

## Customer Success Story: Detecting Various Levels of Color with High Accuracy per ASTM Method D156, D6045

A Guided Wave Saybolt Color Analyzer System was fully implemented for real-time color measurement of various grades of LNG (liquefied natural gas) product with multiple specification requirements.

### The Customer

The customer is a leading natural gas pipeline operator. Currently they own over 71,000 miles of pipeline that move natural gas, natural gas liquids (NGLs), refined products, and crude oil. The company trucks both in-spec and out of spec LNG products to meet customer demand.

### The Problem

The inbound LNG product is maintained at a different specification than the outbound/exported LNG product. Color analysis is necessary for both the in and outbound LNG product because in each case, the customer requires a high degree of accuracy and repeatability that is reliable and consistent to third party standards.

The customer was looking for an analyzer to measure the Saybolt color of the LNG flowing in their pipeline.

### The Challenge - Detecting Various Levels of Color

LNG is natural gas cooled to a liquid state. Natural Gas is composed primarily of methane, but may also contain propane, ethane, and other heavier hydrocarbons as well as small residual quantities of  $N_2$ ,  $O_2$ ,  $CO_2$ ,  $H_2O$ , and some sulfur containing compounds. Prior to liquefaction these residual materials are removed with only clean hydrocarbons remaining. The composition of natural gas can vary slightly from different producing locations.

Typically LNG is a colorless material, but during distillation the carryover of larger hydrocarbons (C6+) can affect the color of the LNG (typical specification for C6+ in LNG is 0 to 0.05%).

Measuring the Saybolt or ASTM color online is a key parameter in many light hydrocarbon mixes for quality control to detect this carryover. Monitoring the color allows the refiner to verify that the product is within specification. Any "out of spec" product can be reprocessed before being sold.

Saybolt Color (ASTM D156) measures yellowness and has a scale that ranges from -16 (darkest) to +30 (lightest). Figure 2 shows the Saybolt measurement scale on a Guided Wave Saybolt Analyzer.



### The Challenge - Detecting Various Levels of Color

Since the Guided Wave customer required the measurement of various grades of LNG, they could not use just a "go" or "no-go" color analyzer. They needed to find an analyzer that was able to detect varying levels of color with a high degree of accuracy in accordance with ASTM D156 and ASTM D6045.

The customer could then implement an alarm set-point to direct the LNG product to the correct tank (for inbound or outbound product) or to the "Slop" tank for re-processing.

### The Solution

By using a Guided Wave Saybolt Color Analyzer system, the customer was able to accurately measure this color change with repeatable values. Guided Wave provided a complete ready-to-go solution which included a 50 mm pathlength SST probe, fiber optic cables for remote processing, control software and Saybolt application calibration. The analytical calculations are all encoded in the software so answers and alarms are clearly reported.

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## The Smart Choice

The customer came to Guided Wave because our Saybolt Color Analyzer is a complete solution that provides accurate, real-time, reliable results. The analyzer employs a dual-beam design – meaning; the system has an continual internal optical reference check that allows it to self-compensate for signal variation due to non-sample conditions. This technology provides long term stable readings offering laboratory grade results from a process analyzer. It consistently measures the color variation without interference from other factors.

Its linearity and repeatability, as well as its low maintenance requirements make it a cost effective, smart choice to help optimize production, improve yields, ensure consistent product quality and enhance profitability.

- Unique dual beam optics - for long term, stable operation
- Up to two (2) independent measurement points - for added analytical flexibility at reduced cost per point
- High efficiency yet rugged fiber optics - analyzer electronics can be located away from a hazardous sample point
- In-door touch screen or Ethernet (Modbus TCP) - easy local or remote analyzer operation and control
- Analytical calculations are all encoded in the software - answers and alarms are clearly reported

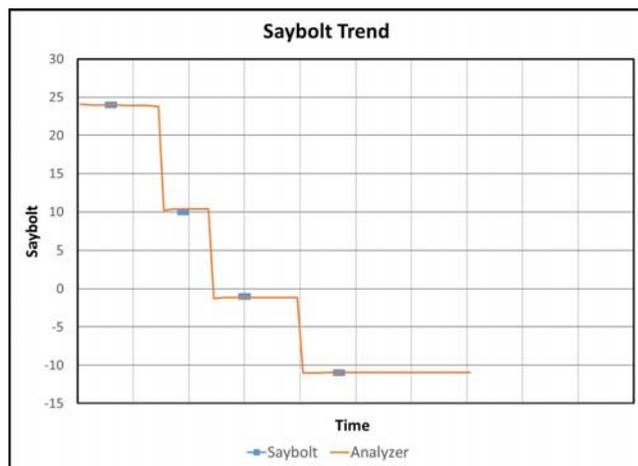


Figure 1

## The Conclusion

This customer has been successfully operating the Guided Wave Saybolt Color Analyzer for over a year. They have also purchased additional analyzers, as well as recommended the Saybolt Color Analyzer to other companies in this industry as the standard to follow for this process.

## The Proof Continuous Accurate Saybolt Color Measurement

Figure 1 shows a typical trend chart monitoring Saybolt color of a continuous flowing process. Figure 2 shows an initial calibration chart showing the measured values as compared to laboratory standard values. For more information see Guided Wave's Saybolt Color Analyzer data sheet #1062 and LNG Application Note #3080.

## Control You Can Measure

By partnering with Guided Wave customers gain the advantage of 30+ years of experience in online process monitoring and stream sample analysis. We deliver a total solution that includes optically matched components and a well planned calibration approach leading to long-term success and savings. Our entire product line is designed and developed to provide real-time data of laboratory quality, while thriving in the most demanding processing plant environments. Choose Guided Wave - for control you can measure.

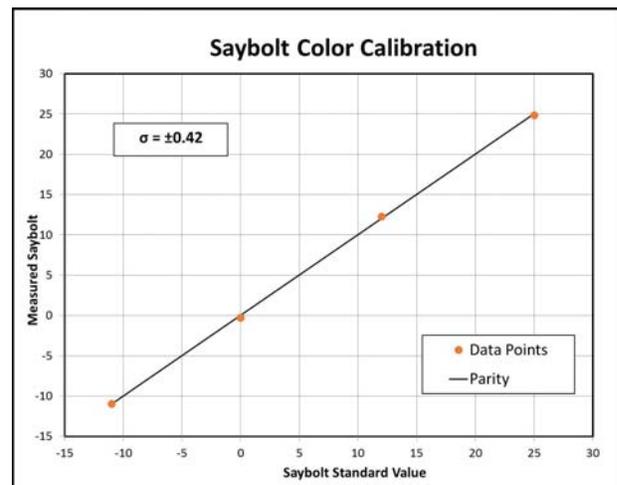


Figure 2



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