Bay Insulation Systems
Member of the Bay Family of Companies

Bay Rider™ Thermal Performance

Technical Bulletin

The Bay Insulation Systems' Bay Rider™ machines install the insulation system facing first, followed by one or two layers of unfaced insulation. This enhances thickness recovery of the insulation and improves the overall thermal performance of the roof. The accompanying tables provide thermal performance levels achievable with Cetified-R Metal Building Insulation installed with Bay Rider.

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 overall thermal performance. To address the complexities involved, Bay Insulation Systems 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 Bay Insulation Systems Certified-R Metal Building Insulation for single and double layers. Table 2 gives performance values at a mean temperature of 75°F using Bay Insulation Systems unfaced insulation for single and double layers.

Table 1 - Bay Rider Thermal Performance (using Certified-R Metal Building Insulation)

Insulation*	1" x 3" Thermal Block	1" x 6" Thermal Block	1" x 6" Polyisocyanurate Thermal Block
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	0.057	0.055	0.054
R10/R-11	0.056	0.054	0.053
R10/R-13	0.054	0.052	0.050
R-11/R-13	0.053	0.051	0.049
R13/R-13	0.050	0.049	0.047
R10/R-19	0.048	0.046	0.045
R11/R-19	0.047	0.045	0.044
R-13/R-19	0.046	0.044	0.043
R-16/R-19	0.045	0.043	0.042
R-19/R-19	0.044	0.042	0.040

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®. Bay Rider Insulation not to be laminated.

Bay Rider™

Bay Rider installs Bay Insulation Systems Certified-R Metal Building Insulation unfaced, out-of-package, for both single and double layers with a vapor retarder. This provides a cost-effective installation with an attractive appearance. Proper use of Bay Rider enables the Bay Rider licensee and contractor to comply with OSHA standards. Bay Insulation Systems has a Certified Bay Rider Operator Program (CBROP) where a trained operator who is certified or an apprentice in the CBROP is required to operate the machines at all time for the entire project. This helps to insure proper use of the equipment.

Table 2 - Bay Rider™ Thermal Performance (using Bay Rider Insulation)

Insulation*	1" x 3" Thermal Block	1" x 6" Thermal Block	1" x 6" Polyisocyanurate Thermal Block
R-10	0.092	0.090	0.088
R-11	0.088	0.086	0.086
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
R10/R-11	0.061	0.059	0.058
R10/R-13	0.058	0.056	0.054
R-11/R-13	0.058	0.055	0.054
R13/R-13	0.055	0.053	0.052
R10/R-19	0.052	0.050	0.049
R11/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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