SECTION B — PERFORMING OPERATIONS; TRANSPORTING

B32 LAYERED PRODUCTS

B32B LAYERED PRODUCTS, i.e. PRODUCTS BUILT-UP OF STRATA OF FLAT OR NON-FLAT, e.g. CELLULAR OR HONEYCOMB, FORM

Note(s)

1. This subclass covers :
   - layered products comprising different kinds of material or layered products not characterised by the particular kind of material used;
   - a product similar to a layered product but comprising only material in the form of a sheet or network embedded in a mass of plastics or of physically-similar substances which mass penetrates the said sheet or network and lies on both sides of the latter (e.g. so that the sheet or network reinforces the plastics substance) provided that the embedded sheet or network extends coherently or connectedly over substantially the whole area of the product; thus the embedded sheet or network may be a fabric or a series of rods connected by cross wires. The manner of making such a product is, however, classified in this subclass only if it is essentially a process of building-up an assembly of layers of which at least one outer layer is preformed. If the embedded material comprises only a series of unconnected rods, the product is not classified in this subclass.
2. This subclass does not cover :
   - processes or apparatus used in, or in connection with, the production or treatment of any product, if the process or apparatus is solely applicable to and fully classifiable in a single other class or subclass for processes or apparatus, e.g. B05, B29C, B29D, B44D, C08J, C09J or C23;
   - compositions or preparation or treatment thereof, unless they are essentially restricted to layered products and cannot be fully classified in another class without ignoring this restriction;
   - etched metallic pattern on the surface of a printed circuit board.
3. In this subclass, a film formed on a layer by spreading a substance thereon is not considered to constitute a layer itself if it serves only as an adhesive or its purpose is merely to finish a surface of a product.
4. In this subclass, the following terms or expressions are used with the meanings indicated:
   - "layer" is a sheet or strip or anything else having a small thickness relatively to its other dimensions which, together with at least one other layer, exists in a product, whether it pre-existed, e.g. as a separate sheet or strip, or was formed during the production of the layered product. It may or may not be homogeneous or cohesive; it may be an assembly of fibres or pieces of material. It may be discontinuous, e.g. in the form of a grating, honeycomb, or frame. It may or may not be in complete contact with the next layer, e.g. a corrugated layer against a flat layer;
   - "layered product" comprises at least two layers secured together. The term "secured" includes any method of uniting layers, e.g. needling, stitching, gluing, nailing, dovetailing or the interposition of an adhesive or adhesive impregnated support. It may also be an intermediate stage in the production of an article which is not layered in its final form, e.g. a panel with a protective layer which is stripped off when the panel is placed in its position of use. The layers are preformed layers or layers formed in situ on a preformed layer and may consist of coherent solid materials, including honeycombs and other cellular materials or of non-coherent solid materials composed of assemblies of strands, strips, fibres, tiles or the like;
   - "filamentary layer" means a layer of threads or filaments of any substance (e.g. wires) of more or less unlimited length placed in an orderly arrangement and secured together; it may be woven, knitted, braided, or netted, or formed of threads crossed or laid side and bonded together;
   - "fibrous layer" means a random assembly of fibres or filaments, usually of limited length, e.g. felt, fleece; the fibres may or may not be interengaged or connected, e.g. by adhesive.
5. In groups B32B 1/00-B32B 33/00, at each level of indentation, in the absence of an indication to the contrary, classification is made in the first appropriate place.
6. If a layered product is characterised by the way it is produced and not by its structure or composition, the production method should be classified in groups B32B 37/00 or B32B 38/00, or in subclass B29C, for example in groups B29C 45/16 or B29C 47/06.
7. The classification of layered products is provided for in many classes, most of which are confined to a particular kind of material. However, in order that this subclass may provide a basis for making a complete search with respect to layered products, all relevant subject matter is classified in this subclass even though it may also be classified in other classes.

Subclass index

LAYERED PRODUCTS CHARACTERISED BY
Their structure
general shape.....1/00, 3/00
layer structure.....3/00, 5/00
relation between layers.....7/00
Substances used
bituminous or tarry substances, water-setting substances.....11/00, 13/00
metal, glass, ceramics, mineral fibres or particles.....15/00, 17/00, 18/00, 19/00

wood, paper, cellulosic plastic substances.....21/00, 29/00, 23/00
rubber, synthetic resin.....25/00, 27/00
other substances.....9/00
Their properties.....33/00
MAKING LAYERED PRODUCTS
Methods or apparatus for laminating.....37/00
Ancillary operations.....38/00
Controlling or monitoring.....41/00
Other operations, e.g. repairing.....43/00

1/00 Layered products essentially having a general shape other than plane

Note(s)

For classification of a product in this group, surface unevennesses or non-uniformities and the shape of individual layers are ignored.

