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# INTERNATIONAL STANDARD



# 3327

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Hardmetals — Determination of transverse rupture strength

*Métaux durs — Détermination de la résistance à la flexion*

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## FOREWORD

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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 3327 was drawn up by Technical Committee ISO/TC 119, *Powder metallurgical materials and products*, and circulated to the Member Bodies in December 1973.

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

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

The Member Bodies of the following countries expressed disapproval of the document on technical grounds:

Japan  
U.S.A.

# Hardmetals — Determination of transverse rupture strength

## 1 SCOPE

This International Standard specifies methods of determining the transverse rupture strength of hardmetals.

## 2 FIELD OF APPLICATION

This test is applicable to hardmetals of negligible ductility. If it is applied to hardmetals showing significant plastic deformation before breaking, incorrect results may be obtained. In such instances the test may be used for comparison purposes only.

## 3 REFERENCE

ISO . . ., *Hardmetals — Sampling and preparation of test pieces.*<sup>1)</sup>

## 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

5.1 Testing equipment of any system providing a static condition of loading and an accuracy of 1 % may be used.

5.2 The fixture for testing shall have two freely lying support cylinders (rollers) with a fixed distance between them and a freely lying load cylinder (roller). The three cylinders shall be of equal diameter between 3,2 and 6 mm.

Alternatively, the load may be applied by a ball having a diameter of 10 mm.

The support and load components shall be made of tungsten carbide hardmetal which will not be visibly deformed by the applied load. Surface roughness  $R_a$  of the cylinders and the ball shall be not greater than  $0,63 \mu\text{m}$ .

5.3 The support cylinders shall be mounted parallel, with the span between them  $30 \pm 0,5$  mm for long test pieces and  $14,5 \pm 0,5$  mm for short test pieces. The measurement

of the span used for calculation shall be made to an accuracy of 0,1 mm for short test pieces and 0,2 mm for long test pieces.

5.4 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.

## 6 SAMPLING

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

6.2 The test pieces shall be of rectangular cross-section and shall have the dimensions shown in table 1.

TABLE 1

Dimensions in millimetres

Type	Length	Width	Thickness
A	$35 \pm 1$	$5 \pm 0,25$	$5 \pm 0,25$
B	$20 \pm 1$	$6,5 \pm 0,25$	$5,25 \pm 0,25$

NOTE — In general, test pieces of type B result in about 10 % higher strength values compared with those of type A, provided they have the same surface conditions. The repeatability is similar for both types.

6.3 In the preparation of test pieces, heating and cold-working shall be minimized. The finishing shall be done on the four longest faces of the test piece. The edges shall have a chamfer of 0,15 to 0,2 mm at an angle of  $45^\circ$ . The thickness of the layer taken off each side shall be not less than 0,1 mm and the roughness  $R_a$  of the finished surface shall be not greater than  $1,0 \mu\text{m}$ .

It is also permitted to use the test pieces in the as-sintered condition. Such test pieces shall have a chamfer of 0,4 to 0,5 mm at an angle of  $45^\circ$ , made before sintering.

6.4 The deviation from parallelism of opposite longitudinal sides, in both longitudinal and transverse directions, shall not exceed 0,03 mm for each 10 mm length for as-sintered test pieces and 0,01 mm for each 10 mm length for ground test pieces.

1) In preparation.