

# INTERNATIONAL STANDARD

**ISO  
9656**

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## Pliers and nippers for electronics — Test methods

**iTeh STANDARD PREVIEW**  
*Pinces pour l'électronique — Méthodes d'essai*  
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ISO 9656:1989

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Reference number  
ISO 9656 : 1989 (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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 9656 was prepared by Technical Committee ISO/TC 29,  
*Small tools*.

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Annex A of this International Standard is for information only.

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International Organization for Standardization

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# Pliers and nippers for electronics — Test methods

## 1 Scope

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

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

## 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 1337 : 1980, *Wrought coppers (having minimum copper contents of 99,85 %) — Chemical composition and forms of wrought products.*

ISO 9654 : 1989, *Pliers and nippers for electronics — Single-purpose nippers — Cutting nippers.*

## 3 Wire cutting test

### 3.1 General

Cutting nippers for electronics shall cut copper wire in accordance with ISO 1337. The range of diameters of the test wire are specified in ISO 9654.

Upon completion of the test, the cutting edges shall show neither visible indentation nor distortion which could affect the cutting performance of the tool. Nor shall the tool show any damage that could affect its further use.

### 3.2 Diagonal and oblique cutting nippers

**3.2.1** Place a straight length of the minimum diameter test wire on a hard, flat, horizontal surface. The wire shall be cut using the point of the jaws with the cutting edge vertical, solely by the application of manual force on the handles.

**3.2.2** Place a maximum length of 25 mm of the minimum diameter test wire at any position along the top two-thirds of the cutting edges, measured from the point. The wire shall be cut solely by the application of manual force on the handles.

**3.2.3** Diagonal and oblique cutting nippers shall cut the maximum diameter test wire at any position along the cutting edges.

## 3.3 All other cutting nippers for electronics

Place a maximum length of 25 mm of the minimum diameter test wire at any position along the cutting edges. The wire shall be cut solely by the application of manual force on the handles. The same requirement applies also when using the maximum diameter test wire.

## 4 Torsion test for round nose pliers

### 4.1 Test block

The jaws shall be inserted into two 90° V notches in the test block such that the points of the jaws are 3 mm apart and the jaws are clamped over a length of 2 mm from the point (see figure 1). The test block shall have a hardness of between 40 HRC and 45 HRC.

### 4.2 Procedure

With the jaws clamped in the test block, and the handles clamped to resist the turning moment, apply sufficient torque, first in a clockwise direction and then in an anticlockwise direction, to rotate the jaws relative to the handles through the angle  $\alpha$  specified in table 1 appropriate to the type of plier under test.

Table 1

Length of jaws	<i>L</i> mm	$\alpha$
Short jaws	112	20°
	125	
Long jaws	125	25°
	140	

Upon completion of the test, the points of the jaws shall show no angular misalignment and the tool shall show no damage that could affect its further use.

**5 Load test for flat nose and snipe nose pliers**

**5.1 Test piece**

Pliers shall grip a 3 mm thick test piece over a length of 2 mm measured from the point (see figure 2). The hardness of the test piece shall be between 30 HRC and 40 HRC.

**5.2 Procedure**

Apply the load  $F_1$  (see figure 2), calculated using the formulae given in tables 2 and 3, appropriate to the type of plier under test.

**Table 2**

Length of jaws	Flat nose pliers		
	Load test		
	$L$ mm	$F$ N	$F_1$
Short jaws	112 125	500	$F_1 = \frac{F \times L_2}{L_1}$
Long jaws	125 140	400	

**Table 3**

Length of jaws	Snipe nose pliers		
	Load test		
	$L$ mm	$F$ N	$F_1$
Short jaws	112 125	400	$F_1 = \frac{F \times L_2}{L_1}$
Long jaws	125 140	250	

Upon completion of the test, the tool shall show no damage that could affect its further use.

