

# glaringly obvious

We were recently approached to see if we could provide 'glare' measurements for our paints and colours, which led to a little head scratching trying to define exactly what was being asked of us.

For the most part, glare seems to be a comparative phenomenon. A bright oncoming full-beam headlight; coming at you suddenly when driving at night along a country road; irises having fully dilated your eye pupils to maximise what little light was previously available, will certainly cause dangerous 'glare'!

The exact same light, coming at you in full daylight; pupils fully contracted, will go past scarcely noticed. Similarly, a single white house on a bush clad hill will stand out like a sore thumb while the same dwelling in a 'pueblo blanco' would be part of the background, with potted greenery and flowers providing the visual 'stand out'.

The most useful data that we can supply are 'light reflectance values' (LRV) but, it must be admitted, these do not tell the whole story.

I am reminded of a neighbourhood dispute in a very high class hill suburb. The neighbour higher up the hill complained vociferously that, at certain times of day, the sunlight reflecting off the lower neighbour's unpainted galvanised roof caused intolerable 'glare'. The lower neighbour was instructed to paint their roof a dark colour with a LRV of less than 5. This the lower neighbour duly did, but, as the restriction was only the colour, he used a typical durable gloss roof paint. At those times of day the 'glare' problem was exacerbated!

Paints reflect (reflect is used here to include reflection, refraction and diffraction) in two ways - specularly (or mirror like) and diffusely. Similar to the example described above, a high gloss black paint can reflect enormous amounts of light but one has to be opposite the light source to perceive this. The amount of specularly reflected light is such that the underlying colour becomes indistinguishable.

A flat, white paint also reflects an enormous amount of light

but does so diffusely. A gloss paint provides a smooth surface while, to a photon of light, a flat paint is like a boulder strewn beach from which it will bounce in totally unpredictable angles. From whichever angle one views such paint, it will be uniformly bright but without the intense glare one can experience 'downside' of a glossy paint.

There is another intensification of reflected light as exhibited by fluorescent paints and those containing 'optical brighteners'. These products have the ability to absorb some of the ultra violet light spectrum and emit it as longer wavelength, violet/blue wave light. The eye is very sensitive to these wavelengths and perceives them as being somewhat 'glary'.

Your scribe has an idiosyncratic (and somewhat embarrassing) method of measuring glare. When stuck in front of bright paints in full sunshine I sneeze - many times. Repeated applications to the International Standards Association failed to convince them as to the relevance of the 'ATISHOO' scale of glare measurement.

LRV demands of various bodies can bring conflict which can be difficult to resolve. Councils applying covenants to paint colours used on buildings erected in bush clad suburbs may demand a LRV of less than 50% in order to manage the aesthetics of a development. Suppliers of several building systems and elements however, are cautious about the effect of the excess heat that may be absorbed and specify an LRV of not less than 40% - hence the dilemma.

The paint industry does offer a path forward through the use of infra-red reflecting pigments (such as Resene CoolColour) but the conversation has yet to be had that will provide a facile framework for their specification.

While an LRV value is a useful indicator for the visual 'glare' properties of a colour; Total Solar Reflectance (TSR) is more useful to achieve a picture of the thermal stress a colour may inflict. A better specification for a covenanted colour could read: 60% gloss - not more than 10%; LRV - not less than 50%; TSR - not less than 40%. Glaringly obvious? Not quite - but something to work on.



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