

Energy Efficient Solutions

Energy Efficient Fact Sheet

What do the R and U value ratings mean?

R-Value:

Thermal resistance is a measure of ability to retard heat flow. R is an expression of the total resistance to heat flow through a complete panel section or construction assembly. R-Value represents a value of the thermal resistance in hours - square foot - degrees Fahrenheit per BTU of a typical panel section. R-Value is the numerical reciprocal of the U-factor ($R=1/U$). The higher the R, the higher the insulating value.

U-Factor:

Overall coefficient of heat transmission through a built-up panel section measured in BTU's per hour per square foot of area per degree Fahrenheit between the air on one side to the air on the other side (BTU's/hr-ft²-°F). The lower the U-factor, the better the insulation.

Most building products manufacturers cite a calculated value for thermal performance (R and U Values) of doors. While this remains the industry standard, more specs with the latest standards for thermal transmittance (ASTM C 1363) and air infiltration (ASTM E283) are being written. Note, ASTM C1363 is the most current test standard for thermal transmittance and replaces ASTM C 236.]

You will see some differences between the calculated core rates (ASTM C518) and the operable rates as door and frame construction varies. Design professionals are beginning to see these variances in other building products such as wall partitions (an industry that has already begun to move from calculated to operable values). We believe it's important you and your customers understand the operable performance levels of the opening assemblies you purchase along with the calculated values.

Door U - Factor and R - Value Testing

Door Series / Core	ASTM C518 Calculated		ASTM C1363* Operable	
	R - Value	U - Factor	R - Value	U - Factor
Trio-E / Polyurethane	11.0	0.09	3.4	0.29
Trio-E / Polyurethane - Kerf Frame	11.0	0.09	2.7	0.36
D - Series / Polyisocyanurate	12.23	0.08	2.6	0.39
E - Series / Polystyrene	6.87	0.46	2.6	0.39
E - Series Embossed / Polystyrene	6.87	0.46	2.5	0.40
Trio / Polyurethane	11.0	0.09	2.4	0.42
D - Series / Honeycomb	2.62	0.38	1.8	0.57

*Tested with hardware from other ASSA ABLOY Group brands including Corbin Russwin, Pemko, McKinney, Sargent and Yale in a Fleming Thermal Break Frame.

What is air infiltration?

- Air infiltration: A measurement of the air leakage around the perimeter of a door opening.
- CFM = Cubic Feet per Minute

Air Infiltration Testing

Door Series / Core	ASTM E283* Operable	
	CFM / SQ FT	CFM / LN FT
Any Fleming Door Construction with Fleming Thermal Break Frame	0.04	0.06

*Tested with hardware from other ASSA ABLOY Group brands including Corbin Russwin, Pemko, McKinney, Sargent and Yale in a Fleming Thermal Break Frame

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