HDT Vicat 4U
The new generation - user friendly, ergonomical and modular
The State of the Art!

The HDT Vicat 4U in semi- or fully automatic version is designed as a modular instrument for any application. Whether in the control lab of incoming material, monitoring of the production run or in the research and development of polymer materials as well as for education purposes. This modular HDT-Vicat tester is the best choice for almost every use.

This microprocessor-controlled HDT Vicat tester is able to run simultaneous but also independent tests with up to 4 specimens in semi-or fully automatic mode. The control of the instrument is exclusively done by our multifunctional testing software program k-BASE. The almost free configuration of parameter sets allows a unlimited flexibility in the test preparation as well as during the performing of the tests.

The following tests can be perfomed depending on the instrument configuration:

► Determination of heat resistance temperature HDT (Heat Distortion Temperature) on thermoplastics or fiber-reinforced thermosetting plastics

► determination of the Vicat softening temperature VST of thermoplastic materials

► determining of the creep behaviour while performing a three-point-bending test

Features:

- Universal, semi- or fully automatic HDT/Vicat Tester
- Modular system (upgradeable)
- Automatic correction of the coefficient of linear thermal expansion
- Fully digital LVDT (path mesurement) with a resolution of 0,001 mm
- Air bearings guarantee a nearly friction free test performance
- Temperature measurement at each station (HDT or VICAT) by PT 100 (1/3 DIN)
- Inertgas overlay
- Inbuilt cooling pipe for a quick and efficient back cooling
- Programming, test run and evaluation by our k-BASE Software platform
- Automatic - fully digital - calibration procedure via our k-BASE software program

HDT (Heat Distortion Temperatur)
• DIN EN ISO 75, ASTM D 648, JIS K 72o7

VICAT (Vicat Softening Temperature)
• DIN ISO 3o6, ASTM D 1525

CREEP Test
• EN ISO 899-2

Standards

TECHNICAL INFORMATION

Testing methods:

HDT-Test

HDT edgewise

The determination of the heat deflection temperature (HDT or HDTUL) according ISO 75 or ASTM D 648 records the temperature at which a polymer sample, which usually is non deformable at room temperature, is deformed under a specified load. A specimen (thermoplastic material, incl. filler or fibre-reinforced) will be tested at a constant flexural stress*), in accordance with the simple 3-Point bending test. The test will be done in an electrically heated oil bath while the temperature increases at 2°C/min.
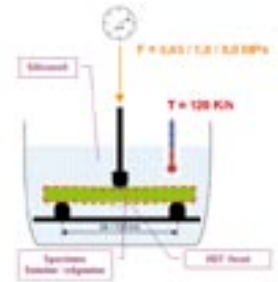
If the deflection (additional strain of 0.2%), measured in the middle of the sample support is reached (e. g. 0.32 mm), the temperature (HDT) of the heat transfer fluid nearby the specimen is measured.

*) Requested outer fibre (flexural) stress:
Method HDT A: Fibre stress σ = 1.8 N/mm² or MPa (constant),
Method HDT B: Fibre stress σ = 0.45 N/mm² or MPa (constant),
Method HDT C: Fibre stress σ = 8.0 N/mm² or MPa (constant)

