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**INTERNATIONAL STANDARD**



**2420**

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

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## **Leather – Determination of apparent density**

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## 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 2420 was drawn up by Technical Committee ISO/TC 120, *Leather*.

It was approved in November 1971 by the Member Bodies of the following countries :

Brazil	Iran	Romania
Chile	Israel	South Africa, Rep. of
Czechoslovakia	Italy	Spain
Egypt, Arab Rep. of	Netherlands	Turkey
France	New Zealand	United Kingdom
Germany	Poland	U.S.S.R.
Hungary	Portugal	

No Member Body expressed disapproval of the document.

This International Standard is based on method IUP/5 of the International Union of Leather Chemists' Societies.

# Leather — Determination of apparent density

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the apparent density of leather.

It is applicable to all leathers for which an accurate measurement of thickness can be made.

## 2 REFERENCES

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

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

## 3 PRINCIPLE

Accurate measurement of the thickness and diameter of a disk of leather; calculation of its volume. Weighing of the disk and calculation of the apparent density by dividing the mass by the volume.

## 4 APPARATUS

**4.1 Steel press knife**, the inner wall of which is a right circular cylinder of diameter 70 mm. The angle formed at the cutting edge between the internal and external surface of the press knife shall be approximately  $20^\circ$  and the wedge of this angle shall be of a depth exceeding the thickness of the leather.

**4.2 Thickness gauge**, as specified in ISO 2589.

**4.3 Balance**, accurate to 0,001 g.

**4.4 Instrument for measuring diameter.**

## 5 TEST PIECES

Cut test pieces by applying the press knife to the grain surface. Then condition them in accordance with ISO 2419. (See also Note 4 of that International Standard.)

NOTE — To obtain cleanly cut test pieces, it is advantageous to place a thick sheet of paper between the sample and the cutting board.

## 6 PROCEDURE

### 6.1 Test conditions

Carry out all operations in the standard atmosphere specified in ISO 2419.

### 6.2 Measurement of thickness

Measure the thickness of each test piece in accordance with ISO 2589, using the load stated therein unless otherwise specified. Measure the thickness, in millimetres, at three points forming the corners of an equilateral triangle and each situated approximately 20 mm from the centre of the test piece; also measure the thickness at the centre of the test piece.

Take the arithmetic mean of the four results as the thickness of the test piece in millimetres.

### NOTES

1 With compressible leathers the application of any load by the gauge used in measuring thickness may result in appreciable changes of thickness, and hence in apparent density. For certain purposes it may be desirable to use a smaller load than that specified in ISO 2589. If this is done the fact shall be noted; the load used and the number of measurements shall be stated in the test report.

2 For test pieces cut from leathers of uneven thickness it may be desirable to measure the thickness at more than four points.

### 6.3 Measurement of diameter

Measure the diameter of the test piece, in millimetres, in two directions at right angles to one another on the grain surface, and in two directions at right angles to one another on the flesh surface. Make the measurement to the nearest 0,01 mm.

NOTE — For thick leathers, measurements of diameter to the nearest 0,05 mm are sufficiently accurate.

### 6.4 Calculation of volume

Calculate the volume of the test piece by treating it as a right circular cylinder having a diameter and height equal to the diameter and thickness measured as described.

### 6.5 Measurement of mass

Measure the mass of the test piece, in grams, to the nearest 0,001 g.

## 7 EXPRESSION OF RESULTS

Calculate the apparent density, in kilograms per cubic metre, from the formula

$$\frac{1,273 \times 10^6 \times m}{t \times D^2}$$

where

*m* is the mass, in grams, of the test piece;

*t* is its thickness, in millimetres;

*D* is its diameter, in millimetres.

NOTE — Apparent relative density is given by the formula

$$\frac{1\,273\,m}{t \times D^2}$$

## 8 TEST REPORT

The test report shall include the following particulars :

- a) reference to this International Standard;
- b) the apparent density of each test piece, to three significant figures;
- c) the load used to measure the thickness, if different from that specified;
- d) any other deviation from the prescribed method;
- e) the reference of the lot.

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