BS EN 3863:2013

BSI Standards Publication

Aerospace series — Non-metallic materials — Glass transparencies — Test methods — Determination of flatness

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee ACE/65, Non-metallic materials for aerospace purposes.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Luft- und Raumfahrt - Nichtmetallische Werkstoffe - Transparente Glaswerkstoffe - Prüfverfahren - Bestimmung der Ebenheit

This European Standard was approved by CEN on 17 November 2012.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 3863:2013) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, 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of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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Introduction

This standard is part of the series of EN non-metallic materials standards for aerospace applications. The general organisation of this series is described in EN 4385. This standard is a level 3 document as defined in EN 4385. It has been prepared in accordance with EN 4386.

1 Scope

This European Standard defines the requirements for the determination of the flatness of monolithic glass transparencies for aircraft applications. The method is designed to eliminate the effect of the glass deflecting under its own weight, thus eliminating false results.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 4385, *Aerospace series — Non-metallic materials — General organisation of standardisation — Links between types of standards* 1)

EN 4386, *Aerospace series — Non-metallic materials — Rules for the drafting and presentation of test method standards* 1)

3 Terms, definitions, symbols and abbreviations

Not applicable.

4 Health, safety and environment

This European Standard does not necessarily include all health, safety and environment requirements, associated with its use.

Persons using this European Standard shall be familiar with normal laboratory / test house practices.

It is the responsibility of the user to establish satisfactory health, safety and environment practices and to ensure conformity with any European, National or local laws / regulations.

5 Principle/technique

The transparency is held in a vertical position such that its mean plane is parallel to a reference plane. The gap between the glass and the reference plane is then measured at predetermined positions by means of wedge gauges.

1) Published as ASD-STAN Prestandard at the date of publication of this standard (www.asd-stan.org).

6 Resources

6.1 Apparatus/facilities

A stand to hold the transparency in a vertical position (see Figure 1). The stand shall have two nearly vertical side-members, at a greater width spacing than the glass, drilled at equal pitch. These side-members shall be fixed at the same angle to the vertical, not to exceed 0,1 radians, and together shall define a reference plane.

A steel straight edge of greater size than the stand.

Pegs, which are inserted into the drilled holes in the stand side members, and support the straight edge at defined vertical intervals.

Three adjustable support pads against which to support the transparency.

Wedge gauges.

6.2 Materials/reagents

Not applicable.

6.3 Qualification of personnel

Not applicable.

7 Test samples/test pieces

Not applicable.

8 Test procedure

See Figure 1.

The transparency shall be set up in the support stand with an average gap of 1 mm to 2 mm from the reference plane.

The straight edge shall be supported on the pegs at the lowest level, and the gap between the transparency and the reference plane measured using the wedge gauges. The gap shall be measured at horizontal intervals of 100 mm across the width of the glass.

The straight edge shall then be moved 100 mm vertically, and the horizontal measurements repeated.

The whole process shall then be repeated at 100 mm vertical intervals until the whole of the area of the transparency has been measured.

All measurements shall be made to an accuracy of $\pm$ 0,1 mm.

NOTE 1 In order to show any local distortion of the surface, the measurements of thermally tempered glass that has been tong supported in the furnace may need to be made at an increased frequency.

NOTE 2 It is acceptable to make the measurement using a computerised system, having an identical or a better accuracy.

9 Expression of results

All measurements shall be recorded in millimetres to the first decimal place.

The arithmetic mean of all of the gap measurements shall be determined. This arithmetic mean shall then be subtracted from each individual gap measurement, and the resulting difference reported in chart form, as in the example shown in Figure 2.

10 Measurement uncertainties

The precision of this test method is not known because inter-laboratory data are not available.

11 Designation

Not applicable.

