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LEED 2.2 NC PROGRAM

The LEED Green Building Rating System is a system developed to certify “green” buildings under a system created and promulgated by the U.S. Green Building Council. LEED stands for “Leadership in Energy and Environmental Design”. The current version of this program is LEED 2.2 NC, for New Construction. Architects attempt to certify their buildings for a variety of reasons, including state and local government incentives in some areas, Federal government requirements on some projects, professional recognition and because they want to be environmentally responsible.

The rating system gives points for a project in the following categories: **SS** sustainable sites (14 possible points), **WE** water efficiency (5 possible points), **EA** energy and atmosphere (17 possible points), **MR** materials & resources (13 possible points), **EQ** indoor environmental quality (15 possible points), and **ID** innovation & design process (5 possible points). The total possible points are 69. To become certified takes 26 to 32 points. 33 to 38 points gets the building Silver Certification. 39 to 51 points achieves Gold Certification and 52 to 69 points obtains Platinum Certification. There are also several items that are minimum requirements for any certification level and do not earn any points. These items are erosion and sediment control, fundamental building systems commissioning, minimum energy performance, CFC reduction in HVAC&R equipment, storage & collection of recyclables, minimum indoor air quality performance, and environmental tobacco smoking control. The LEED program certifies buildings only; not individual construction products so Fabral can not seek LEED certification of any of our products.

Let’s get to specifics of how an Architect can gain LEED points by using Fabral’s products! The first possible point is under sustainable sites. One point can be earned under credit **SS 7.2** by using a roof system that is highly reflective AND has a high emissivity as rated by a new method called the Solar Reflectance Index (SRI). This requirement is intended to reduce the heat island effect. LEED no longer uses the Energy Star program requirements. One nice change is that the SRI is calculated from the initial reflectivity and the initial emissivity. This means that, unlike Energy Star approval, we no longer have to wait 3 years for aged reflectivity values for the LEED program. For a low slope roof of 2:12 or less, the SRI must be at least 78. For a steep slope roof of over 2:12 pitch the SRI must be at least 29. We have many colors that meet the steep slope requirements and a few that meet the stiffer low slope requirements. The SRI values for our standard colors and some special colors are listed on the tables at the end of this technical bulletin. A reflective metal roof can also help toward the energy efficiency prerequisite and the optimized energy performance requirements in credit **EA 1** which is up to 10 credits under energy & atmosphere section. This section compares the reduced design energy cost for the project compared to the energy cost budget according to ASHRAE Standard 90.1. The greater the energy savings, the more the points, up to 10 points for a 42% reduction in energy requirements over the ASHRAE energy budget. ASHRAE is the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. Highly reflective metal roofing helps reduce the air-conditioning costs and helps to meet this requirement, but it’s only a small part of the equation. Under credit **EA 2**, between 1 and 3 points are available for developing on-site renewable energy. This can be accomplished using Fabral’s Solar SSR system. **EA 2.1** allows 1 point for generating 2.5% of the building’s energy requirements on-site with solar panels. **EA 2.2** allows 2 point for generating 7.5% of the building’s energy requirements on-site with solar panels and **EA 2.3** allows 3 points for



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generating 12.5% with solar panels. (In 2009 this credit is scheduled to go up to 7 points for 13% generated by solar panels.)

