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BS ISO 13314:2011



BSI Standards Publication

Mechanical testing of metals — Ductility testing — Compression test for porous and cellular metals

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13314 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 2, *Ductility testing*.

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Introduction

Porous and cellular metals have attractive properties due to their unique cell morphology. When they are used as a crush energy absorbing component of automotive machines, compressive properties are necessary for industrial design. However, the deformation behaviour of porous metals and metallic foams is quite different from conventional dense metals. Test methods for conventional metallic materials are not suitable for porous metals and metallic foams. Standardization of a test method for porous metals and metallic foams is required.

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Mechanical testing of metals — Ductility testing — Compression test for porous and cellular metals

1 Scope

This International Standard specifies a test method for compressive properties of porous and cellular metals with a porosity of 50 % or more. Compressive tests can be carried out at ambient temperature under quasi-static strain rate conditions.

2 Normative references

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

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 9513, *Metallic materials — Calibration of extensometers used in uniaxial testing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 compressive stress

σ

compressive force divided by the initial cross-sectional area perpendicular to the loading direction

NOTE Compressive stress is expressed in newtons per square millimetre.

3.2 compressive strain

e

overall compressive displacement divided by the initial height (gauge length) of the test specimen

NOTE Compressive strain is expressed as a percentage.

3.3 first maximum compressive strength

compressive stress corresponding to the first local maximum in the stress-strain curve

See Figure 1.

NOTE It cannot be determined if no local maximum occurs.