VERSAROC®

CEMENT BONDED PARTICLE BOARD SUBFLOORING

- **Strong, durable cement bonded particle board structural fire-resistant panel in standard sizes of 4' x 8' and 4' x 10' with tongue & groove edges on the long dimensions and square edges on the short dimensions. Standard thicknesses of 12mm (1/2") and 19mm (3/4") available. Other thicknesses available as special order.**
- **Dimensionally stable, factory primer sealed against surface water absorption.**
- **VERSAROC® panels have a maximum linear variation with change in moisture from 50% to 90% relative humidity of 0.06% tested in accordance with ASTM D1037, which means the panels will not buckle or warp like wood sheathing.**
- **Average ultimate shear strength of 1,205 PLF in accordance with ASTM E455.**
- **Cutting of VERSAROC® panels requires a carbide-tipped saw blade and a circular saw equipped with dust collection or suppression to control airborne dust. Fastening is also conventional, using a screw gun and self-drilling No. 8 gauge screws. Because these panels are so durable, they may be installed in most weather conditions, including mild precipitation (rain or snow) and temperatures from 0 – 125 degrees F.**
- **Highly fire resistant. UL tested and listed for zero flame spread and zero smoke development in accordance with ASTM E84 / UL 723**
- **Zero silica content – zero asbestos content – zero formaldehyde content.**
- **100% termite & rot resistant.**

VERSAROC® subfloors are mechanically fastened to cold-formed steel joists, trusses or framing members. A fire-rated ceiling assembly is attached to the bottom of the floor joists to complete the construction. This floor system is designed to carry gravity and lateral loads. Finished floor materials, such as residential carpet and pad, may be applied directly onto VERSAROC® subfloors. For retrofit or renovation projects, VERSAROC® subflooring can also be installed on wood joists and hot -rolled steel framing. A 19mm (3/4") VERSAROC® board has an STC value of 33 without any other collateral floor systems materials considered.

VERSAROC® 19mm (3/4") subfloors can carry a maximum total uniformly distributed load, live and dead, of 280 lbs. persq. ft. without regard for deflection or safety factor with support spacing not greater than 24" o.c. See VERSAROC® load tables for recommended live load designs at various support spacings.

LIMITATION

VERSAROC® subfloors should not be left in service without an appropriate finish floor covering such as ceramic tile, vinyl, wood, carpet of other approved materials. Without an underlayment, future removal of these floor coverings may damage the structural subfloor. The only floor coverings that do not require an underlayment are residential carpet and pad. Do not gap VERSAROC® subfloor panels. As with all types of constructions, appropriate safety procedures must be followed to protect installers from personal injuries resulting from lifting incorrectly, falling, and eye, hand, and lung irritation from dust. Care must be taken when placing pallets of VERSAROC® on the floor framing. A pallet of VERSAROC® 19mm (3/4") 4' x 8' (22 panels) weighs approximately 3,700 lbs. Do not exceed floor limits of the framing system when loading pallets or panels on open framing or completed floor assemblies. Store units next to structural walls where the joists meet the wall.

INSTALLATION SPECIFICATION

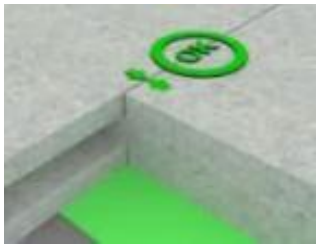
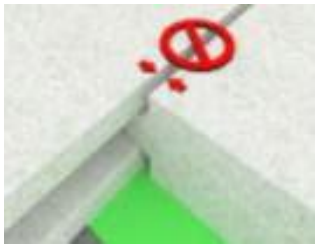
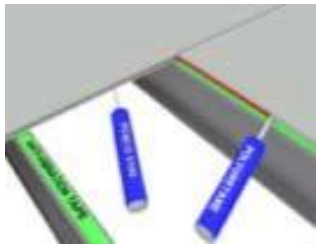
To perform in the expected manner, VERSAROC® subfloors must be installed according to specifications, using only the listed materials and components.

FRAMING

The steel floor framing must be designed to meet the strength and deflection criteria specified in the contract documents. The attachment or bearing edge must be a minimum of 2" (51mm) wide with at least ¾" of the panel bearing on the supporting flange. Metal framing must be minimum of 16 gauge and spaced no greater than 24" (610mm) o.c. Follow the contract documents and the steel framing manufacturer's recommendations for the proper installation and bracing of the framing. The steel structure to which VERSAROC® decking is to be applied should be fairly even and supportive of the attachment. Fasteners should not protrude above the height of the joist surface and joist. Beam and rim joists should be fairly even.

