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Pliers and nippers — Methods of test

Pinces et tenailles — Méthodes d'essai

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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 2.

The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 5744 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 10, *Assembly tools for screws and nuts, pliers and nippers*.

This third edition cancels and replaces the second edition (ISO 5744:1988) which has been technically revised.

Pliers and nippers — Methods of test

1 Scope

This International Standard specifies methods of test for checking the correct functioning of pliers and nippers.

The test parameters have been specified on the basis of the functional uses of the tools.

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 12166:1988, *Copper and copper alloys — Wire for general purposes*

IEC 60317-0-1, *Specifications for particular types of winding wires — Part 0-1: General requirements — Enamelled round copper wire*

3 General

Unless otherwise specified, values like dimensions used for positioning a test piece, test forces and locations for applying test forces have a tolerance of ± 2,5 %.

4 Load test

4.1 General

The test shall be carried out using suitable equipment which can be checked by comparison with a standard.

All tests shall be executed on the same tested tool and in the sequence of tests specified in this International Standard.

4.2 Pliers and nippers

For the type and size of tool, given in the dimensional standards, define a point for the application of the load on the handles at distance l_1 from the centre of the joint rivet, and insert a suitable test piece into the jaws (see 4.4).

If a pair of pliers is fitted with a comfort grip, the test shall preferably be carried out with the comfort grip removed.

Apply a load of 50 N and measure the width, w_1, of the handles. Increase the load to the specified value, F, as given in the tables of the applicable product standard, and then reduce it to 50 N. The load F shall be applied four times and then the width, w_2 of the handles shall again be measured at the same distance l_1.

The difference between the first and second readings shall not exceed the maximum value of permanent set ($s = w_1 - w_2$), see Figures 1, 2, 3 and 4, appropriate to the type and size of tool.

After the test, the tool shall show no deformation that can affect its use.

If the load test cannot conveniently be carried out at distance l_1 from the centre of the joint rivet, then a more suitable position for the load may be chosen at distance l'_1 from the centre of the joint rivet. The load F' at distance l'_1 from the centre of the joint rivet shall then be calculated from the formula

$$F' = \frac{F \times l_1}{l'_1}$$

where

F is the load at distance l_1 (see Figures 1, 2 and 3);

F' is the calculated load at distance l'_1;

l_1 is the distance from the centre of the joint rivet to the point of application of the load given in the applicable product standard;

l'_1 is the measured distance from the centre of the joint rivet to the point of application of the load.

After the load test, the permanent set, s, shall not exceed the value given in the applicable product standard.

4.3 Lever-assisted pliers

For the type and size of tool, given in the dimensional standards, define a point for the application of the load on the handles at distance l_1 from the centre of the joint rivet, and insert a suitable test piece into the jaws (see 4.4).

Apply a load of 0,5 × F; reduce it to 50 N and measure the width, w_1, of the handles. Increase the load to the specified value F, and then reduce it to 50 N. The load F shall be applied four times and then the width, w_2, of the handles shall again be measured at the same distance l_1.

The difference between the first and second readings shall not exceed the maximum value of permanent set ($s = w_1 - w_2$), see Figures 1, 2 and 3, appropriate to the type and size of tool.

After the test, the tool shall show no deformation that can affect its use.

