



Percent shrinkage and shrinkage force at specified temperatures are important quality parameters of films, nonwovens, laminated products and fabrics.

The Thermal Shrinkage Tester **TST 1** determines the thermal shrinkage or the shrinkage force which is built up in plastic films being heated to a preset defined temperature for a specified period of time. After cooling the samples down to ambient temperature, a measurement of the residual shrinkage or shrinkage force is also possible.

The following tests can be carried out with **TST1**

- shrinkage
- shrinkage force
- percent shrinkage versus time
- shrinkage force versus time
- percent shrinkage versus temperature
- shrinkage force versus temperature

User friendly software on a connected PC allows automatic numerical evaluation and graphical presentation of the results. The specially designed oven eliminates ambient influence.

A high resolution length measuring sensor and load cell, together with the precise temperature control of the heater, guarantee stable testing conditions and very accurate and reproducible results.

After loading the sample the test is performed fully automatically controlled by a computer, without any influence of the operator.

Scope:

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

Since the instrument is computer controlled all test parameters are easily set and stored, corresponding to different tested materials.

The oven movement takes place automatically and is controlled by the computer.

Therefore, once the test configuration is set the operator just needs to prepare the sample onto the measuring sensor and push the START button.

This is time saving and since any operator influence on the test is avoided, reproducible and most accurate tests are obtained.

Beside the measurement of shrinkage or shrinkage force at a given temperature, further valuable information can be gathered from recording the measurable variable versus temperature by heating the sample with a constant rate of temperature increase, starting from an initial low temperature.

In this way, a comprehensive characterisation of the thermo-

mechanical properties of the sample is possible.

TST 1 serves for quality control purposes in the production of plastic films as well as a sophisticated tool in research and development.

Method:

The sample is heated to a certain temperature for a specified period of time. Either the sample's change of length or the forces built up in the sample are monitored via the connected computer.

Testing temperature:

From 45°C to 300°C

Heater length:

Length of heater: 250 mm

Temperature distribution:

Constant temperature distribution of $\pm 2^\circ\text{C}$ in at least 80% of the heater length

Cooling device:

Fast cooling by means of air pressure (6 bar)

Shrinkage length:

From 99% to -500%

Accuracy: $\pm 0,1\%$

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

Pretensioning:

With pretension weights, 2 pcs.; 5 g, 13 g included in delivery scope

Pretension adjustment:

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

Resolution:

Force: 1 cN (=0,01N)

Temperature (display): 0,1°C

Shrinkage length: 0,1%

Power supply:

TST 1: 90-240 V / 50-60 Hz, 1700 W

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

Control- and evaluation system:

Personal computer with comfortable **WINDOWS®** based software for controlling the test procedure and evaluation of test results.

Dimensions:

Height: 320 mm

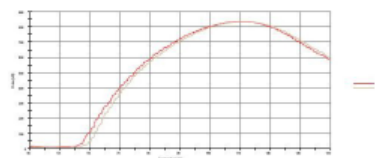
Width: 510 mm

Depth: 500 mm

Weight: approx. 25 kg

TST1 - Report

Serial No.:	134	LENZING INSTRUMENTS	
Software version:	1.52		
Test ID:	H400084g091000	Date:	14.10.2008 09:29:59
Template:	Test_Ramp	Start at:	40°C
Protocol:	05_121212	Stop at:	140°C
Remarks:	05_121212	Heater:	10°C/min
Objective [mN]	Maximum [mN]		
552,3	558,1		
558,8	554,1		



Technical data and pictures are subject to change!

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quality improvement

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