INTERNATIONAL STANDARD

ISO 2739

Third edition
2012-06-01

Sintered metal bushings — Determination of radial crushing strength

Bagues en métal fritté — Détermination de la résistance à l'écrasement radial

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 2739:2012
https://standards.iteh.ai/catalog/standards/sist/e09de007-a0e5-49ad-8996-19652cc2fa34/iso-2739-2012

Reference number
ISO 2739:2012(E)

© ISO 2012

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 2739:2012
https://standards.iteh.ai/catalog/standards/sist/e09de007-a0e5-49ad-8996-19652cc2fa34/iso-2739-2012

COPYRIGHT PROTECTED DOCUMENT

© ISO 2012

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

© ISO 2012 – All rights reserved

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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 2739 was prepared by Technical Committee ISO/TC 119, *Powder metallurgy*, Subcommittee SC 3, *Sampling and testing methods for sintered metal materials (excluding hardmetals)*.

This third edition cancels and replaces the second edition (ISO 2739:2006), which has been technically revised.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 2739:2012
https://standards.iteh.ai/catalog/standards/sist/e09de007-a0e5-49ad-8996-19652cc2fa34/iso-2739-2012

© ISO 2012 – All rights reserved

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 2739:2012
https://standards.iteh.ai/catalog/standards/sist/e09de007-a0e5-49ad-8996-19652cc2fa34/iso-2739-2012

Sintered metal bushings — Determination of radial crushing strength

1 Scope

This International Standard specifies a method of measuring the radial crushing strength of sintered metal parts in the form of hollow cylinders, commonly known as bushings.

This method is applicable to sintered bushings composed of pure or alloyed metal powders.

2 Principle

A hollow cylinder is submitted to a continuously increasing radial load until breakage occurs, provided that the deformation does not exceed 10 % of the diameter. The maximum load observed is used to calculate a value in relation to the dimensions of the hollow cylinder known as “radial crushing strength”.

3 Apparatus

3.1 Pressing apparatus, that enables a radial load to be applied to a hollow cylinder.

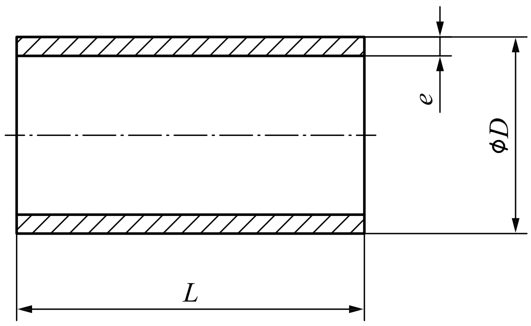
iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 2739:2012

3.2 Load-measuring device, accurate and readable to 0,1 % of the full scale. The lowest testing range that can provide a measureable result should be used.

3.3 Loading plates, two flat, ground, hardened steel plates of sufficient size to encompass the test specimen that can be fastened to the press platens and that will remain parallel.

4 Test piece

The test piece (see Figure 1) shall be in the form of a sintered hollow cylinder (which may or may not be oil-impregnated), without flanges, notches, grooves, pronounced chamfers, drilled holes, oilways or keyways. If necessary, the cylinder may be machined but, in this case, the results obtained may differ from those obtained with a cylinder that has not been machined.



Key

L length of the hollow cylinder

D external diameter of the hollow cylinder

e thickness of the cylinder wall

Figure 1 — Test piece

© ISO 2012 – All rights reserved

5 Procedure

5.1 Clean any surface oil from the specimen and measure the outside diameter, the inside diameter and the length within 0,5 % tolerance.

For test specimens with an outside diameter < 10 mm, the outside diameter may be measured to the nearest 0,05 mm.

For test specimens with an inside diameter < 10 mm, the inside diameter may also be measured to the nearest 0,05 mm.

For test specimens with a length ranging from ≥ 2 mm to < 10 mm, the length may be measured to the nearest 0,05 mm.

