



---

# EQ Form 2.3 VOC Process Mass Balance Worksheet Instructions for Form 780-1440

---

Air Pollution Control Program fact sheet

2/2009

This information should be consistent with the construction permit and is optional. A clearly labeled spreadsheet with these calculations is acceptable.

An emission factor calculated by mass balance will usually be more accurate for a specific process at your facility rather than using the standard U.S. Environmental Protection Agency emission factor. You still need to associate the process with a Source Classification Code, or SCC, even if you calculate your own emission factor.

Examples of Volatile Organic Compound, or VOC, operations include degreasing, spray painting, adhesive application, flexographic or gravure printing and equipment cleaning. Generally, VOC processes will have separate SCCs and calculations that need to be on separate worksheets. Additional VOC Process Mass-Balance Worksheet forms may be needed to show different VOC material types associated with the same emission unit.

Please maintain a copy of the Material Safety Data Sheet, or MSDS, for each of the VOC materials listed on Form 2.3. Do not submit the MSDS with the Emission Inventory Questionnaire, or EQ, unless the process has been changed or a new product has been implemented.

Complete the Facility Name, Federal Information Processing Standard or FIPS County Number, Plant Number and Year of Data fields at the top.

**Emission Unit Number** - This is the unique identification number for each specific VOC process. This identification must match the unit number entered on *Form 1.1 Process Flow Diagram*, *Form 1.2 Summary of Emission Units* and *Form 2.0 Emission Unit Information*.

**Source Classification Code** - This code identifies the type of processes associated with an emission unit. SCCs specific to your facility are contained in AP-42 U.S. Environmental Protection Agency *Compilation of Air Pollution Emission Factors or Factor Information and Retrieval System*. This is a required field. If you cannot locate a SCC specific to your process, use the SCC most closely associated with your process.

**Segment Number** - See Form 2.0 instructions.

## **Total Annual Throughput and Total Pounds of VOC**

**Application Method** - This application method uniquely identifies the operation or VOC process that is producing the VOC emissions for this emission unit. Examples include spray, roller, dip or electrostatic.

**Material Type** - This box is used to uniquely identify the material being used. Examples include primers, paints, clear coats, inks, thinners and solvents. For primers, paints and inks, different colors of these materials may be grouped together into the same emission unit if the percent VOC in each material is the same.

**[A] Annual Throughput (tons/yr or gal/yr)** - This figure is the total amount of a specific material type used at this emission unit during the year. This figure must be expressed in either tons/year or gallons/year. Material that is not used and is returned to the manufacturer as “out of specification” should not be included in this annual throughput figure.

**[B] Maximum Percent by Weight of VOC in Material** - This value of the percentage of VOCs in the material (by weight) should be available from the MSDS provided by the supplier for the specific material associated with this emission unit. If the annual throughput unit of measure is tons, then percent by weight of VOC should be in tons, not gallons.

**[C] Density (lbs/unit)** - The value for the material should be available from the MSDS provided by the supplier for the specific material associated with this emission unit. If the specific gravity is given on the MSDS, multiply the specific gravity by 8.34 to obtain the density expressed in pounds of material per gallon of liquid. If the annual throughput is reported in tons, then density will always be 2,000 pounds.

**[D] Pounds of VOC Per Unit** - The value for this material should be available from the MSDS provided by the supplier for the specific material associated with this emission unit. If the pounds of VOC per unit figures are not known, then they can be calculated by multiplying the percent VOC by weight (B) in the material by the density (C) of that material. If the throughput unit of measure is tons, then pounds of VOC per unit should be in tons, not gallons.

**[E] VOC (lbs/year)** - This figure is the total amount of VOCs released for the specific material associated with this emission unit. The VOC figure can be calculated by multiplying the annual throughput (A) for each material by the pounds of VOC per unit (D) for the same material.

**[F] Total Annual Throughput** - The summation of all values in column A. This figure should be entered in the annual throughput box in section 3, Form 2.0 associated with this emission unit.

**[G] Total VOC (lbs/year)** - This figure is the total of the VOC amounts calculated in the above boxes in column E.

### **Calculation of Pounds of VOC Recovered**

**Amount of Material Shipped as Hazardous Waste** -This figure is the total amount of material listed on the Hazardous Waste Manifest as having been shipped from this particular VOC process during the year. This figure should be expressed as the total pounds of waste shipped for this emission unit. Waste materials not included in the annual throughput figure calculated above should not be included in the VOC calculation for this block. Documentation must be provided for the amount of material shipped.

**Percent VOC Content of Waste** - This figure is the weighted average for the VOC content of all shipments of hazardous waste shipped from this emission unit. If specific test data is not available on the VOC content of the waste, an estimate for this percent VOC figure may be provided with any supporting documentation available. Supporting documentation must be provided for the percent VOC content.

**[H] Lbs of VOC Recovered** - This figure is the amount of VOC recovered or shipped as a liquid hazardous waste from the process associated with this emission unit.

### **Calculation of Pounds of VOC Emitted Prior to Control Equipment**

Calculate the pounds of VOC emitted prior to any control devices by taking the total pounds of VOC figure and subtracting the pounds of VOC recovered. The result of this subtraction should be the total amount of VOCs emitted from the VOC process during the year.

**Interim Policy as of Feb. 11, 1999** - *Emissions from inks used by non-heatset, offset lithographic printers should be adjusted by multiplying pounds of VOC emitted prior to control by 5 percent. This calculation should be noted on item [3]. The EPA method 24 may also be used to calculate a percentage in lieu of the 5 percent value. Calculations for determining this percentage must be submitted with Form 2.3. Please note: Either the percentage calculated using EPA method 24, or the 5 percent value may be used, but not both.*

### **Calculation of Emission Factor**

**[J] Emission Factor in Lbs/Unit** - The emission factor should be calculated by taking the pounds of VOCs emitted prior to control equipment and dividing by the total annual throughput. This emission factor should be entered in the VOC emission factor box in section 5 on Form 2.0 that is associated with this emission unit.

### **For More Information**

Missouri Department of Natural Resources  
Air Pollution Control Program  
P.O. Box 176  
Jefferson City, MO 65102-0176  
800-361-4827 or 573-751-4817  
573-751-2706 fax  
[www.dnr.mo.gov/env/apcp/index.html](http://www.dnr.mo.gov/env/apcp/index.html)