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Method for
Sampling Airborne Particulates
Generated by Welding and
Allied Processes

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Approved by
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Abstract

This document aids the reader in the proper technique for sampling welding fume in the workplace. Emphasis is placed on positioning the sampling device and calibration of the equipment.



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Method for Sampling Airborne Particulates Generated by Welding and Allied Processes

Scope

This standard prescribes a procedure for sampling fumes generated by welding and allied processes. Because it is limited to health hazard evaluation, the standard is primarily concerned with sampling at the worker's breathing zone (see 3.1). It also prescribes procedures for general area sampling of fumes. However, the sampling methods described by this standard apply only to the sampling of solid particulate matter. ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, should be referenced for safe practices to follow when performing welding operations.

1. Definitions

general area. Sampling zone located at an appropriate location within the operating work area but outside the welder's helmet. The general area sample is taken during the performance of normal working operations.

breathing zone. The area immediately adjacent to the welder's nose and mouth, inside the welder's helmet when worn, or within 9 in. (230 mm) of the welder's nose and mouth when a helmet is not worn.

welding fume. Airborne solid particulate matter generated by the welding process. Fume particles are usually submicron in size, and thus tend to remain airborne and drift with air currents.

weld zone. The localized area including the weld metal, heat-affected zone, and adjacent surfaces from which contaminants may be volatilized by the heat of welding to form welding fumes.

2. Referenced Documents

The following standards are referenced in the mandatory section of this document and may be obtained from the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

(1) ANSI/AWS F1.4, *Methods for Analysis of Airborne Particulates Generated by Welding and Allied Processes*

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

3. Summary of Methods

3.1 The breathing zone test is designed to measure the exposure of an individual welder to the welding fume generated by welding processes. When a helmet is worn, sampling is performed by drawing a measured volume of air through a filter assembly, and trapping the solid particulate matter on the filter. The filter cassette inlet is positioned inside the welding helmet at mouth level, approximately 2 in. (50 mm) to the right or left of the breathing zone centerline. If a helmet is not worn, the breathing zone sample is obtained by placing the filter cassette within 9 in. (230 mm) of the operator's nose.

3.2 The general area sampling test is designed to measure the concentration level of welding fumes and other particulate matter that may be present or generated from other sources in the environment. The general area sample is not indicative of personal exposure levels, but can provide information on contaminant background levels in the vicinity. Sampling is performed by drawing a measured volume of air through a filter cassette assembly positioned at a selected point of interest and trapping the solid particulate matter on the filter.