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EUROPEAN STANDARD

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English version

**Adhesives - Test method for shear impact  
strength of adhesive bonds (ISO 9653:1991)**

Adhésifs - Essai de tenue au choc par  
cisaillement du joint adhésif (ISO 9653:1991)

Klebstoffe - Prüfverfahren für die  
Scherschlagfestigkeit von Klebungen  
(ISO 9653:1991)

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REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO  
Urad RS za standardizacijo in meroslovje  
LJUBLJANA

SIST.....EN 29653.....

PREVZET PO METODI RAZGLASITVE

-02- 1998

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

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

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### Foreword

This European Standard has been taken over by the Technical Committee CEN/TC 193 "Adhesives" from the work of ISO/TC 61 "Plastics" of the International Organization for Standardization (ISO).

This document was submitted to the formal vote and the result was positive.

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of an identical text or by endorsement, at the latest by September 1994, and conflicting national standards shall be withdrawn at the latest by September 1994.

In accordance with the CEN/CENELEC Internal Regulations, 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.

### Endorsement notice

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# INTERNATIONAL STANDARD

**ISO**  
**9653**

First edition  
1991-12-15

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## Adhesives — Test method for shear impact strength of adhesive bonds

**iTeh STANDARD PREVIEW**  
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Reference number  
ISO 9653:1991(E)

ISO 9653:1991(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75% of the member bodies casting a vote.

International Standard ISO 9653 was prepared by Technical Committee ISO/TC 61, *Plastics*, Sub-Committee SC 11, *Products*.

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# Adhesives — Test method for shear impact strength of adhesive bonds

## 1 Scope

**1.1** This International Standard specifies a method for the determination of the comparative impact value of adhesive bonds in shear, when tested on standard specimens, and using specified conditions of preparation, conditioning and testing.

**1.2** The method is intended to be used for wood-to-wood or metal-to-metal bonds, but may be extended to cover plastics-to-plastics bonds as well as bonds between combinations of these materials.

## 2 Definition

For the purposes of this International Standard, the following definition applies.

**2.1 impact value:** Energy absorbed by a specimen of standard design when sheared by a single blow of a testing-machine hammer. The impact value is expressed in joules per square metre.

## 3 Principle

The impact value is determined by using a pendulum-type impact machine on a metal-to-metal or wood-to-wood specimen.

## 4 Apparatus

**4.1 Pendulum-type impact machine**, with a impact-head velocity of 3,4 m/s, comprising the elements specified in 4.1.1 to 4.1.3.

**4.1.1 Impact head**, with a flat striking face slightly wider than the specimen and aligned to strike the specimen full-face.

**4.1.2 Specimen-holding fixture**, as shown in figure 1. The fixture illustrated is not always suitable for use with all impact machines and vices. Dimensions and design of the fixture may be varied as required for adaptation to machines and vices available, provided the following general requirements are met:

The fixture shall be machined from a solid piece of steel and solidly bolted to the base of the testing machine. Corners shall be drilled to ensure that the specimen sets flush against the retaining end of the fixture. The drilled corners are provided to minimize dirt collection at the corners which could hold the end of the specimen away from the face of the fixture. The fixture shall be provided with a screw to tighten the specimen in the fixture to minimize the tendency of the specimen to overturn when struck. A metal plate may be placed between the end of the block and the end of the screw when non-metallic adherends are used. The fixture shall be so located that the specimen will be struck at the point of maximum head velocity.

