



# **SENTRIGARD**

## **METAL SYSTEMS**

### **TECHNICAL BULLETIN**

#### **ENERGY STAR APPROVAL**

Sentrigard Metal Roofing Systems has Energy Star approval for every metal roofing product we make when it is produced using bare Galvalume or clear acrylic coated Galvalume. (We use clear acrylic coated Galvalume for all of our “unpainted” Galvalume.) We also have Energy Star approval on many of our standard colors for both our Architectural and our Wood Frame product offerings. Attached are summary pages showing all of our standard colors and several non-standard colors, the initial and aged reflectivity values and the initial emissivity values. There is no Emissivity requirement in the Energy Star program, but it must be reported. Emissivity is a requirement of several other programs, such as the LEED program. The emissivity values for our Energy Star approved colors have now been tested by the LEED required ASTM E408 test method. (LEED is addressed in Technical Bulletin 726)

The Energy Star program is an EPA program that is promoting highly reflective roofs. The theory is that roofs that reflect most of the solar energy will stay cooler and require less electricity for air conditioning. This, in turn, reduced the amount of electricity that must be produced, which reduces the amount of pollutants discharged into the air at the power plants. This is good for the environment and that's why the EPA is pushing it. Several states are beginning to mandate energy saving construction products, like this one. Notably, California and New York are leading the way. Other states will be following close behind. Architects are also asking about these issues and specifying energy efficient products. This issue and recyclability are becoming more important every day. (Recyclability is addressed in Technical Bulletin 725.)

**The IRS home owner energy credit has been extended for 2011. That means, homeowners that purchase a Sentrigard painted, ENERGY STAR certified metal roof from Jan. 1, 2011 through Dec. 31, 2011 will qualify for a tax credit of up to \$500. This credit is 10% of the material cost and applies to residential re-roofing projects that use painted metal roofing that meets the Energy Star requirements, up to the \$500 credit. The credit does not apply to the installation costs; just the cost of the metal roofing material. Use IRS tax form 5695 for this credit. A copy of Sentrigard's “Manufacturer's Certification Statement” letter should be given to the homeowner for his tax files. It does not need to be submitted with the tax forms but should be kept with his tax records. Please note that even though unpainted Galvalume is Energy Star approved, it is not eligible for the IRS tax credit. The material must be painted to qualify for the credit. Please note that we have revised our residential standing seam colors with special pigments, and have phased in our Grandrib 3 colors, so the tax credit for some colors from some of our plants for Grandrib 3 is only applicable for material that shipped after the date listed in our certification letter.**

In order to qualify for Energy Star approval as a low slope roof product (2:12 pitch or less) the product must have an initial reflectance of 0.65 or higher and a reflectance of 0.50 or higher after 3 years. In order to qualify for Energy Star approval as a steep slope roof product (greater than 2:12 pitch) the product must have an initial reflectance of 0.25 or higher and a reflectance of 0.15 or higher after 3 years. The Galvalume producers ran the extensive series of tests on bare Galvalume to qualify for both the low and steep slope requirements. They have distributed this test report to anyone that wishes to get approval.



