

# CPC COOPERATIVE PATENT CLASSIFICATION

## B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

### SEPARATING; MIXING

## B05 SPRAYING OR ATOMISING IN GENERAL; APPLYING FLUENT MATERIALS TO SURFACES, IN GENERAL

(NOTE omitted)

## B05D PROCESSES FOR APPLYING FLUENT MATERIALS TO SURFACES, IN GENERAL (conveying articles or workpieces through baths of liquid [B65G](#), e.g. [B65G 49/02](#))

### NOTES

1. This subclass covers:
  - processes for applying liquids or other fluent materials to a surface or part of a surface, in general, by any mechanical or physical method and particularly processes producing a uniform distribution of liquids or other fluent materials on a surface;
  - pretreatment of surfaces to which liquids or other fluent materials are to be applied;
  - after-treatment of applied coatings.
2. Attention is drawn to the Note following the title of class [B05](#).

### WARNING

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>Processes for applying liquids or other fluent materials (<a href="#">B05D 5/00</a>, <a href="#">B05D 7/00</a> take precedence)</b>    | 1/265 | • • {Extrusion coatings}   |
| 1/002       | • {the substrate being rotated}   | 1/28  | • performed by transfer from the surfaces of elements carrying the liquid or other fluent material, e.g. brushes, pads, rollers                  |
| 1/005       | • • {Spin coating}  |       |  |
| 1/007       | • {using an electrostatic field ( <a href="#">B05D 1/02</a> - <a href="#">B05D 1/16</a> take precedence)}                                 | 1/283 | • • {Transferring monomolecular layers or solutions of molecules adapted for forming monomolecular layers from carrying elements}                |
| 1/02        | • performed by spraying   | 1/286 | • • {using a temporary backing to which the coating has been applied}  |
| 1/025       | • • {using gas close to its critical state}   | 1/30  | • performed by gravity only, i.e. flow coating   |
| 1/04        | • • involving the use of an electrostatic field {( <a href="#">B05D 1/025</a> and <a href="#">B05D 1/14</a> take precedence)}             | 1/305 | • • {Curtain coating}  |
| 1/045       | • • • {on non-conductive substrates}  | 1/32  | • using means for protecting parts of a surface not to be coated, e.g. using stencils, resists   |
| 1/06        | • • • Applying particulate materials  | 1/322 | • • {Removable films used as masks}  |
| 1/08        | • • Flame spraying  | 1/325 | • • • {Masking layer made of peelable film}  |
| 1/10        | • • • Applying particulate materials  | 1/327 | • • • {Masking layer made of washable film}  |
| 1/12        | • • Applying particulate materials ( <a href="#">B05D 1/06</a> , <a href="#">B05D 1/10</a> take precedence)                               | 1/34  | • Applying different liquids or other fluent materials simultaneously  |
| 1/14        | • • • Flocking  | 1/36  | • Successively applying liquids or other fluent materials, e.g. without intermediate treatment   |
| 1/16        | • Flocking otherwise than by spraying   | 1/38  | • • with intermediate treatment ( <a href="#">intermediate treatment per se B05D 3/00</a> )  |
| 1/18        | • performed by dipping  | 1/40  | • Distributing applied liquids or other fluent materials by members moving relatively to surface   |
| 1/185       | • • {applying monomolecular layers ( <a href="#">B05D 1/204</a> takes precedence)}  | 1/42  | • • by non-rotary members  |
| 1/20        | • • substances to be applied floating on a fluid  | 1/60  | • {Deposition of organic layers from vapour phase (vapour phase deposition in general <a href="#">C23C 14/00</a> , <a href="#">C23C 16/00</a> )} |
| 1/202       | • • • {Langmuir Blodgett films (LB films)}  | 1/62  | • {Plasma-deposition of organic layers (plasma deposition in general <a href="#">C23C 14/00</a> , <a href="#">C23C 16/00</a> )}                  |
| 1/204       | • • • • {LB techniques}   |       |  |
| 1/206       | • • • • {LB troughs}  |       |  |
| 1/208       | • • • • {After-treatment of monomolecular films}  |       |  |
| 1/22        | • • using fluidised-bed technique ( <a href="#">fluidised-bed technique in general B01J 8/24</a> )  |       |  |
| 1/24        | • • • Applying particulate materials  |       |  |
| 1/26        | • performed by applying the liquid or other fluent material from an outlet device in contact with, or almost in contact with, the surface |       |  |

