

HDT VICAT AUTO



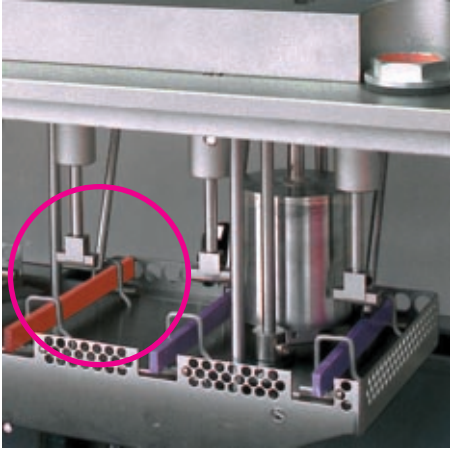
DESIGN AND PRODUCTION OF
INSTRUMENTS AND APPARATUS
FOR QUALITY CONTROL
ON MATERIALS



These instruments are made in
compliance with CE health
and safety requirements



HDT VICAT Auto - code 6970.000
HDT VICAT Auto Plus - code 6971.000



HDT test station

“HDT” test means: determination of temperature of deflection under load

Field of application

The test determines the temperature at which a specified deflection occurs when a standard test specimen is subjected to a bending stress, to produce one of the nominal surface stresses according to international standards. This test is very important for both quality control and research into plastics because it determines the heat resistance characteristics of materials, and is indispensable to define precisely the thermal behaviour of the polymers. The values obtained are indicative of the heat resistance characteristics of materials, and in specific case directly applicable for design purposes.

Method

The specimen, in the form of a rectangular bar of dimensions complying with the chosen standard, is tested as a simple beam with a load applied at midspan to produce a maximum, nominal surface stress according to the chosen standard. The test assembly, with the loaded specimen, is then immersed in a heat-transfer medium, equipped with a system capable of increasing the temperature linearly at a uniform rate (generally 2 °C/min).

When the specimen reaches a specified deflection the temperature is recorded.

This value is indicated as the Temperature of Deflection Under Load, T_f , in degrees Celsius of the material under test.

“VICAT” test means: determination of the VICAT softening temperature

Field of application

The test determines the temperature at which a standard indenter penetrates 1 mm under the surface of a test specimen under load. It is used to establish the differences between many types of thermoplastic materials and compounds with regard to their softening properties.

Method

An indenting tip of 1 mm² circular cross sectional area is placed on the specimen and is loaded with a constant force (10 N or 50 N depending on the standard method used). The test assembly, with the loaded specimen, is immersed in a heat-transfer medium equipped with a system capable of increasing the temperature linearly at a uniform rate (generally, 50° C/hour or 120° C/hour).

The temperature, when the needle has penetrated 1 mm into the specimen, is recorded.

This temperature, expressed in °C, is indicated as the VICAT Softening Temperature of the material under load.

Standards

Designed and built to meet the following standards:

“HDT” TEST

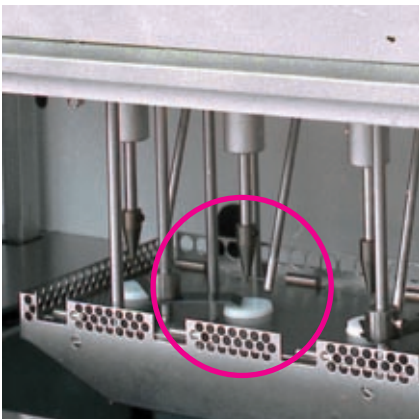
ASTM D 648 - ISO 75 - DIN 53461 - BSI 2782 - Met 121 C - NT T 51-005 - UNE 53075

and others equivalent.

“VICAT” TEST

ASTM D 1525 - ISO 306 - DIN 53460 - BSI 2782 - Met. 120 C - NT T 51-021 - UNE 53118

and others equivalent.



VICAT test station



HDT VICAT Auto - code 6970.000



HDT VICAT Auto keyboard and display

HDT VICAT Auto Features

The automatic HDT VICAT Auto has been designed and developed by CEAST to perform heat Distortion Temperature and Vicat Softening Temperature tests on six independent test stations up to the temperature of 300°C.

This new microprocessor-based apparatus applies the latest electronic technology to the field of polymer testing. It generates continuous data throughout ramped and constant temperature tests, and is therefore useful for investigating DILATATION COEFFICIENT, ELASTIC MODULUS and CREEP.

HDT VICAT Auto Plus Features

The automatic HDT VICAT Auto Plus can be considered as the natural evolution of HDT VICAT Auto. Based upon the HDT VICAT Auto, equipped with a solenoid valve for the automatic regulation of nitrogen flow rate over the oil bath and with an enhanced safety control, it allows to perform HDT and VICAT tests up to 375°C, a very high temperature reachable by an oil bath based instrument. The instrument has all the other features which are the same of the HDT VICAT Auto.

