SLOVENSKI STANDARD
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Aerospace series - Test methods for transparent materials for aircraft glazing - Part 3: Determination of refractive index

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Luft- und Raumfahrt - Prüfverfahren für transparente Werkstoffe zur Verglasung von Luftfahrzeugen - Teil 3: Bestimmung des Brechungsindexes

Série aérospatiale - Méthodes d'essais pour matériaux transparents pour vitrages aéronautiques - Partie 3: Détermination de l'indice de réfraction

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart,36 B-1050 Brussels

Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries and votes carried out in accordance with the rules of this Association, this Standard has successively received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 1993, and conflicting national standards shall be withdrawn at the latest by July 1993.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard :

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Introduction

The method described in this standard differs from ISO 489, method A, in the testing conditions.

1 Scope

This standard specifies the method used for the determination of the refractive index applicable for transparent materials used in aircraft glazing.

2 Purpose of the method

This method is used for the control of purity and composition of materials.

The refractive index shall be considered when designing the parts.

3 Definition

The refractive index n_D^{23} is the ratio of the velocity of light in a vacuum to that in the material measured at 23 °C for the sodium D line at wavelength 589,3 nm.

4 Apparatus and material

4.1 Abbe refractometer or any other refractometer that can be shown to give the same results ; the accuracy shall be 0,001.

4.2 Source of white light.

4.3 Contacting liquid

Saturated aqueous solution of zinc chloride made slightly acid.

5 Specimens

The specimen cut from the sample shall be of such a size as will fit on the face of the fixed half of the refractometer prisms.

For the Abbe refractometer the dimensions are as follows :

- 6 mm wide,
- 12 mm long,
- 3 mm thick.

For necessary accuracy the surface of the specimen in contact with the prism shall be sufficiently flat and polished in order to obtain satisfactory contact between the specimen and the prism. This contact is indicated by the dividing line between the light and dark halves of the eyepiece field appearing sharp and straight.

A second surface is prepared under the same conditions perpendicular to the first and on one end of the test specimen. These two surfaces shall intersect along a sharp line without a bevelled or rounded edge.

6 Conditioning

The specimen shall be preconditioned at (23 ± 2) °C, (50 ± 5) % relative humidity for at least 48 h prior to testing. Before the determination, the apparatus shall reach the same conditions.

The test is to be performed immediately after conditioning.

7 Procedure

The procedure for the Abbe refractometer is described herebelow. For other refractometers the procedure may be modified if necessary.

The determination is carried out at (23 ± 0,5) °C. A small drop of the contacting liquid is placed on the polished surface of the specimen which is then placed in firm contact with the surface of the prism with the polished small edge of the specimen towards the source of light. The index arm of the refractometer is then adjusted until half of the eyepiece field is dark. The compensator (Amici prism) drum is then adjusted until all colour is removed from the field, after which the index arm is adjusted by means of the vernier until the dividing line between the light and dark portions of the field coincides exactly with the point of intersection of the eyepiece cross hairs.

The refractive index for the sodium D line is then read on the instrument scale.

8 Test report

The test report shall include the following information :

- reference to this standard,
- refractive index to the nearest significant figure warranted by the precision and repeatability of measurement (if the refractive index is expressed to more than three significant figures, the wavelength of light for which the measurement was made is also reported),
- position on the original sample from which the specimen was cut.