International Standard 4819

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Household sewing machines — Determination of reproducibility of stitch length setting

Machines à coudre domestiques (ou de ménage) — Détermination de la fiabilité du réglage de la longueur de point

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4819 was developed by Technical Committee ISO/TC 148, *Sewing machines*, and was circulated to the member bodies in August 1982.

It has been approved by the member bodies of the following countries :

China	Italy	United Kingdom
Czechoslovakia	South Africa, Rep. of	USSR
Egypt, Arab Rep. of	Spain	Yugoslavia
Germany, F. R.	Sweden	
India	Switzerland	

The member body of the following country expressed disapproval of the document on technical grounds :

Poland

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Household sewing machines — Determination of reproducibility of stitch length setting

1 Scope and field of application

This International Standard specifies a method for the determination of the reproducibility of the stitch length at constant settings of the stitch length setting control after various adjustments.

The method is applicable to motor-operated household sewing machines, but it may also be possible to apply it to hand- or treadle-operated machines.

2 References

ISO 536, *Paper and board — Determination of grammage.*

ISO 2784, *Continuous forms used for information processing — Sizes and sprocket feed holes.*

ISO 2959, *Textiles — Woven fabric description.*

ISO 3535, *Forms design sheet and layout chart.*

3 Principle

Sewing together two plies of cotton fabric with an intermediate layer of paper parallel to their long sides. Repeated stitching, without sewing thread, at six given positions of the stitch length setting control. Calculation of the mean stitch length and the percentage variation of stitch length at each setting.

4 Material and apparatus[1)]

4.1 Rule, graduated in millimetres.

4.2 Cotton fabric, as specified in the annex. Ten pieces, not creased and not washed, 60 mm × 200 mm. The long side must follow the warp thread.

4.3 Paper, as specified in the annex. Five pieces, 60 mm × 200 mm.

4.4 Sewing machine needle Nm 60 to Nm 70, as specified in the annex. The needle system shall be in accordance with the specifications of the sewing machine manufacturer.

5 Preparation of the sewing machine

5.1 Fit the machine with the needle plate and presser foot supplied with the machine, as specified in the manufacturer's instruction manual.

5.2 Adjust the force of the presser foot as specified in the manufacturer's instruction manual.

If no instructions are specified in the manual, and if the force is adjustable by means of a setting device accessible to the user, the force shall be adjusted to 18 ± 1 N, measured with the presser foot in the down position.

1) Materials other than those specified in the annex may be used, but, if so, this shall be stated in the test report.

If no force regulating device is provided for the presser foot, or if it is not accessible to the user, the test shall be carried out with the force as set by the manufacturer.

5.3 Open out the working surface of the machine in the direction of feed, as the whole sample must rest straight and completely flat for the duration of the test, behind and in front of the needle.

5.4 Set the machine for straight stitch type.

5.5 Thread the machine.

6 Procedure

6.1 Superimpose two plies of cotton fabric with an intermediate layer of paper and then place this sample between the presser foot and the needle plate.

6.2 Sew this sample together parallel to the long sides, approximately 5 mm from the edge.

6.3 Unthread the machine.

6.4 Place this sewn sample with the intermediate layer of paper between the presser foot and the needle plate and turn the hand-wheel until the needle pierces the sample.

6.5 Continue piercing the sample at adjustments as described in 6.6 and at a speed in the range 200 to 500 stitches per minute to the end of the sample, guiding it lightly by hand.

6.6 With each sample measure the increasing stitch length at 25, 50 and 75 % of the total range of the stitch length setting control and then after passing through the maximum stitch length setting (100 %), measure the decreasing stitch length at 75, 50 and 25 %. Measurement at these six positions constitutes one measuring cycle.

6.7 After each cycle set the stitch length setting control to zero.

6.8 Make marks on the stitch length setting control for each position, if necessary.

6.9 Carry out five measuring cycles.

7 Expression of results

7.1 Measure the distance between the markings obtained on the paper according to clause 6, to the nearest 0,5 mm. In order to achieve this, measure the total length of 11 consecutive markings from the approximate centre of each stitch length setting and divide the resulting value by 10.

