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# INTERNATIONAL STANDARD 3800 / 1

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

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## Threaded fasteners — Axial load fatigue testing — Part I : Test methods

*Éléments de fixation filetés — Essais de fatigue sous charge axiale —  
Partie I : Méthodes d'essai*

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**Descriptors :** fasteners, threaded mechanical parts, bolts, screws, nuts (fasteners), tests, fatigue tests.

Price based on 7 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 3800/1 was developed by Technical Committee ISO/TC 2, *Fasteners*, and was circulated to the member bodies in May 1975.

It has been approved by the member bodies of the following countries :

Australia	Ireland	Spain
Belgium	Italy	Sweden
Chile	Japan	Switzerland
Czechoslovakia	Mexico	Turkey
Denmark	Netherlands	United Kingdom
Finland	New Zealand	U.S.A.
France	Norway	U.S.S.R.
Germany	Poland	Yugoslavia
Hungary	Romania	
India	South Africa, Rep. of	

No member body expressed disapproval of the document.

# Threaded fasteners — Axial load fatigue testing — Part I : Test methods

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the conditions for carrying out axial load fatigue tests on threaded fasteners. ISO 3800/II<sup>1)</sup> specifies methods of statistically determining fatigue strengths. The tests specified are of the fluctuating tension type as defined in ISO/R 373, sub-clause 3.2.3, and are carried out at room temperature, in air, the loading applied being along the longitudinal axis of the fastener. These methods allow the fatigue strength of threaded fasteners in open joints (clamped parts are not in contact) to be determined independently of their application.

Since the test fixtures can introduce variables in results, minimum requirements are specified to reduce their effect. Calibration and alignment control methods are included.

## 2 REFERENCES

ISO/R 80, *Rockwell hardness test (A and B scales) for steel.*

ISO/R 273, *Clearance holes for metric bolts.*

ISO/R 373, *General principles for fatigue testing of metals.*

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

ISO 885, *General purpose bolts and screws — Metric series — Radii under head.*

ISO 1099, *Metals — Axial load fatigue testing.*

ISO 1101, *Tolerances of form and of position.*

## 3 PRINCIPLE

Tests are made on threaded fasteners to determine fatigue properties such as those shown by the *S/N* curve (Wöhler curve) described in ISO/R 373.

Test threaded fasteners are mounted in an axial load fatigue testing machine and subjected to fluctuating tension type loading as defined in ISO/R 373, sub-clause 3.2.3.

Tests with constant mean stress  $\sigma_m$  or constant stress ratio  $R_s = \sigma_{min}/\sigma_{max}$  may be used.

The test is continued until the test piece fails, or until a predetermined number of stress cycles has been exceeded. Generally the number of test cycles is determined by the material or by the endurance fatigue strength of the test specimen. For threaded steel fasteners, the test may be discontinued at  $5 \times 10^6$  cycles in general. The definition of failure is given in ISO/R 373.

1) In preparation.