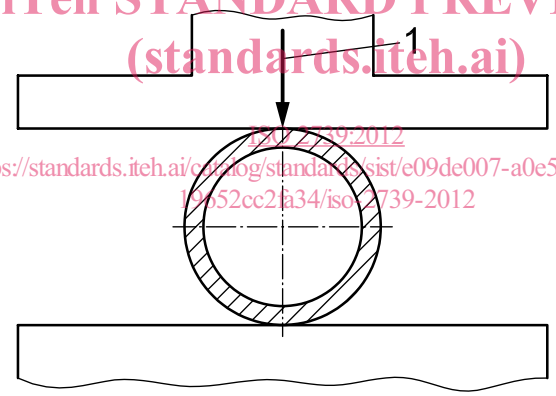
For test specimens with a length < 2 mm, the length may be measured to the nearest 0,01 mm.

5.2 Wipe the loading plates clean and lay the test specimen in the central region of the lower plate, the axis of the test specimen being parallel to the planes of the plates (see Figure 2).

5.3 Bring the upper plate and the test specimen into contact and slowly apply the diametric load at a rate (platen speed) that does not exceed 5 mm/min.

5.4 Record the load at which the test specimen fractures or the first reading at which the applied load drops. The measuring value of the load should be kept at 0,1 % of the total load.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 2739:2012
https://standards.iteh.ai/catalog/standards/sist/e09de007-a0e5-49ad-8996-19b52cc2fa34/iso-2739-2012



Key

1 applied load

Figure 2 — Test arrangement

© ISO 2012 – All rights reserved

6 Expression of results

The radial crushing strength of the bushing, K, in newtons per square millimetre, is given by the following equation:

$$K = \frac{F(D - e)}{Le^2}$$

where

F is the maximum load, in newtons (N), incurring fracture;

L is the length, in millimetres (mm), of the hollow cylinder;

D is the external diameter, in millimetres (mm), of the hollow cylinder;

e is the thickness, in millimetres (mm), of the cylinder wall.

This equation is valid only if the ratio e/D is less than 1/3[1)].

7 Precision statement (Statement of accuracy)

On the basis of test error alone, the difference in the absolute value of two test results obtained in the same laboratory will be expected to exceed repeatability (r) only 5 % of the time. If such a difference is found to be larger than r, there is reason to question one or both results.

Similarly, the difference between two test results obtained in different laboratories will be expected to exceed reproducibility (R) only 5 % of the time. If the difference is found to be larger than R, there is reason to question one or both measurements.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Table 1 — Precision data

ISO 2739:2012
https://standards.iteh.ai/catalog/standards/sist/e09de007-a0e5-49ad-8996-19652ee2fa34/iso-2739-2012

Values in megapascals

Material	K	r	R
CTG — 1001 — K23 (C-T10G-K160)	214	15	23
FC — 1000 — K 20	400	34	45
FC — 0208 — 50 (F-08C2-340)	785	48	48
1 MPa = 1 N/mm^2			

NOTE With permission, this clause was taken from MPIF[2)] Standard 55, 1998, *Determination of radial crush strength (K) of powder metallurgy test specimens*.

8 Test report

The test report shall include the following information:

a) a reference to this International Standard;

b) all details necessary for identification of the specimen;

c) whether the specimen is as sintered or sized;

d) whether the specimen has been machined or not, and, if so, a drawing showing how the specimen has been taken from the part;

1) In this case, the tensile strength is approximately equal to 0,5K.

2) Metal Powder Industries Federation, USA

© ISO 2012 – All rights reserved

e) whether the specimen has been oil-impregnated or not;

f) the result obtained, reported to the nearest 10 MPa;

g) all operations not specified in this International Standard, or regarded as optional;

h) details of any occurrence that may have affected the result.

If necessary, the data required for the identification of the test piece shall be agreed between the manufacturer and the user.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 2739:2012
https://standards.iteh.ai/catalog/standards/sist/e09de007-a0e5-49ad-8996-19652cc2fa34/iso-2739-2012

© ISO 2012 – All rights reserved

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 2739:2012
https://standards.iteh.ai/catalog/standards/sist/e09de007-a0e5-49ad-8996-19652cc2fa34/iso-2739-2012