VICAT-Test

VICAT-Support

This method determines the softening temperature as a characteristic value for the behaviour of thermoplastics while heating according ISO 306 or ASTM D 1525. The indentation head is a specific Vicat needle with a round cross section. Charged by a defined load, the needle penetrates into a thermoplastic specimen when using a temperature rate of 50 or 120 K/h. If the penetration depth of 1 mm +/-0.01 mm is reached, the temperature value at this point is preserved as Vicat softening temperature in °C.
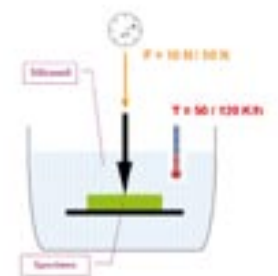
*) Requested loads:
Method A with a load of 10 N,
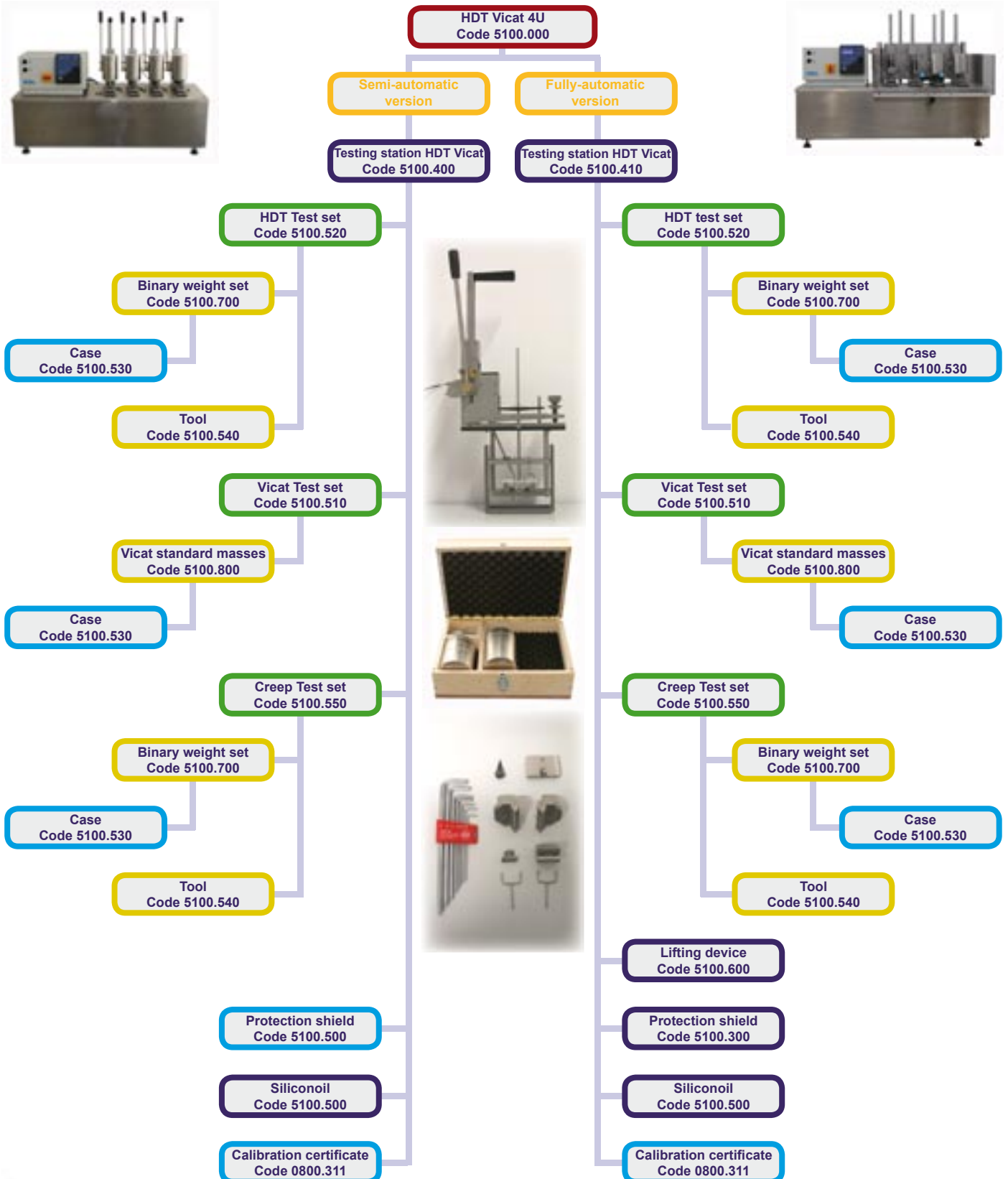Method B with a load of 50 N

Creep-Test

Creep-Test

In this method, the deflection of a specimen in 3-point - bending mode at constant temperature and constant load will be recorded via time. From the deflection, the span distance, the height of the sample, and the bending stress, the creep modulus and the strain will be calculated.

