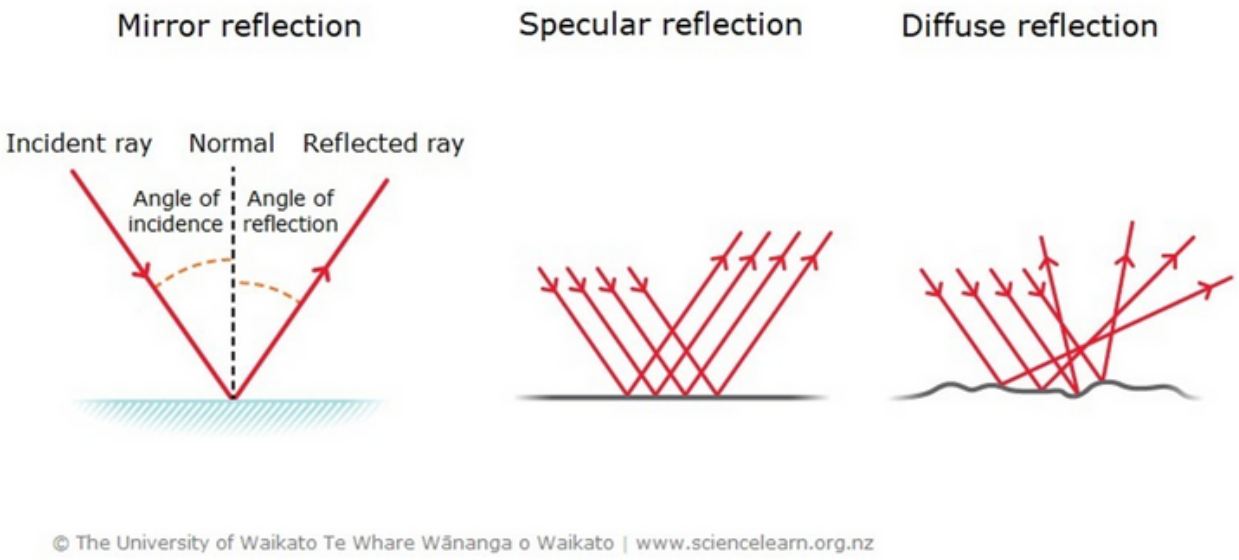
Reflections and Varnish Sheens

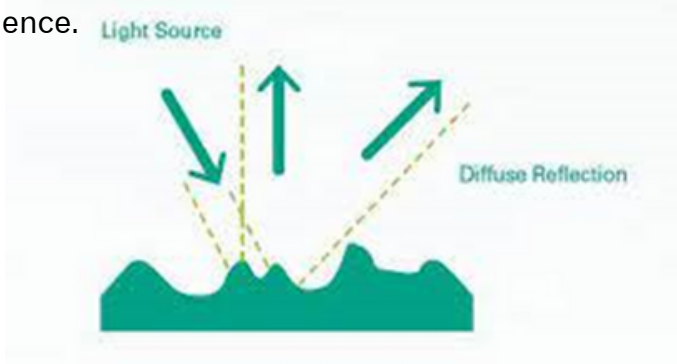
Polyvine have been producing Dead Flat finishes for over 30 years and are regarded as the leaders of non-reflective sheens.

Reflection is when light bounces off an object. If the surface is smooth and shiny, like glass, water or polished metal, the light will reflect at the same angle as it hit the surface. This is called specular reflection.

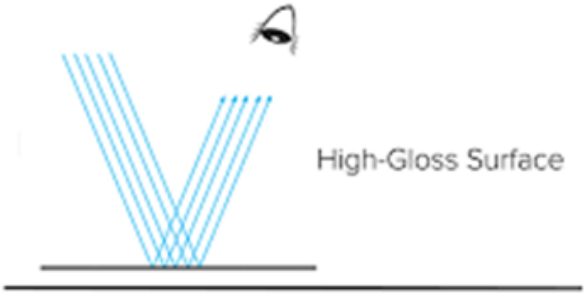


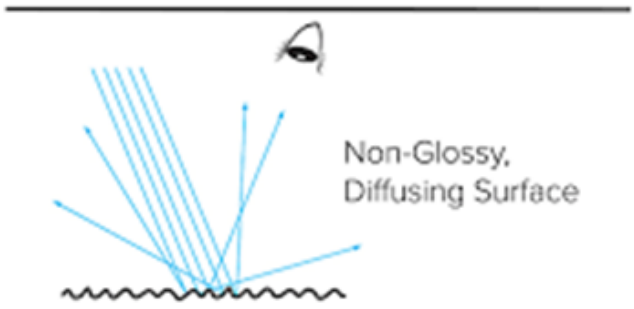
Lake reflection

For a rough surface, reflected light rays scatter in all directions. This is called diffuse reflection. Most of the things we see are because light from a source reflected off it.
The angle at which light hits a reflecting surface is called the angle of incidence, and the angle at which light bounces off a reflecting surface is called the angle of reflection.
If you want to measure these angles, imagine a perfectly straight line at a right angle to the reflective surface (this imaginary line is called 'normal'). If you measure the angle of incidence and the angle of reflection against the normal, the angle of incidence is exactly the same as the angle of reflection. With a flat mirror, it is easy to show that the angle of reflection is the same as the angle of incidence.