1/02 • Receptacles, e.g. tanks
1/04 • characterised by feature of form at particular places, e.g. in edge regions
1/06 • characterised by fillings or added members in hollow portions
1/08 • Tubular products

3/00 Layered products essentially comprising a layer with external or internal discontinuities or unevennesses, or a layer of non-planar form (continuous layers of fibres or filaments B32B 5/02; foamed layers B32B 5/18)**; Layered products essentially having particular features of form** (B32B 1/00 takes precedence)

Note(s)

In this group, channels, voids, and cavities may be filled otherwise than with air, e.g. with gas, with liquid, with other material different from that of the layer in which they occur.

3/02 • characterised by features of form at particular places, e.g. in edge regions
3/04 • • characterised by a layer folded at the edge, e.g. over another layer
3/06 • • for securing layers together; for attaching the product to another member, e.g. to a support (use or provision of nails, stitches, or similar separate fastening elements for these purposes B32B 7/08)
3/08 • • characterised by added members at particular parts
3/10 • characterised by a discontinuous layer, i.e. apertured or formed of separate pieces of material

Note(s)

In this group, a series of spaced separate elements forming in effect a broken surface should be regarded as a layer.

3/12 • • characterised by a layer of regularly-arranged cells whether integral or formed individually or by conjunction of separate strips, e.g. honeycomb structure
3/14 • • characterised by a face layer formed of separate pieces of material
3/16 • • • secured to a flexible backing
3/18 • • characterised by an internal layer formed of separate pieces of material
3/20 • • • of hollow pieces, e.g. tubes; of pieces with channels or cavities
3/22 • • • of spaced pieces
3/24 • • characterised by an apertured layer, e.g. of expanded metal (layer of netting or fibres B32B 5/02)
3/26 • characterised by a particular shape of the outline of the cross-section of a continuous layer; characterised by a layer with cavities or internal voids (regular cells B32B 3/12)
3/28 • • characterised by a layer comprising a deformed thin sheet, e.g. corrugated, crumpled (B32B 29/08 takes precedence) **[3]**
3/30 • • characterised by a layer formed with recesses or projections, e.g. grooved, ribbed

5/00 Layered products characterised by the non-homogeneity or physical structure of a layer (B32B 9/00-B32B 29/00 take precedence)

Note(s)

In this group, fibres, filaments, granules, or powder forming or included in a layer may be impregnated, bonded together, or embedded in a substance such as synthetic resin. If the substance of the fibres, or the like, or the impregnating, bonding, or embedding substance, is important it is classified in the relevant group for the substance.

5/02 • characterised by structural features of a layer comprising fibres or filaments (formed of particles, e.g. chips, chopped fibres, powder, B32B 5/16)

Note(s)

This group covers, in addition to filamentary and fibrous layers as defined in Note (4) following the title of this subclass, layers of substances having an intrinsic fibrous nature (e.g. paper, wood), if the fibrous nature is important and the particular substance is not important.

5/04 • • characterised by a layer being specifically extensible by reason of its structure or arrangement
5/06 • • characterised by a fibrous layer needled to another layer, e.g. of fibres, of paper
5/08 • • the fibres or filaments of a layer being specially arranged or being of different substances
5/10 • • characterised by a fibrous layer reinforced with filaments
5/12 • • characterised by the relative arrangement of fibres or filaments of adjacent layers
5/14 • characterised by a layer differing constitutionally or physically in different parts, e.g. denser near its faces
5/16 • characterised by features of a layer formed of particles, e.g. chips, chopped fibres, powder
5/18 • characterised by features of a layer containing foamed or specifically porous material
5/20 • • foamed in situ
5/22 • characterised by the presence of two or more layers which comprise fibres, filaments, granules, or powder, or are foamed or specifically porous

5/24 • • one layer being a fibrous or filamentary layer
5/26 • • • another layer also being fibrous or filamentary
5/28 • • • impregnated with or embedded in a plastic substance
5/30 • • one layer comprising granules or powder
5/32 • • both layers being foamed or specifically porous

7/00 Layered products characterised by the relation between layers, i.e. products essentially comprising layers having different physical properties or products characterised by the interconnection of layers (in respect of orientation of features, see the relevant groups for the features concerned, e.g. B32B 5/02 for direction of fibres; in respect of substances B32B 9/00-B32B 29/00)
7/02 • in respect of physical properties, e.g. hardness
7/04 • characterised by the connection of layers
7/06 • • permitting easy separation
7/08 • • by mechanical connection, e.g. stitching (by interengagement of layers B32B 3/00, e.g. B32B 3/04, B32B 3/06, B32B 3/30; by needling fibrous layers B32B 5/06)
7/10 • • one or both of the layers having adhesive or inter-reactive properties
7/12 • • using an adhesive
7/14 • • • applied in stripes or other spaced arrangement

Layered products characterised by particular substances used

Note(s)

In groups B32B 9/00-B32B 29/00, the following expressions are used with the meanings indicated:
- "specific substance" covers specified alternative substances if they are all covered by a single main group;
- "particulate layer" means a layer of particles, e.g. chips, chopped fibres, powder.

