
International Standard



5940

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Carbonaceous materials for the production of aluminium — Pitch for electrodes — Determination of softening point by the ring-and-ball method

Produits carbonés utilisés pour la production de l'aluminium — Brai pour électrodes — Détermination du point de ramollissement par la méthode bille et anneau

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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 5940 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in November 1978.

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

Australia	India	South Africa, Rep. of
Belgium	Israel	Sweden
Bulgaria	Italy	Switzerland
Czechoslovakia	Korea, Rep. of	Thailand
Egypt, Arab Rep. of	Mexico	Turkey
France	New Zealand	United Kingdom
Germany, F. R.	Poland	USA
Hungary	Romania	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Canada
Netherlands

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

Carbonaceous materials for the production of aluminium — Pitch for electrodes — Determination of softening point by the ring-and-ball method

1 Scope and field of application

This International Standard specifies a method of using the ring-and-ball apparatus for the determination of the softening point (softening temperature) of pitch used in the production of aluminium.

The method is applicable to pitches having softening points equal to or greater than 30 °C.

2 Reference

ISO 6257, *Carbonaceous materials used in the production of aluminium — Pitch for electrodes — Sampling*.

3 Principle

Preparation of a disc-shaped test piece by moulding a test portion in a ring, fitting the prepared ring into a heated bath and placing a steel ball on the upper surface of the test piece.

Determination of the temperature at which the test piece, on heating at a prescribed rate, softens sufficiently to sag to a specified depth under the mass of the ball.

This temperature corresponds to the softening point (softening temperature).

4 Reagents

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

4.1 Glycerol, for use with pitches having softening points greater than 85 °C.

4.2 Water, for use with pitches having softening points in the range 30 to 85 °C.

5 Apparatus

Ordinary laboratory apparatus and

5.1 Ring-and-ball apparatus (see figure 1 for assembled apparatus), comprising :

5.1.1 Rings, brass, tapered (see figure 2), having the following dimensions :

- depth : $6,4 \pm 0,1$ mm;
- internal diameter at bottom : $15,9 \pm 0,1$ mm;
- internal diameter at top : $17,5 \pm 0,1$ mm;
- external diameter above shoulder : $20,6 \pm 0,1$ mm;
- external diameter below shoulder : $18,5 \pm 0,5$ mm.

5.1.2 Steel balls, of diameter 9,53 mm, each weighing $3,50 \pm 0,05$ g.

5.1.3 Ball centring guides.

A suitable form of guide is shown in figure 3.

5.1.4 Bath; a heat-resistant glass squat form beaker of capacity 800 ml.

5.1.5 Ring support, having the shape and dimensions shown in figures 1 and 4.

The support consists essentially of two parallel brass plates, one above the other, and $25 \pm 0,5$ mm apart. The upper plate is designed to support the two rings (5.1.1) and its thickness is equal to the distance between the lower surface of one ring and its shoulder.

The two plates are supported by a circular or rectangular holder which rests on the top of the bath and which has a central hole intended for the thermometer (5.1.6).

5.1.6 Thermometer, solid-stem, mercury-in-glass type, having :

- a) a range from 0 to 120 °C for pitches which have softening points between 30 and 120 °C;
- b) a range from 50 to 210 °C for pitches which have softening points greater than 120 °C.

Details of suitable thermometers are given in annex A, but other thermometers of similar characteristics may also be used.