|             |  |             |   |
|-------------|--|-------------|---|
| <b>3/00</b> | <b>Pretreatment of surfaces to which liquids or other fluent materials are to be applied; After-treatment of applied coatings, e.g. intermediate treating of an applied coating preparatory to subsequent applications of liquids or other fluent materials (successively applying liquids or other fluent materials <a href="#">B05D 1/36</a>; drying ovens <a href="#">F26B</a>)</b> | 3/141       | . . . {Plasma treatment}  |
| 3/002       | . {Pretreatment}   | 3/142       | . . . . {Pretreatment}  |
| 3/005       | . . {Pretreatment for allowing a non-conductive substrate to be electrostatically coated}  | 3/144       | . . . . {of polymeric substrates}   |
| 3/007       | . {After-treatment}  | 3/145       | . . . . {After-treatment}   |
| 3/02        | . by baking { ( <a href="#">B05D 3/04</a> takes precedence) }  | 3/147       | . . . . {Curing}  |
| 3/0209      | . . {Multistage baking}  | 3/148       | . . . . {affecting the surface properties of the coating}   |
| 3/0218      | . . {Pretreatment, e.g. heating the substrate}   | 3/20        | . {by magnetic fields}  |
| 3/0227      | . . . {with IR heaters}  | 3/203       | . . {pre-treatment by magnetic fields}  |
| 3/0236      | . . . {with ovens ( <a href="#">B05D 3/0227</a> takes precedence) }  | 3/207       | . . {post-treatment by magnetic fields}   |
| 3/0245      | . . . {with induction heating}   | <b>5/00</b> | <b>Processes for applying liquids or other fluent materials to surfaces to obtain special surface effects, finishes or structures</b>   |
| 3/0254      | . . {After-treatment}  | 5/005       | . {Repairing damaged coatings}  |
| 3/0263      | . . . {with IR heaters}  | 5/02        | . to obtain a matt or rough surface   |
| 3/0272      | . . . {with ovens}   | 5/04        | . to obtain a surface receptive to ink or other liquid ( <a href="#">B05D 5/02</a> , { <a href="#">B41M 5/52</a> } take precedence)   |
| 3/0281      | . . . {with induction heating}   | 5/06        | . to obtain multicolour or other optical effects ( <a href="#">B05D 5/02</a> takes precedence)  |
| 3/029       | . . . {with microwaves}  | 5/061       | . . {Special surface effect}  |
| 3/04        | . by exposure to gases   | 5/062       | . . . {Wrinkled, cracked or ancient-looking effect}   |
| 3/0406      | . . {the gas being air}  | 5/063       | . . . {Reflective effect ( <a href="#">B05D 5/067</a> takes precedence) }   |
| 3/0413      | . . . {Heating with air}   | 5/065       | . . {having colour interferences or colour shifts or opalescent looking, flip-flop, two tones}  |
| 3/042       | . . . {Directing or stopping the fluid to be coated with air}  | 5/066       | . . . {achieved by multilayers}   |
| 3/0426      | . . . {Cooling with air}   | 5/067       | . . {Metallic effect}   |
| 3/0433      | . . {the gas being a reactive gas}   | 5/068       | . . . {achieved by multilayers ( <a href="#">B05D 5/066</a> takes precedence) }   |
| 3/044       | . . . {Pretreatment}   | 5/08        | . to obtain an anti-friction or anti-adhesive surface (rendering particulate materials free-flowing in general, e.g. making them hydrophobic <a href="#">B01J 2/30</a> )  |
| 3/0446      | . . . . {of a polymeric substrate}   | 5/083       | . . {involving the use of fluoropolymers}   |
