



Standard Practice for Personal Sampling and Analysis of Endotoxin in Metalworking Fluid Aerosols in Workplace Atmospheres¹

This standard is issued under the fixed designation E 2144; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers quantitative methods for the personal sampling and determination of bacterial endotoxin concentrations in poly-disperse metalworking fluid aerosols in workplace atmospheres. Users should have fundamental knowledge of microbiological techniques and endotoxin testing.

1.2 Users of this practice may obtain personal or area exposure data of endotoxin in metalworking fluid aerosols, either on a short-term or full-shift basis in workplace atmospheres.

1.3 This practice gives an estimate of the endotoxin concentration of the sampled atmosphere.

1.4 This practice seeks to minimize inter laboratory variation but does not ensure uniformity of results.

1.5 It is anticipated that this practice will facilitate inter laboratory comparisons of airborne endotoxin data from metalworking fluid atmospheres, particularly metal removal fluid atmospheres, by providing a basis for endotoxin sampling, extraction, and analytical methods.

1.6 In 1997, the Occupational Safety and Health Administration (OSHA) empanelled a Standards Advisory Committee to make recommendations to the Administration regarding measures that the Administration could take to improve the health of workers exposed to metalworking fluids. A report to the Assistant Secretary of Labor for OSHA was submitted in July, 1999. Subcommittee E34.50 believes that the user community would benefit significantly if a standard method was developed to give the community guidance on a methodology for the sampling and analysis of personal airborne endotoxin exposure assessments in facilities using water-miscible metal removal fluids, based on the LAL assay or other endotoxin detection technologies as they become available.

1.7 This practice does not attempt to set or imply limits for personal exposure to endotoxin in metalworking fluid aerosols in workplace environments.

1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the*

responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres²

D 4840 Guide for Sampling Chain-of-Custody Procedures³

D 5337 Practice for Flow Rate for Calibration of Personal Sampling Pumps²

D 6629 Test Method for Metal Removal Fluid Aerosol in Workplace Atmospheres²

E 1370 Guide for Air Sampling Strategies for Worker and Workplace Protection²

E 1497 Practice for Safe Use of Water-Miscible Metal Removal Fluids²

E 1542 Terminology Relating to Occupational Health and Safety²

2.2 OSHA Standards:⁴

29 CFR 1910.1000 Air Contaminants

29 CFR 1910.1450 Occupational Exposure to Hazardous Chemicals in Laboratories

2.3 Other Documents:

Criteria Document for a Recommended Standard: Occupational Exposure to Metalworking Fluids⁵

NIOSH Manual of Analytical Methods (NMAM)⁵

3. Terminology

3.1 For definitions of terms in this practice relating to sampling and analysis of atmospheres, refer to Terminology D 1356. For definitions of terms in this practice relating to occupational health and safety, refer to Terminology E 1542.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *endotoxins, n*—a lipopolysaccharide derived from the outer membrane of Gram-negative bacteria.

² Annual Book of ASTM Standards, Vol 11.03.

³ Annual Book of ASTM Standards, Vol 11.01.

⁴ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁵ Available from U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, 4676 Columbia Pkwy., Cincinnati, OH 45226.

¹ This practice is under the jurisdiction of ASTM Committee E34 on Occupational Health and Safety and is the direct responsibility of Subcommittee E34.50 on Health and Safety Standards for Metal Working Fluids.

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