

# Understanding LRV and SRI

Light Reflectance Value (LRV) and Solar Reflectance Index (SRI) are two measures of light reflectance that are used in architecture and design to help determine the impact colour choice will have on the appearance of an internal environment, and the potential heat build-up of external surfaces.

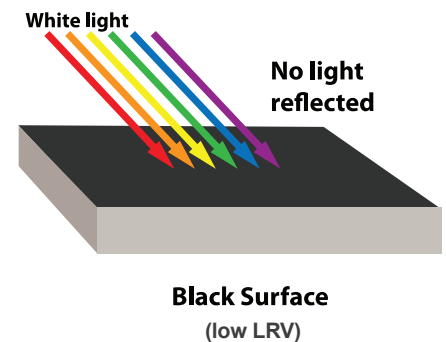
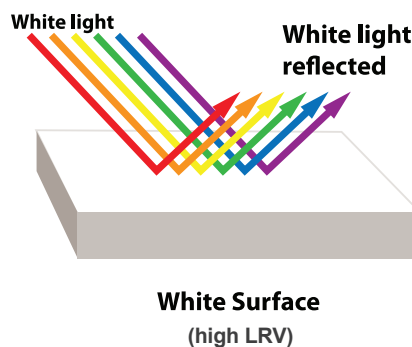
## WHAT IS LRV?

Light Reflectance Value (LRV) is a measurement commonly used in architecture and design. LRVs are a measure of the percentage of visible and usable light that is reflected from a surface when illuminated by a light source.

LRV gives an indication of how light or dark a color is as determined by how much light the color reflects. LRVs are reported on a scale from 0-100 with 0 being dark and 100 being bright. The darker the color, the lower the LRV number. The lighter the color, the higher the LRV number.

Here are some examples of LRVs\*, these are indications only and will vary:

- White paint on plasterboard, 80
- White paint on concrete, 60
- Uncoated concrete, 25-40
- Bricks, 15-50
- Dark timber, 20
- Asphalt, 10
- Black chalkboard, 5



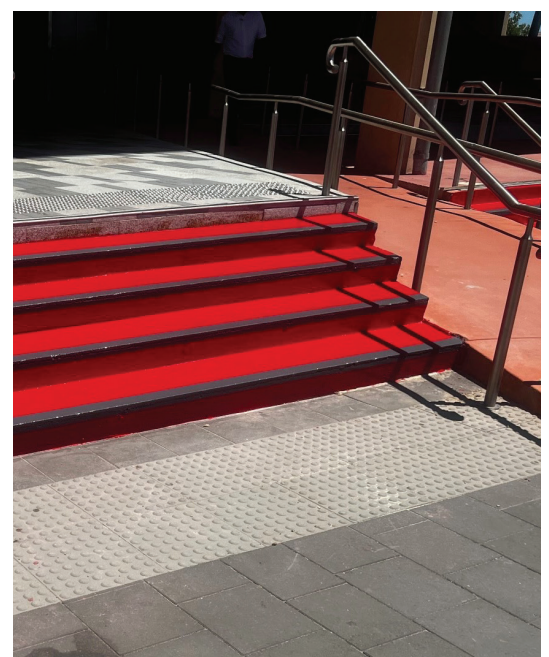
## WHY IS LRV IMPORTANT?

It is important to understand the light reflectance of surface coverings such as coatings, carpets, etc used in commercial buildings, in order to efficiently plan lighting and provide visual contrast where required for safety and area demarcation.

LRVs are commonly requested for public access and healthcare environments for areas such as walkways and stairwells where the use of contrasting colours is required to help minimise the risk of trips and falls.

## HOW IS LRV MEASURED?

There is no Australian or International standard test method to determine the LRV, instead, the LRV is determined according to British standard, BS 8493:2008. BS 8493:2008 measures the LRV of the specimen using CIE2 Tristimulus Y103, Illuminant D654 and the 10° colorimetric observer.



\*Reference: <https://decolux.com.au/news/2018/approximate-reflectance-values-of-typical-building-finishes>

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## WHAT IS SRI?

The Solar Reflectance Index (SRI) is a measure of the solar reflectance and emissivity of materials that can be used as an indicator of how hot they are likely to become when exposed to the sun. Solar reflectance is the ability of a material to reflect solar energy from its surface back into the atmosphere. Emissivity is the ability of a material to release absorbed energy, eg. heat from a substrate. SRI is only relevant for external use materials.

SRI is reported on a scale from 0 to 100, with black being 0 and white being 100. The more solar radiation that is absorbed, the hotter the surface will become and the lower the SRI value. More reflective surfaces will remain cooler in sunshine and have higher SRI values.



## WHY IS SRI IMPORTANT?

With a growing focus on energy efficiency, SRIs are more frequently requested. Selecting higher SRI materials and/or colours, (more reflective) for buildings, helps to reduce heat absorption on sunny days, thereby reducing the energy requirements for cooling the building.

For example, a concrete surface finished with a high SRI colour will typically have a lower temperature under sunny conditions compared to a low SRI colour. In reality there are many other influences besides colour that determine the solar reflectance and emissivity of a surface.

## HOW IS SRI MEASURED?

SRI is calculated according to ASTM E1980 - Solar Reflectance Index (SRI) of horizontal and low-sloped opaque surfaces. The calculation is based on a mathematical formula that includes measured values for thermal emittance (ASTM C1371), total solar reflectance (ASTM C1549), solar absorption (ASTM E1980), three convective coefficients, solar flux, the Stefan Boltzman constant, and various other coefficients. This method is used to calculate SRI for surfaces with an emissivity greater than 0.1. Due to the definition of SRI it is possible to have an SRI less than 0 or greater than 100.



