



SLOVENSKI STANDARD
SIST ISO 3378:1998

01-april-1998

Usnje - Ugotavljanje odpornosti lica proti razpokanju in indeksa razpokanja

Leather -- Determination of resistance to grain cracking, and of crack index

Cuir -- Détermination de la résistance de la fleur à la flexion et de l'indice de gerçure

Ta slovenski standard je istoveten z: ISO 3378:1975

[SIST ISO 3378:1998](https://standards.iteh.ai/catalog/standards/sist/7e6da2e5-9070-45b2-81a4-3ec0f9174235/sist-iso-3378-1998)

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ICS:

59.140.30 Usnje in krzno Leather and furs

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INTERNATIONAL STANDARD



3378

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Leather — Determination of resistance to grain cracking, and of crack index

Cuir — Détermination de la résistance de la fleur à la flexion et de l'indice de gerçure

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Descriptors : leather, tests, bend tests, brittleness.

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

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 3378 was drawn up by Technical Committee ISO/TC 120, *Leather*, and circulated to the Member Bodies in May 1974.

It has been approved by the Member Bodies of the following countries :

Australia	Germany	South Africa, Rep. of
Brazil	Hungary	Spain
Bulgaria	India	Thailand
Canada	Iran	Turkey
Chile	Ireland	United Kingdom
Czechoslovakia	Israel	U.S.S.R.
Egypt, Arab Rep. of	Poland	Yugoslavia
Ethiopia	Portugal	
France	Romania	

No Member Body expressed disapproval of the document.

This International Standard is based on method IUP/12 of the International Union of Leather Technologists' and Chemists' Societies.

Leather – Determination of resistance to grain cracking, and of crack index

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for determining the resistance of leather to grain cracking and for determining the crack index.

This method is applicable particularly to heavy leathers.

2 REFERENCES

ISO 2419, *Leather – Conditioning of test pieces for physical tests.*

ISO 2589, *Leather – Physical testing – Measurement of thickness.*

3 PRINCIPLE

Bending of the leather, grain outwards, around a mandrel of known diameter and observation of whether the leather cracks, the forces applied to the leather in bending it being the lowest that are required to maintain the leather and mandrel in contact.

4 APPARATUS

4.1 The following apparatus is required :

4.1.1 **Clamp** or other device which rigidly holds one end of the test piece.

4.1.2 **Mandrel** of the appropriate diameter.

When the determination of crack index is required, the following set of numbered mandrels, having the diameters shown, is necessary :

Mandrel No :	Diameter mm
1	61,67 ± 0,03
2	35,00 ± 0,03
3	23,57 ± 0,03
4	17,22 ± 0,03
5	13,18 ± 0,03
6	10,38 ± 0,03
7	8,33 ± 0,03
8	6,76 ± 0,03

(See 8.1 and 8.2)

4.1.3 **Roller**, diameter 25 mm.

4.2 The mandrel and roller shall make contact with the flesh and the grain surface respectively of the middle portion of the test piece, across its full width. The axes of both the mandrel and the roller shall be perpendicular to the length of the test piece. The axis of the mandrel shall be fixed relative to the clamp and the axle of the roller shall be attached to a handle pivoted at the axis of the mandrel.

Figure 1 shows in plan view the relative positions of the clamp, the mandrel and the roller.

