Metallic and other inorganic coatings — Test method of cyclic heating for thermal-barrier coatings under temperature gradient (ISO 13123:2011)
Metallic and other inorganic coatings - Test method of cyclic heating for thermal-barrier coatings under temperature gradient

ISO 13123:2011

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Foreword

This document (EN ISO 13123:2011) has been prepared by Technical Committee ISO/TC 107 "Metallic and other inorganic coatings" in collaboration with Technical Committee CEN/TC 240 “Thermal spraying and thermally sprayed coatings” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2012, and conflicting national standards shall be withdrawn at the latest by June 2012.

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Endorsement notice

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

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ISO 13123 was prepared by Technical Committee ISO/TC 107, Metallic and other inorganic coatings.
Introduction

Thermal-barrier coatings (TBCs) are refractory coatings which provide thermal insulation for turbine blades and vanes, as well as for combustion chamber liners in power generation, aviation gas turbines and rocket combustors. They allow operation at substantially higher surface temperatures than is possible with bare metal, and thus TBCs have been used to extend the life of components that suffer from severe heat load cyclically during operation.

Conventional isothermal test methods are not suitable for evaluating the TBC under high heat load with a large temperature-gradient condition. Standardization of a cyclic heating test method for determination of their thermal-barrier performance and cyclic heat resistance under a temperature gradient field is required.
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Metallic and other inorganic coatings — Test method of cyclic heating for thermal-barrier coatings under temperature gradient

1 Scope

This International Standard applies to the test method of cyclic heating to evaluate the thermal-barrier performance and cyclic heat resistance of the thermal-barrier coatings provided for high-temperature components, such as burners, rotor and stator blades, etc. of power-generation gas turbines used in thermal power plants, aircraft engines and rocket engines.

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 1463, Metallic and oxide coatings — Measurement of coating thickness — Microscopical method
ISO 2063, Thermal spraying — Metallic and other inorganic coatings — Zinc, aluminium and their alloys
ISO 2178, Non-magnetic coatings on magnetic substrates — Measurement of coating thickness — Magnetic method
ISO 14917, Thermal spraying — Terminology, classification
ISO 80000-1, Qualities and units — Part 1: General

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2063, ISO 14917 and the following apply.

3.1 temperature gradient
temperature gradient caused by heating and cooling of both material surfaces of a test piece with thermal-barrier coatings

3.2 cyclic-heating testing
testing in which a temperature gradient is applied cyclically to the test piece with a thermal-barrier coating