

~~[R307. Environmental Quality, Air Quality.~~

~~R307-351. Graphic Arts.~~

~~R307-351-1. Purpose.~~

~~———— The purpose of this rule is to limit volatile organic compound (VOC) emissions from graphic arts printing operations.~~

~~R307-351-2. Applicability.~~

~~———— R307-351 applies to graphic arts printing operations in Box Elder, Cache, Davis, Salt Lake, Utah and Weber counties as specified below. For purposes of determining whether the emissions applicability threshold or an equivalent threshold is met, the owner or operator shall consider source-wide emissions from all printing operations including related cleaning activities prior to controls.~~

~~———— (1) R307-351-4 applies to all packaging and publication rotogravure; packaging and publication flexographic; and specialty printing operations employing VOC containing inks, including dilution and cleaning materials, that have potential to emit on a per press basis equal to or greater than 25 tons per year of VOC. Flexible packaging printing is exempt from R307-351-4.~~

~~———— (2) R307-351-5 applies to all flexible packaging printing operations with potential to emit on a per press basis, from the dryer, prior to controls, equal to or greater than 25 tons per year of VOC from inks, coatings and adhesives combined.~~

~~———— (3) R307-351-6(1) applies to individual heatset web offset lithographic printing presses and individual heatset web letterpress printing presses with potential to emit from the dryer, on a per press basis, prior to controls, equal to or greater than 25 tons per year of VOC. Heatset presses used for book printing and heatset presses with maximum web width of 22 inches or less are exempt from R307-351-6(1).~~

~~———— (4) R307-351-6(4) applies to offset lithographic printing operations that emit at least 2.7 tons per year actual emissions of VOC, or an equivalent level, before consideration of controls. Any press with total fountain solution reservoir of less than one gallon and sheet fed presses with maximum sheet size of 11 inches by 17 inches or smaller are exempt from R307-351-6(4).~~

~~———— (5) R307-351-6(5) applies to offset lithographic printing and letterpress printing operations that emit at least 2.7 tons per year actual emissions of VOC, or an equivalent level, before consideration of controls. Cleaners used on electronic components of a press, pre-press cleaning operations (e.g., platemaking), post-press cleaning operations (e.g., binding), cleaning supplies (e.g., detergents) used to clean the floor (other than dried ink) in the area around a press, or cleaning performed in parts washers or cold cleaners are exempt from R307-351-6(5).~~

~~———— (6) R307-351-7 applies to all graphic arts printing operations that emit at least 2.7 tons per year actual emissions of VOC, or an equivalent level, before consideration of controls.~~

~~R307-351-3. Definitions.~~

~~———— The following additional definitions apply to R307-351:~~

~~———— "Alcohol" means any of the following compounds, when used as a fountain solution additive for offset lithographic printing: ethanol, n-propanol, and isopropanol.~~

~~———— "Alcohol Substitute" means a nonalcohol additive that contains VOCs and is used in the fountain solution.~~

~~———— "Automatic Blanket Wash System" means equipment used to clean lithographic blankets which can include, but is not limited to those utilizing a cloth and expandable bladder, brush, spray, or impregnated cloth system.~~

———"Cleaning Solution" means a liquid solvent or solution used to clean the operating surfaces of a printing press and its parts. Cleaning solutions include, but are not limited to blanket wash, roller wash, metering roller cleaner, plate cleaner, impression cylinder washes, rubber rejuvenators, and other cleaners used for cleaning a press, press parts, or to remove dried ink or coating from areas around the press.

———"Blanket" means a synthetic rubber material that is wrapped around a cylinder used in offset lithography to transfer or "offset" an image from an image carrier.

———"Capture efficiency" means the fraction of all VOC emissions generated by a process that are delivered to a control device, expressed as a percentage.

———"Capture system" means the equipment (including hoods, ducts, fans, etc.) used to collect, capture, or transport a pollutant to a control device.

———"Coating" means material applied onto or impregnated into a substrate. Such materials include, but are not limited to, solvent borne and waterborne coatings.

