
**Fine ceramics (advanced ceramics,
advanced technical ceramics) —
Methods of test for ceramic coatings —
Determination of fracture strain**

*Céramiques techniques — Méthodes d'essai des revêtements
céramiques — Détermination de la déformation à la rupture*





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Foreword

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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.

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Introduction

The fracture strain of a coating is a critical factor often determining the performance of a coated product. Clearly, if stressed either directly or due to thermal effects (thermal expansion coefficient mismatch between the coating and substrate) coating cracking can occur if the critical fracture stress/strain is exceeded, and in many cases the effectiveness of the coating will be reduced. For example, corrosion-resistant coatings lose their protective character if cracking occurs, and optical coatings become ineffective when cracked. In many cases, cracking is the first stage of a much more serious form of failure in which large areas of the coating can spall.

This International Standard describes a method for the determination of fracture strain using a technique of applying stresses to a coupon of material by a uniaxial tensile or compressive test or a beam bending test where the initiation of fracture in the coating is determined using an acoustic emission method.

The extent to which coated components can withstand external applied loads is an important property in the application of any coated system, and usually the failure stress is required. For calculation of the stress, both the fracture strain and Young's modulus of the coating should be known. ISO 14577-4:2007^[1] can be used to measure Young's modulus by depth-sensing indentation, but there are other methods involving flexure and impact excitation that may also be applied (References [2], [3]).

