

Visual appearance can determine a person's perception of a product. Perception is subjective. A key measurement parameter used to define and quantify a product's overall visual quality is gloss.



High Gloss

Gloss is measured by directing a constant intensity light beam, at a fixed angle, on to the test surface and then monitoring the amount of reflected light from the same angle. This specular reflectance is measured using a glossmeter.

Different surfaces require different reflective angles.

**High Gloss**

Surfaces with a brilliant or highly polished finish reflect images clearly. This distinct reflection is caused by the incident light reflecting on the surface in a specular direction.



Semi & Matt Gloss

**Semi & Matt Gloss**

Semi and matt surfaces reflect images less distinctly and with reduced intensity.

On semi or matt surfaces light not only reflects in a specular direction but also is scattered causing the reflected image to appear diffused.

## Choosing the correct angle for gloss measurement

Gloss measurement is based on the amount of light reflected on the surface relative to a polished glass reference standard, measured in Gloss Units (GU). The amount of light that is reflected on the surface is dependent on the angle of incidence and the properties of the surface.

Gloss is categorised as either matt, semi or high gloss. In order to determine the most appropriate measurement angle start with a glossmeter set at a 60° angle of incidence.

If the result is between 10 - 70GU, the coating is termed 'semi-gloss' and should be measured using the 60° angle. If the result is less than 10GU, the product is 'low gloss' and should be measured using the 85° angle and if it is greater than 70GU, the product is known as 'high gloss' and should be measured using the 20° angle.

All three angles should be recorded (20, 60 & 85°) when measuring gloss on anodised metals to ensure a complete understanding of the specular reflectance between the coating and the metal substrate.



Gloss Range	60° value	Measure with
High Gloss	> 70GU	20°
Semi Gloss	10 - 70GU	60°
Low/ Matt	< 10GU	85°

### % Reflectance (%)

% Reflectance compares the amount of light energy transmitted and received by a glossmeter and expresses the value as a percentage. The shinier a surface is, the closer the value will be to 100%.

Whilst the Gloss Unit (GU) scale is linear, each angle of incidence has a different measurement range; 0 – 2000GU (20°), 0 – 1000GU (60°), 0 – 160GU (85°).

% Reflectance displays the measurement value as a percentage relative to the selected angle of incidence. For example, a value of 1000GU at 20° would be expressed as 50%<sub>20</sub> and 500GU would be expressed as 25%<sub>20</sub>, but at 60° this would be expressed as 50%<sub>60</sub>.

### Haze (HU)

Haze causes a drop in reflected contrast and causes 'halos' to appear around the reflected light sources, dramatically reducing the visual quality.

In accordance with ASTM D4039 haze is defined as the numeric difference between the specular reflectance at 60° and 20°.

This is expressed in Haze Units (HU).