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9.36.2.4. - Calculating the Effective Thermal Resistance of “Rainscreen” Wall Assemblies

Effective December 19, 2014 Article 9.36.2.4. will require builders to calculate the effective thermal resistance of above ground opaque assemblies (walls, roofs and suspended floors). Appendix table A-9.36.2.4.D provides values for common materials in these assemblies to support the calculation of effective thermal resistance, but there are no values provided for wall air cavities less than 13mm.

For many communities in B.C., 9.27.2.2. requires wall assemblies to include a first and second plane of protection separated by a capillary break of not less than 9.5mm (aka “rainscreen”). While these assemblies are not directly addressed by table 9.36.2.4.D, “rainscreen” air cavities between 9.5mm and 13mm thick do provide a thermal resistance (RSI) of 0.15 (m²·K)/W. The vertical furring or strapping in a “rainscreen” assembly does not impact the thermal performance of the cavity and is not included in the calculation of the effective thermal performance of the wall.

Table A-9.36.2.4.(1)D
Thermal Resistance Values of Common Building Materials⁽¹⁾

Air Cavities ⁽²⁾⁽³⁾	Thickness of Air Space	Thermal Resistance (RSI), (m ² ·K)/W per mm	Thermal Resistance (RSI), (m ² ·K)/W for thickness listed
Walls (heat flow horizontal) faced with non-reflective material ⁽⁴⁾	9.5mm	—	0.15
	13mm	—	0.16
	20mm	—	0.18
	40mm	—	0.18
	90mm	—	0.18

It is also important to clarify the intent of note (2) to Table A-9.36.2.4.(1)D, which states:

“air cavities measuring less than 13 mm cannot be included in the calculation of effective thermal resistance of the assembly.”

BC Building and Safety Standards Branch staff have confirmed the intent of this note with staff at the Canadian Codes Centre. The intent was not to mean that air cavities less than 13mm had no RSI value. Rather, it means that, at the time 9.36. was developed, air cavities less than 13mm were not considered.

However, as this bulletin establishes, air cavities less than 13mm can be considered in the calculation of effective thermal resistance with a value of $0.15 \text{ (m}^2 \cdot \text{K)/W}$. This value is the result of the same scientific principles that were used to establish the values for air cavities in Table A-9.36.2.4.D.

This bulletin is not intended to contradict the information in Table A-9.36.2.4.D, but rather to include additional information in the table that was not considered when the table was first created. Code users should use the information in this bulletin as well as the appendix to 9.36. to comply with the legal requirements in the Division B.