

CPC COOPERATIVE PATENT CLASSIFICATION

C CHEMISTRY; METALLURGY

(NOTES omitted)

METALLURGY

C25 ELECTROLYTIC OR ELECTROPHORETIC PROCESSES; APPARATUS THEREFOR

(NOTES omitted)

C25D PROCESSES FOR THE ELECTROLYTIC OR ELECTROPHORETIC PRODUCTION OF COATINGS; ELECTROFORMING; 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:

C25D 2/00	covered by	B23K 28/006
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 19/00	covered by	C25D 17/00

- 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.

1/00	Electroforming	3/24	. . . from cyanide baths
1/003	. {3D structures, e.g. superposed patterned layers}	3/26	. . of cadmium
1/006	. {Nanostructures, e.g. using aluminium anodic oxidation templates [AAO]}	3/28	. . . from cyanide baths
1/02	. Tubes; Rings; Hollow bodies	3/30	. . of tin
1/04	. Wires; Strips; Foils	3/32	. . . characterised by the organic bath constituents used
1/06	. Wholly-metallic mirrors	3/34	. . of lead
1/08	. Perforated or foraminous objects, e.g. sieves (C25D 1/10 takes precedence)	3/36	. . . characterised by the organic bath constituents used
1/10	. Moulds; Masks; Masterforms	3/38	. . of copper
1/12	. by electrophoresis	3/40	. . . from cyanide baths {, e.g. with Cu+}
1/14	. . of inorganic material	3/42	. . of light metals
1/16	. . . Metals	3/44	. . . Aluminium
1/18	. . of organic material	3/46	. . of silver
1/20	. Separation of the formed objects from the electrodes {with no destruction of said electrodes}	3/48	. . of gold
1/22	. . Separating compounds	3/50	. . of platinum group metals
3/00	Electroplating; Baths therefor	3/52	. . . characterised by the organic bath constituents used
3/02	. from solutions (C25D 5/34 - C25D 5/46 take precedence)	3/54	. . of metals not provided for in groups C25D 3/04 - C25D 3/50
3/04	. . of chromium	3/56	. . of alloys
3/06	. . . from solutions of trivalent chromium	3/562	. . . {containing more than 50% by weight of iron or nickel or cobalt}
3/08	. . . Deposition of black chromium {, e.g. hexavalent chromium, CrVI}	3/565	. . . {containing more than 50% by weight of zinc}
3/10	. . . characterised by the organic bath constituents used	3/567	. . . {containing more than 50% by weight of platinum group metals}
3/12	. . of nickel or cobalt	3/58	. . . containing more than 50% by weight of copper
3/14	. . . from baths containing acetylenic or heterocyclic compounds	3/60	. . . containing more than 50% by weight of tin
3/16 Acetylenic compounds	3/62	. . . containing more than 50% by weight of gold
3/18 Heterocyclic compounds	3/64	. . . containing more than 50% by weight of silver
3/20	. . of iron	3/66	. from melts
3/22	. . of zinc	3/665	. . {from ionic liquids}

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

WARNING

Group [C25D 5/00](#) is impacted by reclassification into groups [C25D 5/60](#), [C25D 5/605](#), [C25D 5/611](#), [C25D 5/615](#), [C25D 5/617](#), [C25D 5/619](#), [C25D 5/623](#), [C25D 5/625](#), [C25D 5/627](#), and [C25D 5/67](#).

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

- 5/003 . {Electroplating using gases, e.g. pressure influence}
- 5/006 . {Electroplating with applied electromagnetic field, not locally, e.g. for plating magnetic layers}

(Frozen)

WARNING

Group [C25D 5/006](#) is no longer used for the classification of documents as of August 1, 2020.

The content of this group is being reclassified into groups [C25D 5/007](#), [C25D 5/009](#), [C25D 5/011](#), and [C25D 5/013](#).

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

- 5/007 . {Electroplating using magnetic fields, e.g. magnets}

WARNING

Group [C25D 5/007](#) is incomplete pending reclassification of documents from group [C25D 5/006](#).

