AMERICAN NATIONAL STANDARD

ANSI/ASSE Z9.1 – 2016
Ventilation and Control of Airborne Contaminants During Open-Surface Tank Operations

ANSI/ASSE Z9.1 - 2016

AMERICAN SOCIETY OF SAFETY ENGINEERS

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American National Standard

Ventilation and Control of Airborne Contaminants During Open-Surface Tank Operations

Secretariat

American Society of Safety Engineers
520 N. Northwest Highway
Park Ridge, Illinois 60068

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American National Standards Institute, Inc.

American National Standard

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Foreword (This Foreword is not a part of American National Standard Z9.1-2016.)

This standard was developed from extended and careful examination of successful current practice in the control of health hazards resulting from open-surface tank operations. The requirements set forth are considered the minimum necessary to ensure the safety of the workers involved. Appendix A contains information on the properties of potentially toxic contaminants.

Much of this standard is drawn from an earlier standard: ANSI Z9.1-1991, *Open-Surface Tanks--Ventilation and Operation*. Prior to the 1991 edition, there were four earlier versions of the standard: ANSI Z9.1-1977 (administratively withdrawn by ANSI on March 2, 1988), ANSI Z9.1-1971, ANSI Z9.1-1951, and ANSI Z9.1-1941.

How to Read this Standard: The standard is presented in a two-column format. The left column presents the requirements of the standard; the right column provides clarification and explanation of the requirements plus “how to comply” information.

This standard also contains Appendices, which are informative and are not considered a mandatory part of this standard.

Flexibility: Requirements are minimum criteria and can be adapted to the needs of the user. Demonstrably equal or better approaches are acceptable. Where standard provisions are in conflict with other standards and codes, the more stringent should be applied. Where the user deviates from standards requirements, the user should document justification for the deviation.

Auditing: The standard is auditable. An Audit Form is provided in the Appendix B.

Response and Update: Please contact the American Society of Safety Engineers if you have questions, comments or suggestions. As with all ANSI standards, this is a work in progress. New technology and research continues to change in this field and it is hoped that future versions of the standard will reflect this growth in knowledge. Suggestions for improvement are welcome, and should be sent to:

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This standard was processed and approved for submittal to ANSI by the Z9 Accredited Standards Committee on Health and Safety Standards for Ventilation Systems. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the Z9 Committee had the following members:

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Ovidiu Munteanu, Secretary
Timothy R. Fisher, CSP, CHMM, ARM, CPEA, Assistant Secretary
Jennie Dalesandro, Administrative Technical Support

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D. Jeff Burton, MS, P.E.
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Kyle Hankinson
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Kathleen Paulson, P.E.

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STANDARD REQUIREMENTS

EXPLANATORY INFORMATION
(Not part of American National Standard Z9.1)

1. SCOPE, PURPOSE AND APPLICATION

1.1 Scope. This standard establishes minimum control requirements and ventilation system design criteria for controlling and removing air contaminants to protect the health of personnel engaged in open-surface tank operations. It is not intended to cover fire protection.

1.2 Objectives. The objectives of this standard are to:

- Protect the health and well-being of open-surface tank workers by establishing minimum requirements to control emissions of gases, vapors or mists from open-surface tank operations.
- Prevent explosive concentration of gases or vapors in ducts, hoods and enclosures.
- Protect workers from splashes and other contact with liquids.
- Prevent objectionable increases in humidity.
- Advise establishments to conform to local or state air pollution regulations.

Due to the wide variation between operations, locations, work practices, construction, equipment age, etc., compliance with this standard cannot guarantee that the objectives of Section 1.2 will be met at all times and at all locations.

1.3 Application. This standard applies to industrial occupancies utilizing open surface tanks, and tanks with automated tank covers, for the purpose of immersing parts in liquids or vapors for: cleaning, altering the