

## EMISSIONS ACTIVITY CATEGORY FORM PRINTING OPERATIONS

*This form is to be completed for each printing press or printing operation. State/Federal regulations which may apply to printing operations. Note that there may be other regulations which apply to this emissions unit which are not included in this list.*

1. Reason this form is being submitted (Check one)

New Permit       Renewal or Modification of Air Permit Number(s) (e.g. R001)\_\_\_\_\_

2. Maximum Operating Schedule: \_\_\_\_\_ hours per day; \_\_\_\_\_ days per year

If the schedule is less than 24 hours/day or 365 days/year, what limits the schedule to less than maximum? See instructions for examples. \_\_\_\_\_

3. Type of printing method employed in this press:

Flexographic    Rotogravure (publication)    Rotogravure (packaging)    Rotogravure (other)  
 Lithographic (heatset)    Lithographic (non-heatset)    Screen    Other, describe \_\_\_\_\_

4. Feed method of press:    Web       Sheetfed       Manual  
 Other, describe \_\_\_\_\_

5. Complete the table below listing specific details of this press.

Press Manufacturer	Model Number	Press Speed (impressions/hr)	Max. Impression Width (inches)	Number of print units	Coating Unit? (yes/no)

6. Does the press or printing operation employ one or more drying/curing ovens?    Yes       No

If "yes", complete the table below. (See Instructions)

	Electric	Fuel fired (indicate fuel type)	Ultraviolet (UV) or Electron Beam (EB)	Infrared (IR)	Total number of drying units on press
Number of units					

For fuel fired ovens only: Do solvent or ink oil vapors come in direct contact with flame?

Yes

No

7. Complete the following table listing the chemical products used on each press or printing operation. See Instructions on completing this section.

Chemical Category	Product Name	VOC Content <sup>a</sup>			Annual Usage Amount <sup>b</sup>	
		% by weight	% by volume <sup>c</sup>	lbs/gallon	pounds	gallons
Inks & Varnishes						
Cleanup Solvents						
Fountain Solution Additives (lithographic presses only)						
In-line Coatings						

**Notes:**

- a. Check MSDS or supplier data for VOC content. For products tracked in pounds, enter VOC content in “% by weight”. For products tracked in gallons, enter VOC content in “lbs per gallon”.
- b. Enter usage amount in pounds or gallons, depending on how the product is tracked or purchased (Example: ink in pounds, solvent in gallons, etc.). Usage equals beginning inventory, minus final inventory, plus purchases, minus credits for documented disposal or returns to suppliers.
- c. Needed for flexographic and rotogravure inks and coatings only - see Instructions.

8. For operations other than heatset lithographic printing, are any of the inks or coatings listed in Question 7 required to be baked, heat-cured, or heat polymerized at temperatures above 250°F?  
 Yes       No

If yes, list all coatings required to be baked, heat cured, or heat polymerized:

---



---

9. Are any photochemically reactive materials, as defined in OAC rule 3745-21-01(C)(5), used in this air contaminant source (including cleanup)?       Yes       No

10. (*For flexographic and rotogravure facilities only*): What is the total annual maximum usage (in tons) of coatings and inks in all flexographic and rotogravure presses at the facility?  
 \_\_\_\_\_ tons/year

11. Method of press cleaning:

Manual wiping with rags (complete information below)

Are used rags stored in closed containers?       Yes       No

Disposal or treatment method for used rags:       Sent off site to laundering facility  
 Laundered on-site  
 Sent off site for disposal

Automatic blanket washing system

12. List the vapor pressure of all cleaning solvents used on this press either in pounds per square inch absolute (psia) or millimeters of mercury (mmHg):

Name of cleaning solvent	Vapor pressure at 20° Celsius (68° F)	
	psia	Or mmHg

13. If used solvents are sent off site for disposal, indicate the approximate number of gallons shipped annually and indicate year applicable.

