

APPLICATION NOTE

Online Monitoring of ASTM (D1500) Color (0-7) Using a ASTM ClearView® db Photometer

Purpose

To determine ASTM (D1500) color with the cost effective GUIDED WAVE™ ASTM ClearView® db Dual-Beam fiber optic photometer.

Measurement Background

ASTM color (reference ASTM D1500, ASTM D1524) describes the color measurement method for fuels including lubricating oils, heating oils, diesel fuels, and petroleum waxes. The color scale ranges from 0.5 to 8. The lowest value of 0.5 being a light yellow, 2 being yellow, 5 being orange, and 8 being a deep red. ASTM color is an important product quality measurement for many refinery and petrochemical processes.

Experimental

Certified standards for ASTM color (<0.5 to 7) were used to calibrate our ClearView db photometer. The ClearView db provides the ability to measure two separate sample locations on-line, in real time. The ASTM color configured ClearView db has two analytical wavelengths and one reference wavelength. The photometer is connected via fiber optics to a sample cell (flow cell or inline probe) with a 5 mm pathlength. Measurements of five certified standards were collected.

Results

The resulting calibration is shown in figure 1. The linear calibration gives an R2 value of 0.994 and a standard error of ± 0.2 ASTM units. (An R2 value of 1 indicates a perfect correlation between the model and reference method). The ClearView db has long-term photometric drift of <500 μ AU rms, which provides for excellent long term measurement stability.

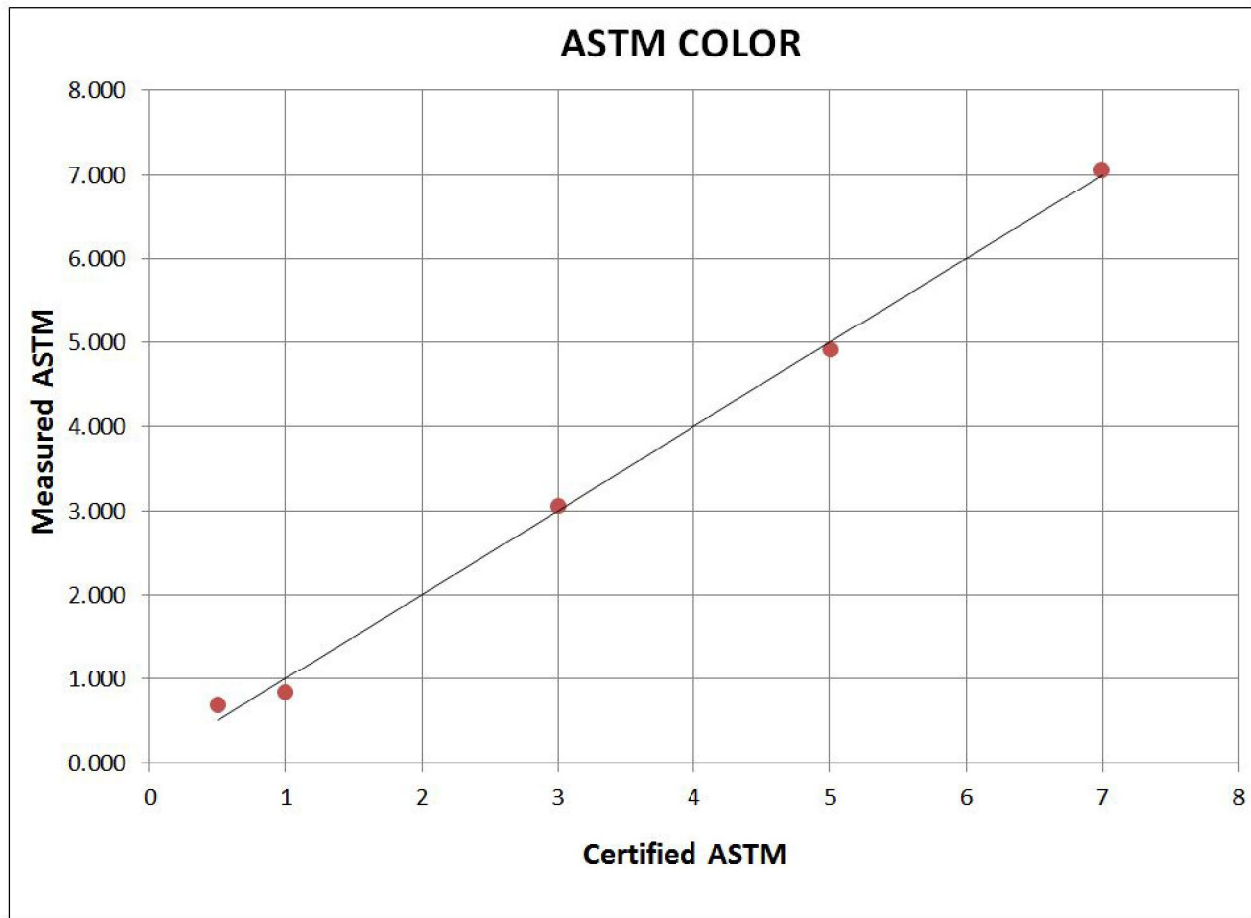


Figure 1

Summary

The measurement of ASTM Color using NIR spectroscopy is both fast and reliable utilizing our hardware and software tools as described here. The ASTM ClearView db photometer is an excellent choice for on-line, real-time ASTM color measurement from 0 to 7. The ClearView db can be configured with 4-20 mA analog outputs (6 outputs max on a single channel system, and 4 outputs per channel on a dual channel system) and corresponding contact closure outputs to alert error states. The ClearView db is also capable of Modbus communication via Ethernet. For more detailed information regarding system specifications and the ASTM ClearView db analyzer please contact a Process Insights sales or technical specialist.

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