

3.2 Fiberboards Classified by Manufacture

3.2.1 Hardboard

3.2.1.1 Description

A generic term for a sheet manufactured primarily from interfelted lignocellulosic fibers (usually wood) consolidated under heat and pressure in a hot press to a density of 880 to 1041 kg/m³ (55 to 65 lb/ft³) (specific gravity 0.9 to 1.0) or greater, and to which other materials may have been added during manufacture to improve certain properties.

3.2.1.2 Physical/Mechanical Properties

This material is generally a stiff grade of fiberboard with isotropic physical properties.

3.2.1.3 Applications

The normal uses for this material include nearly all automotive applications where fibrous board structures are specified.

3.2.2 Paperboard

3.2.2.1 Description

A generic term for a sheet manufactured primarily from cellulosic fibers, produced by conventional pulping and paper making process and equipment.

3.2.2.2 Physical/Mechanical Properties

Except for the characteristic fibrous structure, the physical properties may vary over a wide range. The paperboards are anisotropic with the board machine direction having greater strength and dimensional stability.

3.2.2.3 Applications

The normal uses for this material include nearly all automotive applications where fibrous board structures are specified.

3.2.3 Chipboard

3.2.3.1 Description

A general term describing a type of fiberboard produced primarily from mixed grades of waste paper and most often produced on a cylinder machine. The final product may be sold as either a single ply or laminated board.

3.2.3.2 Physical/Mechanical Properties

The material is usually characterized by low density and gray color and is used where strength and quality are not required. The final product may be modified by the addition of nonfibrous components to impart water resistance or other special properties. The normal range of thickness is from about 0.23 to 1.14 mm (0.009 to 0.045 in) for single ply and 1.27 to 5.08 mm (0.050 to over 0.200 in) for laminated constructions.

3.2.3.3 Applications

Used in applications where appearance and ultimate strength are not important. Typical uses include visor cores, trim panel subfoundations, and some gasket applications.

3.2.4 Laminated Board

3.2.4.1 Description

A general term describing a board comprised of two or more single plies of board, paper, or other sheet materials in any combination, firmly adhered to each other by means of an adhesive between the plies. The adhesion and cohesion of the entire finished structure are such that it will function as a single unit.

3.2.4.2 Physical/Mechanical Properties

Except for the multiple structure, the physical characteristics of laminated boards vary over a wide range of properties. Because of the general nature of the term, there are few typical physical characteristics.

3.2.4.3 Applications

Typical uses include head liners, trunk liners, glove boxes, and door panels.

3.2.5 Wet Machine Board (Homogeneous)

3.2.5.1 Description

This material is produced on a one cylinder wet machine. It is manufactured by the building up on a roll of a number of wet plies of paper stock (refined cellulose fibers) from a continuous web. The wet plies adhere mechanically to one another in the wet state and, when the desired thickness of board has been reached, the wet stock (approximately 40% solids) is removed from the make roll as a sheet. It is then pressed, dried, and calendared to the desired finished thickness. The pressing and drying operations develop strong fiber-to-fiber chemical and mechanical bonds within the plies and between the ply interfaces.

3.2.5.2 Physical/Mechanical Properties

This board is characterized by high density stiffness and strength. This material is commonly produced in calipers ranging from a minimum of 1.27 mm (0.050 or 0.060 in) up to a thickness of 25.4 mm (0.500 to 1.0 in) for various applications. This material frequently contains nonfibrous components such as resins or asphalt to develop water resistance, formability, or other special properties.

3.2.5.3 Applications

Typical uses include tacking strips and dash insulators.

3.2.6 Kraft Paper

3.2.6.1 Description

Kraft is the generic name for paper of high strength which identifies the sulfate chemical pulping process from which the paper is made. The sulfate pulping process involves cooking wood fibers in an alkaline medium to produce strong, cellulosic fiber which is normally converted to paper on a Fourdrinier paper machine.

3.2.6.2 Physical/Mechanical Properties

The term paper is normally restricted to materials 0.23 mm (0.009 in) or under in caliper and usually less than 127 g/m² (26 lb/1000 ft²). The kraft paper is characterized by a reddish-brown color in the unbleached state, but may be bleached to a very high brightness white for some applications. This material normally has high strength and is relatively dense.

3.2.6.3 Applications

Uses include wire wrapping, braided insulators, liner for laminated fiberboards, and water shields.

3.3 Fiberboards Classified by Manufacture

3.3.1 Foundation Board

3.3.1.1 Description

A fiberboard, usually a hardboard or a laminated kraft paper board, that is used as a structural foundation or a supporting member in a trim panel assembly.

3.3.1.2 Physical/Mechanical Properties

Boards selected for foundation applications generally require a high degree of strength, rigidity, and dimensional stability; hence, most foundation boards are specified in thicknesses of 2.03 mm (0.08 in) or greater. Various applications may require this board to be coated to facilitate dielectric bonding or to be painted, embossed, or perforated for decorative purposes.

3.3.1.3 Applications

Typical applications include door and rear quarter panels, package tray panels, and headlining applications.

3.3.2 Subfoundation Board

3.3.2.1 Description

A fiberboard or liner used as a subfoundation in combination with a foundation board. It is used as a carrier for subsequent trim or product applications.

3.3.2.2 Physical/Mechanical Properties

These boards are often chosen for their flexibility and as a result caliper usually ranges from 0.25 to 0.76 mm (0.010 to 0.030 in). In some cases, the boards may be coated to facilitate dielectric bonding. They are usually characterized by medium strength, good plybond, good dimensional stability, and are usually treated for water resistance.

3.3.2.3 Applications

Typical automotive uses are in conjunction with door panels and rear quarter panels.

3.3.3 Forming Board

3.3.3.1 Description

A board suitable for shallow forming or forming into random three-dimensional shapes through the use of heat and pressure applied in a matched set of dies. This board may be one ply or a laminated combination of basic boards or a molded fiber pulp product.

3.3.3.2 Physical/Mechanical Properties

The primary composition of these boards is normally refined cellulosic fibers which may or may not be supplemented by the addition of some synthetic fibers. Usually these boards contain various amounts of thermoplastic or thermosetting resins to facilitate formability and to enhance the stability and rigidity of the formed part. Normal thicknesses range from about 1.78 to 3.05 mm (0.070 to 0.120 in).

3.3.3.3 Applications

Used in parts requiring three-dimensional shapes with rounded corners, such as formed arm rests, heater ducts, firewall components, and package trays.