus for continuously conveying articles into baths B65G , e.g. B65G 49/00 ; electric devices see the relevant classes, e.g. H01B , H02G) {(C25D 7/06 , C25D 11/005 , C25D 13/22 , C25 takes precedence)}
C25D 17/001	<ul style="list-style-type: none"> {Apparatus specially adapted for plating wafers, e.g. semiconductors, solar cells} <p><u>WARNING</u></p> <p>Groups C25D 17/005-C25D 17/008 are not complete, pending reorganization, see also C25D 17/00</p>
C25D 17/002	<ul style="list-style-type: none"> {Cell separation, e.g. membranes, diaphragms}
C25D 17/004	<ul style="list-style-type: none"> {Sealing devices}
C25D 17/005	<ul style="list-style-type: none"> {Contacting devices}
C25D 17/007	<ul style="list-style-type: none"> {Current conducting devices}
C25D 17/008	<ul style="list-style-type: none"> {Current insulating devices}
C25D 17/02	<ul style="list-style-type: none"> Tanks; Installations therefor
C25D 17/04	<ul style="list-style-type: none"> <ul style="list-style-type: none"> External supporting frames or structures
C25D 17/06	<ul style="list-style-type: none"> Suspending or supporting devices for articles to be coated
C25D 17/08	<ul style="list-style-type: none"> <ul style="list-style-type: none"> {Supporting} racks {i.e. not for suspending}
C25D 17/10	<ul style="list-style-type: none"> Electrodes {e.g. composition, counter electrode}
C25D 17/12	<ul style="list-style-type: none"> <ul style="list-style-type: none"> Shape or form (C25D 17/14 takes precedence)
C25D 17/14	<ul style="list-style-type: none"> <ul style="list-style-type: none"> for pad-plating
C25D 17/16	<ul style="list-style-type: none"> Apparatus for electrolytic coating of small objects in bulk
C25D 17/18	<ul style="list-style-type: none"> <ul style="list-style-type: none"> having closed containers
C25D 17/20	<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> Horizontal barrels
C25D 17/22	<ul style="list-style-type: none"> <ul style="list-style-type: none"> having open containers

- C25D 17/24 . . . Oblique barrels
- C25D 17/26 . . . Oscillating baskets
- C25D 17/28 . . with means for moving the objects individually through the apparatus during treatment

C25D 21/00**Processes for servicing or operating cells for electrolytic coating**

- C25D 21/02 . Heating or cooling
- C25D 21/04 . Removal of gases or vapours {; gas or pressure control (electroplating characterized by the use of gases [C25D 5/003](#))}
- C25D 21/06 . Filtering {particles other than ions (filtering ions [C25D 21/22](#))}
- C25D 21/08 . Rinsing
- C25D 21/10 . Agitating of electrolytes; Moving of racks
- C25D 21/11 . Use of protective surface layers on electrolytic baths
- C25D 21/12 . Process control or regulation (controlling or regulating in general [G05](#))
- C25D 21/14 . . Controlled addition of electrolyte components
- C25D 21/16 . Regeneration of process solutions {([C25D 13/24](#) takes precedence)}
- C25D 21/18 . . of electrolytes ([C25D 21/22](#) takes precedence)
- C25D 21/20 . . of rinse-solutions ([C25D 21/22](#) takes precedence)
- C25D 21/22 . . by ion-exchange