

Low Temperature Check

Automatic instrument for the determination for both TR TEST and BRITTLENESS POINT

Tests at low temperatures permit to evaluate the crystallization effects and to compare viscoelastic properties of rubber and rubber-like materials at low temperatures. Temperature Retraction and Brittleness Point tests are useful for the selection of materials suitable for low-temperature service.

Instrument characteristics

The structure of the Low Temperature Check has been designed to permit the installation of arrangements for TR and Brittleness point tests. The structure includes all common parts required for low temperature testing:

- 5 litres thermal insulated stainless steel bath for cooling liquid.
- heat exchangers for bath cooling
- thermal resistance for bath heating
- PT 100 thermal sensor and PID thermoregulator with 0.1°C accuracy for the automatic regulation of both cooling and heating
- stirrer for bath homogenization
- compressed air pressure control and cleaning system.
- electronic card for the complete control fitted with usb port for connection to pc.
- safety devices: independent bath overheating controller, thermal switch, pneumatic lock for sample holders

Cooling system

The bath cooling devices provided by Gibitre can be either a nitrogen tank or a refrigeration unit.

The regulation of the cooling is automatically controlled by the instrument according to the temperature set of the test procedure in use.

Temperature retraction test

The arrangement for TR test includes:

- Sample holder for the simultaneous test of 6 samples
- Pneumatic lifting system for the easy handling of the sample holder
- Windows bases software for TR test performance

The Sample Holder makes it possible to:

- carry out simultaneous testing on 6 samples.
- read automatically the retraction of each sample with 0.06 mm resolution
- lock sample position in extended position during test preparation
- automatically release of test

samples at the end of the conditioning time.

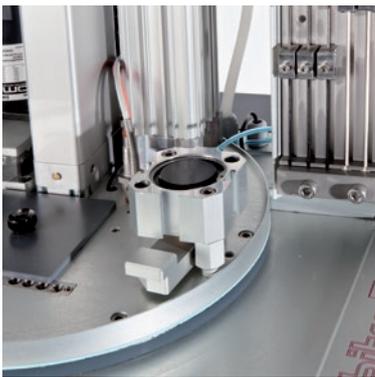
The software permits to prepare and store test procedures with custom defined test conditions.

When the test procedure to be used has been selected:

- the user is asked to insert test identification, sample length and percentage elongation for each group of samples (up to 3 groups of samples can be tested simultaneously)
- the temperature of the cooling bath is automatically adjusted to



- the set value for sample immersion.
- when the immersion temperature has been reached, the operator is asked to insert the samples.
- after immersion, the instrument automatically regulates the conditioning temperature according to the requirements of the standards and measures conditioning time.
- the samples are automatically released after the defined conditioning time
- the test is started and the temperature is increased with 1°/min. gradient in conformity with the standards.
- the retraction curves, the temperature vs. time curve for each sample are automatically drawn until the set final temperature is reached.
- test results are calculated for each sample
- results are automatically compared with tolerance limits set for



- each product
- for each group of samples, statistic results (max. min. mean, standard deviation, Cp, Cpk) are calculated.
- at the end of the test, independent test reports for each group of samples can be prepared. The test report may include: customer logo, complete test identification, test conditions, sample initial length and % elongation, test curves, test results, test statistics, tolerance limits, legend of results, operator digital signature.
- test results and test curves for each sample are saved in Gibitre Standard database.
- software usage and report printout languages can be selected among the available ones (see table)

Brittleness point test

The arrangement for Brittleness Point test includes:

- Pneumatically actuated striker



- Sample holder for the simultaneous test of 10 samples
- Windows bases software for Brittleness Point test performance
- Datagest software for database management.

The striker is in compliance with international standards and the clearance can be set according to the kind of test (4.8, 5.2, 5.7, 6.4 mm). A pneumatic piston drives the striker and permits to perform the tests while the samples are immersed in the cooling liquid. A pressure regulator enables the speed of the striker to be adjusted in compliance with standards depending from the number of samples and the density of the cooling liquid in use.

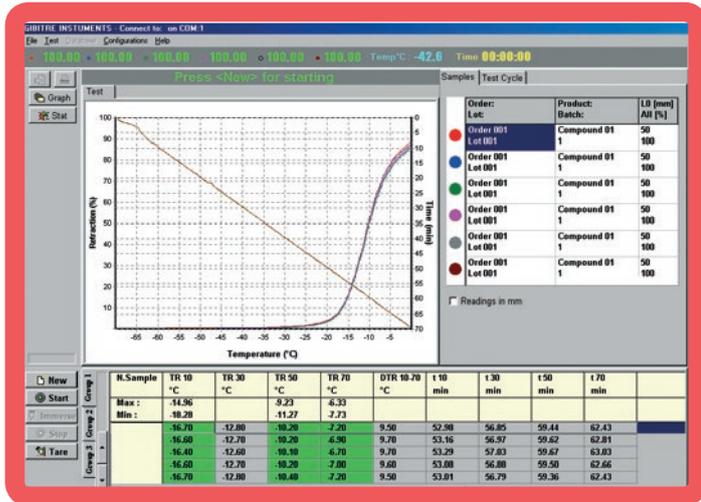
The software permits to prepare and store test procedures with custom test conditions

