



ADDITIONAL TECHNICAL INFORMATION FOR A GRAPHIC ARTS PROCESS (PRINTING)

The following information will be used for the technical review of a permit to install application for a **printing process**. This information is in addition to the general requirements outlined in the AQD document "Information for an Administratively Complete Permit to Install Application", Part 2 - Additional Supporting Information, Items A through F. All of the information may not be needed for each application. Also, this document may not be all inclusive. Additional information beyond that identified may be necessary to complete the technical review of any individual application. In the event a determination is made that new additional information is needed for a technical review, this document will be updated.

All referenced guidance documents are available at <http://www.deq.state.mi.us/aps> or you may contact the Permit Section at 517-373-7023.

A. Process Description

1. Describe the type of printing (e.g., offset lithography - sheet fed or web fed; flexographic; gravure; screen printing; letter press - platen, flatbed or rotary; digital or electronic printing) and type of curing (e.g., non-heat set, heat set).
2. Provide a description and detailed schematic flow block diagram for each process or emission unit (EU). For each press, include the make, model, printing width, and the dates of original installation and last modification.
3. Describe each coating, ink, reducer and press wash/blanket wash solvent as received, consisting of the following information:
 - a) The density in pounds per gallon or the VOC content in percent by weight, and the percent by volume of solids in the material before it is reduced.
 - b) A listing of each component¹ in each coating, ink, reducer and press wash/blanket wash solvent. In most cases, Material Safety Data Sheets are sufficient. This information will be used to determine compliance with Rule 225 which requires an analysis of Toxic Air Contaminant (TAC) emissions and their impacts. TAC emissions may result from individual components in the coating. Therefore, multiple information sources may be necessary to estimate emissions of TACs. For additional and more detailed documentation you may include, or in the future may be asked to include, additional sources of data such as Environmental Data Sheets, Environmental Constants Sheets or formulation data.
 - c) For each specific component provide:
 - i. The specific chemical name, such as xylene, methanol or lead chromate, and the respective Chemical Abstract Service (CAS) number. If after a rigorous effort has been made, the component does not appear to have a CAS number, identify the component by a generic or common name (i.e., aromatic hydrocarbon, alcohol, glycol ether, chromium pigment) and provide all available information on the chemical family, properties, characteristics, composition, etc. Lack of adequate chemical identification may delay the analysis of the TAC emissions.
 - ii. The percent of the component in the coating, ink, reducer or press wash/blanket wash solvent by weight.
4. The material and reducer mixing ratio, by volume (i.e., 3 parts reducer to 128 parts ink).
5. For lithographic printing, indicate whether or not each press has an automatic blanket cleaning system.
6. For flexographic printing, the number of printing rollers and whether a clear coat is applied over the ink.
7. The normal and maximum amount of each material to be applied in one hour and one year
8. The normal and maximum operating schedule in hours per day, days per week, and weeks per year.
9. A description of the substrates to be printed on.

¹ "Component" includes organic solvents, water, pigments, resins, catalysts, curing agents, accelerators, and other materials.

10. For an existing source, a sample of the recordkeeping system used for recording material usage and calculating emissions.

B. Regulatory Discussion

The following state air pollution control regulations may be applicable. Please review these regulations carefully to determine if they apply to your process and summarize the results in the application. The Air Pollution Control Rules may be viewed and downloaded from the AQD website at: www.michigan.gov/deqair.

