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

*Matériaux métalliques — Essais de ductilité — Essai de compression
à haute vitesse des métaux poreux et cellulaires*



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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 2, *Ductility testing*.

Introduction

Porous and cellular metals have attractive properties due to their unique cell morphology. When they are used as impact energy absorbing components in automotive structures, knowledge of their high-speed compressive properties is necessary for industrial design. The high-speed compressive deformation behaviour of porous and cellular metals is quite different from their static compressive properties. Testing methods for static compressive deformation are, therefore, insufficient for characterization of high-speed compressive deformation. Standardization of a testing method for the high-speed compressive behaviour of porous and cellular metals is required.

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

1 Scope

This International Standard specifies methods for high speed compression testing, at room temperature, of porous and cellular metals having a porosity of 50 % or more. The speed range applicable to this test method is 0,1 m/s to 100 m/s (or 1 s^{-1} to 10^3 s^{-1} in terms of the initial strain rate when the specimen height is 100 mm).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 376, *Metallic materials — Calibration of force-proving instruments used for the verification of uniaxial testing machines*

ISO 7500-1, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system*

ISO 13314, *Mechanical testing of metals — Ductility testing — Compression test for porous and cellular metals*

ISO 80000-1, *Quantities and units — Part 1: General*

3 Terms and definitions

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

3.1

test speed

movement speed of the pressing jig, which applies the compressive force to the test piece, when the pressing jig contacts the test piece

3.2

initial strain rate

value derived by dividing the test speed by the initial height of the test piece

3.3

sampling frequency

frequency used to sample the measurement data per unit time

3.4

drop height

initial distance between the pressure application plane of the pressing jig and the top surface of the test piece in the drop weight impact testing machine

3.5

approach length

initial distance between the pressure application plane of the pressing jig and the top surface of the test piece in the servo-type high-speed compression testing machine