

15A NCAC 02D .0961 OFFSET LITHOGRAPHIC PRINTING AND LETTERPRESS PRINTING

(a) For the purposes of this Rule, the definitions listed in this Paragraph and Rules .0101 and .0902 of this Subchapter shall apply.

- (1) "Composite partial vapor pressure" means the sum of the partial pressure of the compounds defined as volatile organic compounds. Volatile organic compounds composite partial vapor pressure is calculated as follows:

$$PP_c = \sum_{i=1}^n \frac{(W_i)(VP_i)/MW_i}{\frac{W_w}{MW_w} + \frac{W_c}{MW_c} + \sum_{i=1}^n \frac{W_i}{MW_i}}$$

Where:

W_i = Weight of the "i" volatile organic compound, in grams

W_w = Weight of water, in grams

W_c = Weight of exempt compound, in grams

MW_i = Molecular weight of the "i" volatile organic compound, in g/g-mole

MW_w = Molecular weight of water, in g/g-mole

MW_c = Molecular weight of exempt compound, in g/g-mole

PP_c = Volatile organic compounds composite partial vapor pressure at 20 degrees Celsius (68 degrees Fahrenheit), in mm Hg

VP_i = Vapor pressure of the "i" volatile organic compound at 20 degrees Celsius (68 degrees Fahrenheit), in mm Hg

- (2) "First installation date" means the actual date when this control device becomes operational. This date does not change if the control device is later redirected to a new press.
- (3) "Fountain solution" means water-based solution that applies to lithographic plate to render the non-image areas unresponsive to the ink.
- (4) "Heatset" means any operation in which heat is required to evaporate ink oils from the printing ink, excluding ultraviolet (UV) curing, electron beam curing and infrared drying.
- (5) "Letterpress printing" means a printing process in which the image area is raised relative to the non-image area and the paste ink is transferred to the substrate directly from the image surface.
- (6) "Non-heatset" means a lithographic printing process where the printing inks are set by absorption or oxidation of the ink oil, not by evaporation of the ink oils in a dryer. For the purposes of this Rule, use of an infrared heater or printing conducted using ultraviolet-cured or electron beam-cured inks is considered non-heatset.
- (7) "Offset lithography" means a printing process that uses sheet-fed or web method of press feeding and transfers ink from the lithographic plate to a rubber-covered intermediate "blanket" cylinder and then from the blanket cylinder to the substrate.
- (8) "Press" means a printing production assembly composed of one or more units used to produce a printed substrate including any associated coating, spray powder application, heatset web dryer, ultraviolet or electron beam curing units, or infrared heating units.
- (9) "Sheet-fed printing" means offset lithographic printing when individual sheets of paper or other substrate are fed to the press.
- (10) "Web printing" means offset lithographic printing when continuous rolls of substrate material are fed to the press and rewound or cut to size after printing.

(b) This Rule applies to any offset lithographic and any letterpress printing operations sources that are not covered by Subparagraph (c)(1) of Rule .0966 of this Section and whose emissions of volatile organic compounds exceed:

- (1) the threshold established in Paragraphs (b) and (f) of Rule .0902 of this Section; or
- (2) an equivalent level of three tons per 12-consecutive month rolling period.

(c) Volatile organic compounds content in the fountain solution for on-press (as-applied) heatset web offset lithographic printing shall meet one of the following requirements or equivalent level of control as determined in permit conditions:

- (1) contain 1.6 percent alcohol or less, by weight, as applied, in the fountain solution;
- (2) contain three percent alcohol or less, by weight, on-press (as-applied) in the fountain solution if the fountain solution is refrigerated to below 60 degrees Fahrenheit; or

