Application Notes

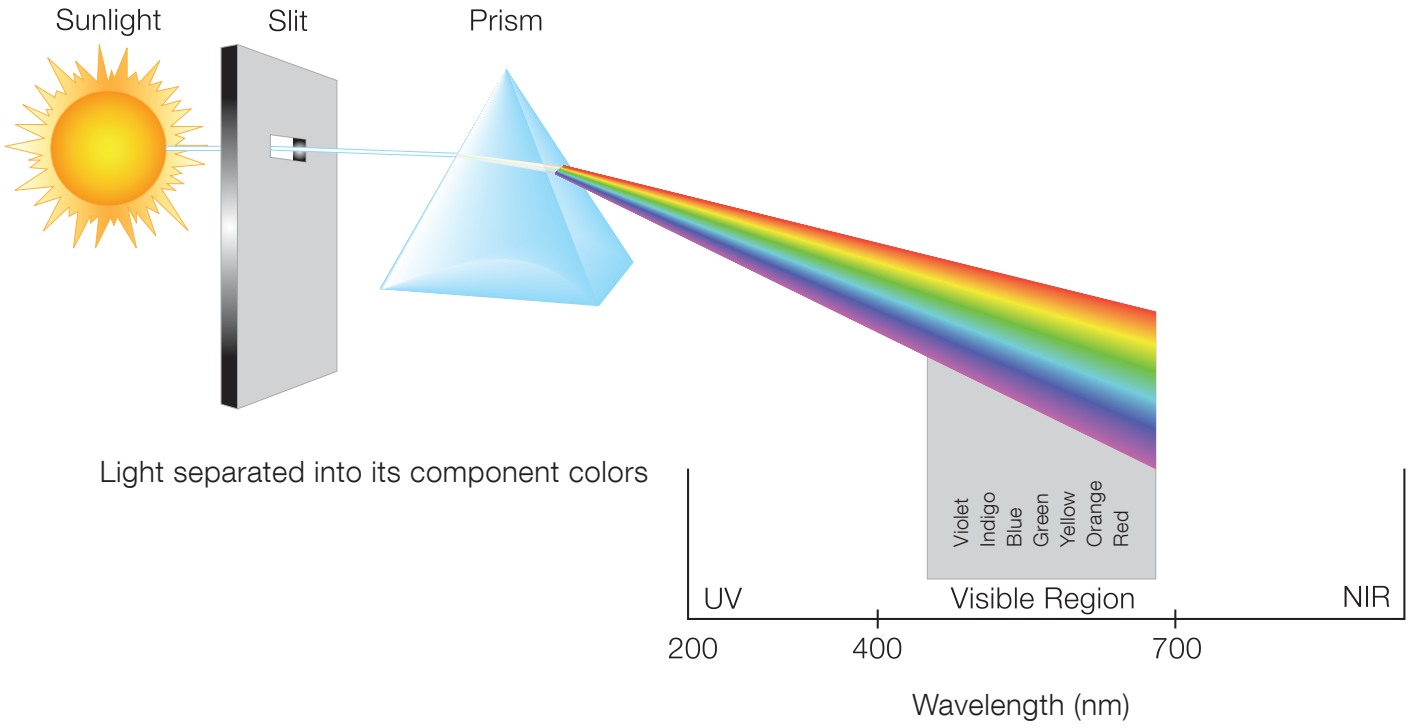
ABB Analytical - PUV3402 Multiwave process photometer
Color monitoring in refinery applications

Industry: Refining

Introduction

For refineries, the measurement of color in hydrocarbon liquids provides an important quality control parameter. The human eye responds to the visible region of the electromagnetic spectrum (400-700nm). The dispersion of white light through a prism, which results in a “rainbow” of colors as shown in the drawing below, represents a familiar example of visible light.

The observation of color arises from the absorption and emission of light by a sample. The intensity of the absorption of light at a characteristic wavelength is proportional to the intensity of the color. The property normally measured in refineries is the degree of yellowness of oil and gasoline samples. Color measurements can be made on-line with a visible photometer by comparing the intensity of light at a specific wavelength with a color standard.



Light separated into its component colors

Analyzer

The following table summarizes several common refinery color measurements:

Product	ASTM method	Color units
Gasoline Jet fuel Naphtha/Kerosene	D156	-15 to +30 Saybolt
Lube oils Heating oils Diesel fuel	D1500	0 -8 ASTM units

Discussion

The PUV3402 UV Process Photometer (Multiwave) is a reliable, robust photometer for monitoring color in refinery applications. This Photometer uses narrow bandpass optical filters to measure light intensity at reference and measure wavelengths in the visible region of the spectrum. An optical schematic of the Multiwave Photometer is provided below.

Benefits

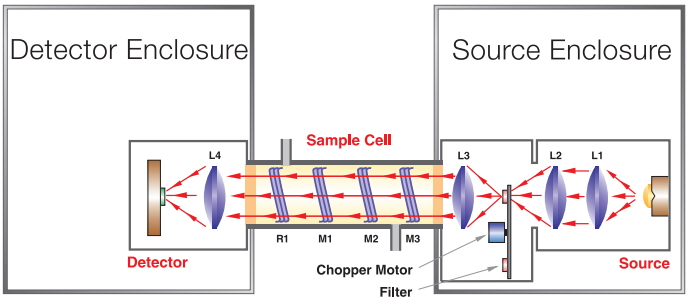
This rugged optical bench offers the following benefits:

– Reliable color analyses in refinery applications.
– Simple mechanical design that promotes easy service and maintenance.
– Analyzer compensates for obstruction of cell windows.
– Analyzer compensates for source and detector aging.

The PUV3402 Process Photometer provides continuous color monitoring. Corrective action can be taken immediately to avoid the shipment of off-specification refinery products. The PUV3402 has been successfully used for numerous color monitoring applications in refineries.

Conclusions

The PUV3402 Process Photometer allows continuous monitoring of color in refinery applications. These measurements can be made in Saybolt Color Units or ASTM color units. The PUV3402 can also be used to measure APHA color units in petrochemical and chemical applications.



Optical Schematic

For more information please contact:
ABB Inc.
Analytical Measurements
843 N. Jefferson Street
Lewisburg, WV 24901
USA
Phone: 1 304 647 4358
Fax: 1 304 645 4236
email: analyzeit@us.abb.com

www.abb.com/analytical

9AKK105408A2894

A_N_PUV3402_Color monitoring in refinery applications-EN 06.2009