



Changes in length and shrinkage force at specified temperatures are two dominant quality parameters for films, nonwovens, laminated products and fabrics.

Efficient quality control is made easy with Lenzing Instruments' Thermal Shrinkage Tester **TST 1**, which tests one sample with a width of up to 50 mm for percent shrinkage or shrinkage force resulting from heating of the material. The thermal shrinkage properties are analyzed by means of heating the sample at a preset and defined temperature for a specified period of time. Moreover, **TST 1** offers the possibility of dynamic tests, at which the behaviour of the material is observed during exposure to a temperature ramp at a constant rate of temperature increase. Subsequent cooling of the sample to ambient temperature enables determination of the residual shrinkage or shrinkage force.

Optionally, measurements may be performed according to customized testing sequences, including settings such as temperature ramps. After sample loading, the test is performed fully automatically and computer controlled, without any operator influence on the measurement. The specially designed oven-type heater protects the measurement from any ambient influence and together with the high resolution length measuring sensor respectively load cell, TST 1 guarantees for stable testing conditions, highest accuracy and reproducibility of results. During the test, the entire shrinkage behaviour is graphically displayed on the connected PC. This enables precise monitoring and analysis of production irregularities, making TST 1 a sophisticated tool for research and development. User friendly software offers flexible and comfortable testing with detailed reports of results. TST 1 is standardized according to ISO 14616 and DIN 53369.



Scope:

Automated determination of thermal shrinkage and shrinkage force according to ISO 14616 and DIN 53369 .

Method:

Product details and test method are entered in the software program. The sample is prepared and pretensioned by means of clamping a pretension weight onto the specimen end. By a mouse click or by pressing the instrument button, the measurement is started and performed according to the selected test parameters. The oven-type heater automatically moves to cover the sample. After completed measurement, the oven automatically uncovers the sample to finish the measurement or to start a measurement of the residual shrinkage properties of the material, depending on entered test specifications.

Results:

Results of the **TST 1** measurement are not limited to numerical data of the registered length difference or shrinkage force, but the shrinkage behaviour of the heated material is displayed graphically at each point of the test duration as well as in the report. Together with the graphical illustration of the measurement, the report also includes a thorough statistical evaluation of the generated results as well as test details.

Testing temperature:
45 °C - 300 °C

Heater length:
250 mm

Temperature distribution:
Constant temperature distribution of ± 2 °C in at least 80 % of the heater length

Shrinkage length:
99 % - 500 %
Accuracy ± 0.1 %

Range of shrinkage force:
An option of 5, 10, 30 kg to be specified by the customer
Accuracy: At 5 kg < 0.2 %
(at 50 % of full scale)

Max. sample width:
50 mm

Min. sample length:
600 mm

Pretensioning:
With pretension weights;
2 pcs. 5 g and 2 pcs. 13 g are included in the delivery scope

Pretension adjustment:
Fine adjustment of the pretension by means of a mechanical set screw

Resolution:
Force: 1 cN (=0.01 N)
Temperature (display): 0.1 °C
Shrinkage length: 0.1 %

Power supply:
90 - 240 V
50/60 Hz, 600 W

Dimensions:
Height: 290 mm
Width: 450 mm
Depth: 550 mm
Weight: 25 kg

Control- and evaluation system:
PC with intuitive Windows® based software for control of the test procedure and evaluation of test results

Optionally available:

- Sample-cutting device
- Fast cooling by means of air pressure (6 bar)
- Transparent protection flap
- Additional pretension weights
- OPC UA interface

Technical data and pictures are subject to change.