ADHESIVES

Do not gap VERSAROC® panels. A recommended construction adhesive must be placed in all panel joints (both tongue & grove and square edge joints) prior to boards being tightened and screw fastened to framing.

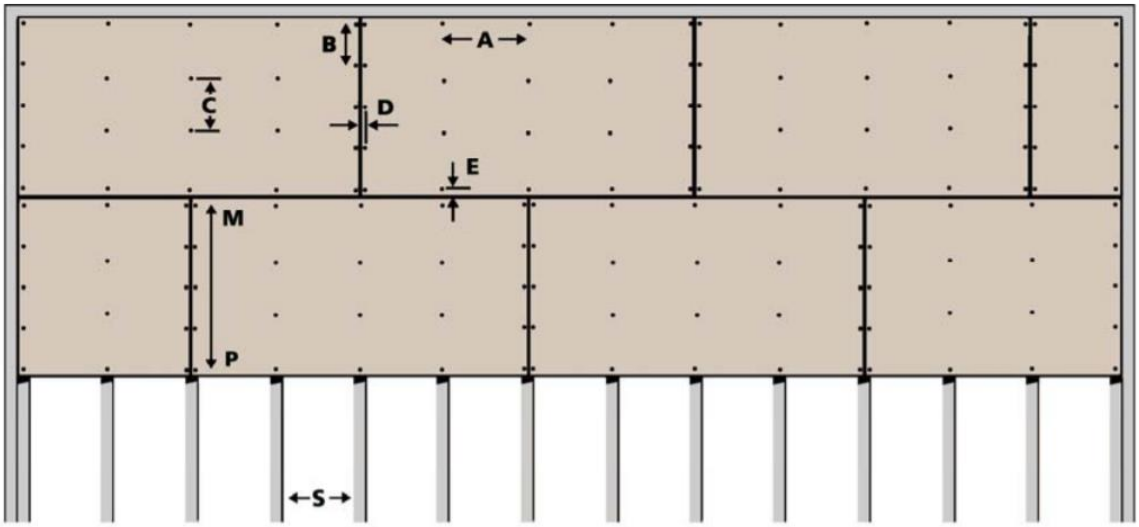




- ALPHA Systems PEMCO P5100 Joint Adhesive, or equivalent
- LOCTITE PL400 Subfloor Adhesive
- Henkel FS-450 Joint Adhesive, or equivalent
- SikaFlex Joint Adhesive, or equivalent

JOBSITE TRAFFIC PROTECTION

Place protective sheathing materials (i.e. plywood or additional layer of VERSAROC®) on the floor in traffic areas to protect the newly installed subfloor panels from excessive wear and damage.

Typical fastener layout for installation of VERSAROC® Floors



S = Support centers not to exceed 24 inches on center.
A = 6”-12” o.c. around perimeter
B = 12” on center at panel endings over supports.
C = 12” on center along supports within field of panel.
D = 3/4” from panel end joint edges.
E = 2” from panel side joint edges.
M-P = Bond all board edges with non-flammable adhesive.

Bonding of Joints in fire rated assemblies: All long dimensions of panels are tongue & groove configuration. All short dimensions of panels are square edges. Tongue & groove as well as square edged conditions both are to be bonded using PEMCO 5100 Polyurethane Adhesive or equal. Adhesive to be non-flammable, solvent free, zero V.O.C., and compatible with Portland cement-based products (see adhesives & bonding notes on page 5).

Fastener Recommendations: Corrosion resistant screws with self-countersinking heads, such as Grabber item# GH8158LG and HILLMAN item# 41876 or equal, #8 diameter minimum with self-drilling ‘TEK’ point for metal framing are recommended. The length of the fastener to be selected should be 2 to 3 times the board thickness. Surface treatments being applied should always be considered when selecting the appropriate fastener types.

