
**Corrosion of metals and alloys —
Determination of the critical crevice
temperature (CCT) for stainless steels
under potentiostatic control**

*Corrosion des métaux et alliages — Détermination de la température
critique de corrosion caverneuse (TCCC) des aciers inoxydables sous
contrôle potentiostatique*

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Foreword

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

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Introduction

Stainless steel is susceptible to pitting corrosion, crevice corrosion, and stress-corrosion cracking, etc., although it is used as generally corrosion-resistant material. The basic methodology for testing localized corrosion was first standardized in ASTM G 150. This method describes the susceptible to pitting corrosion and it is also standardized in ISO 17864. In this International Standard, the susceptible to crevice corrosion is examined. This is performed by recording the electrochemical critical crevice corrosion temperature for a material using a specific crevice former. Crevice corrosion phenomenon is generally of a random nature and therefore these measurements require at least a couple of values.

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Corrosion of metals and alloys — Determination of the critical crevice temperature (CCT) for stainless steels under potentiostatic control

1 Scope

This International Standard describes the procedure for determining the critical crevice temperature (CCT) for stainless steels under potentiostatic control.

The principal advantage of the test is the rapidity with which the CCT can be measured in a single test procedure. The CCT, as determined in this International Standard, can be used as a relative index of performance, for example, to compare the relative performance of different grades of stainless steel.

The test described in this International Standard is not intended to determine the temperature at which crevice corrosion will occur in service.

This method is not intended for materials with critical pitting temperature (CPT) values below 20 °C measured in accordance with ISO 17864, when measured in the same test solution and at the same potential

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 3696, *Water for analytical laboratory use — Specification and test methods*

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

ISO 17864, *Corrosion of metals and alloys — Determination of the critical pitting temperature under potentiostatic control*

ISO 18070, *Corrosion of metals and alloys — Crevice corrosion formers with disc springs for flat specimens or tubes of stainless steels in corrosive solutions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8044, ISO 17864 and the following apply.

3.1

critical crevice temperature

CCT

lowest temperature on the surface of the specimen at which stable propagating crevice corrosion occurs under specified test conditions

Note 1 to entry: The critical crevice corrosion temperature is defined as the temperature of the specimen at which the current density exceeds a specified value. A recommended value is 10 $\mu\text{A cm}^{-2}$, referring to area exposes in the measurement to make sure that it is above the passive current, for 60 s. A 60 s delay is used in order to ensure that the observed current increase originates from stable propagating crevice corrosion, and not a short-lived current peak.^[4]