

Solar Absorptance

Fact Sheet – Solar Absorptance, Reflectance & Light Reflectance Value

Solar Absorptance (SA) is the fraction of the sun's radiation that the surface absorbs and is used by the NCC 2022 to provide limitations on walling and roofing materials.

Typically, the SA of a material is primarily determined by its colour. Lighter colours have lower SA values which indicates the surface absorbs a lesser amount of solar radiation (heat), and darker colours have higher SA values which indicates the surface absorbs a larger amount of solar radiation.

As the effect of absorptance by walls is not large (predominately roof colour related), it is usually shown as either 'light,' 'medium,' or 'dark.' Light materials have a lower Solar Absorptance and will reflect more heat, while dark materials have a higher Solar Absorptance and will absorb more. Unlike many other materials, clay masonry units absorb and release heat almost equally well.

NCC Solar Absorptance Classifications

Light	<0.4
Medium	0.4-0.6
Dark	>0.6

Approximate Solar Absorptance Value* for each colour.

Colour	Value
Slate (dark grey)	0.90
Red, Green	0.75
Yellow, buff	0.60
Zinc aluminium-dull	0.55
Galvanised steel-dull	0.55
Light grey	0.45
Off white	0.35
Light cream	0.30

*Approximate only

SA is an effective way to measure the ability of a wall to reject solar heat, but it does not consider the wall's ability to radiate out any absorbed heat. The alternative, more accurate method to measure this is the Solar Reflectance Index (SRI).

Solar Reflective Index

The Solar Reflectance Index (SRI) is an indicator of how hot a material can get, **with higher values suggesting a cooler surface** and lower values suggesting a hotter surface. SRIs are calculated using the solar absorptance and thermal emittance of a specific material.

SRI is a more accurate measure than SA as it accounts for the thermal-emissive properties of the material itself rather than just its colour.

This index combines both solar reflectance and thermal emittance to provide a comprehensive measure of a material's ability to reject solar heat. It is expressed on a scale from 0 (least reflective) to 100 (most reflective) where higher values indicate better performance in keeping surfaces cool.

Solar reflectance is the inverse of solar absorptance and is a measure of a materials ability to bounce back solar energy that is, to reflect light.

Choosing lighter coloured bricks and roof tiles will reduce the amount of heat energy entering your home, leading to lower energy bills and increased thermal comfort.

SAI focuses solely on how much solar energy is absorbed, while SRI provides a more holistic view by considering both reflection and emission properties to assess how well a material can stay cool under solar exposure.

Light Reflectance Value

Light Reflectance Value (LRV) quantifies the lightness and brightness of a colour, the degree to which colour reflects light.

Measured on a scale of 0 to 100, black being closest to 0%, white closer to 99%.

Below the mid-point of 50% the colour will tend to be darker absorbing more light than it will reflect back into the room. Colours with LRV higher than 50% will be lighter and will reflect more light back into the room than is absorbed.

Light and colour play fundamental roles in architecture. LRV is also a consideration where safety is a concern. Higher LRV colours can be used to improve visibility and lighting in areas like parking garages, staircases, walkways and other safety-critical zones and where visual contrast and area demarcation is required for safety.

Examples listed below of Light Reflectance Values* for dry and wet, face bricks and pavers.

Product	Dry	Wet
2 Course Face Bricks		
Bremer Bay	46.10	35.93
Bullara	62.69	43.32
Kennedy	10.12	7.47
Loongana Limestone	43.06	41.69
Shale	27.29	20.14
Standard Face Bricks		
Cream Mexi	42.09	32.63
Red Smooth	14.99	13.02
Concrete Pavers		
Arctic	38.25	21.49
Charcoal	9.36	3.99
Pewter	25.22	13.58
Sea Mist	34.70	14.51
Silver	39.79	30.07
Storm Cloud	15.24	6.01
Tundra	44.00	23.81
Heavy Duty Clay Pavers		
Golden Dune	34.12	24.15
Red	13.95	10.49
Cautional Tactile Pavers 60mm		
Charcoal	7.52	3.63
Limestone	35.25	26.22
Pewter	15.10	9.82

*Assessed by Midland Brick

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