



DRAW TENSION INSTRUMENT

Filament characteristics such as molecular orientation, dyeability, shrinkage and shrinkage recovery are important quality parameters, but usually their determination is time consuming and expensive. These characteristics are straight connected to the draw tension or draw elongation, which are directly related to shrinkage force and shrinkage - but measured on a running yarn. That means faster measurement, information about variation and better useability of the results.

DTI 600 is designed to determine the draw tension on the workfloor immediately after the filament leaves production. In this way, the time of response to irregularities in the process and therewith the production of low quality lots is reduced to a minimum.

DTI 600 stands out for modern, automatic, high performance filament testing.

Out of the results of the draw tension test, orientation irregularities, shrinkage and the future dyeability can be judged quickly and easily in a reliable way.

By measuring both draw elongation and draw tension, **DTI 600** offers a versatile tool for complete and accurate quality determination.

Wide varieties of different filaments are easily and rapidly tested, since the varying test parameters are easily changeable and storable in the connected computer according to any requirements of the tested filaments.

DTI 600 features a high degree of user friendliness and flexibility due to the unique automatic string up and sample removal as well as the powerful evaluation software.

FILAMENT TESTING

Scope:

Draw tension is a property of yarn which reflects the orientation of polymer molecules. Malfunctions in the filament yarn spinning process will result in variations of the orientation.

With the draw elongation test, the change in yarn length under thermic influence can be measured on the running yarn.

Orientation is related to the yarn's dyeability and other processing properties. Therefore, draw tension data are used to evaluate these properties and to predict possible irregularities and problems in further processing steps.

By measuring the draw tension only moments after bobbins have left the spinning machines, filament irregularities due to production variations are determined in a fast and efficient way.

With the aid of the draw tension tests, necessary corrections in the production process can be carried out soonest possible after their appearance. Previous installations show that on the basis of draw tension results, producers have strongly reduced the time consuming tensile test by using the **DTI 600** for the routine control.

If draw ratio 1.0 is selected, the instrument also allows to determine the shrinkage force within flat yarn or within texturized yarns - besides the draw force of POY yarns.

Method:

Draw tension measurement: During the course of a cycle, **DTI 600** continuously measures the tension produced in a sample yarn which is heated to a certain temperature and drawn to a certain percentage.

Draw elongation measurement:

During the test, **DTI 600** continuously controls and records the draw ratio so that the pre-set tension remains constant. The draw ratio corresponds therewith directly to the draw elongation or in other words to the yarn's thermal shrinkage behaviour at a certain pretension.

Non routine tests:

For product development and detailed process studies, non routine tests can be carried out during the course of ramps, e.g. tension vs. different yarn speeds and draw ratio or elongation at different tensions (dynamic tensile test).

The **DTI 600** features automatic string up and sample removal.

DTI 600 complies with **ASTM D 5344**

Sample feeding:

Automatic string up and sample removal

Accuracy:

Draw ratio: $\pm 0.02 \%$
Draw force: $\pm 0.1 \text{ cN}$
Temp.: 1 % of actual temperature

Denier range:

10 - 510 den (11 - 560 dtex)
(up to 1300 den, 1430 dtex on request)

Tension (force) range:

0 to 800 cN

Draw ratio:

0.2 to 20 via electronic servo motors

Temperature:

Ambient temperature - 280 °C,
other temperatures on request

Testing speed:

Up to 1000 m/min

Testing time:

approx. 30 sec/test

Control system:

Freely programmable control system in connection with an Windows® evaluation PC via Ethernet-Interface

Options:

- Ethernet interface with external source
- SESS automatic bobbin changer
- Bar code reader
- OPC UA interface

Dimensions:

Height: 1780 mm
Width: 850 mm
Depth: 620 mm
Weight: 220 kg

Power supply:

230 / 115 VAC $\pm 10 \%$,
50 / 60 Hz, 1500 W

Air supply:

90 psi instrument air,
20 scfm (6 bar, 0.6 Nm³/min)

Software features:

- Long term data storage
- Product table
- Network adaptation
- Automatic barcode recognition
- Freely configurable test program

Technical data and pictures are subject to change!

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