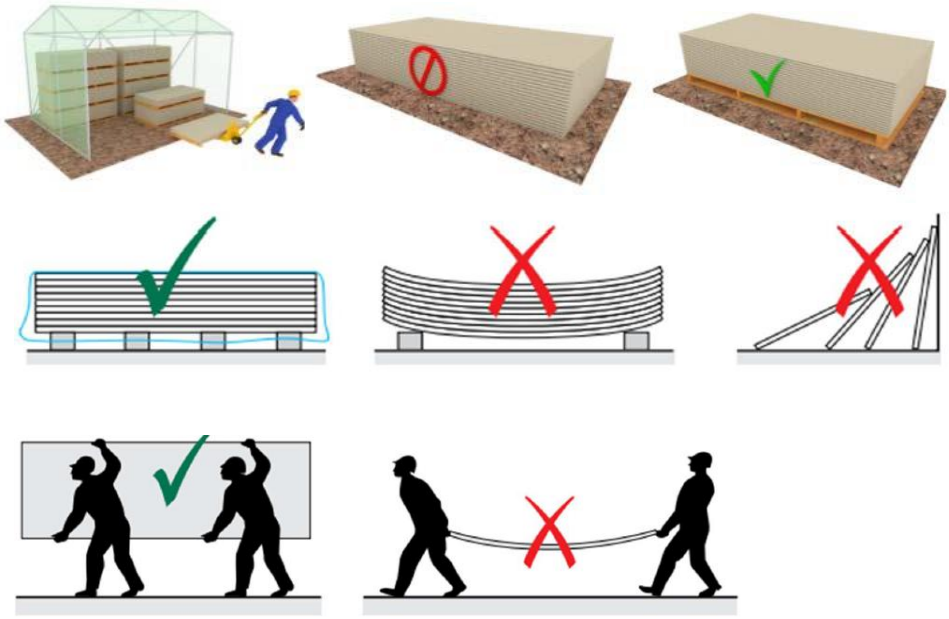
Self countersinking head

Steel Framing

Wood Framing

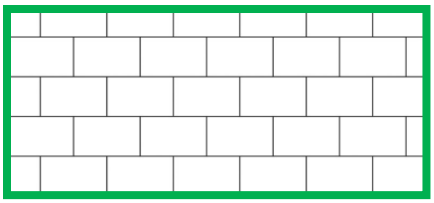
HANDLING & STORAGE

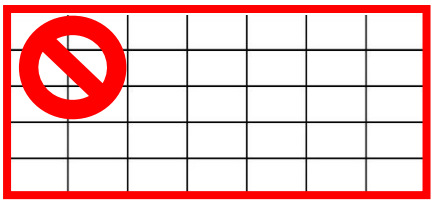
VERSAROC® panels should be stored indoors or under protective cover from inclement weather. Store panels flat on level supports not exceeding 30” o.c. Never store panels on edges or upright. Stack full pallets no more than 4 units high. If temporarily stored outdoors, a weather protective covering must be secured over the pallets. When hand carrying single panels, the must be carried on edge with the 4 ft. dimension vertical.



Installation

Install panels in a running bond pattern with long dimension across supports and short dimensions bearing on flange of support so that end joints fall over the center of the framing members and are staggered by at least two supports from the end joints in the adjacent rows. For all panels less than 24” wide, all edges must be supported by blocking. Blocking must be galvanized cold-formed steel, 16 gauge minimum. The attachment flange or bearing edge must be at least 2” wide and a least ¾” of the panel must bear on the supporting flange or edge. Staggered panel joints layout on framing.





Load Tables

1. Continuous loading conditions where panels span 3 or more supports of equal spacing. Uniformly distributed live loads in pounds per square foot allowable on VERSAROC® ® panels.

PANELS SPANNING 3 OR MORE SUPPORTS				
VERSAROC® ® Panel Thickness	Load Governed By	12" o.c. Supports	16" o.c. Supports	24" o.c. Supports
16mm (5/8")	L/240 ^ between supports L/360 ^ between supports	212 212	117 117	50 50
19mm (3/4")	L/240 ^ between supports L/360 ^ between supports	299 299	166 166	71 71
22mm (7/8")	L/240 ^ between supports L/360 ^ between supports	402 402	224 224	96 96
25mm (1")	L/240 ^ between supports L/360 ^ between supports	520 520	290 290	125 125
28mm (1-1/8")	L/240 ^ between supports L/360 ^ between supports	654 654	365 365	158 158
32mm (1-1/4")	L/240 ^ between supports L/360 ^ between supports	790 790	477 477	208 208
38mm (1-1/2")	L/240 ^ between supports L/360 ^ between supports	889 889	605 605	264 264