Under materials & resources 1 point can be earned under credit **MR 2.1** by recycling or salvaging at least 50% of the construction, demolition and land clearing waste. Naturally, 100% of any scrap metal roofing and siding panels or drop from cutting can be recycled. This 50% number, like all of the LEED points, is based on the entire construction project, so recycling 100% of the metal roofing and siding panel scrap may not offset the scrap from other construction products that are not salvageable. As with most of these averaged points, the higher than required values from metal panels help to offset other “less green” products. An additional point can be earned under credit **MR 2.2** by recycling or salvaging at least 75% of the construction, demolition and land clearance waste. Under credit **MR 4.1** one point is awarded if the weighted average recycled content of the building products are at least 10% and an additional point is awarded under credit **MR 4.2** if the weighted average recycled content of the building products are at least 20%. The recycled content is defined as the post-consumer recycled content plus half the pre-consumer content. (Pre-consumer was formerly called post-industrial recycled content.) Per our Technical Bulletin 725, this number for steel is 22.3 % plus $\frac{1}{2}$ of 6.1 % = 25.4 %. For Fabral aluminum from Alcan’s Oswego plant the number is 35% plus $\frac{1}{2}$ of 55% = 62.5%. For copper it’s 50% plus $\frac{1}{2}$ of 25% = 62.5%. As you can see, the more metal roofing and siding they use on a project the better chance that have to offset the poor, less fortunate other construction products with little or no recycled content and the better the chance they’ll get the 2 points, or at least 1 point from this credit. Credit **MR 5.1** allows 1 credit if a weighted average of 10% of the building material is manufactured regionally. This is defined as the final production point being within 500 miles of the jobsite. For jobsite roll formed panels this is an easy requirement. For other products it depends on the jobsite location and the production plant for the product. Under credit **MR 5.2**, 1 credit is issued if a weighted average of 20% of the building materials is produced from material that is extracted, harvested or recovered as well as manufactured within 500 miles of the project site. This is a tough requirement for metal products since the raw materials are extracted from all over the world and very difficult to trace back from a specific project to the extraction point. As a result, metal panels typically do not contribute to this point.



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ARCHITECTURAL KYNAR COLORS 10/26/07

COLOR	Color Number	Initial Total Solar Reflectivity	3 Yr. Exposed Solar Reflectivity	Initial Emissivity	Energy Star Approved	SRI
APOTHECARY BLUE	V32	0.26	No Data	0.88		26
BANNER RED	V93	0.48	0.47	0.89	YES	55*
BONE WHITE	V03	0.65	0.66	0.90	YES	79 **
BRIGHT COPPER	V25	0.45	0.39	0.86	YES	50 *
BRIGHT SILVER	V26	0.57	0.58	0.77	YES	64 *
BURGUNDY	V24	0.25	0.24	0.90	YES	25
CHARCOAL GRAY	V06	0.10	No Data	0.90		6
COLONIAL RED	V07	0.23	0.23	0.92		24
DARK BRONZE	V09	0.07	0.07	0.90		2
CLASSIC GREEN	V08	0.14	0.13	0.90		11
HARTFORD GREEN	V10	0.09	0.09	0.90		5
HEMLOCK GREEN	V11	0.21	0.20	0.90		20
MANSARD BROWN	V27	0.08	0.08	0.93		5
MATTE BLACK	V12	0.07	0.06	0.89		2
MEDIUM BRONZE	V29	0.10	No Data	0.90		6
MUSKET GRAY	V30	0.15	0.15	0.90		13
OLD TOWN GRAY	V13	0.25	0.25	0.90	YES	25
PATINA GREEN	V14	0.26	0.27	0.89	YES	26
PEWTER	V40	0.23	No Data	0.87		21
REGAL BLUE	V15	0.16	0.16	0.88		13
REGAL WHITE	V38	0.68	0.68	0.89	YES	83 **
SANDSTONE	V17	0.51	0.51	0.89	YES	59 *
SEAL BROWN	V18	0.12	No Data	0.88		8
SIERRA TAN	V70	0.38	0.39	0.9	YES	42 *
SLATE BLUE	V19	0.22	0.22	0.89		21
SLATE GRAY	V20	0.22	0.22	0.91		22
STONE WHITE	V31	0.62	0.61	0.90	YES	75 *
SURREY BEIGE	V21	0.41	0.41	0.90	YES	46 *
TEAL	V22	0.13	0.14	0.88		9
TERRA COTTA	V23	0.38	0.37	0.89	YES	42 *
TURQUOISE	V28	0.20	No Data	0.89		18
REFLECTIVE WHITE	Dynapon	0.70		0.86	CRRC approved	85 **
SOLAR WHITE	WeatherX	0.70		0.85	CRRC approved	85 **
REGAL WHITE	Fluropon L/S	0.70		0.85	CRRC approved	85 **
BONE WHITE	Fluropon	0.70		0.84	CRRC approved	85 **
SOLAR WHITE	Fluropon L/S	0.70		0.85	CRRC approved	85 **
GALVALUME UNPAINTED		0.78	0.58	0.06	YES	75 *
GALVALUME / CLEAR		0.68	0.55	0.14	YES	58 *

