INTERNATIONAL STANDARD

ISO 3325

Sintered metal materials, excluding hardmetals — Determination of transverse rupture strength

Matériaux métalliques frittés, à l'exclusion des métaux durs — Détermination de la résistance à la flexion

First edition — 1975-07-01

UDC 669-492.8 : 620.174

Ref. No. ISO 3325-1975 (E)

Descriptors : powder metallurgy, sintered products, tests, bend tests.

ISO 3325-1975 (E)

Price based on 2 pages

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3325 was drawn up by Technical Committee ISO/TC 119, *Powder metallurgical materials and products,* and circulated to the Member Bodies in March 1974.

It has been approved by the Member Bodies of the following countries :

Austria	Italy	Turkey
Bulgaria	Poland	United Kingdom
Canada	Romania	U.S.A.
Chile	South Africa, Rep. of	U.S.S.R.
Finland	Spain	Yugoslavia
France	Sweden	
Ireland	Thailand	

No Member Body expressed disapproval of the document.

Sintered metal materials, excluding hardmetals — Determination of transverse rupture strength

1 SCOPE

This International Standard specifies a method for the determination of the transverse rupture strength of sintered metal materials, excluding hardmetals.

2 FIELD OF APPLICATION

This method is applicable to sintered metal materials, excluding hardmetals, that may or may not have been subjected to heat treatment after sintering and also to materials that have been sized or coined after sintering.

It is only applicable to materials having a uniform hardness throughout their section and negligible ductility, i.e. a ductility corresponding to a permanent deformation of less than about 0,3 mm. If the test is applied to materials showing significant plastic deformation before breaking, incorrect results may be obtained. In such instances the tensile test should be used.

3 REFERENCE

ISO 3955, *Sintered metal materials, excluding hardmetals — Sampling.* [1]

4 PRINCIPLE

Breaking of a test piece lying freely on two supports by application of a load at the midpoint of the span under conditions of short-term static loading.

5 APPARATUS

Testing equipment of any system providing a static condition of loading and an accuracy of ± 1 %.

The fixture for testing shall have two support cylinders (rollers) with a fixed distance between them and a load cylinder (roller). All three cylinders shall be 3,0 ± 0,1 mm in diameter and shall be made either of hardened steel with a hardness of at least 700 HV or of hardmetal. The cylinders shall be mounted parallel and the distance between the centres of the support cylinders shall be 25 ± 0,2 mm, measured with an accuracy of ± 0,1 mm. The load cylinder shall be mounted midway between the support cylinders.

The mounting of the cylinders shall be such as to account for the permitted deviation from parallelism of the top and bottom faces of the test piece.

A diagrammatic arrangement of a typical test apparatus is shown in the figure.

6 SAMPLING

6.1 Sampling shall be carried out in accordance with ISO 3955.

6.2 The test piece shall be nominally 6 mm thick and produced from a die cavity having the dimensions 30 mm X 12 mm. The test piece thickness shall be uniform within 0,1 mm over the whole length. Alternatively, machined test pieces may be used, in which case care shall be taken during machining to ensure that no stress raisers are introduced into the specimen.

7 PROCEDURE

7.1 Measure the width and thickness of the test piece at its midpoint to the nearest 0,01 mm.

7.2 Place the test piece on its 30 mm X 12 mm face symmetrically on the support cylinders so that its longitudinal axis is perpendicular to the longitudinal axes of the cylinders. Apply a load at a position midway between the two cylinders. Increase the load slowly and steadily, so that the time to fracture is not less than 10 s. Record the value at which the load suddenly drops due to the first crack.

---

1) At present at the stage of draft.

8 EXPRESSION OF RESULTS

The transverse rupture strength, R_{tr}, in newtons per square millimetre, is given by the formula :

$$R_{tr} = \frac{3 F l}{2 b h^2}$$

where

F is the load, in newtons, required for fracture, measured at the moment of breakdown of the test piece;

l is the distance, in millimetres, between the supports;

b is the width, in millimetres, of the test piece at right angles to its height;

h is the height (thickness), in millimetres, of the test piece parallel to the direction of the test load application.

Report the arithmetical mean of at least five transverse rupture strength determinations, rounded to the nearest 10 N/mm².

9 TEST REPORT

The test report shall include the following information :

a) reference to this International Standard;

b) all details necessary for identification of the test sample;

c) the result obtained;

d) all operations not specified by this International Standard, or regarded as optional;

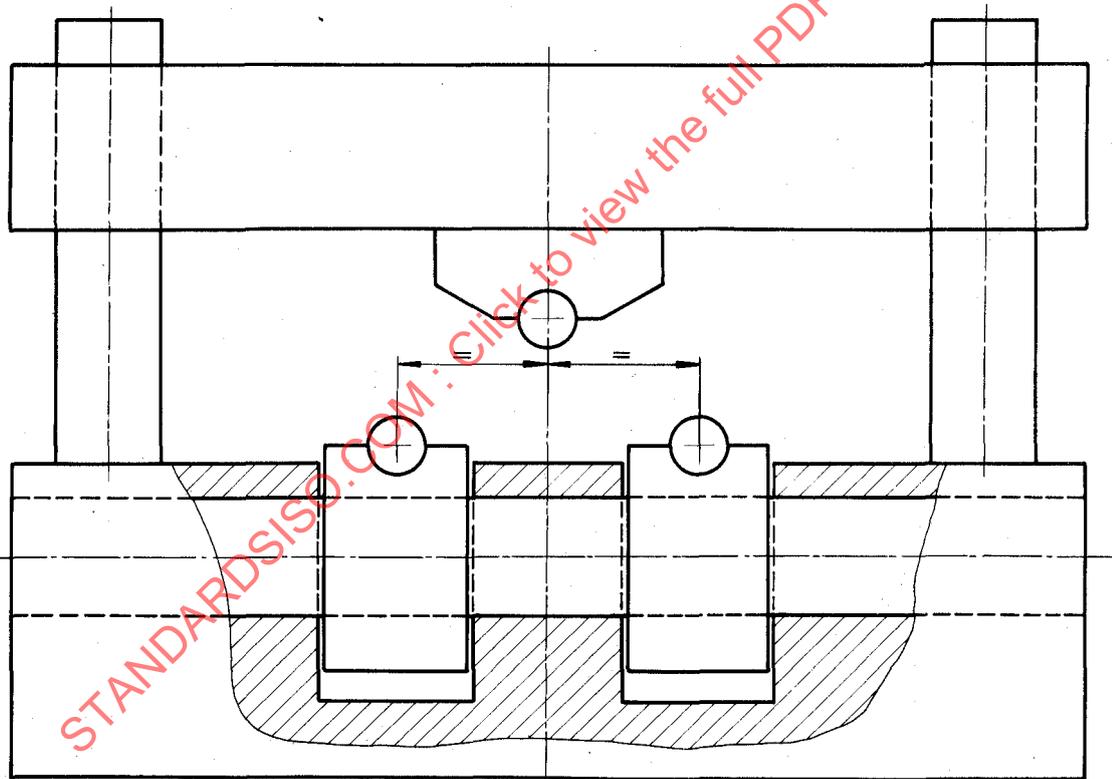e) details of any occurrence which may have affected the result.

FIGURE — Testing equipment for determination of transverse rupture strength