Groups [C25D 5/006](#) and [C25D 5/007](#) should be considered in order to perform a complete search.

- 5/009 . . {Deposition of ferromagnetic material}

WARNING

Group [C25D 5/009](#) is incomplete pending reclassification of documents from group [C25D 5/006](#).

Groups [C25D 5/006](#) and [C25D 5/009](#) should be considered in order to perform a complete search.

- 5/011 . {Electroplating using electromagnetic wave irradiation (using locally applied electromagnetic radiation [C25D 5/024](#))}

WARNING

Group [C25D 5/011](#) is incomplete pending reclassification of documents from group [C25D 5/006](#).

Groups [C25D 5/006](#) and [C25D 5/011](#) should be considered in order to perform a complete search.

- 5/013 . . {Wavelengths other than ultra-violet [UV], visible or infra-red [IR], e.g. X-rays or microwaves}

WARNING

Group [C25D 5/013](#) is incomplete pending reclassification of documents from group [C25D 5/006](#).

Groups [C25D 5/006](#) and [C25D 5/013](#) should be considered in order to perform a complete search.

- 5/02 . Electroplating of selected surface areas
- 5/022 . . {using masking means}

WARNING

Group [C25D 5/022](#) is incomplete pending reclassification of documents from group [C25D 11/022](#).

Groups [C25D 11/022](#) and [C25D 5/022](#) should be considered in order to perform a complete search.

- 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
- 5/08 . Electroplating with moving electrolyte e.g. jet electroplating {using locally applied jets of electrolyte [C25D 5/026](#)}

WARNING

Group [C25D 5/08](#) is impacted by reclassification into groups [C25D 5/60](#), [C25D 5/605](#), [C25D 5/611](#), [C25D 5/615](#), [C25D 5/617](#), [C25D 5/619](#), [C25D 5/623](#), [C25D 5/625](#), and [C25D 5/627](#).

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

- 5/10 . Electroplating with more than one layer of the same or of different metals (for bearings [C25D 7/10](#))

WARNING

Group [C25D 5/10](#) is impacted by reclassification into groups [C25D 5/60](#), [C25D 5/605](#), [C25D 5/611](#), [C25D 5/615](#), [C25D 5/617](#), [C25D 5/619](#), [C25D 5/623](#), [C25D 5/625](#), and [C25D 5/627](#).

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

- 5/12 . . at least one layer being of nickel or chromium

WARNING

Group [C25D 5/12](#) is impacted by reclassification into groups [C25D 5/60](#), [C25D 5/605](#), [C25D 5/611](#), [C25D 5/615](#), [C25D 5/617](#), [C25D 5/619](#), [C25D 5/623](#), [C25D 5/625](#), and [C25D 5/627](#).

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

- 5/14 . . . two or more layers being of nickel or chromium, e.g. duplex or triplex layers

WARNING

Group [C25D 5/14](#) is impacted by reclassification into groups [C25D 5/60](#), [C25D 5/605](#), [C25D 5/611](#), [C25D 5/615](#), [C25D 5/617](#), [C25D 5/619](#), [C25D 5/623](#), [C25D 5/625](#), and [C25D 5/627](#).

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

- 5/16 . Electroplating with layers of varying thickness

WARNING

Group [C25D 5/16](#) is impacted by reclassification into groups [C25D 5/60](#), [C25D 5/605](#), [C25D 5/611](#), [C25D 5/615](#), [C25D 5/617](#), [C25D 5/619](#), [C25D 5/623](#), [C25D 5/625](#), and [C25D 5/627](#).

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

- 5/18 . Electroplating using modulated, pulsed or reversing current

WARNING

Group [C25D 5/18](#) is impacted by reclassification into groups [C25D 5/60](#), [C25D 5/605](#), [C25D 5/611](#), [C25D 5/615](#), [C25D 5/617](#), [C25D 5/619](#), [C25D 5/623](#), [C25D 5/625](#), and [C25D 5/627](#).

