

Great Lakes Phosphorus Issue



Overview

- ▶ Increasing levels of phosphorus into the western basin of Lake Erie has led to significant algae blooms in mid to late summer for the past 15 years
- ▶ A biological component of these algae blooms are cyanobacteria. Cyanobacteria are also known as blue-green algae, and are a family of single-celled algae.
- ▶ The most severe impact of these algae blooms occurred when the city of Toledo Ohio shut down their drinking water system for three days in 2014 due to the presence of cyanobacteria above safe levels

Phosphorus

- ▶ Most available forms of Phosphorus are from agricultural run off from fertilizer and animal feeding units and not from industrial sources.
- ▶ Key word here is available. Also known as dissolved reactive phosphorus. DRP
- ▶ Agricultural guidelines for fertilizer application are in place but are not enforced.
- ▶ Agricultural sources are generally “non-point” and therefore difficult to regulate

Phosphorus

- ▶ US EPA and Canada EPA have agreed to reduce the phosphorus level into the western basin of Lake Erie by 40% by 2025
- ▶ On July 11, 2018 Ohio Governor John Kasich took matters into his own hands with an executive order regarding agricultural pollution feeding Lake Erie's chronic toxic algae problem.
- ▶ In February 15 2019, newly elected Governor Mike DeWine vowed to follow the lead of his predecessor in protecting the water quality of Lake Erie.
- ▶ On March 28 2019, President Donald Trump announced that he will allocate \$300,000,000 for the Great Lakes Restoration Initiative

Why Worry

- ▶ Phosphorus is used in many industrial sources, specifically as an extreme pressure additive in certain metalworking fluids. There are only 4 extreme pressure additives. They are:
 - ▶ Phosphorus, Chlorine, Sulfur and Overbased Calcium Sulfonates
- ▶ Nitrogen can contribute to algae growth and has been mentioned in discussion along with phosphorus
 - ▶ Nitrogen is present in many metalworking fluid formulations, such as alkanolamines.
- ▶ This phosphorus issue is not going away, and indeed has become more visible since the last ILMA meeting in October 2018.

Why Worry

- ▶ Mar 1, 2019 - Toledo, Ohio just granted Lake Erie the same legal rights as people . **A controversial referendum passed this week establishes a bill of rights for the Great Lake and grants it legal standing in suing polluters**
- ▶ Jeff Leiter will comment further on this subject.

Why Worry?

- ▶ Toledo residents recently passed charter amendment, granting Lake Erie the same rights as a “person” (humans and corporations)
 - ▶ Justice William O. Douglas’ dissent in *Sierra Club v. Morton* (1972)
 - ▶ “Should trees have standing”?
- ▶ Residents act as “guardians” that can take legal action against entities that violate the Lake’s rights to “flourish and naturally evolve” without interference
- ▶ Modeled on “rights of nature” laws passed by Tamaqua, PA; Lafayette, CO; Ponca Nation of Oklahoma; Chippewa Nation of Minnesota; and, some countries

Why Worry?

- ▶ Frustrated with algae blooms in Lake Erie
- ▶ Targeting phosphorus from agricultural fertilizer runoff and industrial discharges
- ▶ Court challenges already filed on constitutionality arguments
 - ▶ Equal protection and freedom of speech
 - ▶ Violates Ohio state law because Toledo, as a local government, cannot override the governing structure of Lake Erie

MWF Committee: ASTM E1868-10(2015)

- ▶ Importance: integral to SCAQMD Rule 1144 (<https://www.arb.ca.gov/DRDB/SC/CURHTML/R1144.PDF>)
- ▶ ASTM procedures require review of every standard at least once every five years
- ▶ Discussion

This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.



Designation: E1868 – 10 (Reapproved 2015)

Standard Test Methods for Loss-On-Drying by Thermogravimetry¹

This standard is issued under the fixed designation E1868; 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 These test methods describe a procedure for determining the amount of volatile matter of any kind that is driven off from a test specimen under a specific set of temperature and time conditions. These test methods determine only the mass of material lost, not its identity.

1.2 These test methods are applicable to a wide variety of solid or liquid materials, mixtures, or blends where the major component is stable at the test temperature.

NOTE 1—These test methods can be applied to the analysis of volatile organic compounds (VOC) content in metalworking fluids and direct contact lubricants subject to South Coast Air Quality Management District (SCAQMD) Rule 1144.

(Moisture) Content of Soil and Rock by Mass
D2288 Test Method for Weight Loss of Plasticizers on Heating (Withdrawn 2010)³
D2595 Test Method for Evaporation Loss of Lubricating Greases Over Wide-Temperature Range
D2832 Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings
D3175 Test Method for Volatile Matter in the Analysis Sample of Coal and Coke
D4017 Test Method for Water in Paints and Paint Materials by Karl Fischer Method
D4893 Test Method for Determination of Pitch Volatility
E177 Practice for Use of the Terms Precision and Bias in

MWF - MWF Performance Standards

- ▶ Importance: while some guidelines for MWF management exist, no performance standards exist. Should there be a new effort?
- ▶ Existing guidelines:
 - ▶ ILMA/OSHA: Best Practices: https://www.osha.gov/SLTC/metalworkingfluids/metalworkingfluids_manual.html
 - ▶ UKLA: Good Practice Guide: <http://www.ukla.org.uk/wp-content/uploads/UKLA-HSE-Good-Practice-Guide-for-Safe-Handling-and-Disposal-of-Metalworking-Fluids.pdf>
 - ▶ STLE White Paper: Development of Guidelines for Using and Maintaining MWFs: https://www.stle.org/ItemDetail?iProductCode=WP_METALWORKING&Category=HITEPAPER&WebsiteKey=a70334df-8659-42fd-a3bd-be406b5b83e5
- ▶ Discussion: is this a role for ILMA? ASTM?