High work and easy operation

The HDT VICAT Auto and the HDT VICAT Auto Plus are designed for maximum throughput of specimens in busy laboratories with a high work load. All six stations are automatically raised and lowered by a mechano-pneumatic system at the beginning and end of tests. An independent pneumatic system applies the selected weights after the pre-heat time (if necessary), and then removes them at test end.

When the selected cooling temperature is reached, all stations are automatically raised ready for insertion of the next batch of specimens. With 6 stations, it is possible to perform HDT and VICAT tests simultaneously at the same temperature ramps conditions.

Creep Tester

The HDT VICAT Auto and the HDT VICAT Auto Plus are well suited to measure flexural Creep (2 mm max. sample deflections) both under isothermal and not isothermal condition. Creep limited to crucial deflection and using appropriate software code 0710.443.

Elastic Modulus

The elastic modulus function of temperature can also be calculated by the HDT VICAT Auto and the HDT VICAT Auto Plus using experimental data.

Dilatation Effects

The HDT VICAT Auto and the HDT VICAT Auto Plus permit also to evaluate the negative deflection during the initial part of the test.

This is normally attributed to dilatation coefficient of specimen. Coefficient can be useful project of moulded pieces.

Safety

The instruments are designed to comply with European safety directives.

| Technical Data | |
|---|---|
| Number of stations | 6 |
| Test capabilities | HDT, VICAT, CREEP, HDT and VICAT tests at the same time, DILATATION, MODULUS with dedicated software (optional) |
| Temperature range | + 20 ÷ +300°C (in HDT VICAT Auto) + 20 ÷ +375°C (in HDT VICAT Auto Plus) |
| Thermal distribution | ± 0.5 at 300°C |
| Thermal stability | ± 0.5 at 300°C |
| Temperature preset accuracy | ± 0.2°C |
| Temperature resolution | 0.1°C |
| Temperature ramps selectable via keyboard | 120 ± 10°C/h (12±1°C/6 min) 50 ± 5°C/h (5±0.5°C/6 min) Operator may select any other rate between 50 and 120°C/h |
| Temperature measurement | 1- bath control (PT 100 Ω calibrated thermorsistance) 1- each station (PT 100 Ω calibrated thermorsistance) optional |
| Deflection/penetration measurement | LVDT |
| LVDT accuracy for each station | ± 0.001 mm |
| Automatic compensation for thermal expansion for each station | yes |
| Built-in microprocessor to carry out instrument processing with PID heating control | yes |
| Electronic control with alphanumeric polyfunctional keyboard | Liquid Crystal Display 128 x 240 points CPU board and amplifier system included |
| Graphic display | Graphs, parameters |
| Deflection/penetration trasducer zeroing | automatic |
| Cooling system at test end | automatic |
| Cooling time from 200 to 50 °C | 20 min approx. |
| Separate water chiller (code 6975.000) | optional |
| Autocheck during test execution | yes |
| Nitrogen diffuser and valve (a manual valve for HDT VICAT Auto and a solenoid valve for the HDT VICAT Auto Plus), to create a layer of Nitrogen to prevent the heat transfer medium from degrading at high temperatures | yes |
| Nitrogen bottle and connections (separate) | optional |
| Oil pumps | 2 |
| Oil level dipstick | yes |
| Safety thermostat | yes |
| Heat transfer fluid | 20 kg |
| Binary mass system (one set for each station) consisting of a set of 13 masses to cover all HDT and VICAT tests using any mass from 67 to 5140 g in steps of 1 g | ancillary |

| Technical Data | |
|--|---|
| HDT Test | |
| HDT capability to test sample in flatwise or edgewise position with 64 or 100 mm fixed span according to international standards | yes |
| HDT with variable span from 60 to 210 mm according to ISO 75-3 | yes (on request) |
| Automatic calculation and list of masses to apply to reach defined stress according to norms | from 0.450 - 0.455 - 0.500 - 1.80 - 1.82 - 5.00 to 8.00 MPa |
| HDT testing heads complete with traceable certificates | one for each station |
| HDT positioning tool for HDT head positioning | optional |
| VICAT Test | |
| 10 N and 50 N masses (1 set for each station) for VICAT tests only | Optional (alternatively for VICAT and HDT tests see Binary mass system) |
| VICAT testing heads complete with traceable certificates | one for each station |
| Data Acquisition | |
| Parallel port for test printout | yes |
| RS 232 serial port for connection with PC | yes |

| Technical Characteristics | |
|----------------------------------|--|
| Overall dimensions [mm] | 1490 x 810 x 740 |
| Weight [kg] | 200 |
| Supply | 230 V - 50 Hz - Singlephase (110 V - 60 Hz on request) |
| Power [W] | 4000 |
| Paint | fuchsia RAL 4006 - gray RAL 7035 |
| Compressed air (6 bar) | required |

