
International Standard



4817

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Household sewing machines — Determination of directional stability (drift)

Machines à coudre domestiques (ou de ménage) — Détermination de la stabilité directionnelle (déplacement latéral)

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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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4817 was prepared by Technical Committee ISO/TC 148, *Sewing machines*.

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Household sewing machines — Determination of directional stability (drift)

1 Scope and field of application

This International Standard specifies a method for the determination of the directional stability (drift) caused by irregularities of the feed mechanism as an individual machine function, without using a sewing thread.

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 353, *Processed writing paper and certain classes of printed matter — Method of expression of dimensions.*

ISO 2959, *Textiles — Woven fabric descriptions.*

3 Definitions

For the purpose of this International Standard, the following definitions apply.

3.1 directional stability: Actual direction of the material according to the theoretical direction of the feed of the material in the machine.

3.2 theoretical direction of the feed of the material: Direction parallel to the slots of the needle plate through which the feeding device moves for the transport of the material.

3.3 actual direction of the feed of the material: Direction indicated by the holes pierced by the needle in the sample at the end of the test.

4 Principle

Stitching, at a given speed, one ply of cotton fabric with the machine set for straight stitch type and for zigzag stitch type. During stitching, the long side of the sample shall be parallel to the theoretical direction of a directional guide. Calculation of the average value P of the results obtained for five tests carried out for each stitch type. These average values correspond to the directional stability of the feed mechanism as an individual machine function, i.e. without using sewing threads.

5 Material and apparatus¹⁾

5.1 Cotton fabric, as specified in the annex. Ten pieces, not creased and not washed, 60 mm × 200 mm. One of the coloured threads shall be in the middle of the cotton fabric piece and parallel to its long side. The long side shall follow the warp thread.

5.2 Ten sewing machine needles Nm 80, as specified in the annex. The needle system shall be in accordance with the specifications of the sewing machine manufacturer.

5.3 Directional guide of A4 graph paper, graduated in millimetres, as specified in ISO 353. The guide shall have an opening in the centre for the free passage of the feeding device and the presser foot.

6 Preparation of the sewing machine

6.1 Fit the machine with the needle plate and presser foot for each stitch type supplied with the machine, as specified in the manufacturer's instruction manual.

6.2 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.

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.

6.3 Open out the working surface of the machine in the direction of feed, as the whole directional guide shall rest straight and completely flat on the surface in front and behind the needle. The guide shall be fixed to the working surface, so that the lines of the guide are parallel to the theoretical direction of the feeding device.

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

6.4 Set machines of the zigzag stitch type for both straight stitch and zigzag stitch conditions. Set machines of the straight stitch type for straight stitch conditions.

Set the stitch length regulator

- a) for the straight stitch type, to a position corresponding to a stitch length of $1 \text{ mm} \pm 10 \%$;
- b) for the zigzag stitch type, to a position corresponding to a stitch length of $0,5 \text{ mm} \pm 10 \%$;
a stitch width of $4 \text{ mm} \pm 10 \%$.

6.5 Change the needle for each test.

NOTE — No sewing thread is used in this test.

7 Procedure

7.1 Place one ply of cotton fabric on the directional guide between the feeding device and the presser foot. Turn the handwheel until the needle pierces the central coloured thread in the sample. In the case of the zigzag stitch type, make the first stitch on the left on the central coloured thread.

7.2 Operate the machine at a speed of 700 stitches per minute $\pm 5 \%$ over a length of 150 mm.

Machines which cannot reach a maximum speed of 700 stitches per minute shall be tested at the highest possible constant speed.

Lightly guide the sample at the operator end in order to keep it in the theoretical direction, that is, parallel to the lines of the directional guide, for the duration of the test.

7.3 Variations between the theoretical and the actual direction of the feed of the material may be seen by the position of the coloured thread in the fabric centre in relation to the pierced line (see the figure).

7.4 Repeat this test five times for each stitch type.

8 Expression of results

8.1 Evaluate the results of the test according to the figure by measuring the distance *A* or *B* and record the value to the nearest 0,5 mm.

8.2 For each stitch type, calculate the arithmetic mean of the *A* or *B* deviations from the five tests performed and record this value as P_A and/or P_B .

8.3 If during the five tests either *A* or *B* deviations are measured, the average value of the deviations *A* and the average value of the deviations *B* shall be indicated. These average values represent the directional stability (drift).

9 Test report

The test report shall include

- a) a reference to this International Standard;
- b) the average value P_A and/or P_B , in millimetres, resulting from the tests on the straight stitch type;
- c) the average value P_A and/or P_B , in millimetres, resulting from the tests on the zigzag stitch type;
- d) the highest possible constant speed if the machine could not be tested at the required speed.

