

Calculating Air Emissions from Dry Cleaning Facilities

This guide can be used for calculating air emissions from dry cleaning facilities. Air emissions information is needed for question #30 of the Ohio EPA Permit to Install application (Form 3150), question 2f of the Permit to Operate application (Form 3161) and all biennial Non-Title V Air Fee Emissions Reports where emissions must be reported.

Step 1: Determine annual solvent usage in gallons.

Review inventory and purchase records for the amount, in gallons, of perchloroethylene or other cleaning solvent used in one year, then figure the annual usage as follows:

$$\text{Annual usage (gal.)} = \text{Beginning inventory} - \text{Final inventory} + \text{Purchases}$$

Step 2: Calculate Air Emissions in tons/year.

Most, but not all, of the dry cleaning solvent used evaporates into the air during the various cleaning steps. The Ohio EPA recognizes that some solvent is retained in filters and muck disposed of as waste. It is assumed 66% of the perchloroethylene used in dry-to-dry machines is emitted to the air, while 82.3% is emitted from transfer machines. Using the annual usage from Step 1 above, annual air emissions can be calculated as follows:

for dry-to-dry machines using perchloroethylene:

$$\text{Tons/year} = \frac{\text{Annual usage (gal.)} \times 13.5 \times 0.66}{2000} \quad \text{or} \quad \text{Annual usage (gal.)} \times 0.004455$$

for transfer machines using perchloroethylene:

$$\text{Tons/year} = \frac{\text{Annual usage (gal.)} \times 13.5 \times 0.823}{2000} \quad \text{or} \quad \text{Annual usage (gal.)} \times 0.005555$$

for machines using petroleum solvents:

$$\text{Tons/year} = \frac{\text{Annual usage (gal.)} \times \text{solvent density}^*}{2000}$$

** check solvent MSDS or call supplier for this value*

Step 3: Complete application forms or emissions reports

The tons/year emission values calculated using the equations above can be used to complete question #30 of the Ohio EPA Permit to Install application (Form 3150), question 2f of the Permit to Operate application (Form 3161) and all biennial Non-Title V Air Fee Emissions Reports. For permit applications, emissions need not be listed in terms of hourly rates, i.e. pounds per hour. Only tons/year emissions values are needed. See the following example problem.

EXAMPLE PROBLEM

Calculate the air emissions and complete question #30, Permit to Install application (form 3150) for a new dry-to-dry machine using perchloroethylene.

Step 1: Maximum annual usage is estimated to be 120 gallons/year based on identical machines at other facilities and historical inventory.

Step 2: Calculate emissions using the proper equation for a dry-to-dry, perchloroethylene machine:

$$\text{Tons/year} = \frac{120 \times 13.5 \times 0.66}{2000} = 0.53$$

Step 3: Complete question #30, Permit to Install application (form 3150) as follows:

Pollutant Name	Proposed Maximum Hourly Emissions (lb/hr)	Proposed Maximum Yearly Emission (Tons/year)
<i>perchloroethylene</i>	<i>not applicable</i>	<i>0.53</i>

For additional assistance with EPA regulations and requirements, please contact Ohio EPA's Small Business Program at (614) 644-4830.