

METHOD OF TEST

EXTENSION AND MODULUS OF STRETCH LACES

PURPOSE

To assess the extensibility and power of stretch laces.

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. Metal ruler graduated in mm. (See test method PG).

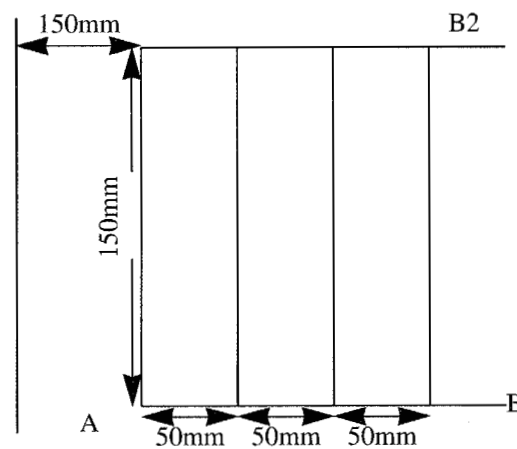
TEST SPECIMEN All Over Stretch Lace Fabrics

Please read the whole of this section before commencing preparation of specimens.

Avoid fabric within 150mm of the selvages. Cut three specimens 150mm x 50mm with the longer side parallel to the elastomeric threads (usually the warp direction).

Due to the variable knitting structure of lace fabrics, the exact sampling positions should be agreed between fabric supplier garment makers and M&S Technologist. Retaining photocopies of specimens may help resolve these queries.

To overcome the problems of specimen selection from large pattern repeats, specimens should be selected as described below.



1. Draw a line 150mm long in the warp direction at least 150mm from and parallel to the selvage and accurately cut up this line (A).
2. At right angles to this cut edge, draw two lines B, and B2 150mm apart towards the centre of the fabric. Cut along these lines.
3. Exactly 50mm from and parallel to line A, draw a line 150mm long in the warp direction. Cut up this line. Repeat this process to give 3 specimens each exactly 50mm wide. The width of the specimens is critical to the accuracy of the test results.

Check the width of each specimen. If not 50mm wide, repeat preparation from point 1.

Where the lace stretches in both warp and weft direction, both directions should be tested. Specimens should be selected in a manner similar to that described above.

Narrow Laces

1. LACES LESS THAN 50mm WIDE.
Test laces in their finished width with 150mm in the length direction.
2. LACES WIDER THAN 50mm BUT NOT MORE THAN 100mm. Cut specimens 50mm wide from each edge. Each specimen should be 150mm long. Select at least three specimens.
3. LACES WIDER THAN 100mm. Select at least three specimens each 50mm wide by 150mm long, one from each edge and one from the centre.

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.

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

3. 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

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

For ALL OVER LACES, state the direction 'warp' or 'weft' in which the specimen was tested.

For ALL LACES report the individual readings and the average of the three specimens for:-

1. The extension at 1.5kg load.
2. The load at 40% extension to the nearest 10g (modulus).