| 3/0453      | . . . {After-treatment}  | 5/086       | . . . {having an anchoring layer}   |
| 3/046       | . . . . {Curing or evaporating the solvent}  | 5/10        | . to obtain an adhesive surface   |
| 3/0466      | . . {the gas being a non-reacting gas ( <a href="#">B05D 3/0406</a> takes precedence) }  | 5/12        | . to obtain a coating with specific electrical properties   |
| 3/0473      | . . . {for heating, e.g. vapour heating}   | <b>7/00</b> | <b>Processes, other than flocking, specially adapted for applying liquids or other fluent materials to particular surfaces or for applying particular liquids or other fluent materials {(coating of foodstuffs <a href="#">A23P 20/17</a>, <a href="#">A23P 20/15</a>, <a href="#">A23P 20/18</a>) }</b> |
| 3/048       | . . . {for cooling}  | 7/02        | . to macromolecular substances, e.g. rubber (treatment or coating of shaped articles made of macromolecular substances <a href="#">C08J 7/00</a> )  |
| 3/0486      | . . {Operating the coating or treatment in a controlled atmosphere}  | 7/04        | . . to surfaces of films or sheets (producing layered products by applying coatings of pasty or pulverulent plastics <a href="#">B29C 41/00</a> )   |
| 3/0493      | . . {using vacuum}   | 7/06        | . to wood   |
| 3/06        | . by exposure to radiation ( <a href="#">B05D 3/02</a> takes precedence ; plasma treatment <a href="#">B05D 3/141</a> ) }  | 7/08        | . . using synthetic lacquers or varnishes   |
| 3/061       | . . {using U.V.}   | 7/10        | . . . based on cellulose derivatives  |
| 3/062       | . . . {Pretreatment}   | 7/12        | . to leather (chemical treatment of leather <a href="#">C14C</a> ; dyeing leather <a href="#">D06P</a> )  |
| 3/063       | . . . . {of polymeric substrates ( <a href="#">B05D 3/064</a> takes precedence) }  | 7/14        | . to metal, e.g. car bodies (involving a chemical reaction between the metal and the coating <a href="#">C23</a> )  |
| 3/064       | . . . . {involving also the use of a gas}  | 7/142       | . . {Auto-deposited coatings, i.e. autophoretic coatings}   |
| 3/065       | . . . {After-treatment}  | 7/144       | . . . {After-treatment of auto-deposited coatings}  |
| 3/066       | . . . . {involving also the use of a gas}  | 7/146       | . . {to metallic pipes or tubes (processes for coating the interior of pipes <a href="#">B05D 7/222</a> ) }   |
| 3/067       | . . . . {Curing or cross-linking the coating}  | 7/148       | . . {using epoxy-polyolefin systems in mono- or multilayers}  |
| 3/068       | . . {using ionising radiations (gamma, X, electrons) }   | 7/16        | . . using synthetic lacquers or varnishes   |
| 3/08        | . by flames  |             |   |
| 3/10        | . by other chemical means  |             |   |
| 3/101       | . . {Pretreatment of polymeric substrate}  |             |   |
| 3/102       | . . {Pretreatment of metallic substrates ( <a href="#">C23C</a> takes precedence) }  |             |   |
| 3/104       | . . {Pretreatment of other substrates}   |             |   |
| 3/105       | . . {Intermediate treatments}  |             |   |
| 3/107       | . . {Post-treatment of applied coatings}   |             |   |
| 3/108       | . . . {Curing}   |             |   |
| 3/12        | . by mechanical means  |             |   |
| 3/14        | . by electrical means  |             |   |

