Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

EC-04

Degreasing Operations Calculation Form

Air Quality Permit Program

Instructions on Page 3

Fill out this form completely for each degreaser, or attach sheets with equivalent information.

If the degreaser emits Hazardous Air Pollutants (HAPs), fill out and attach Form EC-13A.

Important note: If you are subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP): Halogenated Solvent Cleaning, **do not** follow the calculation procedures provided on this form. You must instead follow the calculation procedures in the rule.

1a) AQ Facility ID No.: _____ **1b)** AQ File No.: _____

2) Facility name: _____

3) Emission unit ID number: _____

4) Stack/vent ID number: _____

5) Control equipment ID number: _____

6) Type of Degreasing:

- ☐ Cold Cleaner surface area: _____ ft^2
- ☐ Open Top Vapor surface area: _____ ft^2
- ☐ Conveyorized, Vapor
- ☐ Conveyorized, Non Boiling
- ☐ Other: _____

7) Identify the solvents used:

_____

8) Potential emissions summary: (Ignore this item if using this form for Registration Permit Option D)

Solvent	Pollutant	8a) VOC/ODS * content (%)	8b) Emission factor ☐ (ton/yr/unit) ☐ (lb/hr/ft^2)	8c) Emission rate (lbs/hr)	8d) Maximum uncontrolled emissions (tons/yr)	8e) Pollution control efficiency (%)	8f) Maximum controlled emissions (tons/yr)	8g) Limited controlled emissions (tons/yr)	8h) Actual VOC emissions (tons/yr)
	VOC								
	ODS								
	VOC								
	ODS								
	VOC								
	ODS								

* VOC = Volatile Organic Compounds
ODS = Ozone Depleting Substance

9) Operating limitations, if applicable (Ignore this item if using this form for Registration Permit Option D):

10) Actual emissions summary: (For use only if using this form for Registration Permit Option D)

Solvent	10a) Amount used (gallons/yr)	10b) VOC content (%)	10c) Uncontrolled emissions (tons/yr)	10d) Pollution control efficiency (%)	10e) Controlled emissions (tons/yr)

Instructions for Form EC-04

1a) **AQ Facility ID No. --** Fill in your Air Quality (AQ) Facility Identification Number (ID) Number (No.). This is the first eight digits of the permit number for all permits issued under the operating permit program. If your facility has never been issued a permit under this program, leave this line blank.

1b) **AQ File No. --** Fill in your AQ File Number, if known. This number can be found in the "cc" section of correspondence from the Minnesota Pollution Control Agency (MPCA).

2) **Facility name --** Enter your facility name.

3) **Emission unit ID number(s) --** Fill in the identification number of the emission unit. Obtain this number from your *Emission Unit Information Form* (GI-05B). Indicate total facility or multiple units if applicable. [Note: If you are using this form for Registration Permit Option D, you did not fill out Form GI-05B; instead, just provide information identifying the emission unit.]

4) **Stack/Vent designation number(s) --** Fill in the designation number of the stack(s) or vent(s) through which the unit will exhaust into the atmosphere. Obtain these numbers from your *Stack/Vent Information Form* (GI-04). Indicate total facility or multiple stacks if applicable. [Note: If you are using this form for Registration Permit Option D, you may skip this question.]

5) **Control equipment** - Fill in a description of the type of control equipment. Use either the identifying number from Form GI-05B, or the description from Form RP-D2, as applicable. If none, enter "None."

6) **Type of degreasing --** Check the appropriate box to indicate the type of degreasing at your facility. Fill in the surface area in square feet, if applicable. (Note: If you are using this form for Registration Permit Option D, you may skip this question.)

7) **Identify the solvents --** Identify all organic solvents used in the degreaser (e.g., perchloroethylene, nonmethane Volatile Organic Compounds [VOCs]).

If you are using this form for Registration Permit Option D, skip items 8 and 9 and go on to item 10.

8) **Potential emissions summary:**

8a) **VOC/ODS content --** Fill in the VOC and ODS (ozone depleting substance) content of the solvent(s) used in the degreaser. This information can be obtained from the Material Safety Data Sheet (MSDS).

(Example: The MSDS shows that the solvent contains 90% Freon 113 and 5% volatile organic compounds. The VOC content is 5%. The ODS content is 90%.)

8b) **Emission factor --** Fill in the emission factor for the degreaser. Use the most current emission factors available. As defined in Minn. R. 7005.0100, subp. 10a, "emission factor" means the most accurate and representative emission data available from one of the following sources:

A. The emission factor listed in the Compilation of Air Pollutant Emission Factors (AP-42), fifth edition, U.S. Environmental Protection Agency (EPA), Technical Support Division, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711, January 1995, as amended, which is incorporated by reference and is available at the EPA Internet site www.epa.gov/ttn/chief/ap42/index.html. It is not subject to frequent change. Where more than one emission factor is listed in AP-42, "emission factor" means the one approved by the commissioner using best engineering judgment and based on one or more of the considerations in item C, subitem (2).

B. The emission factor listed in Factor Information Retrieval (FIRE) Data System, Version 6.25, U.S. Environmental Protection Agency (EPA), Technical Support Division, Office of Air Quality Planning and Standards, as amended, which is incorporated by reference and is available at the EPA Internet site http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main. Where more than one emission factor is listed, emission factor means the one approved by the commissioner using best engineering judgment and based on one or more of the considerations in item C, subitem (2). It is subject to frequent change.

C. (1) An emission factor developed or approved by the commissioner and derived from the following sources:

(a) other EPA publications including, but not limited to, Locating and Estimating documents, Control Technology Center documents, the preamble and background information documents for New Source Performance Standards or National Emission Standards for Hazardous Air Pollutants;

(b) EPA databases and computer programs;

(c) engineering publications;

(d) performance test data from the same or a similar emission unit at the same or a similar facility;

(e) manufacturer's performance tests; or

(f) emission data developed by the regulated party using the best engineering judgment criteria listed in subitem (2).