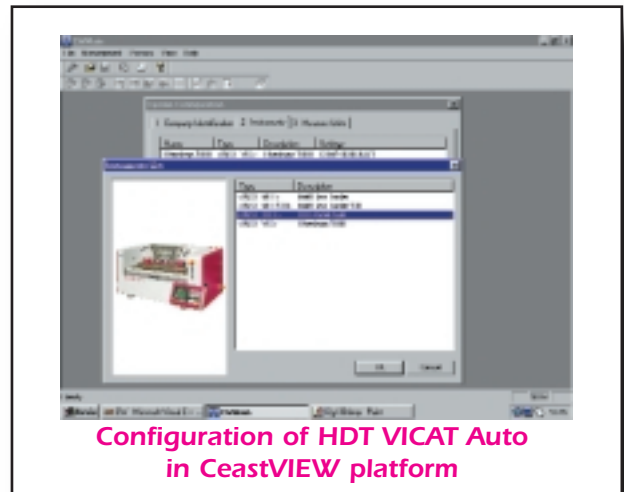
CEAST Software Available for HDT VICAT Auto

"VisualTHERM" software - code 0710.500.

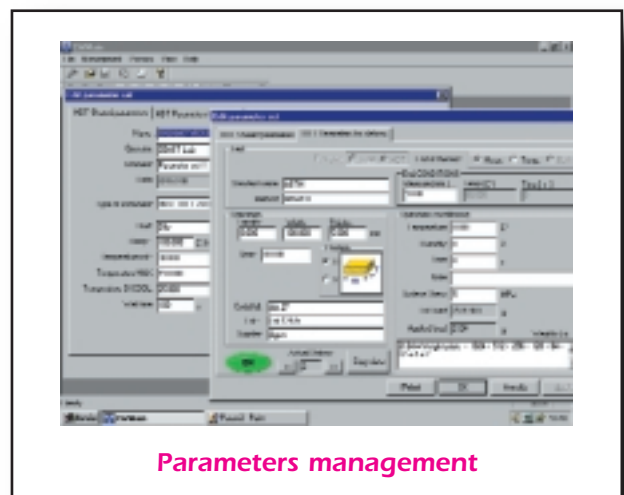
VisualTHERM is the software developed by Ceast for the complete management of both HDT VICAT Auto and HDT VICAT Auto Plus. This software is based upon the CeastVIEW platform.

As for all CeastVIEW based software, the extraordinary information organization, which the software is based upon, makes the management of HDT and Vicat Softening Temperature tests very simple and functional. The software accessibility, together with the password management on three levels according to the Module Operator and with the availability to run the program in demo version, make the whole system perfectly suitable to the most advanced organization of laboratories. Both the HDT VICAT Auto and the HDT VICAT Auto Plus are managed by the same software. If, during software configuration, the HDT VICAT Auto Plus has been chosen, an additional option is implemented: it is possible to select the heat medium fluid temperature at which the insulating Nitrogen will be diffused.

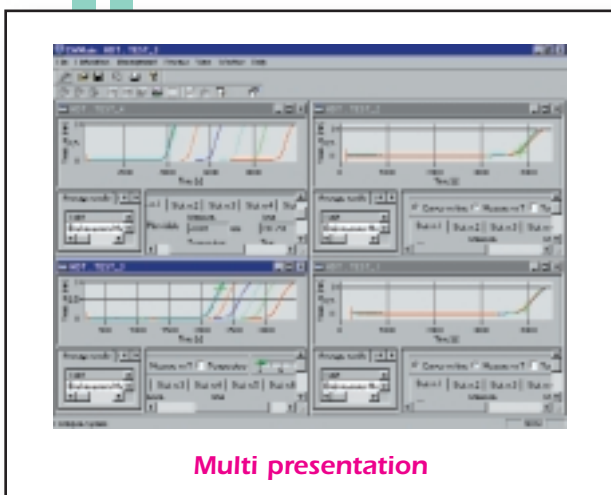
For further details please revert to the software leaflet.



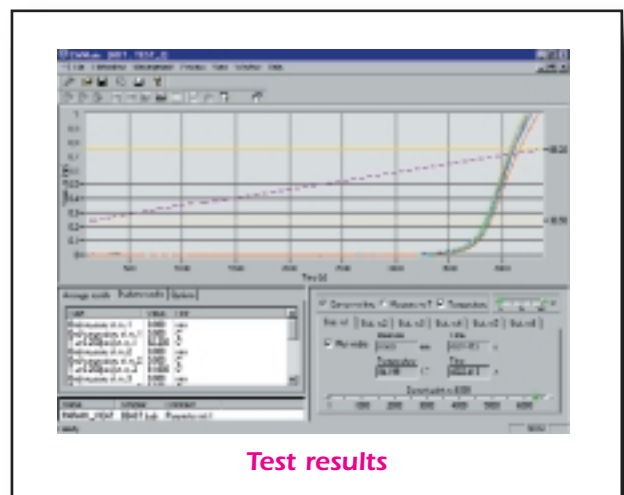
Configuration of HDT VICAT Auto in CeastVIEW platform



Parameters management



Multi presentation



Test results

"Due to the continuous development policy of CEAST's Research and Development Department, changes may be introduced without notice"



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