

**CPC****COOPERATIVE PATENT CLASSIFICATION****B05D**

**PROCESSES FOR APPLYING LIQUIDS OR OTHER FLUENT MATERIALS TO SURFACES, IN GENERAL** (apparatus for applying liquids or other fluent materials to surfaces [B05B](#), [B05C](#); {coating of foodstuffs [A23P 1/084](#), [A23P 1/085](#)})

**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](#).

**B05D 1/00**

**Processes for applying liquids or other fluent materials** ([B05D 5/00](#), [B05D 7/00](#) take precedence)

B05D 1/002

- . {the substrate being rotated}

B05D 1/005

- . . {Spin coating}

B05D 1/007

- . {using an electrostatic field ([B05D 1/02](#) to [B05D 1/16](#) take precedence)}

B05D 1/02

- . performed by spraying

B05D 1/025

- . . {using gas close to its critical state}

B05D 1/04

- . . involving the use of an electrostatic field {([B05D 1/025](#) and [B05D 1/14](#) take precedence)}

B05D 1/045

- . . . {on non-conductive substrates}

B05D 1/06

- . . . Applying particulate materials

B05D 1/08

- . . Flame spraying

B05D 1/10

- . . . Applying particulate materials

B05D 1/12

- . . Applying particulate materials ([B05D 1/06](#), [B05D 1/10](#) take precedence)

B05D 1/14

- . . . Flocking

B05D 1/16

- . Flocking otherwise than by spraying

B05D 1/18

- . performed by dipping

B05D 1/185

- . . {applying monomolecular layers ([B05D 1/204](#) takes precedence)}

B05D 1/20

- . . substances to be applied floating on a fluid

B05D 1/202

- . . . {Langmuir Blodgett films (LB films)}

B05D 1/204

- . . . . {LB techniques}

B05D 1/206

- . . . . {LB troughs}

B05D 1/208

- . . . . {After-treatment of monomolecular films}

B05D 1/22

- . . using fluidised-bed technique (fluidised-bed technique in general [B01J 8/24](#))

B05D 1/24

- . . . Applying particulate materials

- B05D 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
- B05D 1/265
  - . {Extrusion coatings}
- B05D 1/28
  - performed by transfer from the surfaces of elements carrying the liquid or other fluent material, e.g. brushes, pads, rollers
- B05D 1/283
  - . {Transferring monomolecular layers or solutions of molecules adapted for forming monomolecular layers from carrying elements}
- B05D 1/286
  - . {using a temporary backing to which the coating has been applied}
- B05D 1/30
  - performed by gravity only, i.e. flow coating
- B05D 1/305
  - . {Curtain coating}
- B05D 1/32
  - using means for protecting parts of a surface not to be coated, e.g. using stencils, resists
- B05D 1/322
  - . {Removable films used as masks}
- B05D 1/325
  - . . {Masking layer made of peelable film}
- B05D 1/327
  - . . {Masking layer made of washable film}
- B05D 1/34
  - Applying different liquids or other fluent materials simultaneously
- B05D 1/36
  - Successively applying liquids or other fluent materials, e.g. without intermediate treatment
- B05D 1/38
  - . with intermediate treatment ([intermediate treatment per se B05D 3/00](#))
- B05D 1/40
  - Distributing applied liquids or other fluent materials by members moving relatively to surface
- B05D 1/42
  - . by non-rotary members
- B05D 1/60
  - {Deposition of organic layers from vapour phase ([vapour phase deposition in general C23C 14/00, C23C 16/00](#))}
- B05D 1/62
  - {Plasma-deposition of organic layers ([plasma deposition in general C23C 14/00, C23C 16/00](#))}
- B05D 3/00**

**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 B05D 1/36](#); [drying ovens F26B](#))**
- B05D 3/002
  - {Pretreatment}
- B05D 3/005
  - . {Pretreatment for allowing a non-conductive substrate to be electrostatically coated}
- B05D 3/007
  - {After-treatment}
- B05D 3/02
  - by baking {([B05D 3/04](#) takes precedence)}
- B05D 3/0209
  - . {Multistage baking}
- B05D 3/0218
  - . {Pretreatment, e.g. heating the substrate}
- B05D 3/0227
  - . . {with IR heaters}
- B05D 3/0236
  - . . {with ovens ([B05D 3/0227](#) takes precedence)}
- B05D 3/0245
  - . . {with induction heating}
- B05D 3/0254
  - . {After-treatment}
- B05D 3/0263
  - . . {with IR heaters}

