First edition
2000-02-15

Metallic and other inorganic coatings — Test for residual embrittlement in both metallic-coated and uncoated externally-threaded articles and rods — Inclined wedge method

Revêtements métalliques et autres revêtements inorganiques — Essai de fragilisation résiduelle des articles et tiges filetés avec et sans revêtement métallique extérieur — Méthode de la cale biaise

Reference number
ISO 10587:2000(E)

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 734 10 79
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Web www.iso.ch

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Foreword

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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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 10587 was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*, Subcommittee SC 2, *Test methods*.

Annex A of this International Standard is for information only.

Introduction

When atomic hydrogen enters steels and certain other alloys, it can cause loss of ductility or load-carrying ability or cracking (usually as submicroscopic cracks), or catastrophic brittle failures at applied stresses well below the yield strength or even the normal design strength for the alloys. This phenomenon often occurs in alloys that show no significant loss in ductility when measured by conventional tensile tests, and is frequently referred to as hydrogen-induced delayed brittle failure, hydrogen stress cracking or hydrogen embrittlement. The hydrogen can be introduced during cleaning, pickling, phosphating, electroplating, autocatalytic processes and in the service environment as a result of cathodic protection reactions or corrosion reactions. Hydrogen can also be introduced during fabrication, for example, during roll forming, machining and drilling, due to lubricant break-down, and during welding or brazing operations.

A variety of articles have threads as part of their structure. Examples are tools such as metal and wood working clamps, metal vices, tension clamps and taps, and hardware items such as threaded metal projectiles and bomb components, rifles, spring tension adjusters and piano stool lifts.

Industrial practice for threaded articles and rods has evolved three graduated levels of test exposure to assure reduced risk of hydrogen embrittlement (see clause 2). These levels have evolved from commercial applications having varying levels of criticality. In essence, they represent the confidence level that is required. They also represent the time that finished goods are held before they can be shipped and used. This time equates to additional cost to the manufacturer that may of necessity be added to the cost of the finished goods.