

INVESTIGATION OF SEAM PERFORMANCE USING TWO DIFFERENT METHODS

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OBJECTIVITIES

There are a lot of standard methods which investigate the seam slippage and seam strength, so the aim of this work is to compare two ISO standard methods and to determine whether the same assessment of the seam performance will be obtained.

MATERIALS AND METHODS

Seam performance of three lightweight fabrics was investigated using two methods. The characteristics of fabrics used are given in Table 1. The first method used in this investigation was the needle clamp method ISO 13936-3, and the second method ISO 13935-2:2004 + ISO 13936-1:2004 where test procedure involves extension of two samples, one without seam and one with seam. The seam samples were sewn using the sewing parameters given in Table 2. The test procedure of the method ISO 13936-3 at the Figure 1 is shown, and the test procedure of the method ISO 13936-1:2004 + ISO 13935-2:2004 at Figure 2 is shown.

Table 1. Characteristics of fabrics used in tests

Fabric	Composition	Weave	Yarn count (tex)		Yarn density (cm ⁻¹)		Cover factor	Surface density (g·m ⁻²)
			Warp	Weft	Warp	Weft		
F1	Silk	plain	3.2	3.2	47	40	0.52	28
F2	PES	plain	7.2	7.2	35	29	0.54	47
F3	cotton	plain	14	14	54	26	0.82	114

