ABYC E-2 July 2019

Electrical Division Standard

Electrical Project Technical Committee

The ABYC Standards and Technical Information Reports for Small Craft are the product of a consensus of representatives of government, industry and public sectors. It is intended solely as a guide to aid manufacturers and the marine community in the design, construction, equipage and maintenance of small craft.

ABYC reviews each standard at least every five years at which time it may be reaffirmed, revised, or withdrawn. ABYC welcomes any written comments on the standards and Technical information reports.

ABYC E-2

CATHODIC PROTECTION

Origin and Development

E-2, *Cathodic Protection* was first published in 1965 with revisions in 1971, 1973, 1981, 1996, 2001, 2008 and 2013. The July 2019 revision is the work of the Electrical Project Technical Committee.

Electrical Project Technical Committee

This list represents the membership at the time the committee was balloted.

Ward Eshleman, *Chair*
William Brian Criner, *Vice Chair*

Colin Althen	James Coté	John Lach
Scott Berry	David DeHorn	Robert Macias
Denis Bonneau	William Drake	Thomas Marhevko
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Po Chang	LA Holmes	Dave Potter
Jay Check	Charles Johnson	Ray Toth
Pete Chisholm	Wayne Kelsoe	Ray Wong

Membership on a committee shall not in and of itself constitute an endorsement of ABYC or any document developed by the committee on which the member serves.

This standard, which is the result of extended and careful consideration of available knowledge and experience on the subject, was developed under procedures accredited as meeting the criteria for American National Standards and is intended to provide minimum performance requirements. The Project Technical Committee that approved the standard was balanced to ensure that individuals from competent and concerned interests have had an opportunity to participate.

ABYC's Project Technical Committee (PTC) meetings are open to the public. All inquiries regarding standards activity, interpretations, or meeting attendance should be directed to the ABYC Technical Department at comments@abycinc.org.

ABYC and its committees do not "approve" or "endorse" any item, construction, or proprietary device.

Request for Interpretations

Upon written request the Electrical PTC will render an interpretation of any requirement of the standard. The request for interpretation should be clear and unambiguous. Requests should be presented to the PTC in a manner in which they may be answered in a "Yes" or "No" fashion.

The committee reserves the right to reconsider any interpretation when or if additional information that might affect it becomes available to the PTC. Persons aggrieved by an interpretation may appeal to the Committee for reinterpretation.

Summary of Revisions

This list indicates revisions to the standard when compared with the previously published version. It is not intended to be used independently of the standard. It should be used for informational purposes and as a guide to the official requirements contained in this standard. It is the responsibility of the user to read and understand the complete standard.

The main changes in this revision of E-2, *Cathodic Protection* as compared with the previous edition dated 7/13, are:

- Scope and Purpose were combined
- Units of Measurement section was added
- Definition section was revised
- Cathodic bonding conductor requirements were revised
- Magnesium sacrificial anodes requirements were expanded
- Impressed current system requirements were clarified
- TABLE 1 was expanded with zinc reference cell potentials

TABLE OF CONTENTS

E-2 CATHODIC PROTECTION

Based on ABYC's assessment of the existing technology, and the problems associated with achieving the goals of the standard, ABYC recommends compliance for systems and associated equipment manufactured and/or installed after July 31, 2020.

2.1 *SCOPE*

This standard applies to the design, installation, and use of cathodic protection systems on boats with sacrificial anodes or impressed currents.

2.2 *UNITS OF MEASURE*

Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate.

2.3 *REFERENCES*

The following references form a part of this standard. Unless otherwise noted the latest version of referenced standards shall apply.

2.3.1 ABYC - American Boat & Yacht Council, Inc, 613 Third Street, Suite 10, Annapolis, MD 21403. Phone: (410) 990-4460. Fax: (410) 990-4466. Website: www.abycinc.org

A-28, *Galvanic Isolators*
E-11, *AC & DC Electrical Systems on Boats*
TE-4, *Lightning Protection*

2.3.2 ASTM - ASTM International 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. Phone: (610)-832-9500. Fax: (610)-832-9555. Website: https://www.astm.org

ASTM B418 - *Standard Specification for Cast and Wrought Galvanic Zinc Anodes*
ASTM B605 - *Standard Specification for Electrodeposited Coatings of Tin-Nickel Alloy*

2.3.3 Military Specifications (MILSPEC) - A specification developed by the US Armed Forces. Obtain the referenced specifications from the Naval Publications and Form Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

MIL-A-18001 - *Military Specification: Anodes, Sacrificial Zinc Alloy*
MIL-A-21412 - *Military Specification: Anodes, Corrosion Preventative, Magnesium Alloy, Cast or Extruded Shapes With Cast-In Cores*

2.4 *DEFINITIONS*

For the purpose of this standard the following definitions apply.

2.4.1 Active-Passive Metals - metals that exhibit two distinct corrosion potentials depending on the composition of the electrolyte, other environmental factors, and/or surface conditions of the metal itself. The austenitic (300-series) stainless steels are typical examples of active-passive metals.

2.4.2 Amphoteric - capable of reacting chemically in an acid or a base. Certain oxides of a few metals, including aluminum, tin, lead, and zinc, are amphoteric, which renders those metals more susceptible to corrosion in alkaline electrolytes than other metals.

2.4.3 Anode (Galvanic Anode) -

2.4.3.1 an electrode of a simple electrochemical cell at which metal ions pass into the electrolyte and the metal wastes away, or

2.4.3.2 an electrode of a galvanic cell which has a more negative corrosion potential than another electrode of the cell; or

2.4.3.3 an electrode of a supplied-current cell which is connected to the positive terminal of a DC current source (see Cathode).