

Method of sampling and test for

Carbonaceous materials used in aluminium manufacture

Part 1. Electrode pitch

**Section 1.12 Determination of mesophase
content**

Confirmed January 2011

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Chemicals Standards Policy Committee (CIC/-) to Technical Committee CIC/24, upon which the following bodies were represented:

- Aluminium Federation
- British Ceramic Research Ltd.
- Chemical Industries Association
- Institute of Petroleum
- Refractories Association of Great Britain

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Foreword

This Section of BS 6043 has been prepared under the direction of the Chemicals Standards Policy Committee. BS 6043 provides methods of sampling and test for carbonaceous materials used in aluminium manufacture. The standard is published in four Parts, each Part being divided into Sections.

Part 1 comprises a series of methods of test for electrode pitch as follows.

Section	Subject	Identical with
1.1	Sampling	ISO 6257
1.2	Water content (Dean and Stark method)	ISO 5939
1.3	Softening point (ring and ball method)	ISO 5940
1.4	Content of toluene-insoluble material	ISO 6376
1.5	Content of quinoline-insoluble material	ISO 6791
1.6	Coking value	ISO 6998
1.7	Density	—
1.8	Ash	ISO 8006
1.9	Sulfur content	ISO 9055
1.10	Volatile matter content (gas chromatographic method)	—
1.11	C/H ratio of quinoline-insoluble material	—
1.12	Mesophase content	—
1.13	Sulfur content (routine method)	—

Other international methods of test for electrode pitch are under consideration and, subject to approval by the United Kingdom, will be published as British Standards as they become available.

It is essential to use BS 6043 : Section 1.1 in conjunction with this Section of BS 6043.

This British Standard calls for the use of substances and/or procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

This standard describes a method of test only, and should not be used or quoted as a specification defining the characteristics of a product. Reference to this Section should state that the method of test used is in accordance with BS 6043 : Part 1 : Section 1.12 : 1994.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Method

1 Scope

This Section of BS 6043 describes a method for the determination of the mesophase content of electrode binder pitch by a microscopic point-counting procedure.

2 References

2.1 Normative references

This Section of BS 6043 incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this Section of BS 6043 only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

2.2 Informative references

This Section of BS 6043 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions

3.1 mesophase

Optically anisotropic component identifiable as essentially spherical particles of diameter approximately 1 μm or larger, in pitches which have been subjected to prolonged thermal treatment at temperatures above approximately 350 °C.

NOTE. A guide to the typical microscopic appearance of mesophase particles under polarized light is given by the photomicrograph in figure 1. Guidance is also given in annex A on the differentiation of mesophase from other anisotropic features which may be present in pitch.

3.2 counting points

Points of intersection of the lines forming the crosses in the microscope eyepiece graticule.

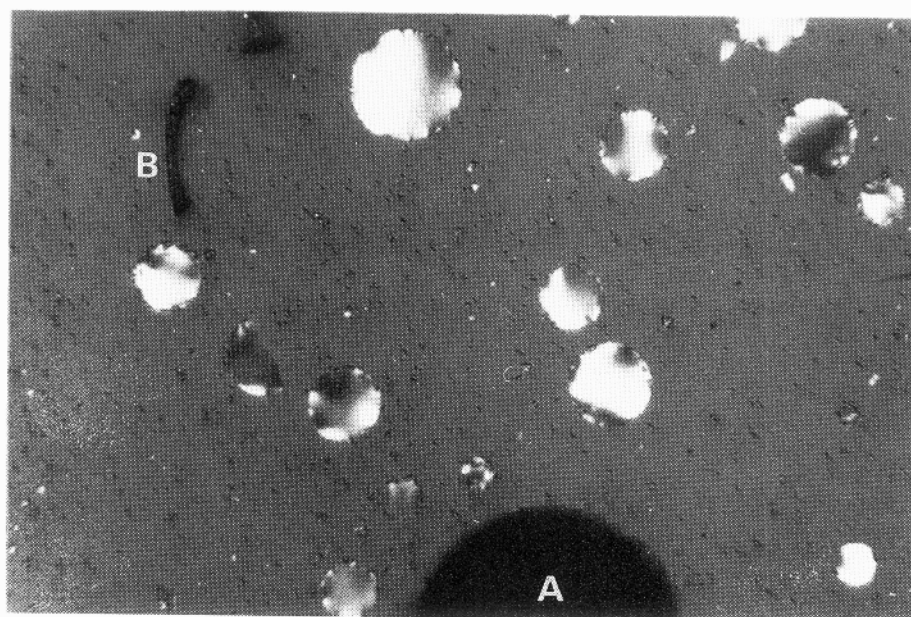
3.3 hit

Point-counting score allocated when the microscopic image of a counting point lies wholly within the boundary of the image of a mesophase particle.

3.4 half-hit

Point-counting score allocated when the microscopic image of a counting point lies exactly over the image of the boundary between a mesophase particle and the isotropic background.

NOTE. Guidance on scoring hits and half-hits during point counting is given in annex B.



NOTE. Linear magnification factor 500. The feature at A is a bubble void; the feature at B is a particle of carry-over coke. The numerous small dark particles standing in slight relief are primary quinoline-insoluble matter.

Figure 1. Typical microscopic appearance of mesophase particles under polarized light