

TECHNICAL ADVISORY BULLETIN

To: GAF Commercial Sales, Master Select Contractors, Distributors

From: Technical Services Department

Subject: Changes to FM Approvals Standard 4470



Quality You Can Trust...
From North America's
Largest Roofing Manufacturer!™

Date: 12/20/2012

No: TAB-C 2012-15

What Is The Issue?

To prevent overstressing of steel decks per engineering steel design guidelines, **effective 12/31/12**, FM Approvals will revise steel deck span (bar joist spacing) allowances. Blanket acceptance of 6 foot deck spans will no longer be offered.

What Else Do I Need To Know?

- Specifics are detailed in the Codes & Testing Update 12-16 **Changes to FM Approval Standards 4470** attached to this document.
- Review the attached correspondences from **FM Approvals** and **SPRI** for additional information.

Where Can I Get More Information?

GAF Technical Services can assist you... with these and other questions you may have regarding your new roof installation. GAF Technical Services can be contacted at **800-ROOF-411** (800-766-3411). Also, the GAF website is a great resource for just about any question you may have or for additional information you may require. Please visit: www.gaf.com.



Codes & Testing Update

Number: CTU 12-16

Changes to FM Approvals Standard 4470

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*TO: GAF Low Slope Sales,
Marketing, 411 Line, Technical
Services, AIS, R&D*

FROM: The Codes Dept.

DATE: November 15, 2012

Background – what is happening?

FM Approvals will revise steel deck span (bar joist spacing) allowances effective 12/31/12 to prevent overstressing of steel decks per engineering steel design guidelines. Blanket acceptance of 6 foot deck spans will no longer be offered. Specifics are detailed in the attached Excel file from FM Approvals.

FM Approved Mechanically Attached 5 ft. Wide TPO Installations on 22 ga. Decks:

- **Industry:** 6 ft. deck spans are still OK through Class 1-120 with 33 ksi, 22 ga., deck and through Class 1-225 with 80 ksi, 22 ga. deck
- **GAF:** No effects on current FM Approved GAF mechanically attached EverGuard® TPO Systems with 5 ft. sheets

FM Approved Mechanically Attached 8 ft. Wide TPO Installations on 22 ga. Decks:

- **Industry:** 6 ft. deck spans are only OK through Class 1-75 with 33 ksi, 22 ga. deck and through Class 1-135 with 80 ksi, 22 ga., deck
- **GAF:** No effects on current FM Approved GAF mechanically attached EverGuard® TPO Systems with 8 ft. sheets

FM Approved Mechanically Attached 10 ft. Wide TPO Installations on 22 ga. Decks:

- **Industry:** FM Approved 6 ft. deck spans are no longer available with 33 ksi, 22 ga. deck. 5 ft. spans are allowed at Class 1-60 only and 4 ft. spans are allowed through Class 1-75. 80 ksi, 22 ga. decks are OK with 6 ft. spans through Class 1-90 and on 5 ft and 4.5 ft. spans for Class 1-105 and Class 1-120, respectively.
- **GAF:** GAF's Class 1-120 & 1-105 rated, 6 in. o.c. attachments of EverGuard® TPO to 33 ksi, 22 ga. deck and 80 ksi, 22 ga. decks can no longer be installed over these decks when placed along 6 ft. spans. These attachment patterns can be used, however, with 8 ft. wide EverGuard® TPO sheets over 80 ksi, 22 ga. deck placed along 6 ft. spans and maintain the 1-120 and 1-105 ratings. Existing Class 1-75 and Class 1-90 rated, 12 in. o.c. attachments of EverGuard® TPO to 22 ga., 80 ksi decking remain in place.

What happens if 20 ga. or 18 ga. decking is available for use with mechanically fastened TPO options where a FM Approval is needed?

