



NRCA update on roofing industry technical issues

Education Seminar – September 12, 2025

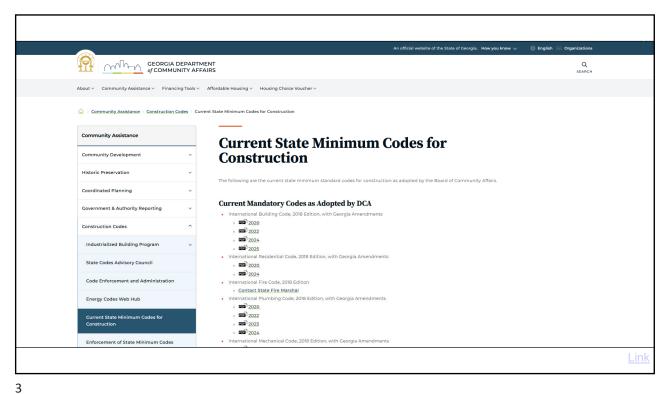


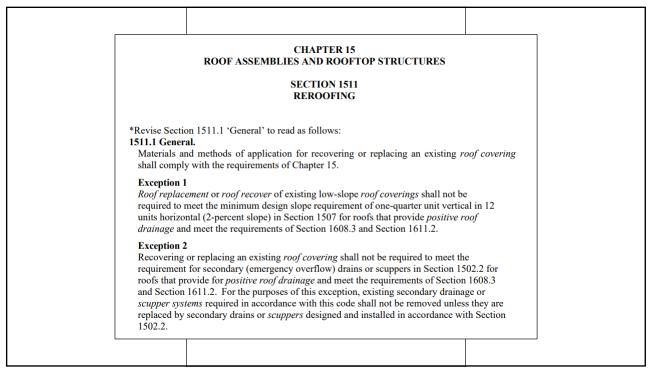
Mark S. Graham

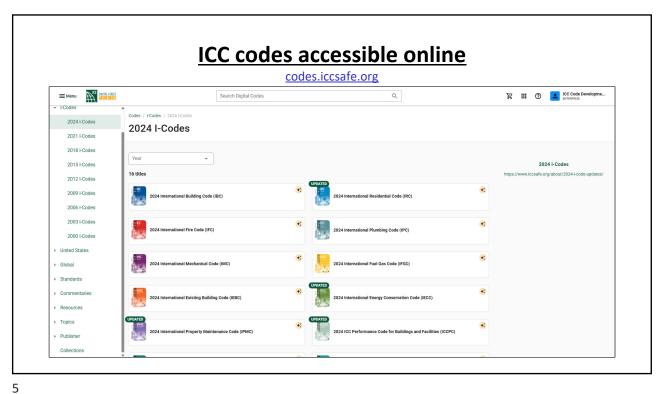
Vice President, Technical Services National Roofing Contractors Association Rosemont, Illinois

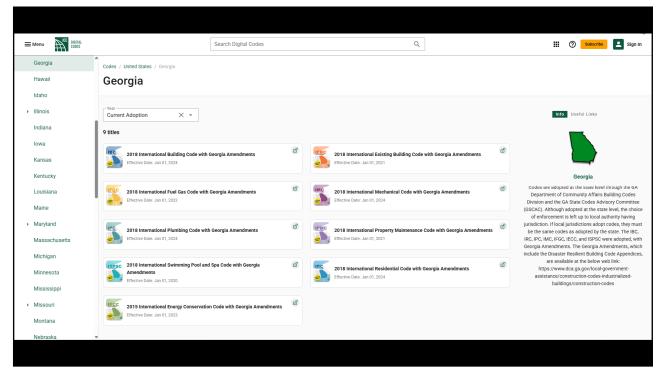
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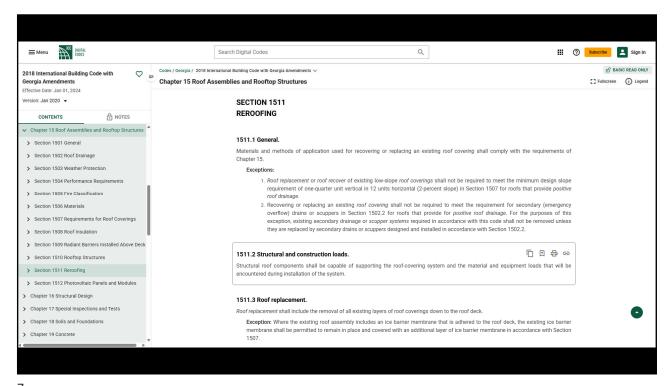
Code issues