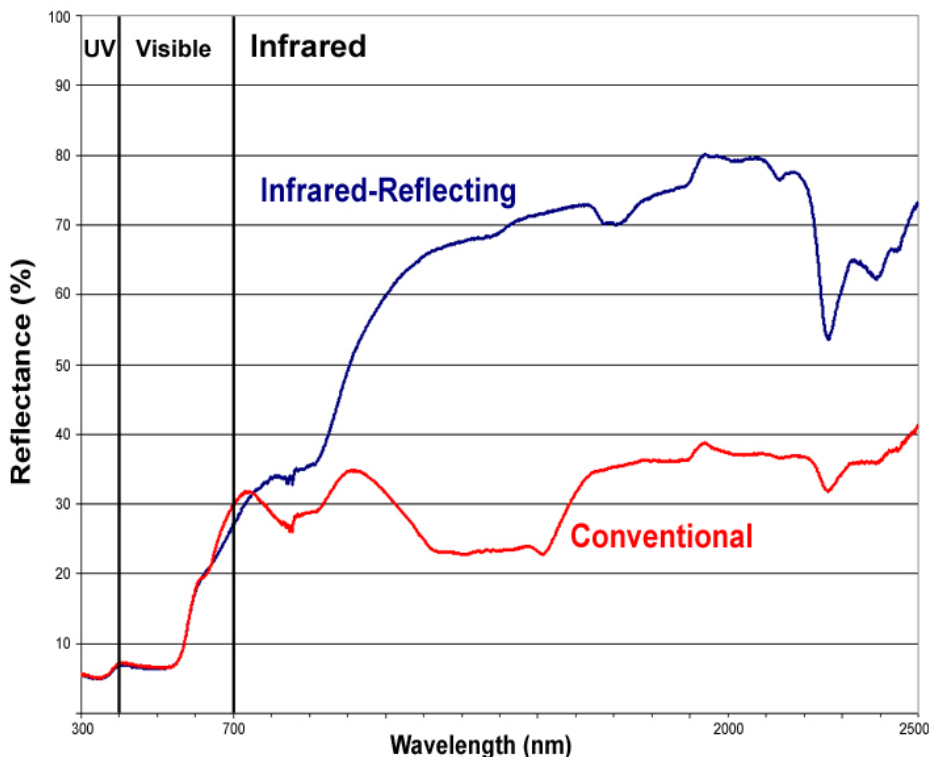
# SENTRIGARD

## METAL SYSTEMS

### TECHNICAL BULLETIN

Sentrigard Metal Roofing Systems also has approval for many of our standard and special colors, which are shown on the attached lists. Please be aware that even though our Kynar colors Bone White and Regal White meet the more severe low slope reflectivity requirements, they were aged for 3 years at a 12:12 pitch. The Energy Star program requires they be aged at 2:12 or less. This is just a formality and these colors will certainly meet the aged requirements at 2:12 pitch, but they have not been tested that way so they are technically only Energy Star approved for steep slope use. Most Architects understand that these colors meet the intent of the low slope requirements and will use them for these applications. Our paint vendor is retesting these colors but we are a few years away from having these aged values. One recent change to the Energy Star program allows the use of color families for the 3 year aged values. This has allowed us to get colors approved even though they haven't been aged 3 years on a test fence.

As you can see from the list, light colors are more reflective than dark colors. Darker colors absorb more solar energy, which heats up the panels and the living space inside the building and causes the air conditioner to work harder. Many Architects, however, prefer dark colored roofs which would have lower reflectivity values and not meet the Energy Star standards. This dilemma can be resolved by orders special paint colors with Infrared Reflective pigments. About half of the energy that strikes the earth is in the infrared range. These special pigments reflect more of the energy in that range while not impacting the visible light range significantly; therefore, not impacting the color we see. (See the chart below.) We have revised most of our standard colors using these special pigments so our dark colors also meet the Energy Star and LEED requirements.