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TECHNICAL INFORMATION
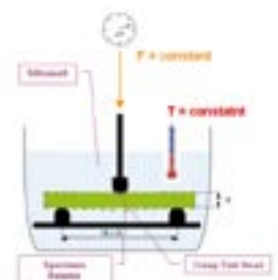
Configuration:

```
                          HDT Vicat 4U
                          Code 5100.000
                    ┌──────────┴──────────┐
          Semi-automatic              Fully-automatic
             version                      version

     Testing station HDT Vicat    Testing station HDT Vicat
          Code 5100.400                Code 5100.410
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Semi-automatic version

- HDT Test set — Code 5100.520
  - Binary weight set — Code 5100.700
    - Case — Code 5100.530
  - Tool — Code 5100.540
- Vicat Test set — Code 5100.510
  - Vicat standard masses — Code 5100.800
    - Case — Code 5100.530
- Creep Test set — Code 5100.550
  - Binary weight set — Code 5100.700
    - Case — Code 5100.530
  - Tool — Code 5100.540
- Protection shield — Code 5100.500
- Siliconoil — Code 5100.500
- Calibration certificate — Code 0800.311

Fully-automatic version

- HDT test set — Code 5100.520
  - Binary weight set — Code 5100.700
    - Case — Code 5100.530
  - Tool — Code 5100.540
- Vicat Test set — Code 5100.510
  - Vicat standard masses — Code 5100.800
    - Case — Code 5100.530
- Creep Test set — Code 5100.550
  - Binary weight set — Code 5100.700
    - Case — Code 5100.530
  - Tool — Code 5100.540
- Lifting device — Code 5100.600
- Protection shield — Code 5100.300
- Siliconoil — Code 5100.500
- Calibration certificate — Code 0800.311

TECHNICAL INFORMATION

HDT Vicat 4U
Code 5100.000

Basic Instrument HDT-Vicat 4U

The basic unit HDT Vicat 4U can be equipped with up to 4 testing stations (code 5100.400 or 5100.410). Basically, the ISO standard asks for a dual determination (2 specimen per test run), so that the basic unit should be equipped with at least 2 testing stations.

The following components / accessories are standard scope of supply in the basic unit:
- Control unit
- Bath cover for not used stations
- Software k-BASE
- Technical documentation

We recommend the following accessories for an operational testing:
- 2 testing stations (5100.400 or 5100.410)
- Accessories for HDT-, VICAT- or Creep-Test
- Siliconoil

Necessary options

Necessary options

Options for an instrument used in semi-automatic mode:
- Testing station, Code 5100.400 (Number: 1 .... 4 Pcs.) with accessories (see particular options)
- Siliconoil, Code 0800.418 or HT Siliconoil
or:
Options for an instrument used in fully-automatic mode:
- Testing station, Code 5100.410 (Number 1 .... 4 Pcs.) with accessories (see particular options)
- Lifting device for test station and masses, Code 5100.600
- Protection shield, Code 5100.300
- Siliconoil, Code 0800.418 or HT Siliconoil

Particular options
(at least 1 set necessary)

Particular options (at least 1 set necessary)

Each test station can be equipped with one of the following test sets:
- HDT test set, Code 5100.520 with accessories (see combinable options)
- VICAT test set, Code 5100.510 with accessories (see combinable options)
- CREEP Test set, Code 5100.550 with accessories (see combinable options)