Note: Reflectivity tested by ASTM C1549 and Emissivity measured by ASTM E408 on all Energy Star approved colors and rounded to the nearest tenth. For non-Energy Star approved colors, Emissivity by ASTM C1371.

* Indicates color meets the steep slope requirement of SRI of 29 or higher

** Indicates color meets the steep slope requirement of SRI of 29 or higher and the low slope requirement of SRI of 78 or higher.



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ARCHITECTURAL NON-STANDARD KYNAR COLORS
VALSPAR'S SR COOL ROOF COLORS
10/26/07

COLOR	Valspar formulation Number	Initial Total Solar Reflectivity	3 Yr. Exposed Solar Reflectivity	Initial Emissivity	Energy Star Approved	SRI
ARTIC WHITE SR	431A704	0.56	0.55	0.84	YES	65 *
BONE WHITE SR	431A893	0.72	0.70	0.84	YES	86 **
REGAL WHITE SR	431R976	0.70	0.68	0.84	YES	85 **
ASH GRAY SR	432R313	0.39	0.39	0.85	YES	42 *
SLATE GRAY SR	432R315	0.40	No Data	0.86		43 *
CHARCOAL GRAY SR	432R521	0.27	No Data	0.85		26
BROWNSTONE SR	433A735	0.38	0.38	0.85	YES	40 *
SANDSTONE SR	433B272	0.51	0.50	0.85	YES	58 *
ALMOND SR	433B330	0.57	0.56	0.86	YES	67 *
SIERRA GOLD SR	433B364	0.47	0.46	0.86	YES	53 *
BRICK RED SR	434A764	0.29	0.29	0.87	YES	29 *
TERRA COTTA SR	434A847	0.35	0.35	0.87	YES	37 *
REGAL RED SR	434A986	0.42	0.41	0.84	YES	45 *
ARCADIA GREEN SR	435R600	0.34	0.33	0.88	YES	36 *
FOREST GREEN SR	435R603	0.27	0.26	0.85	YES	26
HUNTER GREEN SR	435RZ601	0.29	No Data	0.85		28
PACIFIC BLUE SR	436B307	0.26	No Data	0.85		24
ALPINE BLUE SR	436R413	0.32	No Data	0.85		32 *
SEAL BROWN SR	437R640	0.31	No Data	0.87		32 *
MANSARD BROWN SR	437R645	0.26	No Data	0.85		24
DARK BRONZE SR	437R842	0.29	No Data	0.84		28
COPPER PENNY SR	439RZ063	0.43	0.42	0.83	YES	46 *
CHAMPAGNE SR	439Z739M	0.50	No Data	0.78		54 *
BRIGHT SILVER SR	439ZZ221M	0.60	0.60	0.77	YES	68 *

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

* Indicates color meets the steep slope requirement of SRI of 29 or higher

** Indicates color meets the steep slope requirement of SRI of 29 or higher and the low slope requirement of SRI of 78 or higher.



