

# TECH TALK *from* Georgia-Pacific Gypsum

Technical Insight from the Roof Board Experts

## Thermal Barriers Boost Roofing System Fire Safety

Roofing substrates that block heat from fires should also deliver moisture resistance and mechanical strength.

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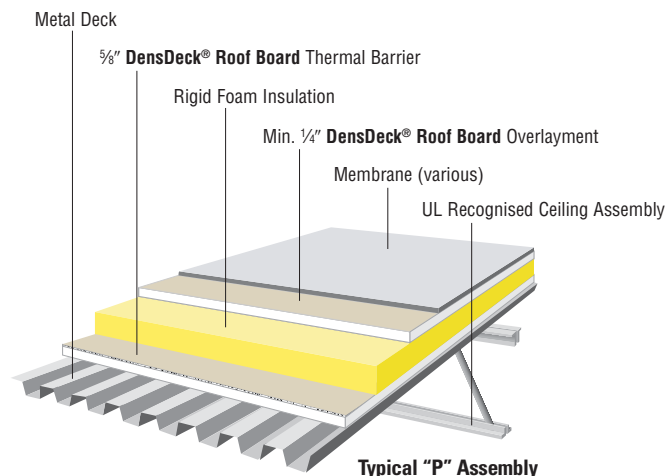
Roofs need fire protection. That's simple. Many of the components of roofing systems are combustible, and we want to keep fire from penetrating those combustible layers.

That's why roofing systems include thermal barriers. Substrates that act as thermal barriers can protect roofs from fires outside the building *and* from fires inside. And, of all the thermal barrier choices designers have, DensDeck® Roof Board delivers a superior combination of thermal and mechanical performance.

### Hourly ratings protect building occupants

Hourly fire ratings for roofing assemblies protect building occupants by giving them time to get out when there is a fire inside the building. These ratings tell you that the assembly has been tested to withstand fire exposure for one, two or four hours, depending on the use of the building, size and type of construction, distance to exits and other factors.

Because insulation, vapor retarders and the membrane itself may be flammable, a thermal barrier underneath is necessary to achieve an hourly fire rating. The barrier retards heat from an interior fire from reaching these layers.



In addition, Underwriters Laboratories (UL) 1256 standard, and many building codes, call for a thermal barrier separating unfaced rigid foam made of expanded (EPS) or extruded (XEPS) polystyrene from any fire exposure. A layer of 1/4" (minimum) DensDeck between a steel deck and the foam insulation meets the thermal barrier requirement for UL 1256 testing. A 5/8" DensDeck substrate as a thermal barrier will meet many hourly fire rated "P" assemblies.

### Underside thermal barriers need moisture resistance

A thermal barrier below insulation can be exposed to moisture from leaks and from condensation. If the roof leaks, the water will end up on the barrier just above the deck. In warm, humid climates where buildings are air-conditioned, moisture may condense within the barrier due to the lower side being cooled by the inside air.

Type X gypsum board is frequently used as a thermal barrier under roof insulation because it has more fire resistance than standard gypsum board. But typical type X board is moisture sensitive. It will wick water into itself, delaminate and become a reservoir for trapped water. That can jeopardize the physical properties of the board and the roof.

The moisture-resistant core of DensDeck holds up to moisture much better than type X gypsum board, and its inorganic fiberglass facings have been tested for resistance to mold per ASTM D 3273. Superior moisture performance makes DensDeck the better choice.

### Fire class ratings protect the roof from external fires

Fire A, B and C Class ratings measure fire resistance and spread of flame from the exterior. A layer of 1/4" (minimum) DensDeck between the insulation and the roof membrane can enhance fire class ratings.

DensDeck provides two benefits. First, it protects the insulation from exposure to external fires. Second, it can also reduce the spread of flame of the membrane itself because the surface of DensDeck acts as a heat sink. When fire hits DensDeck, the board chemically releases steam vapor which cools the assembly and retards flame spread. The enhanced fire protection of DensDeck can open design options such as steeper slopes that allow faster draining of water and snow loads.

With combustible decks in particular, building codes may limit the roof slope, or the types of roof coverings, because of the combustibility of the entire assembly. UL has determined that a 1/4" DensDeck layer allows the use of combustible decks in applications that would otherwise require a noncombustible deck.

**Use DensDeck® Roof Boards in many P-number assemblies**

A P-number identifies a pre-defined roof assembly that UL has tested for fire performance. P-number assemblies specify construction details such as the depth of steel joists, insulation thickness and type, to the gauge of hanger wires, etc. Architects select specific P-number assemblies to match construction designs.

