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**INDUSTRY STANDARD OF THE
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JJF 1436-2013

Replacing JJG 654-1990

**Calibration Specification of Ultrasonic Hardness Testers
(English Translation)**

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Introduction

This specification according to the rules JJF 1071-2010 "National Calibration Specifications writing rules" provisions of the preparation.

This specification in the development process to fully consider the JJG654-1990 "ultrasonic hardness", JB/T 9377-2010 "Ultrasound hardness tester technical conditions", ASTM A1038-2005 ultrasonic contact impedance method Portable Hardness Standard Test Method for Testing (Standard test method for portable hardness testing by the ultrasonic contact impedance method), DIN 50159-2 "hardness testing of metallic materials - Part 2. Hard Degree detector test and calibration "(Metallic materials-Hardness testing with the UCI method-Part 2.

Verification and calibration of the testing devices) ultrasonic hardness of terminology, Symbols and definitions, as well as the relevant technical requirements, technical specifications and test methods. This specification gives the ultrasonic hardness meter the amount of the specific characteristics of the calibration conditions, calibration items and calibration methods.

This specification instead of JJG654-1990. Compared with JJG654-1990, in addition to editorial changes, the master of this specification to technical changes are as follows.

- UCI introduced the concept;
- Test Force showed an increase, hardness indication error and repeatability;
- Remove the frequency of checks;
- Remove the parameters and test items related to the indenter;
- Increased repeatability test force calibration items;
- An increase in the measurement of test force shall be measured using a pressure head carriage;
- Increased before calibration, parameters should first specimen input ultrasonic hardness only after calibration;
- Of standard hardness block size used in the calibration made a new proposal;
- Increased uncertainty analysis;
- Page format adds the certificate and certificate format;
- Increasing the calibration of other hardness values.

Ultrasound hardness tester calibration specification

1 Scope

This instruction applies to ultrasound hardness (hereinafter referred to as hardness) calibration.

2. References

This specification refers to the following documents.

JJG144-2007 standard dynamometer JJG148-2006 standard Vickers hardness block GB/T 12604.1-2005 Terminology for nondestructive testing ultrasonic testing (ISO 5577:2000) JB/T 9377-2010 Ultrasonic hardness tester technical conditions Standard Test Method for ASTM A1038-2005 ultrasonic contact impedance method using a portable hardness testing (Standard test method for portable hardness testing by the ultrasonic contact impedance method) DIN 50159-2 ultrasonic UCI hardness testing of metallic materials - Part 2. Detection and hardness tester Calibration (Metallic materials-Hardness testing with the UCI method-Part 2.

Verification and calibration of the testing devices) for dated references, only the dated edition applies to this specification; undated reference documents Member, the latest edition (including any amendments) applies to this specification.

3 Overview

Ultrasound hardness tester is the use of UCI method (Ultrasonic Contact Impedance) measuring instruments. The basic principle is to weld Vibration rod diamond pyramid indenter, incentives to its free-running frequency when the indenter constant load and the object hanging when the resonance direct contact and using the resonant frequency calculate the hardness value of the measured object. Ie frequency variation value by Piezoelectric ceramic into a voltage signal, according to the elastic modulus of the material is calculated hardness values of the measured object, and its conversion He hardness.

Hardness according to equation (1).

$A = f(E_{eff}, \Delta f) HV = 0.102 \times \sin^2 \alpha \times (1)$ where.

A --- indentation area;

E_{eff} --- modulus of elasticity;

--- Frequency change $[\Delta f]$ f;

f --- function symbols;

HV --- Vickers hardness;