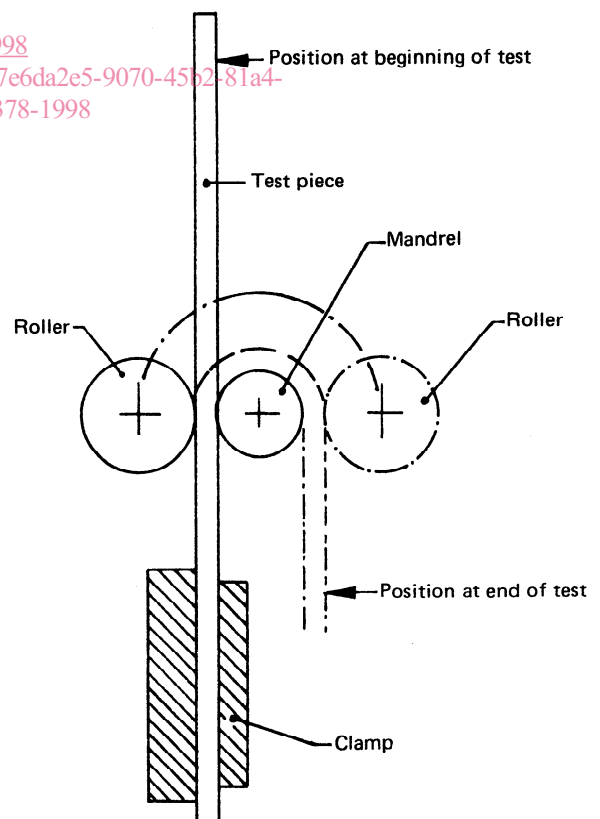


FIGURE 1 – Positions of clamp, mandrel and roller

6.2 Resistance to cracking using a given mandrel

6.2.1 With the test piece in position, turn the handle through 180° in 5 ± 1 s, thus bending the test piece, grain outwards, around the mandrel. (If the apparatus described in 4.3 is used, do this by turning the handle through 180° about C as pivot, causing F to roll on the grain surface of the leather and bend it around E or B.)

During the bending, watch the grain to see whether cracking occurs.

6.2.2 If the leather is to be tested on more than one mandrel, use the largest mandrel first, followed in order of decreasing size by the others.

6.3 Determination of crack index

6.3.1 For some purposes it is merely necessary to decide whether a leather does or does not crack when bent round a mandrel of specified diameter, no account being taken of the thickness.

For other purposes it is desirable to take into account the thickness of the leather. The crack index is a measure of the tendency to crack which takes into account the thickness of the leather. It is determined as follows:

6.3.2 Using each of the set of numbered mandrels in turn starting with No. 1, carry out the procedure described in 6.1 and in 6.2.1. Note the number of the largest mandrel which causes grain cracking.

7 EXPRESSION OF RESULTS

7.1 If determination of the resistance to cracking over a specified mandrel is carried out, express the result either as a pass or as a failure.

7.2 If determination of the crack index is carried out, multiply the number, n , of the largest mandrel on which the test piece cracks by the test piece thickness, δ , to obtain the crack index, $n\delta$.

If the grain cracks when the leather is being bent round the largest mandrel of all, the crack index shall be expressed as "less than $1,5 \delta$ " (not " δ "). If it fails to crack when bent round the smallest mandrel, the crack index shall be expressed as "greater than $8,5 \delta$ " (not " 8δ ").

8 NOTES ON PROCEDURE

8.1 The diameters of the set of mandrels are so chosen that bending a leather 5 mm thick round them causes extensions of the grain of $(5n + 2,5 \%)$, if the neutral axis of the leather is assumed to be midway between the grain and flesh surface in the bent test piece.

If such a leather does not crack on mandrel $(n - 1)$, but cracks on mandrel n , it cracks when its percentage extension lies between $5(n - 1) + 2,5$ and $5n + 2,5$ (that is, when the percentage extension lies between $5n - 2,5$ and $5n + 2,5$), so $5n$ is an acceptable estimate of the percentage extension of the grain at crack.

For a leather 5 mm thick, however, $5n$ is the crack index, so for this leather the crack index is equal to the estimated percentage extension of the grain when cracking occurs.

8.2 For leather of thickness other than 5 mm the crack index $n\delta$ is not exactly equal to the percentage extension of the grain at crack, but it is a sufficiently close estimate of it for those mandrel sizes on which cracking is likely to occur in practice. The following table shows, for different leather thickness and mandrel on which the leather first cracks,

- the crack index;
- the percentage extension of the grain at crack, if this occurs midway between the extension given by the corresponding mandrel and that given by the next larger mandrel.

Mandrel No.	Thickness of leather, mm											
	3		4		5		6		7		8	
	a)	b)	a)	b)	a)	b)	a)	b)	a)	b)	a)	b)
1	3	—	4	—	5	—	6	—	7	—	8	—
2	6	6	8	8	10	10	12	12	14	13	16	15
3	9	10	12	12	15	15	18	17	21	20	24	22
4	12	13	16	17	20	20	24	23	28	26	32	29
5	15	17	20	21	25	25	30	29	35	32	40	35
6	18	20	24	26	30	30	36	34	42	37	48	41
7	21	24	28	30	35	35	42	39	49	43	56	46
8	24	29	32	35	40	40	48	44	56	48	64	52

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9 TEST REPORT

The test report shall include the following particulars :

- a) a reference to this International Standard;
- b) if the leather has been tested over a mandrel (or mandrels) of specified diameter, whether or not cracking has occurred in each case;
- c) the crack index, if it has been determined;
- d) any deviation from the prescribed method (notably, conditioning of the test pieces);
- e) the reference of the lot;
- f) whether the test piece came from the whole hide, bend, shoulder or belly.

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