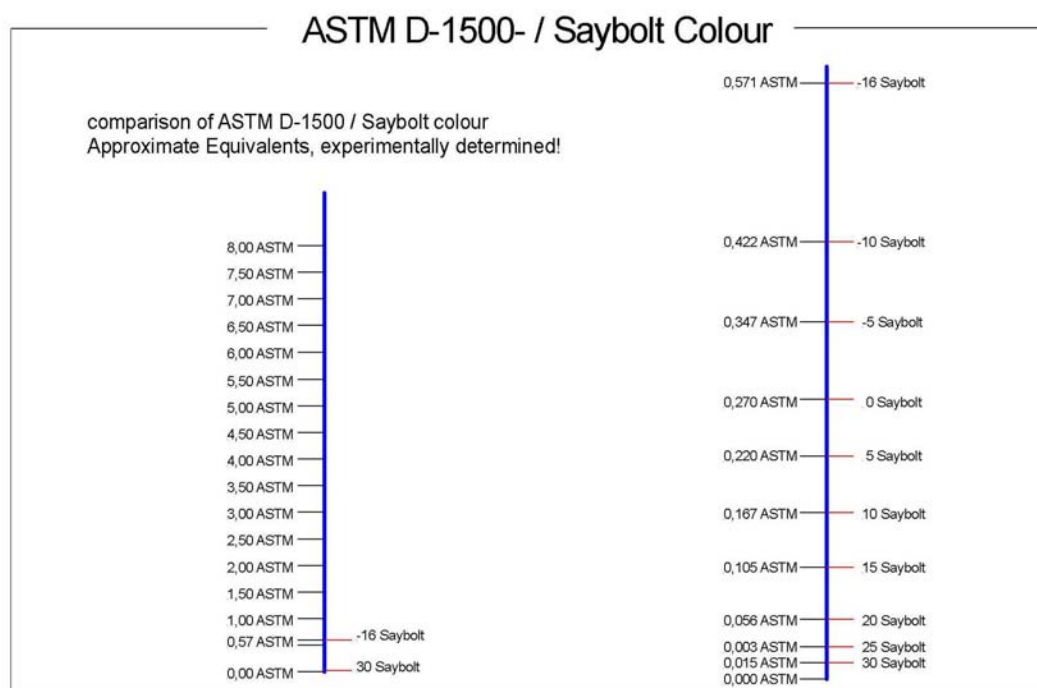


# ASTM D-1500 Colour / Saybolt Colour



typical measurement ranges:

30 to -16 Saybolt

0-1 ASTM

0-2 ASTM

0-5 ASTM

0-8 ASTM

The American Society for Testing and Materials (ASTM) compiled a summary of examination procedures for the petrochemical and refining industry. The ASTM D-1500 colour is a known procedure for colour measurement in oil and petrol products. The ASTM- scale shows a range of 0 ASTM (no colour) up to 8 ASTM (dark / nearly black colour). Products with low colour less than 0.5 ASTM are often measured by using the Saybolt colour (ASTM D-156). Both colour units are traditionally found by visual comparison of product samples with standardized colour glasses.

Modern inline colour measurement systems are much more reproducible than the human eye and the colour is observed permanently. A change in colour is often a good indicator for the final product quality. Therefore it is very important to detect a change in colour immediately. The observation of mixing ratios, dilution factors and decolourisation filters, distillation columns are typical applications. A constant colour value helps to increase plant efficiency and product quality.

## Typical applications for measuring the ASTM- colour value:

- Observation of separation in comparative distillation processes
- Colour measurement of oil (lubricating oil, hydraulic oil, heat oil, etc.)
- Colour measurement of fuel (diesel oil, kerosene, benzene, etc.)
- Observation of semifinished products

## The dual channel absorption measurement (model MoniSpec-AD / Messenger)

This principle of measurement is perfectly suited to monitor the ASTM- or Saybolt- colour values. The model MoniSpec-AD / Messenger operates according to this dual channel principle.

Each MoniSpec-AD Sensor is produced to customer specification, optimized for the requested application. Different optical path lengths (OPL), allow realizing the required measurement ranges. Interference factors such as coating of measurement windows, lamp aging, turbidity, etc. are compensated for by the single beam dual channel method. This will reduce maintenance and raise the long term stability of the measurement system.

The transmitter Model Messenger allows the operation of up to 2 sensors at the same time. The Messenger evaluates the absorption turbidity in addition to the colour values. Colour and turbidity can be monitored in parallel.

## Inline- Photometry

### The Detection of Colour in liquid Products

The physical science considers light as electromagnetic waves. Colour is defined as a light released sense impression mediated by eye. Colour is not a clear defined magnitude like e.g. temperature or pressure, colour is a subjective impression. A colour impression will be caused, in case electromagnetic waves of the visible spectrum (wavelengths of about 380nm up to 750nm) will fall on the eye. White light (colourless) consists from the summation of all colours of the visible spectrum. A colour impression accrues for the eye, in case a specific range of wavelengths within the visible spectrum will be absorbed.

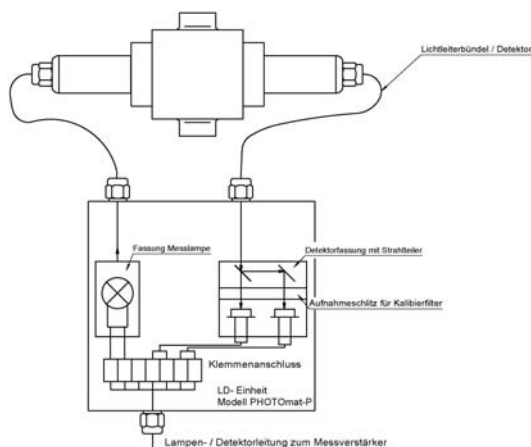
#### Comparison of absorbed Light Colour against Product Colour



The sensor model **MoniSpec-AD** uses the principle of dual channel light absorption to detect colour in liquids. The measurement channel detects colour and turbidity, the reference channel detects turbidity only. The difference between measurement and reference channel  $[(\text{colour} + \text{turbidity}) - \text{turbidity} = \text{colour}]$  provides the colour signal.

The sensor model **PHOTomat-AD** uses the same principle of measurement. Optical fibres separate flow cell and detection components. Two armoured fibres bundles go from the measuring cell to the LD- unit of the system. Lamp optics, reference detector and the measuring detector are located inside the LD- unit and not affected by process conditions, like temperature or pressure.

#### Model PHOTomat-AD / Messenger



#### Advantages:

- Low maintenance
- Calibration filter
- Calibration Interval typical 12 month
- Material of measuring windows: Sapphire
- Light transmission via armoured fibre bundles
- Pressure Rating: ANSI class 600 / PN64
- Temperature Rating: 180C°
- Active components (lamp & detectors) separated from process
- Optional cleaning jets / CIP & SIP capable

#### Typical Applications:

- Product Colour
- Hazen Colour in APHA
- ASTM D1500 & ASTM D156 (Saybolt) Colour

#### Model MoniSpec-AD / Messenger



#### Advantages:

- Low maintenance
- Calibration interval typical 12 month
- Material of measuring windows: Sapphire
- Pressure Rating: ANSI class 300 / PN16
- Temperature Rating: 140C°
- Installation: DIN, ANSI, SMS, NPT, APV, TH, ...
- Optional cleaning jets / CIP & SIP capable

- EBC Colour
- Lovibond Colour
- and many more!