Air Program Fact Sheet
Lithographic Printing RACT
Part 1 and Part 2—2019 Update

July 2019

Air Management Program

This summary explains how the Reasonably Available Control Technology (RACT) rule for lithographic printing may affect businesses. The RACT rule for lithographic printing reduces the emissions of volatile organic compounds (VOCs) from inks, fountain solutions, and cleaning solutions.

Currently there are two lithographic printing rules in Wisconsin Administrative Codes. The regulations are in sections NR 422.142 (Part 1) and 422.143 (Part 2) of Wisconsin Administrative Code.

Part 1 was put in place in 1995 and Part 2 in 2009. DNR recently revised Part 1 and Part 2 to clarify how the requirements in the rules apply to a facility. Effective July 1, 2019, a facility will be subject to only Part 1 or Part 2 requirements, not both. The majority of existing lithographic printing facilities and all new facilities located in the affected areas are subject to the requirements in Part 2. A few existing facilities located in Kewaunee and Manitowoc counties are subject to the requirements in Part 1. The specific requirements that apply to an operation will depend upon the operation's location and size, the type of lithographic presses and emissions.

How does this regulation affect a business?

RACT Part 1

This regulation affects a business only if it meets **all** of the following criteria:

- the printing facility is located in Kewaunee or Manitowoc county;
- the printing press was constructed before July 1, 2019; and
- the maximum theoretical emissions (MTE) of VOCs from all lithographic printing presses at the facility are greater than or equal to 1,666 pounds in any one month.

How does a facility calculate maximum theoretical emissions?

Maximum theoretical emissions (MTE) is defined in s. NR 419.02 (11) and is the quantity of VOC emissions that could be emitted if printing presses:

- operated at design capacity or maximum production capacity
- operated 730 hours per month, and
- do not count reductions of emissions from the use of any pollution control equipment.

A facility may limit their MTE for this rule by taking production limitations specified in a federally enforceable operating permit.

[24 hr/day x 365 day/yr] ÷ 12 mo/yr = 730 hr/mo

Since this is a hypothetical "worst case" situation, raw materials —such as inks, fountain solutions, coatings, cleaning solutions—with the highest VOC content used in practice should be used for this calculation. However, to account for VOC retention on the substrate, the rule does allow the use of certain retention factors when determining the maximum VOC content of inks. Multiply the VOC content of:

- heatset inks by 0.80
- non-heatset inks by 0.05

The calculation of MTE is generally set up as the maximum hourly usage of VOC materials multiplied by the maximum VOC content of the materials, times the appropriate retention factor. This number is then multiplied by 730 hours per month. The MTE is calculated for each printing press, and the sum of all the presses equals the facility's total monthly MTE for VOC emissions.

Additional guidance on MTE calculations (http://dnr.wi.gov/files/pdf/pubs/am/am460.pdf) is available from the Small Business Environmental Assistance Program (SBEAP).

If the monthly MTE is greater than or equal to 1,666 pounds, the facility must comply with the RACT rule. However, the facility may still avoid the requirements of this rule by obtaining an elective operating permit from DNR that limits allowable emissions to less than 1,666 pounds per month or by obtaining a limit included in the facility's source-specific federally enforceable operation permit.

Table 1: Usage Thresholds Estimated to Result in Actual Emissions Less than 3 tons per year

Type of Printing Operation	12-Month Rolling Material Use
Sheet-fed and/or Non-heatset web, but no Heatset-web	768 gallons of cleaning solutions and fountain solutions
Heatset Web alone or with sheet-fed/non-heatset web	5400 pounds of ink, cleaning solutions, and fountain solutions

RACT Part 2

This regulation affects a facility that has actual emissions of VOCs, before consideration of controls, from all lithographic printing presses greater than or equal to 3 tons in any consecutive 12-month rolling period and meets **any** of the following criteria:

- located in Kenosha, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county;
- constructed or modified on or after July 1, 2019, and located in Kewaunee or Manitowoc county;
- located in any area designated as a moderate, serious, severe, or extreme ozone nonattainment area; or
- located in any area formerly classified as a moderate, serious, severe, or extreme ozone nonattainment area that has subsequently been redesignated to attainment, except for any facility subject to Part 1.

