

METHOD OF TEST

EXTENSION AND MODULUS OF ELASTOMERIC FABRICS AND NARROW ELASTICS

PURPOSE

To assess the extensibility and power of warp knit elastomeric fabrics and narrow elastics.

APPARATUS

1. A constant rate of traverse tensile testing instrument that meets the following requirements (see Equipment Index Ref: 13U, 16A, 18A and 24D)

- (a) Load cell with 10kg capacity.
- (b) 500mm per minute constant rate of traverse and return cycling.
- (c) Pneumatically operated top and bottom metal faced line contact jaws being at least 50mm wide. Adjust the machine so that the line contact jaws are parallel and the distance between them is exactly 100mm.

To ensure this is accurate clamp pieces of carbon paper and plain paper, each approximately 150mm long, in the jaws. Open and close the jaws to produce an impression on the paper. Using the metal ruler check the distance between the two parallel lines produced is exactly 100mm.

- (d) Either Autographic load/extension chart recorder compatible with the above requirements and the testing instrument. The chart should have a cross head speed ratio of 1:1.

or A computer with Marks & Spencer approved software and printer may be used.

- 2. Balance capable of weighing $\pm 0.01\text{g}$.
- 3. Metal ruler graduated in mm. (See test method PG).

TEST SPECIMEN Fabrics

Avoid fabric within 300mm of the selvages.

No two specimens should contain the same set of warp or weft threads.

Warp Knits

Using a metal ruler and scissors cut three specimens each 150mm x 50mm, the longer dimension in the *length*.

These specimens are to be cut along the elastomeric thread.

Also, cut three specimens each 150mm x 50mm, the longer dimension in the *width*. These specimens are to be cut at right angles to the elastomeric thread.

Important: The 50mm width of specimen measurement is critical, do not use a template.

Bra Straps: Cut three specimens each 150mm along the length of the strap, ensuring the specimens are representative of the entire sample.

All Other Narrow Elastics:

Measure the effective width of the elastic trim in mms, with elastane included (ignoring frill).

1mm-24mm effective width - cut three specimens 150mm long, without stretching the elastic.

25mm and upwards effective width - cut a specimen larger than one metre. Condition for 16 hours and then cut and weigh exactly one metre of the elastic. Record the weight to the nearest 0.01g. Without stretching the elastic, cut three specimens 150mm long.

CONDITIONING Condition the prepared test specimens for a minimum of 16 hours in the standard atmosphere for testing, at a temperature of $20^{\circ} \pm 2^{\circ}\text{C}$ and a relative humidity of $65\% \pm 2\%$.

The equipment must be sited in this atmosphere.

Carry out the tests in this atmosphere.

METHOD

1. Set up testing equipment in the conditioned atmosphere as described under "Apparatus".
2. The required cycling load is determined as follows:

Full width Fabrics

Control fabrics

(greater than 44 dtex elastane) 3.60kg

Warp knit fabrics

(less than 44 dtex elastane) 1.50kg

Narrow Fabrics

Bra Straps

3.60kg

Bra Underbands

2.50kg

All other Narrow Elastics

1mm-15mm effective width

1.50kg

16mm-24mm effective width

2.50kg

25mm and upwards:

Weight per metre:

up to 2.00g

0.75kg

2.01g - 3.75g

1.20kg

3.76g - 5.00g

1.50kg

5.01g - 7.50g

2.50kg

7.51g - 11.00g

3.50kg

11.01g - 17.00g

4.25kg

17.01g - 25.00g

5.25kg

25.01g - 36.00g

6.25kg

above 36.00g

7.50kg

3. With the minimum amount of handling, clamp a test specimen in the jaws so that it is mounted centrally and at right angles to the jaws. Cycle twice to the required cycling load, to produce a load extension curve on the chart or computer monitor.

For narrow elastics, ensure that the effective width area is clamped centrally and squarely.

RESULTS

4. Repeat this procedure with the remaining specimens so that three separate pairs of curves are produced. These will be used to calculate the extension and modulus.
1. **Apparatus with a computer:**
Print the results achieved at the end of each set of tests.
2. **Apparatus with Chart Recorder:**
For each specimen tested, use the second outward curve to calculate:
 - (a) The extension at the required cycling load. (see Point A on the graph on the second load curve).
 - (b) The load at 40% extension to the nearest 10g. This is the modulus. (See Point B on the graph on the second load curve).

REPORT

1. How the specimens were tested:
 - (a) Direction of test (length or width)
 - (b) The cycling load
 - (c) Weight per metre (where applicable)
 - (d) Effective width of elastic (where applicable).
2. For each direction (if applicable), report the individual readings and the average of the three specimens for:-
 - (a) Extension at cycling load.
 - (b) Modulus at 40% extension.