Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks

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Shall: As used in a standard, “shall” denotes a minimum requirement in order to conform to the specification.

Should: As used in a standard, “should” denotes a recommendation or that which is advised but not required in order to conform to the specification.

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1 Scope

1.1 General

This standard is applicable to stationary atmospheric and low-pressure (up to and including 15 psig) aboveground petroleum storage tanks used in all sectors of the petroleum and petrochemical industry, including:

— crude oil and gas production,

— refining,

— petrochemicals,

— pipelines and terminals,

— bulk storage,

— ethanol facilities.

This standard provides requirements for safely planning, coordinating, and conducting tank entry and cleaning operations, from removal from service through return to service.

This standard does not and cannot cover every possible unique hazard or situation that may arise during tank cleaning operations. Site, product, and tank-specific hazards and situations shall be addressed by employers using the appropriate principles and considerations provided for by this standard.

1.2 Non-applicability and Other Tank Cleaning Applications

This standard does not apply to the following types of tanks or vessels:

— pressure vessels and pressurized tanks exceeding 15 psig,

— cryogenic or refrigerated vessels or pressure tanks,

— vessels and tanks maintained under a vacuum,

— process vessels,

— underground storage tanks.

Although API Standard 2015 is not intended to cover these types of tanks and vessels, many of the safe tank cleaning and entry principles and requirements in this standard apply and should be considered.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Bulletin E2, *Bulletin on Management of Naturally Occurring Radioactive Materials (NORM) in Oil and Gas Production*

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API Standard 650, *Welded Tanks for Oil Storage*

API Standard 653, *Tank Inspection, Repair, Alteration and Reconstruction*

API Recommended Practice 2003, *Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents*

API Recommended Practice 2009, *Safe Welding, Cutting and Hot Work Practices in the Petroleum and Petrochemical Industries*

API Recommended Practice 2026, *Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum* Service

API Recommended Practice 2027, *Ignition Hazards and Safe Work Practices for Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service*

API Publication 2202, *Dismantling and Disposing of Steel from Aboveground Leaded Gasoline Storage Tanks*

API Recommended Practice 2207, *Preparing Tank Bottoms for Hot Work*

API Standard 2217A, *Guidelines for Work in Inert Confined Spaces in the Petroleum Industry*

API Recommended Practice 2219, *Safe Operating Guidelines for Vacuum Trucks in Petroleum Service*

API Recommended Practice 2220, *Improving Owner and Contractor Safety Performance*

ACGIH [1], *TLVs and BEIs Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices*

ANSI Z49.1 [2], *Safety in Welding, Cutting, and Allied Processes*

ANSI Z88.1, *Respiratory Protection against Radon Dangers*

ANSI Z88.6, *Respiratory Protection—Respirator Use—Physical Qualifications for Personnel*

ANSI Z88.10, *Respirator Fit Testing Methods*

ANSI Z117.1, *Safety Requirements for Confined Spaces*

CGA G-7.1 [3], *Commodity Specification for Air*

ICS, IAPH, and OCIMF; ISGOTT [4], *International Safety Guide for Oil Tankers and Terminals*

NFPA [5], *Fire Protection Handbook*

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1 American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Cincinnati, Ohio 45240-1634, www.acgih.com.

2 American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, New York 10036, www.ansi.org.

3 Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, Virginia 20151, www.cganet.com

4 International Chamber of Shipping, 38 St Mary Axe, London, EC3A 8B, www.ics-shipping.org.; International Association of Ports and Harbors, 7th Floor, South Tower New Pier Takeshiba 1-16-1 Kaigan, Minato-ku, Tokyo 105-0022 Japan, www.iaphworldports.org.; Oil companies International Marine Forum, 27 Queen Anne's Gate, London, SW1H9BU, England, www.ocimf.com.; Available from: Witherby Seamanship, Witherby Seamanship International Ltd, 4 Dunlop Square, Deans Estate, Livingston EH54 8SB, United Kingdom, www.witherbyseamanship.com.

5 National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169-07471

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NFPA 30, *Flammable and Combustible Liquids*

NFPA 51B, *Cutting and Welding Processes*

NFPA 70, *National Electrical Code*

NFPA 77, *Static Electricity*

NFPA 326, *Safeguarding of Tanks and Containers for Entry, Cleaning or Repair*

3 Terms and Definitions

For the purposes of this document, the following definitions apply.

3.1
air supplied respiratory protection
A respirator that provides a supply of safe breathing air from a tank (either a self-contained breathing apparatus, portable tank, or an air line supply tank) or from a source of fresh air (approved breathing air compressor) not subject to potential contamination.

3.2
atmospheric monitoring equipment
The oxygen monitors, combustible gas indicators, and toxic substance analyzers used to test or sample atmospheric conditions and determine, indicate, measure, and monitor the amount of oxygen and hazardous substances in the atmosphere.

3.2.1
combustible gas indicator
An instrument used to sample the atmosphere and indicate the concentration of vapor/gas present in the atmosphere as a percentage of the lower explosive (flammable) limit.

3.2.2
flammable vapor indicator
See *combustible gas indicator.*

3.2.3
oxygen monitor
A device capable of detecting, monitoring, and measuring the concentration of oxygen in the atmosphere.

3.3
blanking
The absolute closure of a pipe by fastening a solid, flat plate (designed to retain anticipated pressure) between two flanges, using two gaskets and fully engaged bolts or stud bolts in all flange bolt-holes.

NOTE See ASME B16.47 for additional information.

3.4
blinding
The absolute closure of the open end of a pipe by fastening a solid, flat plate (designed to retain anticipated pressure) across the opening, using a gasket and fully engaged bolts or stud bolts in all flange bolt-holes.

NOTE See ASME B 16.5 for additional information.

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