

Clipay Building Products Company

TECHNICALLY SPEAKING

The True Value of Insulation

What is “R” value, and what does it have to do with sectional doors?

More importantly, how do published “R” values relate to value for you?

R Value/U Value:

R-value is defined as a material’s resistance to the flow of heat. but before you can understand the resistance to heat flow, you need to understand “U” value. “U” value is defined as the overall coefficient of heat transmission and is a measure of the heat (number of BTUs (British Thermal Units)) transmitted through 1 sq. ft. of a substance in one hour. It is dependent on the temperature differential on each side of the substance. The “U” value of a substance, then measures heat flow through that substance. The “R” value measures the resistance to that heat flow and is the reciprocal of the “U” value. (1 divided by the U value.)

There are three typical “R” values reported by sectional door manufacturers.

- 1.) **Calculated “R” value.** This is simply a calculation of the resistance of each of the components calculated through a cross section of the door including the air film that surrounds the actual material. This figure is typically very impressive, but has little indication of the actual resistance to heat flow of the entire door.
- 2.) **Tested cross section “R” value:** This value is derived by actually testing the resistance to heat flow through a cross section at one point on a door section. This value very closely mirrors the calculated “R” value, but may actually be higher than the calculated value because the combination of materials actually provide more resistance than the calculated value.
- 3.) **The installed “R” value.** This value is derived by actually testing the thermal conductivity of an entire door in the installed state and dividing the amount of heat flow by the total square ft. area of the door. This tested value gives the most accurate “R” value because it considers not only the construction of the section, but also the entire configuration of the installed door.

The sectional door industry typically uses polystyrene foam, polyurethane foam, or sometimes Mineral Wool as insulating materials. The characteristics of polyurethane foam provide higher “R” values per inch of thickness than polystyrene, and both of these provide more insulation value than mineral wool. See chart A below. Although these higher “R” values translate into higher published “calculated” “R” values and higher cross section “tested” “R” values, Clipay wanted to be sure that we were using the best building materials to provide the best possible product for our consumers.

Since we believed that the true test of insulation value of a sectional overhead door is the insulation value in the installed product, we contracted Architectural Testing in York, PA to test some of our products and some products of our largest competitors. Chart B below shows the results of those tests. (Actual test results can be provided) As you can see, the published “calculated R” value is much higher than the actual installed “R” value. Because the difference in installed “R” values is much less significant than the published “R” values, we have continued to work to provide the best product available aesthetically, the most environmentally friendly product that we can provide, and, coupled with expert installing dealers, a great value for our final users.

Manufacturer	Product	Section Thickness	Insulation Pur= Poly-urethane EPS = Poly-styrene	Exterior Gauge	Interior gauge	Mfg pub. R-Value/ U-Value	Tested* Installed R-Value
Wayne-Dalton	TS150	1-3/8"	PUR	30	n/a	11.47/.087	5.88
Clopay	Model 3622	1-3/4"	PUR	20	26	15.05/.066	6.97
Clopay	Model 3603	1-3/4"	PUR	26	26	15.05/.066	6.97
Haas	710, 712, 716 series	1-3/4"	PUR	26	26		6.25
Ideal Door	Model C0X17	1-3/4"	PUR	20	26	15.05/.066	6.97
Ideal Door	Model C6X17	1-3/4"	PUR	26	26	15.15/.066	6.97
Overhead Door	Model 591	1-5/8"	PUR	28	28	14.86/.067	5.26
Overhead Door	595 Series	1-5/8"	PUR	20	26	14.86/.067	5.26
Clopay	Model 3200	2"	EPS	24	27	9.1/.11	4.55
Clopay	Model 3203 raised panel	2"	EPS	24	27	9.1/.11	4.55
Clopay	Model 3220	2"	EPS	20	27	9.1/.11	4.55
Overhead Door	592 Series	2"	PUR	28	26	17.5/.057	5.56
Wayne-Dalton	TS200	1 7/8"	PUR	27	28	14.96/.067	6.25
Wayne-Dalton	TS200	1 7/8"	PUR	27	28	14.96/.067	6.25
Wayne-Dalton	TS-200-20	1-7/8"	PUR	20	26	14.96/.067	6.25
Clopay	Model 3300	3"	EPS	25	27	12.15/.080	6.25
Haas	Model 816	3"	PUR	26 ga	26	24	8.67
Raynor	Tri-Core™	3"	EPS	26	26	13.55/.0738	4.545
Raynor	TC-20	3"	EPS	20	26	13.55/.0738	4.55
Raynor	Tri-Core II	3"	EPS	28	28	13.55/.0738	4.55