
**Sintered metal materials, excluding
hardmetals — Fatigue test pieces**

*Matériaux métalliques frittés, à l'exclusion des métaux-durs — Éprouvettes
pour essais de fatigue*



Foreword

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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.

International Standard ISO 3928 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 3928:1977) which has been technically revised.

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1 Scope

This International Standard specifies:

- the die cavity dimensions used for making fatigue test pieces by pressing and sintering, together with certain dimensions of the test piece obtained from such a die;
- the dimensions of the test pieces machined from sintered and powder forged materials.

This International Standard is applicable to all sintered metals and alloys, excluding hardmetals.

2 Pressed and sintered test pieces for fatigue test by reverse bend and axial testing

2.1 General

The pressed and sintered piece may also be subjected to further treatment, such as sizing, polishing or heat treatment. If such treatments are applied, they shall be stated in the test report. In a metallographically examined cross section of a test piece, in the gauge region, the piece shall show no micro-lamination greater than 0,25 mm in length. Corners shall be broken in the gauge area.

2.2 Test piece specification: unnotched

Figure 1 a) shows a drawing of the unnotched test piece. The flatness and parallelism of 0,1 mm are mandatory. The other dimensions are advisory. Burrs shall be avoided.

2.3 Test piece specification: notched

Figure 2 a) shows a drawing of the notched test piece. The flatness and parallelism of 0,1 mm are mandatory. The other dimensions are advisory. Burrs shall be avoided. The tooling radius 5,5 mm of the die is subject to wear, then the corresponding radius dimension of the test piece shall be reported.

3 Die specifications

3.1 General

The die should preferably be of hardmetal and its surface finish shall be such as to allow compression of test pieces under normal conditions. The die may include a small exit taper to facilitate ejection and avoid cracks or microlaminations in the test pieces. Die cavity may be tapered 0,01 per side to aid ejection. Die bore may be enlarged by 0,5 % for tooling to be used for repressing.

The die should be well supported with shrink rings (of internal diameter $120\text{ mm}^{+0,01}\text{ mm}$), so as to minimize lateral expansion during compacting. Such support decreases the possibility of cracking of the specimen at ejection. To reduce the incidence of cracks in the specimen, it is recommended to use top punch hold down during ejection.