

# CPC COOPERATIVE PATENT CLASSIFICATION

## C CHEMISTRY; METALLURGY

(NOTES omitted)

### METALLURGY

#### C25 ELECTROLYTIC OR ELECTROPHORETIC PROCESSES; APPARATUS THEREFOR

(electrodialysis, electro-osmosis, separation of liquids by electricity [B01D](#); {separation of isotopes by electrochemical methods [B01D 59/38](#)}; working of metal by the action of a high concentration of electric current [B23H](#); treatment of water, waste water or sewage by electrochemical methods [C02F 1/46](#); surface treatment of metallic material or coating involving at least one process provided for in class [C23](#) and at least one process covered by this class [C23C 28/00](#), [C23F 17/00](#); anodic or cathodic protection [C23F](#); single-crystal growth [C30B](#); metallising textiles [D06M 11/83](#); decorating textiles by locally metallising [D06Q 1/04](#); electrochemical methods of analysis [G01N](#); electrochemical measuring, indicating or recording devices [G01R](#); electrolytic circuit elements, e.g. capacitors, [H01G](#); electrochemical current or voltage generators [H01M](#))

(NOTES omitted)

#### 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

##### WARNINGS

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

<a href="#">C25D 2/00</a>	covered by	
<a href="#">C25D 5/24</a>	covered by	<a href="#">C25D 5/34</a>
<a href="#">C25D 5/26</a>	covered by	<a href="#">C25D 5/36</a>
<a href="#">C25D 5/28</a>	covered by	<a href="#">C25D 5/38</a>
<a href="#">C25D 5/30</a>	covered by	<a href="#">C25D 5/42</a> , <a href="#">C25D 5/44</a>
<a href="#">C25D 5/32</a>	covered by	<a href="#">C25D 5/46</a>
<a href="#">C25D 13/06</a>	covered by	<a href="#">C09D 5/44</a>
<a href="#">C25D 13/08</a>	covered by	<a href="#">C09D 5/4476</a>
<a href="#">C25D 13/10</a>	covered by	<a href="#">C09D 5/448</a>
<a href="#">C25D 19/00</a>	covered by	<a href="#">C25D 17/00</a>
- 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.

<b>1/00</b>	<b>Electroforming</b>	<b>1/20</b>	• Separation of the formed objects from the electrodes {with no destruction of said electrodes}
1/003	• {3D structures, e.g. superposed patterned layers}	<b>1/22</b>	• • Separating compounds
1/006	• {Nanostructures, e.g. using aluminium anodic oxidation templates [AAO]}	<b>3/00</b>	<b>Electroplating: Baths therefor</b>
1/02	• Tubes; Rings; Hollow bodies	3/02	• from solutions ( <a href="#">C25D 5/34</a> - <a href="#">C25D 5/46</a> take precedence)
1/04	• Wires; Strips; Foils	3/04	• • of chromium
1/06	• Wholly-metallic mirrors	3/06	• • • from solutions of trivalent chromium
1/08	• Perforated or foraminous objects, e.g. sieves ( <a href="#">C25D 1/10</a> takes precedence)	3/08	• • • Deposition of black chromium {, e.g. hexavalent chromium, CrVI}
1/10	• Moulds; Masks; Masterforms {, e.g. mandrels, stampers}	3/10	• • • characterised by the organic bath constituents used
1/12	• by electrophoresis {(electrophoretic coating <a href="#">C25D 13/00</a> )}	3/12	• • of nickel or cobalt {( <a href="#">C25D 3/56</a> takes precedence)}
1/14	• • of inorganic material	3/14	• • • from baths containing acetylenic or heterocyclic compounds
1/16	• • • Metals	3/16	• • • • Acetylenic compounds
1/18	• • of organic material		

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

**WARNING**

Group [C25D 3/665](#) is not complete, pending reorganization, see also [C25D 3/66](#)

### 5/00 Electroplating characterised by the process; Pretreatment or after-treatment of workpieces

- 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](#)
- 5/006 . {Electroplating with applied electromagnetic field, not locally, e.g. for plating magnetic layers}
- 5/02 . Electroplating of selected surface areas
- 5/022 . . {using masking means ([C25D 11/022](#) takes precedence)}
- 5/024 . . {using locally applied electromagnetic radiation, e.g. lasers}
- 5/026 . . {using locally applied jets of electrolyte}
- 5/028 . . {one side electroplating, e.g. substrate conveyed in a bath with inhibited background plating}
- 5/04 . Electroplating with moving electrodes