\_\_\_\_\_ # gallons shipped off site during \_\_\_\_\_ calendar year

Average solvent content of solvent waste: \_\_\_\_\_ percent by volume

# INSTRUCTIONS FOR COMPLETION OF THE EMISSIONS ACTIVITY CATEGORY FORM FOR PRINTING OPERATIONS

## **GENERAL INSTRUCTIONS:**

Provide complete responses to all applicable questions. If an item does not apply to the emissions unit, write in "Not Applicable" or "NA." If the answer is not known, write in "Not Known" or "NK." If you need assistance in understanding a question after reading the instructions below, contact your Ohio EPA District Office or Local Air Agency for assistance. Submittal of an incomplete application will delay application review and processing. In addition, the application may be returned as incomplete if all applicable questions are not answered appropriately.

## **APPLICABLE REGULATIONS:**

*The following State and Federal Regulations may be applicable to printing operations. Note that there may be other regulations which apply to this emissions unit which are not included in this list.*

Federal: 40 CFR 60, (NSPS) Subpart A (General provisions), Subpart QQ (publication rotogravure printing), and Subpart FFF (flexible vinyl and urethane coating and printing).

40 CFR 63, (MACT) Subpart A (General provisions), Subpart KK (publication rotogravure, product and packaging rotogravure, and wide web flexographic printing).

State: OAC rule 3745-31-02 (Permit to Install)  
OAC rule 3745-35-02 (Permit to Operate)  
OAC rule 3745-21-07(G) - Operations using liquid organic materials  
OAC rule 3745-21-09(H) - Vinyl coating lines  
OAC rule 3745-21-09(Y) - Flexographic, packaging rotogravure and publication rotogravure printing lines  
OAC rule 3745-21-10 - Compliance test methods and procedures

If you would like a copy of these regulations, contact your Ohio EPA District Office or Local Air Agency. State regulations may also be viewed and downloaded from the Ohio EPA website at <http://www.epa.state.oh.us/dapc/regs/regs.html>. Federal regulations may be viewed and downloaded at <http://www.epa.gov/docs/epacfr40/chapt-I.info/subch-C.htm>.

## **CALCULATING EMISSIONS:**

Manufacturers of some types of emissions units and most types of control equipment develop emissions estimates or have stack test data which you can request. Stack testing of the emissions may be done. Emissions unit sampling test data may be either for this emissions unit or a similar one located at the facility or elsewhere. You may develop your own emission factors by mass balance or other knowledge of your process, if you can quantify inputs and outputs accurately. You may be able to do this on a small scale or over a short period of time, if it is not practical during regular production. If you have control equipment, you may be able to quantify the amount of pollutants collected over a known time period or production amount. Any emission factor calculation should include a reference to the origin of the emission factor or control efficiency.

Ohio EPA Engineering Guides #56 and #68 may be consulted when determining emissions from printing operations. These Engineering Guides may be found online at

*These fundamental equations can be used to determine VOC emissions from printing operations and presses which do not have add-on emission control devices:*

For lithographic, non-heatset ink & varnish: Emissions (lbs/yr) = VOC content (% by weight) x usage (lbs/yr) x 0.05

For lithographic, heatset ink & varnish: Emissions (lbs/yr) = VOC content (% by weight) x usage (lbs/yr) x 0.80

For flexographic, rotogravure, or screen inks, fountain solution additives, and in-line coatings: Emissions (lbs/yr) = VOC content (lbs/gallon) x usage (gallons/year) OR VOC content (% by weight) x usage (lbs/year)

For cleanup solvents: Emissions (lbs/yr) = VOC content (lbs/gallon) x usage (gallons/year)

For manual press cleaning using low-evaporative solvents (see note below):

$$\text{Emissions (lbs/yr)} = \text{VOC content (lbs/gallon)} \times \text{usage (gallons/year)} \times 0.50$$

Note: The equation above can only be used if the vapor pressure of the cleaning solvent is less than 10 millimeters of mercury (mmHg) at 20 degrees Celsius **and** the used cleaning towels are stored in closed containers. Check the MSDS or call the supplier for vapor pressure information.

