

# Measuring Saybolt Color in Natural Gas Liquids (NGLs)

Applied Analytics Application Note No. AN-045



## Application Summary

Detector: **OMA-300 Colorimeter**

Process Stream: **NGL**

Typical Measurement Range: **Saybolt scale, -16 (darkest) to +30 (lightest)**

## Introduction

Natural Gas Liquids, or NGLs for short, consist mainly of ethane, propane, butane, isobutane, and pentane. NGLs have many applications, including their use as petrochemical feedstocks, heat sources, and more. When natural gas and oil are removed from the ground, the NGLs (and any impurities) must be extracted in order for the natural gas and oil to be marketable.

The NGLs, once removed from the natural gas or oil, can go through further processing before being sold. NGL compositions can vary widely depending on the gas field they were collected from. For this reason, maintaining the quality of the NGLs is of great importance. Low-quality NGLs can damage refining equipment, leading to costly repairs and clean up. Inputs to NGL pipelines are constantly monitored for changes in quality. NGL quality can be indicated by color. Slight changes in color may be indicative of degrading equipment, losses in process efficiency, overheating, distillation column malfunction and more.

Dips in the quality lead to “yellowing” of the NGL stream. In the past, NGL discoloration was measured manually by comparing “grab samples” to the standard Saybolt color scale using the method detailed by ASTM D156 (Standard Test Method for Saybolt Color of Petroleum Products). The Saybolt scale would then be used to correlate the color of the sample to a numerical value, which would then be correlated to the overall product quality. This process was unsafe and inaccurate. Measurement of NGL discoloration can be done safely and accurately today using an OMA-300 analyzer. The range of the Saybolt scale is -16 (dark yellow) to +30 (nearly transparent/clear).

The OMA-300 is proven in providing continuous, real time measurements corresponding to the Saybolt color scale. The spectrophotometer inside the OMA-300 obtains a full UV-Vis high-resolution absorbance spectrum by transmitting a white light signal through the sample fluid and measuring lost intensity at each measurement wavelength. The OMA-300 then correlates the measured absorbance spectrum to a Saybolt number.

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## OMA-300 Colorimeter Benefits

- » Continuously measures the Saybolt color of NGL for quality assurance
- » Totally solid-state build with no moving parts — modern design for low maintenance
- » Ultra-safe fiber optic design eliminates the need to bring sample fluid inside analyzer unit
- » One-time calibration at factory or site. No need for re-calibration

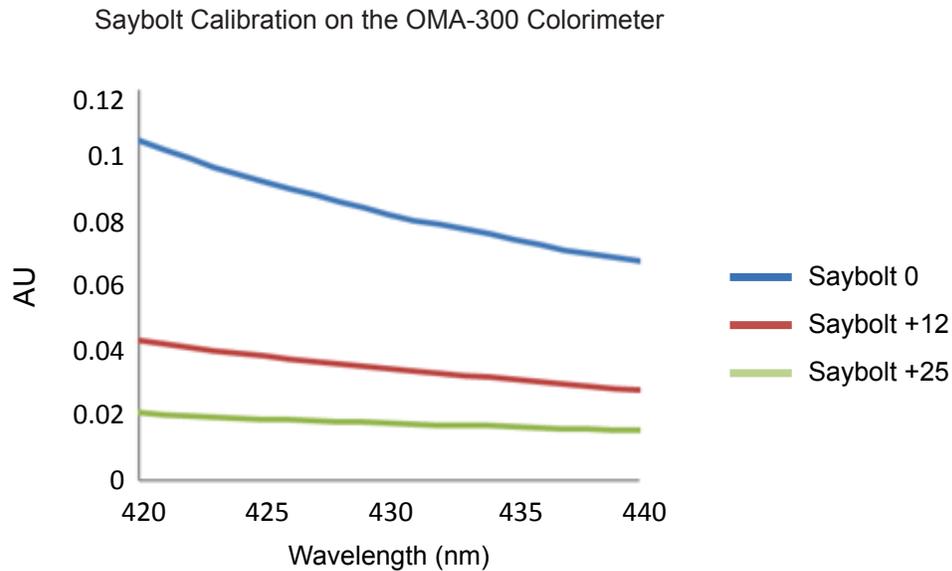


Fig 1: Example of Saybolt Absorbance Spectra

Above is an example of spectra collected from three different Saybolt standards on the OMA-300. The different standards show different levels of absorbance across a given wavelength range.



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