Load Tables

2. Single Span Condition Uniformly distributed live loads in pounds per square foot allowable on VERSAROC® ® panels.

PANELS SPANNING 3 OR MORE SUPPORTS				
VERSAROC® ® Panel Thickness	Load Limited By	12" o.c. Supports	16" o.c. Supports	24" o.c. Supports
16mm (5/8")	L/240 ^ between supports L/360 ^ between supports	169 169	93 93	39 30
19mm (3/4")	L/240 ^ between supports L/360 ^ between supports	239 239	132 132	56 51
22mm (7/8")	L/240 ^ between supports L/360 ^ between supports	321 321	178 178	76 76
25mm (1")	L/240 ^ between supports L/360 ^ between supports	415 415	231 231	99 99
28mm (1-1/8")	L/240 ^ between supports L/360 ^ between supports	521 521	290 290	125 125
32mm (1-1/4")	L/240 ^ between supports L/360 ^ between supports	682 682	380 380	164 164
38mm (1-1/2")	L/240 ^ between supports L/360 ^ between supports	865 865	482 482	209 209

* Load calculations based upon a safety factory of 4. Moisture content of VERSAROC® is assumed to be 9% by weight (±3%) as shipped from the factory - this is considered 'dry' condition. If VERSAROC® is allowed to become saturated, reduce to live load working capacity approximately 30% until the boards have re-dried. All load table data remains valid for re-dried boards. Technical tables and specifications are provided as general guidelines only. No table can be sufficiently comprehensive to overall details of a specific project design. We recommend that all installations be designed and reviewed by a qualified architect or engineer.

Floor Finishes

Follow the contract documents and the floor finish manufacturer's recommendations for the application of finished flooring. Note that most floor finishes will require an underlayment. Before the application of floor finish materials, ensure that all panels are properly fastened with the fastener head driven flush or slightly.

PHYSICAL PROPERTIES	VALUES	TEST STANDARD
Thermal Conductivity (12mm / ½" panel)	K' value 1.054 BTU/hr-ft2 – °F 'R' value 0.447 hr-ft2 -°F/BTU	ASTM C518
Coefficient of Linear Thermal Expansion (12mm / ½")	0.589 x 10-5 per °F 1.06 x 10-5 per °C	ASTM D696
Density - Oven Dry	77 lbs. per cu. ft.	ASTM D1037
Moisture Content	6.8%	ASTM D1037
Linear Variation with Change in Moisture **50% to 90% relative humidity:** **Parallel to fibers –** **Perpendicular to fibers –**	 0.06% 0.09%	ASTM D1037
Saturated Thickness Swelling (24 hour water immersion)	0.51%	ASTM D1037
PH Value	11-13	As per Manufacturer
Water Vapor Permeance	3.93 Perm-Inches 6.342 US Perms	ASTM E96
Formaldehyde Content	Zero	EN 120
Asbestos Content	Zero	EN 120
Silica Content	Zero	EN 120
Frost Resistance	No Effect after 50 cycles Freeze/Thaw	EN 112
Rot & Termite Resistance	Resilient to destruction	100% Resistant

MECHANICAL PROPERTIES	VALUES	TEST STANDARD
Concentrated load	854 lb. (3.58 kN) static 0.031" (0.7874 mm) max. deflection @ 200 lb. (0.89 kN)	ASTM E661 (550 lbs., 0.108")
Modulus of Elasticity, psi	717,800	ASTM C120
Modulus of Rupture, psi	1,840	ASTM C120
Shear Strength, psi	1,424	ASTM D732
Tensile Strength, psi	667	ASTM D1037
Compressive Strength, psi	4,852	ASTM D1037
Impact Strength, Izod Method	0.4607	ASTM D256
Permissible Design Value, psi	326	Manufacturer
Shear Diaphragm (19mm, ultimate shear value)	2,185 lbf with adhesive 1,210 lbf without adhesive	ASTM E455

COMBUSTION CHARACTERISTICS	VALUES	TEST STANDARD
Flame Spread / Smoke Development	Zero / Zero	ASTM E84*
Fire Resistance Ratings	1 & 2 hour Floor/Ceiling Assemblies	ASTM E119
Fire Resistance Ratings	1&1 ½ Hr. Rated roof assemblies	ANSI/UL 263†

- ◊ Underwriters Laboratories tested in accordance with ASTM E84 and ANSI / UL 723
- ◊ UL listed Filed # R25239
- ◊ UL Assembly BXUV.P523 acceptable alternate for roof sheathing

Submittal Approval

Project Name:	
Contractor/Architect:	
Date:	