- B05D 3/0272 . . . {with ovens}
- B05D 3/0281 . . . {with induction heating}
- B05D 3/029 . . . {with microwaves}
- B05D 3/04 . by exposure to gases
- B05D 3/0406 . . {the gas being air}
- B05D 3/0413 . . . {Heating with air}
- B05D 3/042 . . . {Directing or stopping the fluid to be coated with air}
- B05D 3/0426 . . . {Cooling with air}
- B05D 3/0433 . . {the gas being a reactive gas}
- B05D 3/044 . . . {Pretreatment}
- B05D 3/0446 . . . . {of a polymeric substrate}
- B05D 3/0453 . . . {After-treatment}
- B05D 3/046 . . . . {Curing or evaporating the solvent}
- B05D 3/0466 . . {the gas being a non-reacting gas ([B05D 3/0406](#) takes precedence)}
- B05D 3/0473 . . . {for heating, e.g. vapour heating}
- B05D 3/048 . . . {for cooling}
- B05D 3/0486 . . {Operating the coating or treatment in a controlled atmosphere}
- B05D 3/0493 . . {using vacuum}
- B05D 3/06 . by exposure to radiation ([B05D 3/02](#) takes precedence; {plasma treatment [B05D 3/141](#)})
- B05D 3/061 . . {using U.V.}
- B05D 3/062 . . . {Pretreatment}
- B05D 3/063 . . . . {of polymeric substrates ([B05D 3/064](#) takes precedence)}
- B05D 3/064 . . . . {involving also the use of a gas}
- B05D 3/065 . . . {After-treatment}
- B05D 3/066 . . . . {involving also the use of a gas}
- B05D 3/067 . . . . {Curing or cross-linking the coating}
- B05D 3/068 . . {using ionising radiations (gamma, X, electrons)}
- B05D 3/08 . by flames
- B05D 3/10 . by other chemical means
- B05D 3/101 . . {Pretreatment of polymeric substrate}
- B05D 3/102 . . {Pretreatment of metallic substrates ([C23C](#) takes precedence)}
- B05D 3/104 . . {Pretreatment of other substrates}
- B05D 3/105 . . {Intermediate treatments}
- B05D 3/107 . . {Post-treatment of applied coatings}
- B05D 3/108 . . . {Curing}
- B05D 3/12 . by mechanical means
- B05D 3/14 . by electrical means
- B05D 3/141 . . {Plasma treatment}
- B05D 3/142 . . . {Pretreatment}

- B05D 3/144 . . . . {of polymeric substrates}
- B05D 3/145 . . . {After-treatment}
- B05D 3/147 . . . . {Curing}
- B05D 3/148 . . . . {affecting the surface properties of the coating}
- B05D 3/20 . . {by magnetic fields}
- B05D 3/203 . . {pre-treatment by magnetic fields}
- B05D 3/207 . . {post-treatment by magnetic fields}

**B05D 5/00****Processes for applying liquids or other fluent materials to surfaces to obtain special surface effects, finishes or structures**

- B05D 5/005 . {Repairing damaged coatings}
- B05D 5/02 . to obtain a matt or rough surface
- B05D 5/04 . to obtain a surface receptive to ink or other liquid ([B05D 5/02](#), [B41M 5/52](#) take precedence)
- B05D 5/06 . to obtain multicolour or other optical effects ([B05D 5/02](#) takes precedence)
- B05D 5/061 . . {Special surface effect}
- B05D 5/062 . . . {Wrinkled, cracked or ancient-looking effect}
- B05D 5/063 . . . {Reflective effect ([B05D 5/067](#) takes precedence)}
- B05D 5/065 . . {having colour interferences or colour shifts or opalescent looking, flip-flop, two tones}
- B05D 5/066 . . . {achieved by multilayers}
- B05D 5/067 . . {Metallic effect}
- B05D 5/068 . . . {achieved by multilayers ([B05D 5/066](#) takes precedence)}
- B05D 5/08 . to obtain an anti-friction or anti-adhesive surface (rendering particulate materials free-flowing in general, e.g. making them hydrophobic [B01J 2/30](#))
- B05D 5/083 . . {involving the use of fluoropolymers}
- B05D 5/086 . . . {having an anchoring layer}
- B05D 5/10 . to obtain an adhesive surface
- B05D 5/12 . to obtain a coating with specific electrical properties

