

Instructions: VOC/HAP Emissions Calculation Spreadsheet

The *VOC/HAP Emissions Calculation Spreadsheet* is intended as guidance only and may be impacted by changes in legislation, rules, and regulations adopted after the date of publication. The Michigan Department of Environmental Quality (DEQ) does not require that this specific spreadsheet be used; it is only provided as an example and may be modified to fit your needs. If any changes are made to imbedded formulas within the worksheets, the DEQ is not responsible for the altered spreadsheet. Although the spreadsheet makes every effort to assist users in meeting their recordkeeping compliance obligations, use of this spreadsheet does not constitute the rendering of legal advice.

Introduction

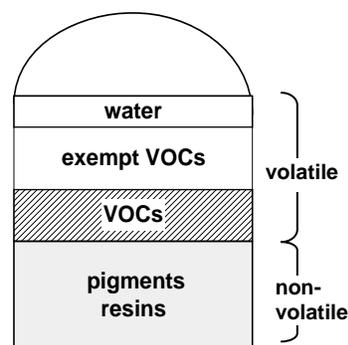
This guidance provides directions for the *VOC/HAP Emissions Calculation Spreadsheet*, which can be used to calculate VOC and HAP emissions from paints, solvents, and other evaporative loss products. The spreadsheet is specifically geared towards smaller companies who need help with recordkeeping to demonstrate compliance with their general permit or exemption. It can be difficult for facilities that use paints, solvents or other evaporative loss products to track air emissions because facilities often use a number of products, and each product usually contains several pollutants. Spreadsheets can be used as a tool to help track product usage and calculate monthly air contaminant emissions.

This spreadsheet is an Excel document and can be downloaded from the Michigan Department of Environmental Quality [Air Quality Division's](http://www.michigan.gov/deqair) (AQD) website. Go to www.michigan.gov/deqair, select "Clean Air Assistance" and scroll down to "Surface Coating Operations."

Coatings are made up of four components:

- resins/binders
- pigments
- additives
- solvents/diluents/thinners

The resins/binders, pigments, and additives are considered the solids, or non-volatile portion of the coating. The solvents/diluents/thinners, which could consist of water, volatile organic compounds (VOCs) and exempt organic solvents, are considered the volatile portion of the coating.



Volatile organic compounds contribute to the formation of ground level ozone, an air contaminant that triggers a variety of health problems including aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis. Rule 122(f) of the Michigan Air Pollution Control Rules defines a VOC as "any compound of carbon or mixture of compounds of carbon excluding 29 compounds that U.S. Environmental Protection Agency (EPA) identified to have negligible photochemical reactivity". Some of the 29 compounds are referred to as **exempt organic solvents** such as acetone and methyl chloroform. For a copy of Rule 122(f), go to www.michigan.gov/deqair, select "Laws and Rules" and then "Air Pollution Control Rules". Select "Part 1 General Provisions", and scroll down to R 336.1122 Definitions; V.

Hazardous air pollutants (HAPs) are those pollutants that are known or suspected to cause cancer and/or other serious health effects, such as reproductive effects, birth defects, or adverse environmental effects. The U.S. EPA has identified 187 compounds as HAPs. Examples of HAPs include benzene, which is found in gasoline; perchlorethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. To view the complete list of HAPs, go to www.epa.gov/ttn/atw/188polls.html.

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Some of the volatiles in a coating may fall under the definition of both a VOC and a HAP. For example, benzene, perchlorethylene, methylene chloride, and formaldehyde are both VOCs and HAPs.

Getting Started

Overview of Spreadsheet

The spreadsheet consists of four sections:

- I. Product Information
- II. Daily Information
- III. Monthly Totals
- IV. Twelve Month Rolling Totals

Complete one spreadsheet for every coating line(s) or emission unit (EU) in your facility. If your facility has more than one EU, then save each spreadsheet under a different EU name (EU 1, EU 2, etc.).

NOTE: When you open the spreadsheet, you may get a message box asking you to enable/disable macros. Please click "enable macros." Go up to your top menu and click on "Tools," "Macro," and then "Security." You will need to change your security level to medium and then press OK. You will now be able to run the spreadsheet.

There are many formulas imbedded into the worksheets to calculate the daily and monthly totals, and for calculating the VOC and HAP emissions. These formulas are protected so they cannot be altered by users.

Information Needed

The following information is needed to calculate VOC and HAP emissions from coatings, thinners and solvents used for cleanup.