Before calculating actual emissions, use Table 1 thresholds to estimate whether the facility is affected by Part 2. If usage is always below the threshold, the facility can assume that the limitations do not apply and only records are required. If the facility is above the thresholds in the table, it may still be exempt, but a calculation of actual

Table 2: RACT Emission Limits for Heatset Web Lithographic Printing

Material	Part 1	Part 2
Emissions from the printing presses	Any press subject to Part 1: ≥ 90% destruction of VOCs, or outlet concentration of ≤ 20 ppmv	New control devices installed on/after May 1, 2010 on any individual press subject to Part 2 with MTE ≥25 tons VOC per year: • ≥ 95% destruction of VOCs, or • outlet concentration ≤ 20 ppmv Existing control devices installed before May 1, 2010 on any individual press subject to Part 2 with MTE ≥25 tons VOC per year: • ≥ 90% destruction of VOCs, or • outlet concentration ≤ 20 ppmv
Fountain Solution	≤ 1.6% VOC by weight (bw) if not refrigerated ≤ 3% VOC bw if refrigerated ≤ 5% VOC bw and no restricted alcohol ≤ 13.5% VOC bw if printing on metal or plastic, contains restricted alcohol and refrigerated	≤ 1.6% VOC bw if not refrigerated ≤ 3% VOC bw if refrigerated ≤ 5% VOC bw and no restricted alcohol
Press Cleaning Solution	≤ 70% VOC bw, or ≤10 mm Hg composite partial vapor pressure at 68°F	≤ 70% VOC bw or ≤10 mmHg composite partial vapor pressure at 68°F

emissions is required to be certain. Use the Printer emission calculations worksheet as an example to help with actual emissions calculations. When using the worksheet for purposes of determining rule applicability, replace the maximum usage for each material with normal usage of all materials used but do not include a control device efficiency.

How does a business comply with these regulations?

Businesses must comply with each regulation that applies in four areas. The four areas of compliance include:

1. Emission limits
2. Record keeping
3. Compliance testing and schedule
4. Certification requirements

Table 3: RACT Emission Limits for Non-heatset Lithographic Printing

Material	Part 1	Part 2
Fountain Solution	**Web presses:** ≤ 5% VOC by weight (bw) and no restricted alcohol ≤ 13.5% VOC bw if printing on metal or plastic and refrigerated **Sheet-fed Presses:** ≤ 5% VOC bw if not refrigerated ≤ 8.5% VOC bw if refrigerated ≤ 13.5% VOC bw if printing on metal or plastic, contains restricted alcohol and refrigerated	**Web presses:** ≤ 5% VOC by weight (bw) and no restricted alcohol **Sheet-fed Presses:** ≤ 5% VOC bw if not refrigerated ≤ 8.5% VOC bw if refrigerated
Press Cleaning Solution	≤ 70% VOC bw or ≤10 mm Hg composite partial vapor pressure at 68°F	≤ 70% VOC bw or ≤10 mmHg composite partial vapor pressure at 68°F

1. Emission limits

The emission limits for Part 1 and Part 2 are summarized in Table 2 for heatset printing operations and Table 3 for nonheatset printing operations.

The following exemptions apply to printing operations subject to Part 2:

- Use of up to 110 gallons of cleaning solutions, on a 12−consecutive month rolling basis, that do not meet the VOC limitations for the cleaning solutions.
- Any lithographic press with a total fountain solution reservoir of less than one gallon is exempt from the VOC limitations for the fountain solutions.
- Sheet-fed presses with a maximum sheet size of up to 11 inches by 17 inches are exempt from the VOC limitations for the fountain solutions.
- Printing of books on any heatset lithographic press are exempt from the control device efficiency requirements.
- Heatset lithographic presses with a maximum web width of up to 22 inches are exempt from the control device efficiency requirements.

NOTE: the emission limits refer to "restricted alcohols" which means an alcohol that contains only one hydroxyl (-OH) group and less than five carbon atoms; such as methanol, ethanol, propanol and butanol.

2. Record keeping

All lithographic printing facilities located in the areas affected by these rules must keep records, even those emitting below the thresholds or claiming an exemption. Appropriate records must be kept showing compliance with any applicable requirement. If a facility is exempt from any portion of the rule, records must be kept supporting that exemption. Keep records at the facility for a minimum of five years.

