

COMcheck: Entering Insulation Systems Not Listed in the Energy Codes

By Tim Belcher, NBG Energy Lead

As the use of COMcheck becomes more common so do the questions we receive related to its use. One question in particular has come up more frequently than others. How do you correctly input roof or wall insulation systems when the system in question is not represented in the pre-populated “Construction Details” drop down menus in COMcheck? This is critically important when utilizing an insulation system that is not represented in the energy codes and for which hot box testing or finite element modeling has been used to verify the systems thermal performance.

In COMcheck the “Construction Details” drop down menu for Metal Buildings is populated with those systems whose performance is detailed in ASHRAE 90.1, tables A2.3.3 Assembly U-Factors for Metal Building Roofs, and A3.2.3 Assembly U-Factors for Metal Building Walls. We will look at roof inputs as examples below. When selecting one of these systems the input is fairly straightforward. Select “Metal Building, Standing Seam”, or “Metal Building, Screw Down” as the Assembly. Select the Construction Detail that describes the type of insulation system you will be utilizing. Then input the system R-value in the “Cavity Insulation R-Value” column. COMcheck populates the U-Factor based on the values given in the previously mentioned ASHRAE 90.1 tables.

Project										
Envelope		Interior Lighting		Exterior Lighting		Mechanical		Requirements		
Roof Skylight Exterior Wall Window Door Basement Floor										
Component	Assembly	Building Area Type	F... D...	Construction Details	Gross Area or Slab Perimeter	Units	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	
▼ Building										
1	Roof 1	Metal Building, Standing Seam	1 - Warehouse...	Single Insulation Layer with Thermal Blocks	10000	ft2	19.0	0.0	0.082	
2	Exterior Wall 1	Insulation Entirely Above Deck Metal Building, Standing Seam Metal Building, Screw Down Attic Roof with Wood Joists Attic Roof with Steel Joists Other (U-Factor Option)	Warehouse...	Single Insulation Layer with Thermal Blocks Double Insulation Layer with Thermal Blocks Filled Cavity with Thermal Blocks Liner System with Thermal Blocks Liner System without Thermal Blocks	3000	ft2	19.0	0.0	0.147	

When using tested systems not represented in the energy codes such as the CBC Single Layer R-25, R-30, and R-38 systems, or Insulated Metal Panels the method is different. The key is to select “Other (U-factor Option)” and then select from the “Metal Building Roof” or “Metal Building Wall” options that follow. By doing so the ability to select a “Construction Detail” is disabled and the user is prompted to manually enter the U-factor of the insulation assembly that is to be used.

Project										
Envelope		Interior Lighting		Exterior Lighting		Mechanical		Requirements		
Roof Skylight Exterior Wall Window Door Basement Floor										
Component	Assembly	Building Area Type	F... D...	Construction Details	Gross Area or Slab Perimeter	Units	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	
▼ Building										
1	Roof 1	Other Metal Building Roof	1 - Warehouse...		10000	ft2			0.031	
2	Exterior Wall 1	Insulation Entirely Above Deck Metal Building, Standing Seam Metal Building, Screw Down Attic Roof with Wood Joists Attic Roof with Steel Joists Other (U-Factor Option)	Warehouse...	Single Layer Mineral Fiber (compressed at ...)	3000	ft2	19.0	0.0	0.147	

The insulation supplier should be able to provide you with the U-factor values for their tested assemblies along with any supporting documentation of the stated performance which may be required by building code officials.

If you have any questions related to the energy code compliance of your metal building project please call the Energy Hotline at 844-682-6724, or email NBG.Energy@nucor.com.