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Corrosion of metals and alloys — Guidelines for the selection of methods for particle-free erosion corrosion testing in flowing liquids

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National foreword

This Published Document is the UK implementation of ISO/TR 16203:2016.

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Corrosion of metals and alloys — Guidelines for the selection of methods for particle-free erosion corrosion testing in flowing liquids

Corrosion des métaux et alliages — Lignes directrices pour la sélection des méthodes d'essai d'érosion-corrosion exempte de particule dans des liquides en mouvement

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Foreword

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The committee responsible for this document is ISO/TC 156, *Corrosion of metals and alloys.*

Introduction

Particle-free erosion corrosion is a major problem in industries handling liquids flowing rapidly that are corrosive especially at high temperatures and high pressures. This mode of corrosion usually leads to rapid metal loss with possibly catastrophic consequences. In order to prevent, mitigate and control the problems, it is important to determine the resistance to corrosion of materials accurately. This may be achieved by the use of test methods reproducing a specific mode of erosion corrosion.

TECHNICAL REPORT **ISO/TR 16203:2016(E)**

Corrosion of metals and alloys — Guidelines for the selection of methods for particle-free erosion corrosion testing in flowing liquids

1 Scope

This Technical Report provides information on the erosion corrosion test of materials in single-phase flowing liquids and guidance for selection of test methods.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8044, *Corrosion of metals and alloys — Basic terms and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8044 and the following apply.

3.1
erosion
progressive loss of original material from a solid surface due to mechanical interaction between the surface and a fluid, a multicomponent fluid, or impinging liquid or solid particles

3.2
erosion corrosion
process involving conjoint corrosion and erosion

3.3
particle free erosion corrosion
corrosion of metallic materials in single phase flowing liquids

4 Principles

4.1 Erosion corrosion describes the mechanical removal of metals leading to enhanced corrosion. The process is synergistic in the sense that the localized loss of material can create additional turbulent flow that encourages further film removal or even prevents its formation. The conditions in which erosion corrosion occurs will be a sensitive function of the application but there are a range of laboratory test methods that have been developed to simulate typical service applications and can provide a basis for assessing the relative susceptibility of materials to damage development.

4.2 Erosion corrosion test is conducted either by setting up a uniform flow velocity distribution or by inducing different flow velocities or different rates of corrosion over the surface of test specimen. In the former, corrosion damage increases as the flow velocity of liquid increases, while in the latter, the damage increases as the difference in the corrosion rates becomes larger.