INTERNATIONAL STANDARD

ISO 14589

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Blind rivets — Mechanical testing

Rivets aveugles — Essais mécaniques

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 14589 was prepared by Technical Committee ISO/TC 2, *Fasteners*.

Annex A of this International Standard is for information only.

Blind rivets — Mechanical testing

1 Scope

This International Standard specifies the methods of mechanical testing of blind rivets including:

— shear test (see clause 3),

— tensile test (see clause 3),

— mandrel head retention capability test (see clause 4),

— mandrel push out resistance test (prior to setting) (see clause 5), and

— mandrel break load test (see clause 6),

at an ambient temperature of 10 °C to 35 °C.

It applies to blind rivets with nominal diameters up to and including 6,4 mm.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 7500-1:1999, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system*.

3 Shear and tensile tests

3.1 Principle of shear and tensile tests

The tests consist of straining a blind rivet which is set in a test fixture by a shear load or tensile load to failure.

3.2 Test fixtures for shear and tensile tests

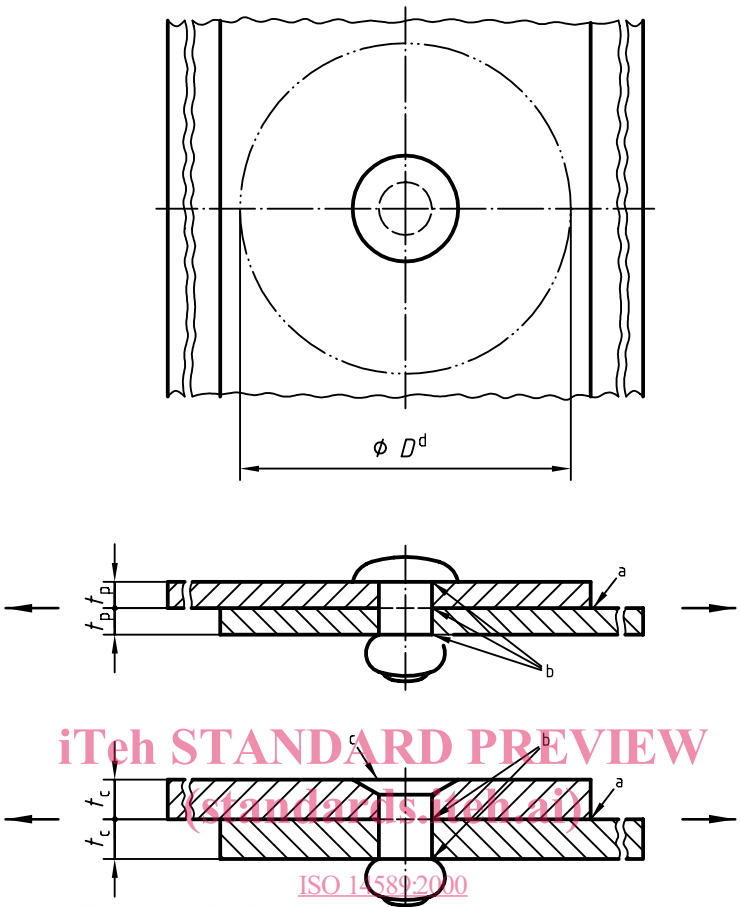
Two test fixtures are specified for each of both test methods. The test fixtures specified in 3.2.1.1 and 3.2.2.1 may be used for routine testing. The test fixtures specified in 3.2.1.2 and 3.2.2.2 may also be used for routine testing but are decisive in the case of dispute and are the referee test fixtures in such cases.

3.2.1 Test fixtures for shear testing

3.2.1.1 Routine shear testing

See Figure 1 for basic dimensions.

Surface roughness in micrometres



a $Rz4$

b There shall be no burrs at the corners of the test clearance holes.

c Countersink angle shall be the nominal angle of the rivet head with the tolerance $^{0}_{-2°}$.

d Minimum circular plane area around the axis of the specimen with diameter D = 25 mm.

Figure 1 — Test fixture for routine shear testing

The test plates shall be made of steel having a hardness of not less than 420 HV30. To minimize the effect of distortion under load, fitted steel bolts should be used for attachment to the testing machine.

Test plates shall be discarded when the test clearance holes to accommodate the test rivet are no longer round, show signs of wear or damage or exceed the maximum diameter specified in Table 2.

For plate thicknesses and test clearance hole diameters see 3.2.3.

3.2.1.2 Referee shear testing

The inserts used in the test fixture according to Figure 3 shall have dimensions and finish as given in Figure 2.

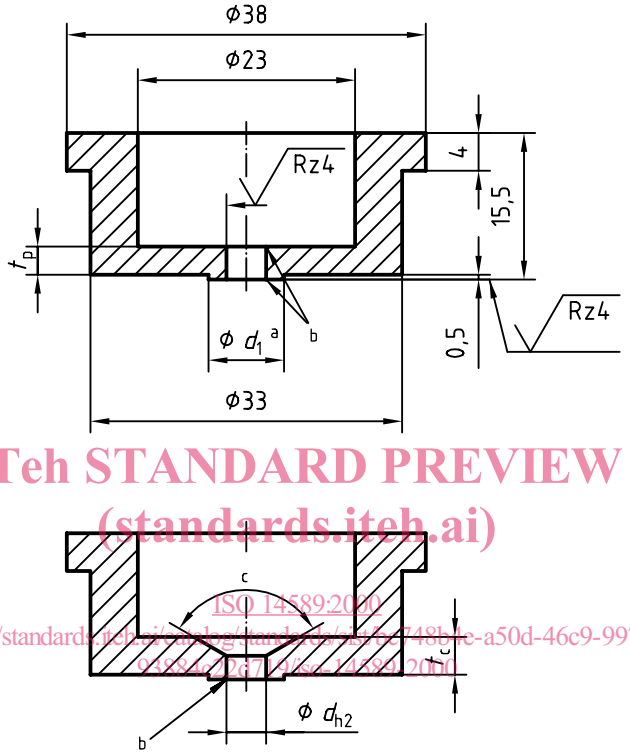
The inserts shall be made of hardened and tempered steel and shall have a hardness of 700 HV30 minimum. The test fixture which accommodates the test inserts shall be self-aligning when mounted in the tensile testing machine.

