



NACE SP0387-2014
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Standard Practice

Metallurgical and Inspection Requirements for Cast Galvanic Anodes for Offshore Applications

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Foreword

The purpose of this standard practice is to set minimum physical quality and inspection standards for cast galvanic anodes for offshore applications. The objectives of this standard are to standardize an industry-wide practice that can be used by consultants, manufacturers, and users to define the physical requirements of cast galvanic anodes, and to be specific enough to assist the inspection authority in its task of confirming that cast galvanic anodes comply with the physical requirements.

This standard is complementary to NACE SP0176,¹ DNV⁽¹⁾-RP-B401² and EN⁽²⁾ 12495.³

This standard was originally prepared in 1987 by NACE Task Group T-7L-5, a component of Unit Committee T-7L on Cathodic Protection, in association with a working group of the Corrosion Control Engineering Joint Venture (CCEJV), sponsored by NACE International and the Institute of Corrosion Science and Technology (ICorr).⁽³⁾ It was reaffirmed in 1990, revised in 1999, and reaffirmed in 2006 by Specific Technology Group (STG) 30, "Oil and Gas Production—Cathodic Protection." It was revised in 2014 by Task Group (TG) 454, "Review and Revise as Necessary SP0387-2006," which is administered by STG 30, "Oil and Gas Production—Cathodic Protection." This standard is issued by NACE under the auspices of STG 30.

In NACE standards, the terms *shall*, *must*, *should*, and *may* are used in accordance with the definitions of these terms in the *NACE Publications Style Manual*. The terms *shall* and *must* are used to state a requirement, and are considered mandatory. The term *should* is used to state something good and is recommended, but is not considered mandatory. The term *may* is used to state something considered optional.

⁽¹⁾ Det Norske Veritas (DNV), Veritasveien 1, P.O. Box 300, 1322 Høvik, Norway.

⁽²⁾ European Committee for Standardization (CEN), rue de Stassart 36, B-1050 Brussels, Belgium.

⁽³⁾ Institute of Corrosion Science and Technology (ICorr), P.O. Box 253, Leighton Buzzard, Bedfordshire LU7 1FG United Kingdom.

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Section 1: General

- 1.1 This standard defines minimum physical quality and inspection standards for cast galvanic anodes for offshore applications.
- 1.2 This standard is applicable to typical offshore platform anode configurations, and although some aspects of the standard may be relevant to all galvanic anodes, it is not intended to apply to bracelet, tank, pipeline, or extruded anodes, or generally to anodes below 50 kg (110 lb) net weight.
- 1.3 This standard is applicable to cast galvanic anodes used on offshore structures, e.g., cast galvanic anodes with circular or trapezoidal cross sections, with length substantially greater than width, and generally of a "stand-off" (having extensions to the steel insert to achieve stand-off) or flush-mounted configuration.
- 1.4 The manufacturer shall be responsible for meeting the quality levels specified in this standard. The user may determine the extent of inspection to be conducted to prove compliance with the quality specified.
- 1.5 The manufacturer shall have a documented quality plan for the manufacture and inspection of cast galvanic anodes, which may be in accordance with ISO⁽⁴⁾ 10005.⁴

Section 2: Definitions

Batch: A group of anodes produced before, between, or after a significant interruption of the casting sequence of a heat of anodes.

Cast Galvanic Anode: A metal that provides sacrificial protection to another metal that is more noble when electrically coupled in an electrolyte. This type of anode is the electron source in one type of cathodic protection.

Certificate of Conformity: A written statement made by the representative (executive) of the manufacturer and endorsed by a representative of the user that the anodes listed comply with the requirements of the purchase order.

Cold Lap: (1) A linear discontinuity with rounded edges at exposed surfaces that is caused by solidification of the meniscus of a partially cast metal or alloy (e.g., an anode used for cathodic protection) as a result of interrupted flow of the casting stream or the joining of two casting streams at too low a temperature. (2) A protective film consisting of one or more coats, applied in a predetermined order by prescribed methods to an as-specified dry film thickness, including any reinforcing material that may be specified.

Cold Shut: Horizontal surface discontinuity caused by solidification of a portion of a meniscus during the progressive filling of a mold, which is later covered with more solidifying metal as the molten metal level rises. Cold shuts generally occur at corners remote from the point of pour.

Cracking: Fracture of a material along a path that produces a linear discontinuity (without complete separation).

Electrochemical Properties: Those properties of potential and current capacity that characterize a galvanic anode and that can be assessed by quantitative tests.

Heat: The product that is cast to a planned procedure in one melting operation in one furnace, without significant interruption. It is also called a melt and defines the molten metal and identifies the anodes cast from it.

Insert: The form over which the anode is cast and that is used to connect the anode to the structure requiring protection. It is sometimes referred to as a core.

Low-Carbon Steel: Steel having less than 0.30 mass percent carbon and no intentional alloying additions.

Nonmetallic Inclusions: Particles of oxides and other refractory materials entrapped in liquid metal during the melting or casting sequences.

⁽⁴⁾ International Organization for Standardization (ISO), 1 rue de Varembe, Case Postale 56, CH-1211 Geneva 20, Switzerland.