1. The monthly usage of the products in gallons.
2. *Environmental data from the Material Safety Data Sheet (MSDS) Physical Properties section, Certified Product Data Sheet (CPDS), Environmental Data Sheet (EDS), or lab data that contains:
 - a. The density (pounds of coating/gallon of coating) or the specific gravity of the product;
 - b. The total VOC content (pounds of VOC/gallon) of the product;
 - c. The names and percent by weight of each HAP in the product.

For guidance on how to read data sheets, as well as examples, please see **Attachment A**.

***ATTENTION**

June, 2007 - AQD is currently reviewing the rules and methods for determining VOC content of a coating. Federal reference method 24 or an alternate method approved by AQD should be used. However, if your permit currently states that you can use VOC content data from the MSDS, CPDS, or EDS, and you are not using federal reference method 24, then continue with your current practices.

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I. Product Information

To add a product to the spreadsheet, go to the **Product Info Tab** and click on the “Add New Product” button. This will take you to the **Product Information Form** where you can enter the following data:

Data Entry

1. Product number, name, and type (make sure to include thinners). If purge and cleanup solvent is used, go to the **Monthly Totals Tab** and follow those instructions.
2. Density of the product in pounds per gallon, or, if density is not provided, enter the specific gravity into the appropriate field and it will automatically be multiplied by 8.34 pounds per gallon (density of water) to calculate the density of the product.

NOTE: If you enter both the density of the product and the specific gravity, the user-entered density number will override the calculation based on specific gravity.

Product Info ✕

Product Information Form

Product Identification

Product Number	Product Name	Product Type ▼
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Product Information

Specific Gravity OR **Density**

VOC Information

Lbs VOC/Gal (Minus Water/Exempt Solvent)	AND	Lbs VOC/Gal (With Water/Exempt Solvents)
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HAP Information

HAP Name	Percent (%) by Weight	HAP Name	Percent (%) by Weight
☐ ▼		☐ ▼	
☐ ▼		☐ ▼	
☐ ▼		☐ ▼	
☐ ▼		☐ ▼	
☐ ▼		☐ ▼	
☐ ▼		☐ ▼	

3. Total pounds of VOC per gallon (minus water and exempt solvents) of product AND total pounds VOC per gallon (plus water and exempt solvents) of product (also found on data sheet “as packaged” or “actual VOC content”). If the two values are different, the VOC content with water and exempts should be the lower value. If you need assistance finding these numbers from the data sheet, contact your supplier or the DEQ Environmental Assistance Program at 1-800-662-9278.
4. Name and percentage of each individual HAP in the product. There is a drop down HAPs menu in the form. The first 20 HAPs listed are the most prevalent in coating products. After the first 20, the other HAPs are listed in alphabetical order. For percent by weight, if a range is given, you must use the highest value to calculate your emissions.

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Once you have all of your information entered, click on the “*Add Product*” button. This will enter the data into the spreadsheet. Complete the **Product Information Form** for each product used at the coating line(s)/emission unit.

The best way to make a revision to product information is to go to the **Product Info Worksheet**, go to the row where the product is listed, and make necessary changes to user-entered data. To delete a product, go to the **Product Info Worksheet**, go to the row where the product is listed, and delete all user-entered data from the cells in that row. The next time you enter new product info into the **Product Information Form**, the information will transfer to this row, replacing the information that you deleted.

II. Daily Information

There are 12 daily information worksheets: one worksheet for each month of the year. The data from the **Product Information Tab** will transfer to each **Daily Info Tab**. If you add new products during the year, go to the **Product Information Tab**, click on the “*Add New Product*” button and complete a **Product Information Form**.

Data Entry

Go to the **Daily Info Tab** for the reporting month, and enter the amount (in gallons) of *product applied* each day.

The VOC and HAP emissions will automatically calculate, and the data will transfer to the **Monthly Totals** and **12 Month Rolling Worksheets**. The following formula for calculating VOCs is already entered into this worksheet.

Pounds of VOC emitted/month = Amount Used (gal of product/month) x VOC content of product (lbs VOC (plus water and exempt solvents)/gal of product)

The same calculation will be performed for the HAP emissions. The totals are displayed at the bottom of each column for each pollutant.

III. Monthly Totals

The data from the **Daily Information Worksheets** will automatically tabulate into the **Monthly Totals Worksheet**. The following are the only two situations where you would need to enter data into the **Monthly Totals Worksheet**.

1. Control Device:

Data Entry

If you have a control device for the emission unit, click on the “*Specify Control Device*” button which will open the **User Entry Form**. Within this form, click “yes” for control device, and then enter the control device’s percent capture efficiency and destruction efficiency (be sure to enter data as whole numbers and not decimals--e.g. for 80%, enter 80 instead of .80).

NOTE: Control efficiencies may be listed on the equipment, in the equipment documentation, or by contacting the equipment supplier.