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

- 5/20 . Electroplating using ultrasonics {, vibrations}

WARNING

Group [C25D 5/20](#) is impacted by reclassification into groups [C25D 5/60](#), [C25D 5/605](#), [C25D 5/611](#), [C25D 5/615](#), [C25D 5/617](#), [C25D 5/619](#), [C25D 5/623](#), [C25D 5/625](#), and [C25D 5/627](#).

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

- 5/22 . Electroplating combined with mechanical treatment during the deposition

WARNING

Group [C25D 5/22](#) is impacted by reclassification into groups [C25D 5/60](#), [C25D 5/605](#), [C25D 5/611](#), [C25D 5/615](#), [C25D 5/617](#), [C25D 5/619](#), [C25D 5/623](#), [C25D 5/625](#), and [C25D 5/627](#).

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

- 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 of non-metallic surfaces ([C25D 7/12](#) takes precedence)

WARNING

Group [C25D 5/54](#) is impacted by reclassification into group [C25D 5/56](#).

Groups [C25D 5/54](#) and [C25D 5/56](#) should be considered in order to perform a complete search.

- 5/56 . . of plastics

WARNING

Group [C25D 5/56](#) is incomplete pending reclassification of documents from group [C25D 5/54](#).

Groups [C25D 5/54](#) and [C25D 5/56](#) should be considered in order to perform a complete search.

- 5/60 . {Electroplating characterised by the structure or texture of the layers}

WARNING

Group [C25D 5/60](#) is incomplete pending reclassification of documents from groups [C25D 5/00](#), [C25D 5/08](#), [C25D 5/10](#), [C25D 5/12](#), [C25D 5/14](#), [C25D 5/16](#), [C25D 5/18](#), [C25D 5/20](#), and [C25D 5/22](#).

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

- 5/605 . . {Surface topography of the layers, e.g. rough, dendritic or nodular layers}

WARNING

Group [C25D 5/605](#) is incomplete pending reclassification of documents from groups [C25D 5/00](#), [C25D 5/08](#), [C25D 5/10](#), [C25D 5/12](#), [C25D 5/14](#), [C25D 5/16](#), [C25D 5/18](#), [C25D 5/20](#), and [C25D 5/22](#).

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

- 5/611 . . . {Smooth layers}

WARNING

Group [C25D 5/611](#) is incomplete pending reclassification of documents from groups [C25D 5/00](#), [C25D 5/08](#), [C25D 5/10](#), [C25D 5/12](#), [C25D 5/14](#), [C25D 5/16](#), [C25D 5/18](#), [C25D 5/20](#), and [C25D 5/22](#).

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

- 5/615 . . {Microstructure of the layers, e.g. mixed structure}

WARNING

Group [C25D 5/615](#) is incomplete pending reclassification of documents from groups [C25D 5/00](#), [C25D 5/08](#), [C25D 5/10](#), [C25D 5/12](#), [C25D 5/14](#), [C25D 5/16](#), [C25D 5/18](#), [C25D 5/20](#), and [C25D 5/22](#).

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

- 5/617 . . . {Crystalline layers}

WARNING

Group [C25D 5/617](#) is incomplete pending reclassification of documents from groups [C25D 5/00](#), [C25D 5/08](#), [C25D 5/10](#), [C25D 5/12](#), [C25D 5/14](#), [C25D 5/16](#), [C25D 5/18](#), [C25D 5/20](#), and [C25D 5/22](#).

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

- 5/619 . . . {Amorphous layers}

WARNING

Group [C25D 5/619](#) is incomplete pending reclassification of documents from groups [C25D 5/00](#), [C25D 5/08](#), [C25D 5/10](#), [C25D 5/12](#), [C25D 5/14](#), [C25D 5/16](#), [C25D 5/18](#), [C25D 5/20](#), and [C25D 5/22](#).