- 5/06 . . Brush or pad plating {(electrodes for pad plating [C25D 17/14](#))}
- 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)}
- 5/10 . Electroplating with more than one layer of the same or of different metals (for bearings [C25D 7/10](#))
- 5/12 . . at least one layer being of nickel or chromium
- 5/14 . . . two or more layers being of nickel or chromium, e.g. duplex or triplex layers
- 5/16 . Electroplating with layers of varying thickness {, e.g. rough surfaces} {; Hull cells}
- 5/18 . Electroplating using modulated, pulsed or reversing current
- 5/20 . Electroplating using ultrasonics {, vibrations}
- 5/22 . Electroplating combined with mechanical treatment during the deposition
- 5/34 . Pretreatment of metallic surfaces to be electroplated
- 5/36 . . of iron or steel
- 5/38 . . of refractory metals or nickel
- 5/40 . . . Nickel; Chromium
- 5/42 . . of light metals
- 5/44 . . . Aluminium
- 5/46 . . of actinides
- 5/48 . After-treatment of electroplated surfaces
- 5/50 . . by heat-treatment
- 5/505 . . . {of electroplated tin coatings, e.g. by melting}
- 5/52 . . by brightening or burnishing
- 5/54 . Electroplating {on} non-metallic surfaces {, e.g. on carbon or carbon composites} ([C25D 7/12](#) takes precedence)
- 5/56 . . on {thin or conductive} plastics {(coating metallic material [C23C](#))}

### 7/00 Electroplating characterised by the article coated

- 7/001 . {Magnets}

**WARNING**

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

- 7/003 . {Threaded pieces, e.g. bolts, nuts}
- 7/005 . {Jewels or clockworks}
- 7/006 . {Nanoparticles}
- 7/008 . {Thermal barrier coatings}
- 7/02 . Slide fasteners
- 7/04 . Tubes; Rings; Hollow bodies
- 7/06 . Wires; Strips; Foils
- 7/0607 . . {Wires}
- 7/0614 . . {Strips or foils}
- 7/0621 . . . {In horizontal cells}
- 7/0628 . . . {In vertical cells}
- 7/0635 . . . {In radial cells}
- 7/0642 . . . {Anodes}
- 7/065 . . . {Diaphragms}
- 7/0657 . . . {Conducting rolls}
- 7/0664 . . . {Isolating rolls}
- 7/0671 . . . {Selective plating}
- 7/0678 . . . . {using masks}
- 7/0685 . . . {Spraying of electrolyte}

