PRODUCTION EXPERTISE



AUTOMATIC GLASS DENSITY TESTER ADT 2.0

Fully automatic measurement of the density of transparent and opaque glass samples according to the Settling Method



Application

The density of glass is dependent on its chemical composition and is therefore an important indicator for the stability of the glass production. With the Automatic Density Tester the physical density of up to 6 glass samples can be determined at the same time with high precision. The measurement is carried out fully-automatically and can be performed within hours. The Density Tester is therefore a simple and compact instrument for modern quality assurance and production monitoring.

Measuring procedure

The density of the glass samples is determined with the Settling Method according to M. A. Knight. Up to 4 glass samples of the same probe are inserted into each test tube together with an additional reference sample, whose density has been determined according to Archimedes' principle. The test tubes are filled with a special liquid, whose density is adjusted at

normal temperature, so that the samples swim on the liquid at test start. During the measuring, the temperature in the water bath is increased slowly and continuously at approximately 3 K/h.

The density of the liquid in the test tubes decreases linear with the increasing temperature, so that samples sink according to their actual density and activate the light barrier.

Through the light barrier alarm the actual temperature is registered and is related to the samples. The density of the glass samples is determined by a temperature comparison with the reference sample and is recorded alternatively as an absolute density or as a density difference. The actual measuring data in each test tube can also be read during the measuring, without disturbing the measuring procedure.

After having reached the final temperature the heating is switched off and the water bath is cooled. Initial and final temperature as well as heating speed can be adjusted individually. The regular darkening of the density liquid is compensated by an automatic adjusting of the light density .

Assembly and function

The Automatic Glass Density Tester consists of the following components:

- six test tubes with high density liquid (bromnaphtaline/ tetrabromethanemixture) for six glass probes
- water bath with circulating pump for tempering the test tubes
- regulated heating with overheating safeguard of the water bath
- heat exchanger with cooling-water connection (regulated via solenoid valve) to reduce the temperature of the water bath
- PT-100 transmitter with graduation by 1/10 degree divisions and 12 Bit A/D converter to measure the temperature of the density liquid
- six mantenance-free, self-calibrating infrared-light barriers with ambient light filters and 8 Bit A/D converter for measurement recording
- electronics for control of the measuring process and analysis of the measuring results
- control panel with foil keyboard and background lighted LCD display for in and output of measuring parameters and results
- parallel interface for printing the measuring results

Technical data

Housing Heating Circulating pump Tempering medium Density liquid

Measuring range Measuring accuracy Measuring time Sample size Power supply Ambient temperature Dimensions Weight PVC, white max. 100W 35 W distilled water Mixture of 1-bromnaphtaline and 1, 1, 2, 2-tetrabromethane approx. 1,5 bis 2,9d g/cm3 \pm 0,0002 g/cm3 typical 2 h, min. 1 h approx. 5 bis 10 mm edge length 230 V / 50 Hz or 115 V / 60 Hz (optional) approx. 20 to 30°C 365mm depth, 630mm width, 300mm height approx. 25kg