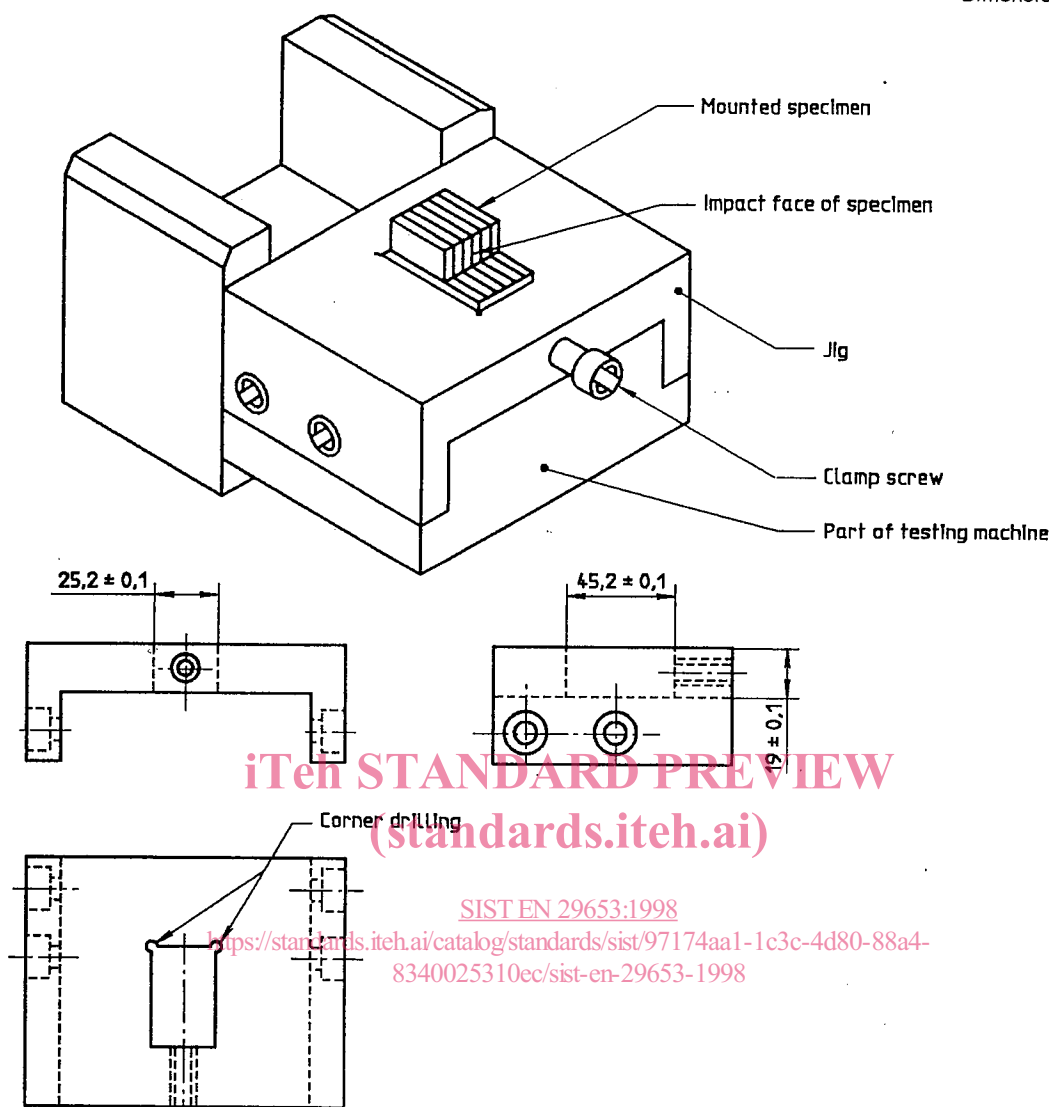


Figure 1 — Adapter fixture for impact machines

**4.1.3 Vice or bolts**, to hold the fixture firm and immobile under the stress of the testing-machine hammer. The total height of the vice fixture and specimen shall be such that the lower edge of the striking face of the impact head strikes the specimen as near the adhesive line as possible, preferably within 0,80 mm. Ordinarily, the distance between the top of the jaws of the vice of the machine and the bottom of the striking face of the head is 22 mm. The proper height of the specimen may be obtained by adjusting its height in the fixture.