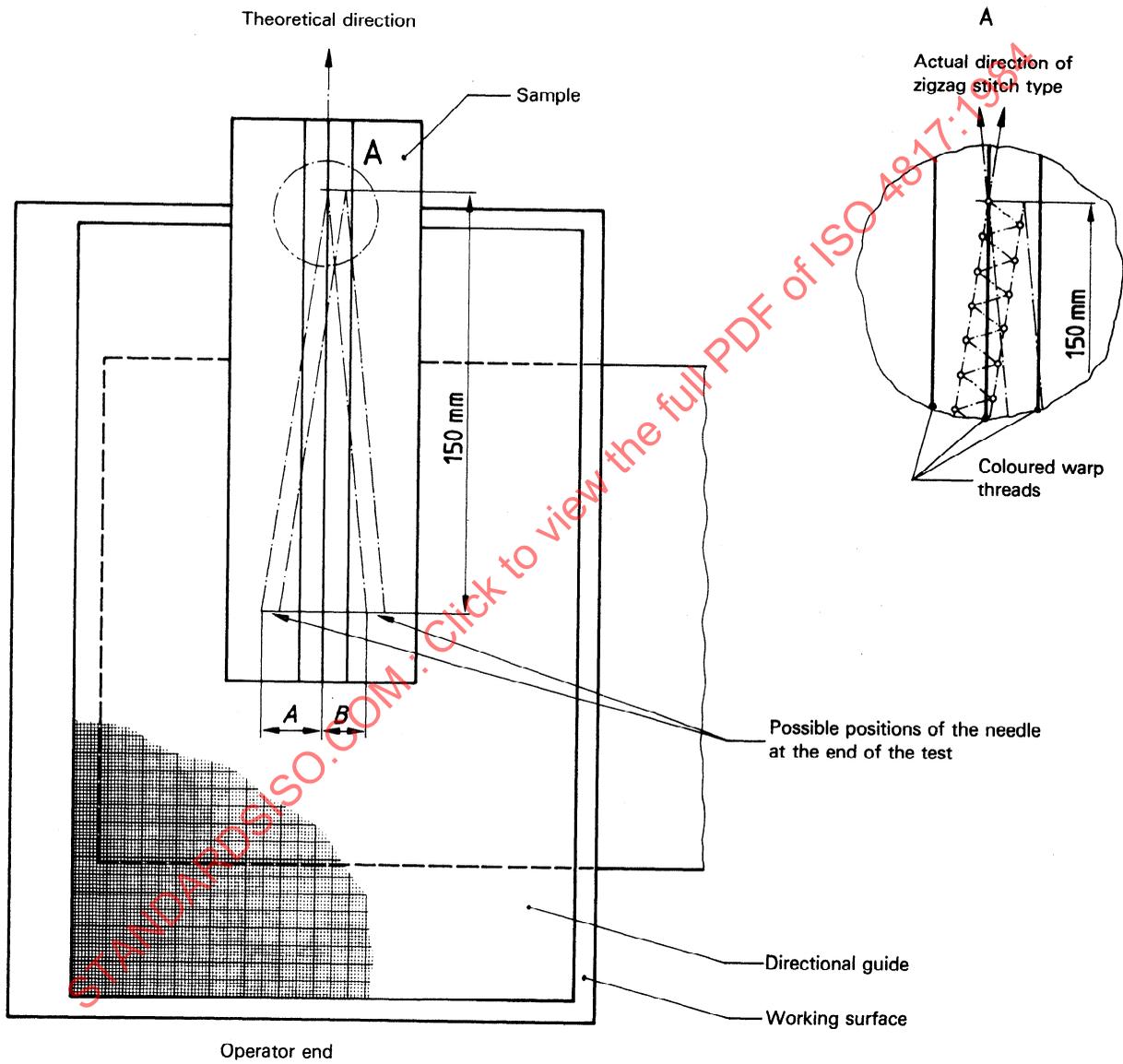


Figure — Procedure

Annex

Specification of material and apparatus

A.1 Cotton fabric¹⁾

The cotton fabric shall have the following characteristics:

- a) state of fabric : bleached, without dressing, with coloured warp threads;
- 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/m²

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

A.2 Sewing machine needle Nm 80

A.2.1 A sewing machine needle designated Nm 80 is a needle of 0,8 mm diameter at the cylindrical part of the needle blade above the short groove, but below any reinforcement of the blade.

A.2.2 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							21		
45						4							20		
50						5							19		
55					3/0	6	022						18		
60					2/0	8		2/0		3/0		8	17		
65			2 1/2		0	9	025	0					16		
70				10	1	10	027	1	2/0	2/0	13	2/0	10	15	
75	1	10	3			11	029						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 times diameter d of the needle blade within its cylindrical part above the clearance, the 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, Germany, F.R.) or from the ISO Central Secretariat.