UL says that DensDeck meets the requirements of type X board in many P-number assemblies and its superior moisture resistance can improve roof performance in those P-number applications.

**Roof system warranties can include DensDeck**

Major system manufacturers warrant the use of DensDeck roof boards in their total system warranties.

An additional benefit of using DensDeck above a steel deck is its ability to support a temporary roof during construction. A high-density core, and fiberglass facings bonded to the gypsum, give DensDeck strength to support construction traffic and materials storage. A layer of 1/4" DensDeck will support 450 lbs. over the 2 5/8" flutes of a steel deck. Both Perlite and wood fiber board may have problems with construction traffic loads.

**DensDeck delivers options — and peace of mind**

In roofing systems, there are many choices. Manufacturers, building owners, contractors and architects all have options when designing and specifying a system. When you add DensDeck to the equation, you create opportunities for enhanced performance and longer roof life.

DensDeck gives building owners enhanced fire protection, which means insurance premiums may be lower. Increased durability resists unpredictable environmental exposures. And having inorganic components

directly exposed to inside air gives a level of comfort about limitations on mold growth.

If you're making decisions and choosing roofing products, you may be subjecting those products to some exposure that you wouldn't expect. The moisture resistance and mechanical strength of DensDeck pay off when the work environment turns unpredictably tough.

Whatever the application, DensDeck can enhance the overall performance of the entire roof assembly with fire resistance, strength, moisture resistance, testing for mold and mildew, and sound isolation. Specify it in your next roofing job.

For more information on DensDeck in roofing systems, visit our website at [www.densdeck.com](http://www.densdeck.com) or contact any GP sales agents or independent sales representative.

5/8" DensDeck® Fireguard® Type X Roof Board is classified by Underwriters Laboratories and can be used in the following UL "P" assemblies:

- P225, P227, P230, P235, P254, P257, P259, P266, P302, P508, P510, P512, P514, P518, P701, P711, P713, P714, P717, P718, P719, P720, P722, P725, P726, P727, P728, P729, P730, P731, P732, P733, P734, P735, P736, P738, P739, P740, P741, P742, P743, P801, P811, P815, P819, P824, P825, P826, P828, P921

UL of Canada:

- R210, R217, R221, R222, R223, R224, R225, R702, R703, R804, R805, R806



**SALES INFORMATION AND ORDER PLACEMENT**

U.S.A. Midwest: **1-800-876-4746** West: **1-800-824-7503**  
 South: **1-800-327-2344** Northeast: **1-800-947-4497**

CANADA Canada Toll Free: **1-800-387-6823**  
 Quebec Toll Free: **1-800-361-0486**

**TECHNICAL INFORMATION**

Georgia-Pacific Gypsum Technical Hotline  
 U.S.A. and Canada: **1-800-225-6119**  
[www.gpgypsum.com](http://www.gpgypsum.com)

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**LIMITATION OF REMEDIES AND DAMAGES**

Unless otherwise stated in our written warranty for these products, our sole liability for any product claim shall be limited to reimbursement of the cost of repair or replacement of the affected product, up to a maximum amount of two times the original purchase price for the affected product. We shall not be responsible under any circumstances for lost profits, damage to a structure or its

contents, or indirect, incidental, special or consequential damages. Claims shall be deemed waived if they are not submitted to us in writing within ten (10) days after discovery of a product defect/circumstance giving rise to a claim.

**CAUTION: For product fire, safety and use information, go to [gp.com/safetyinfo](http://gp.com/safetyinfo).**

**HANDLING AND USE**

**CAUTION:** This product contains fiberglass facings which may cause skin irritation. Dust and fibers produced during the handling and installation of the product may cause skin, eye and respiratory tract irritation. Avoid breathing dust and minimize contact with skin and eyes. Wear long sleeve shirts, long pants and eye protection. Always maintain adequate ventilation. Use a dust mask or NIOSH/MSHA approved respirator as appropriate in dusty or poorly ventilated areas.

For additional product fire, safety and use information go to [www.gp.com/safetyinfo](http://www.gp.com/safetyinfo) or call 1-800-225-6119.

**FIRE SAFETY CAUTION**

Passing a fire test in a controlled laboratory setting and/or certifying or labeling a product as having a one-hour, two-hour, or any other fire resistance or protection rating and, therefore, as acceptable for use in certain fire rated assemblies/systems, does not mean that either a particular assembly/system incorporating the product, or any given piece of the product itself, will necessarily provide one-hour fire resistance, two-hour fire resistance, or any other specified fire resistance or protection in an actual fire. In the event of an actual fire, you should immediately take any and all actions necessary for your safety and the safety of others without regard for any fire rating of any product or assembly/system.