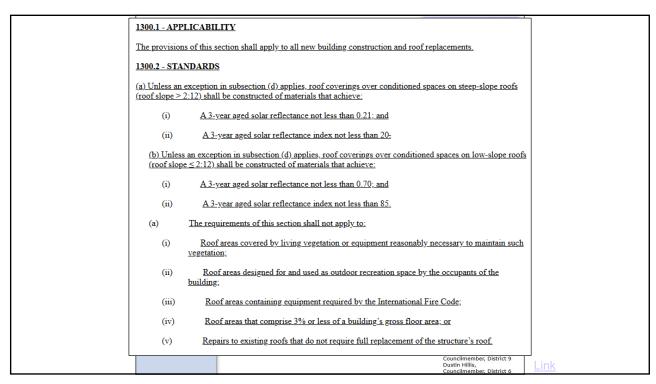








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Wood sheathing roof decks

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Standards for wood structural panels

International Residential Code, 2018 Edition

Plywood:

- U.S. Department of Commerce PS-1, "Structural Plywood"
- CSA Group O325, "Construction Sheathing"

Oriented-strand board (OSB):

- U.S. Department of Commerce PS-2, "Performance Standard for Wood-based Structural-use Panels"
- CSA Group O437, "Standards for OSB and Waferboard"

Common, but not referenced in the Code

Plywood and OSB:

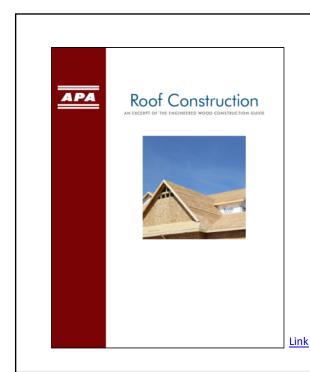
 APA-The Engineered Wood Association Standard PRP-108, "Performance Standards and Policies for Structural-Use Panels"

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Roof sheathing attachment

IRC 2018 Table 602.3(1), Rows 30-32 (minimum attachment):

- Panel edges:
 - 2½-inch-long 8d common nails at 6 inches o.c. at supported panel edges
- Intermediate supports:
 - 2½-inch-long 8d common nails at 12 inches o.c. at intermediate supports



APA Form E30, "Roof Construction"

--Roofing-specific excerpts from APA's *Engineered Wood Construction Guide* (102 pages)

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NRCA has concerns about the long-term performance of OSB panels, including those addressed by PS 2 used as substrates for asphalt shingle roof systems. Although NRCA acknowledges the widespread use of OSB panels for constructing roof deck substrates, experience has shown OSB panels are subject to dimensional changes, ridging and fastener backout resulting from changing moisture conditions the roof decks typically encounter. NRCA has received reports of asphalt shingle roof assemblies constructed with OSB panel decks experiencing panel edge swelling, warping and buckling. NRCA also is concerned about the effects on OSB panels of repeated fastener removal and new fastener installation as existing roof systems are removed and replacement roof systems are installed during a roof deck's life. Because of these reasons, NRCA does not recommend using OSB panels as a substrate for asphalt shingle roof systems.

The NRCA Roofing Manual: Steep-slope Roof Systems—202
Asphalt Shingle Roof Systems | Chapter 2—Roof Decks

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<u>Professional Roofing</u> September 2024

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Nailbase insulation considerations

- Double layer design and application
- Taped joints can control vapor leaks/underlayment wrinkling at board joints
- Pressure-tested and FRT nailbase are not good ideas for nailbase

Polyiso. testing

R-value testing

Facer sheet adhesion (with the Chicago Roofing Contractors Association)

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LTTR - ASTM C1303 and ASTM C518

- A 15-year time-weighted average R-value
- The predicted R-value after 5-years (under controlled laboratory conditions)

R-value – ASTM C518

• R-value at the time of the test

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- LTTR and R-value is typically tested and reported at 75 F.
- NRCA tests at 75 F, but we also test at 40 F and 110 F.

