BRITISH STANDARD

BS EN
15336:2007

Adhesives — Determination of the time to rupture of bonded joints under static load

The European Standard EN 15336:2007 has the status of a British Standard

ICS 83.180

BSI
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National foreword

This British Standard was published by BSI. It is the UK implementation of EN 15336:2007.

The UK participation in its preparation was entrusted to Technical Committee PRI/52, Adhesives.

A list of organizations represented on PRI/52 can be obtained on request to its secretary.

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 March 2007

ISBN 978 0 580 50421 1

Amendments issued since publication

Amd. No.	Date	Comments

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15336

February 2007

ICS 83.180

English Version

Adhesives - Determination of the time to rupture of bonded joints under static load (ISO 15109:1998 modified)

Adhésifs - Détermination du temps jusqu'à la rupture de joints collés soumis à une charge statique (ISO 15109:1998 modifiée)

Klebstoffe - Bestimmung der Zeit bis zum Bruch geklebter Fügeverbindungen unter statischer Belastung (ISO 15109:1998 modifiziert)

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Ref. No. EN 15336:2007: E

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Foreword

This document (EN 15336:2007) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by AENOR.

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of an identical text or by endorsement, at the latest by August 2007, and conflicting national standards shall be withdrawn at the latest by August 2007.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Safety statement

Persons using this document should be familiar with the normal laboratory practice, if applicable. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory conditions.

1 Scope

This European Standard describes a procedure for the determination of the time to failure of a bonded joint, using a specimen which is statically loaded under specified conditions. This method can only be used for comparing adhesives, and the results cannot be used for design purposes.

2 Normative references

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

EN 1465, *Adhesives — Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies (ISO 4587:1979 modified)*

EN 13887, *Structural adhesives — Guidelines for surface preparation of metals and plastics prior to adhesive bonding*

EN ISO 291, *Plastics — Standard atmospheres for conditioning and testing (ISO 291:2005)*

EN ISO 10365, *Adhesives — Designation of main failure patterns (ISO 10365:1992)*

3 Principle

The time to rupture of a bonded lap-shear specimen is measured under a specific load.

4 Apparatus

4.1 Test rig, capable of holding specimens securely at one end, in the vertical position, the other end of each specimen being linked to a fixture capable of receiving different weights in order to vary the load. The direction of the load shall coincide with the longitudinal axis of the specimen. The rig shall be capable of loading several specimens simultaneously. It shall be designed such that any vibration associated with breakage of one specimen will not influence the remaining specimens. The rig shall be placed in an environmentally controlled cabinet or be designed such that the specimens are tested under controlled conditions.

4.2 Timer, capable of measuring the time to failure of a specimen to an accuracy of ± 1 %.

5 Specimens

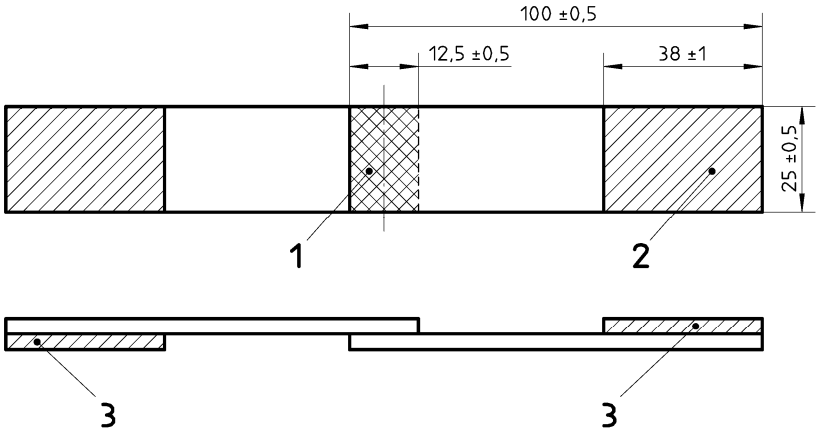
5.1 Adherend material

The adherends shall be made of metal, rigid plastic or rigid fibre-reinforced plastic.

5.2 Shape and dimensions

Specimens shall be as shown in Figure 1. The thickness of the adherends shall be sufficient to avoid significant plastic deformation.

Dimensions in millimetres



Key

1 Bonded zone

2 Gripped zone

3 Spacer plate

Figure 1 — Test specimen for all adherend materials

5.3 Cleaning and surface treatment of adherends

The cleaning and surface treatment of adherends shall be in accordance with the instructions of the adherend manufacturer and/or adhesive manufacturer, and/or shall be chosen from the methods described in EN 13887.

5.4 Preparation of specimens

Prepare specimens in accordance with the procedure described in EN 1465. Apply and cure the adhesive in accordance with the manufacturer's recommendations. Control the bond line thickness by appropriate means, such as glass spheres or wire spacers. When using glass spheres, the content shall not exceed 0,5 % of the mass of the adhesive. When using wire spacers, prepare the specimens in such a way that the final test piece does not include the area containing the wire.

The bond line thickness shall be reported in the test report.

5.5 Conditioning and testing atmosphere

Condition and test the specimens in one of the standard atmospheres specified in EN ISO 291.

5.6 Number of specimens

Prepare and test at least three specimens for each stress investigated.

6 Procedure

Attach the specimens to the test rig. Allow them to reach equilibrium in the controlled conditions selected for the test. Using weights, carefully apply the loads necessary to obtain the required stresses.

NOTE It is usual to investigate stresses which are a percentage of the tensile lap-shear strength determined in accordance with EN 1465.

Record the time to failure of each specimen.

Determine the failure pattern for each specimen, in accordance with EN ISO 10365.

7 Expression of results

Record graphically the stress investigated versus the average time to failure, plotting the stress as the ordinate and the time to failure as the abscissa on a logarithmic scale.

8 Precision

The precision of this test method is not known because interlaboratory data are not available. When interlaboratory data are obtained, a precision statement will be added at the following revision.

9 Test report

The test report shall include the following information:

a) reference to this European Standard;

b) all details necessary for identification of the adhesive tested, including type, source and manufacturer's code number;

c) all details necessary for complete identification of the adherends used, including their dimensions and the method of preparing the surfaces prior to bonding;

d) bond line thickness;

e) atmosphere used for conditioning and testing;

f) number of specimens tested;

g) graph of stress versus time to failure;

h) failure pattern for each specimen;

i) date of the test.

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