- **33 ksi, 20 ga.:** 8' wide sheets maintain ratings through Class 1-90 with 6 ft. deck spans but 10 ft. wide sheets are subject to the following uplift limitations: Class 1-60 for 6 ft. spans, Class 1-75 for 5 ft. spans and Class 1-90 for 4 ft. spans.
- **80 ksi, 20 ga.:** 8 ft. wide sheets maintain ratings through Class 1-165 with 6 ft. spans and 10 ft. wide sheets maintain ratings through Class 1-120 with 6 ft. spans.
- **33 ksi, 18 ga.:** 8 ft. wide sheets maintain ratings through Class 1-120 with 6 ft. spans but 10 ft. wide sheets are subject to the following uplift limitations: Class 1-90 for 6 ft. spans, Class 1-105 for 4.5 ft. spans and Classes 1-135 and 1-150 for 4 ft. spans.
- **80 ksi, 18 ga.:** 8 ft. wide sheets maintain ratings through Class 1-225 and 10 ft. wide sheets maintain ratings through Class 1-150 with 6 ft. deck spans.
- We will use these bullets as points of reference when extending current mechanically attached EverGuard® TPO listings to thicker decks. Existing attachments on 22 ga., 80 ksi can be extrapolated to thicker 80 ksi decks but existing attachments to 22 ga., 33 ksi can be extrapolated to thicker 33 ksi decks or thicker 80 ksi decks within the above parameters.



Codes & Testing Update

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TO: GAF Low Slope Sales,
Marketing, 411 Line, Technical
Services, AIS, R&D

FROM: The Codes Dept.

DATE: November 15, 2012

What other code resources are available to support projects if an FM Approval is not needed?

If a FM Approval is not needed, consider referencing a Miami Dade NOA, Florida Building Code Document or an ICC Evaluation Report for mechanically fastened EverGuard® TPO options..... there are many options available.

- GAF FBC Document on Share Point [– Click here to view](#)
- GAF Miami Dade TPO over Steel Document on Share Point [– Click here to view](#)
- GAF ICC Evaluation Report for TPO on Share Point [– Click here to view](#)

What are all of the specifics of how these changes impact individual FM Approved mechanically attached EverGuard® TPO systems?

Sheet Width	Fastener Spacing	Fasteners and Plates	Decking	Current Max Deck Span and Rating		Changes Effective 12/31/12 - Max Deck Span, Deck Type and Sheet Width Options
10 ft.	6 in.	SXHD & 2-3/4" SXHD	22 ga., 33 ksi	6 ft.	Class 1-120	<ul style="list-style-type: none"> ● To maintain 1-120 with 6 ft. deck spans without changing the deck: use a 5 ft. wide sheet ● To maintain 1-120 with 6 ft. deck spans and narrower sheets using a thicker deck: use 18 ga, 33 ksi decking with an 8 ft. wide sheet ● To maintain 1-120 with a narrower deck span and a thicker deck: use 18 ga., 33 ksi deck on a maximum 4 ft. deck span ● Do you need an 80 ksi option? - See the row directly below.
10 ft.	6 in.	XHD & 2-3/4" SXHD	22 ga., 80 ksi	6 ft.	Class 1-120	<ul style="list-style-type: none"> ● To maintain 1-120 with 6 ft. deck spans and a narrower sheet without changing the deck: use an 8 ft. wide sheet ● To maintain 1-120 with 6 ft. deck spans using a thicker deck: use 20 ga., 80 ksi deck ● To maintain 1-120 with a narrower deck span without changing the deck: reduce deck span to max 4.5 ft.
10 ft.	6 in.	XHD & 2" XHD, 2-3/8" XHD or Eyehook	22 ga., 33 ksi	6 ft.	Class 1-105	<ul style="list-style-type: none"> ● To maintain 1-105 with 6 ft. deck spans without changing the deck type: use a 5 ft. wide sheet