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SUPER ALURITE 2000
WOODFRAME COLORS
10/26/07

COLOR	Color Number	Initial Total Solar Reflectivity	3 Yr. Exposed Solar Reflectivity	Initial Emissivity	Energy Star Approved	SRI
BRIGHT WHITE	424	0.59	No Data	0.89		70*
EVERGREEN	574	0.14	No Data	0.9		11
CHARCOAL	551	0.11	No Data	0.9		7
CLASSIC BURGUNDY	553	0.10	No Data	0.89		6
TAN	555	0.42	0.39	0.9	YES	48*
COCOA BROWN	556	0.14	No Data	0.9		11
DARK BROWN	559	0.09	No Data	0.9		5
HICKORY MOSS	572	0.32	0.32	0.9	YES	34*
BLACK	580	0.07	No Data	0.9		2
IVORY	583	0.60	0.56	0.87	YES	71*
CARIBBEAN BLUE	584	0.25	0.25	0.9	YES	25
LIGHTSTONE	588	0.47	0.48	0.89	YES	54*
LIGHT GRAY	589	0.24	No Data	0.9		24
PATINA GREEN	593	0.37	0.38	0.9	YES	41*
BRICK RED	598	0.25	0.28	0.9	YES	25
WHITE	599	0.55	0.53	0.89	YES	65*
BRIGHT RED	545	0.40	No Data	0.89		45*
ANTIQUE BRONZE	554	0.12	No Data	0.9		9
DARK BLUE	558	0.16	No Data	0.9		14
ASH GRAY	548	0.37	0.37	0.89	YES	41*
WHITE	299	0.58	0.57	0.89	YES	69*
POLAR WHITE	560	0.63	0.62	0.89	YES	76*
GALVALUME UNPAINTED		0.78	0.58	0.06	YES	75*
GALVALUME/ CLEAR		0.68	0.55	0.14	YES	58*

Emissivity measured by ASTM C1371.

- * Indicates color meets the steep slope requirement of SRI of 29 or higher
- ** Indicates color meets the steep slope requirement of SRI of 29 or higher and the low slope requirement of SRI of 78 or higher.



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ENDURACOTE WOODFRAME COLORS 10/26/07

COLOR	Color Number	Initial Total Solar Reflectivity	3 Yr. Exposed Solar Reflectivity	Initial Emissivity	Energy Star Approved	SRI
BRIGHT WHITE	824	0.60	No Data	0.89		72*
EVERGREEN	875	0.25	No Data	0.89		25
CHARCOAL	851	0.18	No Data	0.90		16
CLASSIC BURGUNDY	853	0.19	No Data	0.88		17
TAN	855	0.38	0.39!	0.90	YES	42*
COCOA BROWN	856	0.20	No Data	0.90		19
DARK BROWN	859	0.16	No Data	0.90		14
HICKORY MOSS	870	0.36	0.32!	0.89	YES	39*
BLACK	880	0.14	No Data	0.90		11
IVORY	883	0.62	0.56!	0.89	YES	75*
CARIBBEAN BLUE	881	0.27	0.25!	0.90	YES	28
LIGHTSTONE	887	0.51	0.48!	0.90	YES	60*
LIGHT GRAY	889	0.31	No Data	0.89		33*
PATINA GREEN	893	0.38	0.38!	0.90	YES	42*
BRICK RED	898	0.31	0.28!	0.90	YES	33*
WHITE	899	0.54	0.53!	0.89	YES	64*
BRIGHT RED	845	0.28	No Data	0.89		29*
ANTIQUE BRONZE	854	0.20	No Data	0.89		18
GALLERY BLUE	826	0.12	No Data	0.90		9
HARTFORD GREEN	821	0.09	No Data	0.91		6
ASH GRAY	848	0.46	0.37!	0.91	YES	53*
WHITE	299	0.58	0.57!	0.89	YES	69*
POLAR WHITE	860	0.63	0.65!	0.89	YES	76*
GALVALUME UNPAINTED		0.78	0.58	0.06	YES	75*
GALVALUME/ CLEAR		0.68	0.55	0.14	YES	58*

! Note: Aged values approved based on 3 year aged values of Super Alurite equivalent colors. Emissivity measured by ASTM C1371.

* Indicates color meets the steep slope requirement of SRI of 29 or higher

** Indicates color meets the steep slope requirement of SRI of 29 or higher and the low slope requirement of SRI of 78 or higher.