



**NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC  
OF CHINA**

**中华人民共和国国家标准**

GB/T 11345-1989

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**Method for Manual Ultrasonic Testing and Classification of  
Testing Results for Ferritic Steel Welds**

**钢焊缝手工超声波探伤方法和探伤结果分级**

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## 1. Subject content and application scope

This national standard specifies the general methods for testing the defects in the weld joints/heat-affected zone, determining the defect position/size and evaluating the defects, as well as classifying the testing results.

This national standard is applicable to manual ultrasonic testing under complete-penetration butt-weld impulse reflection method for the ferrite steel whose thickness of base metal is no less than 8 mm.

This national standard is not applicable to the welds of the cast steel and Austenitic stainless steel, the butt welds of the steel tube whose external diameter is less than 159 mm, the fillet welds of tube base whose internal diameter is less than or equal to 200 mm, and the longitudinal welds of the tube whose external diameter is less than 250mm and internal-external diameter ratio is less than 80%.

## 2. Normative References

ZB Y 344	Naming Method of Probes Used for Ultrasonic Inspection
ZB Y 231	Performance Testing Method of Probes Used for Ultrasonic Inspection
ZB Y 232	Technical Conditions for No.1 Standard test block Used in Ultrasonic Inspection
ZB J 04 001	Testing Method of Operating Characteristics of A-type Impulse Reflection Ultrasonic Inspection System

## 3. Terms and Definitions

### 3.1 Simplified Horizontal Distance, $l'$

It means the horizontal distance measured from the leading edge of probe to the defect detection surface.

### 3.2 Defect's indicated length, $\Delta l$

It means the defect length measured from the probe movement distance according to the required measurement method in the ultrasonic testing of weld.

### 3.3 Breadth of the probe interface, $W$

For circumferential seam testing, it refers to probe breadth; for longitudinal seam testing, it refers to probe length. See Figure 1.

### 3.4 Longitudinal defect

It means the defect that is basically parallel to the weld trend.

### 3.5 Transverse defect

It means the defect that is basically perpendicular to the weld trend.

### 3.6 Geometric critical angle, $\beta$

It's referred to the angle of refraction when the axial line of the refraction acoustic beam and the inner wall are tangential during the testing of cylindrical works.

### 3.7 Parallel Scan

During the oblique defect detection, the probe is placed on the surface of weld and

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