- 7/18 . . . based on cellulose derivatives
- 7/20 . to wires (for insulating electric cables [H01B 13/16](#))
- 7/22 . to internal surfaces, e.g. of tubes
- 7/222 . . {of pipes}
- 7/225 . . . {Coating inside the pipe}
- 7/227 . . {of containers, cans or the like}
- 7/24 . for applying particular liquids or other fluent materials
- 7/26 . . synthetic lacquers or varnishes ([B05D 7/08](#), [B05D 7/16](#) take precedence)
- 7/50 . {Multilayers}

**NOTE**

A possible inorganic pretreatment or coating on the substrate such as chromatation, phosphatation, plating, is not counted as a layer. This group covers mostly multilayers characterised by each layer and the succession of them (laminates in general [B32B](#))

- 7/51 . . {One specific pretreatment, e.g. phosphatation, chromatation, in combination with one specific coating (pretreatment of metallic substrates [C23C](#); pretreatment before coating in general [B05D 3/00](#))}
- 7/52 . . {Two layers}
- 7/53 . . . {Base coat plus clear coat type}
- 7/532 . . . . {the two layers being cured or baked together, i.e. wet on wet}
- 7/5323 . . . . . {the two layers being applied simultaneously}
- 7/534 . . . . {the first layer being let to dry at least partially before applying the second layer ([B05D 7/538](#) takes precedence)}
- 7/536 . . . . {each layer being cured, at least partially, separately}
- 7/538 . . . . {No curing step for the last layer}
- 7/5383 . . . . . {No curing step for any layer}
- 7/5385 . . . . . {the two layers being applied simultaneously}
- 7/54 . . . {No clear coat specified}
- 7/542 . . . . {the two layers being cured or baked together}
- 7/5423 . . . . . {the two layers being applied simultaneously}
- 7/544 . . . . {the first layer is let to dry at least partially before applying the second layer}
- 7/546 . . . . {each layer being cured, at least partially, separately}
- 7/548 . . . . {No curing step for the last layer}
- 7/5483 . . . . . {No curing step for any layer}
- 7/5485 . . . . . {the two layers being applied simultaneously}
- 7/56 . . {Three layers or more}
- 7/57 . . . {the last layer being a clear coat}
- 7/572 . . . . {all layers being cured or baked together}
- 7/5723 . . . . . {all layers being applied simultaneously}
- 7/574 . . . . {at least some layers being let to dry at least partially before applying the next layer ([B05D 7/577](#) takes precedence)}
- 7/576 . . . . {each layer being cured, at least partially, separately}
- 7/577 . . . . {some layers being coated "wet-on-wet", the others not}

- 7/578 . . . . {No curing step for the last layer}
- 7/5783 . . . . . {No curing step for any layer}
- 7/5785 . . . . . {all layers being applied simultaneously}
- 7/58 . . . {No clear coat specified}
- 7/582 . . . . {all layers being cured or baked together}
- 7/5823 . . . . . {all layers being applied simultaneously}
- 7/584 . . . . {at least some layers being let to dry, at least partially, before applying the next layer ([B05D 7/587](#) takes precedence)}
- 7/586 . . . . {each layer being cured, at least partially, separately}
- 7/587 . . . . {some layers being coated "wet-on-wet", the others not}
- 7/588 . . . . {No curing step for the last layer}
- 7/5883 . . . . . {No curing step for any layer}
- 7/5885 . . . . . {all layers being applied simultaneously}

**2201/00 Polymeric substrate or laminate**

- 2201/02 . Polymeric substrate
- 2201/04 . Laminate
- 2201/06 . . Laminate of which the last layer is not a polymer

**Substrate****2202/00 Metallic substrate**

- 2202/10 . based on Fe
- 2202/15 . . Stainless steel
- 2202/20 . based on light metals
- 2202/25 . . based on Al
- 2202/30 . based on refractory metals (Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, W)
- 2202/35 . . based on Ti
- 2202/40 . based on other transition elements
- 2202/45 . . based on Cu

**2203/00 Other substrates**

- 2203/20 . Wood or similar material
- 2203/22 . Paper or cardboard
- 2203/24 . Leather
- 2203/30 . Other inorganic substrates, e.g. ceramics, silicon
- 2203/35 . . Glass

**2210/00 Applying material to more than three types of substrate materials****2252/00 Sheets**

- 2252/02 . of indefinite length
- 2252/04 . of definite length in a continuous process
- 2252/10 . Applying the material on both sides

**Shape of substrate****2254/00 Tubes**

- 2254/02 . Applying the material on the exterior of the tube
- 2254/04 . Applying the material on the interior of the tube
- 2254/06 . . Applying the material on the interior and exterior of the tube

**2256/00 Wires or fibres****2258/00 Small objects (e.g. screws)**

- 2258/02 . The objects being coated one after the other

**2259/00** Applying the material to the internal surface of hollow articles other than tubes**2301/00** Inorganic additives or organic salts thereof

- 2301/10 . Phosphates, phosphoric acid or organic salts thereof
- 2301/20 . Chromates, chromic acid or organic salts thereof
- 2301/30 . Acids
- 2301/50 . Bases

**Additives other than fillers present in the coating material or in the coating bath****2320/00** Organic additives

- 2320/10 . Detergents

**2350/00** Pretreatment of the substrate

- 2350/10 . Phosphatation
- 2350/20 . Chromatation
- 2350/30 . Change of the surface
  - 2350/33 . . Roughening
  - 2350/35 . . . by chemical means
  - 2350/38 . . . by mechanical means
  - 2350/40 . . . by adding a porous layer
  - 2350/50 . . Smoothing
- 2350/60 . Adding a layer before coating
- 2350/63 . . ceramic layer
- 2350/65 . . metal layer

