

Roofing Issues: Decks to Dockets  
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***Technical Issues Posing Liability Risks  
to Roofing Contractors***


presented by

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1

**Topics**

- Lightweight structural concrete roof decks
- Polyisocyanurate insulation
- Asphalt
- Asphalt shingles
- RCI



2




**Lightweight structural concrete**


- Moisture-related problems
- Lightweight difficult to differentiate from normal weight
- Designers are non-specific; manufacturers “exclude” responsibility

***Problems and Risks Posed  
by Concrete Roof Decks***

**Tomorrow, 11:30 a.m. - 12:45 p.m.**




3




**Polyisocyanurate insulation**

- New manufacturers:
  - GAF (1 new, 1 being constructed, 1 announced)
  - Soprema (1 new plant announced)
- Personnel
- Revision of PIMA’s QualityMark<sup>CM</sup> program
- Facer sheets



4



**PIMA QualityMark<sup>CM</sup> program**

- 2004-2013:
  - Polyisocyanurate insulation is labeled using LTTR, determined using CAN/ULC-S770-03
- Beginning on January 1, 2014:
  - Polyisocyanurate insulation is labeled using a new LTTR, determined using CAN/ULC-S770-09 or ASTM C1303-11



5



**LTTR values**

| Thickness  | LTTR (2004 – 2013) | New LTTR (2014 –) |
|------------|--------------------|-------------------|
| 1 inch     | 6.0                | 5.6               |
| 1.5 inches | 9.0                | 8.6               |
| 2 inches   | 12.1               | 11.4              |
| 3 inches   | 18.5               | 17.4              |
| 4 inches   | 25.0               | 23.6              |



6



**Long-term thermal resistance (LTTR)**

- LTTR is intended to represent the R-value tested after five years of aging when stored in a controlled laboratory environment.
- This five-year figure corresponds closely to a predicted 15-year, time weighted average of R-values

**Is five years “long-term”  
in the context of the roofing industry?**



7



**LTTR values vs. NRCA recommended design values**

| Thickness  | LTTR (2004 – 2013) | New LTTR (2014 –) | NRCA's recommended R-values |                    |
|------------|--------------------|-------------------|-----------------------------|--------------------|
|            |                    |                   | Heating conditions          | Cooling conditions |
| 1 inch     | 6.0                | 5.6               | 5.0                         | 5.6                |
| 1.5 inches | 9.0                | 8.6               | 7.5                         | 8.4                |
| 2 inches   | 12.1               | 11.4              | 10.0                        | 11.2               |
| 3 inches   | 18.5               | 17.4              | 15.0                        | 16.8               |
| 4 inches   | 25.0               | 23.6              | 20.0                        | 22.4               |





8



**NRCA recommends....**

NRCA recommends designers specify polyisocyanurate insulation by its thickness – not R-value – based upon the required R-value for specific project conditions.



9

**Polyiso. facer sheets**

ASTM C1289

ASTM C1289, Type II:



- Class 1 (cellulose/glass fiber facers):
  - Grade 1 – 16 psi
  - Grade 2 – 20 psi
  - Grade 3 – 25 psi
- Class 2 (coated glass facers):
  - Grade 1 – 16 psi
  - Grade 2 – 20 psi
  - Grade 3 – 25 psi
- Class 3 (uncoated glass facers)
- Class 4 (high density):
  - Grade 1 – 80 psi
  - Grade 2 – 110 psi
  - Grade 3 – 140 psi

10

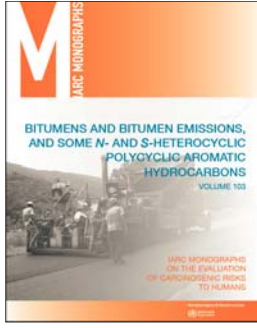
**NRCA recommends...**

When specifying polyisocyanurate insulation, NRCA recommends specifiers use the ASTM C1289 designation followed by the specific type classification and, if applicable, class and grade classifications necessary to identify the intended products’ compressive strength and facers.

11



**Asphalt**



***IARC Monograph – 103:***

- Group 2A –Probably carcinogenic to humans
- Pgs. 160 – 165 specific to “Roofing workers exposed to bitumens”

No new regulation (yet)

12

**Some terminology...**

**Flash point (FP):** the lowest temperature at which asphalt vapors above a volatile combustible substance can ignite in air when exposed to an ignition source; tested using ASTM D92.

**Equiviscous temperature (EVT):** the temperature at which asphalt attains proper viscosity (flow rate) for built-up membrane application; tested using ASTM D4402 – 125 cP (mop application) and 75 cP (mechanical spreader application).



13



**NRCA recommends...**

“...NRCA recommends designers specify asphalt with a sufficiently high enough FP temperature top provide a minimum 125-degree differential between an asphalt’s EVT and FP temperature to allow for proper application of built-up membranes.”



14



**Are asphalts currently installable?**

- Comply with MSDS
- Comply with manufacturers’ installation instructions
- Comply with NRCA’s guidelines



15



**Asphalt shingles**

- ~~ASTM D225 (organic shingles)~~
- ASTM D3462 (fiberglass shingles)
- ICC-ES AC 438 (alternative asphalt shingles)



16





**RCI**

**Manual of Practice:**

- Sec. 1: Introduction
- Sec. 2: Recommended practices for consulting
- Sec. 3: Recommended practices for QAO
- Sec. 4: Specialized areas of practice
- Appendixes

18

**Questions?**

19

 **NRCA**

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20