

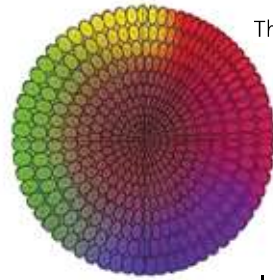
Industrial Coatings – A fascinating decoration

Patchwork might be good for quilts but certainly not for coated industrial goods. As many finished products consist of multiple components which are manufactured by different suppliers and at different locations, uniformity of color and appearance is crucial. Not only the paint batches need to be delivered with consistent quality, but also the production process of the finished product needs to be controlled.

According to Wikipedia the oldest transmitted paint formulation dates back to the 12th century. Since then a lot has changed. Industrial coatings with lower solvent content were introduced resulting in water based systems with almost no solvent. Increasing environmental demands during the last years and requirements for low VOC (volatile organic compounds) systems open the doors for powder coatings with 100 % solids content. Independent of the material, the optical properties of industrial coatings need to fulfill certain quality aspects before they can be applied on the final product.

Color and Gloss harmony

Color consistency from batch to batch is of course a “must” requirement for an industrial coating. The “correct” color has to be ensured across different material types and gloss levels. Color tolerances are dependent on the application and the hue. Studies have proven that CIELab color space is not uniform.



The diagram shows the CIELab color space divided into a multiple number of ellipsoidal micro-spaces. All colors within one ellipse are perceived as the same color. It can clearly be noticed that the size and shape of the ellipses are different dependent on the hue. Additional, chromatic

colors have larger ellipses than achromatic colors and a difference in hue is more obvious than a difference in chroma.

Therefore, tolerances need to be defined by color families and differently for the individual color components ($\Delta L^*a^*b^*C^*H^*$). Over the years, new color systems and equations for solid colors were developed based on visual studies: e.g. ΔE_{CMC} – ΔE_{94} – ΔE_{99} – ΔE_{2000} . They correct for the non-uniformity of CIELab color space and improve visual correlation. Additionally, the major advantage of these equations is that one tolerance can be used for all colors.

spectro2guide includes all new equations and even simultaneously measures 60° gloss to ensure complete appearance harmony.

BYK-Gardner Solution



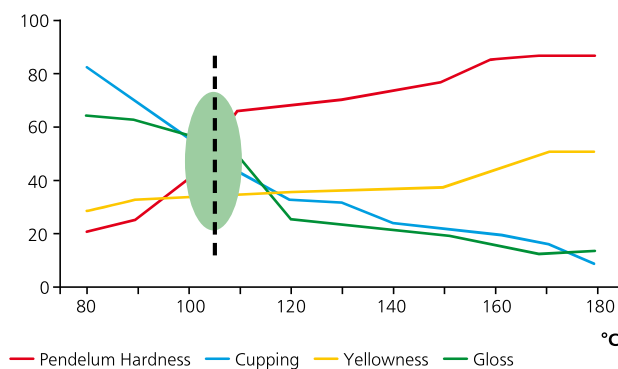
Color & Gloss
spectro2guide



Objective Visual Evaluation
byko-spectra pro

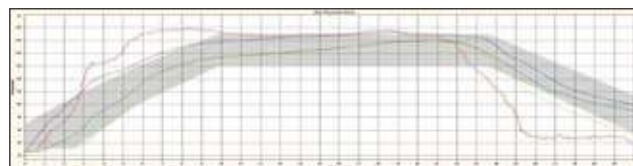
Temperature control of the production oven

The prerequisite for proper physical and optical properties is a controlled and stable baking process. Temperature as well as baking time determines the cross-linking quality of the paint. The picture on the right shows how on the one hand hardness and flexibility of the paint film are influenced by the baking temperature, but on the other hand also the optical properties color and gloss.



The oven recorder temp-gard is a valuable tool to routinely monitor the temperature distribution of the ovens as well as the object temperature. As the object temperature is highly influenced by the material, material thickness, and shape of the product, it is recommended to select the most critical measurement spots on the object. Additionally, one sensor is used to monitor air temperature.

The graph below shows temperature measurements of a multi-component product. Sensor 1 is placed on a part made out of thinner steel. The high curing index of 244% clearly determines that the part is over-cured and most probably will not reach the product specifications.



Temperature Control
temp-gard



Temperature Control Accessories
Temperature Probes