

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

DL/T 1845-2018

**Test method for Leeb hardness of high-alloy steels in power
equipment**

电力设备高合金钢里氏硬度试验方法
(English Translation)

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard is under the jurisdiction of the Technical Committee for Standardization of Metal Materials for Power Stations in the Power Industry.

1 Scope

This standard specifies the test principles, test objects, symbol descriptions and tests for the Leeb hardness test of high-alloy steel products or components of power equipment Instrument, test piece requirements, test procedures, test result processing, conversion relationship between Leeb hardness and Brinell hardness, etc.

This standard applies to the determination of the Leeb hardness of the following products or parts of high alloy materials and the conversion relationship between the Leeb hardness and the Brinell hardness.

- a) 10Cr9Mo1VNbN (ASTM A/ASME SA335-P91, ASTM A/ASME SA213-T91), 10Cr9MoW2VNbBN (ASTM A/ASME SA335-P92, ASTM A/ASME SA213-T92);
- b) GH4145, C422 (22Cr12NiWMoV);
- c) 20Cr13, 05Cr17Ni4Cu4Nb, 14Cr12Ni3Mo2VN, 22Cr12NiWMoV;

This standard applies to the determination of the Leeb hardness of D-type impact devices.

2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated versions apply to this article Pieces. For the cited documents without date, the latest version (including all amendments) applies to this document.

GB/T 17394.1 Metallic materials Leeb hardness test Part 1: Test method GB/T 17394.2 Metallic materials Leeb hardness test Part 2: Inspection and calibration of hardness tester

3 Test principle

The test principle of the Leeb hardness should meet the relevant requirements of GB/T 17394.1.

4 Symbols and instructions

The Leeb hardness value is followed by the symbol "HL" followed by a suffix character indicating the type of impact body. All data used in this standard Obtained from the Leeb hardness test of the D-type impact device, the data unit is HLD.

Other hardness converted with the Leeb hardness tester shall be attached with the corresponding hardness symbol before the Leeb hardness symbol.

Examples.

570HLD means that the Leeb hardness value measured using the impact body of type D in the direction of gravity is 570.

200HBHLD means that the Brinell hardness value converted from the Leeb hardness value measured by the D-type impact device is.200.

5.1 Leeb hardness tester

For the structure of the impact device of the Leeb hardness tester, see the relevant appendix of GB/T 17394.1.

The inspection and calibration of the Leeb hardness tester shall be carried out in accordance with the provisions of GB/T 17394.2.

5.2 Support ring

The support ring shall comply with the relevant provisions of GB/T 17394.1.

6.1 Surface shape

6.1.1

The coordination between the test piece and the support ring shall comply with the relevant provisions of GB/T 17394.1.

6.1.2

The test surface should be flat. For curved specimens, the radius of curvature should not be less than 30mm.

6.2 Thickness and quality

The thickness and quality of the test piece shall comply with the relevant provisions of GB/T 17394.1.

6.3 Surface treatment

The change of hardness caused by processing and grinding process should be avoided. Any coating, scale, decarburized layer, lubricant, dirt or other Surface irregularities need to be completely removed. The surface of the test piece should be smooth, the maximum allowable value of the surface roughness parameter Ra at the test position is 1.6 μm (equivalent to polishing with no less than 600 metallographic water sandpaper). The test surface should be processed and polished to meet the requirements of roughness If necessary, use roughness test pieces for comparison.

7 Test procedures

7.1

The daily inspection of the hardness tester used shall be carried out in accordance with the relevant provisions of GB/T 17394.1. The material and hardness of the test piece should be selected A standard hardness block with a similar range calibrates the hardness tester.

7.2

The instrument should be kept clean and tidy during the test, and the impact body should be cleaned regularly to remove iron dust and dust contaminated on the impact body Sundries. The ball head of the impact body shall be periodically inspected and calibrated in accordance with the provisions of GB/T 17394.2. If it does not meet the requirements, it shall be replaced immediately.

Note 1: During the impact body test of the Leeb hardness tester, it is easy to be contaminated with

debris such as iron filings or dust.

If it is not accurate.

Note 2: Long-term high-frequency use of the Leeb hardness chronograph may cause wear on the impact body ball head. Using a worn impact body ball head for the Leeb hardness test will produce ?Error.

7.3

Before testing, check the contamination or looseness of the support ring regularly, and keep it in a tightened state. The sediment and dust on the bottom of the support ring need to be Clear. After the rubber coating of the support ring wears out, a new support ring needs to be replaced. When the support ring is replaced, accessories that are fully compatible with the hardness tester should be used.

7.4

The ambient temperature during the test shall comply with the relevant regulations of GB/T 17394.1.

7.5

The Leeb hardness tester should be avoided in the occasion of strong vibration, severe dust, corrosive gas, magnetic field or electromagnetic field.

7.6

During the test, the direction of the impact velocity vector should be perpendicular to the local surface area to be tested, and the test piece and the impact device should be closely connected Touch, can not produce relative sliding.

7.7

The hardness tester should be set correctly before the test. During the test, first push down the loading sleeve to lock the impact body, and hold the coil component with one hand Press the supporting ring of the impact device on the surface of the test piece, press or push the release device with the other hand to measure the hardness, and pass the indicating device Read the corresponding hardness value set. If the deviation from the gravity direction exceeds 5°, it will cause measurement error and should be corrected.

Note 3: When testing the Leeb hardness of the test piece on site, a variety of test directions may appear. For the hardness tester with automatic direction correction function, it should be set correctly.

For hardness testers without automatic direction correction function, it is advisable to use a suitable clamping device to fix the standard hardness block, calibrate the Leeb hardness tester, and then repair Positive Leeb hardness value.