International Standard 5400

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

Leather — Determination of total silicon content — Reduced molybdosilicate spectrometric method

Cuir — Détermination de la teneur en silicium total — Méthode spectrométrique au molybdosilicate réduit

First edition — 1984-03-01

UDC 675 : 543.849 **Ref. No. ISO 5400-1984 (E)**

Descriptors : leather, tanning, tests, determination of content, silicon, spectrophotometric analysis.

Price based on 2 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (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 authorized 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 5400 was developed by Technical Committee ISO/TC 120, *Leather*, and was circulated to the member bodies in May 1981.

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

Brazil	Kenya	Sri Lanka
China	Korea, Rep. of	Tanzania
Egypt, Arab Rep. of	Mexico	Turkey
Ethiopia	New Zealand	United Kingdom
Germany, F.R.	Romania	USSR
Hungary	South Africa, Rep. of	
India	Spain	

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

France

Printed in Switzerland

Leather — Determination of total silicon content — Reduced molybdosilicate spectrometric method

1 Scope and field of application

This International Standard specifies a reduced molybdosilicate spectrometric method for the determination of the total silicon content of leather.

It is not possible to define the chemical identity of the silicon compounds present in leather and the results are expressed in terms of the oxide SiO_2. Organo-silanes are present in leather and they may be determined by this procedure. Organo-silanes are almost quantitatively extracted from leather by tetrahydrofuran or dichloromethane, and this forms the basis of a method for their determination (Elliott, JSLTC, 1964, **48**, 105; SLTC-Method SLC/16). A more reliable estimate of inorganic silicon-containing compounds will therefore be obtained if leathers suspected of containing organo-silanes are first extracted with dichloromethane.

2 References

ISO 835, *Laboratory glassware — Graduated pipettes —*

Part 1 : General requirements.

Part 2 : Pipettes for which no waiting time is specified.

ISO 1042, *Laboratory glassware — One-mark volumetric flasks.*

ISO 2418, *Leather — Laboratory samples — Location and identification.*

ISO 2588, *Leather — Sampling — Number of items for a gross sample.*

ISO 4044, *Leather — Preparation of chemical test samples.*

3 Principle

Oxidation of a test portion in a Parr bomb under alkaline conditions to destroy organic matter and to solubilize the mineral matter. Formation of the molybdosilicate complex and spectrometric measurement at a wavelength of 630 nm.

4 Reagents

During the analysis, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

4.1 Concentrated sulfuric acid, ϱ_{20} = 1,83 g/ml, diluted 1 + 1 with water.

4.2 Sulfuric acid, standard solution, $c(1/2\ H_2SO_4)$ = 1,0 mol/l.

4.3 Glycerol.

4.4 Sodium sulfate, 100 g/l solution.

4.5 Ammonium molybdate, 100 g/l solution containing 2 ml of ammonium hydroxide, ϱ_{20} = 0,880 g/ml, per 100 ml of solution.

4.6 Tin(II) chloride, dihydrate, 10 g/l solution.

Dissolve 10 g of $SnCl_2.2H_2O$ in 12 ml of warm hydrochloric acid, ϱ_{20} = 1,19 g/ml and 5 ml water, then dilute to 1 000 ml.

Prepare this solution fresh.

4.7 Fusion mixture, consisting of

100 g of sodium peroxide;

10 g of potassium nitrate;

3 g of powdered sucrose.

5 Apparatus

Ordinary laboratory apparatus and

5.1 Parr bomb, 22 ml.

5.2 Beaker, of capacity 250 ml.

5.3 One-mark volumetric flasks, of capacity 100 and 500 ml, complying with the requirements of ISO 1042.

5.4 Pipettes, complying with the requirements of ISO 835/1 and ISO 835/2.

5.5 Analytical balance, accurate to 0,001 g.

5.6 Spectrometer or photo-electric absorptiometer.

5.7 pH meter, fitted with glass and reference electrodes.