

# TECH TALK *from* Georgia-Pacific Gypsum

Technical Insight from the Roof Board Experts

## DensDeck® Prime Roof Board Assemblies Exceed New FM Roof Requirements

Recent FM Approvals tests give DensDeck Prime roof assemblies 225, 285 and 315 PSF listings.

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In January of 2006, Factory Mutual (FM) made significant changes in its testing standards for wind uplift resistance in adhered membrane roofing systems. FM's announced intent was to require higher standards for wind uplift resistance ratings for FM insured buildings used in high-risk areas, such as coastal areas and the Caribbean Islands. Standards for wind uplift resistance ratings used in lower-risk areas farther inland were also increased, but less dramatically.

In recent tests, roof assemblies using DensDeck® Prime in fully adhered membrane assemblies over steel decks have met or surpassed the new FM requirements for perimeters and corners not only for the 90 PSF rating commonly used in coastal areas, but also a more severe 120 PSF rating.

### Summary of FM's new 90 PSF and 120 PSF rating requirements

For building design pressures up to and including 45 PSF, using a FM safety factor of 2, FM now requires the roof assembly to withstand these tested differential ultimate pressures:

Pressures for 90 PSF rating		
Field of Roof	Perimeter Areas of Roof	Corner Areas of Roof
90	150	225

For building design pressures up to and including 60 PSF, using a FM safety factor of 2, FM now requires the roof assembly to withstand these differential ultimate pressures:

Pressures for 120 PSF rating		
Field of Roof	Perimeter Areas of Roof	Corner Areas of Roof
120	195	300

Roof assemblies must now be tested to these pressures on a 12' x 24' uplift testing table. The old method of simply increasing the roof-field fastener count by fixed percentages for perimeter and corner areas of adhered systems is no longer accepted for the FM field of roof ratings of 90 PSF and higher.

### DensDeck Prime assemblies meet new 90 PSF and 120 PSF requirements

Georgia-Pacific has been actively participating in testing of roof assemblies having DensDeck Prime as a cover board and there are now a number of new elevated pressure tested results. The following assemblies were built and tested at FM Approvals:

#### Assembly #1— Achieved FM 225 PSF

- 3-ply glass felt Type III, asphalt mopped
- ½" DensDeck Prime, attached to the deck
- 24—#14 fasteners and 3" plates per 4' x 8' board.
- 1.5" polyisocyanurate insulation, loose laid
- Grade min. 33 KSI steel deck, attached to purlins per FM requirements

#### Assembly #2— Achieved FM 315 PSF

- 3-ply glass felt Type III, asphalt mopped
- ½" DensDeck Prime, attached to the deck
- 32—#14 fasteners and 3" plates per 4' x 8' board
- 1.5" polyisocyanurate insulation, loose laid
- Grade min. 33 KSI steel deck, attached to purlins per FM requirements

#### Assembly #3— Achieved FM 285 PSF

- 45 mil fleece-backed EPDM membrane fully adhered
- ½" DensDeck Prime attached to the deck
- 32—#15 fasteners and 3" plates per 4' x 8' board
- 1.5" polyisocyanurate insulation, loose laid
- Grade min. 33 KSI steel deck, attached to purlins per FM requirements

In addition, a number of membrane manufacturers have tested various types of DensDeck® Roof Board with their adhered membranes and have achieved a variety of high uplift results. Ongoing testing will add additional listings in 2007

### Rating requirements below 90 PSF have changed slightly

For FM adhered membrane in ultimate roof ratings of 75 PSF and lower, finding perimeter and corner fastening rates by multiplying the field fastening rate is still acceptable, but new FM 1-29 Loss Prevention Data Sheet requirements are now more stringent. In the past, the increase in fastener count was 50 and 75 percent for the perimeter and corner areas respectively for adhered membranes. In 2006, that was increased to 50 and 100 percent with minimum fastening rates required, unless testing allows a lower number.

Here is a summary of the new FM Approvals requirements for an ultimate 60 or 75 PSF field of roof rating.

Pressures in PSF and Fastener Count for FM 60 PSF and 75 PSF ratings		
Field of Roof	Perimeter Areas of Roof	Corner Areas of Roof
60 PSF	105 PSF	150 PSF
75 PSF	120 PSF OR 50% increase in fastener rate above field of roof fastener rate, with a minimum of 16 fasteners per 4 x 8 board	180 PSF OR 100% increase in fastener rate above field of roof fastener rate, with a minimum of 32 fasteners per 4 x 8 board

### Specifying appropriate lower ratings may reduce project costs

The new FM Approval requirements for 90 PSF and higher wind uplift ratings may increase construction costs. Wind uplift requirements are determined by a number of factors including but not limited to

geographical region, local geography, importance and exposure factors as well as building design. Architects and designers may be able to reduce project costs by specifying 75 PSF or lower roof ratings if those are appropriate to the region and the individual project. A number of Wind Load Design Guides based on ASCE-7 are available from NRCA, RCI and SPRI as well as on FM's RoofNav. For FM acceptance, be sure roof design and installation meet the Approval Guide, RoofNav, Loss Prevention Data Sheets 1-28, 1-29, and 1-49, as well as Wind Design and Perimeter flashing requirements. *(Decisions about roofing system designs should not be based solely on this GP Tech Talk.)*

### Contact GP

For more information about the use of DensDeck® products within a roof system, call your area Georgia-Pacific Gypsum commercial roofing manager, your Georgia-Pacific Gypsum DensDeck independent representative or our Technical Hotline at 1-800-225-6119. Or visit our Web site at [www.DensDeck.com](http://www.DensDeck.com).



### 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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