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Sheet Width	Fastener Spacing	Fasteners and Plates	Decking	Current Max Deck Span and Rating		Changes Effective 12/31/12 - Max Deck Span, Deck Type and Sheet Width Options
10 ft.	6 in.	XHD & 2" XHD, 2-3/8" XHD or Eyehook	22 ga., 33 ksi	6 ft.	Class 1-105	Continued from Page 2 <ul style="list-style-type: none"> ● To maintain 1-105 with 10 ft. wide sheet and a thicker deck installed on a narrower span: use 18 ga., 33 ksi deck on a max 4.5 ft. span ● To maintain 1-105 using a narrower sheet and a thicker deck installed on a narrower span: use 20 ga., 33 ksi decking on a max 5 ft. deck span with an 8 ft. wide sheet ● To maintain 1-105 with a narrower sheet and a thicker deck on a 6 ft. span: use 18 ga., 33 ksi decking with an 8 ft. sheet ● Do you only want a 1-90 but need a 6 ft. deck span? – Use minimum 18 ga., 33 ksi decking ● Do you need an 80 ksi option? - See the row directly below.
10 ft.	6 in.	XHD & 2" XHD, 2-3/8" XHD or Eyehook	22 ga., 80 ksi	6 ft.	Class 1-105	<ul style="list-style-type: none"> ● To maintain 1-105 with 6 ft. deck spans and a narrower sheet without changing the deck: use an 8 ft. wide sheet ● To maintain 1-105 with 6 ft. deck spans using a thicker deck: use min. 20 ga., 80 ksi decking ● To maintain 1-105 with a narrower deck span without changing the deck: reduce deck span to max 5 ft. ● Do you only want a 1-90 but need a 6 ft. deck span? – This meets 1-90 when retaining the 6 ft. deck span.
10 ft.	12 in.	SXHD & 2-3/4" SXHD	22 ga., 80 ksi	6 ft.	Class 1-90	<ul style="list-style-type: none"> ● No Changes – stays in place as is
10 ft.	12 in.	XHD and 2-3/8" XHD	22 ga., 80 ksi	6 ft.	Class 1-75	<ul style="list-style-type: none"> ● No Changes – stays in place as is
10 ft.	12 in.	XHD and 2" XHD, 2-3/8" XHD or Eyehook	22 ga., 33 ksi	6 ft.	Class 1-60	<ul style="list-style-type: none"> ● To maintain 1-60 with 6 ft. deck spans and a narrower sheet without changing the deck: use an 8 ft. wide sheet



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Sheet Width	Fastener Spacing	Fasteners and Plates	Decking	Current Max Deck Span and Rating		Changes Effective 12/31/12 - Max Deck Span, Deck Type and Sheet Width Options
10 ft.	12 in.	XHD and 2" XHD, 2-3/8" XHD or Eyehook	22 ga., 33 ksi	6 ft.	Class 1-60	Continued from Page 3..... <ul style="list-style-type: none"> To maintain 1-60 with 6 ft. deck spans using a different deck: use min. 20 ga., 33 ksi decking or min. 22 ga. 80 ksi decking To maintain 1-60 with 10 ft. wide sheet and a narrower deck span: use 22 ga., 33 ksi decking on a max 5 ft. deck span
8 ft.	12 in.	SXHD & 2-3/4" SXHD	22 ga., 33 ksi	6 ft.	Class 1-75	<ul style="list-style-type: none"> No Changes – stays in place as is
8 ft.	18 in.		22 ga., 80 ksi	6 ft.	Class 1-60	<ul style="list-style-type: none"> No Changes – stays in place as is
5 ft.	12 in.	XHD and 2-3/8" XHD	22 ga., 33 ksi	6 ft.	Class 1-90	<ul style="list-style-type: none"> No Changes – stays in place as is

What other options are available if FM Approval is needed with EverGuard® TPO and 22 ga. steel decking installed over 6 ft. spans?

Consider Drill-Tec™ RhinoBond® options..... these RhinoBond® options offer the use of 10 ft. wide sheets and a system that will install "dry" much more quickly than a traditionally fastened mechanically attached system. RhinoBond® "grid attachment" options also offer customers less sheet "flutter" compared to a traditionally fastened mechanically attached sheet. Check RoofNav or contact GAF Technical Services for additional installation details.

- **For Class 1-90:** Six (6) Drill-Tec™ RhinoBond® TPO XHD Plates and Drill-Tec™ XHD Fasteners per 4 x 8 ft. EnergyGuard™ Polyiso Insulation board ("grid attachment") over 22 ga., 33 ksi decking on a 6 ft span.
- **For Class 1-120:** Eight (8) Drill-Tec™ RhinoBond® TPO XHD Plates and Drill-Tec™ SXHD Fasteners per 4 x 8 ft. EnergyGuard™ Polyiso Insulation board (fasteners installed in a 24 x 24 in. grid) over 22 ga, 80 ksi decking on a 6 ft. span.