Test results

Physical properties

Manufacturer	Apparent density (lb/ft³)	Thickness (inches)
1c	2.726	2.578
1p	2.002	2.594
2c	3.254	2.576
2p	2.024	2.585
3p	2.218	2.500
4p	2.057	2.735

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Test results

R-value

Manufacturer	R-value (75 F)
1c	14.4
1p	13.9
2c	13.6
2p	15.6
3p	13.2
4p	15.3

More test results

R-value

Manufacturer	R-value (40 F)	R-value (75 F)	R-value (110 F)
1c	10.8	14.4	12.8
1p	8.9	13.9	12.0
2c	14.5	13.6	12.1
2p	15.4	15.6	13.4
3 p	12.6	13.2	11.6
4p	16.9	15.3	13.1

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Preliminary conclusions

- Tested R-values vary
- Some tested R-values are already lower than LTTR
- Some samples are exhibiting different characteristics

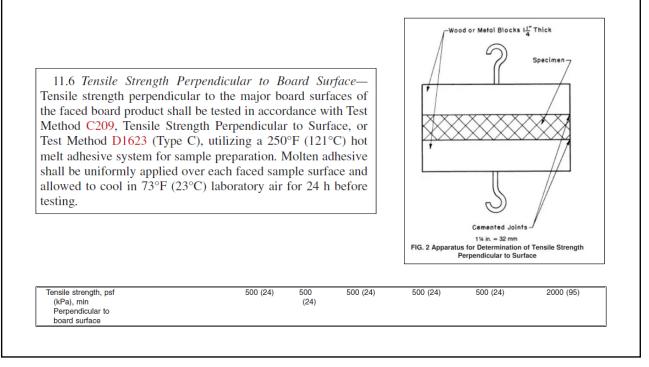
Preliminary recommendations

 Specify, purchase and sell polyisocyanurate insulation (and all insulation products) based on their thicknesses, not its R-values

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Polyiso facer sheet adhesion



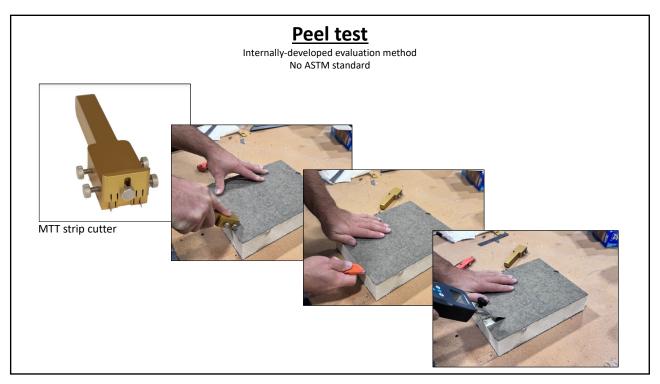


Test results

ASTM C209 tensile strength

Manufacturer	Tensile strength Average (psf)	Standard deviation (psf)
1c	1,888	556
1p	2,041	909
2c	1,874	730
2 p	1,301	409
3р	1,029	495
4p	1,185	327

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Test results

Manufacturer	Peel strength Average (psi)	Standard deviation (psi)
1c	2.78 MD 3.03 XMD	0.62 MD 0.44 XMD
1p	2.52 MD 2.89 XMD	0.78 MD 0.94 XMD
2c	2.30 MD 2.30 XMD	0.31 MD 0.28 XMD
2р	2.52 MD 2.36 XMD	0.61 MD 0.53 XMD
3р	2.83 MD 2.97 XMD	0.59 MD 0.57 XMD
4р	2.61 MD 2.19 XMD	0.56 MD 0.76 XMD
Average	2.59 MD 2.62 XMD	

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Preliminary conclusions

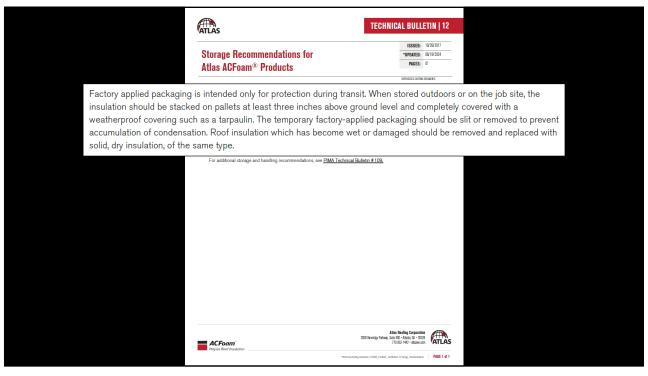
- Our peel test method seems viable
 - More refinement of the test method may be needed
- Peel values are only about 10% of tensile values
- Peel values seem low
- More testing is planned:
 - More polyiso. specimens (production lots, plants)
 - Board top vs. board bottom
 - Impact of knit lines
 - Other faced insulation boards