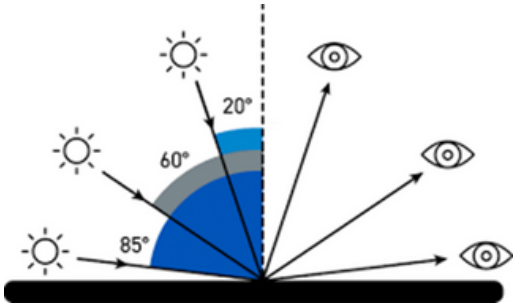


Some light is scattered in all directions when it hits very small particles such as gas molecules or much larger particles such as dust or droplets of water.
The amount of scattering depends on how big the particle is compared to the wavelength of light that is hitting it. Smaller wavelengths are scattered more.
"Why is the sky blue?" is a common question. Light from the sun is made of all the colours of the rainbow. As this light hits the particles of nitrogen and oxygen in our atmosphere, it is scattered in all directions. Blue light has a smaller wavelength than red light, so it is scattered much more than red light. When we look at the sky, we see all the places that the blue light has been scattered from.
This is similar to the question: "Why are sunsets red?" When the sun appears lower in the sky, the light that reaches us has already travelled through a lot more of the atmosphere. This means that a lot of the blue light has been scattered out well before the light arrives at us, so the sky appears redder.
Clouds appear white because the water droplets are much larger than the wavelengths of light. For this situation, all wavelengths of light are equally scattered in all directions.





Sheen is measured with a Gloss Meter and quoted as an angle.
The lower the angle the higher the gloss.
Gloss, Semi-gloss, Satin (Eggshell), Matt (Flat), Dead Flat.



Polyvine Varnish Sheen Levels
ISO 2813:2014
Paints and varnishes — Determination of gloss value at 20°, 60° and 85° GU
The measurement scale, gloss units (GU), of a glossmeter is a scaling based on a highly polished reference black glass standard.

Gloss	Satin	Dead Flat
87	57	3

Light and Colour

Light Refraction
Many factors affect how interior paint colours are perceived, but the two most common are light and sheen. Sunlight, artificial light, shadows, surface texture and even reflections from other surfaces all affect colours on interior painted walls.

“The room you painted for me isn't the right colour. It doesn't look anything like the paint chip I picked.”
Why does my room look like it's painted two different colours?
Without light, there is no colour.
How a colour is perceived is affected by a number of factors, but when it's on interior walls, the two most common factors are light and sheen.

The impact of sunlight
Sunlight is the purest light and provides the purest colour from the spectrum standpoint of the perception of colour, but sunlight changes over time. As the day progresses and the earth rotates, the intensity of the light changes and you'll observe changes in the appearance of colour.
The way sunlight varies through the day is pretty obvious. Photographers are very aware of this and often seek to take their photos during certain parts of the day to make best use of these effects. The same applies to paint colour. What may look great at 7 a.m. may look different at 4 p.m.; it's related to the intensity of the sunshine and the shadowing.

In the morning, sunlight is warmer because it's lower on the horizon. It will give a yellowish cast to your space, but, because of the imparted extra warmth, colour is often its most beautiful in the morning.
As the day progresses to midday, sunlight develops a cool, bluish cast. It is an interesting paradox that the physically hottest sunlight imparts the least 'warmth' to colour. The hottest colour temperature (measured in Kelvin units) is blue — off the top end of the visible scale to ultraviolet — and the coolest is red — off the low end to infrared.
At midday, especially in areas that receive direct sunlight, colour can appear washed out. As the afternoon wears on towards sunset, daylight again warms with a reddish cast.
Homeowners and painting contractors experience this every day, but it doesn't become a top-of-mind topic until you're painting. There are seasonal changes that affect sunlight, too. Winter sunlight is a bit more on the cooler, blue side than summer sunlight.