Consider options in which the EverGuard® TPO membrane is fully adhered, an EverGuard® Freedom™ TPO membrane is self adhered or an EverGuard® TPO FB Ultra membrane is fully adhered or ribbon adhered.... Existing 1-90 through 1-120 rated, adhered TPO options over 22 ga., 33 ksi steel decking installed on 6 ft. spans will not be impacted by these changes. Below are general guidelines for some options at the 1-90 through 1-120 pressure levels that GAF can offer. Check RoofNav, Previous Codes & Testing Updates or Call 1-800-Roof-411 for specifics or to explore other options.

- **For Class 1-90:**
 - Min 1.5 in. EnergyGuard™, EnergyGuard™ RH, RN, RM Polyiso fastened 1 per 2.0 ft² (16 fasteners per 4 x 8 ft. board) | TPO is fully adhered, ribbon attached or self adhered.
 - Min 1.5 in. EnergyGuard™, EnergyGuard™ RH, RN, RM Polyiso loose laid | Min. 48 x 96 x 0.25 in. SECUROCK® Gypsum-Fiber Roof Board fastened 1 per 2.0 ft² (16 fasteners per 4 x 8 ft. board) | TPO is fully adhered, ribbon attached or self adhered.



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- Min 1.5 in. EnergyGuard™, EnergyGuard™ RH, RN, RM Polyiso loose laid | Min. 48 x 96 x 0.25 in. Dens Deck® Prime fastened 1 per 2.0 ft² (16 fasteners per 4 x 8 ft. board) | TPO is fully adhered or ribbon attached
- Min 1.5 in. EnergyGuard™, EnergyGuard™ RH, RN, RM Polyiso loose laid | Min. 48 x 96 x 0.25 in. Dens Deck® DuraGuard Roof Board fastened 1 per 2.7 ft² (12 fasteners per 4 x 8 ft. board) | TPO is self adhered
- **For Class 1-105:**
 - Loose laid min 1.5 in. EnergyGuard™, EnergyGuard™ RH, RN, RM Polyiso | Min. 48 x 96 x 0.25 in. SECUROCK® Gypsum-Fiber Roof Board or Dens Deck® Prime fastened 1 per 1.6 ft² (20 fasteners per 4 x 8 ft. board) | TPO is fully adhered or self adhered
 - Loose laid min 1.5 in. EnergyGuard™, EnergyGuard™ RH, RN, RM Polyiso | StormSafe™ is mechanically secured 18 in. o.c. in the lap and 18 in. o.c. in two rows in the field of the sheet | TPO is self adhered
- **For Class 1-120:**
 - Min. 48 x 96 x 2.0 in. EnergyGuard™ RN Polyiso fastened 1 per 1.6 ft² (20 fasteners per 4 x 8 ft. board) | Min. 48 x 96 x 0.25 in. SECUROCK® Gypsum-Fiber Roof Board is ribbon attached 12 in. o.c. | TPO is fully adhered or self adhered
 - Min. 48 x 96 x 1.5 in. EnergyGuard™ Polyiso fastened 1 per 1.33 ft² (24 fasteners per 4 x 8 ft. board) | TPO is ribbon attached 12 in. o.c.

What else do I need to know?

Adhered roofing systems will be subject to steel deck span restrictions as well but the limitations will be less severe. This effects all of GAF's FM Approved options with fully adhered, ribbon attached, spot attached (i.e. Stratavent® Eliminator™ Perforated) RUBEROID®, GAFGLAS®, Liberty™ and EverGuard® systems. Here are the key points:

- 22 ga., 33 ksi deck on 6 ft. Spans – Adhered roof cover systems will be limited to Class 1-165
- 22 ga., 80 ksi deck on 6 ft. Spans – Adhered roof cover systems will be limited to Class 1-225

Do you have questions or need more information?

- Contact the Technical Services 411 Line at 800-766-3411 or technicalquestions@gaf.com with questions
- Review the attached correspondences from FM Approvals and SPRI for additional information

INDUSTRY INFORMATION BULLETIN



**To: Commercial Roofing Roof System and Component Suppliers
Commercial Roofing Roof System Specifiers**

From: Mike Ennis, SPRI Technical Director

Date: 11/05/12

No: 1-12

Industry Alert

SPRI would like you to be aware that:

- Significant changes have been made by Factory Mutual to FM 4470 with regard to steel deck stresses on FM insured buildings;
- Changes will be effective as of 12/31/2012; and
- Changes will effect FM insured building specifications.

