Master Wall Inc.®
Building a Culture of Excellence

Technical Bulletin

Corporate: P.O. Box 397 • Fortson • Georgia • 31808 • 800-755-0825 • FAX 706-569-6704
Technical: 800-760-2861

MW# 160-030118

Topic: Light Reflectance and EIFS

Dark colors absorb more of the sun's energy than lighter colors. This isn't surprising as we've all experienced this in one way or another, but how does this apply to EIFS? Color choice can spell the difference between a successful project and failure.

Why is this Important?

The EIFS lamina is directly bonded to the insulation board. The lamina is thin and will, more or less, transfer 100% of the solar energy directly to the insulation board, which has a service temperature up to 160F (C) and can begin melting at 180F (C).

On a sunny day a white surface can rise to about 115F (C), but a black surface can rise to 195F (C). See a problem? While colors are rarely absolutely white or black, keeping the insulation board at or below its service temperature becomes very important if the building is to perform as intended.

This black building melted the insulation board shortly after installation. White and gray panels on either side were fine. Avoid large, dark surfaces with EIFS.

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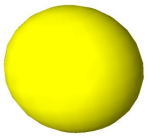
Light Reflectance Value

The reflectance value of an individual color indicates the amount of light that individual color will reflect. Black has a reflectance value of zero and absorbs all light. Surfaces low in reflectance value are generally very dark and can get very hot (such as the black seats in a car). On the other hand, white has a reflectance value of nearly 100 and keeps buildings light and cool. All colors fit between these two extremes. A color with a reflectance value of 60 (which means it reflects 60% of the light that falls on it) will reflect more light than a color with a reflectance value of 30 (which means it reflects 30% of the light that falls on it).



Consider the angle of the wall as it absorbs more sunlight. Reflective adjacent surfaces can reflect intense light onto the system.

Understanding Light Reflectance in Design

When designing buildings, design professionals need to consider not only the overall color scheme for the building, but the effect that a color choice will have on the building. Aside from basic pigment tints, the reflective properties of a finish will also affect its performance. Lighter, brighter colors reflect the sunlight and typically use less pigments. Darker colors can accelerate the breakdown of organic pigments and increase solar absorption. Highly reflective glass either on the building or elsewhere can concentrate light and increase the intensity.

The “angle of incidence” with the sun will also affect the reflectivity of a surface. The closer a shape is to perpendicular to the sun the more sunlight it will absorb. Designers should consider limiting the use of great expanses of angled walls to limit solar heat gain and maximize reflectivity.

Small areas of dark color will absorb less sunlight than larger ones. Plan for this in the design.

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Master Wall® recommends that colors with a light reflectance value (LRV) of 30% or greater in EIFS applications. If darker colors are used they should be limited to very small areas as large surfaces will absorb more solar radiation.

Can the designer still be creative within these limitations? Historically the answer has been yes. Most "Manufacturer's Standard" colors are designed around a softer palette of colors that compliment the occasional bold feature. Attached are our LRV's for the standard colors. If considering custom colors please reach out to us and we can help.

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Light Reflectance Values for Standard Colors

COLOR	LRV%
#840 White	91.10
#420 White	91.06
#609 Linen	90.25
#461 Pampas White	90.13
#108 Burns White	89.59
#301 China White	89.36
#143 White Waters	88.52
#341 Silky White	88.05
#22 Kool	87.17
#933 Stow	85.08
#406 Silver Fox	84.27
#410 Beech	84.26
#610 Dutch Cream	83.54
#106 Sky	83.42
#611 Flax	83.12
#559 Mellow	82.64
#101 Polar White	82.43
#400 Crème	82.19
#482 Magnolia White	81.65
#102 Seamist	81.29
#505 Pearl Gray	80.47
#606 Fuzzy Peach	80.28
#413 Amarillo White	80.25
#208 Sandle Beige	80.09
#460 Amarillo	79.55
#402 Par	79.54
#463 Calvary	79.49
#522 Antique Ivory	79.27
#473 Truffle	78.78
#500 Egg	78.29
#107 Beach Sand	78.09
#206 Natural White	77.63
#340 Mockingbird	76.17
#475 Chalk	75.41
#380 Mountain Haze	74.90
#504 Oyster Gray	74.78
#155 Tripoli Tan	74.24

COLOR	LRV%
#105 Gillam	73.54
#660 Taupe	73.14
#368 Driftwood	72.05
#120 Salmon	72.01
#408 Sandlewood	71.93
#360 English Fog	71.58
#104 Clay	70.85
#934 Pebble Sand	70.83
#613 Boca Raton	70.45
#210 London White	70.38
#909 Victorian	70.22
#180 Beige	69.34
#618 Light Beige	69.32
#372 Soft Plum	68.76
#464 Lunar	68.75
#310 Ash	67.16
#150 Iris	66.27
#330 Dove Gray	65.98
#900 Adobe	65.37
#403 Weathered	63.61
#616 Tan	62.82
#646 Sage	57.97
#930 Pink Champagne	57.72
#517 Wooden Oar	56.38
#227 Brown	55.88
#920 Pine Cone	46.07
#927 Scarlet Red	45.41