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TECH TALK *from* Georgia-Pacific Gypsum

Technical Insight from the Roof Board Experts

DensDeck® Roof Board Underlayment Offers Fire Resistance Plus System Performance

Adds resistance to fire, moisture and foot traffic for roof systems.

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If you're approving a budget for a roof design or making decisions about roof components, you should know why architects specify DensDeck® Roof Board for fire resistance. DensDeck delivers fire rating performance, superior moisture resistance and compressive strength that other fire-resistant components may not provide. DensDeck can reduce overall installed costs and improve roof system performance with its unique moisture-resistant, high-density gypsum core and tough fiberglass mat facings.

Gypsum and fire resistance go together

Where building codes require hourly fire ratings or an external fire resistance classification for a roof, the assemblies typically contain high-density gypsum board. Why gypsum? Besides being non-combustible, the chemistry of gypsum actively resists the penetration of the heat. When exposed to flame, gypsum releases chemically combined moisture that protects both the board and the structure.

ASTM standards define gypsum board suitable for fire protection as Type X. DensDeck in ⅝″ thickness meets Type X requirements while also delivering additional moisture resistance and strength benefits.

Moisture resistance and strength are important

Rain—or even heavy dew—during construction can damage other roof boards and drive up waste. The core of DensDeck is treated to resist moisture. The board is also protected by fiberglass facings that retain strength when wet.

Even if roof board is not exposed to weather, it's easy for moisture to become trapped in a roof assembly. Dew and condensation during construction—or roof defects after installation—allow moisture into the roof assembly that can foster the growth of mold and mildew. The fiberglass mat facings of DensDeck resist the growth of mold which enhances the long-term quality of the building environment.

Standard paper-faced Type X gypsum board lacks the water-resistant core and fiberglass mat facings that DensDeck has. Therefore, it's more vulnerable to both water damage and mold growth. These are two of the reasons architects choose DensDeck over other gypsum boards.

DensDeck also has a strength advantage over other boards. The embedded fiberglass mat facings make DensDeck strong enough to bridge voids in the deck and support foot traffic during and after installation.

DensDeck compensates for aging in membranes

An important fire protection factor to consider is that, over time, exposure to sunlight and weather may change the fire-resistant characteristics of roofing membranes.

In a recent evaluation, samples of roofing membranes from actual roof installations—Class A assemblies aged a minimum of four years—were put through the same ASTM E 108-00 test used to rate new roof assemblies. Only a few of the samples met current requirements for flame spread or burn-through protection. After approximately one-quarter of their life cycles, many membranes had lost significant fire protection capabilities.

It's worth remembering that building codes and ASTM test standards are written for minimum protection. To deliver that protection over time, roof designs should include a margin for deterioration. That means either increasing the fire protection of the membrane or designing assemblies that have long-term fire protection built into them.

A cost-effective solution is to include DensDeck in the roof assembly. DensDeck can ensure long-term compliance with fire codes—even as the membrane ages—while providing moisture resistance and physical protection against foot traffic and hail.

DensDeck works in many applications

Depending on the roof design, DensDeck can contribute to fire ratings either directly underneath a membrane or below an insulation layer.

DensDeck has been classified in numerous UL P assemblies and can replace standard Type X gypsum board in many others. P assemblies are roof designs—including components, fasteners and adhesives—that have been tested and classified by UL to achieve 1-hour fire protection. Architects frequently specify P assemblies to ensure a roof system meets fire protection standards required by building codes.

Roof membranes get classification help

Class A, B and C roof classifications cover external flame spread and burn-through characteristics. Because the entire roof assembly is rated together, ¼″ DensDeck as part of the assembly improves fire performance and helps the assembly meet a Class A rating. With wood construction—where fire is always an issue—DensDeck above a wood deck makes it easier to accomplish a Class A rating.

The slope of a roof also affects the fire rating, which often is an issue in re-roofing. DensDeck under the membrane allows designers to accomplish "unlimited" slope—5″ in 12″ or 45 degrees—with a Class A rating.

Most building codes require some kind of fire barrier under wood shakes. ¼″ DensDeck makes an ideal choice for these applications.

Insulation layers get heat protection

Where foam insulation is used on top of DensDeck, the foam can be bonded with adhesives or fastened mechanically. Over steel decks, ⅝″ DensDeck helps accomplish a one-hour fire rating. Under expanded polystyrene (EPS) insulation, ¼″ DensDeck can meet code requirements for a 15-minute thermal barrier between the foam and the inside of the building.

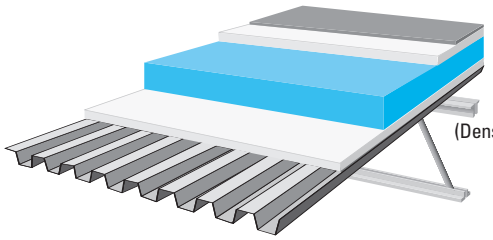
Check test results for specific assemblies

Fire protection ratings and classifications are specific to individual assembly designs. Georgia-Pacific and systems manufacturers are continually testing the fire performance of DensDeck products in roof assemblies. For current fire performance information in a specific application, check the test data for that particular design.

DensDeck® Fire Resistance Highlights

- 0 smoke, 0 flame spread per ASTM E-84
- Replaces any generic Type X gypsum board
- Permits Class A assemblies over combustible decks
- 15-minute thermal barrier using ¼″ DensDeck®
- FM Class 1 can be achieved using ½″ DensDeck

Thermal Barrier and Fire Barrier

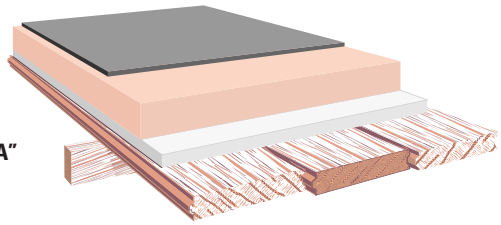


Roofing Membranes
Min. ¼″ DensDeck XEPS, MEPS
Min. ¼″ DensDeck (DensDeck® Prime preferred for adhered systems)
Steel Deck

¼″ DensDeck under EPS as 15 minute Thermal Barrier

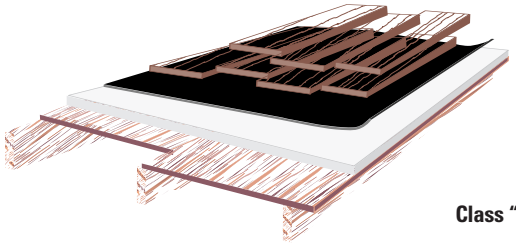
Thermal Barrier Board Underlayment

Roofing Membranes
Polyisocyanurate
Min. ¼″ DensDeck®
Wood Deck



Wood Deck Class "A"

Wood Shakes

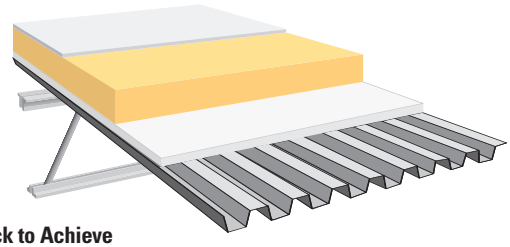


Wood Shakes
Roofing Felt Underlayment
Min. ¼″ DensDeck
Plywood Deck
Rafters

Class "A" Assembly with Wood Shakes

Fire Protection Barrier

Roofing Membranes
Rigid Foam Insulation
Min. ⅝″ DensDeck
Metal Deck



Foam Insulation and ⅝″ DensDeck to Achieve 1-Hour P Assembly Rating

Georgia-Pacific Gypsum

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

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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.

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 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.