Combinable option

Combinable options

- Each HDT Test set, Code 5100.520 requires a binary weight set
- Each VICAT Test set, Code 5100.510 requires standard Vicat masses (alternatively, also the binary weight set can be used for)
- Each CREEP Test set, Code 5100.550 requires a binary weight set

The tool, Code 5100.540 is necessary only once!

Further possible options

Further possible options

- Each case can contain upto 2 set of masses with accessories
- The protection shield can be ordered as an option for the semi-automatic instrument (the fully automatic instrument requires absolutely the protection shield)

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TECHNICAL INFORMATION

k-BASE Software:

Our **k-BASE software** as a multifunctional software platform is taking into account the current Microsoft ® technology. Previous programs can also be used after an update (Service Pack) to the current version of our software program.

The connection of the instruments is made by RS 232 or USB to a standard PC or laptop.
The software can be installed on any computers in your corporate network. Thus, you have various access to your data.
This is possible even without the connection of an instrument and you can:
- create parameter sets and/or
- evaluate or work on existing tests.

Language change

Online change of languages

K-BASE is available in different languages, where the change of languages can be done online. It suffices a simple mouse click.
Thus, the test report can be printed in another language, saved as a PDF file, if necessary, sent via email to the customer.
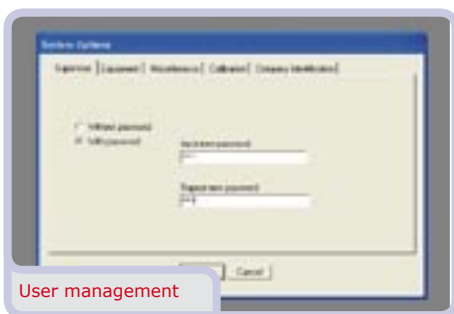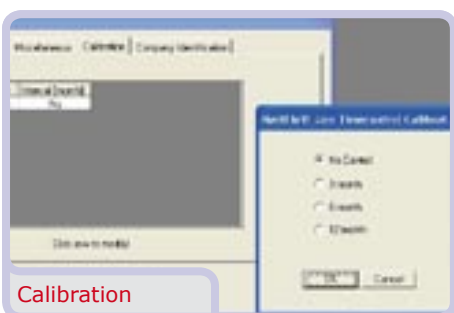

User management

User management

With k-BASE, specific program areas can be restricted. The setting of a password, different functions of the software to a specific user group (operator) can be hided.

Under this user administration and the individual user definition, it can be documented any time who and when has worked with k-BASE.
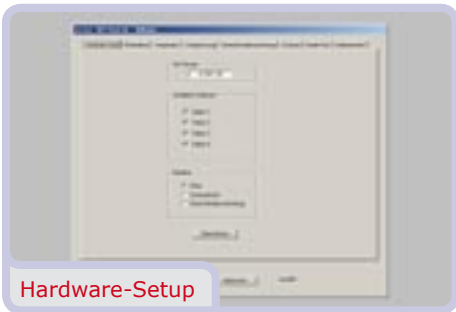

Calibration

Calibration

k-BASE reminds you automatically to the specified (predetermined by the administrator) calibration intervall - without any further obligation!
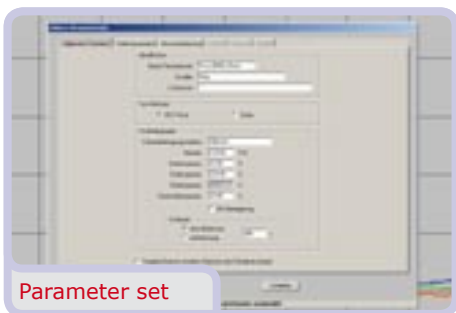
Hardware-Setup

Due to the modular construction, k-BASE is always in a position to adjust a new instrument configuration.
If you want to upgrade or expand your instrument at a later time - it is possible through a simple hardware setup done by the software at any time and without any additional expense (additional wiring or EPROM change).
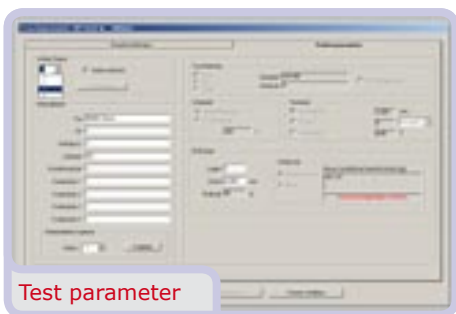
Hardware-Setup

Parameter set

Your test parameter have to be entered in k-BASE only once. K-BASE separates the main input parameter from the individual test parameters (e.g. material data, etc.). This saves time while performing of tests. A input specified field monitoring prevents false entry.
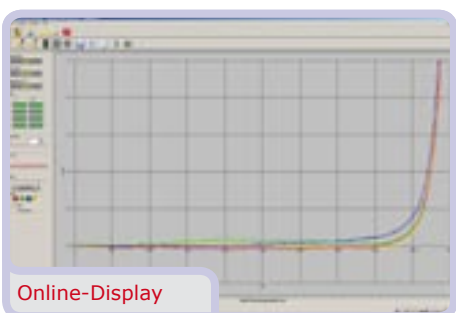
Parameter set

Test parameter