**NOTE 1** Additional information on impact-testing machines and their calibration may be found in ISO 178:1975, *Plastics — Determination of flexural properties of rigid plastics*, and ISO 179:1982, *Plastics — Determination of Charpy impact strength of rigid materials*.

**4.2 Conditioning chamber**, capable of maintaining a relative humidity of  $(50 \pm 5) \%$  at  $23 \text{ °C} \pm 2 \text{ °C}$ .

**NOTE 2** A saturated solution of calcium nitrate will give approximately 51 % relative humidity at the test temperature.

## 5 Specimens

**5.1** The specimen for metal-to-metal adhesives shall conform to the dimensions given in figure 2 a) whenever possible. In cases where this specimen cannot be fractured in the testing machine available, the dimensions of the 25 mm by 25 mm block may be reduced to a smaller square, keeping the dimensions of the 25 mm by 45 mm block constant. The dimensions of the specimen and bonded area shall be clearly stated in the test report (clause 12). In any case, it is desirable that the specimen size

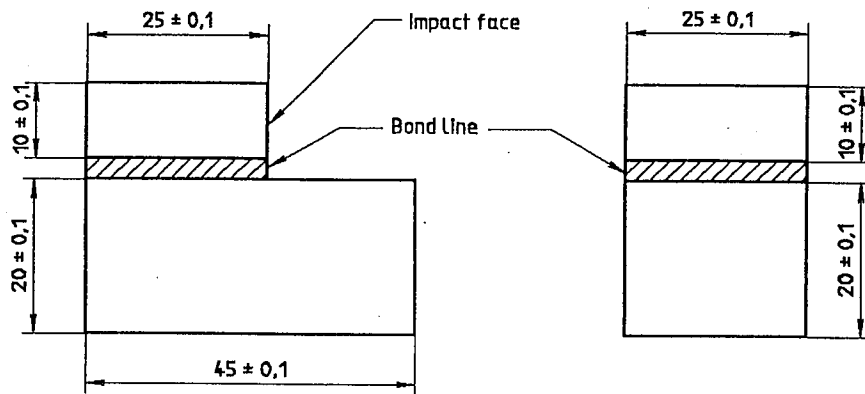


be such as to give impact strengths that fall somewhere near the middle range of the testing machine, since readings in the highest and lowest ranges are often unreliable. The specimen shall be assembled in such a way that the face receiving the impact load is at the point of maximum velocity of the impact head. The impact face of the specimen shall be

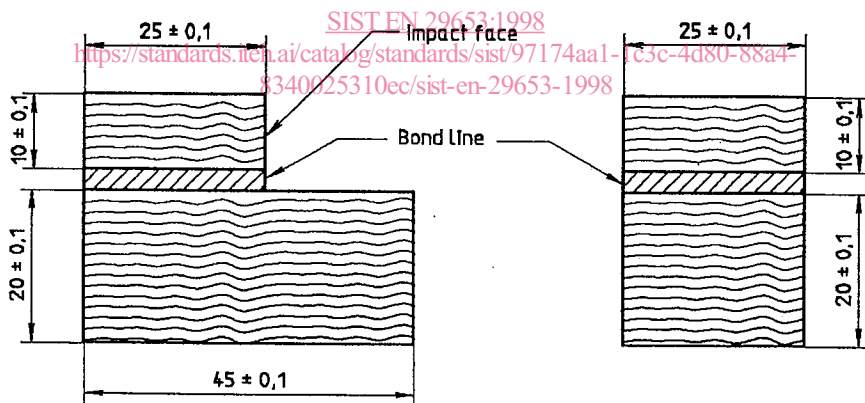
square and flat, perpendicular to the plane of the bond, and parallel to the striking face of the pendulum.

Tests on adhesives with high impact strength should be conducted on steel to minimize deformation. Specimens may be re-used after testing, provided that the face receiving the impact is not deformed.

Dimensions in millimetres



a) Metal-to-metal specimen



b) Wood-to-wood specimen showing grain direction

Figure 2 — Block shear impact specimen