1. State of Michigan, Department of Environmental Quality, Act 451 of 1994, Natural Resources and Environmental Protection Act, Part 55 Air Pollution Control and the following promulgated rules:
 - a) Rules 215 and 216 apply to an existing facility which has a current Renewable Operating Permit (ROP). A Permit to Install issued for the installation of new equipment or modifications to existing equipment is incorporated into an ROP pursuant to Rules 215 and 216.
 - b) Rule 220 applies to a major source and/or a major modification at a source which is located in a non-attainment area. A non-attainment area is one where the National Ambient Air Quality Standards (NAAQS) are not being met. Rule 220 requires compliance with the lowest achievable emission rate (LAER) and an emission reduction (offset) for each non-attainment air contaminant emitted in significant quantities as defined by Rule 119(e). However, a source may choose to “net out” of the requirements of Rule 220. Refer to “Guidelines for a Netting Demonstration” for additional detailed information.
 - c) If the process or equipment was installed or modified after April 17, 1992, Rules 224 – 230 apply. Rule 224 requires the application of Best Available Control Technology for toxics (T-BACT) for all non VOC toxic air contaminants (TACs). T-BACT does not apply to emissions of VOCs. Rule 225 limits the emission impacts of TACs and requires a demonstration that the proposed emission of each TAC complies with a health-based screening level. Compliance can be demonstrated using any of three methods described in Rule 227(1) including the use of computerized dispersion modeling. Refer to “Guidelines for Conducting a Rule 224 T-BACT Analysis,” “TACs-Demonstrating Compliance with Rule 225,” and “Dispersion Modeling Guidance” for additional detailed information.
 - d) If the process or equipment was installed or modified after August 1, 1979, Rule 702 applies. This rule requires Best Available Control Technology (BACT) for new sources of volatile organic compounds (VOCs). Refer to “Instructions for Conducting a BACT Analysis” for additional detailed information. Rule 702(d) specifies that an emission limit for any new source of VOC emissions shall not exceed the maximum allowable emission rate specified in Part 6 of the rules that would otherwise apply if the source was an existing source. Rule 624 would be the applicable rule for an existing rotogravure and/or flexographic printing process. “Existing source” and “new source” are defined in Rule 601 and Rule 701 respectively. If applicable, please, specify which subpart of Rule 624 applies to the operation, and the VOC content levels / averaging periods the materials (ink, coatings) will achieve.
 - e) Rule 901 prohibits emissions of an air contaminant in quantities that cause either a) injurious effects to human health or safety, animal life, plant life of significant economic value, or property; or b) unreasonable interference with the comfortable enjoyment of life and property.
2. Federal Prevention of Significant Deterioration (PSD), 40 CFR Part 52.21. The federal PSD regulations apply to a major source and/or a major modification at a source which is located in an attainment area. An attainment area is one where all the NAAQS are being met. However, as with the non-attainment permitting, a source subject to the PSD regulations may choose to “net out” of the requirements. Refer to “Federal PSD Requirements,” “Instructions for Conducting a BACT Analysis,” and “Guidelines for a Netting Demonstration” for additional detailed information.
 - The Clean Unit test is an alternate method for determining PSD applicability. It encourages industries to invest in control equipment by providing greater operational flexibility after the control equipment is installed. Refer to “Federal PSD Requirements” and the “PSD Workbook” which is available on the Internet at <http://www.deq.state.mi.us/aps/downloads/permits/PSD%20Workbook.pdf>.
3. National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 63, Subpart KK, Printing and Publishing Industry (for flexographic printing).

4. If a specific MACT does not apply: Section 112(g) regulations of the federal Clean Air Act require any constructed or reconstructed major source of Hazardous Air Pollutants (HAPs) be equipped with Maximum Achievable Control Technology (MACT) for individual and total HAPs greater than 10 and 25 tons per year, respectively. Refer to "Guidelines for Conducting a 112(g) Analysis" for additional detailed information.

