

JIS

JAPANESE INDUSTRIAL STANDARD

**General rule of ultrasonic
testing of metals by
pulse echo technique**

JIS Z 2344—1993

Translated and Published

by

Japanese Standards Association

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.



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General rule of ultrasonic testing of
metals by pulse echo technique

Z 2344-1993

1. Scope This Japanese Industrial Standard specifies the general items relating to detection and evaluation a discontinuity (hereafter called "flaw") by the ultrasonic testing using pulse echo technique with A scope presentation (hereafter called "ultrasonic testing").

Remarks: The following standards are cited in this Standard.

JIS Z 2300-Glossary of terms used in nondestructive testing

JIS Z 2345-Standard test blocks for ultrasonic testing

JIS Z 2350-Method for measurement of performance characteristics of ultrasonic probes

JIS Z 2352-Method for assessing the overall performance characteristics of ultrasonic pulse echo testing instrument

JIS Z 2354-Method for measurement of ultrasonic attenuation coefficient of solid by pulse echo technique

2. Definition of terms The definitions of the major technical terms used in this Standard are subject to JIS Z 2300.

3. Presentation of testing diagram

3.1 Basic symbols The following basic symbols should be applied to display the testing diagram, and the examples of the use of these symbols are shown in Fig. 1.

T : Transmitter pulse indication

F : Flaw echo

B : Back wall echo (including edge echo)

S : Surface echo (used in the immersion testing method)

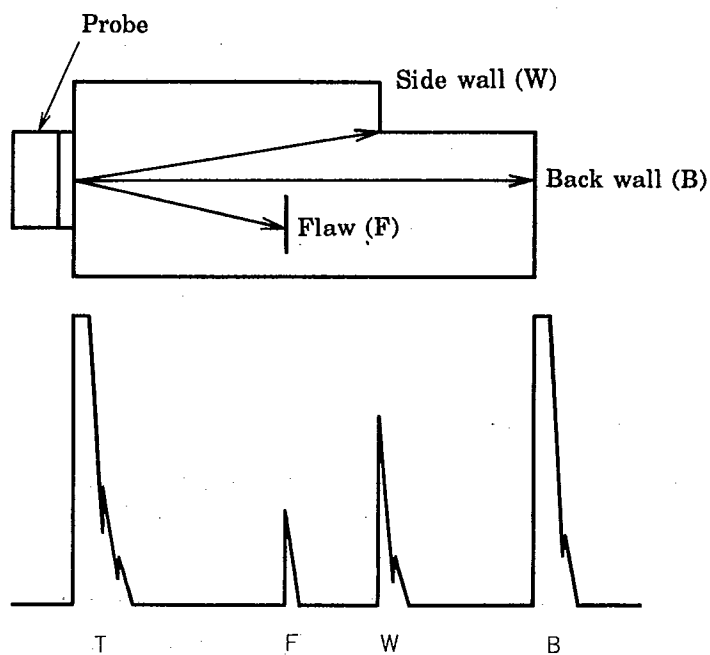
W : Side wall echo

Related standard:

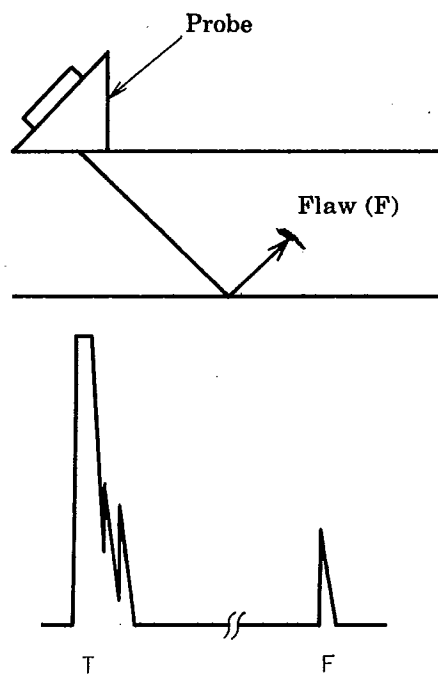
JIS Z 2351- Method for assessing the electrical characteristics of ultrasonic testing instrument using pulse echo technique