———"Composite partial vapor pressure" means the sum of the partial pressure of the compounds defined as VOCs.

———"Control device" means a device such as a carbon adsorber or oxidizer which reduces the VOC in an exhaust gas by recovery or by destruction.

———"Control device efficiency" means the ratio of VOC emissions recovered or destroyed by a control device to the total VOC emissions that are introduced into the control device, expressed as a percentage.

———"Flexible packaging" means any package or part of a package the shape of which can be readily changed. Flexible packaging includes, but is not limited to, bags, pouches, liners and wraps utilizing paper, plastic, film, aluminum foil, metalized or coated paper or film, or any combination of these materials.

———"Flexographic press" means an unwind or feed section, which may include more than one unwind or feed station (such as on a laminator), a series of individual work stations, one or more of which is a flexographic print station, any dryers (including interstage dryers and overhead tunnel dryers) associated with the work stations, and a rewind, stack, or collection section. The work stations may be oriented vertically, horizontally, or around the circumference of a single large impression cylinder. Inboard and outboard work stations, including those employing any other technology, such as rotogravure, are included if they are capable of printing or coating on the same substrate. A publication rotogravure press with one or more flexographic imprinters is not a flexographic press.

———"Flexographic printing" means the application of words, designs, and pictures to substrate by means of a roll printing technique in which the pattern to be applied is raised above the printing roll and the image carrier is made of rubber or other elastomeric materials.

———"Fountain solution" means a mixture of water and other volatile and non-volatile chemicals and additives that wets the nonimage area of a lithographic printing plate so that the ink is maintained within the image areas.

———"Heatset" means an offset lithographic printing or letterpress printing operation in which the ink solvents are vaporized by passing the printed surface through a dryer.

———"Letterpress printing" means a method where the image area is raised relative to the non-image area and the ink is transferred to the substrate directly from the image surface.

———"Narrow web flexographic press" means a flexographic press that is not capable of printing substrates greater than 18 inches in width and that does not also meet the definition of rotogravure press (i.e., it has no rotogravure print stations).

———"Non-heatset", also called coldset, means an offset lithographic printing or letterpress printing

operation in which the ink dries by oxidation and/or absorption into the substrate without use of heat from dryers.

———"Offset lithographic printing" means a planographic method in which the image and non-image areas are on the same plane and the ink is offset from a plate to a rubber blanket, and then from the blanket to the substrate.

———"Overall control efficiency" means the total efficiency of a control system, determined either by:

———(1) The product of the capture efficiency and the control device efficiency; or

———(2) A liquid-liquid material balance.

———"Packaging printing" means rotogravure or flexographic printing, not otherwise defined as publication printing, upon paper, paper board, metal foil, plastic film, and other substrates, which are, in subsequent operations, formed into packaging products and labels. This includes, but is not limited to, folding cartons, flexible packaging, labels and wrappers.

———"Printing operation" means the application of words, designs, or pictures on a substrate. All units in a machine which have both coating and printing units shall be considered as performing a printing operation.

———"Printing Press" means a printing production assembly composed of one or more units used to produce a printed substrate, including but not limited to, any associated coating, spray powder application, heatset web dryer, ultraviolet or electron beam curing units, or infrared heating units.

———"Publication rotogravure printing" means rotogravure printing upon paper that is subsequently formed into books, magazines, catalogues, brochures, directories, newspaper supplements, and other types of printed materials.

———"Publication rotogravure press" means a rotogravure press used for publication rotogravure printing. A publication rotogravure press may include one or more flexographic imprinters. A publication rotogravure press with one or more flexographic imprinters is not a flexographic press.

———"Roll coating" means the application of a coating material to a substrate by means of hard rubber or steel rolls.

———"Roll printing" means the application of words, designs and pictures to a substrate usually by means of a series of hard rubber or steel rolls each with only partial coverage.

———"Rotogravure coating" means the application of a uniform layer of material across the entire width of the web to substrate by means of a roll-coating technique in which the pattern to be applied is etched on the coating roll. The coating material is picked up in these recessed areas and is transferred to the substrate.

