HDT Vicat Tester / Computerized Model 3 Station

Description

HDT and Vicat Instruments

Standard-compliant testing to:

- ISO 75, ASTM D648
- ISO 306, ASTM D1525
- ISO 2507

AHP offers an instrument with a fully automated test sequence for convenient and easy testing in the field of research and development, incoming goods inspection, production monitoring and for teaching and training purposes. All standards to ISO 75, ISO 306, ASTM D1215 and ASTM D648 are covered with the tests.

Application

AHP offers an automated **HDT/Vicat tester with a fully automated test sequence** for determining Vicat softening and heat deflection temperatures up to 300 °C to ISO and ASTM standards:

- Determination of the **heat deflection temperature (HDT)** according to ISO 75 parts 1 to 3 and ASTM D648 on thermoplastics, ebonite, as well as fiber-reinforced and filled curable plastics.
- Determination of the **Vicat softening temperature (VST)** according to ISO 306 and ASTM D1525 on thermoplastics and according to ISO 2507 on pipes and fittings made of thermoplastics.

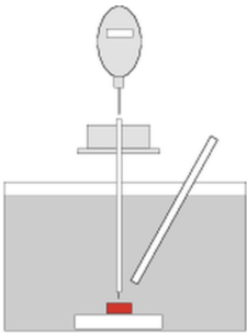
The heat deflection tester is designed for convenient **testing in the fields of research and development, goods inwards checks and production monitoring**. Depending on requirements, the instrument can be equipped with 1, 2, 3 test stations, allowing HDT and Vicat tests to be carried out in

parallel and independently.

Determining the Heat Deflection Temperature

Many plastics applications are placing increasing demands on heat resistance. An important value with regard to the temperature resistance of plastics is the heat deflection temperature. This can be divided into Vicat softening temperature and HDT. In both methods an oil-bath is heated at a defined rate and the temperature is recorded at a deflection or indentation depth specified by the standard.

- Vicat softening temperature to ISO 306 and ASTM D1525 , ISO 2507 (VST: Vicat softening temperature)
- Heat deflection temperature ISO 75 ASTM D648 (HDT: heat deflection temperature)

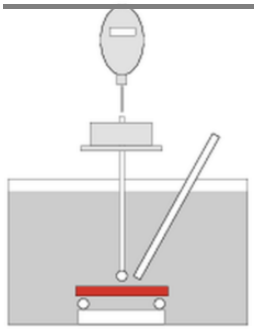


Vicat Softening Temperature (VST) to ISO 306

The indenter is placed on the plastic specimen and loaded with a defined test weight. The specimen is then heated at a specified rate. The VST is obtained when the needle penetrates to a depth of 1 mm. ISO 306 and ASTM D1525 are identical with regard to the test sequence.

ISO 306 distinguishes between 2 procedures and 2 different heating rates, totaling 4 different test methods in all:

- Method A 50 = 10 N load, heating rate 50 K/h
- Method A 120 = 10 N load, heating rate 120 K/h
- Method B 50 = 50 N load, heating rate 50 K/h
- Method B 120 = 50 N load, heating rate 120 K/h



Heat deflection temperature to ISO 75 (HDT)

Heat deflection temperature to ISO 75 (HDT)

The heat deflection temperature (HDT) to ISO 75 indicates the relative behavior of different types of material under load at elevated temperatures. It is determined on materials such as thermoplastics, hard rubber …

Test procedure

For the test to ISO 75, a specimen is placed in a 3-point flexure test kit and loaded with the test weight required to achieve the flexural stress specified in the standard. The temperature is then increased at a uniform heating rate of 120K/h. The temperature at which the specimen reaches the deflection specified in the standard is determined.

Parameter for tests to ISO 75

- **Deflection**: Deflection is specified by ASTM as an absolute deflection of 0.25 mm; ISO standards define an increase in flexural strain of 0.2%.
- **Specimen positioning:** The standard also specifies how the specimen is to be positioned on the anvil: flatwise or edgewise.
- **Flexural stress**: The standards also specify different flexural stresses:

ISO 75

- Method HDT A: flexural stress = 1.8 MPa
- Method HDT B: flexural stress = 0.45 MPa
- Method HDT C: flexural stress = 8.0 MPa

ASTM D 648

- 1.82 MPa and 0.455 MPa
- Duropl. laminates:1/1000 of flexural Young’s modulus

ISO 2507

Test weight

Accurate measurement of specimens before the test, or the use of precisely identical specimens, is therefore extremely important with this method.

Advantages

- The use of a digital measuring system ensures high accuracy with uniform calibration for HDT testers and Vicat testers.
- The automated test sequence makes operation very easy. The test is started once, after which no additional interaction is required.
- The safety device offers maximum protection for the operator
- It is operated via PC
- Testing software provides powerful functionalities, such as measured value and control graphics, result determination, data storage, and export functions.
- Automatic lowering of the measuring stations
- Oil cooling coils for fast start of successive tests

HDT-Vicat Tester from AHP

- USB port to connect to the computer (When the machine is delivered with Embedded PC+Display) then there is no need for an external connection and the operator has full functions of a standard PC
- Graphing data of temperature, time, displacement
- PLC based
- Connection of cooling water from back side
- Includes brass pipes inside chamber for fast cooling
- Automatic valve control of cooling water connection
- Automatic Vicat and HDT temperature determination from the graph
- According to ISO 75 , ISO 306 , ASTM D 648 , ASTM D 1525
- Pneumatic sample elevator
- Number of stations as per customer request (basic is two station)
- Digital indicator for needle depth
- Temperature increase rate as per standard
- Digital timer included
- PID temperature control
- Bath circulation system
- Weight 50N (specific weights are as option)
- Automatic temperature increase rate control vi software
- Over temperature control thermostat
- Training video included
- Including mechanical stirrer for spatial temperature homogeneity

- Stirrer motor speed control
- SS304 bath
- Basic machine is only Vicat softening point and other fixtures for HDT testing is as option. (Please note when you are placing order)
- Basic machine has two station other number of stations are as option
- For the model of HDT-Vicat there are stations for placement of samples for both HDT and Vicat testing
- Easy replacement of resistance heating elements (flange type)
- Easy replacement of temperature sensor from back side

ISO 306 Vicat Test Method