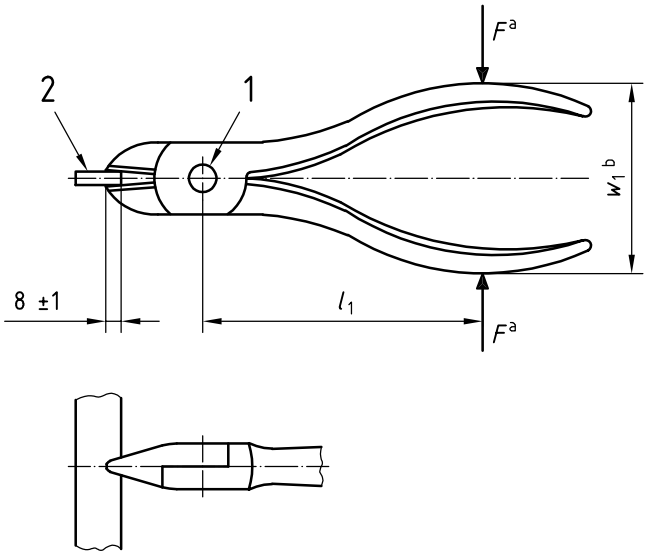
4.4 Test piece

The test piece shall have a hardness value of 30 HRC to 40 HRC and be of such a size and profile as to make contact with the jaws over a length of 8 mm ± 1 mm from the point of the jaws.

For end cutting nippers the test piece shall make contact over the full length of the jaws. With the test piece inserted, the gap between the points of the jaws shall be 3 mm ± 1 mm.

For multiple slip joint pliers and slip joint pliers the contact between the jaws and the test piece shall extend over lengths of 6 mm ± 1 mm.

Dimensions in millimetres



Key

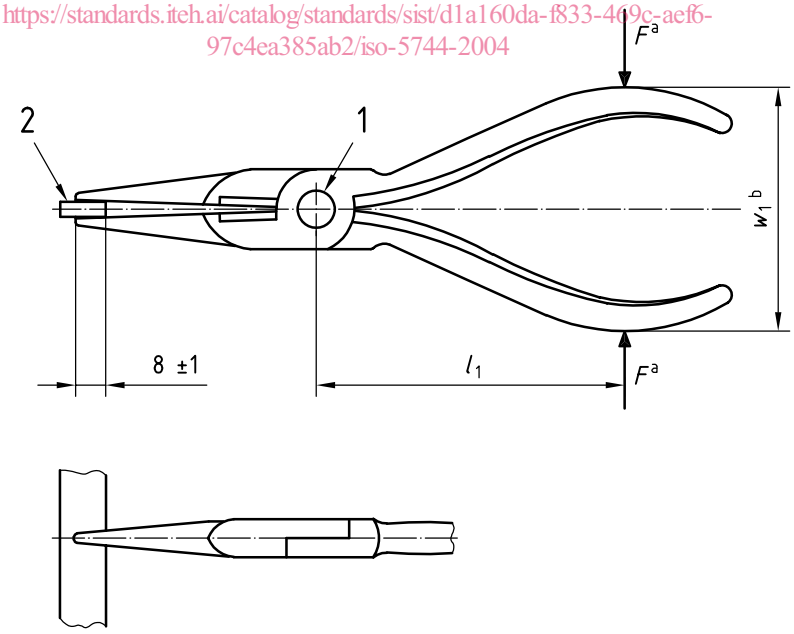
1 joint rivet
2 test piece

a F = load applied in load test or F_1 = force applied in cutting test.

b or w_2 measured in accordance with 4.2.

Figure 1 — Diagonal cutting nippers

Dimensions in millimetres



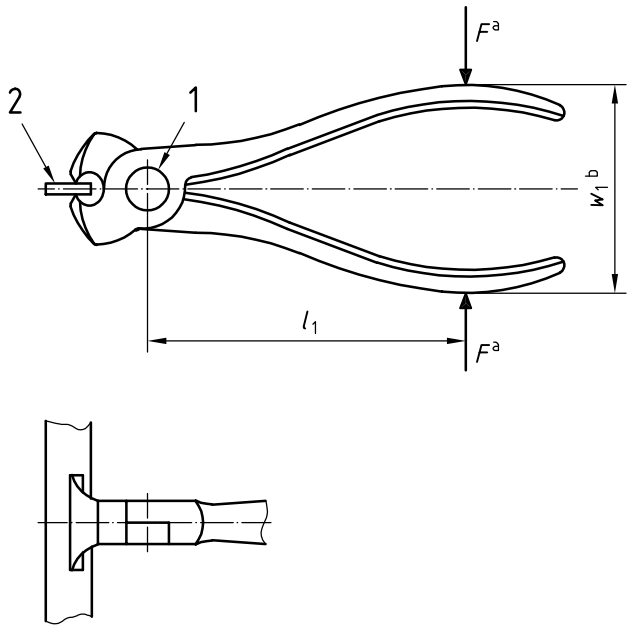
Key

1 joint bolt
2 test piece

a F = load applied in load test or F_1 = force applied in cutting test.

b or w_2 measured in accordance with 4.2.