**B05D 7/00****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 [A23P 1/084](#), [A23P 1/085](#))}**

- B05D 7/02 . to macromolecular substances, e.g. rubber (treatment or coating of shaped articles made of macromolecular substances [C08J 7/00](#))
- B05D 7/04 . . to surfaces of films or sheets (producing layered products by applying coatings of pasty or pulverulent plastics [B29C 41/00](#))
- B05D 7/06 . to wood
- B05D 7/08 . . using synthetic lacquers or varnishes
- B05D 7/10 . . . based on cellulose derivatives
- B05D 7/12 . to leather (chemical treatment of leather [C14C](#); dyeing leather [D06P](#))
- B05D 7/14 . to metal, e.g. car bodies (involving a chemical reaction between the metal and the coating [C23](#))

- B05D 7/142 . . {Auto-deposited coatings, i.e. autophoretic coatings}
- B05D 7/144 . . . {After-treatment of auto-deposited coatings}
- B05D 7/146 . . {to metallic pipes or tubes (processes for coating the interior of pipes [B05D 7/222](#))}
- B05D 7/148 . . {using epoxy-polyolefin systems in mono- or multilayers}
- B05D 7/16 . . using synthetic lacquers or varnishes
- B05D 7/18 . . . based on cellulose derivatives
- B05D 7/20 . to wires (for insulating electric cables [H01B 13/16](#))
- B05D 7/22 . to internal surfaces, e.g. of tubes
- B05D 7/222 . . {of pipes}
- B05D 7/225 . . . {Laminating inside the pipe}
- B05D 7/227 . . {of containers, cans or the like}
- B05D 7/24 . for applying particular liquids or other fluent materials
- B05D 7/26 . . synthetic lacquers or varnishes ([B05D 7/08](#), [B05D 7/16](#) take precedence)
- B05D 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](#))

- B05D 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](#))}
- B05D 7/52 . . {Two layers}
- B05D 7/53 . . . {Base coat plus clear coat type}
- B05D 7/532 . . . . {the two layers being cured or baked together, i.e. wet on wet}
- B05D 7/5323 . . . . . {the two layers being applied simultaneously}
- B05D 7/534 . . . . {the first layer being let to dry at least partially before applying the second layer ([B05D 7/538](#) takes precedence)}
- B05D 7/536 . . . . {each layer being cured, at least partially, separately}
- B05D 7/538 . . . . {No curing step for the last layer}
- B05D 7/5383 . . . . . {No curing step for any layer}
- B05D 7/5385 . . . . . . {the two layers being applied simultaneously}
- B05D 7/54 . . . {No clear coat specified}
- B05D 7/542 . . . . {the two layers being cured or baked together}
- B05D 7/5423 . . . . . {the two layers being applied simultaneously}
- B05D 7/544 . . . . {the first layer is let to dry at least partially before applying the second layer}
- B05D 7/546 . . . . {each layer being cured, at least partially, separately}
- B05D 7/548 . . . . {No curing step for the last layer}
- B05D 7/5483 . . . . . {No curing step for any layer}
- B05D 7/5485 . . . . . . {the two layers being applied simultaneously}

