
Metallic materials — Torque-controlled fatigue testing

*Matériaux métalliques — Essais de fatigue par couple de torsion
commandé*



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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.

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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 1352 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 5, *Fatigue testing*.

This second edition cancels and replaces the first edition (ISO 1352:1977), which has been technically revised.

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1 Scope

This International Standard specifies the conditions for performing torsional, constant-amplitude, nominally elastic stress fatigue tests on metallic specimens without deliberately introducing stress concentrations. The tests are typically carried out at ambient temperature in air (ideally at between 10 °C and 35 °C) by applying a pure couple to the specimen about its longitudinal axis.

While the form, preparation and testing of specimens of circular cross-section and tubular cross-section are described in this International Standard, component and other specialized types of testing are not included. Similarly, low-cycle torsional fatigue tests carried out under constant-amplitude angular displacement control, which lead to failure in a few thousand cycles, are also excluded.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 554:1976, *Standard atmospheres for conditioning and/or testing — Specifications*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

maximum stress

τ_{\max}
highest algebraic value of shear stress in the stress cycle

3.2

minimum stress

τ_{\min}
lowest algebraic value of shear stress in the stress cycle

3.3

mean stress

τ_m
static component of the shear stress

NOTE It is one half of the algebraic sum of the maximum shear stress and the minimum shear stress:

$$\tau_m = \frac{\tau_{\max} + \tau_{\min}}{2}$$