Figure 2 — Snipe nose, flat nose and round nose pliers

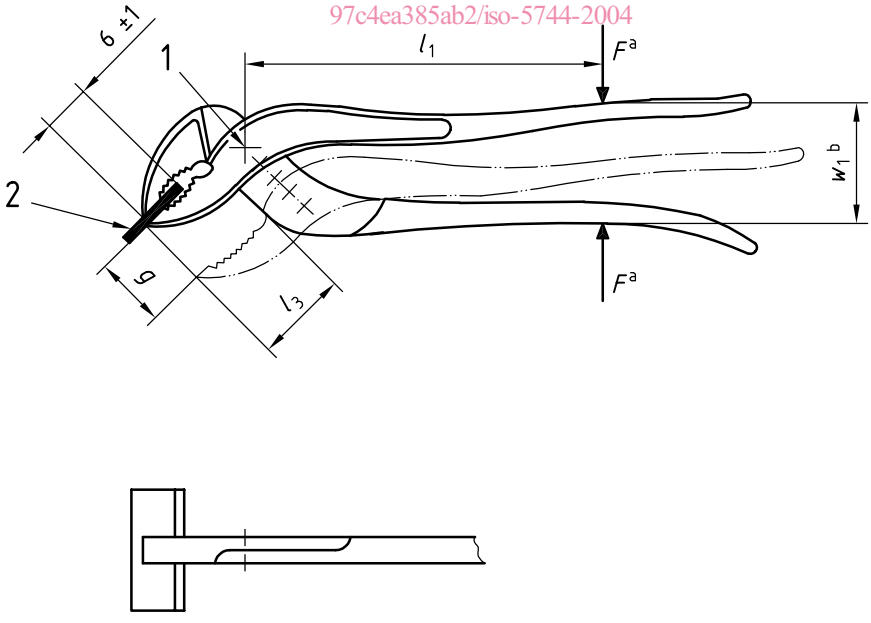


Key

1 joint rivet
2 test piece
a F = load applied in load test or F_1 = force applied in cutting test.
b or w_2 measured in accordance with 4.2.

Figure 3 — End cutting nippers

Dimensions in millimetres



Key

1 joint bolt
2 test piece
a F = load applied in load test.
b or w_2 measured in accordance with 4.2.

Figure 4 — Multiple slip joint pliers

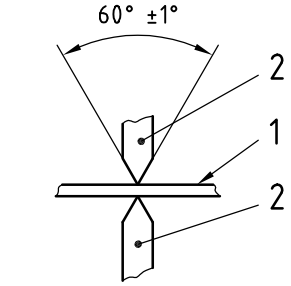
5 Wire cutting test

5.1 Verification of test wire

The wire to be used for cutting tests shall first be verified using equipment that can be checked by comparison with a standard.

Assemble in the test equipment two tungsten carbide cutters, with edges ground to an inclusive angle of 60° ± 1° having a radius of 0,3 mm ± 0,02 mm, with the cutting edges parallel to each other and at right angles to the test wire (see Figure 5).

Record the force required to cut the wire. The mean of three readings shall correspond to the values given in Tables 1 and 2.



Key

1 test wire
2 carbide cutter

Figure 5 — Test equipment

5.2 Cutting force

The cutting force values are given in Tables 1 and 2.

Table 1 — Medium hard test wire

Nominal wire diameter d mm	Approximate tensile strength[a] MPa	Cutting force F_2 N
1,6	1 600	1 800 ± 90
[a] The tensile strength is given for guidance only.		