



A Honeywell Company

Color Stability of Petroleum Distillates

UOP Method 793-12

Scope

This method is for determining the color stability of petroleum distillates. A comparison of the ASTM Saybolt Color, D156 or D6045, as determined on the sample before and after a timed heating period, provides a direct indication of the color stability of the sample.

References

ASTM Method D156, "Saybolt Color of Petroleum Products (Saybolt Chromometer Method)," www.astm.org

ASTM Method D6045, "Color of Petroleum Products by the Automatic Tristimulus Method," www.astm.org

Outline of Method

ASTM Saybolt Color is determined on the sample. The sample is placed in a glass bottle at 15-25°C allowing free access to air. The sample is rapidly heated to 100°C in the absence of light and held at that temperature under atmospheric pressure for 20 hours. After cooling to 15-25°C, the ASTM Saybolt Color is redetermined.

Apparatus

The apparatus listed are in addition to that required for ASTM Method D156, "Saybolt Color of Petroleum Products (Saybolt Chromometer Method)," or ASTM Method D6045, "Color of Petroleum Products by the Automatic Tristimulus Method." References to catalog numbers are included as a convenience to the method user. Other suppliers may be used.

Bottles, 250-mL, borosilicate glass, Wheaton No. 219817, VWR, Cat. No. 16159-856

Cylinder, graduated, 250-mL, Class B, VWR, Cat. No. 89000-256

Lead ring flask weights, to stabilize bottles in the bath, VWR, Cat. No. 29700-004 (optional)

Oil bath (water bath), to 99.9°C, digital control, with stainless steel gable cover, VWR, Cat. No. 13491-028

IT IS THE USER'S RESPONSIBILITY TO ESTABLISH APPROPRIATE PRECAUTIONARY PRACTICES AND TO DETERMINE THE APPLICABILITY OF REGULATORY LIMITATIONS PRIOR TO USE. EFFECTIVE HEALTH AND SAFETY PRACTICES ARE TO BE FOLLOWED WHEN UTILIZING THIS PROCEDURE. FAILURE TO UTILIZE THIS PROCEDURE IN THE MANNER PRESCRIBED HEREIN CAN BE HAZARDOUS. MATERIAL SAFETY DATA SHEETS (MSDS) OR EXPERIMENTAL MATERIAL SAFETY DATA SHEETS (EMSDS) FOR ALL OF THE MATERIALS USED IN THIS PROCEDURE SHOULD BE REVIEWED FOR SELECTION OF THE APPROPRIATE PERSONAL PROTECTION EQUIPMENT (PPE).
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Reagents and Materials

The reagents and materials listed are in addition to that required for ASTM Method D156. References to catalog numbers are included as a convenience to the method user. Other suppliers may be used.

Bath fluid, heat transfer fluid, temperature range to 150 °C, VWR, Cat. No. 13270-794

Procedure

The analyst is expected to be familiar with general laboratory practices, the technique of chromometry, and the equipment being used.

Preparation of Apparatus

Place the oil bath in a fume hood that is shielded from light to avoid exposure of the samples during aging. Alternatively, a special ventilation hood may be fitted over the bath to permit free air circulation without exposure of the samples to light. Fill the bath with oil to a sufficient depth so that the oil will be at or above the level of the sample when the test bottles are inserted, but not so high that the inserted bottles will float and become unstable. Lead ring flask weights may be used to prevent floatation of the bottles in the bath. Establish a temperature of $100 \pm 2^{\circ}\text{C}$.

Sample analysis

1. Determine the Saybolt Color of the sample as described in ASTM Method D156 or ASTM Method D6045.
 - The sample may need to be filtered before measurement, see ASTM Method D156.
2. Using the 250-mL graduated cylinder, measure 120 mL of the sample to be tested into a clean, dry bottle.
3. Place the uncovered bottle into the oil bath, protect from light, and allow the fuel sample to age for 20 hours at $100 \pm 2^{\circ}\text{C}$.
4. Remove the sample from the bath and allow it to cool to ambient temperature.
5. Determine the Saybolt Color on the cooled, heat-treated fuel sample as described in ASTM Method D156 or ASTM Method D6045.
 - The sample may need to be filtered before measurement, see ASTM Method D156.

Report

Report the Saybolt Color of the fuel before and after heat treatment.

Precision

The repeatability and reproducibility of the Saybolt Color test is listed in ASTM Method D156 and ASTM Method D6045.

Repeatability and Site Precision

Six replicate color stability analyses were performed on an oil sample. The estimated standard deviation was calculated at the Saybolt colors listed in the Table. Two analyses performed in one laboratory by the same analyst on the same day should not differ by more than the repeatability allowable difference shown in the Table with 95% confidence.

Table
Repeatability, Saybolt Color

<u>Initial Color</u>	<u>Color Change</u>	<u>Within-Day esd</u>	<u>Allowable Difference</u>
+22	-7	1.7	4

The data in the Table represent short-term estimates of the repeatability of the method. When the test is run routinely, use of a control standard and a control chart is recommended to generate an estimate of long-term repeatability.

Reproducibility

There is insufficient data to calculate the reproducibility of the test at this time.

Time for Analysis

The elapsed time for one analysis is 23 hours. The labor requirement is 1 hour.

Suggested Suppliers

VWR International, 1310 Goshen Parkway, West Chester, PA 19380, USA (610-431-1700)
www.vwr.com