- (3) contain five percent alcohol substitute or less, by weight, on-press (as-applied) and no alcohol in the fountain solution.
- (d) Volatile organic compounds content in the fountain solution for on-press (as-applied) sheet-fed lithographic printing shall meet one of the following requirements or equivalent level of control as determined in permit conditions:
- (1) contain five percent alcohol or less, by weight, on-press (as-applied) in the fountain solution;
 - (2) contain 8.5 percent alcohol or less, by weight, on-press (as-applied) in the fountain solution if the fountain solution is refrigerated to below 60 degrees Fahrenheit; or
 - (3) contain five percent alcohol substitute or less, by weight, on-press (as-applied) and no alcohol in the fountain solution.
- (e) Volatile organic compounds content in emissions from fountain solution from non-heatset web offset lithographic printing shall not exceed five percent alcohol substitute (by weight) on-press (as-applied) and contain no alcohol in the fountain solution.
- (f) An owner or operator of an individual web offset lithographic printing press dryer or letterpress -printing heatset press subject to this Rule that emits 25 or more tons per year potential emissions of volatile organic compounds shall:
- (1) use an enforceable limitation on potential emissions to keep individual heatset press below 25 tons per year potential to emit volatile organic compounds (petroleum ink oil) threshold, which can be achieved by using inks and coatings that contain less than 31.25 tons per year volatile organic compound (petroleum ink oil) where 20 percent retention factor of petroleum ink oil applies, or by using other methods established by permit conditions; or
 - (2) use an add-on control system that meets one of the following requirements:
 - (A) reduces volatile organic compounds emissions from each dryer by at least 90 percent volatile organic compounds emissions control efficiency established by procedures defined in Paragraph (h) of this Rule for a control device from heatset dryers at whose first installation date was prior to July 1, 2010, at facilities with potential to emit 100 tons or more of volatile organic compounds per year and May 1, 2013, at facilities with potential to emit less than 100 tons of volatile organic compounds per year; or
 - (B) reduce volatile organic compounds emissions from each dryer by at least 95 percent volatile organic compounds emissions control efficiency established by procedures defined in Paragraph (h) of this Rule for a control device from heatset dryers whose first installation date was on or after July 1, 2010, at facilities with potential to emit 100 tons or more of volatile organic compounds per year and May 1, 2013, at facilities with potential to emit less than 100 tons of volatile organic compounds per year; or
 - (C) maintain a maximum volatile organic compounds outlet concentration of 20 parts per million by volume (ppmv), as hexane (C₆H₁₄) on a dry basis.
- (g) The control limits established in:
- (1) Paragraphs (c), (d), and (e), shall not be applied to any press with total fountain solution reservoir of less than one gallon; and
 - (2) Paragraph (d) shall not be applied to sheet-fed presses with maximum sheet size 11x 17 inches or smaller; and
 - (3) Paragraph (f)(2) shall not be applied to a heatset press used for book printing, or to a heatset press with maximum web width of 22 inches or less.
- (h) If the owner or operator of a printing press is required by permit conditions to determine:
- (1) the volatile organic compounds content, the EPA test Method 24 or approved alternative methods shall be used;
 - (2) the control efficiency by measuring volatile organic compounds at the control device inlet and outlet, the EPA test Methods 18, 25, 25A, or approved alternative methods shall be used.
- (i) All test methods defined in Paragraph (h) of this Rule shall be conducted at typical operating conditions and flow rates.
- (j) The owner or operator of any facility subject to this Rule shall demonstrate compliance with RACT applicability requirements by calculating volatile organic compounds emissions and keep records of the basis of the calculations required by the Rules .0605 and .0903 of this Subchapter. Volatile organic compounds emissions from offset lithographic printing and letterpress printing shall be determined by permit condition requirements or by using the following retention and capture efficiency factors:
- (1) the retention factors are:
 - (A) 20 percent for heatset petroleum ink oils;

- (B) 100 percent for heatset vegetable ink oils;
 - (C) 95 percent for sheet-fed and coldset web petroleum ink oils;
 - (D) 100 percent for sheet-fed and coldset web vegetable ink oils.
- (2) the retention factor is 50 percent for low volatile organic compounds composite vapor pressure cleaning materials in shop towels where:
- (A) volatile organic compounds composite vapor pressure of the cleaning material is less than 10 mm Hg at 20°C; and
 - (B) cleaning materials and used shop towels are kept in closed containers.
- (3) carryover (capture) factors of volatile organic compounds from automatic blanket wash and fountain solution to offset lithographic heatset dryers are:
- (A) 40 percent VOC carryover (capture) factor for automatic blanket washing when the volatile organic compounds composite vapor pressure of the cleaning material is less than 10mmHg at 20°C.
 - (B) 70 percent VOC carryover (capture) factor for alcohol substitutes in fountain solution.
- (4) capture efficiency for volatile organic compounds (petroleum ink oils) from oil-based paste inks and oil-based paste varnishes (coatings) in heatset web offset lithographic presses and heatset web letterpress presses shall be demonstrated by showing that the dryer is operating at negative pressure relative to the surrounding pressroom. As long as the dryer is operated at negative pressure, the capture efficiency for VOC from the heatset lithographic inks and varnishes (coatings) formulated with low volatility ink oils is 100 percent of the VOC (ink oils) volatilized in the dryer. Capture efficiency test is not required in this situation.
- (k) Except as specified in this Paragraph, all cleaning materials used for cleaning a press, press parts, or to remove dried ink from areas around the press shall meet one of the following requirements:
- (1) the volatile organic compounds content shall be less than 70 percent by weight; or
 - (2) composite partial vapor pressure of volatile organic compounds shall be less than 10 mm Hg at 20 degrees Celsius.
 - (3) no more than 110 gallons per year of cleaning materials that do not meet the requirements of Subparagraph (1) or (2) of this Paragraph shall be used during any 12 consecutive months.
- (l) The owner or operator of any facility subject to this Rule shall maintain the following records for a minimum of five years:
- (1) parametric monitoring for processes and control devices as determined and at the frequency specified in the permit or by Paragraph (f) of this Rule; and
 - (2) the total amount of each individual or class of fountain solution and ink used monthly for the printing operations and the percentage of volatile organic compounds, alcohol, and alcohol substitute as applied in it; and
 - (3) the total amount of each individual or class of cleaning solutions used monthly with vapor pressure and the percentage of volatile organic compounds as applied in it; and
 - (4) the total amount of cleaning solutions used monthly with vapor pressure and the percentage of volatile organic compounds as applied which does not meet the vapor pressure or percentage of volatile organic compounds requirements of Paragraph (k) of this Rule; and
 - (5) temperature of fountain solutions for lithographic printing presses using alcohol at the frequency specified in the permit; and
 - (6) any other parameters required by the permit in accordance with the Rules .0903 and .0605 of this Subchapter.
- (m) The owner or operator of any source subject to this Rule shall comply with Rules .0903 and .0958 of this Section.

*History Note: Authority G.S. 143-215.3(a)(1); 143-215.107(a)(5);
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