



JAPANESE
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STANDARD

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JIS P 8134 : 1998

**Board — Determination of puncture
resistance**

ICS 85.060

Descriptors : board (paper), perforating tests, impact testing, strength of materials

Reference number : JIS P 8134 : 1998 (E)

P 8134:1998**Foreword**

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS P 8134:1994** is replaced with this standard **JIS P 8134:1998**.

This revision is made for conformity with the corresponding International standard, **ISO 3036**, *Board — Determination of puncture resistance*.

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4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Board — Determination of puncture resistance

Introduction This Standard is the Japanese Industrial Standard prepared based on **ISO 3036**, *Board — Determination of puncture resistance*, published in 1975 as the first edition, and is prepared without any modification in technical content with the exception of the following specified content.

[Outline of difference in specified content]

- ① **JISs** are supplemented in normative references. ② Inserting plate is supplemented to the apparatus. ③ To calibrate the test apparatus, the method stated in **JIS** is supplemented. ④ In the clause of sampling, the method specified in **JIS** is supplemented. ⑤ In the pretreatment of test pieces, the method specified in **JIS** is supplemented.

The places in this Standard, where dotted lines have been underlined, are the items not mentioned in corresponding International Standard.

1 Scope This Japanese Industrial Standard specifies testing method of puncture resistance of board.

This testing method especially applies to thick board, containing corrugated fiberboard, to be used for packaging cases.

Remarks 1 The International Standard corresponding to this standard is listed as follows.

ISO 3036:1975 *Board — Determination of puncture resistance*

- 2 When the selection between **ISO** and **JIS** is obliged in this Standard, either one of **ISO** or **JIS** shall be chosen through this whole Standard.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent edition (containing the amendments) of the standards indicated below shall be applied.

JIS P 0001 *Glossary of terms used in pulps and papers industry*

JIS P 8110 *Paper and board — Sampling for testing*

JIS P 8111 *Conditioning of paper and paperboard for test*

JIS P 8116 *Paper and board — Determination of tearing resistance*

JIS Z 9041 *Presentation and reduction of data*

ISO 186 *Paper and board — Sampling to determine average quality*

ISO 187 *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

3 Definition For the purpose of this Standard, the definitions given in **JIS P 0001** and the following definitions apply.

- a) **puncture resistance** The amount of energy required to make puncture on test piece by the impact of a right-angle triangular pyramid puncture head attached to a pendulum.

4 Apparatus Apparatus shall be as follows (see Fig. 1).

- a) The bed plate of the frame of the apparatus shall be firmly attached on a strong base to prevent energy loss.
- b) The pendulum is fitted with an arm, having shape of a 90 ° circular arc, to which the puncture head is attached, and can freely make swinging (see Fig. 2).
- c) The puncture head shall be a right-angled triangular pyramid, having 25 mm ± 0.7 mm in height, of which surface has specular gloss.

The edge made by two surfaces shall be chamfered to make a radius curvature between 1.0 mm to 1.6 mm (see Fig. 3).

- d) The metal collar (see Fig. 4) shall be designed so as to slip off its seating and to make free the arm of the pendulum from friction given by the spring back of test piece when the puncture head has passed through the test piece.

The loss of energy due to friction when the collar is forced off its seating shall not exceed 0.25 J.

- e) The pendulum releasing mechanism holds horizontally the pendulum, then can release it, and shall not give any influence on the swing of pendulum.
- f) In order to prevent accidental releasing, attach safety device on the pendulum releasing mechanism.
- g) The clamping plate shall correctly horizontally fix test piece.

The effective clamping dimension of the clamping plate is at least 175 mm × 175 mm.

The hole of upper clamping plate and lower clamping plate is circular type with 90 mm ± 2 mm in diameter.

The force between two plates by which test piece is fixed shall be 250 N to 1 000 N. If there is no device to measure the force to fix it, take adequate a countermeasures to prevent the test piece from slipping.

- h) The inserting plate (see Fig. 5) shall centrally have an aperture which makes right triangle with 106 mm ± 0.5 mm in one side and with rounded corners of 3 mm radius each, and is used with being inserted between two clamping plates to specify the spot to be tested. It shall be removable when the apparatus is adjusted.
- i) The dial is engraved with several scales corresponding to the energy range. The pointer shall be designed to show the maximum value given while the pendulum is operating even after the puncture head made a puncture.
- The scale divisions shall be calibrated in joules (J).
- j) The plural auxiliary weights shall be attached to the pendulum in order to obtain the energy corresponding to the puncture of a hole.