

Revealing metamerism by spectroradiometry

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Introduction

Nowadays color is an important notion of quality, especially in coatings. For the appreciation and the control of colors, it was necessary to set up a quantifiable, reproducible and objective measurement system. Indeed visual judgment is by definition subjective: nobody has the same eye and thus the same perception of color; furthermore the light source has an influence on color. It is metamerism. A customer wants a paint which stays the same no matter the observation light.

Materials methods

First of all, the spectroradiometer must be calibrated. Every basic color is cut to the white to have a shading which serves as a standard range. Samples were then applied to a contrast card which would be read by the spectroradiometer.

The device can give the formula of an unknown color. For every formulated color, the spectrum of the reflectance in function of the wavelength is shown.

Results

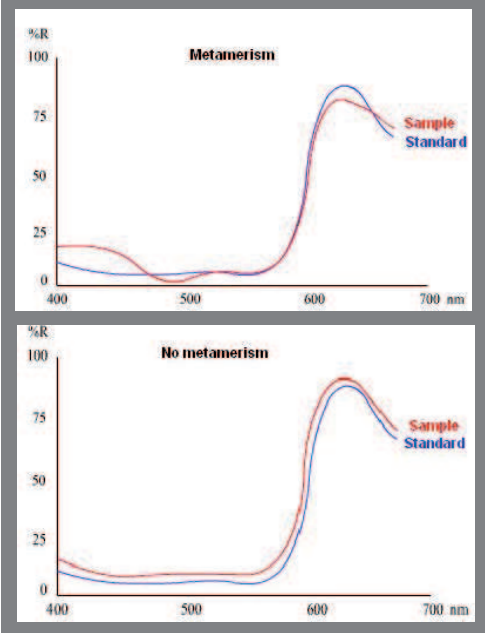
The customer's required tint can be formulated in two different manners. Both were realized, then applied to cards of contrast.

Figure 1 represents two curves of the reflection factor in function of the wavelengths of the two colors. In the first case, the curve of the standard and that of the sample possess several intersection points. It is a case of metamerism. On the second one, curves are parallel, therefore the wavelength of observation did not modify the color of the object.

Conclusion

The color which was finally sent to production was the second one, as it remained identical no matter the observation light.

Figure 1 : Linear graphs of the reflection factor in function of the wavelength for a color.



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