INTERNATIONAL STANDARD

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# Adhesives — Determination of shear strength of adhesive bonds between rigid substrates by the block-shear method

*Adhésifs — Détermination de la résistance en cisaillement d'adhésifs de joints collés par la méthode de cisaillement entre éléments massiques*

Reference number
ISO 13445:1995(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.

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# Adhesives — Determination of shear strength of adhesive bonds between rigid substrates by the block-shear method

## 1 Scope

This International Standard specifies a method for the determination of the shear strength of adhesives used to bond materials with elastic moduli higher than the elastic modulus of the adhesive. The method provides an estimate of the shear strength of an adhesive on various machinable and non-machinable substrate materials.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 291:1977, *Plastics — Standard atmospheres for conditioning and testing.*

ISO 7500-1:1986, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tensile testing machines.*

ISO 10365:1992, *Adhesives — Designation of main failure patterns.*

## 3 Definitions

For the purposes of this International Standard, the following definitions apply.

**3.1 shear stress:** The force applied parallel to a flat adhesive joint, divided by the bond area of the joint.

**3.2 shear strength:** The maximum shear stress sustained by an adhesive joint during a shear test.

## 4 Principle

Blocks, plates or discs are bonded together, and the maximum force required to shear them apart is determined. The method is particularly applicable to the testing of bonds between ceramic parts, glass parts, magnet mouldings and plastic parts having one flat face where machining would be difficult or impractical.

## 5 Apparatus

**5.1 Test machine**, with a capacity of not less than 45 kN in tension. The machine shall conform to the requirements of ISO 7500-1.

**5.2 Shearing fixture**, consisting of a specimen-holding block and a shearing tool (see figures 1 and 2). Adherends measuring up to 80 mm × 80 mm × 13 mm can be held in the block, while the shearing tool can be used with adherends measuring up to 30 mm × 30 mm × 13 mm. A test specimen with adherends approximately of these dimensions is shown in figure 3 a). For test specimens having two smaller adherends as shown in figure 3 b), an adapter plate can be inserted into the specimen-holding block (see figure 4) to keep the shearing tool in its guides and to ensure the specimen is located under the clamp.