

SAFEGUARDS

SGS CONSUMER TESTING SERVICES

SOFTLINES

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HOW TO DETERMINE STRETCH PROPERTIES IN FABRIC OR APPAREL

The use of spandex is becoming increasingly popular within the apparel industry. Using spandex or elastane helps create a less confined feel, and allows a garment to glide over the silhouette for a more flattering look. Moreover, seamless production of products such as underwear and socks is becoming the fashion trend. Results of laboratory testing are important in order to determine if there is sufficient stretch for comfort, fit and freedom of movement and adequate power to recover from deformation. Selection of the appropriate test method for the type of fabric and for the properties needed is vital. The major stretch and recovery tests are shown in the table below.

TESTING METHODS & EVALUATIONS OF STRETCH AND RECOVERY

Test standard	BS 4952 (Replaced by BSEN 14704-1)	DIN / BS/ EN 14704-1	ASTM D3107	ASTM D4964	ASTM D2594
<i>Applicable fabric type</i>	Woven and knitted	Woven, non-woven and knitted	Woven	Woven and knitted	Knitted with low power stretch
<i>Determination</i>	Elongation, residual extension, (could be tested after ageing)	Extension, residual extension	Fabric stretch, fabric growth and recovery	Elongation and modulus at 30/50/70% elongation	Fabric stretch and fabric growth
<i>Test equipment</i>	CRE testing machine	CRE testing machine	Stretch testing instrument	CRE testing machine	Frame & hanger assembly
<i>Sample type</i>	Straight	Straight	Straight	Loop	Loop
<i>Specimen size (mm)</i>	150 x 50 wide	Woven: 250 x 50 wide; Knitted: 250 x 50 wide	320 x 50 wide	350 x 75 wide	500 x 125 wide

(To be continued)



(Continued)

Test standard	BS 4952 (Replaced by BSEN 14704-1)	DIN / BS/ EN 14704-1	ASTM D3107	ASTM D4964	ASTM D2594
Bench mark (mm)	100	Woven: 100 Knitted: 100	250	250	127
Force / extension applied	Specify by client (general 3 kg)	Woven: 6N/cm Weft knit: <5% elastane 3N/cm ;>5% elastane 4N/cm	Stretch: 4 lb. Growth: 85% of stretch result	20 lb. Or specify by client.	5 lb for loose- fitting 10 lb for form- fitting
No. of cycles	2	5	Stretch: 4	3	5
Machine speed	500 mm/min.	Woven: 100mm/min. Knit: 500 mm/min.	5sec. / cycle	500 mm/min.	4-6sec. per cycle
Relaxation time	1 & 30 min.	1 & 30 min.	Stretch: 30min. Growth: 30sec & 30 min.	No	Growth: 60sec & 60 min.

METHODS OF IMPROVING STRETCH PROPERTIES

- Elastic yarn - The weight of the elastic yarn may be increased or a more powerful elastic yarn can be used to improve the fabric's elastic properties. These changes must be kept in balance with the fabric construction so that the fabric weight and handle is not compromised.
- Yarn processing - yarn crimping via thermal or chemical means can be increased, as in the twist-heatset-untwist method of yarn texturing or the inherently stretchy modern elastic polymers like elasolefin and elastomultiester.
- Finishing – Elastic properties can be improved through modifications of the fabric structure by adding stretch silicone treatments to the fabric.



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