UDC 669.14:620.17

Ref. No.: ISO / R 148 - 1960 (E)

# ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

# ISO RECOMMENDATION
# R 148

## BEAM IMPACT TEST V-NOTCH FOR STEEL

1st EDITION
February 1960



For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

# BRIEF HISTORY

The ISO Recommendation R 148, *Beam Impact Test (V Notch) on Steel*, was drawn up by Technical Committee ISO/TC 17, *Steel*, the Secretariat of which is held by the British Standards Institution (B.S.I.).

Between the third and the fourth plenary meeting of ISO/TC 17, held respectively in London, in December 1953 and in Stockholm, in June 1955, Working Group ISO/TC 17/WG 1, *Methods of Mechanical Testing for Steel*, carried on a good deal of research in connection with this sort of test.

A draft proposal was submitted to the Technical Committee during its fourth plenary meeting, but no agreement could be reached and doubts were expressed as to the usefulness of such a test except perhaps for research work. The general opinion at the plenary meeting was, however, that the preparation of such a Recommendation would be desirable, and Working Group No. 1 was requested to continue this study.

A second draft proposal was submitted to the Technical Committee during its fifth plenary meeting, held in London, in March 1957, where it was considerably amended. As a result of decisions reached at this meeting, a third draft proposal was prepared by the Secretariat and was submitted to the members of ISO/TC 17 for their approval. A few minor changes were felt to be in order, and the draft proposal thus revised was adopted as a Draft ISO Recommendation.

On 11 July 1958, the Draft ISO Recommendation (No. 208) was distributed to all the ISO Member Bodies and was approved, subject to some modifications, by the following Member Bodies:

| | | |
|---|---|---|
| Australia | France | Romania |
| Austria | Germany | Spain |
| Belgium | Hungary | Sweden |
| Bulgaria | India | Switzerland |
| Burma | Israel | United Kingdom |
| Chile | Italy | U.S.S.R. |
| Czechoslovakia | New Zealand | Yugoslavia |
| Denmark | Norway | |
| Finland | Poland | |

One Member Body opposed the approval of the Draft: Japan.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in February 1960, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 148 February 1960

# BEAM IMPACT TEST V-NOTCH FOR STEEL

## 1. PRINCIPLE OF TEST

The test consists in breaking by one blow from a swinging hammer, under conditions defined hereafter, a test piece V-notched in the middle and supported at each end. The energy absorbed is determined.

## 2. SYMBOLS AND DESIGNATIONS

| Number | Symbol | Designation | Size dimension |
|---|---|---|---|
| 1 | — | Length of test piece | 55 mm |
| 2 | *a* | Thickness of test piece | 10 mm |
| 3 | *b* | Width of test piece | 10 mm |
| 4 | — | Thickness of test piece minus depth of notch (depth below notch) | 8 mm |
| 5 | — | Angle of notch | 45° |
| 6 | — | Depth of notch | 2 mm |
| 7 | — | Radius of curvature of base of notch | 0.25 mm |
| 8 | *L* | Distance between supports | 40 mm |
| 9 | — | Radius of curvature of supports | r = 1 to 1.5 mm |
| 10 | — | Taper of supports | slope 1:5 |
| 11 | — | Angle at tip of hammer | 30° |
| 12 | — | Radius of curvature of hammer | 2 to 2.5 mm |
| — | KV | Energy absorbed in kilogramme-force-metres or foot-pounds-force | |

