

**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. aluminum 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 5/24](#) to [C25D 5/32](#) 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 5/00B**, [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 7/00B**-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 { without seed layer}
- C25D 7/123 . . { Semiconductors first coated with a seed layer for filling vias}

### **WARNING**

Groups ~~C25D 7/12B~~-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 11/02F~~, [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 [ANOF]}
- 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 . with organic material
- C25D 13/06 . . with polymers {not used, see [C09D 5/44](#)}
- C25D 13/08 . . . by polymerisation in situ of monomeric materials {not used, see [C09D 5/4476](#)}
  
- C25D 13/10 . characterised by the additives used {not used, see [C09D 5/448](#)}
- C25D 13/12 . characterised by the article coated
- C25D 13/14 . . Tubes; Rings; Hollow bodies
- C25D 13/16 . . Wires; Strips; Foils
  
- C25D 13/18 . using modulated, pulsed, or reversing current
  
- C25D 13/20 . Pre-treatment
  
- C25D 13/22 . Servicing or operating { apparatus or multistep processes}
- C25D 13/24 . . Regeneration of process liquids

- C25D 15/00**      **Electrolytic or electrophoretic production of coatings containing { uncharged} embedded materials, e.g. particles, whiskers, wires**
- C25D 15/02      . 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      . { Apparatus specially adapted for plating wafers, e.g. semiconductors, solar cells}
- WARNING**
- Groups [C25D 17/005](#)-[C25D 17/008](#) are not complete, pending reorganization,  
 see also [C25D 17/00](#)
- C25D 17/002      . { Cell separation, e.g. membranes, diaphragms}
- C25D 17/004      . { Sealing devices}
- C25D 17/005      . { Contacting devices}
- C25D 17/007      . { Current conducting devices}
- C25D 17/008      . { Current insulating devices}
- C25D 17/02      . Tanks; Installations therefor
- C25D 17/04      .. External supporting frames or structures
- C25D 17/06      . Suspending or supporting devices for articles to be coated
- C25D 17/08      .. { Supporting} racks{ i.e. not for suspending}
- C25D 17/10      . Electrodes { e.g. composition, counter electrode}
- C25D 17/12      .. Shape or form ([C25D 17/14](#) takes precedence)
- C25D 17/14      .. for pad-plating
- C25D 17/16      . Apparatus for electrolytic coating of small objects in bulk
- C25D 17/18      .. having closed containers
- C25D 17/20      ... Horizontal barrels
- C25D 17/22      .. 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