I. Test procedure of method ISO 13936-3

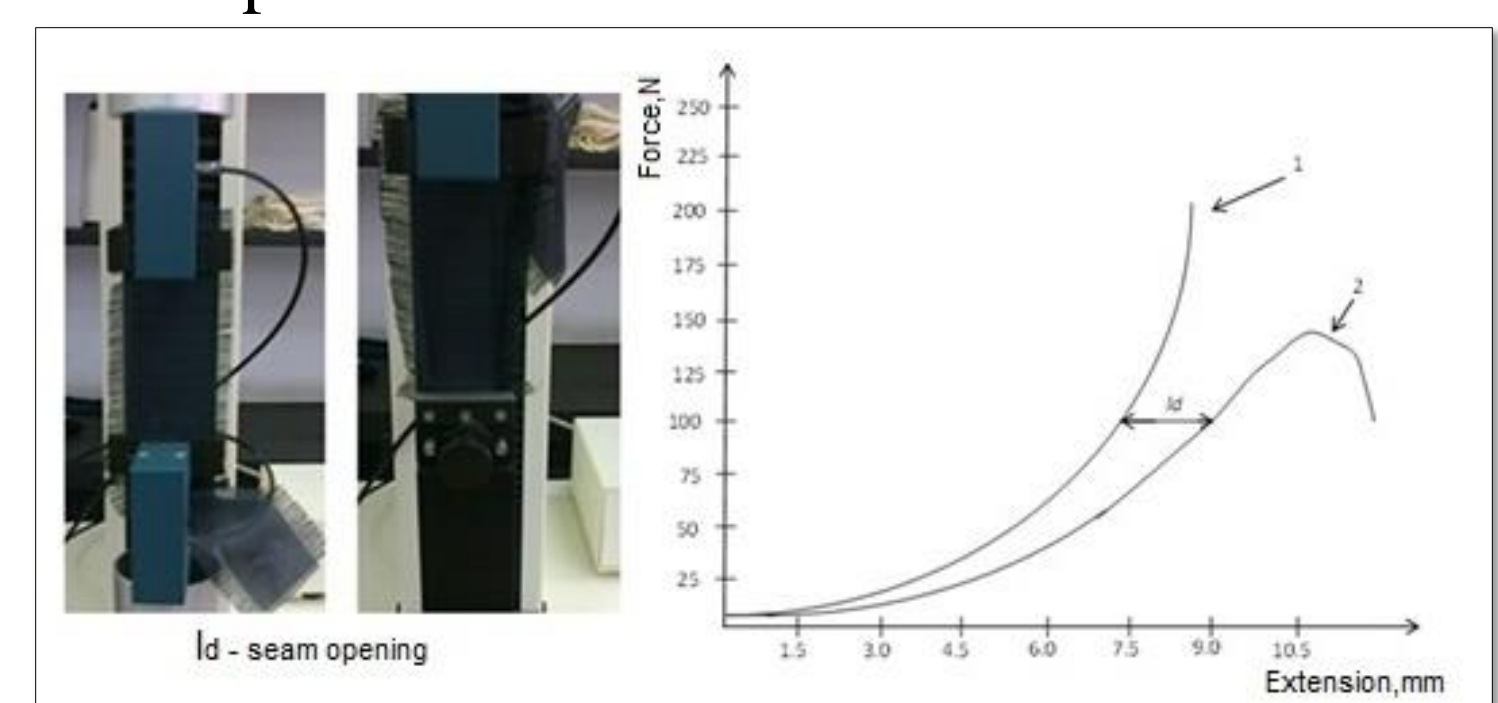


Fig. 1 Seam performance investigation with simulated seam

II. Test procedure of method ISO 13936-1:2004 + ISO 13935-2:2004

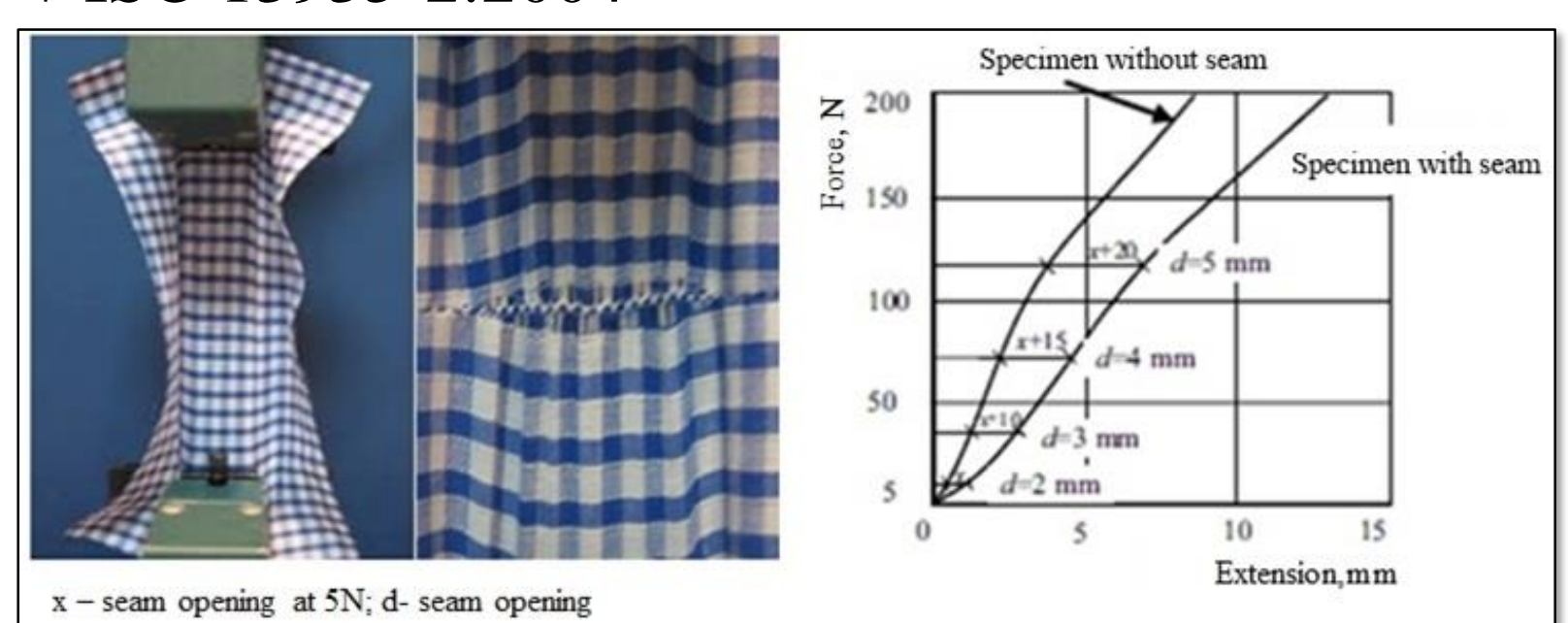


Fig. 2 Seam performance investigation with sewn seam

Table 2. Sewing parameters

Fabric	Thread count (tex)	Needle size	Stitch density (dm ⁻¹)
F1	18	60	50
F2	21	65	50
F3	30	75	50

RESULTS

The results from the needle clamp method ISO 13936-3 in Table 3 are given, and the results from the second method ISO 13936-1:2004 + ISO 13935-2:2004 are given in Table 4.

Table 3. Seam performance investigated according to the method ISO 13936-3

Fabric	Tensile strength (N)	Seam opening (mm)	Seam strength (N)
F1	100	/	77.7
	200	/	
F2	100	3.7	>200
	200	5.1	
F3	100	1.8	187.5
	200	/	

Table 4. Seam performance investigated according to the method ISO 13936-1:2004 + ISO 13935-2:2004

Fabric	Seam slippage strength (N)	Seam strength (N)	Cause of seam breaking
F1	24.5	60.3	Fabric breaks
F2	13.3	20.9	Thread breaks
F3	80.6	163.2	Fabric breaks

CONCLUSION

- Both methods used have comparable evaluation of the fabrics properties with reference to the seam slippage.
- The method ISO 13936-3 may be more restricted for investigation of seam performance of very lightweight fabrics, because breaking of the simulated seam can occur at force lower than 100N.
- The results from investigation of the seam strength have shown that both methods give matched assessment of the seam strength performance.
- Higher seam strength and lower seam slippage obtained according the needle clamp method ISO 13936-3 in comparison with the method with sewn seam ISO 13935-2:2004 + ISO 13936-1:2004, is due to different seam breaking mechanism. The method ISO 13936-3 doesn't involve thread in seam performance investigation and the possibility of fabric damage during sewing is eliminated.