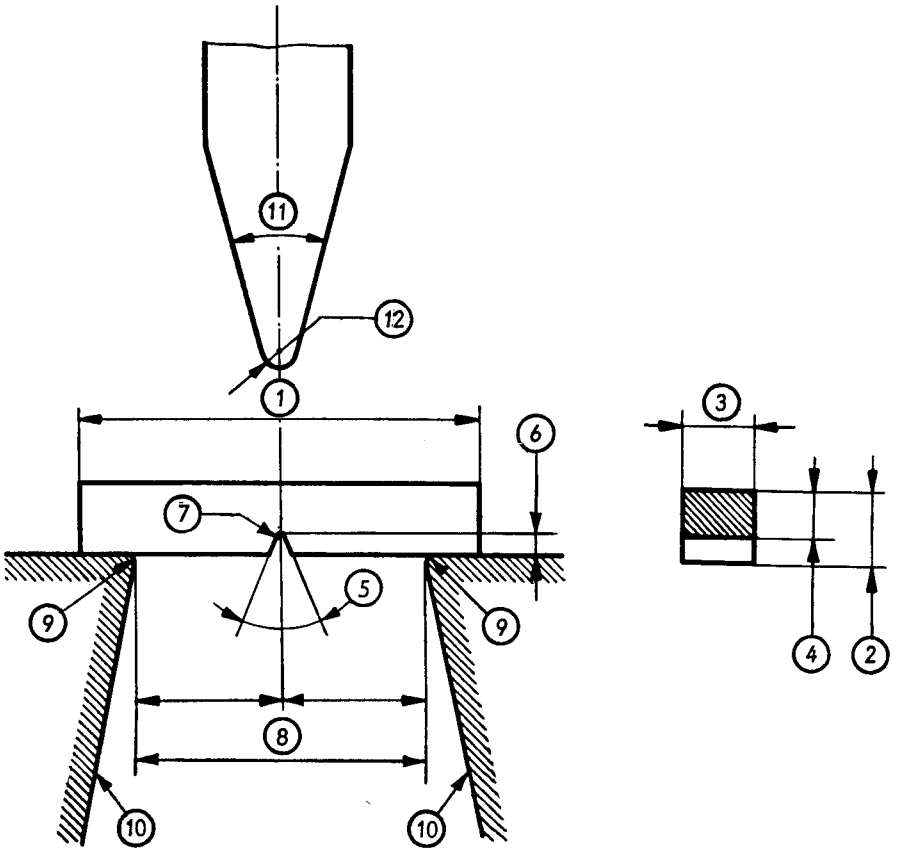


FIGURE. — **Beam impact test (V notch)**

### 3. TEST PIECES

**3.1** The test piece is machined all over, is 55 mm long and of square section with 10 mm sides. In the centre of the length there is a V-notch of 45° included angle, 2 mm deep, with 0.25 mm root radius.

**3.2** The plane of symmetry of the notch is perpendicular to the longitudinal axis of the test piece.

**3.3** The following tolerances on the above dimensions are permitted:

TABLE 1.—**Tolerances on specified dimensions**

| Designation | Nominal dimension | Machining tolerance | |
|---|---|---|---|
| | | Values | ISA symbol |
| Length | 55 mm | ± 0.60 mm | j 15 |
| Thickness | 10 mm | ± 0.11 mm | j 13 |
| Width | 10 mm | ± 0.11 mm | j 13 |
| Angle of notch | 45° | ± 2° | — |
| Depth below notch | 8 mm | ± 0.11 mm | j 13 |
| Root radius | 0.25 mm | ± 0.025 mm | — |
| Distance of plane of symmetry of notch from ends of test piece | 27.5 mm | ± 0.42 mm | j 15 |
| Angle between plane of symmetry of notch and the longitudinal axis of the test piece | 90° | ± 2° | — |

**3.4** The notch may be made by any machining method. The notch should be carefully prepared so that no grooves appear at the base of the notch.

## 4. TESTING MACHINE

**4.1** The testing machine is constructed and installed steady and rigid.

**4.1.1** The following conditions should be satisfied:

TABLE 2.—**Characteristics of testing machine**

| Designation | Metric units |
|---|---|
| Distance between supports | $40 \begin{smallmatrix} +0.5 \\ -0 \end{smallmatrix}$ mm |
| Radius of curvature of supports | 1 to 1.5 mm |
| Taper of supports | 1 : 5 |
| Angle at tip of hammer | $30° \pm 1°$ |
| Radius of curvature of hammer | 2 to 2.5 mm |
| Speed of hammer at the instant of striking | 4.5 to 7 m/s* |

* It is recommended that in future machines the speed of hammer at the instant of striking should be 5 to 5.5 m/s.

**4.1.2** The plane of swing of the hammer is vertical. The machine is constructed so that the loss of energy (such as from translation, rotation or vibration) in the machine framework during a test is negligible.

**4.1.3** The centre of percussion should be at the point of impact of the hammer.

**4.1.4** The accuracy of the graduation of the scale of the machine is $\pm$ 0.5 per cent of the maximum striking energy of the machine.

**4.2** For a standard test the striking energy of the testing machine is $30 \pm 1$ kgf · m. The energy absorbed under these conditions is denoted by KV.

**4.3** Testing machines with different striking energies are permitted, in which case the symbol KV is supplemented by an index.

## 5. TEST REQUIREMENTS

**5.1** The test piece should lie squarely against the supports with the plane of symmetry of the notch within 0.5 mm of the plane midway between them. It should be struck by the hammer in the plane of symmetry of the notch and on the side opposite the notch.