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Metallic materials — Fatigue testing — Strain-controlled thermomechanical fatigue testing method

*Matériaux métalliques — Essais de fatigue — Méthode d'essai de
fatigue thermo-mécanique avec déformation contrôlée*



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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 12111 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 5, *Fatigue testing*.

Introduction

The fatigue lives of structural components subjected to simultaneously occurring thermal and mechanical loadings are often of critical interest and concern to design engineers. A common approach to investigating the behaviours of materials subjected to combined thermal and mechanical loadings is to idealize the conditions of a critical material element on a uniaxial laboratory test specimen. The test condition is one where cyclic, theoretically uniform, within the test section, temperature and strain fields are externally imposed, simultaneously varied and controlled. Such a test is designated as "thermomechanical fatigue", commonly abbreviated as TMF.

In order to ensure reliability and consistency of results from different laboratories, it is necessary to generate and collect all data using test methodologies that comply with an established standard.

This International Standard addresses both the generation and presentation of TMF data.