



INNOVATIONS FOR LIVING®

ELAMINATOR® Insulation System

100 Series: 100 and 120 Machines Thermal Performance

Technical Bulletin

The Owens Corning™ ELAMINATOR® Insulation System, 100 Series machines includes two designs: 100 machines and 120 machines. They install insulation in single or double layers depending on the thermal requirements of the building. Single layer of insulation is installed across the purlins with the ELAMINATOR® 100 Series machines installing the vapor retarder facing along the purlins. The machines hold the overlap facing in position until the roof panel fasteners are installed holding the facing in a permanent position. Double layers of insulation are installed with the ELAMINATOR® 100 Series machines installing the first layer between the purlins with laminated facing whose width is sufficient to allow the insulation to drop down into proper position. (See picture B.) The second insulation layer is installed over the purlins completing the high thermal performance requirements. 120 machines can install patented folded facing for double layer applications allowing MBI Plus Insulation to be installed for **both** layers. (See 300 Series Machine Thermal Data Technical Bulletin.) 100 Series machines install insulation on roof slopes no greater than 3:12.

About the Numbers

The performance of an insulation system depends not only on the amount of insulation installed, but also on the construction details of the building envelope. This is particularly true for metal buildings where structural steel components and fasteners can have a dramatic effect on the

120 machines installing single layer.



Table I

ELAMINATOR® 100 Series Thermal Performance using Certified-R Metal Building Insulation

Insulation*	Thermal Block FOAMULAR® ¹ 1" x 3"	Thermal Block FOAMULAR® ¹ 1" x 6"	Thermal Block Polyisocyanurate 1" x 6"
R-10	0.084	0.082	0.081
R-11	0.080	0.078	0.076
R-13	0.074	0.072	0.070
R-16	0.064	0.062	0.061
R-19	0.059	0.057	0.056
R-10/R-10	0.059	0.057	0.056
R-10/R-11	0.057	0.056	0.054
R-10/R-13	0.055	0.053	0.051
R-11/R-13	0.054	0.052	0.050
R-13/R-13	0.052	0.050	0.049
R-10/R-19	0.049	0.047	0.046
R-11/R-19	0.048	0.046	0.045
R-13/R-19	0.047	0.045	0.044
R-16/R-19	0.045	0.044	0.042
R-19/R-19	0.044	0.042	0.041

Note: Units on U-values are Btu/(hr•ft²•°F), R-values are hr•ft²•°F/Btu.

Data obtained by ANSYS, finite-element model, validated by hot box test (ASTM C 976).

*Certified Metal Building Insulation NAIMA 202-96®.

1. FOAMULAR® is Owens Corning's extruded polystyrene.

MBI Plus Insulation not to be laminated.



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overall thermal performance. To address the complexities involved, Owens Corning uses a combination of large scale hot box testing (per ASTM 976) and mathematical modeling to estimate the overall U-values of these systems. The modeling utilizes the ANSYS® finite element analysis (FEA) software package.

The tables provide estimates of the overall U-value of the standing-seam roof systems, including appropriate air films on top and bottom surfaces. Table 1 gives performance values at a mean temperature of 75°F using Owens Corning™ Certified-R Metal Building Insulation for single and double layers. Table 2 gives performance values at a mean temperature of 75°F using Owens Corning™ unfaced MBI Plus Insulation for single layer. For double layer, the first layer is faced Certified-R Metal Building Insulation and second layer is unfaced MBI Plus Insulation.

100 machines installing double layer.



Table 2

ELAMINATOR® 100 Series Thermal Performance using unfaced MBI Plus Insulation

Insulation*	Thermal Block FOAMULAR® ¹ 1" x 3"	Thermal Block FOAMULAR® ¹ 1" x 6"	Thermal Block Polyisocyanurate 1" x 6"
R-10	0.092	0.090	0.088
R-11	0.088	0.086	0.084
R-13	0.080	0.078	0.077
R-16	0.071	0.068	0.067
R-19	0.065	0.062	0.061
R-10/R-10	0.063	0.060	0.058
R-10/R-11	0.061	0.059	0.058
R-10/R-13	0.058	0.056	0.054
R-11/R-13	0.058	0.055	0.054
R-13/R-13	0.055	0.053	0.052
R-10/R-19	0.052	0.050	0.049
R-11/R-19	0.052	0.050	0.048
R-13/R-19	0.050	0.048	0.047
R-16/R-19	0.049	0.046	0.045
R-19/R-19	0.048	0.045	0.044

Note: Units on U-values are Btu/(hr•ft²•°F), R-values are hr•ft²•°F/Btu.

Data obtained by ANSYS, finite-element model, validated by hot box test (ASTM C 976).

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