OIL COLOR ANALYZER | OILCOL

The Kytola Instruments Oil Color Analyzer is an online instrument based on visible light absorbance (transmittance) to indicate the ASTM D1500 color value of oil.

ASTM D1500 Color

ASTM Color is defined in the ASTM D1500 standard (American Society for Testing and Materials) as a two-digit number color scale to grade oil and petrol products. The scale of 16 values ranges from 0.5 (light, pale) to 8.0 (dark, brown-amber). In between it gradually shifts from light to dark yellow and from orange to red in steps of 0.5; *see image below right.*

The ASTM Color scale is intended for a wide variety of petroleum products such as lubricating, hydraulic, heating, insulating, cooking, mineral, and diesel fuel oils, and even solid petroleum waxes. It has also been adopted by many other standardization bodies (i.e. ISO 2049). For lighter-color products (ASTM color lower than 0.5) the ASTM D156 Saybolt color scale is used.

The ASTM Color scale is mainly used by the petrochemical industry for the grading and quality surveillance of petroleum products. The color is constantly checked during refining processes in order to ensure the required grade, properties and quality.

Color is also used as a means of confirming that the correct oil is being used. Although a change in the color of the oil alone is not necessarily a direct indication of the oil being damaged, it is nevertheless a good quality indicator, and it can at least serve as a pre-alarm. Many contaminants such as particles, water, oxidation, and other unwanted liquids, gases, and additives as well as degradation and aging may (and often do) change the color of the oil in use.

As the allowed limits for oil color are set (by the user), ASTM Color is an easy way to monitor oil quality. It can act as an indicator of the need for more profound oil quality examinations and even to take fast actions to prevent breakdowns of the oil-using machinery.

FEATURES

- Online oil color analyzer
- Scale from 0.5 to 8.0
- Display resolution 0.1
- Accuracy ±0.3 (as the ASTM scale step is 0.5)
- Online measurement with a response time of 5 s
- Easy to install
- Sturdy construction
- Serial connection (Modbus)
- 4 – 20 mA output

APPLICATIONS

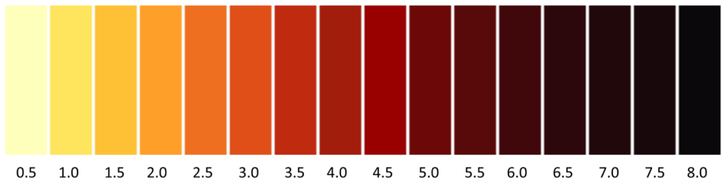
Wide variety of liquid petroleum products:

- Lubricating oils
- Heating oils
- Diesel fuel oils
- Mineral insulating oils
- Hydraulic oils

INDUSTRIES

Where it is essential to know the ASTM color of oil:

- Petrochemical industry
- Offshore and marine
- Pulp and paper
- Steel mills
- Mining
- Power plants



Demonstrative ASTM D1500 color scale

Online Measurement

The ASTM color value is traditionally determined by visually comparing a sample with standardized color glasses. However, modern inline and online devices are much more reproducible and accurate than the human eye, and the observation is done continuously and fast.

This continuous and fast online indication allows quick reaction to sudden changes in product quality and to perform preventative actions before any failures of the oil-using equipment occur.

Traditional measurements require sampling and often even a laboratory to carry out the testing. This can be quite time-consuming and expensive. An online device gives the measurement results continuously and fast. In addition, the measurements can be done at multiple sampling spots of the oil system simultaneously, which essentially makes it easier to find the source of the oil quality change.

OILCOL Oil Color Analyzer – How Does It Work

The Kytola OILCOL Oil Color Analyzer is an online instrument based on visible light absorbance (transmittance) to indicate the ASTM D1500 color value of oil.

A three-color LED is used to backlight the oil sample (one color at a time). Two visual light detectors are used to measure the intensities of the light emitted by the LED. The reference detector measures the intensities just before the sample and is used to compensate any variations in the lighting conditions. The actual measuring detector measures the intensities of the light transmitted through the oil sample.

The measured intensities are then compared to the calibration values (curve), and the ASTM D1500 color value is given as a two-digit number on the scale of 0.5 to 8.0 in steps of 0.1*.

Every OILCOL Oil Color Analyzer is individually calibrated to ensure the best possible accuracy. OILCOL indicates the ASTM D1500 color value even more precisely than the actual standard defines or demands*.

As the measurement is performed online, the response is continuous and fast, which can be crucial in order to detect sudden changes in oil quality and further to be able to react before any failures of the oil-using equipment occur. Time-consuming and expensive sampling and laboratory analyses are also avoided.

**[As the ASTM D1500 standard defines the color value range from 0.5 to 8.0 in steps of 0.5, the indication of the device must be rounded up or down to the closest full or half value according to the standard.]*

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Measuring ASTM D1500 Oil Color

OILCOL Oil Color Analyzer

APPLICATION NOTE