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

GB/T 19748-2019

Replacing GB/T 19748-2005

**Metallic materials - Charpy V-notch pendulum impact test -
Instrumented test method**

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Foreword

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

This standard replaces GB/T 19748-2005 "Steel Charpy V-notch pendulum impact test instrumental test method", and

Compared with GB/T 19748-2005, the main technical changes are as follows.

---The standard name is revised from "Charpy V-notch Pendulum Impact Test Instrumental Test Method for Steel" to "Charpy for Metallic Materials"

Instrumented test method for V-notch pendulum impact test;

---Added the corresponding description of the force calibration device (see 6.2.3);

---The normative appendix C "Small sample instrumented Charpy V-notch pendulum impact test" has been added.

This standard uses the redrafting method to amend and adopt ISO 14556.2015 "Charpy V-notch pendulum impact test instrument for metal materials"

Chemical test methods.

The technical differences between this standard and ISO 14556:2015 and the reasons are as follows.

--- Regarding normative reference documents, this standard has made adjustments with technical differences to adapt to my country's technical conditions and adjustments.

The situation is collectively reflected in Chapter 2 "Normative Reference Documents", and the specific adjustments are as follows.

* Replace ISO 148-1 with GB/T 229 modified to adopt international standards (see Chapter 5, Chapter 7, Chapter 8);

* Replace ISO 148-2 (see 6.1) with GB/T 3808 modified to adopt international standards.

---Expanded the scope of application according to my country's situation "U-shaped notch samples can also refer to this standard";

---According to the order in which the appendices appear in the text, the order of Appendix C and Appendix D has been adjusted.

This standard was proposed by the China Iron and Steel Association.

This standard is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183).

Drafting organizations of this standard. Central Iron and Steel Research Institute, Baosteel Co., Ltd., Metallurgical Industry Information Standards Institute, Shenzhen Wance Test Equipment

Co., Ltd., Steel Research Nac Testing Technology Co., Ltd., Xiwang Special Steel Co., Ltd.

1 Scope

This standard specifies the terms and definitions, principles, specimens, test methods of the instrumental test method for the Charpy V-notch pendulum impact test of metallic materials.

Test equipment and instruments, test procedures, test results evaluation and processing, and test reports.

This standard applies to the measurement of the impact performance of the instrumental Charpy V-notch pendulum of metallic materials.

Compared with the GB/T 229 Charpy pendulum impact test method, this standard provides more product-related faults than ordinary impact tests.

Rift information. U-shaped notch samples can also refer to this standard.

For general information about instrumented impact testing, see literature [3-8].

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article

Pieces. For undated references, the latest version (including all amendments) applies to this document.

GB/T 229 Charpy pendulum impact test method for metallic materials (GB/T 229-2007, ISO 148-1:2006, MOD)

Inspection of GB/T 3808 Pendulum Impact Testing Machine (GB/T 3808-2018, ISO 148-2:2008, MOD)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Eigenvalues of force

3.1.1

Yield force

F_{gy}

The force at the transition point of the force-displacement curve from the straight upward part to the upward part of the curve.

Note. The yield force is the first-order approximation of the force when the entire ligament of the specimen yields (see 9.3).

3.1.2

Maximum force

F_m

The maximum force on the force-displacement curve.

3.1.3

Unstable crack growth starting force

The force at the beginning of a sharp drop in the force-displacement curve (the beginning of unstable crack growth).

3.1.4

Unstable crack growth termination force

Fa

The force at the end of the force-displacement curve drop sharply.

5 Test principle

5.1 This test measures the relationship between the impact force and the bending displacement of the sample during the impact test in accordance with GB/T 229.

Shift the area under the curve to measure the absorbed energy of the sample.

5.2 Even if the area (absorbed energy) under the force-displacement curve is the same, the force-displacement curve measured under different materials and different temperatures may be quite different.

Big. If the force-displacement curve is divided into different characteristic parts, the different stages of the test process can be inferred, and the impact load speed

A large amount of information on the deformation and fracture characteristics of the specimen.

Note. The force-displacement curve cannot be used for structural strength calculations. It is impossible to directly determine the allowable minimum use temperature of structural materials.

6.1 Testing machine

The impact testing machine should meet the requirements of GB/T 3808, and can automatically measure the force-time or force-displacement curve.

The measured total impact energy W_t can be compared with the total absorbed energy KV indicated by the pointer or encoder of the testing machine.

Note. The result of the instrumented method measurement is similar to the result indicated by the dial or encoder, but the value is different [8].

If the deviation between KV and W_t exceeds $\pm 5J$, the following checks should be done.

- a) The friction of the testing machine;
- b) Calibration of the measuring system;
- c) Application software.

6.2.1 Traceability of measurement

The calibration measurement of the instruments used should be traceable to national or international standards.