**Pretreatment of the substrates****2400/00** Indexing scheme for single layers or multilayers**2401/00** Form of the coating product, e.g. solution, water dispersion, powders or the like

- 2401/10 . Organic solvent ([B05D 2401/21 takes precedence](#))
- 2401/20 . Aqueous dispersion or solution
- 2401/21 . . Mixture of organic solvent and water
- 2401/30 . the coating being applied in other forms than involving eliminable solvent, diluent or dispersant
  - 2401/31 . . applied as mixtures of monomers and polymers
  - 2401/32 . . applied as powders
  - 2401/33 . . applied as vapours polymerising in situ

**NOTE**

A process should be classified or coded in [B05D 1/60](#) or [B05D 1/62](#)

- 2401/40 . where the carrier is not clearly specified
- 2401/50 . where organic solvent or water can be used as alternative
- 2401/60 . non aqueous inorganic solvent ([B05D 2401/90 takes precedence](#))
- 2401/90 . at least one component of the composition being in supercritical state or close to supercritical state

**2420/00** Indexing scheme corresponding to the position of each layer within a multilayer coating relative to the substrate

- 2420/01 . first layer from the substrate side
- 2420/02 . second layer from the substrate side

- 2420/03 . third layer from the substrate side
- 2420/04 . fourth layer from the substrate side
- 2420/05 . fifth layer from the substrate side

**2425/00** Indexing scheme corresponding to the position of each layer within a multilayer coating relative to the surface

- 2425/01 . top layer/ last layer, i.e. first layer from the top surface
- 2425/02 . second layer from the top surface
- 2425/03 . third layer from the top surface
- 2425/04 . fourth layer from the top surface
- 2425/05 . fifth layer from the top surface

**2430/00** Component used as a filler in the composition**2451/00** Type of carrier, type of coating (Multilayers)**2490/00** Intermixed layers

- 2490/50 . compositions varying with a gradient perpendicular to the surface
- 2490/60 . compositions varying with a gradient parallel to the surface

**2500/00** Indexation scheme for the composition of layers**NOTE**

**L05D5\*\*/\*\*** codes may be combined with one or more codes of the series [B05D 2400/00](#) with a + sign. Example : [B05D 2503/00](#) + [B05D 2420/01](#) + [B05D 2420/02](#)

**2501/00** Varnish or unspecified clear coat

- 2501/10 . Wax

**Type of polymer or polymer coating****2502/00** Acrylic polymers

- 2502/005 . modified

**2503/00** Polyurethanes**2504/00** Epoxy polymers**2505/00** Polyamides

- 2505/50 . Polyimides

**2506/00** Halogenated polymers

- 2506/10 . Fluorinated polymers
- 2506/15 . . Polytetrafluoroethylene [PTFE]
- 2506/20 . Chlorinated polymers
- 2506/25 . . PVC ([B05D 2520/10 takes precedence](#))

**2507/00** Polyolefins

- 2507/005 . modified
- 2507/01 . Polyethylene
- 2507/015 . . modified
- 2507/02 . Polypropylene
- 2507/025 . . modified

**2508/00** Polyesters**2518/00** Other type of polymers

- 2518/10 . Silicon-containing polymers
- 2518/12 . . Ceramic precursors (polysiloxanes, polysilazanes)

**2520/00** Water-based dispersions

- 2520/05 . Latex
- 2520/10 . PVC [Plastisol]

**2530/00 Rubber or the like****2601/00 Inorganic fillers**

2601/02 . used for pigmentation effect, e.g. metallic effect

2601/04 . . Mica

2601/06 . . . Coated Mica

2601/08 . . Aluminium flakes or platelets

2601/10 . . Other metals

2601/20 . used for non-pigmentation effect

2601/22 . . Silica

2601/24 . . Titanium dioxide, e.g. rutile

2601/26 . . Abrasives

2601/28 . . Metals

**2602/00 Organic fillers**

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**2701/00 Coatings being able to withstand changes in the shape of the substrate or to withstand welding**

2701/10 . withstanding draw and redraw process, punching

2701/20 . withstanding rolling

2701/30 . withstanding bending

2701/40 . withstanding welding