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

- 5/623 . . {Porosity of the layers}

WARNING

Group [C25D 5/623](#) is incomplete pending reclassification of documents from groups [C25D 5/00](#), [C25D 5/08](#), [C25D 5/10](#), [C25D 5/12](#), [C25D 5/14](#), [C25D 5/16](#), [C25D 5/18](#), [C25D 5/20](#), and [C25D 5/22](#).

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

- 5/625 . . {Discontinuous layers, e.g. microcracked layers}

WARNING

Group [C25D 5/625](#) is incomplete pending reclassification of documents from groups [C25D 5/00](#), [C25D 5/08](#), [C25D 5/10](#), [C25D 5/12](#), [C25D 5/14](#), [C25D 5/16](#), [C25D 5/18](#), [C25D 5/20](#), and [C25D 5/22](#).

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

- 5/627 . {Electroplating characterised by the visual appearance of the layers, e.g. colour, brightness or mat appearance}

WARNING

Group [C25D 5/627](#) is incomplete pending reclassification of documents from groups [C25D 5/00](#), [C25D 5/08](#), [C25D 5/10](#), [C25D 5/12](#), [C25D 5/14](#), [C25D 5/16](#), [C25D 5/18](#), [C25D 5/20](#), and [C25D 5/22](#).

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

- 5/67 . {Electroplating to repair workpiece}

WARNING

Group [C25D 5/67](#) is incomplete pending reclassification of documents from group [C25D 5/00](#).

Groups [C25D 5/00](#) and [C25D 5/67](#) should be considered in order to perform a complete search.

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

WARNING

Group [C25D 7/00](#) is impacted by reclassification into group [C25D 7/005](#).

Groups [C25D 7/00](#) and [C25D 7/005](#) should be considered in order to perform a complete search.

- 7/001 . {Magnets}
7/003 . {Threaded pieces, e.g. bolts or nuts}

- 7/005 . {Jewels; Clockworks; Coins}

WARNING

Group [C25D 7/005](#) is incomplete pending reclassification of documents from group [C25D 7/00](#).

Groups [C25D 7/00](#) and [C25D 7/005](#) should be considered in order to perform a complete search.

- 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}
 7/08 . Mirrors; Reflectors
 7/10 . Bearings
 7/12 . Semiconductors

WARNING

Group [C25D 7/12](#) is impacted by reclassification into groups [C25D 7/123](#) and [C25D 7/126](#).

Groups [C25D 7/12](#), [C25D 7/123](#), and [C25D 7/126](#) should be considered in order to perform a complete search.

- 7/123 . . {Semiconductors first coated with a seed layer or a conductive layer}

WARNING

Group [C25D 7/123](#) is incomplete pending reclassification of documents from group [C25D 7/12](#).

Groups [C25D 7/12](#) and [C25D 7/123](#) should be considered in order to perform a complete search.

- 7/126 . . . {for solar cells}

WARNING

Group [C25D 7/126](#) is incomplete pending reclassification of documents from group [C25D 7/12](#).

Groups [C25D 7/12](#) and [C25D 7/126](#) should be considered in order to perform a complete search.

- 9/00 Electrolytic coating other than with metals**
[\(C25D 11/00, C25D 15/00 take precedence; electrophoretic coating C25D 13/00\)](#)

- 9/02 . with organic materials
 9/04 . with inorganic materials

- 9/06 . . by anodic processes
 9/08 . . by cathodic processes
 9/10 . . . on iron or steel
 9/12 . . . on light metals

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

- 11/005 . {Apparatus specially adapted for electrolytic conversion coating (apparatus in general for electrolytic coating [C25D 17/00](#))}
 11/02 . Anodisation
 11/022 . . {Anodisation on selected surface areas}

WARNING

Group [C25D 11/022](#) is impacted by reclassification into group [C25D 5/022](#).

Groups [C25D 11/022](#) and [C25D 5/022](#) should be considered in order to perform a complete search.