Then click “Submit Data” to enter control device information. The actual emissions after control will automatically calculate.

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2. Purge and Clean-up Solvents:

**Data
Entry**

Emissions from purge and clean-up solvents (spray gun washers, rags, etc.) must also be considered in air emission calculations. For each purge and clean-up solvent, enter the amount (in gallons) of solvent used for the month, the solvent density, and the amount of solvent disposed for the month directly in the appropriate row for each month. If the density is not provided, multiply the specific gravity by 8.34 pounds per gallon (density of water), and enter that number into the density field. The total VOC emissions will automatically calculate. For each HAP, enter the individual HAP name and percentage by weight. The pounds of HAPs/gallon and HAP emissions will automatically calculate.

IV. 12-Month Rolling Totals

This worksheet displays the 12 consecutive calendar month (rolling) totals for VOCs and HAPs. The totals for each month are referenced from the **Product Info Worksheet** and the **Monthly Totals Worksheet**. Rolling totals are the sum of the previous consecutive 12-month period. For example, a rolling total would be the sum of emissions from January through December or July through June of the next year and so on. Therefore, a true 12-month rolling total cannot be calculated until you have entered 12 months of actual data.

If you just started using this spreadsheet but still want a true 12-month rolling total, you can enter the previous year's data (from your sources) in rows 8-19, depending on your starting month. Otherwise, wait to enter 12 months of data to get a true 12-month rolling total.

If you have purge and clean-up solvent emissions data in the **Monthly Totals Worksheet**, the VOC and HAP emission numbers will automatically transfer to the **12 Month Rolling Worksheet**.

Other Information

Recordkeeping Requirements

Once you have entered 12 months of data into the spreadsheet, you will have the usage and emissions information required for recordkeeping. You should complete one spreadsheet for every coating line(s)/EU in your facility. If your facility has more than one EU, save each spreadsheet under separate EU names (EU 1, EU 2, etc.). To get total emission numbers from all EUs in your facility, add the totals from all EU spreadsheets together.

NOTE: Some permits require additional recordkeeping information that is too complex to include in one spreadsheet.

Emission records are required to be maintained on file for the most recent five-year period and made available to the AQD upon request.

Transition to New Reporting Year(s)

To start off a new year of recordkeeping, follow these steps:

1. Copy, paste, and re-name the spreadsheet(s) for the new year.
2. Go to all twelve **Daily Info Tabs** and delete usage data in those worksheets.
3. If you no longer use a certain product, go to the **Product Info Tab** and delete the information for the product(s) no longer in use.
4. If you entered data into the **Monthly Totals Worksheet** for purge and clean-up solvent emissions, delete that data (and HAP name(s) if necessary).

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5. On the **12-Month Rolling Tab**, update the dates in column B, rows 8-31 with the new year in the dates. The rest of the dates in the worksheet will automatically update.
6. To get true 12-month rolling totals for the new year, copy the previous year's data from the **12-Month Rolling Worksheet** and Paste Special (value) into the new spreadsheet's **12-Month Rolling Worksheet** rows that are shaded grey.

Your revised spreadsheet is now ready to be used for the new reporting year.