With k-BASE the test can be performed easily and efficiently. Your individual test parameters can be independently programmed or copied from a performed test. A convenient search function supports the selection.
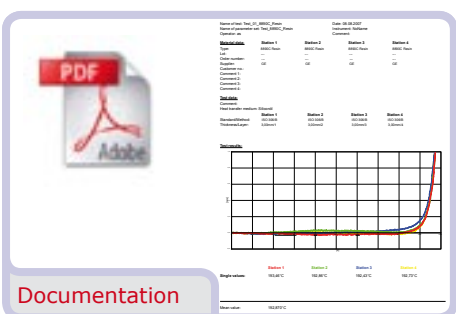
Test parameter

Test run

With k-BASE you can display your actual test results online. The results will be displayed online during the test.
A discontinuation of the measurement is possible at any time, whereby the results will be evaluated until the time of the break off.

Online-Display

Documentation

K-BASE will record and document your data clearly and according the standard. All relevant test conditions, material data, parameters, etc. are documented according the standard.
If reasonable and acceptable, a post-processing can be made at any time.

Documentation

TECHNICAL INFORMATION

Technical data:

	HDT Vicat 4U
Number of testing stations	1 4
Dimensions	
W x H x T (mm), max. (depending on configuration)	1020 x 690 x 520
Weight (kg), approx.	75 kg
Temperature data	
Temperature range (°C)	max. +300°C
Temperature deviation timely (K)	max. +/- 0,3 K
Heating ramp (K/h)	50 ... 120
Cooling system	Water or cooling medium
Heat transfer medium	Siliconoil (special type)
Temperature measurement	via 1 PT 100 each station
Other data	
Measuring range path measurement (mm)	6
Resolution path measurement (mm)	0,001
Accuracy path measurement (mm)	≤ +/- 0,01
Electrical data	
Nominal voltage (±10 %) 50/60 Hz (V)	110 / 230
Power (W), approx.	3000

Further features:

- **Automatic adjustment of the measuring range**
- **Free weight apply** - allows the change of masses without subsequent adjustment of the LVDT transducer
- Special materials combination also allows tests on non-standarized specimen
  - especially when testing specimen taken out of finishing parts
- Test **without** prior **calibration** of the measuring range
- **Adjustable specimen supports** allow standarized test according ISO 899-2
- **Individual** and **independent** (soft- and hardware) configuration of the testing stations
- **Pump** instead of agitator - enables a homogeneous and smart fluidization
- **Pump pressure adjustable** - allows an adjustment depending of the oil viscosity
- Nitrogen overlay on the **entire** bath surface
- Hard- and software support of the **Plug-and-Play technology -** therefore a faster and cost reduced after sales is possible
- **Digital calibration (!)**
- **Modular design allows an upgrade of the instrument - even on site!**
- **USB port**

TECHNICAL INFORMATION

The whole world of Karg Industrietechnik: www.karg-industrietechnik.com

You can find what ever you like to know about us and our products under:

www.karg-industrietechnik.com

Beside any information, news, exhibitions you have also the opportunity to get in touch directly with your responsable sales manager.

We supply quality control instruments for:

- Plastic industry
- Automotive industry
- Laboratories / Universities / Technical high schools
- Electronic industry
- Rubber industry

Due to continuous development policy, changes may be introduced without any notice!

Competence in material testing

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