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

Sample Document

*Matériaux métalliques frittés à l'exclusion des métaux-durs —
Détermination de la résistance à la rupture transversale*

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Foreword

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International Standard ISO 3325 was prepared by Technical Committee ISO/TC 119, *Powder metallurgy*, Subcommittee SC 3, *Sampling and testing methods for sintered metal materials (excluding hardmetals)*.

This second edition cancels and replaces the first edition (ISO 3325:1975), which has been technically revised.

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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. The method is particularly suitable for comparing the sintered strength of a batch of metal powder with that of a reference powder or with a reference strength.

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

It is specially suitable for materials having a uniform hardness throughout their section and negligible ductility, i.e. a ductility corresponding to a permanent deformation of less than about 0,5 mm measured between the two supports during the transverse rupture strength determination. If the test is applied to materials under conditions other than those specified above, the conditions shall be reported.

NOTE 1 The permanent deformation can be measured with sufficient precision from the two fragments of the broken or cracked bar by indexing the lower surface. Alternatively, the deflection of a straight line drawn horizontally on the side of the test piece can be measured using an optical instrument such as a measuring microscope or optical comparator.

2 Principle

A test piece resting on two supports is broken by the application of a load at the midpoint between the supports, under short-term static loading conditions.

3 Apparatus

3.1 Test equipment, of any type providing static loading conditions and an accuracy of $\pm 1\%$.

The equipment shall have two support cylinders (rollers) with a fixed distance between them and a load-application cylinder (roller). All three cylinders shall be $3,2\text{ mm} \pm 0,1\text{ mm}$ in diameter and shall be made either of hardened steel with a hardness of at least 700 HV or of hardmetal.

The support cylinders shall be mounted parallel to each other, and the distance between their centre-lines shall be either $25,0\text{ mm} \pm 0,2\text{ mm}$ or $25,4\text{ mm} \pm 0,2\text{ mm}$, measured with an accuracy of $\pm 0,1\text{ mm}$ for the calculation. The load-application cylinder shall be mounted midway between the support cylinders.

For better accuracy, the mounting of the cylinders should preferably be such as to compensate for any deviation from parallelism between the top and bottom faces of the test piece. This can be accomplished by mounting the support cylinders so that each can be adjusted vertically (see figure 1).

A diagrammatic arrangement of a typical test rig is shown in figure 1.

The fixture should preferably be surrounded by a suitable safety guard.

4 Test piece

4.1 The test piece shall be nominally 6 mm thick and produced from a die cavity of nominal dimensions $30\text{ mm} \times 12\text{ mm}$. The test piece thickness shall be uniform to within 0,1 mm over the whole length and to within 0,04 mm across any width line perpendicular to the height and length.