INTERNATIONAL STANDARD

ISO 22680

First edition
2020-05

Metallic and other inorganic coatings — Measurement of the linear thermal expansion coefficient of thermal barrier coatings

Revêtements métalliques et autres revêtements inorganiques — Mesure du coefficient de dilatation thermique linéaire des revêtements barrières thermiques

Reference number
ISO 22680:2020(E)

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Published in Switzerland

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Foreword

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This document was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*.

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Introduction

Thermal barrier coatings are highly advanced material systems, generally applied to surfaces of hot-section components made of nickel or cobalt-based superalloys, such as combustors, blades and vanes of power-generation gas turbines in thermal power plants and aero-engines operated at elevated temperatures.

The function of these coatings is to protect metallic components for extended periods at elevated temperatures by employing thermally insulating materials that can sustain an appreciable temperature difference between load bearing alloys and coating surfaces. These coatings permit the high-temperature operation by shielding these components, thereby extending their lives.

Although the linear thermal expansion coefficient is an important property of thermal barrier coatings, the existing International Standard (e.g. ISO 17562) describes only a method for measuring this parameter for monolithic ceramics.

This document specifies a method for measuring the linear thermal expansion coefficient of the ceramic top coat for thermal barrier coating.