



Percent shrinkage and shrinkage force at specified temperatures are two dominant quality parameters of technical and industrial yarns such as tire cord, of filament and spun yarns for textile applications as well as of plastic tapes.

Efficient quality control is made easy with Lenzing Instruments' Thermal Shrinkage Tester **TST 510/250**, which tests up to 10 samples simultaneously in one and the same test run for measurement of the thermal shrinkage and/or shrinkage force resulting from heating of the material. The thermal shrinkage properties of the filament yarn are analyzed by means of heating the samples at a pre-set and defined temperature for a specified period of time. Moreover, **TST 510/250** offers the possibility of dynamic tests, at which the behaviour of the yarn is observed during exposure to a temperature ramp at a constant rate of temperature increase. Subsequent cooling of the samples 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 with hold times, tests with different pretension weights during the test cycle and much more. 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 sensors and load cells, **TST 510/250** guarantees for stable testing conditions, highest accuracy and reproducibility of results.

During the test, the entire shrinkage behaviour of the heated yarn is graphically displayed on the connected PC. This enables precise monitoring and analysis of production irregularities, making **TST 510/250** a sophisticated tool for research and development. User friendly software offers flexible and comfortable testing with detailed reports of results.

**TST 510/250** conforms to ASTM D4974, D5591 and EN 13844



### Scope:

Automated determination of thermal shrinkage and shrinkage force according to ASTM D4974, D5591 and EN 13844 .

### Method:

Product details and test method are entered in the software program. Samples are prepared and pre-tensioned by means of clamping pretension weights onto the yarn ends. 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 samples. After completed heating period, the oven automatically uncovers the samples to finish the measurement or to start a measurement of the residual shrinkage properties of the filament depending on entered test specifications.

### Results:

Results of the TST 510/250 measurement are not limited to numerical data of the registered length difference or shrinkage force. Also the shrinkage behaviour of the heated filament 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:

The temperature distribution over the 10 testing positions within the oven-type heater is better than 1 %

### Shrinkage length:

From - 500 % to 99 %  
Accuracy:  $\pm 0.1$  %

### Range of shrinkage force:

1 - 2000 cN  
(other ranges on request)  
Accuracy:  $< 0.2$  % (at 50 % of full scale)  
Calibration: with 10 N weight

### Max. sample width:

1.3 mm  
(5 mm on request)

### Resolution:

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

### Pretensioning:

With easily clamped and combined pretension weights, (depending on sample titer (dtex/den))

### Control- and evaluation system:

PC with intuitive Windows<sup>®</sup> based software for control of the test procedure and evaluation of test results

### Power supply:

230/115 VAC  $\pm 10$  %  
50/60 Hz, 1800 W

### Dimensions:

Height: 1090 mm  
Width: 700mm  
Depth: 750 mm  
Weight: 200 kg

### Data output:

Ethernet

### Optionally available:

- Pneumatic clamps
- Fine adjustment of pretension
- Wider length measuring encoder rolls for tapes with up to 5 mm sample width
- Support for heavy yarns when pretension weights  $> 1$  kg are used
- Additional calibration weight 9 N for heavy yarns
- Additional pretension weights
- Software for programmable test routines

Technical data and pictures are subject to change.