7.2 Record these mean values of the stitch length determined at each setting of the stitch length control; a form to be used for this purpose is shown in the figure.

Cycle number	Stitch length at element settings of		
	25 %	50 %	75 %
1			
2			
3			
4			
5			
Average stitch length			

Figure — Form to be used for recording values of stitch length

7.3 Calculate the average stitch length L at each setting (L_{25}, L_{50}, L_{75}) of the stitch length setting control.

7.4 Calculate the difference between the maximum and minimum values of stitch length at each setting of the stitch length setting control and express this as a percentage of the average stitch length at that setting, by means of the formula

$$\frac{L_{N,\max} - L_{N,\min}}{L_{N\ \text{ave}}} \times 100$$

where N is the setting of the stitch length setting control, i.e. 25 %, 50 % or 75 %.

8 Test report

The test report shall include

a) a reference to this International Standard;

b) the percentage variations of the stitch length for each setting (L_{25}, L_{50} and L_{75}) of the stitch length setting control.

Annex

Specification of material and apparatus

A.1 Cotton fabric[1)]

The cotton fabric shall have the following characteristics :

a) state of fabric : bleached, without dressing;

b) composition : cotton;

c) yarn designation : warp — 300 dtex Z 700 ± 25
weft — 300 dtex Z 700 ± 25

d) counting threads per unit length (loomstate) :
warp — 27 per cm
weft — 27 per cm

e) weave : plain;

f) mass per unit area (loomstate) : 170 ± 10 g/m^2

NOTE — For the description of woven fabric, see ISO 2959.

A.2 Paper for continuous forms

The paper shall have the following characteristics :

a) paper sizes, as specified in ISO 2784;

b) length perforations at left- and right-hand margins as well as cross perforations;

c) layout chart, as specified in ISO 3535. Only one side of the continuous form shall be printed;

d) the grammage of the paper shall be 90 g/m^2. The tolerance shall not exceed 5 % of the weight of paper, determined under standard test conditions as specified in ISO 536;

e) in temperate climates, paper shall have a moisture content in equilibrium within the range 40 to 55 % relative humidity at a temperature of 19 to 23 °C;

f) the surface roughness of both sides of the paper shall have a maximum Bendtsen roughness of 350 ml/min.

A.3 Sewing machine needle Nm 60 to Nm 70

A.3.1 A sewing machine needle designated Nm 60 is a needle of 0,6 mm diameter at the cylindrical part of the needle blade above the short groove, but below any reinforcement of the blade.

A.3.2 Comparison chart of needle sizes

Metric designation Nm *	Other types of designation													
	Columbia		Lewis		Merrow	Singer	Union Special	Willcox and Gibbs	Schiffli	System				
										81,88	292	332	339	459 R	731
40						3					22			21	
45						4					21			20	
50						5					20			19	
55					3/0	6	022				18			18	
60					2/0	8		2/0		3/0	16		8	17	
65			2 1/2		0	9	025	0			14			16	
70				10	1	10	027	1	2/0	2/0	13	2/0	10	15	
75	1	10	3			11	029				12			14	
80	1 1/2	15		12	2	12	032	2	0	0	11	0	12	13	
85	2	20				13				1/2	10				
90	2 1/2	25	3 1/2	14	3	14	036	3	1	1	9	1/2	13	12	
95	3	30				15					8				
100	3 1/2	35	4	16	4	16	040	4	2	2	7	1	14	11	0

* Nm = Numbering metric; corresponding to 100 × the diameter, d, of the needle blade within its cylindrical part above of the clearance above eye or the short groove — but not within the conic part where the blade diameter increases to the shank diameter.

1) A cotton fabric complying with these requirements is available commercially. Details may be obtained from the Secretariat of ISO/TC 148 (DIN, Federal Republic of Germany) or from the ISO Central Secretariat.

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