Textechno
textile testing technology

STATIMAT MEL+

Automatic Tensile- and Elasticity Tester for Elastic Yarns and Fabrics

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Automatic tensile- and elasticity testing of elastomeric yarns

Automatic tensile- and elasticity tests on elastanes (Spandex) have special requirements regarding the delivery of the yarn into the test section at very low pre-tension and the resolution of the force measurement particularly for setting the standardized pre-tension of only 0,01 cN/tex. Furthermore, elastomeric yarns are characterized by an extremely high elasticity with elongation-at-break values, sometimes in excess of 800 %. For standard tensile testers equipped with conventional clamping systems this sometimes results in substantial slippage of the sample in the clamp and in premature breakage at the jaw.

STATIMAT MEL+

Based on the legendary STATIMAT line Textechno has created the fully automatic tensile tester for elastomeric yarns STATIMAT MEL+. This worldwide unique instrument fulfils the specific requirements of testing elastomeric yarns by means of a high-resolution force-measuring system with a resolution of 10 µN (1 mg), dedicated jaw faces, and a special software algorithm. The package changer was modified for minimum friction, in order not to pre-elongate the yarn. These features make the STATIMAT MEL+ a fully automatic tensile- and elasticity tester even for the finest elastomeric yarns.

Further applications are automatic tensile and elasticity tests on elastic core- and combination yarns. Here the high resolution of the STATIMAT MEL+ enables to determine the elastic elongation and the tension of the Spandex core in the yarn. Such data allow to predict the behaviour and comfort of the final knitted or woven elastomeric fabric.
Optionally the MEL+ can be equipped with the collecting- and weighing system AUTOCOUNT and a nip roll feed mechanism in combination with tension-controlling feeders on the yarn creel. **This combination allows fully automatic yarn count measurements on elastic core- and combination yarns**. The nip roll feed mechanism and the AUTOCOUNT system are not suitable for pure elastomeric yarns.

Additional clamps and accessories

In addition to automatic single-yarn tensile testing the STATIMAT MEL+ offers a special software for elasticity testing containing procedures for testing alternating stress, creep, and relaxation.

Further accessories are devices for tensile testing on coarse elastomeric yarns as well as alternating stress tests on several yarn ends simultaneously and on woven- and knitted fabrics.

BISFA rotary clamp

Together with a leading producer of elastanes Textechno has developed the so-called BISFA rotary clamp for high-precision tensile testing especially on coarser elastomeric yarns. In this BISFA- standardized testing method a loop-shaped yarn sample, whose ends are jointly held in the rotary clamp, is wound-up during tensile testing. A position sensor, which defines the gauge length of the yarn sample, controls the rotation of the rotary clamp in such a way that the sample is subject to a constant rate of extension. The yarn loop is lead over a measuring roll, which is connected to the load cell of the force-measuring device. The principle of winding up the yarn sample instead of clamping as in conventional tensile testers eliminates both slippage and the danger of sample breakage at the clamp even on very coarse yarns.

Testing device according to BISFA

Sample holder for 10 specimens

Elasticity tests

In the appliance for simultaneous elasticity testing 10 single yarn loops are clamped side by side. By means of the software for alternating load- and elongation tests as well as creep- and relaxation tests elastic yarn properties can be determined according to various standards.

Due to the relatively long testing times of elasticity tests, testing of 10 yarn loops, i.e. 20 ends, at the same time allows to achieve reliable mean values for such elastic properties, and that faster than by automatic elasticity testing with the standard clamp for automatic testing, which is possible, too.

Fabric testing

With regard to the lateral contraction of knitted fabrics during a tensile test Textechno has developed special pneumatic clamps for knitted fabric samples arranged as a tubular banding, with the seam placed outside of the gauge length.

For testing of the elastic behaviour of woven fabrics containing elastanes pneumatic clamps with special jaw faces are available, too.

Clamp for knitted fabrics

Technical data

Testing methods:

– Automatic static tensile testing with standard software, cyclic-load testing, creep- and relaxation (elasticity) test, and combined elasticity- and tensile testing
– Yarn count measurements*

System components

Test section:
– 2 pneumatic yarn clamps,
automatic linear threading,
min. gauge length 50 mm,
max. travel of draw-off clamp 860 mm
for 100 mm gauge length,
draw-off clamp speed 1 – 5000 mm/min

Package changer:
– Standard version with 10 positions

Measuring systems:
– High-resolution force-measuring device,
resolution 10 µN (1 mg), range 32 N (3,2 kg)
optional ranges: resolution 100 µN (10 mg),
range 62 N (6,2 kg),
resolution 1 mN (100 mg), range 340 N (34 kg)
other ranges on request
– Elongation measuring device with resolver,
resolution 2 µm

Yarn feed mechanism:*
– Nip-roll system, max. yarn delivery speed
400 m/min, resolution of length measurement
0,2 mm

AUTOCOUNT*:
– Yarn collection- and weighing device,
measuring range 0 – 310 g, resolution 1 mg

TESTCONTROL:
– PC system for controlling the test processes
and for the evaluation of the measured data,
connected via USB interface;
– Textechno software as a WINDOWS application;
– Input of all parameters for testing and measured-data evaluation, saving of selected parameter sets under code words;
– PC easily connectible to any type of network

Further technical data

– Mains supply: 220 V, 50 (60) Hz, current
requirement approx. 1 A
– Compressed-air supply: 5 bar, 100 l/min
– Lacquer finish: RAL 9006 /5002
– Dimensions, weight: Height 1730 mm, width
885 mm, depth 700 mm (with AUTOCOUNT:
740 mm), weight approx. 200 kg

*not suitable for pure elastomeric yarns

Technical contents can be subject to changes by Textechno.

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