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

GB/T 33820-2025

Replacing GB/T 33820-2017

**Metallic materials - Ductility testing - High speed compression
test for porous and cellular metals**

金属材料 延性试验 多孔状和蜂窝状金属高速压缩试验方法

(English Translation)

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Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 Symbols and instructions	
5 Principle	
6 Test Equipment	
6.1 Test equipment type	
6.2 Drop weight impact tester	
6.2.1 General requirements	
6.2.2 Hammer	
6.2.3 Press plate	
6.2.4 Force Sensor	
6.2.5 Displacement Sensor	
6.2.6 Shock absorber	
6.3 Servo High-Speed Compression Testing Machine	
6.3.1 General requirements	
6.3.2 Press plate	
6.3.3 Force Sensor	
6.3.4 Displacement Sensor	
6.3.5 Safety pin	
6.3.6 Baffle	
7 Sample	
7.1 Sample preparation	
7.2 Shape and size of test specimen	
8 Drop weight impact test	
8.1 Test Preparation	
8.2 Test	
9 Servo high-speed compression test	
9.1 Test Equipment	
9.2 Test	

10	Calculation
10.1	Compressive strain
10.2	Compressive stress
10.3	Compressive stress-strain curve
10.4	Platform stress (σ_{pl})
10.5	Platform End Point
10.6	Strain at the end of the platform (ϵ_{pl})
10.7	Absorption of Energy
11	Test Report
Appendix A (Informative) Filtering of Measurement Data	
Reference	

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document replaces GB/T 33820-2017 "Metallic materials - Ductility test - High-speed compression test method for porous and cellular metals" Compared with GB/T 33820-2017, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) Added symbols and instructions (see Chapter 4);
- b) Deleted "When the porosity is obviously uneven, the multiple may be appropriately increased" [see 7.2b), Note to 6.2b) of the 2017 edition];
- c) The regulations on the use of adhesives have been changed [see 8.2b), 7.2b of the 2017 edition];
- d) The coordinate axis symbols of all graphs were adjusted and modified;
- e) The unit of compressive stress has been changed (see 10.2, 9.2 of the 2017 edition).

This document is equivalent to ISO 17340:2020 "Metallic materials - Ductility tests - High-speed compression test method for cellular and cellular metals" Law".

The following minimal editorial changes have been made to this document.

--- Added notes on the simultaneous acquisition of compression force and displacement in the drop weight impact test step (see 8.2).

Introduction

Porous and honeycomb metals have excellent properties due to their unique cellular pore structure.

High-speed compression characteristics are essential for industrial design when designing impact-absorbing components.

The high-speed compression deformation is obviously different from its static compression characteristics. Therefore, the static compression deformation test method is not suitable for high-speed compression test.

Standardized test methods for high-speed compression of cellular and cellular metal materials are imperative.

Ductility test of metal materials High-speed compression test method for cellular and cellular metals

1 Scope

This document specifies the method for high-speed compression testing of cellular and cellular metals at room temperature.

This document applies to cellular and cellular metals having a porosity of 50% or more.

The speed range of this test method is 0.1m/s~100m/s (when the sample height is 100mm, the initial strain rate is 1s⁻¹~103s⁻¹).

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

Note: GB/T 13634-2019 Calibration of standard dynamometers for uniaxial testing machines for metallic materials (ISO 376:2011, IDT) system) Note. GB/T 16825.1-2022 Inspection and calibration of static uniaxial testing machines for metallic materials Part 1: Force measurement of tension and/or compression testing machines System verification and calibration (ISO 7500-1:2018, IDT) (armetals) Note. GB/T 31930-2015 Metallic materials - Ductility tests - Compression test on cellular and cellular metals (ISO 13314:2011, IDT) ISO 80000-1 (Quantities and units-Part 1: General)

3 Terms and Definitions

For the purposes of this document, the terms and definitions defined in ISO 13314 and the following apply.

Test speed when applying pressure to the specimen, the speed at which the pressure plate moves when it contacts the specimen.

Initial strain rate the value obtained by dividing the test speed by the initial height of the specimen.

sampling frequency

The number of measurement data samples per unit time.