

ALTERNATIVES TO STRUCTURAL PLYWOOD & OSB

The recent dramatic upswing in structural panel prices and tightened material supply has created concern among the residential construction industry. Several reasons for the price and supply volatility include:

- Previous manufacturer overproduction and low panel prices have caused producers to close less productive mills;
- Flooding and fires in timberlands have reduced log supplies;
- Long and sustained high level of home building activity;
- Reduced inventories at building material distributors; and
- Recent large purchases of structural panels by the federal government destined for the Middle East.

Plywood and OSB are considered commodity products and are used interchangeably. Supply or price characteristics that apply to one typically influences these characteristics in the other sheathing product.

Uncertainty in price or supply of OSB and plywood has prompted the industry to consider alternative sheathing approaches for residential housing.

Alternative Sheathing Products

Imported OSB and Plywood

Factors that affect supply and price for panel products in this country might not influence imports in a similar fashion. Countries the U.S imports plywood from, other than Canada, includes primarily Brazil and Chile. OSB imports, other than from Canada, are negligible but some distributed product comes from Poland, Germany and France. Be sure that panels have appropriate grade stamps or structural certifications if they are intended as structural sheathing.

Due to shipping costs and the commodity nature of wood structural panels, prices may mirror, or exceed, domestic panel prices.

Representative products include panels made from Radiata pine and Kronoply OSB, Triply OSB, and Masisa OSB.

Fiberboard

Impregnated fiberboard has been used as insulative sheathing for years and is known by such names as blackboard, grayboard, or buffaloboard. It can either be structural or non-structural which requires corner bracing. It is constructed of wood, or other plant, fibers which are mixed with binding agents and other materials and compressed together. Many fiberboard products are made using post-consumer recycled fiber.

Fiberboard is primarily used for wall sheathing and floor underlayment. It has a higher R-value than most other wood-based sheathings (approximately 2.4 per inch) and has sound attenuating properties.

Traditionally, it is less expensive than other wood-based sheathings.

Representative products include:

- Stedi-R and Stedi-R Structural by Georgia-Pacific Corporation
- Buildrite Structural Sheathing by International Buildrite, Inc.
- Temple Fiber Brace by Temple Inland
- Celotex Premium Insulating Sheathing by Knight-Celotex

Cementitious Board

Cementitious board is a panel consisting of Portland cement reinforced with fiberglass mesh material. Typically used as backerboard for ceramic tile installations, cement board products have been used as exterior sheathing under a stucco cladding. Not structural in nature, buildings sheathed with cement board must have corner bracing.

Representative products in this category include Durock by USG and WonderBoard by Custom Building Products.

Fiber Cement

A mix of wood fiber and cement—fiber cement is a product increasing market share in the siding market. Panels of fiber cement may come untextured or textured into various siding configurations. Flat panels may be used under stucco and textured fiber cement panels may act as both sheathing and cladding. Check local building codes to determine whether corner bracing is required.

Fiber cement products are marketed under the Hardi-panel or Cemplank brands by James Hardi, and WeatherBoard brand by CertainTeed Corporation.

Gypsum

Gypsum products come in a variety of material configurations including exterior-fated gypsum core with paper faces, gypsum core with glass mat faces, and a core of gypsum, cellulose, and perlite with water-resistive faces. Gypsum panels are used under brick veneer, and stucco finishes. An advantage of gypsum is the ability to obtain a fire-rated wall assembly. Gypsum panels, however, must be handled carefully and the paper-faced products need to be sheltered from precipitation.

The primary manufacturers of gypsum panels include USG, Georgia-Pacific Corporation, and National Gypsum Company. Representative brands include Fiberock, Densglass Gold, and Gold Bond respectively.

Foil or Paper Faced Insulative Board

Foil or paper faced insulative board is a thin (0.078 to 0.137 inch) sheathing product that can be applied in large sheets (up to 80 inches by 16 feet). These products are structural in nature and do not require corner bracing assuming proper fastening and framing. It is less expensive than most sheathing options.

Products in this category include EnergyBrace by Ludlow Coated Products and Thermo-Ply by Simplex Products.

Foam Sheathing

Foam insulating sheathings come in a variety of foam formulations including extruded polystyrene, expanded polystyrene, and polyisocyanurate. Each foam has its particular R-value associated with the material formulation and thickness of the panel. Regardless of foam type, however, foam sheathing is the most insulative of all the sheathing options. Foam sheathing does require corner bracing, as it is not structural in nature.

Wood Boards

Dimension, one-inch thick lumber was the sheathing predominantly used at the turn of the century and has all but lost market share save for a few pockets in the U.S. For year 2002, board sheathing amounted to less than 2/5 of one percent for all sheathing applications.

Boards have been replaced by other products due to their slow speed of installation, their lack of uniform strength, and their higher cost relative to alternative products.

Table I gives a price comparison for various sheathing options based on limited price surveying in the Baltimore/Washington metropolitan area.

**Table I
Representative Sheathing Prices by Product Type**

PRODUCT	DIMENSION	PRICE/PANEL
Plywood	1/2" x 4' x 8'	\$19.35
OSB	7/16" x 4' x 8'	\$19.19
Fiber Board	1/2" x 4' x 8'	\$4.73
Cement Board	3' x 5'	\$14.99
Fiber Cement	4' x 8'	\$25.00
Exterior Gypsum	1/2" x 4' x 8'	\$15.68
Foil Insulative Board	4' x 8'	\$9.35
Foam (extruded)	1/2" x 4' x 8'	\$8.98
Foam (extruded)	3/4" x 4' x 8'	\$10.60

Challenges with Alternatives to Plywood and OSB

While many options exist for sheathing products, these products have a number of issues related to their adoption. These issues are related to their application, their structural limitations, and material characteristics, which impact thermal and moisture performance. When considering alternatives to traditionally used sheathing products, specifiers should factor in building design and local climate conditions.

Application Challenges

Many of the options presented above are applicable only for wall sheathing. Floor and roof sheathing usage rates nationally are twice the volume of wall sheathing. Options for floor sheathing includes slab on grade and other designs using concrete and steel. Implications exist for building frame design due to the increased dead load of the alternative floor systems. While not as limited as flooring, roof sheathing also has limited options available and include gypsum and steel.

Structural Challenges

Many of the sheathing options listed are non-structural in nature necessitating measures to resist shear in walls. While these measures are common such as structural sheathing in corners or using let-in braces, they may require a skill set from contractors where competent employees are difficult to obtain or train.

Additionally, other than the imported wood panels or wood boards, these sheathing options do not act as a nail base. This complicates cladding attachment as additional nailers or care to attach to studs is required.



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