MWF: ASTM E34.50 MWF Health & Safety Standards

- ▶ Importance: E34.50 oversees 12 existing MWF H&S standards
- ▶ Issue: retirements have resulted in less industry participation in shepherding standards developed over last 35 years

MWF: ASTM E34.50 MWF Health & Safety Standards

▶ Standards:

- ▶ **E1302-13(2017) Standard Guide for Acute Animal Toxicity Testing of Water-Miscible Metalworking Fluids**
- ▶ **E1497-17 Standard Practice for Selection and Safe Use of Water-Miscible and Straight Oil Metal Removal Fluids**
- ▶ **E1687-10(2014) Standard Test Method for Determining Carcinogenic Potential of Virgin Base Oils in Metalworking Fluids**

MWF: ASTM E34.50 MWF Health & Safety Standards

▶ Standards (continued):

- ▶ **E2144-11(2016) Standard Practice for Personal Sampling and Analysis of Endotoxin in Metalworking Fluid Aerosols in Workplace Atmospheres**
- ▶ **E2148-16 Standard Guide for Using Documents Related to Metalworking or Metal Removal Fluid Health and Safety**
- ▶ **E2169-17 Standard Practice for Selecting Antimicrobial Pesticides for Use in Water-Miscible Metalworking Fluids**

MWF: ASTM E34.50 MWF Health & Safety Standards

- ▶ Standards (continued):
 - ▶ **E2523-13(2018) Standard Terminology for Metalworking Fluids and Operations**
 - ▶ **E2564-18 Standard Practice for Enumeration of Mycobacteria in Metalworking Fluids by Direct Microscopic Counting (DMC) Method**
 - ▶ **E2657-16 Standard Practice for Determination of Endotoxin Concentrations in Water-Miscible Metalworking Fluids**

MWF: ASTM E34.50 MWF Health & Safety Standards

- ▶ Standards (continued):
 - ▶ **E2693-14 Standard Practice for Prevention of Dermatitis in the Wet Metal Removal Fluid Environment**
 - ▶ **E2694-16 Standard Test Method for Measurement of Adenosine Triphosphate in Water-Miscible Metalworking Fluids**
 - ▶ **E2889-12(2017) Standard Practice for Control of Respiratory Hazards in the Metal Removal Fluid Environment**

MWF: ASTM E34.50 MWF Health & Safety Standards

▶ Two live/WebEx meetings/year:

- ▶ STLE Annual Meeting, 05/23/19, 10:00-Noon
- ▶ ASTM Committee Week, 10/21/19, Marriott Marquis, Houston, TX

- ▶ Contact: Fred Passman, Chair E34 & E34.50, passcapt@live.com or visit www.astm.org

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Designation: E1497 – 17

An American National Standard

Standard Practice for Selection and Safe Use of Water-Miscible and Straight Oil Metal Removal Fluids¹

This standard is issued under the fixed designation E1497; 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 sets forth guidelines for the selection and safe use of metal removal fluids, additives, and antimicrobials. This includes product selection, storage, dispensing, and maintenance.

1.2 Water-miscible metal removal fluids are typically used at high dilution, and dilution rates vary widely. Additionally, there is potential for exposure to undiluted metal removal fluid as manufactured, as well as metal removal fluid additives and antimicrobials.

1.3 Straight oils generally consist of a severely solvent-refined or hydro-treated petroleum oil, a synthetic oil, or other

2. Referenced Documents

- 2.1 *ASTM Standards*:²
 - D7049 Test Method for Metal Removal Fluid Aerosol in Workplace Atmospheres
 - E1302 Guide for Acute Animal Toxicity Testing of Water-Miscible Metalworking Fluids
 - E1542 Terminology Relating to Occupational Health and Safety
 - E1972 Practice for Minimizing Effects of Aerosols in the Wet Metal Removal Environment (Withdrawn 2017)³
 - E2144 Practice for Personal Sampling and Analysis of Endotoxin in Metalworking Fluid Aerosols in Workplace Atmospheres

MWF: ASTM E34.50 MWF Health & Safety Standards

- ▶ **Discussion: can ILMA Manufacturing Members who formulate and market MWFs participate in ASTM E34.50?**

MWF: CA OEHHA - Cobalt Leaching

- ▶ Cobalt & cobalt compounds:
Public Comment Period and Workshops on the Draft Hot Spots Cancer Inhalation Unit Risk Factors for Cobalt and Cobalt Compound
- ▶ Comment period closes 4/22/19. Should we comment?


OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT

Air Toxics Hot Spots Program

**Cobalt and Cobalt Compounds
Cancer Inhalation Unit Risk Factors**

Technical Support Document for
Cancer Potency Factors
Appendix B
Public Comment Draft
March 2019

Air, Community, and Environmental Research Branch
Office of Environmental Health Hazard Assessment
California Environmental Protection Agency



TSCA Enforcement – Chemours

First Notice of Violation (NOV) under TSCA

- NOV: Non-judicial action that:
 - Notifies of alleged violations
 - Requests information to verify
 - Asks for compliance plan
- Not normally the first interaction regarding violations

Chemours' NOV

- Two chemicals of note: GenX and HFPO
- Citations:
 - failure to submit Pre-Manufacture Notice
 - No SNUNs
 - Insufficient control of GenX release
 - Failure to report HFPO and GenX production
- Information request on safety of GenX and HFPO

Future Enforcement

- More NOV's for PFAS?
- EPA has a history with Chemours/DuPont
- Attempt to get information on GenX safety

Questions & Discussion