What are the changes?

Changes to FM 4470 include:

- "Stresses induced to steel roof decking shall be determined by rational analysis and shall not exceed the allowable stresses per the latest addition of the North American Specification for the Design of Cold-Formed Steel Structural Members AIAI S100-2001"; and
- "Limits on roof deck fastener stress have also been added".

FM review of steel deck assemblies

A FM review of all RoofNav Approved steel deck assemblies that "over stress the deck" will be revised to:

- Reduce the deck span;
- Increase the deck thickness and/or;
- Increase the grade of steel; or
- Create new assemblies with a reduced wind rating.

FM Spreadsheet (attached)

FM has provided the attached spreadsheet for both 33- and 80 ksi decking:

- Delineates what an "FM Approved Steel Deck Attachment" will be by fastener row spacing by deck type (ksi) and maximum wind uplift classification.

Recommendations for FM insured buildings

For projects quoted/bid before 12/31/12, you may want to contact the local FM Field Office to:

- Confirm that the proposed roofing system is still acceptable;
- Seek guidance if reroofing project is a recover; and
- Identify acceptable "Rigid Cover Boards".

Recommendations for Non-FM insured buildings

For Non-FM insured buildings:

- Designers do not use the new FM 4470 as the basis for specifications; and
- Contact the roofing system manufacturer and component supplier for wind uplift resistance performance to comply with local building code.

Attached to this bulletin:

- October 2012 letter from FM Approvals announcing these changes;
- Excel worksheet "FM Approved Steel Deck Attachment"; and
- A detailed recommendation from SPRI regarding FM 4470.

FM Approvals
1151 Boston-Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
T: 781 762 4300 F: 781 762 9375 www.fmapprovals.com

October 18, 2012

All 4470 Manufacturers

Subject: FM Approval Standard 4470

This letter is to provide you with highlights of changes recently made to Approval Standard 4470. Some of these changes (such as steel deck stress limitation) were included in the previous version of 4470. They are also included here for reference. The standard was updated to include all testing required in Standard 4450. In addition, several other changes have been made as outlined below. The revised standard refers to existing consensus standards where available and FM Approvals test procedures for others.

You will find a copy of the Approval Standard at our RoofNav website. Go to www.roofnav.com and select Reference Materials followed by Approval Standards. [4470](#) and all [Approval Standards](#) are also available on the FM Approvals website.

The title of the standard has been changed to reflect the various types of Class 1 roof covers available today:

Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction

The following new requirements have been added to the standard:

- Stresses induced to steel roof decking shall be determined by rational analysis and shall not exceed the allowable stresses per the latest edition of the North American Specification for the Design of Cold-Formed Steel Structural Members, AISI S100-2007. Limits on roof deck fastener stress have also been added.

FM Approvals will review all steel deck assemblies to determine which currently Approved assemblies overstress the deck. After identifying the overstressed assemblies, FM Approvals will make the following changes:

- For the existing RoofNav assemblies, reduce the deck span, increase the deck thickness and/or the grade of steel to provide the maximum number of steel deck options available while maintaining the qualified wind rating of the assembly.
- Create new RoofNav assemblies from the existing assemblies with the wind rating reduced to a level where the roof deck is not overstressed while maintaining all parameters of the assembly (i.e. deck span, grades and thicknesses).

We anticipate the above changes being completed by the effective date of the Standard which is 12/31/12. A request for Proposal, sent to your project engineer, is needed for any ratings or FM Approvals you wish to pursue beyond the above. Any request for a proposal must include details of the Approvals desired along with Project ID Numbers for all supporting information.



- Screening tests may be used to identify critical components for use in full scale testing or to evaluate components as alternate to those already tested and found to be satisfactory via the full scale tests. Alternate components must perform to an equal or higher level than the component qualified via large scale testing.
- The revised standard also includes three optional ratings shown below. Send correspondence to your Approvals Engineer if you wish to pursue recognition with either of these ratings.
 1. Dynamic Puncture Resistance Rating of Roof Covers
 2. NCC (Noncombustible Core) Rated Roof Insulation
 3. Solar Reflectance of Roof Surfaces

Please contact your Approvals Engineer with any questions.