9/00 Layered products essentially comprising a particular substance not covered by groups B32B 11/00-B32B 29/00
9/02 • comprising animal or vegetable substances
9/04 • comprising such substance as the main or only constituent of a layer, next to another layer of a specific substance
9/06 • • of paper or cardboard

11/00 Layered products essentially comprising bituminous or tarry substances
11/02 • with fibres or particles embedded in it or bonded with it
11/04 • comprising such substance as the main or only constituent of a layer, next to another layer of a specific substance
11/06 • • of paper or cardboard
11/08 • • of metal
11/10 • next to a fibrous or filamentary layer
11/12 • next to a particulate layer

13/00 Layered products essentially comprising a water-setting substance, e.g. concrete, plaster, asbestos cement, or like builders' material
13/02 • with fibres or particles embedded in it or bonded with it
13/04 • comprising such substances as the main or only constituent of a layer, next to another layer of a specific substance
13/06 • • of metal
13/08 • • of paper or cardboard
13/10 • • of wood; of wood particle board
13/12 • • of synthetic resin
13/14 • next to a fibrous or filamentary layer

15/00 Layered products essentially comprising metal
15/01 • all layers being exclusively metallic **[3]**
15/02 • in a form other than a sheet, e.g. wire, particles
15/04 • comprising metal as the main or only constituent of a layer, next to another layer of a specific substance
15/06 • • of rubber
15/08 • • of synthetic resin
15/082 • • • comprising vinyl resins; comprising acrylic resins **[2006.01]**
15/085 • • • comprising polyolefins **[2006.01]**
15/088 • • • comprising polyamides **[2006.01]**
15/09 • • • comprising polyesters **[2006.01]**
15/092 • • • comprising epoxy resins **[2006.01]**
15/095 • • • comprising polyurethanes **[2006.01]**
15/098 • • • comprising condensation resins of aldehydes, e.g. with phenols, ureas or melamines **[2006.01]**
15/10 • • of wood
15/12 • • of paper or cardboard
15/14 • next to a fibrous or filamentary layer
15/16 • next to a particulate layer
15/18 • comprising iron or steel
15/20 • comprising aluminium or copper

17/00 Layered products essentially comprising sheet glass, or fibres of glass, slag or the like
17/02 • in the form of fibres or filaments
17/04 • • bonded with or embedded in a plastic substance
17/06 • comprising glass as the main or only constituent of a layer, next to another layer of a specific substance
17/08 • • of cellulosic plastic substance
17/10 • • of synthetic resin
17/12 • next to a fibrous or filamentary layer

18/00 Layered products essentially comprising ceramics, e.g. refractory products [4]

19/00 Layered products essentially comprising natural mineral fibres or particles, e.g. asbestos, mica
19/02 • bonded with or embedded in a plastic substance
19/04 • next to another layer of a specific substance
19/06 • next to a fibrous or filamentary layer
19/08 • comprising asbestos

21/00 Layered products essentially comprising wood, e.g. wood board, veneer, wood particle board
21/02 • in the form of fibres, chips, or particles
21/04 • comprising wood as the main or only constituent of a layer, next to another layer of a specific substance
21/06 • • of paper or cardboard
21/08 • • of synthetic resin; of fibre-reinforced resin
21/10 • Next to a fibrous or filamentary layer
21/12 • next to a particulate layer
21/13 • all layers being exclusively wood **[3]**
21/14 • comprising wood board or veneer

23/00 Layered products essentially comprising cellulosic plastic substances
23/02 • in the form of fibres or filaments

23/04 • comprising such substance as the main or only constituent of a layer, next to another layer of a specific substance
23/06 • • of paper or cardboard
23/08 • • of synthetic resin
23/10 • next to a fibrous or filamentary layer
23/12 • next to a particulate layer
23/14 • characterised by containing special compounding ingredients
23/16 • • Modifying agents
23/18 • • Fillers
23/20 • comprising esters
23/22 • comprising ethers

25/00 Layered products essentially comprising natural or synthetic rubber
25/02 • with fibres or particles embedded in it or bonded with it
25/04 • comprising rubber as the main or only constituent of a layer, next to another layer of a specific substance
25/06 • • of paper or cardboard
25/08 • • of synthetic resin
25/10 • next to a fibrous or filamentary layer
25/12 • comprising natural rubber
25/14 • comprising copolymers in which synthetic rubber constituents predominate
25/16 • comprising polydienes or poly-halodienes
25/18 • comprising butyl or halobutyl rubber
25/20 • comprising silicone rubber