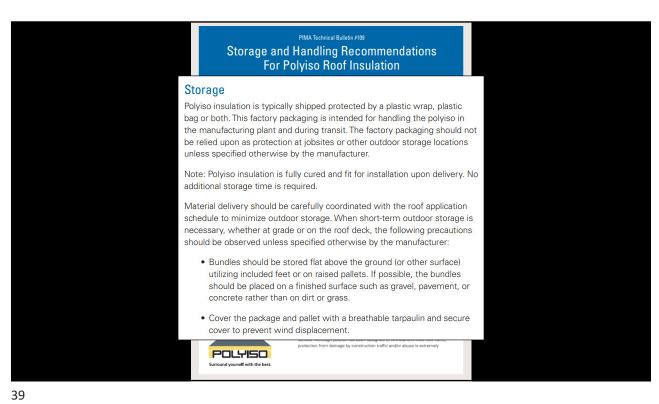
Polyiso. storage

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Roof deck loading considerations

Some examples of roof loading

- Pallet of asphalt shingles (42 bundles): 2,500 to 4,200 lbs.
- Pallet of TPO membrane rolls: 1,400 to 3,450 lbs.
- Pallet of MB cap sheet (20 rolls): About 2,500 lbs.
- Pallet of glass-faced gypsum board (4 x 4): 1,600 to 2,400 lbs.
- Pallet of bonding adhesive (45 pails): 1,800 lbs.
- Bundle of polyiso. (4 x 8): 250 to 500 lbs.

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Some initial considerations

Roof deck loading concerns

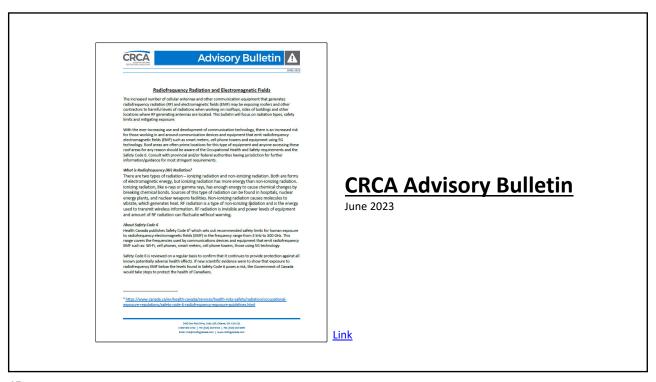
- Roofing operations may exceed live load capacity
- Note joist/framing orientation
- Consider avoiding adjacent load placement
- Position loads across joists/framing
- Consider added dunnage across framing
- Also consider rooftop equipment weight

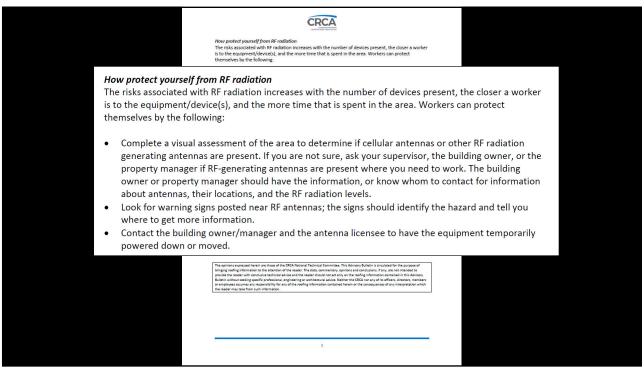
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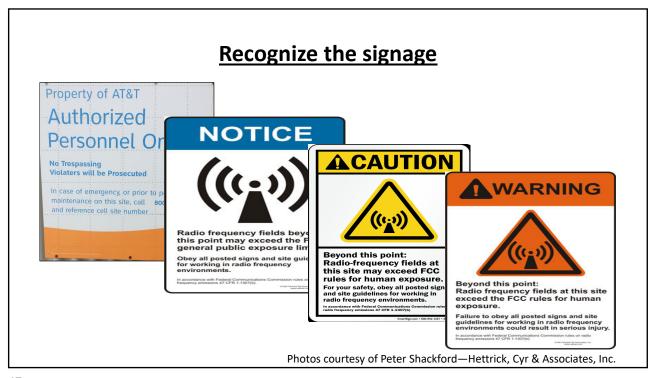
Radio frequency radiation

