



Standard Guide for Using Documents Related to Metalworking or Metal Removal Fluid Health and Safety¹

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1. Scope

1.1 This guide covers information on how to use documents related to health and safety of metalworking and metal removal fluids. As such, this guide will provide the user with sufficient background information to effectively use the documents listed in Section 2. Documents referenced in this guide are grouped as applicable to producers, to users or to all.

1.2 *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 requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 1302 Guide for Acute Animal Toxicity Testing of Water-

Miscible Metalworking Fluids²

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

E 1687 Test Method for Determining Carcinogenic Potential of Virgin Base Oils in Metalworking Fluids²

E 1972 Practice for Minimizing Effects of Aerosols in Wet Metal Removal Environment²

PS 42 Method for Metal Removal Aerosol in Workplace Atmospheres³

PS 94 Practice for Personal Sampling and Analysis of Endotoxin in Metal Removal Fluid Aerosols in Workplace Atmospheres²

2.2 Other Documents:

Management of the Metal Removal Fluid Environment: A Guide to Safe and Efficient Use of Metal Removal Fluids⁴

Criteria for a Recommended Standard: Occupational Exposure to Metalworking Fluids⁵

¹ This guide 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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² *Annual Book of ASTM Standards*, Vol 11.03.

³ Discontinued, see 1998 *Annual Book of ASTM Standards*, Vol 11.03.

⁴ Available from Organization Resources Counselors, Inc., 1910 Sunderland Place, NW, Washington DC 20036 or at <http://www.orc-dc.com>

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, Cincinnati, OH 45226.

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

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

3.1.2 *metal removal fluids, n*—the subset of metalworking fluids that are used for wet machining or grinding to produce the finished part.

3.1.2.1 *Discussion*—Metal removal fluids addressed by this practice include straight or neat oils, not intended for further dilution with water, and water-miscible soluble oils, semisynthetics, and synthetics, which are intended to be diluted with water before use. Metal removal fluids become contaminated during use in the workplace with a variety of workplace substances including, but not limited to, abrasive particles, tramp oils, cleaners, dirt, metal fines and shavings, dissolved metal and hard water salts, bacteria, fungi, microbiological decay products, and waste. These contaminants can cause changes in the lubricity and cooling ability of the metal removal fluid as well as have the potential to adversely affect the health and welfare of employees in contact with the contaminated metal removal fluid.

3.1.3 *mutagenicity index, n*—the slope of the dose response curve for mutagenicity in the modified Ames test described in Test Method E 1687.

4. Significance and Use

4.1 Application of this guide will provide users with information on how to use the various documents listed in Section 2 related to health and safety of metalworking and metal removal fluids.

4.2 Users of the documents listed in Section 2 may fall into several categories, such as producers of metalworking or metal removal fluids, suppliers of raw materials to those producers, users of metalworking or metal removal fluids, and other interested parties, such as non governmental organizations.

4.3 While all parties may wish to be generally familiar with all the documents listed in Section 2, producers and users may each want to focus on certain documents which are directly applicable to them:

4.4 Documents Applicable to Producers:

4.4.1 *E 1687 Test Method for Determining Carcinogenic Potential of Virgin Base Oils in Metalworking Fluids*

4.4.1.1 This test method covers a microbiological test procedure based upon the *Salmonella* mutagenesis assay of Ames