Very truly yours,



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MAX DECK SPANS (FT.) BY WIND RATING/FASTENER SPACING, SHEET GAUGE for 33 ksi

Fastener Row Spacing (ft.)	Gauge	MAX DECK SPANS (FT.) BY WIND RATING/FASTENER SPACING, SHEET GAUGE for 33 ksi																		
		330	315	300	285	270	255	240	225	210	195	180	165	150	135	120	105	90	75	60
3.5	18	4.5	5.5	5.5	5.5	5.5	5.5	6	6	6	6	6	6	6	6	6	6	6	6	6
	20	-	4	4	4.5	4.5	4.5	5	5.5	5.5	5.5	6	6	6	6	6	6	6	6	6
	22	-	-	-	-	-	4	4	4.5	4.5	4.5	5.5	5.5	6	6	6	6	6	6	6
4	18	4.5	4.5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	20	-	-	-	-	4	4.5	4.5	5	5	5.5	6	6	6	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	4	4.5	5	5	6	6	6	6	6	6	6	6
4.5	18	-	4	4	4.5	5	5	5.5	6	6	6	6	6	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	4	4	5	5	5.5	6	6	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	4	4.5	5	5.5	6	6	6	6	6	6	6
5	18	-	-	-	4	4	4.5	5	5	5.5	6	6	6	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	4	4.5	5	5.5	6	6	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6	6	6	6	6	6
5.5	18	-	-	-	-	-	-	4	4.5	5	5.5	6	6	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	4.5	5	6	6	6	6	6	6
6	18	-	-	-	-	-	-	-	4	5	5.5	6	6	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	4.5	5.5	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	5.5	6	6	6	6
6.5	18	-	-	-	-	-	-	-	-	-	4	4.5	5.5	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	5.5	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	5.5	6	6	6
7	18	-	-	-	-	-	-	-	-	-	-	-	4	5.5	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	6	6
7.5	18	-	-	-	-	-	-	-	-	-	-	-	-	4	5.5	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6	6	6
8	18	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5.5	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5.5	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	6	6
8.5	18	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	6	6
9	18	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5.5	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5	6
9.5	18	-	-	-	-	-	-	-	-	-	-	-	-	4	4	4.5	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5	6
10	18	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	6
10.5	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5.5	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	6
11	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	5	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	5.5	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	6
11.5	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5.5	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	5	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6
12	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6
Wind Rating		330	315	300	285	270	255	240	225	210	195	180	165	150	135	120	105	90	75	60