27/00 Layered products essentially comprising synthetic resin
27/02 • in the form of fibres or filaments
27/04 • as impregnant, bonding, or embedding substance
27/06 • as the main or only constituent of a layer next to another layer of a specific substance
27/08 • • of synthetic resin of a different kind
27/10 • • of paper or cardboard
27/12 • next to a fibrous or filamentary layer
27/14 • next to a particulate layer
27/16 • specially treated, e.g. irradiated
27/18 • characterised by the use of special additives
27/20 • • using fillers, pigments, thixotroping agents
27/22 • • using plasticisers
27/24 • • using solvents or swelling agents
27/26 • • using curing agents
27/28 • comprising copolymers of synthetic resins not wholly covered by any one of the following subgroups
27/30 • comprising vinyl resin; comprising acrylic resin
27/32 • comprising polyolefins
27/34 • comprising polyamides
27/36 • comprising polyesters
27/38 • comprising epoxy resins
27/40 • comprising polyurethanes
27/42 • comprising condensation resins of aldehydes, e.g. with phenols, ureas or melamines

29/00 Layered products essentially comprising paper or cardboard
29/02 • next to a fibrous or filamentary layer
29/04 • next to a particulate layer
29/06 • specially treated, e.g. surfaced, parchmentised
29/08 • Corrugated paper, corrugated cardboard **[3]**

33/00 Layered products characterised by particular properties or particular surface features, e.g. particular surface coatings (surface unevennesses or non-uniformities B32B 3/00)**; Layered products designed for particular purposes not covered by another single class**

Methods or apparatus for making layered products; Treatment of the layers or of the layered products [2006.01]

Note(s) [2006.01]

In groups B32B 37/00 and B32B 39/00, the following expressions are used with the meanings indicated:

- "laminating" means the action of combining previously unconnected layers to become one product whose layers will remain together;
- "partial laminating" occurs when one layer does not fully cover a surface of another layer, whereby the layer with the greater surface area is laminated on only part of its surface;
- "adhesive" means a layer, or part of a layer, applied in any state or in any manner, which is incorporated for the purpose of bonding.

37/00 Methods or apparatus for laminating, e.g. by curing or by ultrasonic bonding [2006.01]

37/02 • characterised by a sequence of laminating steps, e.g. by adding new layers at consecutive laminating stations **[2006.01]**
37/04 • characterised by the partial melting of at least one layer **[2006.01]**
37/06 • characterised by the heating method **[2006.01]**
37/08 • characterised by the cooling method **[2006.01]**
37/10 • characterised by the pressing technique, e.g. using direct action of vacuum or fluid pressure **[2006.01]**
37/12 • characterised by using adhesives **[2006.01]**
37/14 • characterised by the properties of the layers **[2006.01]**
37/15 • • with at least one layer being manufactured and immediately laminated before reaching its stable state, e.g. in which a layer is extruded and laminated while in semi-molten state **[2006.01]**
37/16 • • with all layers existing as coherent layers before laminating **[2006.01]**
37/18 • • • involving the assembly of discrete sheets or panels only **[2006.01]**
37/20 • • • involving the assembly of continuous webs only **[2006.01]**
37/22 • • • involving the assembly of both discrete and continuous layers **[2006.01]**
37/24 • • with at least one layer not being coherent before laminating, e.g. made up from granular material sprinkled onto a substrate (B32B 37/15 takes precedence) **[2006.01]**
37/26 • • with at least one layer which influences the bonding during the laminating process, e.g. release layers or pressure equalising layers **[2006.01]**
37/28 • involving assembly of non-flat intermediate products which are flattened at a later step, e.g. tubes **[2006.01]**
37/30 • Partial laminating **[2006.01]**

38/00 Ancillary operations in connection with laminating processes [2006.01]

38/04 • Punching, slitting or perforating **[2006.01]**
38/06 • Embossing **[2006.01]**
38/08 • Impregnating **[2006.01]**
38/10 • Removing layers, or parts of layers, mechanically or chemically (punching, slitting or perforating B32B 38/04) **[2006.01]**
38/12 • Deep-drawing **[2006.01]**
38/14 • Printing or colouring **[2006.01]**
38/16 • Drying; Softening; Cleaning **[2006.01]**
38/18 • Handling of layers or the laminate **[2006.01]**

39/00 Layout of apparatus or plants, e.g. modular laminating systems [2006.01]

41/00 Arrangements for controlling or monitoring lamination processes; Safety arrangements [2006.01]
41/02 • Safety arrangements **[2006.01]**

43/00 Operations specially adapted for layered products and not otherwise provided for, e.g. repairing; Apparatus therefor [2006.01]