- B05D 7/56 . . {Three layers or more}
- B05D 7/57 . . . {the last layer being a clear coat}
- B05D 7/572 . . . . {all layers being cured or baked together}
- B05D 7/5723 . . . . . {all layers being applied simultaneously}
- B05D 7/574 . . . . {at least some layers being let to dry at least partially before applying the next layer ([B05D 7/577](#) takes precedence)}
- B05D 7/576 . . . . {each layer being cured, at least partially, separately}
- B05D 7/577 . . . . {some layers being coated "wet-on-wet", the others not}
- B05D 7/578 . . . . {No curing step for the last layer}
- B05D 7/5783 . . . . . {No curing step for any layer}
- B05D 7/5785 . . . . . . {all layers being applied simultaneously}
- B05D 7/58 . . . {No clear coat specified}
- B05D 7/582 . . . . {all layers being cured or baked together}
- B05D 7/5823 . . . . . {all layers being applied simultaneously}
- B05D 7/584 . . . . {at least some layers being let to dry, at least partially, before applying the next layer ([B05D 7/587](#) takes precedence)}
- B05D 7/586 . . . . {each layer being cured, at least partially, separately}
- B05D 7/587 . . . . {some layers being coated "wet-on-wet", the others not}
- B05D 7/588 . . . . {No curing step for the last layer}
- B05D 7/5883 . . . . . {No curing step for any layer}
- B05D 7/5885 . . . . . . {all layers being applied simultaneously}

**B05D 2201/00****Polymeric substrate or laminate**

- B05D 2201/02 . Polymeric substrate
- B05D 2201/04 . Laminate
- B05D 2201/06 . . Laminate of which the last layer is not a polymer

**Substrate****B05D 2202/00****Metallic substrate**

- B05D 2202/10 . based on Fe
- B05D 2202/15 . . Stainless steel
- B05D 2202/20 . based on light metals
- B05D 2202/25 . . based on Al
- B05D 2202/30 . based on refractory metals (Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, W)
- B05D 2202/35 . . based on Ti
- B05D 2202/40 . based on other transition elements
- B05D 2202/45 . . based on Cu

**B05D 2203/00****Other substrates**

- B05D 2203/20 . Wood or similar material

- B05D 2203/22 . Paper or cardboard
- B05D 2203/24 . Leather
- B05D 2203/30 . Other inorganic substrates, e.g. ceramics, silicon
- B05D 2203/35 . . Glass

#### **B05D 2210/00 Applying material to more than three types of substrate materials**

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##### **B05D 2252/00 Sheets**

- B05D 2252/02 . of indefinite length
- B05D 2252/04 . of definite length in a continuous process
- B05D 2252/10 . Applying the material on both sides

#### **Shape of substrate**

##### **B05D 2254/00 Tubes**

- B05D 2254/02 . Applying the material on the exterior of the tube
- B05D 2254/04 . Applying the material on the interior of the tube
- B05D 2254/06 . . Applying the material on the interior and exterior of the tube

##### **B05D 2256/00 Wires or fibres**

##### **B05D 2258/00 Small objects (e.g. screws)**

- B05D 2258/02 . The objects being coated one after the other

##### **B05D 2259/00 Applying the material to the internal surface of hollow articles other than tubes**

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##### **B05D 2301/00 Inorganic additives or organic salts thereof**

- B05D 2301/10 . Phosphates, phosphoric acid or organic salts thereof
- B05D 2301/20 . Chromates, chromic acid or organic salts thereof
- B05D 2301/30 . Acids
- B05D 2301/50 . Bases

#### **Additives other than fillers present in the coating material or in the coating bath**

##### **B05D 2320/00 Organic additives**

- B05D 2320/10 . Detergents
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##### **B05D 2350/00 Pretreatment of the substrate**

- B05D 2350/10 . Phosphatation
- B05D 2350/20 . Chromatation
- B05D 2350/30 . Change of the surface
- B05D 2350/33 . . Roughening

B05D 2350/35	. . . by chemical means
B05D 2350/38	. . . by mechanical means
B05D 2350/40	. . . by adding a porous layer
B05D 2350/50	. . Smoothing
B05D 2350/60	. Adding a layer before coating
B05D 2350/63	. . ceramic layer
B05D 2350/65	. . metal layer

### **Pretreatment of the substrates**

#### **B05D 2400/00      Indexing scheme for single layers or multilayers.**

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##### **B05D 2401/00      Form of the coating product, e.g. solution, water dispersion, powders or the like**

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

#### **NOTE**

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

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

##### **B05D 2420/00      Indexing scheme corresponding to the position of each layer within a multilayer coating relative to the substrate**

B05D 2420/01	. first layer from the substrate side
B05D 2420/02	. second layer from the substrate side
B05D 2420/03	. third layer from the substrate side
B05D 2420/04	. fourth layer from the substrate side
B05D 2420/05	. fifth layer from the substrate side

