

METHOD OF TEST

EXTENSION, MODULUS AND RESIDUAL EXTENSION OF STRETCH FABRIC

PURPOSE

To assess the extensibility and power of **weft knitted** fabrics, with and without elastomeric content.

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.

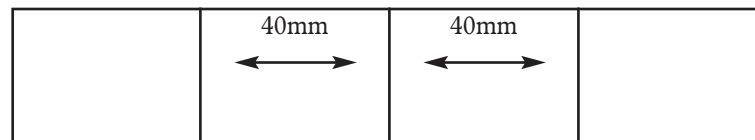
- (d) Either Autographic load/extension chart recorder compatible with the above requirements and the testing instrument. The chart should have a cross head speed ration of 1:1.
- or A computer with Marks & Spencer approved software and printer may be used.
2. Metal ruler graduated in mm. (see test method PG).

TEST SPECIMEN Avoid fabric within 300mm of the selvages. No two specimens should contain the same set of 'warp' or 'weft' threads.

Cut three specimens 150mm x 50mm, with the longer direction parallel to an elastomeric thread (for weft knit fabrics, this will run along the courses).

Cut three specimens 150mm x 50mm with the longer direction at right angles to the elastomeric thread (for weft knit fabrics this will be at right angles to the courses). The 50mm dimension is critical.

Mark the centre of the specimen. 40mm either side of the centre, draw a line across the specimen.



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

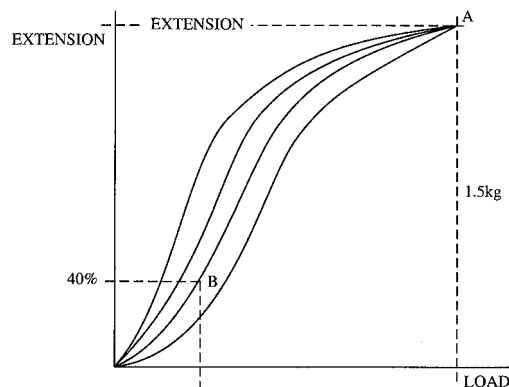
1. Set up testing equipment in the conditioned atmosphere as described under "Apparatus".
2. With the minimum amount of handling, clamp a test specimen in the jaws so that it is mounted centrally and at right angles to the jaws. Cycle twice to a 1.5kg cycling load, to produce a load extension curve on the chart or computer monitor.
3. After the second stretch cycle, allow the crosshead to return to the start position then immediately remove the specimen from the tensile tester, place on a smooth flat surface and measure the distance between the 2 outer lines. Record this and calculate the % residual extension.

$$\% \text{ Residual Extension} = 100 \times \frac{(\text{Recorded Measurement} - 80 \text{ mm})}{80 \text{ mm}}$$

- 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.

RESULTS

- Apparatus with a computer:**
Print the results achieved at the end of each set of tests.
- Apparatus with Chart Recorder:**
For each specimen tested, use the second outward curve to calculate:
 - The extension at 1.5kg cycling load. (See point A on the graph on the second curve).
 - 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

State the direction 'length' or 'width' in which the specimen was tested.

For each direction, report the individual readings and the average for the three specimens of:-

- The extension at 1.5kg load.
- The load at 40% extension to the nearest 10g (Modulus).
- % residual extension measured from the specimen.