



# Standard Test Method for Electrochemical Critical Pitting Temperature Testing of Stainless Steels<sup>1</sup>

This standard is issued under the fixed designation G150; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers a procedure for the evaluation of the resistance of stainless steel and related alloys to pitting corrosion based on the concept of the determination of a potential independent critical pitting temperature (CPT).

1.2 This test methods applies to wrought and cast products including but not restricted to plate, sheet, tubing, bar, forgings, and welds, (see [Note 1](#)).

NOTE 1—Examples of CPT measurements on sheet, plate, tubing, and welded specimens for various stainless steels can be found in Ref ([1](#)).<sup>2</sup> See the research reports (Section [14](#)).

1.3 The standard parameters recommended in this test method are suitable for characterizing the CPT of austenitic stainless steels and other related alloys with a corrosion resistance ranging from that corresponding to solution annealed UNS S31600 (Type 316 stainless steel) to solution annealed UNS S31254 (6 % Mo stainless steel).

1.4 This test method may be extended to stainless steels and other alloys related to stainless steel that have a CPT outside the measurement range given by the standard parameters described in this test method. Appropriate test potential and solution must then be determined.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

<sup>1</sup> This test method is under the jurisdiction of [G01](#) on Corrosion of Metals and is the direct responsibility of Subcommittee [G01.11](#) on Electrochemical Measurements in Corrosion Testing.

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<sup>2</sup> The boldface numbers in parenthesis refer to the list of references at the end of this standard.

## 2. Referenced Documents

### 2.1 *ASTM Standards:*<sup>3</sup>

[D1193](#) Specification for Reagent Water

[D1293](#) Test Methods for pH of Water

[E177](#) Practice for Use of the Terms Precision and Bias in ASTM Test Methods

[E691](#) Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

[G1](#) Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens

[G3](#) Practice for Conventions Applicable to Electrochemical Measurements in Corrosion Testing

[G5](#) Reference Test Method for Making Potentiodynamic Anodic Polarization Measurements

[G46](#) Guide for Examination and Evaluation of Pitting Corrosion

[G107](#) Guide for Formats for Collection and Compilation of Corrosion Data for Metals for Computerized Database Input

[G193](#) Terminology and Acronyms Relating to Corrosion

## 3. Terminology

### 3.1 *Definitions:*

3.1.1 *critical pitting temperature (CPT)*—the lowest temperature on the test surface at which stable propagating pitting occurs under specified test conditions indicated by a rapid increase beyond a set limit of the measured anodic current density of the specimen.

3.1.2 *pitting potential range*—the range of measured potentials where pitting is initiated. This potential range only exists above the minimum critical pitting temperature; see also [Appendix X1](#).

3.1.3 *potential dependent CPT*—the CPT determined at a potential within the pitting potential range of the tested material; see also [Appendix X1](#).

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.