##### **B05D 2425/00      Indexing scheme corresponding to the position of each layer within a multilayer coating relative to the surface**

B05D 2425/01	. top layer/ last layer , i.e. first layer from the top surface
B05D 2425/02	. second layer from the top surface



B05D 2425/03	<ul style="list-style-type: none"> <li>third layer from the top surface</li> </ul>
B05D 2425/04	<ul style="list-style-type: none"> <li>fourth layer from the top surface</li> </ul>
B05D 2425/05	<ul style="list-style-type: none"> <li>fifth layer from the top surface</li> </ul>
<b>B05D 2430/00</b>	<b>Component used as a filler in the composition.</b>
<b>B05D 2451/00</b>	<b>Type of carrier, type of coating (Multilayers)</b>
<b>B05D 2490/00</b>	<b>Intermixed layers</b>
B05D 2490/50	<ul style="list-style-type: none"> <li>compositions varying with a gradient perpendicular to the surface</li> </ul>
B05D 2490/60	<ul style="list-style-type: none"> <li>compositions varying with a gradient parallel to the surface</li> </ul>
<b>B05D 2500/00</b>	<b>Indexation scheme for the composition of layers</b>

**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](#)

<b>B05D 2501/00</b>	<b>Varnish or unspecified clear coat</b>
B05D 2501/10	<ul style="list-style-type: none"> <li>Wax</li> </ul>

**Type of polymer or polymer coating**

<b>B05D 2502/00</b>	<b>Acrylic polymers</b>
B05D 2502/005	<ul style="list-style-type: none"> <li>modified</li> </ul>
<b>B05D 2503/00</b>	<b>Polyurethanes</b>
<b>B05D 2504/00</b>	<b>Epoxy polymers</b>
<b>B05D 2505/00</b>	<b>Polyamides</b>
B05D 2505/50	<ul style="list-style-type: none"> <li>Polyimides</li> </ul>
<b>B05D 2506/00</b>	<b>Halogenated polymers</b>
B05D 2506/10	<ul style="list-style-type: none"> <li>Fluorinated polymers</li> </ul>
B05D 2506/15	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Polytetrafluoroethylene [PTFE]</li> </ul> </li> </ul>
B05D 2506/20	<ul style="list-style-type: none"> <li>Chlorinated polymers</li> </ul>
B05D 2506/25	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>PVC (<a href="#">B05D 2520/10</a> takes precedence)</li> </ul> </li> </ul>
<b>B05D 2507/00</b>	<b>Polyolefins</b>
B05D 2507/005	<ul style="list-style-type: none"> <li>modified</li> </ul>
B05D 2507/01	<ul style="list-style-type: none"> <li>Polyethylene</li> </ul>
B05D 2507/015	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>modified</li> </ul> </li> </ul>
B05D 2507/02	<ul style="list-style-type: none"> <li>Polypropylene</li> </ul>

B05D 2507/025 . . modified

**B05D 2508/00 Polyesters**

**B05D 2518/00 Other type of polymers**

B05D 2518/10 . Silicon-containing polymers

B05D 2518/12 . . Ceramic precursors (polysiloxanes, polysilazanes)

**B05D 2520/00 Water-based dispersions**

B05D 2520/05 . Latex

B05D 2520/10 . PVC [Plastisol]

**B05D 2530/00 Rubber or the like**

**B05D 2601/00 Inorganic fillers**

B05D 2601/02 . used for pigmentation effect, e.g. metallic effect

B05D 2601/04 . . Mica

B05D 2601/06 . . . Coated Mica

B05D 2601/08 . . Aluminium flakes or platelets

B05D 2601/10 . . Other metals

B05D 2601/20 . used for non-pigmentation effect

B05D 2601/22 . . Silica

B05D 2601/24 . . Titanium dioxide, e.g. rutile

B05D 2601/26 . . Abrasives

B05D 2601/28 . . Metals

**B05D 2602/00 Organic fillers**

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**B05D 2701/00 Coatings being able to withstand changes in the shape of the substrate or to withstand welding**

B05D 2701/10 . withstanding draw and redraw process, punching

B05D 2701/20 . withstanding rolling

B05D 2701/30 . withstanding bending

B05D 2701/40 . withstanding welding