- 11/024 . . {Anodisation under pulsed or modulated current or potential}
 11/026 . . {Anodisation with spark discharge}
 11/028 . . {Borodising, i.e. borides formed electrochemically}
 11/04 . . of aluminium or alloys based thereon
 11/045 . . . {for forming AAO templates}
 11/06 . . . characterised by the electrolytes used
 11/08 containing inorganic acids
 11/10 containing organic acids
 11/12 . . . Anodising more than once, e.g. in different baths
 11/14 . . . Producing integrally coloured layers
 11/16 . . . Pretreatment {, e.g. desmutting}
 11/18 . . . After-treatment, e.g. pore-sealing
 11/20 Electrolytic after-treatment
 11/22 for colouring layers
 11/24 Chemical after-treatment
 11/243 {using organic dyestuffs}
 11/246 {for sealing layers}
 11/26 . . of refractory metals or alloys based thereon
 11/28 . . of actinides or alloys based thereon
 11/30 . . of magnesium or alloys based thereon
 11/32 . . of semiconducting materials
 11/34 . . of metals or alloys not provided for in groups [C25D 11/04 - C25D 11/32](#)
 11/36 . Phosphatising
 11/38 . Chromatising

13/00 Electrophoretic coating characterised by the process ([C25D 15/00](#) takes precedence; compositions for electrophoretic coating [C09D 5/44](#))

- 13/02 . with inorganic material
 13/04 . with organic material
 13/06 . . with polymers {(not used, see [C09D 5/44](#))}
 13/08 . . . by polymerisation *in situ* of monomeric materials {(not used, see [C09D 5/4476](#))}
 13/10 . characterised by the additives used {(not used, see [C09D 5/448](#))}
 13/12 . characterised by the article coated
 13/14 . . Tubes; Rings; Hollow bodies
 13/16 . . Wires; Strips; Foils
 13/18 . using modulated, pulsed, or reversing current
 13/20 . Pretreatment

13/22	• Servicing or operating {apparatus or multistep processes}	21/16	• Regeneration of process solutions
13/24	• • Regeneration of process liquids		<u>WARNING</u>
	<u>WARNING</u>		Groups C25D 21/16 - C25D 21/22 are incomplete pending reclassification of documents from group C25D 13/24 .
	Group C25D 13/24 is impacted by reclassification into groups C25D 21/16 , C25D 21/18 , C25D 21/20 , and C25D 21/22 .		All groups listed in this Warning should be considered in order to perform a complete search.
	All groups listed in this Warning should be considered in order to perform a complete search.		
15/00	Electrolytic or electrophoretic production of coatings containing embedded materials, e.g. particles, whiskers, wires	21/18	• • of electrolytes (C25D 21/22 takes precedence)
15/02	• Combined electrolytic and electrophoretic processes {with charged materials}	21/20	• • of rinse-solutions (C25D 21/22 takes precedence)
		21/22	• • by ion-exchange
17/00	Constructional parts, or assemblies thereof, of cells for electrolytic coating		
17/001	• {Apparatus specially adapted for electrolytic coating of wafers, e.g. semiconductors or solar cells}		
17/002	• {Cell separation, e.g. membranes, diaphragms}		
17/004	• {Sealing devices}		
17/005	• {Contacting devices}		
17/007	• {Current directing devices}		
17/008	• {Current shielding devices}		
17/02	• Tanks; Installations therefor		
17/04	• • External supporting frames or structures		
17/06	• Suspending or supporting devices for articles to be coated		
17/08	• • {Supporting} racks {, i.e. not for suspending}		
17/10	• Electrodes {, e.g. composition, counter electrode}		
17/12	• • Shape or form (C25D 17/14 takes precedence)		
17/14	• • for pad-plating		
17/16	• Apparatus for electrolytic coating of small objects in bulk		
17/18	• • having closed containers		
17/20	• • • Horizontal barrels		
17/22	• • having open containers		
17/24	• • • Oblique barrels		
17/26	• • • Oscillating baskets		
17/28	• • with means for moving the objects individually through the apparatus during treatment		
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}		
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		