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ABYC A-24 July, 2015

Equipment Division Standard

Gas Detectors 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ABYC reviews each standard at least every five years at which time it may be reaffirmed, revised, or withdrawn.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 A-24

CARBON MONOXIDE DETECTION SYSTEMS

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GAS DETECTORS PROJECT TECHNICAL COMMITTEE

Tom Marhevko, Chairman

Larry Akins
Taro Amamoto
Miles Beam
Allen Douglas
E. Charles Game
Lou Novak
Jeff Wisniewski

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

NOTE: 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 was developed under procedures accredited as meeting the criteria for American National Standards. 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.

This standard, which is the result of extended and careful consideration of available knowledge and experience on the subject, is intended to provide minimum performance requirements.

ABYC's Project Technical Committee 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", "certify", or "endorse" any item, construction, or proprietary device.

REQUEST FOR INTERPRETATIONS

Upon written request the Gas Detectors 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 which might affect it becomes available to the PTC. Persons aggrieved by an interpretation may appeal to the Committee for reinterpretation.

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A-24 CARBON MONOXIDE DETECTION SYSTEMS

Based on ABYC's assessment of the existing technology, and the problems associated with achieving the goals of this standard, ABYC recommends compliance with this standard for all boats, associated equipment, and systems manufactured after July 31, 2016.

24.1 ***PURPOSE***

These standards are guides for the design, construction, and installation of carbon monoxide detection systems on boats.

24.2 ***SCOPE***

These standards apply to carbon monoxide detection systems on boats.

24.3 ***REFERENCES***

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

24.3.1 ABYC – American Boat & Yacht Council, Inc., 613 Third St., Suite 10, Annapolis, MD 21403. Phone: (410) 990-4460. Fax: (410) 990-4466. Web site: www.abycinc.org.

ABYC E-11, *AC & DC Electrical Systems on Boats*
ABYC TH-22, *Educational Information about Carbon Monoxide*
ABYC TH-23, *Design, Construction, and Testing of Boats in Consideration of Carbon Monoxide*
ABYC T-24, *Owner/Operator's Manual*

24.3.2 UL – Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096. Obtain standards from Global Engineering Documents, Inc., 15 Inverness Way East, Englewood, CO 80112. Phone: (800) 854-7179 (US and Canada), (303) 397-7956 (outside US and Canada), Fax: (303) 397-2740. Website: www.ul.com.

UL 2034, *Single and Multiple Station Carbon Monoxide Alarms*

24.4 ***DEFINITIONS***

For the purpose of this standard, the following definitions apply.

24.4.1 "β" (Beta) – An arbitrary variable name chosen to represent the mathematical calculation of the absolute worst case predicted %COHb levels in a typical individual exposed to the factors (parts per million of carbon monoxide level and minutes of exposure to that CO level) used in that calculation. For the purposes of this standard, "β" is calculated from the following expression:

$$\text{"}\beta\text{"} = [218\,(0.0003 + P/1316)]\ [1 - e^{-T/96.8792}]$$

where P = CO concentration in PPM,
e = base natural logarithm (approx.= 2.71828)
T = time of exposure in minutes

NOTE: For reference purposes, the "β" (Beta) equation solved for T or P is as follows:

$$P = \frac{6.0367\beta}{1 - e^{-T/96.8792}} - 0.3948$$

$$T = -96.8792 \ln\left[1 - \beta/(0.0654 + 0.166P)\right]$$

24.4.2 CO – An abbreviation for carbon monoxide. For the purposes of this standard, the CO level is always expressed in terms of parts per million (PPM) total volume of CO in air.

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