

JIS

JAPANESE INDUSTRIAL STANDARD

Testing Methods for Shear Strength of Plastics by Punch Tool

JIS K 7214—1985

Translated and Published

by

Japanese Standards Association

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Testing Method for Shear Strength of Plastics by Punch Tool

JIS
K 7214-19851. Scope

This Japanese Industrial Standard specifies the testing method for shear strength of plastics by round punch tool, hereinafter, referred to as "test." However, this method is not applicable to foamed plastics.

- Remarks:
1. Various shear properties specified in this method shall be shear strength, shear breaking strength, shear yield strength and shear strength at specified deformation rate.
 2. In case where it is impossible to sample specified test piece of dimensions specified in this body, the test method for shear test by small-size test pieces specified in Appendix may be used.
 3. The units shown in braces { } in this standard are based on the conventional system of units and appended for reference.

2. Definitions

The definitions of the main terms used in this standard shall be as follows besides those specified in JIS K 6900.

- (1) shearing stress The value obtained by dividing the shearing load applied to the test piece at an arbitrary time during a shearing test by the shearing area ⁽¹⁾ of the test piece.
Note (1) The shearing area is the total sectional area of test piece parts assumed to punch the test piece by punch tool, and indicated by the product of circumference of punch and the thickness of the test piece.
- (2) shear strength The maximum value of shearing stresses generated during a shearing test.
- (3) shear fracture strength The shearing stress at the moment when the test piece has been broken during a shearing test.
- (4) shear yield strength The shearing stress at the point where an increase in deformation or deformation rate ⁽²⁾ is observed for the first time without an increase in load on the load-deformation curve during a shearing test.
Note (2) The deformation rate shall be the value obtained by dividing the distance where the surface pushed by punch of the test piece due to shearing load is separated from the original position of this surface during the test by the thickness of test piece.
- (5) shearing strength at specified deformation rate The shearing stress on the curve of the shearing stress-rate of deformation ⁽²⁾ corresponding to the rate of deformation ⁽²⁾ specified in standard and the like.

Applicable Standards: Reference Standards: See page 12.

3. Conditioning of Test Piece and Test Temperature and Humidity

The conditioning of test piece and test temperature and humidity shall be as follows:

- (1) The conditioning of test piece, as a rule, shall be conditioned before the test at standard temperature condition Grade 2 and standard humidity condition Grade 2 (a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $50 \pm 5\%$) in JIS K 7100 for 88h or more.
- (2) The test, as a rule, shall be carried out in a room at the same temperature and humidity as in (1) (a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $50 \pm 5\%$)

4. Test Machine and Apparatus

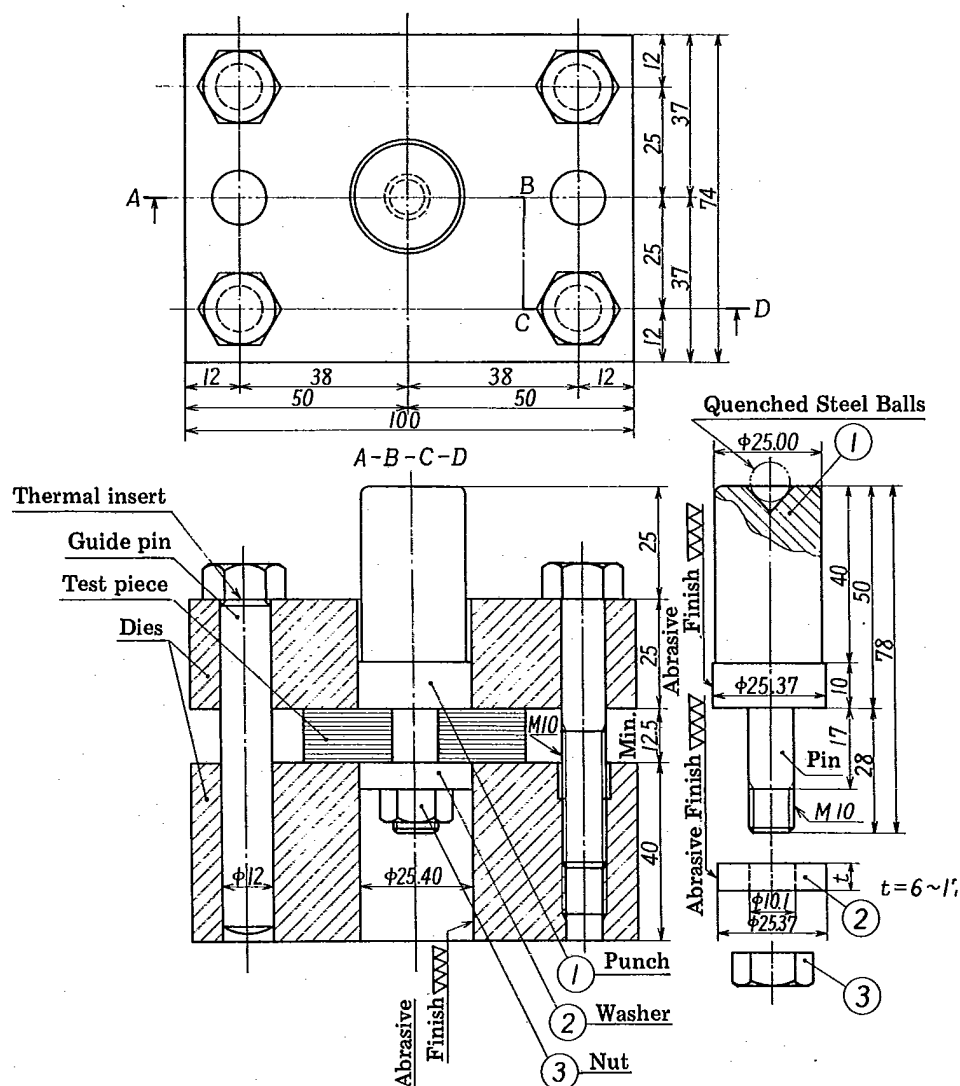
4.1 Test Machine The test machine used shall be of the constant crosshead moving rate type and consist substantially of the following components.

- (1) Shearing Jig The shearing jig is an apparatus for applying a shearing load to the test piece, and consisted of a punch and dies as shown in Table. The shearing jig shall have such construction that the test piece can be correctly fixed to the punch and dies of the shearing jig and the load can be applied to the test piece uniformly. An example of shearing jig suitable for this purpose is shown in Fig. 1.

Table

	Unit: mm
Inner diameter of die, d	25.40
Diameter of punch, D	25.37
Difference between the inner diameter of die and the diameter of punch, $d - D$	0.03

Fig. 1 An Example of Shearing Jig
Unit: mm



Remark: The material of shearing jig, shall be SK3 in JIS G 4401 or equivalent thereto.

- (2) **Load Indicator** The load indicator shall be a mechanism capable of recording all the shearing loads applied to the test piece and indicating the values of load applied at the specified testing speed with a precision of $\pm 1\%$ or superior thereto.

Remark: Because it is practically difficult to obtain a load-deformation curve necessary for the measurement of shear yield strength, a load-time curve may be obtained to use in place of the former.

4.2 Micrometer The micrometer shall be used for measurement of the thickness of test piece, and be a micrometer specified in JIS B 7502 or have a precision equivalent or superior thereto.

4.3 Dial Gauge The dial gauge shall be used for measurement of the thickness of soft test pieces, and be a micrometer specified in JIS B 7503 or have a precision equivalent or superior thereto.