

Massachusetts Department of Environmental Protection Toxics Use Reduction Program

Guidance on Reporting Formaldehyde as Higher Hazard Substances and Quantifying their Use in Combustion Operations under the Toxics Use Reduction Act

There are changes to the requirements for submitting Formaldehyde under Massachusetts Department of Environmental Protection (MassDEP) Toxics Use Reduction (TURA) Form S reports due on July 1, 2013 covering reporting year 2012. This document explains the new reporting requirements and mechanics and provides guidance on determining if combustion activities at your facility are likely to trip the reporting thresholds.

1. Higher Hazard Designation

As of reporting year 2012 formaldehyde has been designated as a higher hazard substance with the following implications for reporting.

REPORTING THRESHOLD REDUCED TO 1000 POUNDS

Designation as a higher hazard substance lowers the reporting threshold from the current threshold of 25,000 pounds if the substance is manufactured or processed or 10,000 pounds if the substance is otherwise used to 1000 pounds. A Form S report is required for each higher hazard substance manufactured OR processed OR otherwise used at 1000 or more pounds in a calendar year. Note that these three types of use are NOT additive for the purposes of determining whether the threshold has been exceeded. For example, a facility that manufactured 700 pounds and otherwise used 350 pounds of formaldehyde would not be required to submit a Form S report on the substance, since neither type of use exceeded 1000 pounds.

STATE ONLY FORM R_s ARE REQUIRED FOR FORMALDEYDE

Designation as a higher hazard substance changes the mechanics of reporting Form R information to the MassDEP Toxics Use Reduction Program and to Environmental Protection Agency (EPA) Toxics Release Inventory (TRI). The TURA system will automatically generate State Only Form R_s for all substances for which the TURA reporting threshold is lower than the EPA Toxics Release Inventory threshold, and for all substances which have different “qualifiers” under the TURA and TRI systems. Therefore facilities will need to:

- Complete the “State Only Form R” for formaldehyde
- Submit a separate Form R to the EPA TRI program

2. What are Common Synonyms for formaldehyde

Formaldehyde (CAS#50-00-0) has several synonyms, including:

Formalin
Formol
Methylene Glycol
Methyl Aldehyde

Methylene Oxide

3. How Is Formaldehyde Commonly Used?

Formaldehyde is primarily used in the manufacture of wood adhesives applied to plywood, particleboard and other manufactured wood products, and in formaldehyde-based resins.¹ Other significant uses of formaldehyde include the manufacture of other chemicals, plastics and coatings, embalming and fertilizers.

Formaldehyde is generated in processes that use paraformaldehyde (CAS# 30525-89-4), formalin, or trioxane.

Formaldehyde may be coincidentally manufactured during the combustion of fuel.

4. Quantifying Formaldehyde Use in Combustion

Formaldehyde use occurs in combustion processes. In general, the quantities formaldehyde manufactured, processed, or otherwise used at a facility during combustion will be dependent on a number of factors, including the type of fuel combusted (coal, oil, gas), the type of combustor, and combustion conditions (e.g., temperature, air/fuel ratio).

Note that the information that follows is provided for general guidance – facilities are required to use the best readily available data applicable to their operations for threshold determinations.

MANUFACTURING:

Based on the EPA's AP-42 emission factors, 1000 or more pounds of formaldehyde is likely to coincidentally manufactured if annual fuel consumption is equal to or greater than the amounts listed below:

- Coal – 4.2 million tons
- No. 6 fuel oil – 30.3 million gallons
- No. 2 fuel oil – 16.4 million gallons
- Natural gas – 6,450 million ft³

Additional data sources on the coincidental manufacture of formaldehyde during combustion can be found in the references cited at the end of this document.

OTHERWISE USE

A substance is “otherwise used” in a production process if it is neither manufactured nor incorporated into the final product. Therefore any contaminants contained in fuel are considered “otherwise used” in the combustion process. The *de minimis* concentration applies to materials that are otherwise used. Materials below the *de minimis* concentrations (0.1 % for formaldehyde) do not need to be counted toward the 1000 pound “otherwise use” threshold. However the entire quantity of substances that are present in concentrations above the *de minimis* level must be counted toward the 1000 pound “otherwise use” threshold

¹ Massachusetts Toxics Use Reduction Institute, Five Chemicals Alternatives Assessment Study: Chapter 4 – *Formaldehyde*. Available at http://www.turi.org/library/turi_publications/five_chemicals_study

- **Formaldehyde** is not likely to be present in fuels or ash above the *de minimis* level

REFERENCES FOR QUANTIFYING FORMALDEHYDE EMISSIONS FROM THE COMBUSTION OF FUEL

It is the responsibility of each facility to determine the best readily available data applicable to their operations. The methods and sources of data for quantifying formaldehyde use include, but are not limited to, the following –

1. Fuel-specific data for the fuels combusted (e.g., obtained from supplier).
2. Facility-specific monitoring data and/or emission factors.
3. For EPRI members – the PISCES database (provides emission factors and models to calculate air emissions), and Toxics Release Inventory for Power Plants (TRIPP) software.
4. EPA's *EPCRA Section 313 Industry Guidance – Electricity Generating Facilities*.
5. EPA emission factors from EPA's *Compilation of Air Pollutant Emission Factors (AP-42)*, 5th ed. - *Chapter 1, External Combustion Sources*. These factors are based on a limited number of samples and may not reflect more accurate information available to the facility for the particular type of fuel combusted and pollution control devices used.