

Notched bar tests —

Part 7: Specification for verification of the test machine used for precision determination of Charpy V-notch impact energies for metals

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Foreword

This part of BS 131 has been prepared by Subcommittee ISE/NFE/4/4. It supersedes BS 131-7:1990 which is withdrawn.

It is intended that this part of this British Standard should be used in conjunction with BS 131-6, *Notched bar tests — Part 6: Method for precision determination of Charpy V-notch impact energies for metals*.

BS 131-6 and BS 131-7 are designed to satisfy the demand from sectors of British industry for a more stringent standard of Charpy testing appropriate to the needs of specific applications where a more precise measure of Charpy impact energy is required.

This part imposes strict control on machine parameters in order to meet the requirements of BS 131-6.

The requirements of quality control testing will continue to be met by BS EN 10045-1 and BS EN 10045-2, or BS 131-1, BS 131-4 and BS 131-5 unless BS 131-6 and BS 131-7 are specified in the product standard.

A machine that has been calibrated to BS 131-7 may be used for testing in accordance with BS EN 10045-1. However, a machine calibrated to BS EN 10045-2 may not be used for testing in accordance with BS 131-6. Caution should be exercised when comparing results obtained on machines calibrated to different parts of this standard or with BS EN 10045.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

1 Scope

This part of BS 131 specifies the way in which the test machine used to carry out precision Charpy V-notch impact tests is verified.

2 Normative references

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of this British Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

BS 131-6, *Notched bar tests — Part 6: Method for precision determination of Charpy V-notch impact energies for metals*.

3 Definitions

For the purposes of this part of BS 131 the following definitions apply.

3.1

compensated machine

machine in which correction for the loss in energy of the pendulum due to windage and friction has been made such that on a free half-cycle of swing of the pendulum from the release position the indicated absorbed energy is zero

3.2

non-compensated machine

machine in which no correction for loss of energy due to windage and friction has been made

NOTE With a machine of this type the indicated absorbed energy on a free half-cycle of swing of the pendulum will have a small positive value.

3.3

centre of strike

that point on the striking edge of the pendulum at which, in the free hanging position of the pendulum, the vertical plane of the striking edge meets the upper horizontal plane of a test piece of half standard height or equivalent gauge bar resting on the test piece supports

3.4

centre of percussion

that point in a body at which, on striking a blow, the percussive action is the same as if the whole mass of the body were concentrated at that point. When the pendulum delivers a blow along a horizontal line passing through the centre of percussion there is no resulting reaction at the axis of rotation

3.5

initial potential energy

energy theoretically available when the pendulum is located in the release position

3.6

reference specimen

test piece of known impact value which can be used as a reference sample for testing the conformity of a machine to the required accuracy of performance

3.7

gauge bar

unnotched bar made to the same nominal dimensions as a full size test piece

3.8

C-type pendulum

pendulum in which any portion of the hammer or weighted mass at the lower end of the pendulum and distance greater than $L_s - 15$ mm from the spindle axis passes between the anvils of the impact test machine (see Figure 1)

3.9

U-type pendulum

pendulum in which the part of the necessary weighted mass at the lower end is designed to pass below and on either side of the test piece anvils of the impact test machine (see Figure 1)

4 Symbols

For the purposes of this part of BS 131 the following symbols apply.

A	Initial potential energy of pendulum
A_v	Calculated absorbed energy
F_1	Force at centre of strike when the pendulum is horizontal (see Figure 2)
H_f	Height of fall of centre of strike of pendulum (see Figure 2)
H_r	Height of rise of centre of strike of pendulum (see Figure 2)
L_a	Distance between anvils (see Figures 3 and 4)
L_p	Distance of centre of percussion of pendulum from axis of rotation (the radius of gyration) (see Figure 2)
L_s	Length of pendulum from centre of strike of pendulum to axis of rotation (see Figure 2)
M	Moment of force of pendulum at its centre of strike
r_a	Radius of curvature of anvils (see Figure 4)
t	Time for complete oscillation of pendulum
V	Impact velocity of pendulum at instant of strike
θ_a	Angle of taper of anvils (see Figure 3)
θ_f	Angle of fall of pendulum (see Figure 2)
θ_r	Angle of rise of pendulum (see Figure 2)

