



NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY

ENVIRONMENTAL GUIDANCE DOCUMENT

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VOC & HAP Emission Calculations For Paints, Solvents, and Other Evaporative Loss Products

Volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions are calculated to demonstrate compliance with an air quality permit or to report actual emissions in an annual emission inventory. 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 evaporative loss materials and there are usually several pollutants in each material. Spreadsheets can help to make calculating monthly emissions less burdensome and may also facilitate demonstrating compliance with permit limits during an inspection.

This guidance document provides directions for the VOC/HAP Air Emission Calculation Spreadsheet that may be used to calculate emissions from paints, solvents, and other evaporative loss products. This spreadsheet is an Excel document and can be downloaded from the Nebraska Department of Environmental Quality (NDEQ) website at www.deq.state.ne.us in the Air Quality Program Publications section. It can also be obtained by contacting the Air Quality Division at (402) 471-2189. The Air Quality Division does not require that this specific spreadsheet be used; it is only provided as an example and may be modified to fit your needs. **This spreadsheet does not include emission calculations for facilities utilizing composite resins and gel coats.**

The following information is needed to calculate VOC and HAP emissions from paints, solvents, and other evaporative loss products.

1. The monthly usage of the product in gallons.
2. The Material Safety Data Sheet (MSDS), Certified Product Data Sheet (CPDS), lab data, or other similar environmental data which contains:
 - a. The VOC and HAP contained in the product;
 - b. The weight percent of each VOC and HAP in the product (sometimes the total VOC content is listed in pounds/gallon of the product and can also be used to calculate your emissions); and
 - c. The density or specific gravity of the product.

VOC/HAP AIR EMISSION CALCULATION SPREADSHEET

This spreadsheet contains five worksheets. One worksheet lists the materials used by the facility and the material constituents. There are three worksheets representing three months of material usage and emission calculations. A worksheet has also been included for the monthly and twelve consecutive calendar month (rolling) totals.

Material Worksheet

You will enter into the spreadsheet all of the evaporative loss materials and their constituents. For each material, provide:

1. Material name or description;
2. Density of the product in pounds per gallon. If density is not provided, multiply the specific gravity by 8.34 pounds per gallon;
3. Percentage of VOC in the product. If the VOC content is given in pound/gallon of material, divide the pound/gallon of VOC by the density of the product to get the percentage of VOC in the product.
 - a. Make sure all of the VOCs in the product are accounted for.
 - b. If the total VOC content for the product is not listed, add up all of the percentages of constituents that are VOCs, including VOCs that are also HAPs.

- c. For a listing of HAPs that are also VOCs, see the “Hazardous Air Pollutant List” on NDEQ’s website; and
4. Percentage of each individual HAP in the product. If a range is given, you must use the highest value to calculate your emissions. Only a few examples of HAPs are listed on the spreadsheet, you will need to remove those on the spreadsheet that aren’t in your products and add HAPs that are not already listed on the spreadsheet.

Supply the information in 1-4 for each material used at the facility.

Monthly Worksheets

If you use this spreadsheet, create a new worksheet for each month. Or if you prefer, you can include each month on one worksheet. If one worksheet is used for multiple months, clearly identify a section for each month and label it appropriately.

The following formula for calculating VOC is already entered into the spreadsheet.

$$\text{VOC tons/month} = \frac{\text{Amount Used (gallons)} \times \text{Density of Material (pounds/gallon)} \times \text{Percentage of VOC}}{2000 \text{ pounds/ton}}$$

For each month, provide the amount of material used, in gallons. When you enter the gallons of product used, the VOC emissions will be automatically entered in the appropriate column.

The same calculation will be made for the HAP emissions, but these emissions are displayed in pounds instead of tons. If you would like the HAP displayed in tons, alter the formula by dividing by 2000 pounds/ton. The totals are displayed at the end of each column for each pollutant. **The example spreadsheet only includes January through March. You will need to insert additional worksheets for the remaining calendar months.**

Totals Worksheet

The “Totals” worksheet displays the twelve consecutive calendar month (rolling) totals for each pollutant, including total HAPs. The totals can be manually entered for each month or referenced from another sheet (e.g. the formula used in cell C3 is “=January!C19”). The spreadsheet enters the information from the monthly January sheet for you instead of you, so you do not need to type in the totals from the monthly sheets). Rolling totals (twelve consecutive calendar months) are the sum of the previous twelve-month period. For example, a rolling total would be the sum of emissions from January through December or February through January of the next year and so on. The formulas are already entered so the rolling totals are automatically calculated when the monthly totals are entered into the appropriate cells.

As mentioned earlier, this is just one method to track your monthly and twelve consecutive calendar month emissions from paints, solvents, and other evaporative loss products. If you have any questions regarding the use of this spreadsheet, call the Air Quality Environmental Assistance Coordinator at (402) 471-2189.