Fig. 1. Basic symbols of the testing diagram

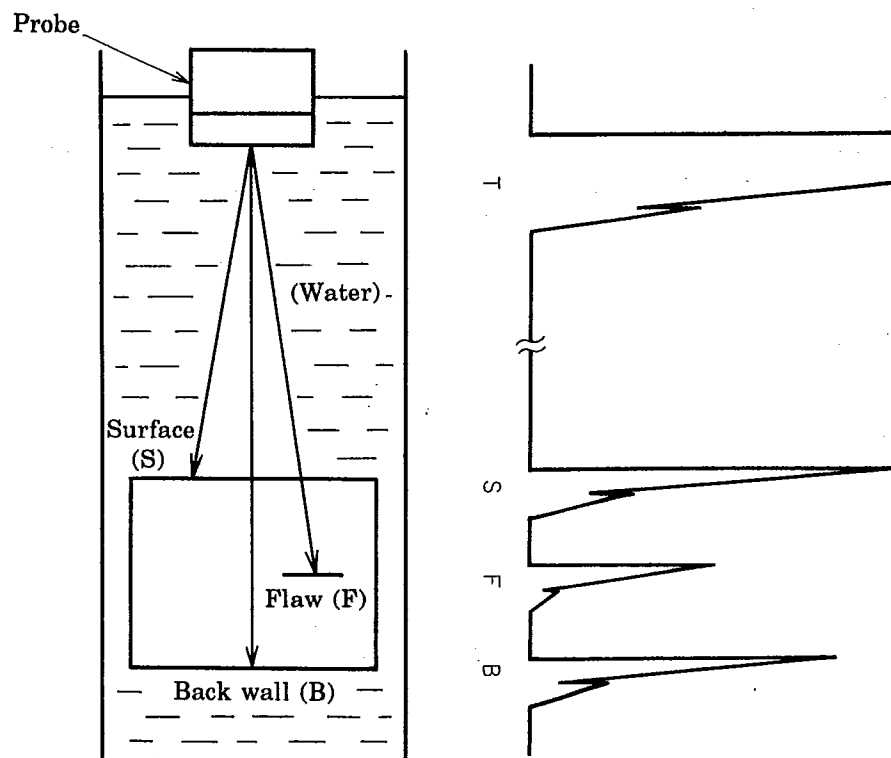
(1) Normal beam technique (with step)



(2) Angle beam technique



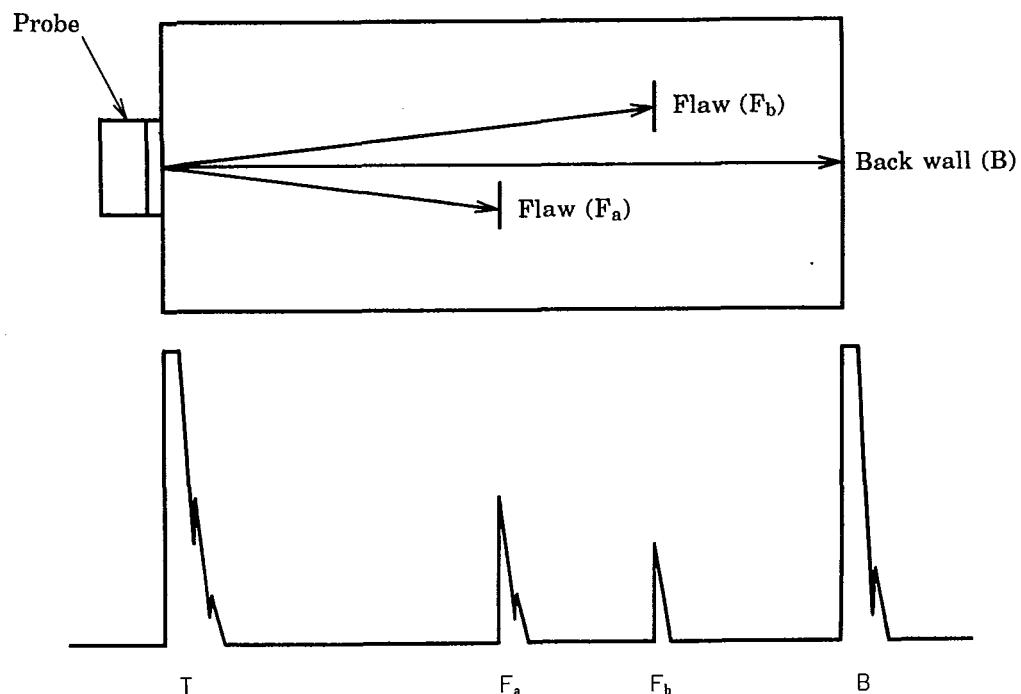
(3) Immersion technique



3.2 Supplemental symbols The supplemental symbols should be as follows.

- (1) Symbols for distinction In the case that the reflectors relating to echoes to be displayed by the same basic symbol are not less than two in the test object, these echoes should be distinguished by attaching the supplemental symbols of a, b, c, ... to the bottom side of right of the basic symbol as shown in Fig. 2 (this Figure shows the testing diagram in the case of existing two flaws.)

Fig. 2. Presentation of symbols in the case that the reflectors relating to echoes to be displayed by the same basic symbol are not less than two in the test object [The case of two reflectors (flaws)]



- (2) Symbols for multiple reflection In the case that it is necessary to distinguish the multiple echoes from the same reflector in the multiple reflection diagram, these echoes should be distinguished by attaching 1, 2, ..., n to the bottom side of right of the basic symbol as shown in Fig. 3. (this shows four back wall reflection.)

In the normal beam testing for plate or rod, the symbols of the echoes from the same flaw are allowed to display as shown in Fig. 4.