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## HOW DO I FIND THE LRV OR SRI FOR A PARTICULAR COLOUR /PRODUCT?

Fosroc ANZ have tested a range of colours for key products for LRV and SRI. Results are reported on the TDS of the relevant product available at [fosroc.com.au](http://fosroc.com.au) or [fosroc.co.nz](http://fosroc.co.nz).

A summary of the results can be found below.

Product	Colour	LRV(%)	SRI
Fosroc Nitoflor FC130	Mid Grey	41.98	N/A
Fosroc Nitoflor FC130	Silver Grey	61.27	N/A
Fosroc Nitoflor FC150 HP	Black	4.28	N/A
Fosroc Nitoflor FC150 HP-FC	Black	4.28	N/A
Fosroc Nitoflor FC150 HP	Curtain Call	13.85	N/A
Fosroc Nitoflor FC150 HP-FC	Curtain Call	13.85	N/A
Fosroc Nitoflor FC150 HP	Fern Green	18.09	N/A
Fosroc Nitoflor FC150 HP-FC	Fern Green	18.09	N/A
Fosroc Nitoflor FC150 HP	Harbour Blue	17.70	N/A
Fosroc Nitoflor FC150 HP-FC	Harbour Blue	17.70	N/A
Fosroc Nitoflor FC150 HP	Koala Grey	33.77	N/A
Fosroc Nitoflor FC150 HP-FC	Koala Grey	33.77	N/A
Fosroc Nitoflor FC150 HP	Light Grey Blue	44.09	N/A
Fosroc Nitoflor FC150 HP-FC	Light Grey Blue	44.09	N/A
Fosroc Nitoflor FC150 HP	Pastel Grey	66.01	N/A
Fosroc Nitoflor FC150 HP-FC	Pastel Grey	66.01	N/A
Fosroc Nitoflor FC150 HP	Raspberry	10.43	N/A
Fosroc Nitoflor FC150 HP-FC	Raspberry	10.43	N/A
Fosroc Nitoflor FC150 HP	Safety Yellow	52.50	N/A
Fosroc Nitoflor FC150 HP-FC	Safety Yellow	52.50	N/A
Fosroc Nitoflor FC150 HP	Sand	57.50	N/A
Fosroc Nitoflor FC150 HP-FC	Sand	57.50	N/A
Fosroc Nitoflor FC150 HP	Silver Grey	63.53	N/A
Fosroc Nitoflor FC150 HP-FC	Silver Grey	63.53	N/A
Fosroc Nitoflor PU200	Bright Blue	21.35	N/A
Fosroc Nitoflor PU200	Curtain Call	12.76	N/A
Fosroc Nitoflor PU200	Jade	12.92	N/A
Fosroc Nitoflor PU200	Oatmeal	48.33	N/A
Fosroc Nitoflor PU200	Pipeline Grey	27.49	N/A
Fosroc Nitoflor PU200	Red Oxide	8.30	N/A
Fosroc Nitoflor PU200	Sunflower	40.99	N/A
Fosroc Nitoflor PU600	Bright Blue	16.92	N/A

Product	Colour	LRV(%)	SRI
Fosroc Nitoflor PU600	Curtain Call	12.50	N/A
Fosroc Nitoflor PU600	Jade	12.89	N/A
Fosroc Nitoflor PU600	Oatmeal	46.41	N/A
Fosroc Nitoflor PU600	Pipeline Grey	28.08	N/A
Fosroc Nitoflor PU600	Red Oxide	7.94	N/A
Fosroc Nitoflor PU600	Sunflower	32.97	N/A
Fosroc Nitoflor SL	Black	4.75	N/A
Fosroc Nitoflor SL	Curtain Call	13.33	N/A
Fosroc Nitoflor SL	Fern Green	17.51	N/A
Fosroc Nitoflor SL	Harbour Blue	17.35	N/A
Fosroc Nitoflor SL	Koala Grey	31.26	N/A
Fosroc Nitoflor SL	Light Blue Grey	41.34	N/A
Fosroc Nitoflor SL	Pastel Grey	62.97	N/A
Fosroc Nitoflor SL	Raspberry	9.70	N/A
Fosroc Nitoflor SL	Safety Yellow	48.78	N/A
Fosroc Nitoflor SL	Sand	54.11	N/A
Fosroc Nitoflor SL	Silver Grey	64.46	N/A
Fosroc Nitoflor FC100	T&G Grey	39.41	32.94
Fosroc Nitoflor PA	Bright Blue	10.87	37.76
Fosroc Nitoflor PA	Curtain Call	11.55	0.54
Fosroc Nitoflor PA	Jade	14.46	24.83
Fosroc Nitoflor PA	Oatmeal	46.21	48.68
Fosroc Nitoflor PA	Signal Red	14.07	59.59
Fosroc Nitoflor PA	Sunflower	49.68	77.27
Fosroc Nitoflor PA	White	93.91	109.16
Fosroc Nitoproof 510	Grey	39.89	29.61
Fosroc Nitoproof Top Coat UV	Light Grey	N/A	41.53
Emer-Clad Façade Matt	Light Grey	52.72	48.05
Emer-Clad Façade Matt	Mid Grey	34.29	27.12
Emer-Clad Façade Matt	White	93.38	105.95
Emer-Clad Façade Satin	Light Grey	54.52	50.14
Emer-Clad Façade Satin	Mid Grey	35.02	25.36
Emer-Clad Façade Satin	White	91.13	102.25

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