

**INTERPRETATION IC 90.1-2016-9 OF  
ANSI/ASHRAE/IES STANDARD 90.1-2016  
Energy Standard for Buildings Except Low-Rise Residential Buildings**

**Date Approved:** October 12, 2019

**Request from:** Casey Harkins, Thermal Design, Inc., P.O. Box 324, Stoughton, WI 53589.

**Reference:** This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IES Standard 90.1-2016, Sections 3.2(R) and 5.4.1 and Tables 5.5-0 through 5.5-8, A2.3.3, A3.2.3 and A9.4.6.1, regarding insulation R-Values for metal building roof and wall assemblies.

**Background:** Over the past year, we have fielded questions from architects, contractors and even other insulation suppliers asking whether 90.1 imposes requirements beyond the rated R-Value of insulation, specifically whether special grades of insulation or specific thicknesses of a rated R-Value are required to demonstrate compliance with the Standard.

The standard defines the minimum rated R-Value of insulation as *“the thermal resistance of the insulation alone as specified by the manufacturer in units of h·ft<sup>2</sup> ·°F/Btu at a mean temperature of 75°F”* and further requires that insulation be labeled with the rated R-Value of insulation (with an exception requiring installer to certify).

Where insulation is required in Section 5.5 or Section 5.6, it is specified either as a minimum rated R-Value of insulation, or as a maximum U-Factor where assemblies listed in Appendix A or calculated in accordance with Appendix A are themselves specified in terms of a rated R-Value of one or more layers of insulation.

The pre-calculated U-Factors in Appendix A assume thicknesses of the insulation utilized in the assembly. The calculated values for metal building assemblies use the fiberglass reference data provided in Table A9.4.6.1. However, in the market the actual thickness of a fiberglass blanket for the same rated R-Value may differ between manufacturers and different grades of fiberglass available on the market.

For example, the reference thickness for an R-19 metal building fiberglass blanket in Table A9.4.6.1 is 5.45 inches. At least one manufacturer rates their R-19 metal building insulation at 6.00 inches, while another rates their R-19 at 6.38 inches.

**Interpretation:** When demonstrating compliance with the minimum rated R-Value of insulation requirement specified in Tables 5.5-0 through 5.5-8, or when demonstrating compliance with the maximum U-Factor requirement specified in Tables 5.5-0 through 5.5-8 utilizing an assembly from Appendix A identified by a rated R-Value of insulation, 90.1 requires that the insulation provide the rated R-Value(s) in accordance with the definition in Section 3.2 and does not require a specific thickness or density for that insulation, nor does it require that the thermal resistance of the insulation alone exceed the rated R-value of insulation.

**Question:** Is this interpretation correct?

**Answer:** No.