

Applications

Applications Note

Insight on Color

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The Gardner Index

Background

The Gardner Index is a yellowness index. It was originally developed for color specification of resins. Initially, liquid standards of potassium dichromate, ferric chloride and cobaltous chloride, or potassium chloroplatinate were used. These solutions varied in stability and had a tendency to fade with time. Colorimetric values are now used to create glass standards as defined in ASTM Designation D1544, “Standard Test Method for Color of Transparent Liquids (Gardner Color Scale).”

The glass standards are normally used for visual, subjective evaluation and assignment of Gardner color values. At HunterLab, the Gardner index is available in EasyMatch QC and Universal Software. A correlation between the Gardner Index and Yellowness Index E313 is used in the form of look-up tables. Measurements are made in total transmittance mode using a 10-mm or 20-mm sample cell. (Refer to your User’s Manual for which one to use.) The samples to be measured should be clear liquids that are similar in hue to the Gardner glass standards. This method provides objective measurement and assignment of Gardner values.

Conditions for Measurement

Instrumental: ColorQuest Sphere, ColorQuest II Sphere, ColorQuest XE, ColorQuest XT, UltraScan, UltraScan XE, or UltraScan PRO

Illuminant: C

Standard Observer Function: 2 degree

Transmittance and/or Reflectance: Transmittance only.

Formulas

No formula is employed in HunterLab instruments for calculating the Gardner Index. Yellowness Index E313 is calculated and its corresponding Gardner value is looked up in a table and displayed.

Typical Applications

This index is generally used for describing the color of drying oils, varnishes, fatty acids, and resins.

For more information, see “Measurement of Color in Resins and Adhesive Systems” by Fred E. Huebner and Harry N. Monck in the September 1992 issue of the *TAPPI Journal*.

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