7/0692	. . . {Regulating the thickness of the coating}	11/36	. Phosphatising {, e.g. NiP, CoP, FeP (bath solutions of NiP, CoP, FeP <a href="#">C25D 3/562</a> )}
7/08	. Mirrors; Reflectors	11/38	. Chromatising
7/10	. Bearings	<b>13/00</b>	<b>Electrophoretic coating characterised by the process</b> ( <a href="#">C25D 15/00</a> takes precedence; compositions for electrophoretic coating <a href="#">C09D 5/44</a> )
7/12	. Semiconductors	13/02	. with inorganic material
7/123	. . {coated first with a seed layer, e.g. for filling vias}	13/04	. with organic material
	<b>WARNING</b>	13/06	. . with polymers {(not used, <a href="#">see C09D 5/44</a> )}
	Groups <a href="#">C25D 7/123-C25D 7/126</a> are not complete, pending reorganization, see also <a href="#">C25D 7/12</a>	13/08	. . . by polymerisation in situ of monomeric materials {(not used, <a href="#">see C09D 5/4476</a> )}
7/126	. . {Semiconductors first coated with a seed layer for solar cells}	13/10	. characterised by the additives used {(not used, <a href="#">see C09D 5/448</a> )}
<b>9/00</b>	<b>Electrolytic coating other than with metals</b> ( <a href="#">C25D 11/00</a> , <a href="#">C25D 15/00</a> take precedence; electrophoretic coating <a href="#">C25D 13/00</a> )	13/12	. characterised by the article coated
9/02	. with organic materials	13/14	. . Tubes; Rings; Hollow bodies
9/04	. with inorganic materials	13/16	. . Wires; Strips; Foils
9/06	. . by anodic processes	13/18	. using modulated, pulsed, or reversing current
9/08	. . by cathodic processes	13/20	. Pretreatment
9/10	. . . on iron or steel	13/22	. Servicing or operating {apparatus or multistep processes}
9/12	. . . on light metals	13/24	. . Regeneration of process liquids
<b>11/00</b>	<b>Electrolytic coating by surface reaction, i.e. forming conversion layers</b>	<b>15/00</b>	<b>Electrolytic or electrophoretic production of coatings containing embedded materials, e.g. particles, whiskers, wires</b>
11/005	. {Apparatus specially adapted for electrolytic conversion coating (apparatus in general for electrolytic coating <a href="#">C25D 17/00</a> )}	15/02	. Combined electrolytic and electrophoretic processes {with charged materials}
	<b>WARNING</b>	<b>17/00</b>	<b>Constructional parts, or assemblies thereof, of cells for electrolytic coating</b> (apparatus for continuously conveying articles into baths <a href="#">B65G</a> , e.g. <a href="#">B65G 49/00</a> ; electric devices <a href="#">see</a> the relevant classes, e.g. <a href="#">H01B</a> , <a href="#">H02G</a> ) {( <a href="#">C25D 7/06</a> , <a href="#">C25D 11/005</a> , <a href="#">C25D 13/22</a> , <a href="#">C25</a> takes precedence)}
	Groups <a href="#">C25D 11/005</a> , <a href="#">C25D 11/022-C25D 11/028</a> , <a href="#">C25D 11/045</a> are not complete, pending reorganization, see also <a href="#">C25D 11/00</a>	17/001	. {Apparatus specially adapted for plating wafers, e.g. semiconductors, solar cells}
11/02	. Anodisation		<b>WARNING</b>
11/022	. . {Anodisation on selected surface areas}		Groups <a href="#">C25D 17/005-C25D 17/008</a> are not complete, pending reorganization, see also <a href="#">C25D 17/00</a>
11/024	. . {Anodisation under pulsed or modulated current or potential}	17/002	. {Cell separation, e.g. membranes, diaphragms}
11/026	. . {Anodisation with spark discharge}	17/004	. {Sealing devices}
11/028	. . {Borodising, i.e. borides formed electrochemically}	17/005	. {Contacting devices}
11/04	. . of aluminium or alloys based thereon	17/007	. {Current conducting devices}
11/045	. . . {for forming AAO templates}	17/008	. {Current insulating devices}
11/06	. . . characterised by the electrolytes used	17/02	. Tanks; Installations therefor
11/08	. . . . containing inorganic acids	17/04	. . External supporting frames or structures
11/10	. . . . containing organic acids	17/06	. Suspending or supporting devices for articles to be coated
11/12	. . . Anodising more than once, e.g. in different baths	17/08	. . {Supporting} racks {, i.e. not for suspending}
11/14	. . . Producing integrally coloured layers	17/10	. Electrodes {, e.g. composition, counter electrode}
11/16	. . . Pretreatment {, e.g. desmutting}	17/12	. . Shape or form ( <a href="#">C25D 17/14</a> takes precedence)
11/18	. . . After-treatment, e.g. pore-sealing	17/14	. . for pad-plating
11/20	. . . . Electrolytic after-treatment	17/16	. Apparatus for electrolytic coating of small objects in bulk
11/22	. . . . . for colouring layers	17/18	. . having closed containers
11/24	. . . . Chemical after-treatment	17/20	. . . Horizontal barrels
11/243	. . . . . {using organic dyestuffs}	17/22	. . having open containers
11/246	. . . . . {for sealing layers}	17/24	. . . Oblique barrels
11/26	. . of refractory metals or alloys based thereon	17/26	. . . Oscillating baskets
11/28	. . of actinides or alloys based thereon	17/28	. . with means for moving the objects individually through the apparatus during treatment
11/30	. . of magnesium or alloys based thereon		
11/32	. . of semiconducting materials		
11/34	. . of metals or alloys not provided for in groups <a href="#">C25D 11/04</a> - <a href="#">C25D 11/32</a>		

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

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