MAX DECK SPANS (FT.) BY WIND RATING/FASTENER SPACING, SHEET GAUGE for 80 ksi

Fastener Row Spacing (ft.)	Gauge	MAX DECK SPANS (FT.) BY WIND RATING/FASTENER SPACING, SHEET GAUGE for 80 ksi																		
		330	315	300	285	270	255	240	225	210	195	180	165	150	135	120	105	90	75	60
3.5	18	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	20	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	22	5.5	5.5	5.5	5.5	5.5	6	6	6	6	6	6	6	6	6	6	6	6	6	6
4	18	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	20	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	22	4.5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
4.5	18	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	20	5.5	5.5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	22	4	4	4.5	5	5	5.5	5.5	6	6	6	6	6	6	6	6	6	6	6	6
5	18	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	20	4.5	5	5.5	5.5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	22	-	-	4	4	4.5	4.5	5	5.5	6	6	6	6	6	6	6	6	6	6	6
5.5	18	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	20	4	4.5	4.5	5	5.5	5.5	6	6	6	6	6	6	6	6	6	6	6	6	6
	22	-	-	-	-	-	4	4.5	5	5.5	6	6	6	6	6	6	6	6	6	6
6	18	5	5.5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	20	-	-	-	4	4.5	5	5.5	6	6	6	6	6	6	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	4	4.5	5	5.5	6	6	6	6	6	6	6	6
6.5	18	4.5	5	5	5.5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	20	-	-	-	-	-	4	4.5	5	5.5	6	6	6	6	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	4	5	5.5	6	6	6	6	6	6	6	6
7	18	-	4	4	4.5	5.5	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	4	4	5	5.5	6	6	6	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	4	4.5	5.5	6	6	6	6	6	6	6
7.5	18	-	-	-	4	4.5	4.5	5.5	6	6	6	6	6	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	4	4.5	5.5	6	6	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	4	4.5	6	6	6	6	6	6	6
8	18	-	-	-	-	4	4	4.5	5	6	6	6	6	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	4	4.5	5.5	6	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	4	5	6	6	6	6	6	6
8.5	18	-	-	-	-	-	4	4	4.5	5	5.5	6	6	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	4	4	4.5	5.5	6	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6	6	6	6
9	18	-	-	-	-	-	-	4	4	4.5	5	5.5	6	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	4	4.5	5	5.5	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5.5	6	6	6	6
9.5	18	-	-	-	-	-	-	4	4	4	4.5	5	5.5	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	4	4	4.5	5	6	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6	6	6
10	18	-	-	-	-	-	-	-	4	4	4.5	4.5	5	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	4	4.5	4.5	5.5	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	4.5	5.5	6	6
10.5	18	-	-	-	-	-	-	-	4	4	4.5	4.5	5	5.5	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	4	4	4.5	5	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5.5	6	6
11	18	-	-	-	-	-	-	-	-	4	4	4.5	5	6	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	5.5	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6	6
11.5	18	-	-	-	-	-	-	-	-	4	4	4.5	5	5.5	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	5.5	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6	6
12	18	-	-	-	-	-	-	-	-	4	4	4.5	5	5.5	6	6	6	6	6	6
	20	-	-	-	-	-	-	-	-	-	-	-	-	4	4.5	5	6	6	6	6
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5	5.5	6	6
Wind Rating		330	315	300	285	270	255	240	225	210	195	180	165	150	135	120	105	90	75	60



SPRI Bulletin RE: FM Approval Standard 4470

On October 18, 2012, FM Approvals (FM) officially notified “All 4470 Manufacturers” (roofing system manufacturers and component suppliers) that FM had revised FM Approval Standard 4470 (FM 4470), *“Single-Ply, Polymer-Modified Bitumen Sheet, Built-UP Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction.”*

Attached is a copy of that notification. FM 4470 may be found on line at www.roofnav.com. The effective date of the revised FM 4470 is December 31, 2012. Some details and the anticipated impact of the changes were included in this letter. FM stated that all changes to RoofNav Assemblies will be completed by this effective date.

It should be noted that FM Global/FM Approvals requires FM 4470 be used when FM insured buildings are having roof systems installed. Neither the existing nor revised FM Standard 4470 is a consensus standard that is included in the current International Building Code (IBC) editions 2009 and 2012.

The letter states that the following new requirements have been added to the Standard:

- *“Stresses induced to steel roof decking shall be determined by rational analysis and shall not exceed the allowable stresses per the latest edition of the North American Specification for the Design of Cold-Formed Steel Structural Members, AISI S100-2001.”*
- *“Limits on roof deck fastener stress have also been added.”*

FM will conduct a full review of all current RoofNav Approved steel deck assemblies that, in its opinion, “overstress the deck”. **The following changes will ensue:**

- *“For the existing RoofNav assemblies, reduce the deck span, increase the deck thickness and/or the grade of steel to provide the maximum number of steel deck options available while maintain the qualified wind rating of the assembly.”*
- *“Create new RoofNav assemblies from the existing assemblies with the wind rating reduced to a level where the roof deck is not overstressed while maintaining all parameters of the assembly (i.e. deck span, grades and thicknesses).”*

FM has provided an Excel spreadsheet (copy attached) which provides two tabs (spreadsheets), one for 33 ksi decking, and the other for 80 ksi decking, that delineate what an “FM Approved

Steel Deck Attachment” will be and the maximum membrane fastener row spacing allowed per deck type and span.

SPRI RECOMMENDATIONS:

With these abrupt changes taking place before year end, what can the design and contractor communities do when they are designing or bidding on **a FM insured project?**

Even more importantly, what can one do when designing a building (including the roof system) on projects that are **not FM insured?** Below are SPRI’s Recommendations:

FM Insured Projects

Neither FM Approvals nor FM Global has provided a transition plan or any guidance when incorporating these changes on FM insured roofing projects that have bid prior to these changes becoming effective on RoofNav.