C. Control Technology Analysis

1. Describe the air pollution control equipment including the destruction efficiency, capture efficiency, basis for efficiency determinations, operating parameters, exhaust rate and exhaust temperature.
2. Rule 702 BACT applies to all sources of VOCs proposed to be installed within the State of Michigan. A Rule 702 BACT analysis is very similar to a PSD top-down BACT analysis. For those sources completing a PSD top-down BACT analysis for VOCs, a Rule 702 BACT analysis is not required. Michigan's air pollution control rules also define BACT as an emission limit. Rule 702 BACT should be applied on a flexible grouping of equipment – subdivisions of emission units and/or groupings of emission units – as long as it is logical to do so. Logical means that the principles on which the groupings (or subdivisions) are made are consistent with federal guidance and sound engineering practices. Refer to "Instructions for Conducting a BACT Analysis" for additional detailed information. The cost analysis for add-on control should look at control options with and without Permanent Total Enclosure (PTE) to capture emissions.
3. Best Available Control Technology for Toxics (T-BACT) means the maximum degree of emission reduction which the Department determines is reasonably achievable for each process that emits toxic air contaminants (TACs) taking into account energy, environmental and economic impacts, and other costs. T-BACT does not apply to VOCs. The analysis must be specific to the process and the TACs subject to a T-BACT review. T-BACT limits can be expressed as an emission limit, control equipment requirements, and/or work practice standards. Refer to "Guidelines for Conducting a Rule 224 T-BACT Analysis" for additional detailed information.
4. Lowest achievable emission rate (LAER) applies to a major source and/or a major modification at a source located in a non-attainment area. Currently the only two pollutants which may be subject to LAER in Michigan are VOCs and NOx. LAER is defined as the lowest emission limitation contained in any State Implementation Plan (SIP) or the lowest emission limitation achieved in practice. Such an emission limit is presumed to be LAER for that source class and category. If an applicant proposes to meet this presumptive LAER, no site-specific control technology determination will be necessary. When an applicant believes the presumptive LAER limit is not achievable, a site-specific determination is required. This determination should include consideration of raw material changes, process changes, and add-on control equipment. The cost of these changes is not considered. Raw material and process changes should be evaluated through technology transfer (i.e., the likelihood that such a change will transfer from one industry to another), based on the manufacture of similar products or use of similar raw materials or fuels. Add-on controls should be evaluated based on the physical and chemical characteristics of the pollutant-bearing exhaust stream.
5. PSD Top-down BACT applies to a major source and/or a major modification at a source of any criteria pollutant located in an attainment area. The Clean Air Act defines BACT as "an emission limitation based on the maximum degree of reduction for each pollutant." BACT should be applied to a flexible grouping of equipment – subdivisions of emission units and/or groupings of emission units – as long as it is logical to do so. Logical means that the principles on which the groupings (or subdivisions) are made are consistent with federal guidance and sound engineering practices. Refer to "Instructions for Conducting a BACT Analysis" for additional detailed information.

D. Emissions Summary and Calculations

Estimate the maximum emission rate of each VOC and non-VOC pollutant, as defined in Rule 122(f), in pounds per hour and tons per year. Provide detailed calculations showing how the VOC/non-VOC emission rates were arrived at based on proposed usage of materials (inks, fountain solutions, coatings, reducers, solvents, paints, clean-up and purge solvents, etc.). Use the pound per hour value for a Rule 225 toxics analysis and the ton per year value for the cost analysis portion of the Rule 702 BACT analysis.

The following EPA documents may be helpful for calculating emissions. They are available from National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161. 1-800-553-6847 Phone, (703) 605-6900 Fax

- Guideline Series: *Control of VOC Emissions from Offset Lithographic Printing*, EPA/453/D-95/001 (PB95201422), \$68.50, 246 Pages
- Alternative Control Techniques Document: *Offset Lithographic Printing*, USEPA 453/R-94-054, June 1994 (PB95201018), \$33.50, 30 Pages

In addition, a Regulatory Guide for the Michigan Lithographic Printing Industry (2nd Edition) is available on the Internet at http://www.michigan.gov/deq/0,1607,7-135-3307_3668_4151-10480--,00.html and a brochure for Lithographic Printers can be found at http://www.michigan.gov/deq/0,1607,7-135-3307_3668_4148-11397--,00.html.

E. Stack/Vent Parameters

If the emission unit is not vented outside, provide the building dimensions (length, width, height) where the process is installed and the possible building discharge point. Provide an estimated exit flow rate in standard cubic feet per minute (scfm) for use in a cost analysis to demonstrate compliance with Rule 702 BACT requirements. Also, provide information about the emission discharge opening for use in performing air dispersion modeling/toxic analysis.