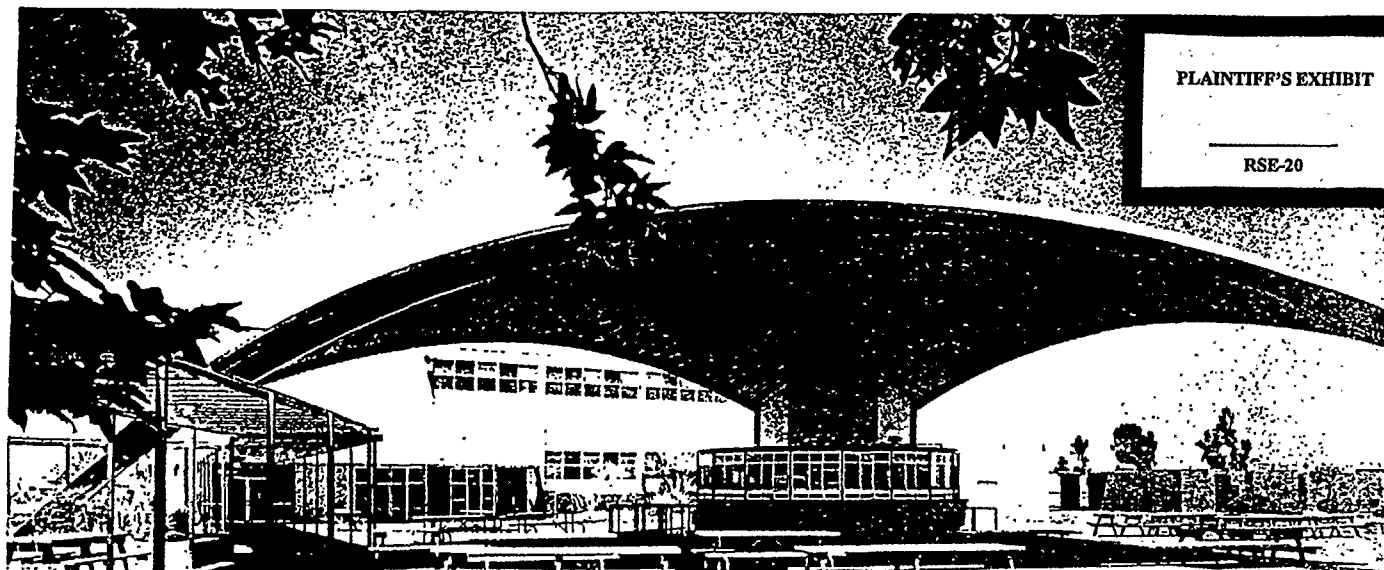




This is Johns-Manville FLEXBOARD®

Tough, versatile and dependable, Johns-Manville Flexboard asbestos-cement sheets are among the most useful building materials ever developed. Johns-Manville research has created a superior quality product that meets Federal Specification SS-B-755, Type F; and, ASTM Specification C220-61, Type F.

These specifications cover Type F (flexible) asbestos-cement sheets and Type U (utility) sheets. The two types are look-alikes, superficially, but there is a difference.

Type F (flexible) sheets are suitable for exterior or interior use where high strength and density, smooth surface, flexibility and low moisture absorption are desired.

Type U (utility) sheets are for general utility construction where it is *not* essential to have the best in flexibility, density and low moisture absorption.

Johns-Manville Flexboard sheets are manufactured consistently to meet Type-F requirements and are available constantly from stock without special order. So, to secure the best, it is important to specify Johns-Manville Flexboard sheets which is a guarantee that Type F (flexible) asbestos-cement sheets will be furnished.

Made of asbestos and cement combined under pressure, then hydraulically *repressed* at 2000 psi for added strength, the laminated Flexboard asbestos-cement sheets are tough, durable boards that are easily handled and flexible. Toughness allows storing and handling in the field without unusual precautions. Durability insures life-long dependability and economy. Flexibility provides a wider scope of design opportunities; makes practical curved or contoured surfaces as well as flat surfaces.

Flexboard may be sawed by hand or by mechanical saws and nailing does not require pre-drilling, even as close as $\frac{3}{8}$ " from panel edges. In new construction or for remodeling, Flexboard may be used for exterior walls or interior partitions; for ceilings, soffits, domed structures or canopies, . . . even outdoor dance floors.

The all mineral composition of Flexboard asbestos-cement sheets makes them fireproof. Underwriters Laboratories, Inc. approve Flexboard as non-combustible.

Their tests show Flexboard will not contribute fuel to a fire, will not permit the spread of flames and will not generate objectionable smoke. Also, Flexboard sheets are rot proof, rodent proof and termite proof. They are absolutely weatherproof, totally immune to moisture, rust and extremes of tropical heat or arctic cold.

Combining low initial cost, ease of construction and freedom from maintenance, Johns-Manville Flexboard asbestos-cement sheets are currently yielding stout service and architectural distinction to commercial and institutional buildings ranging in size from schools and retail shops to giant warehouses, office buildings and transportation terminals.

Wherever it is used, Flexboard meets demanding conditions of construction, durability and appearance because Flexboard is a quality Johns-Manville product, and Johns-Manville is the recognized leader in its field.

This is the basic Flexboard story but it does not stop there.

