



Particleboard

LEADING APPLICATIONS

- Countertops • Kitchen Cabinets • Shelving • Door Core
- Stair Treads • Floor Underlayment • Office & Residential Furniture • Store Fixtures • Manufactured Home Decking •

HOW IT'S MADE

Particleboard is a composite panel product consisting of cellulosic particles of various sizes that are bonded together with a synthetic resin or binder under heat and pressure. Particle geometry, resin levels, board density and manufacturing processes may be modified to produce products suitable for specific end uses. At the time of manufacture, additives can be incorporated to impart specific performance enhancements including greater dimensional stability, increased fire retardancy and moisture resistance.



PARTICLEBOARD IS CONSISTENT, DURABLE AND PRODUCED TO PRECISE THICKNESSES IN A VARIETY OF PANEL SIZES. PARTICLEBOARD IS USED EXTENSIVELY IN RESIDENTIAL KITCHENS **1**, PLAYING A ROLE IN COUNTERTOPS, CABINETS, SHELVING AND FLOOR UNDERLAYMENT. IT IS THE SUBSTRATE OF CHOICE FOR MANY SURFACE TREATMENTS, SUCH AS THERMALLY FUSED LAMINATE **2**.

Today's particleboard gives industrial users the consistent quality and design flexibility needed for fast, efficient production lines and quality consumer products. Particleboard panels are manufactured in a variety of dimensions with a wide range of physical properties, providing maximum design flexibility for specifiers and end users.

Particleboard is widely used in the manufacture of office and residential furniture, countertops, kitchen cabinets, shelving, store fixture, underlayment, door core and stair treads.

PRODUCT STANDARDS, CERTIFICATION AND ENVIRONMENTAL SPECIFICATIONS

ANSI A208.1 Particleboard is the North American industry voluntary standard. It classifies particleboard by density and strength, and covers physical, dimensional and mechanical characteristics as well as formaldehyde emission levels. ANSI A208.1 was developed through the sponsorship of the Composite Panel Association (CPA) in conjunction with producers, users and general interest groups. A summary of the Particleboard Property Requirements is included in this Guide and copies of ANSI A208.1 are available from CPA.



Table A: REQUIREMENTS FOR GRADES OF PARTICLEBOARD

Grade	Dimensional Tolerances			Physical and Mechanical Properties					
	Length & Width mm (inch)	Thickness Tolerance		Modulus of Rupture N/mm ² (psi)	Modulus of Elasticity N/mm ² (psi)	Internal Bond N/mm ² (psi)	Screw-holding		Linear Expansion max. avg. percent
		Panel Average Thickness from Specified mm (inch)	Variance from Panel Average Thickness mm (inch)				Face N (pounds)	Edge N (pounds)	
H-1	±2.0 (±0.080)	±0.200 (±0.008)	±0.100 (±0.004)	14.9 (2161)	2160 (313300)	0.81 (117)	1600 (360)	1200 (270)	NS
H-2	±2.0 (±0.080)	±0.200 (±0.008)	±0.100 (±0.004)	18.5 (2683)	2160 (313300)	0.81 (117)	1700 (382)	1400 (315)	NS
H-3	±2.0 (±0.080)	±0.200 (±0.008)	±0.100 (±0.004)	21.1 (3060)	2475 (359000)	0.90 (131)	1800 (405)	1400 (315)	NS
M-0	±2.0 (±0.080)	±0.200 (±0.008)	±0.100 (±0.004)	7.6 (1102)	1380 (200200)	0.31 (45)	NS	NS	NS
M-1	±2.0 (±0.080)	±0.200 (±0.008)	±0.100 (±0.004)	10.0 (1450)	1550 (224800)	0.36 (52)	NS	NS	0.40
M-S	±2.0 (±0.080)	±0.200 (±0.008)	±0.100 (±0.004)	11.0 (1595)	1700 (246600)	0.36 (52)	800 (180)	700 (157)	0.40
M-2	±2.0 (±0.080)	±0.200 (±0.008)	±0.100 (±0.004)	13.0 (1885)	2000 (290100)	0.40 (58)	900 (202)	800 (180)	0.40
M-3i	±2.0 (±0.080)	±0.200 (±0.008)	±0.100 (±0.004)	15.0 (2176)	2500 (362600)	0.50 (73)	1000 (225)	900 (202)	0.40
LD-1	±2.0 (±0.080)	+0.125 (+0.005)	±0.125 (±0.005)	2.8 (406)	500 (72500)	0.10 (15)	360 (81)	NS	0.40
LD-2	±2.0 (±0.080)	-0.375 (-0.015) +0.125 (+0.005) -0.375 (-0.015)	±0.125 (±0.005)	2.8 (406)	500 (72500)	0.14 (20)	520 (117)	NS	0.40