———"Rotogravure press" means an unwind or feed section, which may include more than one unwind or feed station (such as on a laminator), a series of individual work stations, one or more of which is a rotogravure print station, any dryers associated with the work stations, and a rewind, stack, or collection section. Inboard and outboard work stations, including those employing any other technology, such as flexography, are included if they are capable of printing or coating on the same substrate.

———"Rotogravure printing" means the application of words, designs, and pictures to a substrate by means of a roll printing technique that involves a recessed image area in the form of cells.

———"Specialty printing operations" means all gravure and flexographic operations that print a design or image, excluding publication and packaging printing. Specialty printing operations include, among other things, printing on paper cups and plates, patterned gift wrap, wallpaper, and floor coverings.

———"Web" means a continuous roll of substrate.

~~———— "Wide web flexographic press" means a flexographic press capable of printing substrates greater than 18 inches in width.~~

~~**R307-351-4. Standards for Rotogravure, Flexographic, and Specialty Printing Operations.**~~

~~———— (1) No owner or operator of a packaging and publication rotogravure; packaging and publication flexographic, and specialty printing operations employing VOC-containing ink may operate, cause, or allow or permit the operation of a facility unless:~~

~~———— (a) The volatile fraction of ink, as it is applied to the substrate, contains 25.0% by volume or less of VOC and 75.0% by volume or more of water; or~~

~~———— (b) The ink as it is applied to the substrate, less water, contains 60.0% by volume or more nonvolatile material; or~~

~~———— (c) The owner or operator installs and operates either a carbon adsorption system as described in R307-351-4(1)(c)(i) or an incineration system as described in R307-351-4(1)(c)(ii).~~

~~———— (i) A carbon adsorption system shall reduce the volatile organic emissions from the capture system by a minimum of 90.0% by weight.~~

~~———— (ii) An incineration system shall oxidize, from the capture system, a minimum of 90.0% of the non-methane VOCs measured as total combustible carbon to carbon dioxide and water.~~

~~———— (iii) A capture system as described in R307-351-4(1)(c)(iv) shall be used in conjunction with a carbon adsorption system and an incineration system.~~

~~———— (iv) The design and operation of a capture system must be consistent with good engineering practices and shall be required to provide for an overall reduction in VOC emissions of at least:~~

~~———— (A) 75.0% where a publication rotogravure process is employed;~~

~~———— (B) 65.0% where a packaging rotogravure process is employed; or~~

~~———— (C) 60.0% where a flexographic printing process is employed.~~

~~———— (2) The owner or operator of an emission control device shall provide documentation that the system will attain the requirements of R307-351-4.~~

~~———— (3) The Emission control system shall be operated and maintained in accordance with the manufacturer recommendations.~~

~~———— (4) The owner or operator of an emission control device shall maintain for a minimum of two years records of operating and maintenance sufficient to demonstrate that the equipment is being operated and maintained in accordance with the manufacturer recommendations.~~

~~**R307-351-5. Standards for Flexible Packaging Printing Operations.**~~

~~———— (1) Presses used for flexible packaging printing shall comply with an 80% overall emission control efficiency.~~

~~———— (a) The owner or operator of an emission control device shall provide documentation that the emissions control system will attain the requirements of R307-351-5.~~

~~———— (b) The Emission control system shall be operated and maintained in accordance with the manufacturer recommendations.~~

~~———— (2) The owner or operator of an emission control device shall maintain for a minimum of two years records of operating and maintenance sufficient to demonstrate that the equipment is being operated and maintained in accordance with the manufacturer recommendations.~~

~~———— (3) As an alternative to the overall control efficiency, the following two equivalent VOC content limits may be met by use of low VOC content materials or combinations of materials and controls as follows:~~

~~———— (a) 0.8 kg VOC/kg solids applied; or~~

~~—— (b) 0.16 kg VOC/kg materials applied.~~

~~—— (c) The VOC content limits can be met by averaging the VOC content of materials used on a single press, i.e., within a line. The use of averaging to meet the VOC content limits is not allowed for cross line, i.e., across multiple lines.~~