To better serve the building industry, Flexboard is further processed by Johns-Manville into five Flexboard groups which are covered in this book. They are:

Physical Characteristics of Standard FLEXBOARD

Density, Dry-lb/cu. ft., Avg.	100
Moisture Content (Normal), % Dry Wt., Avg.	8
Water Absorption, % Dry Weight, Maximum (After 24 hour immersion)	22
Tensile Strength (Dry), psi (Modulus of Rupture)	
Long Direction of sheet	5500
Short Direction of sheet	4500
Modulus of Elasticity (Dry), psi	2.0×10^6
Compressive Strength (Normal), psi	14000
Consolidation, in./in. at 500 psi	negligible
Tensile Strength (Normal), psi	
Long Direction of sheet	2350
Short Direction of sheet	1775
Shear Strength (Normal), psi	4000
Charpy Impact Resistance (Normal) in-lb, min.	2.3
(ASTM D 256-54T, Method B-4, span 5" x 1/2" unnotched samples)	
Brinell Hardness No. (Dry) (500 kg. load, 10 mm ball, 10 sec)	18
Freezing and Thawing Resistance	Satisfactory
Moisture Extension, in/in.	
Shrinkage — Normal to dry	0.0022
Expansion — Normal to 90% RH	0.0006
Expansion — Dry to saturated	0.0030
Thermal Expansion, in./in./F	5×10^{-6}
Temperature Limit, Maximum continuous, F	600
Fire Hazard Classification (Underwriters' Laboratories, Inc.)	
Flame Spread	0
Fuel Contributed	0
Smoke Developed	0
Thermal Conductivity, Btu in./sq ft/F/hr	4.5
Dimensional Tolerances (Normal), in	
Thickness	± 0.020
Length	± 0.032
Width	± 0.032
Squareness, per linear foot	0.016
Screw Holding Strength (Normal), lb/screw (Withdrawal load for Type A, No. 6-12 Sheet-Metal Screws)	
1/8" thk	50
3/16" thk	75
1/4" thk	150
Flexibility, Minimum Bending Radius (Normal), in	
Long direction of sheet forming arc of circle	
1/8" thk	30
3/16" thk	36
1/4" thk	66
Short direction of sheet forming arc of circle	
1/8" thk	36
3/16" thk	54
1/4" thk	72

The figures are average values (unless otherwise specified) obtained by accepted test methods. Strength figures must be modified by adequate factors of safety to arrive at working values. "Dry" refers to oven-dried samples; "Normal", to normal conditions of 75F and 50% R.H.

FLEXBOARD PANELS (Continuous Perimeter Supported) ULTIMATE UNIFORM LOAD (lbs/sq ft)

Panel Size	Flexboard Thickness				
	1/8"	3/16"	1/4"	3/8"	1/2"
2' x 4'	105	200	275	475	625
4' x 4'	50	130	192	345	450
4' x 8'	40	82	130	225	330

RECOMMENDED (WORKING) UNIFORM LOADS (lbs/sq. ft) (Safety Factor-3)

2' x 4'	35	67	92	160	208
4' x 4'	17	43	64	115	150
4' x 8'	13	27	43	75	110

DEFLECTION (Inches) AT 40*-lb/SQ. FT. UNIFORM LOADING

2' x 4'	NR	0.33	0.27	0.14	0.09
4' x 4'	NR	NR	0.59	0.43	0.27
4' x 8'	NR	NR	NR	1.09	0.96

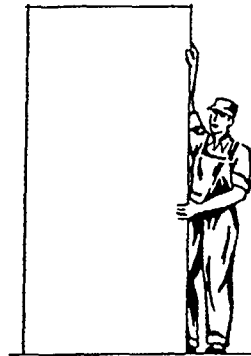
(NR = Not Recommended)

* Equivalent to wind velocity of 100 miles per hour

Deflections exceeding 0.30" not generally acceptable by local building codes for spandrel panels. For balcony enclosures subject to

architectural uses:

spandrels
curtain walls
railings
canopies
ceilings
partitions



STANDARD FLEXBOARD, the basic Type F (flexible) asbestos-cement sheet is manufactured by Johns-Manville in the following sizes*:

thickness — 1/8", 3/16", 1/4", 3/8" and 1/2"

width — 4'

length — 4', 8', 9' (1/8" and 3/16" only), 10' and 12'

Physical Characteristics of Flexboard Sheets and wind load charts are shown at the left. These show the acceptability of Flexboard for indoor or outdoor application under most building code regulations.

The toughness and durability of Flexboard has been proven in virtually every type of environment. Exposed to sun, cold, wind and rain, Flexboard will not deteriorate. It will not rot or rust from prolonged dampness.

It will not mold. Vermin will not attack it. And, it will not powder, crack or chip from excessive dryness.

Johns-Manville Flexboard (repressed for extra long life) is inert, stable and impact resistant. It is unaffected by years of wear and tear. Accidental abuse that scratches or dents many materials is effectively resisted.

In color, the sheets of Standard Flexboard are a stone gray. The hard, smooth surface never needs painting or preservative treatment. But, if color is desired it can be painted. Apply a coat of rubber base** primer; then two coats of paint (exterior grade or interior grade depending on location) in accordance with the paint manufacturer's recommendations.

However, for greater convenience, when painting is anticipated Pre-Primed Flexboard is suggested.

* All of these sizes in all Flexboard groups (Standard, Primed, Micro, Permatone, Perforated) are not always available in every area. Check local supply sources.

** "Rubber base" should be Goodyear Pliolite S-5 or equivalent. Chlorinated rubber base paints may also be used. Consult paint manufacturers for preparation and application.

Johns-Manville **FLEXBOARD**
ASBESTOS-CEMENT SHEETS

RS-10080