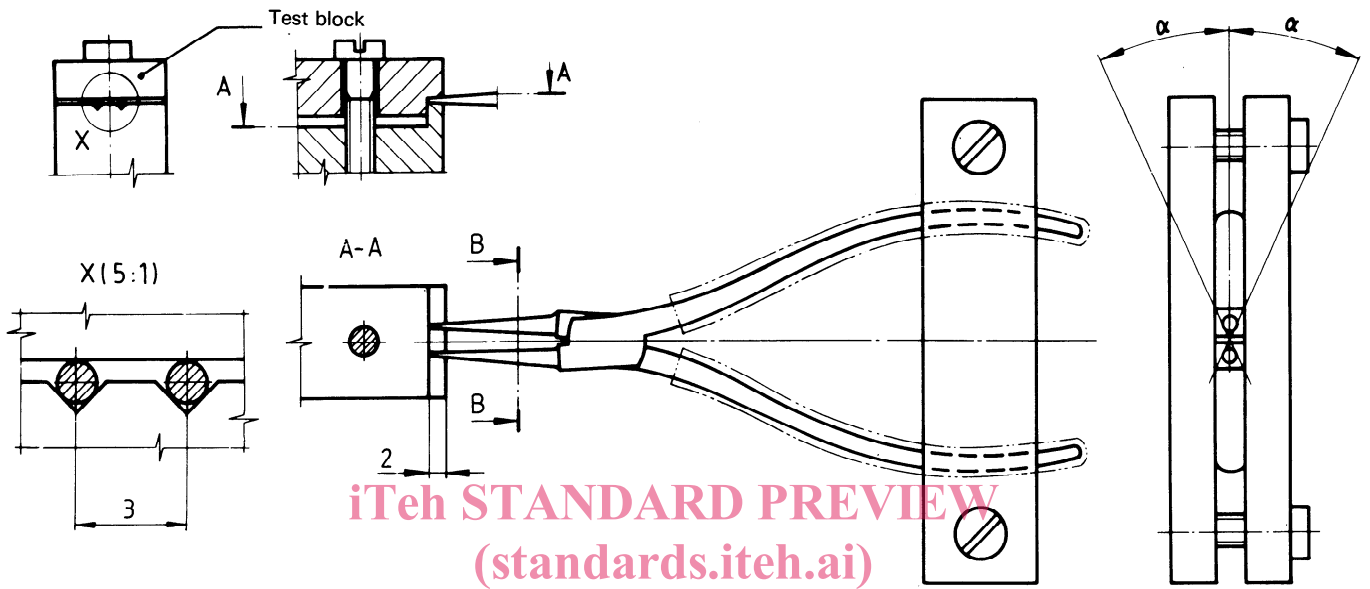
**6 Hardness test of jaws**

The hardness shall be measured on the gripping surface or on an adjacent face at a distance of not more than 1 mm from the gripping surface.

On cutting nippers, the hardness of the cutting edges shall be measured not more than 1 mm from the line of the edges.

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Dimensions in millimetres

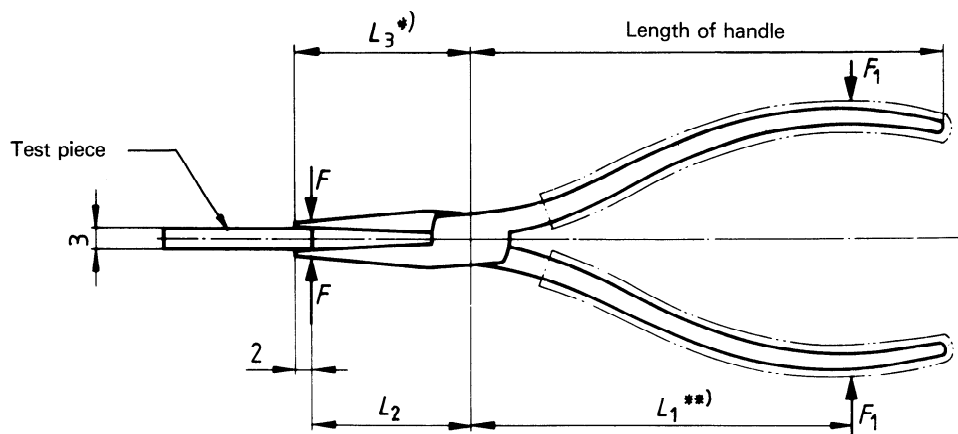


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Figure 1

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Dimensions in millimetres



\*)  $L_3$  is the length from the point of the jaws to the centre of the joint rivet. The test piece shall not be allowed to slip from the jaws.

\*\*\*)  $L_1$  is equal to 0,8 times the length of the handle.

Figure 2

**Annex A**  
**(informative)**

**Bibliography**

ISO 6508 : 1986, *Metallic materials — Hardness test — Rockwell test (scales A - B - C - D - E - F - G - H - K).*

ISO 8979 : 1988, *Pliers and nippers for electronics — Nomenclature.*

ISO 9657 : 1989, *Pliers and nippers for electronics — General technical requirements.*

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