(2) The commissioner shall develop or approve an emission factor using best engineering judgment and based on one or more of the following considerations:

(a) the precision and accuracy of the data;

(b) the design and operational similarity between the emission units tested and the emission units to which the emission factor is to be applied;

(c) the number of emission units tested in developing the emission factor under consideration;

(d) the availability of emission data of equal or greater quality;

(e) the emission unit operating conditions under which the tests were conducted; and

(f) the data analysis procedures.

Remember to use uncontrolled emission factors, and include the applicable units. Show any calculations used to determine maximum continuous rates, and include the source of the emission factors used. Attach a separate sheet, if necessary.

8c) Emission rate -- If the emission factor you used in item 8b) is in units of lb/hr/ft^2, fill in the Maximum Possible Hourly Emission Rate, calculated as follows:

Emission rate (lb/hour) = Emission factor x Surface area

Emission rate (lb/hour) = [item 8b] x Surface area

(Example: The emission factor is 0.15 lb/hr·ft² and the surface area of the unit is 26.3 ft². The emission rate is 0.15 (lb/hr·ft²) x 26.3 (ft²) = 3.95 lb/hr).

If the emission factor used in item 8b) is in units of ton/year/unit, fill in the emission rate by multiplying the emission factor by 0.2283 (lb yr/hr ton), or

Emission rate (lb/hour) = Emission factor x 2000 (lb/ton) ÷ 8760 (hours/year)

Emission rate (lb/hour) = [item 8b] x 0.2283

8d) Maximum uncontrolled emissions --

Fill in the Maximum Uncontrolled Emissions. Calculate the uncontrolled VOC and ODS emissions by using this method:

Maximum uncontrolled emissions (tons/year) = Emission rate (lb/hr) x (% VOC or % ODS / 100) x 4.38 (hr-ton / year-lb)

Maximum uncontrolled emissions (tons/year) = [item 8c} x ([item 8a ÷ 100) x 4.38

8e) Pollution control efficiency -- The pollution control efficiency is the product of the capture efficiency and the destruction/collection efficiency indicated on Form GI-05A. Enter the efficiency here and remember to include on Form CD-01 a plan to demonstrate and maintain the destruction/ collection efficiency. The efficiency should be expressed for each pollutant. If there is no control for the particular pollutant, then indicate zero.

8f) Maximum controlled emissions -- Fill in the Maximum Controlled Emissions, calculated using this method:

Max. Controlled Emissions (tons/year) = Max. Uncontrolled Emissions (tons/year) x (100 – Pollution Control Efficiency) ÷ 100

Max. Controlled Emissions (tons/year) = [item 8d] x (100 – [item 8e]) ÷ 100

(Example: If the maximum possible uncontrolled VOC emissions are 1.72 tons/yr and the efficiency is 60%, then the maximum controlled VOC emissions are 1.72 tons/yr x (100-60)/100 = 0.688 ton/yr of VOC.)

Note: If any of the control devices used in item 8e are integral parts of the equipment design, you may use the control efficiency to calculate items 8c and 8d. Also attach supporting documentation.

8g) Limited controlled emissions -- The limited controlled emissions are calculated by taking into account all limitations on operation of the source you are proposing in this application. These limitations include limits on hours of operation, on the amount of material used, etc. You start the calculation of limited controlled emissions by repeating the calculation of emission rate (item 8c) but taking into account the limits you propose.

If an emission unit is subject to an emission limitation specified in 40 CFR pt. 60, 40 CFR pt. 61, 40 CFR pt. 63 or Minn. R. ch. 7011, you must show this requirement in the calculation of limited controlled emissions and take this into account in calculating the limited controlled emissions. If you choose to propose to comply with a more stringent limit, you should state this clearly and show the resulting allowed emissions in this calculation.

8h) **Actual emissions** -- If this is an existing unit and historical records exist, calculate actual emissions using the previous calendar year of usage data or use the most recent emission inventory report if an inventory was submitted. If this is a new unit or no records exist, use a reasonable estimate of how many hours the unit will be. Report actual emissions in tons/year.

9) **Operating limitations --** Please note that the Maximum Possible Uncontrolled Emissions did not consider any limitations in determining the PTE. If you considered any limitations when calculating the number in item 8g above, (e.g., hours of operation or usage) state the limiting factor(s) here and on Form CD-01.

10) **Actual emissions summary** (for Registration Permit Option D only – if you are not using this form for Registration Permit Option D, do not complete item 10):

For Registration Permit Option D, it is not necessary to associate the emissions with a particular degreaser. You may use this form to calculate all emissions from degreasing, regardless of the number of degreasers you operate.

10a) **Amount used --** Fill in the quantity of each solvent used during the last calendar year.

10b) **VOC content --** Fill in the VOC content of each solvent used in the degreaser. This information can be obtained from the Material Safety Data Sheet (MSDS).

10c) **Uncontrolled emissions** - Fill in the uncontrolled VOC emissions by multiplying column 10a by column 10b and dividing by 2000.

10d) **Pollution control efficiency --** Fill in the pollution control efficiency from Form RP-D2.

10e) **Controlled emissions** -- Fill in the controlled VOC emissions, calculated using the following method:

Controlled emissions (tons/year) = Uncontrolled emissions (tons/year) x (100 – Pollution control efficiency) ÷ 100

Controlled emissions (tons/year) = [item 10c] x (100 – [item 10d] ÷ 100)

The controlled emissions are your actual emissions.