



C.J.P. Sales Ltd.

PVC and Polymer Distribution



Colour Matching PVC

Thank you for requesting a colour match from CJP Sales Ltd we would like to take this opportunity to explain our procedure and how you can get the best from our colour matching services.

The Standard

The quality of the colour match will be dependant on the quality of the standard provided. Ideally we need 1 kg of pellets and enough mouldings to provide 150mm square flat area, or at least 3 good clean mouldings. These mouldings will always be the standard for this colour match. You must only compare the plaques to the standard supplied, one will be returned to you with your plaque for comparison. A small dirty moulding will be very difficult to match to and will reflect the quality of the match provided.

Colour Shade

Seeing a shade of colour is very subjective, especially with white as white is made up from primary colours. Every shade of white is different as we hear of Bright white, Blue white Creamy white, Apple white or Rose white. Each of these contain more or less primary colour. For example: Bright white has less black pigment, Blue white has more blue and less yellow pigment, Creamy white is the opposite with more yellow and less blue pigment, Apple white has more green and less red pigment and Rose white is the opposite again with more red and less green pigment. These pigment levels can be adjusted to create the exact shade. By adding more of one colour pigment impression of that colour is intensified. These shade differences are very slight and only visible when placed together.



What We See And How We See It

Unfortunately we all see colour slightly differently. 7% of men and 0.4% of women are affected by a form of colour blindness, the inability to distinguish red from green. This means that people's perception of colour is slightly different. The environment in which you view the plaques also contributes to the visual affect of colour, more specifically the type of light. Shades of colour can look completely different in different light. For example: Mouldings for out side use will be matched using day light (D65), if you then compare the plaque to the standard inside an office or factory using artificial light they won't look the same. It is important that we know the application and what environment the component is designed for in order to get the match right.

Example

Most people have experienced sample metamerism when putting on two socks that appeared to be black while in the bedroom (which may have incandescent lights), but later finding that one is black and the other is blue upon stepping into the kitchen (which may have fluorescent lights). The differences in the wavelength distribution between the incandescent and fluorescent lights interact with the differences in the spectral reflectance curves of the socks to make them appear the same in one light source and different in another.



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Measuring The Colour

There are a number of distinctive methods of measuring colour. The first is by eye as detailed above and the second is using a Reflected Light Colorimeter or CIELAB, which loosely represents human sensitivity to colour. This measures the 3 dimensions of colour L*A*B:

The Results You Receive

Your standard is measured on the CIELAB device to give a reading; the plaque is then matched to this.

For example:

	L*	A*	B*	
Standard:	91.79	0.18	1.85	
Match (Plaque)	92.13	-0.02	1.65	
Difference	0.34	-0.29	-0.20	Delta E 0.49
Tolerance +/-	.5	.3	.3	Delta E 0.50

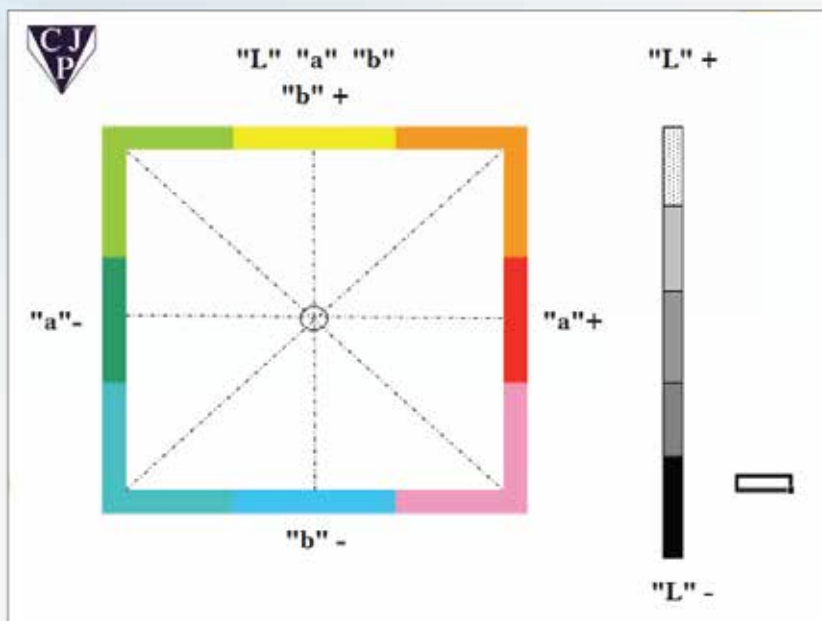
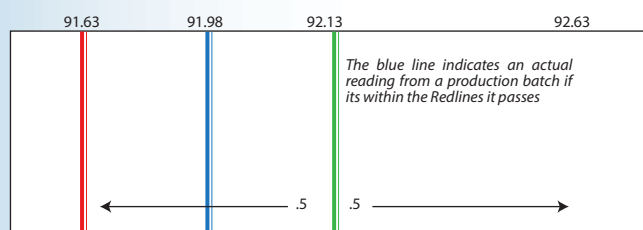
These will be matched in D65 day light unless another light is specified

The above results show that your standard has been measured within the window industry tolerance as shown above. The Delta E is a combined reading and needs to be within 0.50 as shown.

Tolerances

PVC Compounds are made up from a number of different substances all of which are made within a tolerance. As a result each grade has to have a tolerance to work to. The window industries works to +/- .5 .3 .3 for white compounds. It is not possible to produce a grade which will give the same reading every time it's made; this tolerance is very tight and should not be noticeable visually.

L* Value Example



L* = Dark to light A* = Green to red B* = Blue to Yellow

Rematches

In some cases customers do not recognise the CIELAB readings and depend on a visual approval. If a plaque is rejected because it doesn't look the same to the customer, we will rematch using the judgement of the colourist to add or reduce primary colours. This is again subjective and usually results in a number of attempts and possible failure.

Factors To Consider

1. If more than one Colormeter is used, no two are the same and will give different readings that are relative to each other.
2. In some cases when matching lead grades to Calcium zinc there is a higher chance of the colour being affected by light?
3. Some pigments are Metameric which means they look very different in different lights, these are usually based around the Orange, Yellow and Red.
4. PVC when processed can affect the colour. Over heating can cause a shade shift darker, yellower and greener?
5. Always remember your standard, never match a new plaque to a recent production moulding, always compare to the standard.
6. All colours can be adjusted to add more pigment to a shade.
7. The better the standard the better the match.

Good matches only come from good communication and understanding

