chemtronic
Waltemode GmbH

Optical or Acoustic
Process measurement of liquids

- **Turbidity**
- **Colour**
- **Oil in Water**
- **Water in Oil**
- **Oil on Water**

Laboratory Turbidimeter Model TurbiLab-FS

What does turbidity mean?

Turbidity is an optical impression, which describes the characteristic of a transparent product, to scatter light. A focused light beam will be attenuated and scattered in hazy products, so that this product can become practically opaque in bigger layers.

What causes turbidity?

Turbidity is caused by particles in transparent products. A particle is defined as something with a different refractive index as the carrier product. Some examples of particles are minerals, yeast cells, metals, oil drops in water, milk in water, gas bubbles and aerosoles.

Measurement of turbidity

Turbidity is not a clearly defined magnitude like e.g. temperature or pressure. Turbidity is a subjective impression. For this reason turbidity measurement systems will be typically calibrated by using a comparison's standard such as Formazin or Diatomatious Earth (Kieselgur).

Turbidimeter Model TurbiLab-FS

Chemtronic Waltemode GmbH 40789 Monheim am Rhein Niederstr. 14
Phone: +49-(0)2173-57007 Fax: +49-(0)2173-56007 E-mail: info@chemtronic-gmbh.de Internet: www.chemtronic-gmbh.de

Description

The laboratory turbidimeter model TurbiLab-FS uses the principles of 12° forward- and 90° side scattered light, to detect suspended particles in liquids. The instrument detects the turbidity of the liquid only, product- or bottle colour will not affect the measuring results. The measurement will be done directly in a bottle or in a cuvette. The bottle respectively cuvette, turns around its own axis during the measurement cycle. The water inside of the measurement chamber equalizes scratches and unevennesses of the bottles. The measurement result is calculated from average of 200 measurements per bottle rotation. A ratio measurement of direct- / scatter light assure additionally for highly reliable and repeatable measurement results. Comparing 12° and 90° measurement results will allow conclusion of particle size distribution inside the measured liquid.
The device is factory pre- calibrated by using a Formazin suspension (internationally accepted turbidity standard). The typical calibration interval is 12 month. The measurement values will be displayed in EBC units, alternative in FTU, NTU or ppm (units can be switched by using the keypad).

The instrument used as a stand-alone unit and operated from its keyboard, allows:

Application examples:

- Turbidity of water
- Turbidity of wort
- Turbidity of unfiltrated beer
- Turbidity of filtrated beer
- Forcier Test

Model TurbiLab-FS with optional software package allows:

Application examples (kinetics):

- Monitoring & logging of the sedimentation process of yeast
- Monitoring & logging of the yeast activity
- Monitoring & logging of the sedimentation process of DE (Kieselgur)
- Monitoring & logging of the sedimentation process of PVPP

Model TurbiLab-FS with optional software, dosage pump, temperature stabilized measurement chamber and magnetic stirrer upgrades the unit to a titrator. The Windows software controls the measurement cycles and the dosage pump for the reagents. This optional titration unit is particularly designed for haze developing titrations.

Application examples (titration):

- Tannoid content test[1] (Polyphenol reaction)
- Sensitive protein content[2]
- SASPL (saturated ammonium Sulphate precipitation limit)[3]

[1]accuracy 3mg/l (1mg/l with optional temperature stabilized measuring chamber)
[2]accuracy 10% (5% with optional temperature stabilized measuring chamber)
[3]accuracy 0,3ml/10ml (0,1ml/10ml with optional temperature stabilized measuring chamber)

Technical Data

- Principle of measurement: 12° & 90° scatter light (ratio direct light)
- Measuring range 12°: 0-80EBC / 0-250 NTU / 0-250 FTU / 0-500 ppm (auto ranging)
- Measuring range 90°: 0-250EBC / 0-1000 NTU / 0-1000 FTU / 0-2000 ppm (auto ranging)
- Resolution:
  0,01EBC at 0-10EBC
  0,10EBC at 10-100EBC
  1,00EBC at 100-250EBC
- Accuracy: better than 2%
- Light source: LED 650nm Mebak conform (or 860nm conform ISO7027 / EN27027)
- Optical receivers: Si- PIN photo diodes
- Measurements:
  Directly in bottles: e.g. 1,5l PET, Euro bottle, NRW bottle, wine bottles, etc. (max. Ø100mm)
  Standard test tubes OD=25 mm (minimum sample volume 20ml)
- Acquisition time: 7s (standard)
- Backlit LC-Display (two lines, sixteen characters)
- RS-232 interface (alterative blue tooth or USB)
- Supply voltage: 230V/50-60 Hz
- Power consumption: max. 12 W
- Dimensions: 450 x 300 x 500mm
- Weight: 10 kg

Optional features:

- Software package
- Magnetic stirrer with constant speed (300 rpm)
- Single speed piston dosing pump (1µl/h to 1700ml/h)
- Temperature stabilized measuring chamber (external temperature stabilization unit)