New inserts shall be used for each referee test programme.

If the test fixture according to Figure 3 is used for routine testing, test inserts shall be discarded when the test clearance holes to accommodate the test rivet are no longer round, show signs of wear or damage or exceed the maximum diameter specified in Table 2.

For insert thicknesses and test clearance hole diameters see 3.2.3.

Dimensions in millimetres,
surface roughness in micrometres



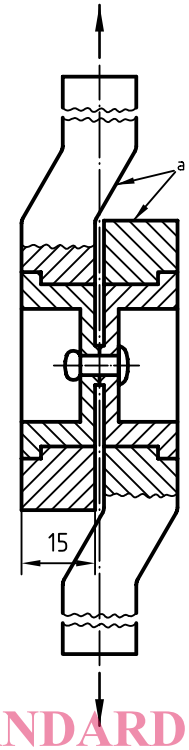
a $d_1 = 2d$, where d is the nominal diameter of the rivet.

b There shall be no burrs at the corners of the test clearance holes.

c Countersink angle shall be the nominal angle of the rivet head with the tolerance $^{0}_{-2°}$.

Figure 2 — Test inserts for blind rivets with protruding head and with countersunk head

Dimensions in millimetres



a Width 50 mm

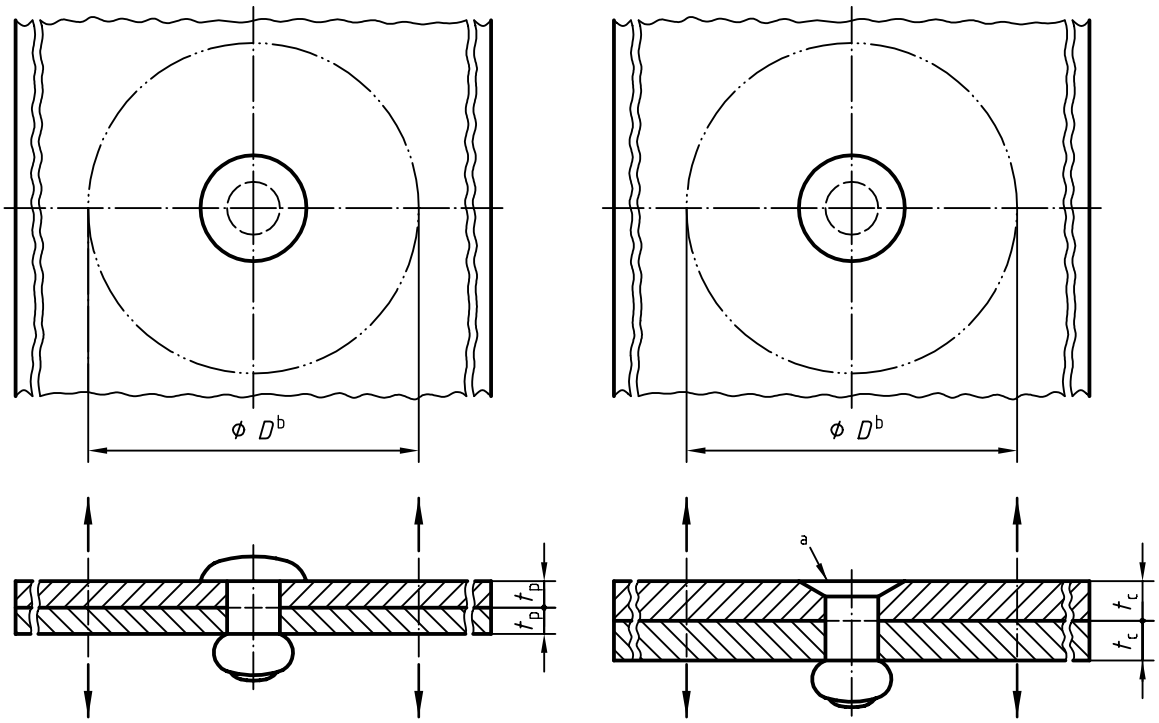
Figure 3 — Test fixture with riveted test assembly for referee shear testing

3.2.2 Test fixtures for tensile testing

3.2.2.1 Routine tensile testing

See Figure 4 for basic dimensions.

NOTE An example of a suitable test fixture is shown in annex A (informative).



a Countersink angle shall be the nominal angle of the rivet head with the tolerance $^{0}_{-2°}$.

b Minimum circular plane area around the axis of the specimen with diameter D = 25 mm.

Figure 4 — Test fixture for routine tensile testing

The test plates shall be made of steel having a hardness of not less than 420 HV30. To minimize the effect of distortion under load, fitted steel bolts should be used for attachment to the testing machine.

Test plates shall be discarded when the test clearance holes to accommodate the test rivet are no longer round, show signs of wear or damage or exceed the maximum diameter specified in Table 2.

For plate thicknesses and test clearance hole diameters see 3.2.3.

3.2.2.2 Referee tensile testing

For the inserts used in the test fixture according to Figure 5, the specifications of 3.2.1.2 apply.