When the test procedure to be used has been selected:

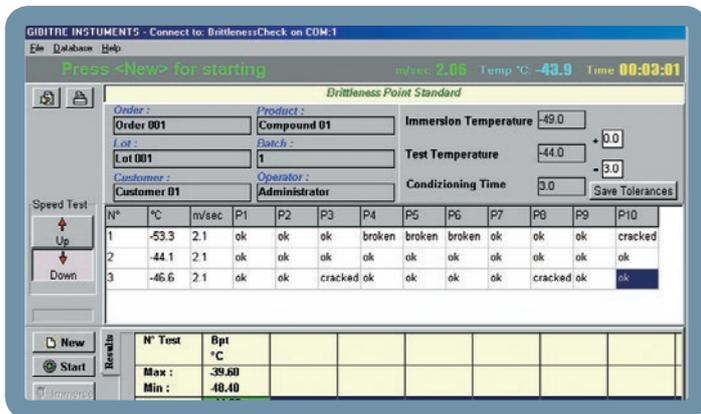
- the user is asked to insert test identification,
- the temperature of the cooling bath is automatically adjusted to the set value for sample immersion.
- when the immersion temperature has been reached, the user is asked to insert the samples.
- after immersion, the instrument automatically regulates the conditioning temperature according to the requirements of the standards and measures conditioning



- time.
- at the end of the conditioning time, the striker is automatically activated
- after the removal of the sample holder from the test bath and the visual inspection, the user can insert in the software the test result for each sample
- the program automatically suggests the temperature for the next test step in compliance with



The main page of Temperature Retraction software: the instrument automatically regulates in compliance with the test parameters defined in the test procedure.



The instrument automatically regulates according to the test parameters defined in the test procedure and the results obtained in the previous test steps.

- the standard test procedure
- at the end of the tests, the software automatically calculates the Brittleness Point Temperature and 50% Brittleness Temperature.
- at the end of the test a reports can be prepared. The test report may include: customer logo, complete test identification, test conditions, detailed results at the end of each tests step, BPT and 50%BT, operator digital signature.
- BTP and 50%BT are saved in the database.
- software usage and report printout languages can be selected among the available ones (see table)

Standards the instrument complies with	TR test: ISO 2921; ASTM D 1329 Brittleness point: ISO 812, 974; ASTM D 2137, D 746; DIN 53 546
Cooling systems	Liquid nitrogen tank, Refrigeration unit
Test temperature	-120 ÷ +20 °C (with liquid nitrogen tank) -70 ÷ +20 °C (with refrigeration unit)
Numerical Test Data (for each test procedure up to 20 test results can be selected)	TR-TEST: TR10, TR30, TR50, TR70, TRX (X customer defined). Time from test start at calculated TR points Brittleness Point: Test temperature, Striker speed
Graphic representation and printout	% Retraction versus Temperature Curves for the 6 samples tested Temperature versus Time curve during test
Temperature check	By means of heat regulator with PID micro-processor with 0.1 °C accuracy
Test chamber	5 litres stainless steel chamber equipped with stirrer to ensure the temperature of the test bath is uniform (ethyl alcohol - silicon oil)
Sample holders for TR-Test	Up to 6 samples Resolution: 0.06 mm Usable sample: length 25, 50, 100 mm Max srlength: 450% (with 50 mm sample)
Sample holders for Brittleness Point	Up to 10 samples Usable sample: type 1 and 2 (ISO 812)
Speed of striker for Brittleness Point test	Pressure regulator for pneumatic piston Striker with automatic or manual start-up
Lifting system	Pneumatic system for lifting sample holder for TR-Test.
Power Supply	220 VAC ±10%, 50 Hz ±3, 4 A, single phase - 110 VAC ±10%, 60 Hz ±3 on request
Power	600 Watt
Compressed air	Min 6 bar. Air treatment unit (cleaning and lubrication) is included.
Instrument dimensions	(W x D x H) 740 x 710 x 1500 mm
Weight	235 Kg
Personal computer (PC Version)	Minimum Configuration: Intel Core i3 2 GB RAM; Compatible operating Systems: 7 and 8 (64 bits); Connection to the instrument via USB cable (included)
Software usage Languages	Italian, English, French, Spanish, German, Portuguese, Russian, Chinese, Japanese, Turkish, Polish.

For the latest news about
Gibitre Instruments: new
products, software updates,
fairs, exhibitions, etc.
please visit
www.gibitre.it



gibitre
INSTRUMENTS

Gibitre Instruments s.r.l.
Via dell'Industria, 73
24126 Bergamo - Italy
Tel.: +39.035.460146
Fax: +39.035.460687
E-mail: customer.service@gibitre.it

We reserve the right to
make changes in design and
specifications without further
notice

EN002.003.2