

AWS F3.2:2018
An American National Standard

Ventilation Guide for Weld Fume



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Approved by the
American National Standards Institute
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Ventilation Guide for Weld Fume

2nd Edition

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Prepared by the
American Welding Society (AWS) Project Committee on Fumes and Gases

Under the Direction of the
AWS Committee on Safety and Health

Approved by the
AWS Board of Directors

Abstract

This document introduces the reader to various types of ventilation systems, including general supply and exhaust and local exhaust, for control of weld fumes. It contains or refers to information on air contaminants found in welding fumes, principles of system design and selection, and drawings that illustrate ventilation techniques.



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Foreword

This foreword is not part of this standard but is included for informational purposes only.

In 1981, the American Welding Society entered into an informal arrangement to distribute an insurance company publication, *Welding Fume Control with Mechanical Ventilation*. In October 1986, the copyright was purchased and an updated version was prepared for publication as ANSI/AWS F3.1:1989, *Guide for Welding Fume Control*. It contained information to help plan new or evaluate existing systems for control of welding fume in the workplace. Because more than a revision was determined to be necessary, ANSI/AWS F3.1:1989 was withdrawn in 1997 and replaced with an updated and expanded ventilation guide, AWS F3.2: 2001. This revision is the second edition of F3.2. The health information listed for welding contaminants in the first edition have been removed and an expanded description of occupational exposure limits was added. New clauses on Maintenance (Clause 9) and Confined Spaces (Clause 10) were added. The last edition of this document used dual dimensions, the International System of Units (SI) followed by U.S. Customary Units in brackets and was designated F3.2M/F3.2. This edition uses U.S. Customary Units with approximate SI equivalents in parentheses, and is designated F3.2. This change was made because ventilation calculations in the U.S. are primarily in U.S. Customary Units.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, Safety and Health Committee, American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

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Ventilation Guide for Weld Fume

1. Introduction, Scope, and General Provisions

1.1 Introduction. A ventilation system consists of either a naturally, or mechanically, supplied and exhausted flow of air which can be used to control fumes and gases generated during welding or cutting operations. Mechanical ventilation systems are typically more consistent in their ability to control contaminants and are generally utilized when it is necessary to:

- (1) Control contaminants to meet occupational exposure limits (PEL, TLV, etc.);
- (2) Advance environmental stewardship by collecting emissions at the source, for disposal and recycle; and
- (3) Improve housekeeping by reducing settled particulates.

1.2 Scope. This guide describes recommended principles of ventilation to be used in facilities where welding and allied processes are performed. The primary objective of this document is to enhance the health and safety of all those found in a welding environment. Other objectives include the provision of information relevant to energy conservation and environmental compliance. This guide does not provide information on respiratory protection or specific precautions related to working in a confined space. Also, this guide does not address issues associated with combustible dust hazards applicable to ventilation systems. Information dealing with this issue can be found in NFPA 654, *Standard for Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids*, and NFPA 484, *Standard for Combustible Metals*.

Basic information related to a range of ventilation systems and techniques that can be used in a welding and cutting environment is provided here. Comparisons are drawn between techniques and highlight both the effectiveness and relative cost of each approach. It is intended that this information will assist in the identification and selection of an appropriate ventilation solution for a specific welding and/or cutting operation.

1.3 Units of Measure. This standard makes sole use of U.S. Customary Units. Approximate mathematical equivalents in the International System of Units (SI) are provided for comparison in parentheses or in appropriate columns in tables and figures.

1.4 Safety. Safety and health issues and concerns are beyond the scope of this standard; some safety and health information is provided, but such issues are not fully addressed herein.

Sources of safety and health information include:

American Welding Society:

- (1) ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*
- (2) AWS Safety and Health Fact Sheets
- (3) Other safety and health information on the AWS website

Material or Equipment Manufacturers:

- (1) Safety Data Sheets (SDS) supplied by materials manufacturers
- (2) Operating Manuals supplied by equipment manufacturers

Applicable regulatory agencies, such as:

- (1) Occupational Safety and Health Administration
- (2) Environmental Protection Agency