On FM insured projects, if a contract or a quote for work will start after the RoofNav constructions have been revised (12-31-12), you will likely want to bring the change in the FM 4470 Standard to the attention of all parties who are involved in the projects. This would include the building owner, architect, general contractor, etc., so that all are informed of the changes and the possible cost increases to the project.

For FM insured projects, consider printing off the “Contractor Package” from RoofNav, as these ratings may not be available after December 31, 2012. The Contractor Package is a pdf document that is date stamped and is expected to provide all of the details of the assembly including, e.g., fastener row spacing, wind uplift rating, the deck strength (ksi), the gauge of the deck, as well as maximum span of the decking.

On FM insured projects, you will likely want to confirm: the specific characteristics of the steel decking for the project; gauge; strength (ksi); how the decking is to be supported on 5’ or 6’ spans, etc.; and how the decking is, or will be, attached to the supports, fasteners, welds, etc. Also consider:

- Table 1 is located in FM Loss Prevention Data Sheet 1-29 *“Roof Deck Securement and Above –Deck Roof Components.”* This table is referenced in the FM Contractor Package

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to provide the recommended rating in the field, perimeter and corner based off a field design pressure.

- Though not stated in the FM letter, reportedly the maximum wind uplift rating on 22 gauge, 33 ksi decking supported on 6' spans will be limited to a FM 1-165. Table 1 shows that even for a FM 1-90 rating, a FM 1-180 and FM 1-225 rating is required in the perimeter and corner zones. This could require changes to the building structure if you are following FM 4470 requirements.

You are also advised to contact the local FM Global office that will be handling the particular project. SPRI encourages you to make sure FM provides direction on the steel decking, and confirms that your proposed steel decking is acceptable for the project. This would be particularly true for buildings that are located in coastal areas-where higher wind uplift ratings are needed at the perimeters and corners of the building.

Furthermore, SPRI recommends that you confirm with the applicable FM field office if a recover application is acceptable, or if the roofing system will have to be removed down to the steel deck. The new revised FM 4470 allows for the following prescriptive enhancement under section 4.3.1.1.6. This enhancement is **only applicable for a reroof condition.**

In view of the foregoing, it is advisable for you to confirm with the applicable FM field office what products are considered "Rigid Cover Board." Also, keep in mind that FM Approvals has not provided a list of these acceptable products, and FM 4470 has a new definition for "Rigid Cover Board."

Non-FM Insured Projects

SPRI recommends that you do not use the new FM 4470 as the basis for specifications.

As stated previously, FM 4470 is not codified. The IBC 2009 and 2012 editions state that roof coverings shall be tested in accordance with UL 1897 or FM 4474 Standards. This does not mean that the testing must take place at either UL or FM Approvals but rather that these two Standards and their stated protocols are used to conduct the wind uplift testing. Accordingly, you may wish to refer to the specific "roofing system manufacturers and component supplier" for wind uplift resistance performance to comply with your local building code.

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The IBC allows wind uplift testing to be conducted at ICC-ES certified and approved test laboratories. If a design pressure is specified for the project, 3rd party certification from the roofing system manufacturer can be provided in the form of a test report from an accredited lab, ICC ES report, Florida Product Approval, Miami Dade County *Notice of Acceptance* or UL online certification directory. Unlike the new FM 4470, however, these other entities document Building Code compliance using codified standards. By not referencing FM 4470 and FM Approvals nomenclatures (FM 1-90, 1-120), you may well avoid ambiguous specifications between the requirements of the Building Code and FM recommendations and/or requirements.

FM Approvals has confirmed that they have no loss history with mechanically fastened single-ply membranes (8', 10' or 12' wide panels) causing damage to the decking or structure. These mechanically attached systems, which have been tested for wind uplift performance at various accredited laboratories, will continue to be offered in the market place.

In short, you are encouraged to identify and comply with the IBC along with the designer of record and/or AHJ (Authorities Having Jurisdiction) specifications. When the building or tenant is FM insured, SPRI recommends that the appropriate FM field office be contacted prior to your starting any work to re-confirm acceptance of the roofing system to FM requirements.

Sincerely,



Mike Ennis
SPRI Technical Director

Enclosed: 4470 letter Oct2012 –George Smith

Enclosed: Excel Spreadsheet MF Cover deck thk_span_rating_summary