12 Test report

The test report shall include:

— reference to the test method designation;

— designation of the apparatus;

— any other information relevant to the test method;

— identification and traceability of the semi-finished product to be tested, in accordance with the technical specification;

— expression of results;

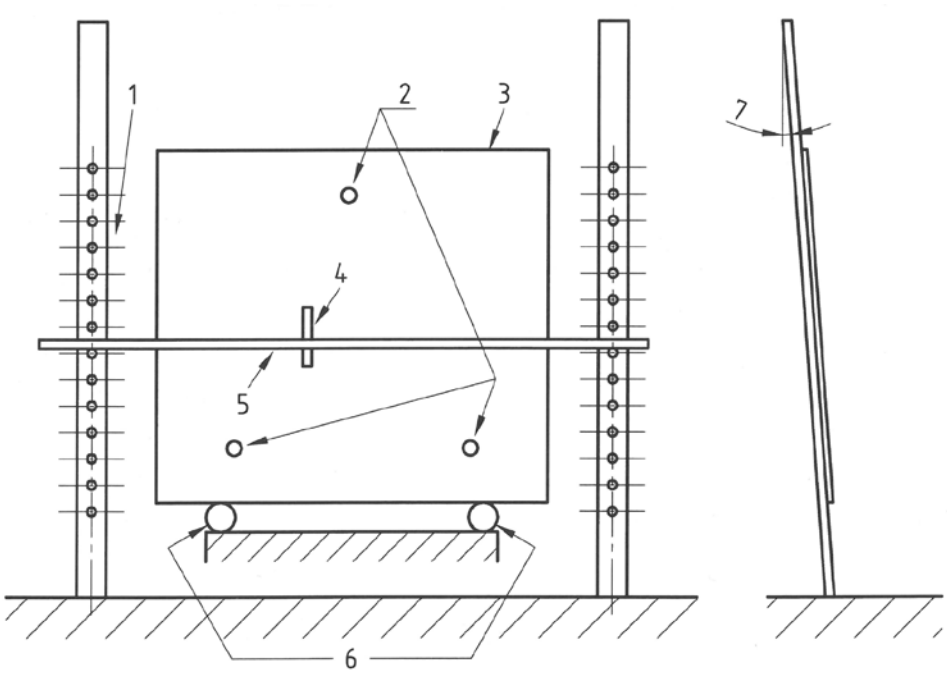
— traceability to test apparatus used;

— traceability to individual performing the test work;

— any incident which may have affected the results;

— any deviation from the test method standard;

— date of test.

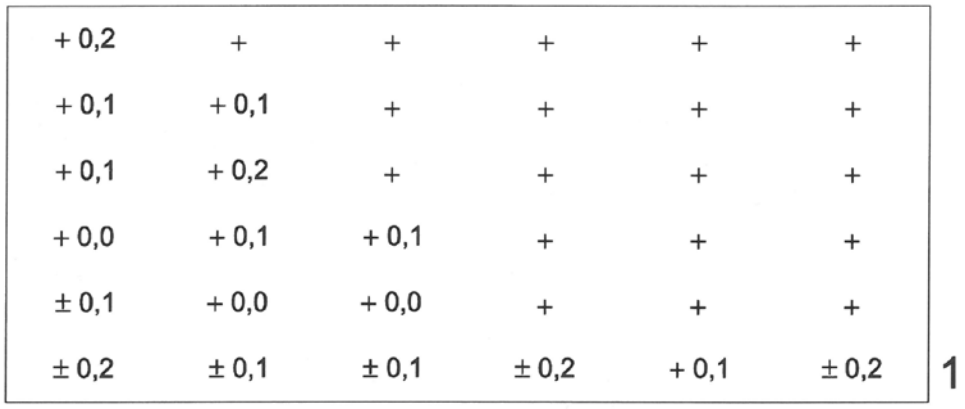


Key

1 straight edge support and pegs
2 adjustable support pads
3 sample under test
4 wedge feeler gauge
5 straight edge
6 sample supports
7 0.1 rads from vertical

Figure 1 — Flatness measurement apparatus

Dimensions in millimetres



Key

1 lower edge of glass

Figure 2 — Recording of flatness (example)

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