Where to Go For Help

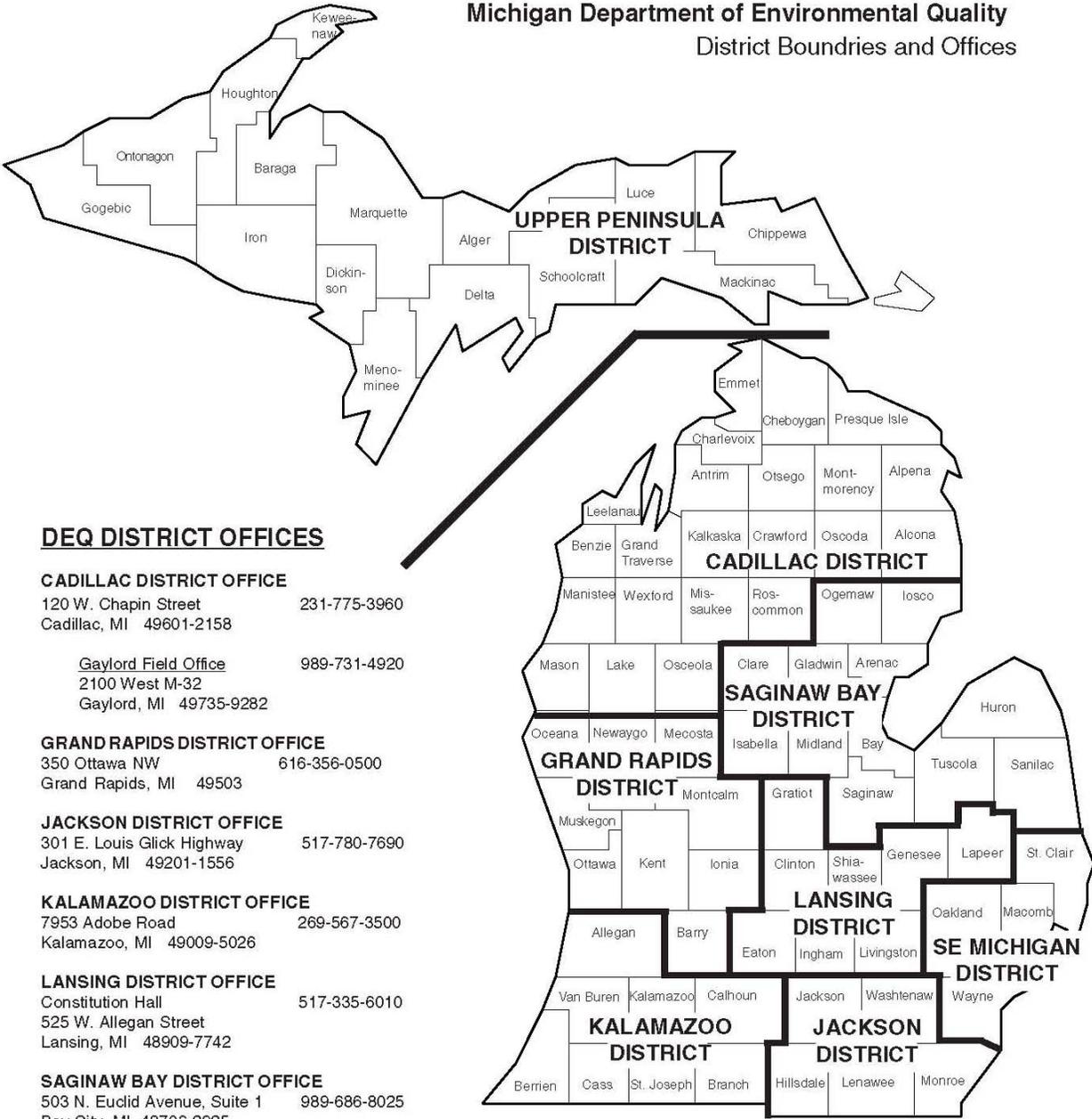
Environmental Assistance Program (EAP):

The EAP can help companies understand and comply with federal and state regulations that protect our air, water, and land. If you need help completing the *VOC/HAP Emissions Calculation Spreadsheet* or have air permitting questions, please contact the EAP at:

Michigan Department of Environmental Quality
Environmental Assistance Program
P.O. Box 30457
Lansing, Michigan 48909-7957
1-800-662-9278
www.michigan.gov/deqair, click on "Clean Air Assistance"

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Michigan Department of Environmental Quality District Boundries and Offices



DEQ DISTRICT OFFICES

CADILLAC DISTRICT OFFICE

120 W. Chapin Street 231-775-3960
Cadillac, MI 49601-2158

Gaylord Field Office 989-731-4920
2100 West M-32
Gaylord, MI 49735-9282

GRAND RAPIDS DISTRICT OFFICE

350 Ottawa NW 616-356-0500
Grand Rapids, MI 49503

JACKSON DISTRICT OFFICE

301 E. Louis Glick Highway 517-780-7690
Jackson, MI 49201-1556

KALAMAZOO DISTRICT OFFICE

7953 Adobe Road 269-567-3500
Kalamazoo, MI 49009-5026

LANSING DISTRICT OFFICE

Constitution Hall 517-335-6010
525 W. Allegan Street
Lansing, MI 48909-7742

SAGINAW BAY DISTRICT OFFICE

503 N. Euclid Avenue, Suite 1 989-686-8025
Bay City, MI 48706-2925

SOUTHEAST MICHIGAN DISTRICT OFFICE

27700 Donald Court 586-753-3700
Warren, MI 48092-2793

Detroit Field Office 313-456-4700
Cadillac Place
3058 West Grand Boulevard, Suite 2-300
Detroit, MI 48202-6058

UPPER PENINSULA DISTRICT OFFICE

420 5th Street 906-346-8300
Gwinn, MI 49841

ENVIRONMENTAL ASSISTANCE CENTER

(for general information):

Telephone: 800-662-9278

Fax: 517-241-0673

POLLUTION EMERGENCIES

Telephone: 800-292-4706

DEQ WEB PAGE

www.michigan.gov/deq