

SOLAR REFLECTANCE

Solar Reflectivity

The environmental classification system LEED asks for the solar reflectance index (SRI) particularly on roofs. The colour is the most important aspect for the solar reflectance and SRI. The SRI is calculated according ASTM E1980-01, which describes the standard practice for calculating Solar Reflectance Index of horizontal and low-sloped opaque surfaces.

SRI (Solar Reflectance Index)

SRI is a value that incorporates both solar reflectance and emittance in a single value to present a material's temperature in the sun. SRI qualifies how hot a surface would get in proportion to standard black and white surfaces. It is calculated using equations based on previously measured values of solar reflectance and emittance as laid out in the American Society for Testing and Materials Standard E 1980. It is expressed as a fraction (0.0 to 1.0) or percentage (0% to 100%).

TE (Thermal Emissivity)

The ratio of the rate of radiant heat energy emitted by a body at a given temperature to the rate of radiant heat energy emitted by a black body under same conditions (temperature and surroundings). The emittance of a material refers to its ability to release absorbed heat. Scientists use a number between 0 and 1, or 0% and 100%, to express emittance. With the exception of metals, most construction materials have emittance above 0.85 (85%).

SR (Solar Reflectance)

Solar reflectance is a measure of the ability of a surface material to reflect sunlight – including the visible, infrared and ultraviolet wavelengths, on a scale of 0 to 1. Solar reflectance is also called “albedo”.

Anodized aluminum

Clear anodized aluminum can play a significant role in cool roof design because of its higher solar reflective index (SRI), solar reflectance, and thermal emittance than, for example, white polyvinylidene fluoride (PVDF) painted aluminum. Comparison of reflectance and thermal emittance properties of anodized aluminum and polyvinylidene fluoride (PVDF) paints.

Product	SR	TE	SRI
Clear Anodize (19 mu anodize film)	0.75	0.81	91
White PVDF paint	0.68	0.85	82
Silver PVDF paint	0.56	0.81	64

Table courtesy of Lorin Industries

Testing standards comply with ASTM C1549 for total solar reflectance; ASTM C1371 for Thermal Emittance and ASTM E1980 for solar reflectance index (SRI) calculations.