Table B: REQUIREMENTS OF PARTICLEBOARD FLOORING PRODUCTS AND BUILDING CODE GRADES

Grade	Dimensional Tolerances			Physical and Mechanical Properties							
	Length & Width Tolerance mm (inch)	Thickness Tolerance		Modulus of Rupture N/mm ² (psi)	Modulus of Elasticity N/mm ² (psi)	Internal Bond N/mm ² (psi)	Hardness N (pounds)	Concentrated Loading N (pounds)	Thickness Swell max. avg. percent	Linear Expansion max. avg. percent	
		Panel Average from Specified mm (inch)	Variance from Panel Average mm (inch)								
PBU	+0 (+0) -4.0 (-0.160)	±0.375 (±0.015)	±0.250 (±0.010)	11.0 (1595)	1725 (250200)	0.40 (58)	2225 (500)	NS ⁷	1.6 (0.063)	NS	0.35
D-2	±2.0 (±0.080)	±0.375 (±0.015)	±0.250 (±0.010)	16.5 (2393)	2750 (398900)	0.55 (80)	2225 (500)	2670 (600)	NS	8	0.30
D-3	±2.0 (±0.080)	±0.375 (±0.015)	±0.250 (±0.010)	19.5 (2828)	3100 (449600)	0.55 (80)	2225 (500)	2670 (600)	NS	8	0.30

Grade	Length & Width mm (inch)	Thickness Tolerance		Modulus of Rupture N/mm ² (psi)	Modulus of Elasticity N/mm ² (psi)	Internal Bond N/mm ² (psi)	Hardness N (pounds)	Screw-holding		Linear Expansion max. avg. percent
		Panel Average from Specified mm (inch)	Variance from Panel Average mm (inch)					Face N (pounds)	Edge N (pounds)	
M-3	±2.0 (±0.080)	±0.200 (±0.008)	±0.100 (±0.004)	16.5 (2393)	2750 (398900)	0.55 (80)	2225 (500)	1100 (247)	1000 (225)	0.35

◀ CONTINUED FROM PAGE 46

Third-party certification to ANSI 208.1 is required for many applications of composite panels. For example, many building code jurisdictions require the physical properties of particleboard underlayment and stair treads to be third-party certified. All manufacturers of particleboard sold in the U.S. must meet the third-party certification and formaldehyde emissions testing requirements under EPA's TSCA Title VI.

Environmental Product Declarations (EPDs) are the widely accepted standardized specification format for communicating the environmental footprint and performance of a product. EPDs are the definitive source of environmental technical data that is scientifically based on life cycle analysis and can be used to directly compare alternative product materials. The existing industry-wide EPD for North American particleboard will be updated and available in late 2018. See page 8 of this Guide for additional information.

PARTICLEBOARD HAS EXCELLENT MACHINING CHARACTERISTICS, WHICH IS IMPORTANT WHEN POSTFORMING HIGH PRESSURE LAMINATE COUNTERTOPS.

PARTICLEBOARD CONTINUED ON PAGE 50 ▶

FORMALDEHYDE EMISSION LIMITS

In compliance with EPA TSCA Title VI, ANSI A208.1 allows for a maximum of 0.09 ppm emission level for particleboard. To meet the needs of the market, many particleboard manufacturers offer ultra-low emitting formaldehyde (ULEF) and no-added formaldehyde (NAF) products. Those companies currently producing ULEF and NAF products are identified in the product listings in this Guide.

In addition, CPA's Eco-Certified Composite (ECC) Grademark Program requires that certified participants meet the stringent emission limits in the EPA TSCA Title VI and California Air Resources Board Airborne Toxic Control Measure (CARB ATCM 93120) regulations.

Finally, various overlays and surface treatments have been shown to significantly reduce product emissions. For additional information about emissions, see the CPA Technical Bulletin "VOC Emission Barrier Effects." ■



Please see pages 98-99 for information about the companies that produce particleboard.

ADVANCES IN PAPER, DÉCOR PRINTING AND RESIN TECHNOLOGY ALLOW FOR THE PRODUCTION OF TEXTURED THERMALLY FUSED LAMINATES ON PARTICLEBOARD ① ADDING HIGH FIDELITY DESIGN TO A STANDARD PARTICLEBOARD PANEL. PARTICLEBOARD IS MADE IN A WIDE RANGE OF PROPERTIES TO SUIT JUST ABOUT ANY PURPOSE. PARTICLEBOARD PLAYS A KEY ROLE IN CABINET MANUFACTURING PLANTS ②



Sculptures machined from Boise Cascade Particleboard