A. ***Heatset web***

If a facility is using a heatset web lithographic printing press with an air pollution control device, the facility must record the following information:

1. Temperature monitoring data for control device for each day of operation.

2. A log or record of any time when the control device or control device monitoring equipment is offline while the associated printing line is in operation.
3. A maintenance log for control device monitoring equipment detailing all maintenance performed including the dates and duration of any outages.
4. Annual inspection results for catalytic oxidizers.

B. ***Fountain solutions requiring temperature monitoring***

This record keeping requirement applies only to fountain solutions that **must** be refrigerated, as indicated in the emissions limit tables:

- Record temperature of fountain solutions for each eight hour shift of operation.

C. ***All fountain solutions used***

- Record the percent by weight VOC content as applied and the chemical name of each restricted alcohol.

D. ***Cleaning solution***

- For each cleaning solution (including a blanket wash, a roller wash, a metering roller cleaner, a plate cleaner, an impression cylinder wash, a rubber rejuvenator, and any other cleaner used for cleaning a press or press parts, or to remove spilled ink or coating from areas around the press), record the percent by weight VOC content as applied or the composite partial vapor pressure for each cleaning solution as applied. For each month of operation, record the volume of all cleaning solutions used which do not meet the emission limitations shown in the tables.

3. Compliance testing

For all lithographic processes: If testing is required, the VOC content of the as-applied fountain solutions and cleaning solutions shall be determined in accordance with s. NR 439.06(3)(j), Wis. Adm. Code, which requires EPA Method 24. In addition, the vapor pressure of each VOC shall be determined by ASTM D2879-92. For more information on the test methods, check with the facility's supplier or contact DNR.

When testing is not requested, the Safety Data Sheet can be a source of the VOC contents and vapor pressure data.

For heatset web lithographic printing presses: The owner or operator of a heatset web lithographic printing press shall demonstrate compliance with the appropriate destruction efficiency limit for the dryer exhaust by performing emission tests on each control device. Initial emission tests for new presses or devices are due within 180 days after installation.

Compliance tests will be performed on one of the following schedules:

- Any facility with allowable VOC emissions from lithographic printing presses of 100 tons or more per year shall perform an emission test which demonstrates compliance with the VOC destruction efficiency requirement every 24 months. Each biennial test shall be performed within 90 days of the anniversary date of the initial emission test or an alternate date approved by the department. The testing exceptions listed in s. NR 439.075 (4), Wis. Adm. Code. may apply to this test schedule.
- Any facility with allowable VOC emissions from lithographic printing presses of less than 100 tons per year shall perform an initial emission test which demonstrates compliance with the VOC destruction efficiency requirement.

4. Certification requirements

Any facility with a lithographic printing press installed after July 1, 2019 in a county or area covered by this rule must provide a compliance certification no later than 180 days after installation either through a permit application or, if exempt from a permit, provide written certification of compliance. Written certification of compliance should include the following:

1. name of facility;
2. address where printing activities are taking place;
3. statement of compliance with the applicable sections of the rule; and
4. signature of the owner (or signature of the person at your facility responsible for ensuring compliance with this rule).

Pollution prevention tips

Following these pollution prevention tips may help reduce VOCs.

Good Housekeeping

- Cover all solvents, used clean-up towels and wipes.
- Limit solvent use by using pumps or squeeze bottles, rather than pails, to wet cleanup cloths.

Computer-to-Plate (CTP) systems

- Neutralize CTP chemistry with high pH.
- Consider using chemistry free CTP systems.

Inventory

- Order and manage to minimize expiration date of materials.
- Centralize responsibility for storing and distributing solvents.

Printing Process

- Use inks with the lowest possible VOC content for the application.
- Properly store oxidizing ink to prevent skin from forming or use "stay open" inks.

Cleanup

- Use automatic blanket washers.
- Use cleanup solution with a lower VOC content or lower vapor pressure.

Additional Assistance

Contact DNR or the Small Business Environmental Assistance Program (SBEAP) for additional assistance or resources, or visit the Printer Portal webpage: http://dnr.wi.gov/topic/SmallBusiness/Resources/Printers.html.

- SBEAP staff at 855-889-3021 or DNRSmallBusiness@wisconsin.gov
- Air Program staff at: http://dnr.wi.gov/topic/AirQuality/Contacts.html

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