**Total press emissions = ink emissions + coating emissions + cleanup emissions + fountain solution emissions**

### **SPECIFIC INSTRUCTIONS:**

1. Indicate whether this is an application for a new permit or an application for permit renewal. If applying for a permit renewal, provide the 4-character OEPA emissions unit identification number.
2. Provide the maximum number of hours per day and days per year the printing operation is expected to operate. The following are examples of why the maximum number of hours per day may be less than 24 or the maximum number of days per year may be less than 365 (this list is not all-inclusive):
  - The facility can only operate during daylight hours.
  - The process can only operate within a certain range of ambient temperatures.
  - The process is limited by another operation (i.e., a bottleneck).
3. Indicate the type of printing method used in the press. If "other", explain the type of printing process.
4. Indicate the method used to move the substrate through the press or printing operation. "Web" refers to the substrate being fed from an unwinding roll. "Manual" refers to the substrate being transferred into the press or operation by hand. If "other", explain the type of process used.
5. Provide the requested specifications for the press. The maximum impression width refers to the greatest width of paper or substrate the press can accommodate. A "coating unit" refers to a unit which is a part of the press which applies aqueous or clear overcoatings meant to protect the printed substrate, increase gloss, or provide a special surface finish.
6. Indicate if the press employs a drying process and indicate the type and number of separate drying ovens. Ultraviolet (UV), Electron beam (EB) and Infra-red (IR) drying units supply radiation to cure special inks. For fuel fired ovens, indicate the type of fuel used, i.e., natural gas, distillate oil, etc.

Check the appropriate box if solvent laden air in the dryer(s) comes into direct contact with the flame of the dryer burners.

7. Provide all applicable data requested concerning the chemical products and inks used on the press in Table 1. If a type of product, such as quick-set ink, includes multiple inks with similar formulations, only list the ink having the highest volatile organic compound (VOC) content and combine the total usage of all similar formulations of the same product type and list this value as the "annual usage amount".

For lithographic inks and varnishes, VOC content is often expressed as % by weight. For rotogravure and flexographic inks, this must also be reported as either as 1) VOC % by volume of the coating or ink, excluding water and exempt solvents, or 2) VOC % by volume of the volatile matter in the coating or ink. Press chemicals other than inks and varnishes typically have VOC contents expressed as lbs VOC/gallon. Complete the appropriate VOC content column for each product. See OAC Rule 3745-21-01(B)(6) for a list of exempt solvents not considered as VOC.

If possible, obtain an "Environmental Data Sheet" or "Product Data Sheet" from your coating supplier. These documents usually list all required VOC data. Material Safety Data Sheets (MSDS) are usually not designed or intended to meet EPA requirements and may not contain all information required.

For a new press, estimate the projected usage based on similar presses if possible. The quantity of products disposed, not used, or returned to supplier may be subtracted from annual usage.

**Note: You do not need to report small quantities (less than 25 gallons/yr) of special chemicals such as blanket conditioners, anti-skin additives, etc. and other small-use chemicals having negligible VOC content.**

8. List all coatings from Question 7 which require baking or heat-curing. In general a "baked" coating requires heating to such temperatures, usually above 250°F, so that a chemical reaction takes place and the coating is no longer soluble in the original solvent. A flash-off or drying oven is an oven used only to accelerate evaporation of the solvent from the coating and usually operates at a temperature no greater than 250°F.
9. The definition of photochemically reactive materials is complex but the information is usually available on the MSDS or from the material supplier. If you have other questions, contact your Ohio EPA District Office or Local Air Agency.
10. Total all inks and coatings (pounds) used annually in all presses at the facility and divide by 2000.
11. Describe the method used to clean the press. If done manually (hand wiping with solvent laden rags), describe method of used rag storage and disposal.
12. Consult product Material Safety Data Sheets (MSDS) or contact the supplier for information concerning the solvent vapor pressure.
13. Provide information on the quantity of used solvents sent off site for disposal. Records of waste shipments (manifests) must be retained as documentation.