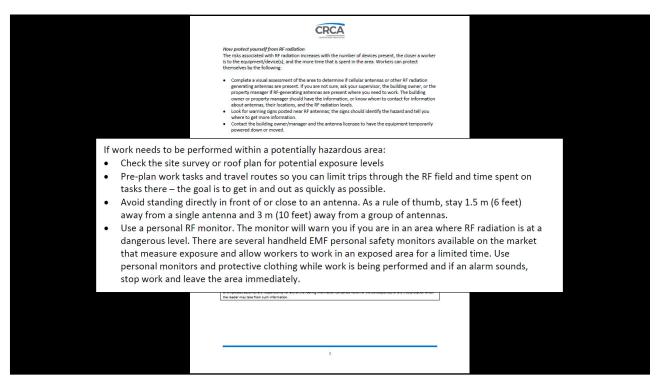
Rooftop cell phone transmitters







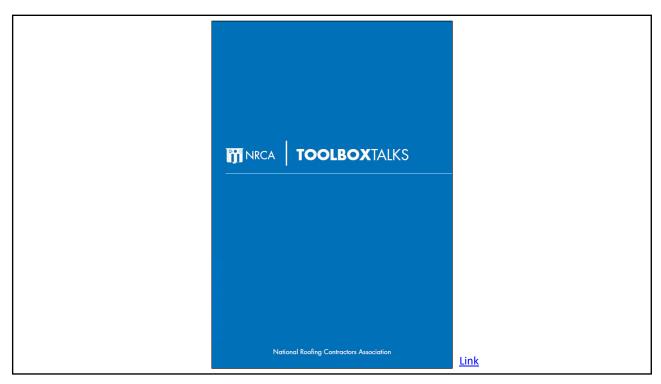


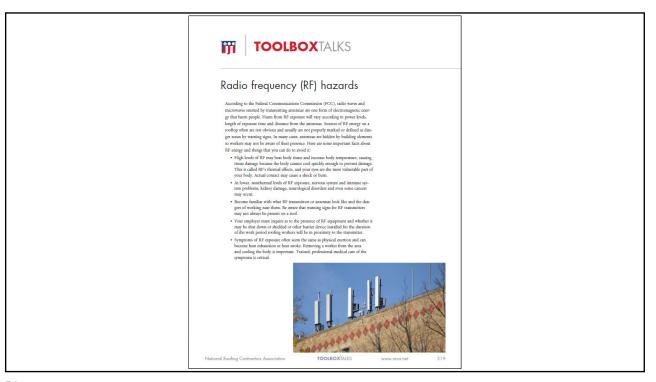


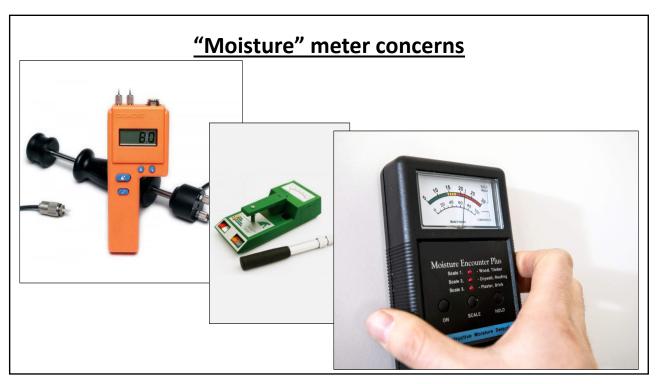
Some useful references

- CRCA Advisory Bulletin (Link)
- Health Canada's Safety Code 6 (Link)
- Federal Communications Commission (Link)
- Center for Construction Research and Training (Link)

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These meters do not read moisture...
...they are reading relative conductivity, which can be correlated to specific materials in specific conditions when properly calibrated.

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Considerations

"Moisture" meters

- Read/understand the instruction manual
- · Understand device sensitivity
- Understand proper operating conditions
- Proper calibration/recalibration is critical
- Don't overstate the meter's capability
- Verify job-specific results with gravimetric analysis

Recent and common technical inquires

Requests of NRCA for technical assistance

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