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Guide for Estimating Welding Emissions for EPA and Ventilation Permit Reporting

American Welding Society

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Guide for Estimating Welding Emissions for EPA and Ventilation Permit Reporting

Prepared by
AWS Project Committee on Fumes and Gases

Under the Direction of
AWS Committee on Safety and Health

Approved by
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 a part of AWS F1.6:2003, *Guide for Estimating Welding Emissions for EPA and Ventilation Permit Reporting,* 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.

Comments and suggestions for the improvement of this standard are welcomed. They should be sent to the Secretary, AWS Safety and Health Committee, American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

Official interpretations of any of the technical requirements of this standard may be obtained by sending a request, in writing, to the Managing Director, Technical Services Division, American Welding Society. A formal reply will be issued after it has been reviewed by the appropriate personnel following established procedures.

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Guide for Estimating Welding Emissions for EPA and Ventilation Permit Reporting

1. Scope

This guide outlines 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 (Method 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 document does not discuss safety issues; for more information, see ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*. This standard makes use of the 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 or figures.

2. Referenced Documents

2.1 The following ANSI standard[1] is referenced in the mandatory section of this standard:

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

2.2 The following EPA document[2] is referenced in the mandatory section of this standard:

The Plain English Guide to the Clean Air Act, EPA-400-K-93-001, April 1993.

1. ANSI Z49.1 is published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.
2. This EPA publication is published by the U.S. Environmental Protection Agency National Service Center for Environmental Publications, P.O. Box 42419, Cincinnati, OH 45242, or may be viewed at the EPA Web site (http://www.epa.gov).

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-400-K-93-001, April 1993). Frequently, calculated total emissions from welding operations are below reporting threshold values and therefore estimating the amount of components of this total may not be required. Because of this, process-based estimates can be used for most reporting without significant impact on operations. Thus, useful estimates can be obtained without extensive research, calculations or testing.

The calculation for the process-based estimate is simple and straightforward. If a more precise estimate is desired, the other methods discussed in 3.3 offer alternatives. As each method increases in precision, so do the complexity, time and cost for estimation increase. It is best to start with the easiest method first and see if it meets the stated need.

Emissions from sources other than the welding consumable (such as zinc oxide fume from welding galvanized material) are not included in estimates from Methods 1, 2, or 3. Estimates for emissions from welding where individual constituents are required to be reported should start with Method 2 under 3.3.

3.1.1 Reporting Requirements for the Components of the Welding Fume. Estimating the amounts of the components of welding fume may not be necessary for reporting, even though the fume may contain materials listed as "Hazardous Air Pollutants" by the EPA (see 2.2). Refer to local regulations to determine the applicable threshold levels for total emissions or emissions of component materials. Though local regulations vary, if the calculated total emissions from the facility (welding and non-welding related) are less than the reporting threshold values, estimating the amount of the components of this total may not be required.