~~**R307-351-6. Standards for Offset Lithographic Printing and Letterpress Printing Operations.**~~

~~—— (1) Requirements for heatset web offset lithographic and heatset letterpress inks and dryers.~~

~~—— (a) Individual heatset web offset lithographic printing presses and individual heatset web letterpress printing presses shall comply with 90% control efficiency for the control device on heatset dryers.~~

~~—— (b) The owner or operator of an emission control device shall provide documentation that the emissions control system will attain the requirements of R307-351-6.~~

~~—— (c) The Emission control system shall be operated and maintained in accordance with the manufacturer recommendations.~~

~~—— (2) The owner or operator shall maintain for a minimum of two years records of operating and maintenance sufficient to demonstrate that the equipment is being operated and maintained in accordance with the manufacturer recommendations.~~

~~—— (3) As an alternative to the control efficiency, the control device outlet concentration may be reduced to 20 ppmv as hexane on a dry basis to accommodate situations where the inlet VOC concentration is low or there is no identifiable measurable inlet.~~

~~—— (4) Requirements for fountain solution.~~

~~—— (a) For heatset web offset lithographic printing, the level of control for VOC emissions from on press (as applied) fountain solution shall meet one of the following:~~

~~—— (i) 1.6% alcohol or less (by weight) in the fountain;~~

~~—— (ii) 3.0% alcohol or less (by weight) in the fountain solution if the fountain solution is refrigerated to below 60 degrees Fahrenheit; or~~

~~—— (iii) 5.0% alcohol substitute or less (by weight) and no alcohol in the fountain solution.~~

~~—— (b) For sheet fed offset lithographic printing, the level of control for VOC emissions from on press (as applied) fountain solution shall meet one of the following:~~

~~—— (i) 5.0% alcohol or less (by weight) in the fountain;~~

~~—— (ii) 8.5% alcohol or less (by weight) in the fountain solution provided the fountain solution is refrigerated to below 60 degrees Fahrenheit; or~~

~~—— (iii) 5.0% alcohol substitute or less (by weight) and no alcohol in the fountain solution.~~

~~—— (c) For non heatset web offset lithographic printing, the level of control for VOC emissions shall be 5.0% alcohol substitute or less (by weight) on press (as applied) and no alcohol in the fountain solution.~~

~~—— (5) Requirements for cleaning materials.~~

~~—— (a) For blanket washing, roller washing, plate cleaners, metering roller cleaners, impression cylinder cleaners, rubber rejuvenators, and other cleaners used for cleaning a press, press parts, or to remove dried ink from areas around a press, only cleaning materials with a VOC composite vapor pressure of less than ten mm Hg at 68 degrees Fahrenheit or cleaning materials containing less than 70 weight percent VOC shall be used.~~

~~—— (b) Up to 110 gallons per year of cleaning materials which meet neither the VOC composite vapor pressure requirement nor the VOC content requirement may be used.~~

~~R307-351-7. Work Practices and Recordkeeping.~~

~~_____ (1) Control techniques and work practices are to be implemented at all times to reduce VOC emissions from fugitive type sources. Control techniques and work practices include:~~

~~_____ (a) Tight fitting covers for open tanks; and~~

~~_____ (b) Keeping cleaning materials, used shop towels, and solvent wiping cloths in closed containers.~~

~~_____ (2) Record keeping and reporting.~~

~~_____ (a) The owner or operator of any source subject to R307-351 shall maintain:~~

~~_____ (i) Records of the annual usage of all materials that may be a source of VOC emissions including, but not limited to, inks, coatings, adhesives, fountain solution, and cleaning materials.~~

~~_____ (ii) All sources subject to R307-351 shall maintain records demonstrating compliance with all provisions of R307-351. These records shall be available to the director upon request.~~

~~R307-351-8. Compliance Schedule.~~

~~_____ (1) All sources within Salt Lake and Davis counties shall be in compliance with this rule by the effective date of this rule.~~

~~_____ (2) All sources within Box Elder, Cache, Utah and Weber counties shall be in compliance with this rule by January 1, 2014.~~

~~KEY: air pollution, graphic arts, VOC, printing operations~~

~~Date of Enactment or Last Substantive Amendment: February 1, 2013~~

~~Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)]~~

R307. Environmental Quality, Air Quality.