# SENTRIGARD

## METAL SYSTEMS

### TECHNICAL BULLETIN

#### ARCHITECTURAL KYNAR COLORS

1/12/12

| COLOR                    | Color Number | Initial Total Solar Reflectivity (color family)* | 3 Yr. Exposed Solar Reflectivity (color family)* | Initial Emissivity (color family)* | Energy Star Approved | Initial Total Solar Reflectivity (actual) | Initial Emissivity (actual) | SRI | Meets LEED Requirement |
|--------------------------|--------------|--------------------------------------------------|--------------------------------------------------|------------------------------------|----------------------|-------------------------------------------|-----------------------------|-----|------------------------|
| ALMOND                   | T23          | 0.61                                             | 0.55                                             | 0.87                               | YES                  | 0.61                                      | 0.87                        | 73  | STEEP                  |
| APOTHECARY               | V32          | 0.26                                             | 0.25                                             | 0.85                               | YES                  | 0.26                                      | 0.85                        | 24  | NO                     |
| BANNER RED               | V93          | 0.40                                             | 0.34                                             | 0.82                               | YES                  | 0.42                                      | 0.84                        | 45  | STEEP                  |
| BONE WHITE               | V03          | 0.65                                             | 0.55                                             | 0.87                               | YES                  | 0.65                                      | 0.86                        | 78  | LOW & STEEP            |
| BRIGHT COPPER            | V25          | 0.45                                             | 0.35                                             | 0.77                               | YES                  | 0.49                                      | 0.85                        | 55  | STEEP                  |
| BRIGHT SILVER            | V26          | 0.57                                             | 0.35                                             | 0.77                               | YES                  | 0.60                                      | 0.77                        | 68  | STEEP                  |
| BURGUNDY                 | V24          | 0.25                                             | 0.23                                             | 0.85                               | YES                  | 0.25                                      | 0.85                        | 23  | NO                     |
| CHARCOAL                 | L01          | 0.27                                             | 0.25                                             | 0.85                               | YES                  | 0.29                                      | 0.89                        | 30  | STEEP                  |
| CLASSIC GREEN            | L02          | 0.27                                             | 0.25                                             | 0.83                               | YES                  | 0.31                                      | 0.85                        | 31  | STEEP                  |
| COLONIAL RED             | L03          | 0.35                                             | 0.23                                             | 0.85                               | YES                  | 0.35                                      | 0.85                        | 36  | STEEP                  |
| DARK BRONZE              | L04          | 0.27                                             | 0.23                                             | 0.85                               | YES                  | 0.28                                      | 0.89                        | 29  | STEEP                  |
| HARTFORD                 | L05          | 0.27                                             | 0.25                                             | 0.83                               | YES                  | 0.30                                      | 0.85                        | 30  | STEEP                  |
| HEMLOCK                  | L06          | 0.35                                             | 0.32                                             | 0.85                               | YES                  | 0.37                                      | 0.85                        | 39  | STEEP                  |
| MANSARD                  | L07          | 0.26                                             | 0.25                                             | 0.85                               | YES                  | 0.29                                      | 0.86                        | 29  | STEEP                  |
| MATTE BLACK              | L08          | 0.27                                             | 0.25                                             | 0.86                               | YES                  | 0.29                                      | 0.86                        | 29  | STEEP                  |
| MEDIUM                   | L09          | 0.26                                             | 0.25                                             | 0.85                               | YES                  | 0.30                                      | 0.85                        | 30  | STEEP                  |
| MUSKET GRAY              | L10          | 0.27                                             | 0.25                                             | 0.85                               | YES                  | 0.33                                      | 0.85                        | 34  | STEEP                  |
| OLD TOWN                 | L18          | 0.27                                             | 0.25                                             | 0.85                               | YES                  | 0.40                                      | 0.86                        | 43  | STEEP                  |
| PATINA GREEN             | V14          | 0.26                                             | 0.27                                             | 0.89                               | YES                  | 0.29                                      | 0.87                        | 29  | STEEP                  |
| PEWTER                   | L11          | 0.36                                             | 0.35                                             | 0.77                               | YES                  | 0.36                                      | 0.85                        | 38  | STEEP                  |
| REGAL BLUE               | L12          | 0.26                                             | 0.25                                             | 0.85                               | YES                  | 0.28                                      | 0.89                        | 29  | STEEP                  |
| REGAL WHITE              | V38          | 0.68                                             | 0.65                                             | 0.86                               | YES                  | 0.68                                      | 0.86                        | 82  | LOW & STEEP            |
| SANDSTONE                | V17          | 0.48                                             | 0.35                                             | 0.85                               | YES                  | 0.54                                      | 0.86                        | 63  | STEEP                  |
| SIERRA TAN               | V70          | 0.31                                             | 0.31                                             | 0.87                               | YES                  | 0.38                                      | 0.85                        | 40  | STEEP                  |
| SLATE BLUE               | L13          | 0.29                                             | 0.28                                             | 0.85                               | YES                  | 0.29                                      | 0.86                        | 29  | STEEP                  |
| SLATE GRAY               | L14          | 0.40                                             | 0.35                                             | 0.85                               | YES                  | 0.40                                      | 0.86                        | 43  | STEEP                  |
| STONE WHITE              | V31          | 0.62                                             | 0.55                                             | 0.87                               | YES                  | 0.61                                      | 0.85                        | 72  | STEEP                  |
| SURREY BEIGE             | V21          | 0.41                                             | 0.41                                             | 0.90                               | YES                  | 0.40                                      | 0.86                        | 43  | STEEP                  |
| TEAL                     | L15          | 0.27                                             | 0.25                                             | 0.83                               | YES                  | 0.30                                      | 0.85                        | 30  | STEEP                  |
| TERRA COTTA              | V23          | 0.27                                             | 0.23                                             | 0.85                               | YES                  | 0.39                                      | 0.84                        | 41  | STEEP                  |
|                          |              |                                                  |                                                  |                                    |                      |                                           |                             |     |                        |
| GALVALUME UNPAINTED      |              | 0.78                                             | 0.58                                             | 0.06                               | YES                  | 0.78                                      | 0.06                        | 75  | STEEP                  |
| GALVALUME / CLEAR COATED |              | 0.68                                             | 0.55                                             | 0.14                               | YES                  | 0.68                                      | 0.14                        | 58  | STEEP                  |

Note: Reflectivity tested by ASTM C1549 and Emissivity measured by ASTM C1371.

\* Indicates color family values, which are used by the Energy Star program. LEED uses actual values.

Note: LEED requirements are an SRI of 29 or higher for steep slope and an SRI of 78 or higher for low slope. CRRC approved colors were not submitted for Energy Star approval.



