



Verify Before Rating

Insulation Inspection Procedures

Philip Fairey, Deputy Director Florida Solar Energy Center RESNET Conference March 2, 2005



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Insulation inspection procedures

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- Assess insulation quality
 - 3 Grades: I, II, and III
 - "Grade I" based on industry published standards
- Provide specific modeling guidance
 - Based on results of field assessment
 - Primarily for software developers, not raters
- Other details
 - Installation practices, framing, compression



Inspection Requirement?

- Yes—to take full credit for thermal performance of properly installed product
- No—not required for a rating
 - Accept defaults if you don't inspect
 - Equivalent to Grade III
 - Parallel to other HERS requirements
 - Envelope, duct testing
- All types of insulation



Modeling (Software, not Rater)

Impact

- Grade I: theoretical (labeled) performance
- Grade II: as if 2% of cavity with 0 insulation in cavity
- Grade III: as if 5% of cavity with 0 insulation
 - Still use interior, exterior sheathing, air films, etc.
- Compression
 - Performance according to manufacturer
 - Default: values in Manual J, 8th edition.



Assessment: Grade I

- Installed according to manufacturers instructions and/or industry standards
- Fills each cavity side-to-side and top-to-bottom
- No substantial gaps or voids around obstructions (i.e. blocking or bridging)
- Split and/or fitted tightly around wiring and other services
- No exterior sheathing is visible through gaps in the material, minimal compression



Boundary condition for "Grade I"



- Gaps clear through insulation-minimal
- Compression or incomplete fill: <2% of area, compressed by <30% of intended thickness



Assessment: Grade II

- Moderate to frequent defects:
- Gaps around wiring, electrical outlets, plumbing, other intrusions
- Rounded edges or "shoulders"
- Incomplete fill amounting to up to 10% of the area with less than 70% of intended thickness; or
- Gaps/spaces clear through the insulation amounting to more up to 2% of total surface area covered by the insulation.



Boundary condition for "Grade II"



• Gaps clear through insulation: <2%

 Compression or incomplete fill: <10% of area, compressed by <30% of intended thickness



Conditions for Wall Insulation

- To attain a rating of "Grade I" or "Grade II":
- Must be enclosed on all six sides
 Sheathing wrap is acceptable
- Must be in substantial contact with the sheathing material on at least one side of the cavity
 - Interior or exterior



Assessment: Grade III

- Gaps and voids amounting to greater than 2% percent of the surface area it is intended to occupy
- Compression greater than 10% of the area compressed (70% or less of rated thickness)



Boundary condition for "Grade III"



 Gaps – no more than 5% missing

- In cases that are worse than "Grade III", the requirement is to measure missing areas.
- If the entire surface is compressed, insulation R-value according to manufacturer (or defaults) for whole assembly



Wall insulation that is:

- Not in substantial contact with the sheathing on at least one side of the cavity
- OR, wall that is open (unsheathed) on one side and exposed to the exterior conditions or a vented attic or crawlspace;
- Shall be rated "Grade III"



Additional for Ceilings

- For "Grade I" rating
 - Must be in complete contact with the surface it is intended to insulate
 - Must have eave baffles
 - Need not be enclosed on the top
- Inspectors need to note whether the framing is covered, and by how much
 - Model cavity insulation separately from continuous insulation



Additional for Floors:

- Must be in complete contact with the surface it is intended to insulate, for "Grade I" rating
- Need not be enclosed on 6 sides, IF in enclosed, unconditioned basement

- Vented, or outdoors does need enclosure



Missing insulation

- Treat as SEPARATE areas
 - Insulation R-values may *not* be averaged over areas
 - Example: If 50 square feet of wall has no insulation, must be counted as separate wall area with no insulation
 - Example: if 100 s.f. of an attic has ½ the R-value of loose fill that exists everywhere else, must be input as 100 s.f. with ½ the R-value