

Translated English of Chinese Standard: GB/T7124-2008

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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

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GB/T 7124-2008 / ISO 4587:2003

Replacing GB/T 7124-1986

**Adhesives - Determination of tensile
lap-shear strength of rigid-to-rigid bonded assemblies**

胶粘剂 拉伸剪切强度的测定

(刚性材料对刚性材料)

(ISO 4587:2003, IDT)

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Foreword

This Standard equivalently adopts ISO 4587: 2003 “Adhesives - Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies” (English version).

This Standard replaces GB/T 7124-1986 “The method for determination of strength properties of adhesive in shear by tension loading (Metal to metal)”.

This Standard equivalently translates ISO 4587:2003. In normative references, it uses national standards to replace the international standards; the referenced standards' contents have no difference with the international standards.

For ease of use, this standard makes the following editorial changes:

- a) "this international standard" is replaced by "this Standard";
- b) Delete the foreword of international standard;
- c) Use decimal point “.” to replace the comma that is used as the decimal point.

The main differences of this Standard, compared with GB 7124-1986, are as follows:

- Modify the name of the standard;
- Add the normative references (Clause 2 of this edition);
- Expand the adhesive material from metal to rigid material (Clause 1 of 1986 edition; Clause 1 of this edition);
- Adhesive surface length of the sample is changed from 12.5 ± 0.5 mm to $12.5 \text{ mm} \pm 0.25$ mm (4.1 of 1986 Edition 4.1; 5.1 of this edition);
- Test plate's thickness is changed from 2.0 ± 0.1 mm to $1.6 \text{ mm} \pm 0.1$ mm (4.1 of 1986 Edition; 5.1 of this edition);
- Add the layer thickness and the control method (5.2 of this edition);
- The test speed is changed from “ 5 ± 1 mm/min” to “the shear load at a rate of 8.3 MPa to 9.8 MPa per minute.” (3.1 of 1986 edition; Clause 7 of this edition);
- The expression of test result is changed from “arithmetic mean, maximum value, minimum value” to “the arithmetic mean and standard deviation of the breaking force or the breaking of the valid specimens.” (8.2 of 1986 version; Clause 8 of this edition).

This Standard was proposed by China Petroleum and Chemical Industry Association.

This Standard shall be under the jurisdiction of National Adhesive Standardization

Adhesives - Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies

1 Scope

This Standard specifies a method for determining the tensile lap-shear strength of rigid-to-rigid bonded assemblies.

This Standard also specifies the specimen preparation and test conditions. This test procedure does not provide design information.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 2918 Plastics - Standard atmospheres for conditioning and testing (GB/T 2918-1998, idt ISO 291:1997)

GB/T 16997 Adhesives - Designation of main failure patterns (GB/T 16977-1997, idt ISO 10365:1992)

ISO 527-1:1993 Plastics - Determination of tensile properties - Part 1: General principles

ISO 17212 Structural adhesives - Guidelines for the surface preparation of metals and plastics prior to adhesive bonding

3 Principle

Adhesive lap-shear bond strength is determined by stressing a single-overlap joint between rigid adherends in shear by the application of a tensile force parallel to the bond area and to the major axis of the specimen.

NOTE 1: Single-lap specimens are economical, practical and easy to make. They are the most widely used specimens for development, evaluation and comparative studies" involving adhesives and bonded products, including manufacturing quality control.

If a machine working at a constant rate of loading is used, apply the shear load at a rate of 8.3 MPa to 9.8 MPa per minute.

Record the highest force during rupture as the breaking force for that specimen.

Record the type of failure in accordance with GB/T 16997.

8 Expression of results

Express the results of the tests as the arithmetic mean of the breaking force, in newtons, or the breaking stress, in megapascals, of the valid specimens. The lap shear strength, in megapascals, is calculated by dividing the breaking force, in newtons, by the shear area, in square millimetres.

9 Precision

This test is widely used and accepted. However, the precision is not known because interlaboratory data are not available.

10 Test report

The test report shall include the following information:

- a) a reference to this Standard;
- b) all details necessary for complete identification of the adhesive tested, including type, source, manufacturer's code number, batch or lot number, form, etc.;
- c) all details necessary for complete identification of the adherends, including the nature of the material and the surface preparation;
- d) a description of the bonding process, including the method of application of the adhesive, drying and precuring conditions (where applicable), curing or setting time, and temperature and pressure for curing or setting;
- e) the average thickness (as precisely as practical) of the adhesive layer after formation of the bond, as well as the method used for controlling the bond thickness;
- f) a complete description of the specimens, including their dimensions and construction, the nominal overlap of the joint, whether the adherends were prepared individually or from panels, if the adherends were prepared from panels the number of panels used, the procedure and conditions used to cut out the adherends and the number of individual specimens tested;
- g) the conditioning parameters prior to testing, and the test atmosphere;

- h) the speed of testing (or the rate of loading in the case of constant rate of load application);
- i) the breaking force or breaking stress for each specimen, the arithmetic mean and the standard deviation;
- j) the type of failure in accordance with GB/T 16997;
- k) details of any deviations from the procedure specified and of any incidents that may have affected the results.

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