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### TECHNICAL BULLETIN

#### ENDURACOTE COLORS 1/12/12

| COLOR               | Color Number | Initial Total Solar Reflectivity (color family)* | 3 Yr. Exposed Solar Reflectivity (color family)* | Initial Emissivity (color family)* | Energy Star Approved | Initial Total Solar Reflectivity (actual) | Initial Emissivity (actual) | SRI | Meets LEED Requirement |
|---------------------|--------------|--------------------------------------------------|--------------------------------------------------|------------------------------------|----------------------|-------------------------------------------|-----------------------------|-----|------------------------|
| BRIGHT WHITE        | 824          | 0.53                                             | 0.53                                             | 0.85                               | YES                  | 0.60                                      | 0.85                        | 71  | STEEP                  |
| EVERGREEN           | 875          | 0.27                                             | 0.25                                             | 0.85                               | YES                  | 0.27                                      | 0.86                        | 26  | NO                     |
| CHARCOAL            | 851          | 0.27                                             | 0.25                                             | 0.85                               | YES                  | 0.35                                      | 0.86                        | 37  | STEEP                  |
| CLASSIC BURGUNDY    | 853          | 0.25                                             | 0.22                                             | 0.86                               | YES                  | 0.26                                      | 0.86                        | 25  | NO                     |
| TAN                 | 855          | 0.44                                             | 0.41                                             | 0.84                               | YES                  | 0.38                                      | 0.90                        | 42  | STEEP                  |
| COCOA BROWN         | 856          | 0.26                                             | 0.22                                             | 0.85                               | YES                  | 0.35                                      | 0.85                        | 36  | STEEP                  |
| DARK BROWN          | 859          | 0.26                                             | 0.22                                             | 0.86                               | YES                  | 0.30                                      | 0.86                        | 30  | STEEP                  |
| HICKORY MOSS        | 870          | 0.38                                             | 0.37                                             | 0.87                               | YES                  | 0.36                                      | 0.89                        | 39  | STEEP                  |
| TRUE BLACK          | 882          | 0.30                                             | 0.24                                             | 0.85                               | YES                  | 0.30                                      | 0.85                        | 30  | STEEP                  |
| IVORY               | 883          | 0.61                                             | 0.53                                             | 0.86                               | YES                  | 0.62                                      | 0.89                        | 75  | STEEP                  |
| CARIBBEAN BLUE      | 881          | 0.26                                             | 0.28                                             | 0.87                               | YES                  | 0.27                                      | 0.90                        | 28  | NO                     |
| LIGHTSTONE          | 887          | 0.52                                             | 0.51                                             | 0.86                               | YES                  | 0.51                                      | 0.90                        | 60  | STEEP                  |
| LIGHT GRAY          | 889          | 0.31                                             | 0.31                                             | 0.87                               | YES                  | 0.31                                      | 0.87                        | 32  | STEEP                  |
| PATINA GREEN        | 893          | 0.36                                             | 0.36                                             | 0.84                               | YES                  | 0.38                                      | 0.90                        | 42  | STEEP                  |
| BRICK RED           | 898          | 0.32                                             | 0.33                                             | 0.86                               | YES                  | 0.31                                      | 0.90                        | 33  | STEEP                  |
| WHITE               | 899          | 0.62                                             | 0.53                                             | 0.86                               | YES                  | 0.54                                      | 0.89                        | 64  | STEEP                  |
| BRIGHT RED          | 845          | 0.25                                             | 0.22                                             | 0.86                               | YES                  | 0.32                                      | 0.86                        | 33  | STEEP                  |
| ANTIQUE BRONZE      | 854          | 0.26                                             | 0.22                                             | 0.83                               | YES                  | 0.29                                      | 0.83                        | 27  | NO                     |
| GALLERY BLUE        | 826          | 0.25                                             | 0.25                                             | 0.86                               | YES                  | 0.29                                      | 0.86                        | 29  | STEEP                  |
| HARTFORD GREEN      | 821          | 0.29                                             | 0.22                                             | 0.85                               | YES                  | 0.29                                      | 0.85                        | 28  | NO                     |
| BRIGHT COPPER PENNY | 939          | 0.48                                             | 0.35                                             | 0.77                               | YES                  | 0.48                                      | 0.83                        | 53  | STEEP                  |
|                     |              |                                                  |                                                  |                                    |                      |                                           |                             |     |                        |
| SIERRA BROWN        | 896          | 0.25                                             | 0.25                                             | 0.85                               | YES                  | 0.25                                      | 0.85                        | 23  | NO                     |
| POLAR WHITE         | 860          | 0.55                                             | 0.53                                             | 0.83                               | YES                  | 0.63                                      | 0.89                        | 76  | STEEP                  |
|                     |              |                                                  |                                                  |                                    |                      |                                           |                             |     |                        |
| GALVALUME           |              | 0.78                                             | 0.58                                             | 0.06                               | YES                  | 0.40                                      | 0.86                        | 75* | STEEP                  |
| GALVALUME/ CLEAR    |              | 0.68                                             | 0.55                                             | 0.14                               | YES                  | 0.61                                      | 0.85                        | 58* | STEEP                  |

Note: Reflectivity tested by ASTM C1549 and Emissivity measured by ASTM C1371.

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