AWS F1.6:2017
An American National Standard

Guide for Estimating Welding Emissions for EPA and Ventilation Permit Reporting

American Welding Society®

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Approved by
American National Standards Institute
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Guide for Estimating Welding Emissions for EPA and Ventilation Permit Reporting

2nd Edition

Supersedes AWS F1.6:2003

Prepared by the
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 assists companies in estimating emissions from welding processes for EPA reporting purposes by choosing the simplest applicable method and following its steps. Example calculations are included.

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Foreword

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

This document originated with the AWS Safety and Health Subcommittee for Fumes and Gases, with assistance from manufacturers and users of welding equipment and consumables. It is intended as a guide that will assist companies in estimating emissions from welding processes for EPA reporting purposes. This is the second edition of this specification. Editorial changes were made to the Scope (Clause 1). A significant change in this edition is the addition of plasma arc cutting fume characterization and fume generation rate data. Substantive changes in text are indicated by a vertical margin line.

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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Guide for Estimating Welding Emissions for EPA and Ventilation Permit Reporting

1. Scope and General Provisions

1.1 Scope. This guide outlines four methods of estimating airborne emissions from the arc welding process. This document does not cover disposal of collected wastes from the welding process, including collected welding fume. Emissions from sources other than the welding consumable (such as zinc oxide from galvanized material) cannot be estimated based upon process or consumable data alone and should be addressed by onsite testing (see 3.3.4). These estimates do not consider gaseous emissions that may be present in welding such as ozone, carbon dioxide, argon, oxides of nitrogen, or other gases.

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.

1.2 Safety. Safety and health issues and concerns are beyond the scope of this standard and therefore are not addressed herein.

Safety and health information is available from the following sources:

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 supplied by materials manufacturers

(2) Operating Manuals supplied by equipment manufacturers

Applicable Regulatory Agencies

Work performed in accordance with this standard may involve the use of materials that have been deemed hazardous, and may involve operations or equipment that may cause injury or death. This standard does not purport to address all safety and health risks that may be encountered. The user of this standard should establish an appropriate safety program to address such risks as well as to meet applicable regulatory requirements. ANSI Z49.1 should be considered when developing the safety program.

2. Referenced Documents

(1) ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*

(2) *The Plain English Guide to the Clean Air Act*, EPA-456/K-07-001, April 2007.

3. Estimating Emissions

3.1 Considerations in Estimating Emissions. Welding fume particulates are essentially submicron in size and are considered to be in the PM-10 classification (particles less than or equal to 10 μm aerodynamic diameter size range, as defined in *The Plain English Guide to the Clean Air Act*, EPA-456/K-07-001, April 2007). Frequently, calculated total emissions from welding operations are below applicable reporting threshold values and therefore estimating the amount