Artificial light's effects
In residential and commercial spaces, artificial lighting is frequently used to either supplement daylight or replace it entirely. The type of artificial lighting plays a large role in how a colour looks.
The kinds of typical artificial lighting most commonly used in residential and commercial spaces include incandescent, fluorescent and halogen. The effects of these artificial lighting sources can make certain colour choices winners or losers.
Incandescent and halogen lighting tends to warm up reds and yellows because the wavelengths of these artificial lights are warm. So, if you have incandescent light and you want blue walls, you might have to make adjustments, such as selecting a value that is a blue toned with red.
Fluorescent light, on the other hand, is very cool lighting. It tends to enhance blues and greens, so, a blue or green paint will appear better with fluorescent lighting.

Shadow effects
When you remove light or tone it down, there is a different effect on the perception of colour.
In areas where there is shadow, colour would never look bright or vibrant, because the colour of the paint never has a chance to jump out. Light waves can't play off the pigments in the paint, But there may be times when this is an important consideration, In a softer-lit area you may be able to see the colour better than in a stronger-lit area.

Combinations at play
In the real world, there isn't just one kind of light at play, you typically have a combination. If there are large windows, it likely will be a combination of a lot of daylight, some artificial light and some shadows. With small windows, you may have the effects of only a little daylight, primarily artificial light and some shadows. But there's more to consider! You may have a southern exposure, with more direct daylight effects; a northern exposure, with mostly indirect daylight; an eastern exposure, with a lot of morning sun; or a western exposure, with mostly afternoon sun. Northern and western exposures provide cooler, bluish tones. Southern and eastern exposures are warmer, more yellow.

Adding gloss to the mix. Flat, eggshell, satin, semi-gloss and gloss. Often the choice in sheen has to do with durability and hiding power, but it also affects the perception of colour.
As a rule, higher gloss paints tend to look brighter. Much like wetting something with water, a high-gloss sheen enriches colour. Gloss often enhances and creates more body and richness to a colour. If you have a duller sheen, the colour is flatter. However, this isn't always the effect you want on walls.
With high sheen you may have problems with glare, the result of harsh lighting.
If you have a sheen that's reflecting light, it's not always as decorative or pleasing. On the other hand, with a flat sheen you don't get the exaggeration you might experience with a gloss. From a decorative standpoint, duller sheens are preferable on some surfaces, such as walls, as opposed to stand out, such as a mantelpiece.

Actions that effect matting systems working in Varnish.

To achieve the matting effect small jagged particles in the varnish must protrude through the surface of the varnish as it dries. This breaks the gloss resin film surface and disperses the light. The density of diffusion controls the amount of flattening.

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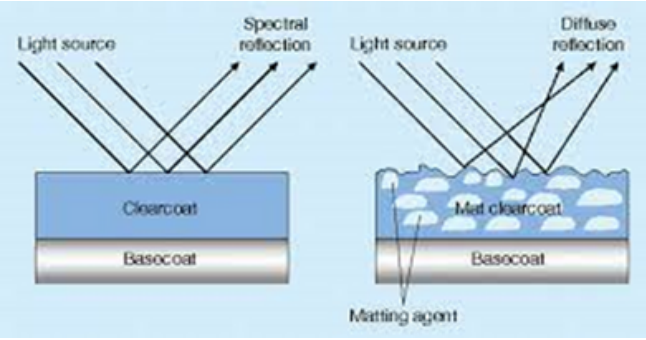

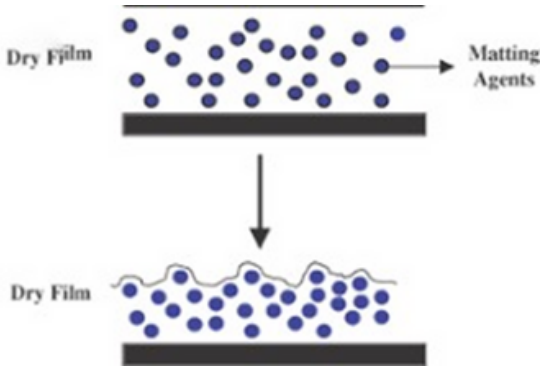

Gloss, Semi-gloss, Satin (Eggshell), Matt (Flat), Dead Flat.

1. If the varnish is applied too thickly, the resin will overcome the particle size of the matting agent, the thicker the application the higher the sheen gain.
Apply dead flat finish sparingly and brush out well.
2.Light Saturation. If the light falling onto the flatted surface is too intense it will saturate the surface and give the illusion of sheen.
3.If the Varnish is applied to a very highly porous surface, the matting can be absorbed into the substrate leaving traces of the glossy resin; giving the illusion of sheen.
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by Peter Wells, Polyvine Technical Director.