R307-351. Graphic Arts.

R307-351-1. Purpose.

_____ The purpose of R307-351 is to limit volatile organic compound (VOC) emissions from graphic arts printing operations.

R307-351-2. Applicability.

_____ R307-351 applies to graphic arts printing operations that use a combined 450 gallons or more of all VOC-containing materials per year and are located in Box Elder, Cache, Davis, Salt Lake, Utah, Tooele, or Weber counties.

R307-351-3. Exemptions.

_____ (1) The provisions of R307-351 shall not apply to graphic arts materials that have a VOC content of less than 25 g/L, minus water and exempt VOCs, as applied.

_____ (2) A graphic arts printing operation may use up to 55 gallons of cleaning materials per year that do not comply with the VOC composite vapor pressure requirement or the VOC content requirement in R307-351-5(4).

R307-351-4. Definitions.

_____ The following additional definitions apply to R307-351:

_____ "Alcohol" means any of the following compounds, when used as a fountain solution additive for offset lithographic printing: ethanol, n-propanol, and isopropanol.

"Alcohol Substitute" means a non-alcohol additive that contains VOCs and is used in the fountain solution.

"Cleaning materials and solutions" means a liquid solvent or solution used to clean the operating surfaces of a printing press and its parts. Cleaning materials and solutions include, but are not limited to blanket wash, roller wash, metering roller cleaner, plate cleaner, impression cylinder washes, rubber rejuvenators, and other cleaners used for cleaning a press, press parts, or to remove dried ink or coating from areas around the press.

"Blanket" means a synthetic rubber material that is wrapped around a cylinder used in offset lithography to transfer or "offset" an image from an image carrier.

"Control system" means the combination of capture and control devices used to reduce emissions to the atmosphere.

"Flexographic printing" means the application of words, designs, and pictures to substrate by means of a roll printing technique in which the pattern to be applied is raised above the printing roll and the image carrier is made of rubber or other elastomeric materials.

"Fountain solution" means a mixture of water and other volatile and non-volatile chemicals and additives that wets the non-image area of a lithographic printing plate so that the ink is maintained within the image areas.

"Graphic arts materials" means any inks, coatings, or adhesives, including added thinners or retarders, used in printing or related coating or laminating processes.

"Graphic arts printing" means the application of words and images using the offset lithographic, letterpress, rotogravure, or flexographic printing process.

"Heatset" means an offset lithographic printing or letterpress printing operation in which the ink solvents are vaporized by passing the printed surface through a dryer.

"Letterpress printing" means a method where the image area is raised relative to the non-image area and the ink is transferred to the substrate directly from the image surface.

"Non-heatset", also called coldset, means an offset lithographic printing or letterpress printing operation in which the ink dries by oxidation and/or absorption into the substrate without use of heat from dryers. 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.

"Offset lithographic printing" means a plane-o-graphic method in which the image and non-image areas are on the same plane and the ink is offset from a plate to a rubber blanket, and then from the blanket to the substrate.

"Printing operation" means the application of words, designs, or pictures on a substrate. All units in a machine which have both coating and printing units shall be considered as performing a printing operation.

"Rotogravure printing" means the application of words, designs, and pictures to a substrate by means of a roll printing technique that involves a recessed image area in the form of cells.

"Web" means a continuous roll of substrate.

R307-351-5. VOC Content Limits.

(1) No owner or operator shall apply graphic arts materials with a VOC content greater than the amounts specified in Table 1 or Table 2, unless the owner or operator uses an add-on control device as specified in R307-351-6.

TABLE 1

VOC Limits

(values in gram of VOC per liter, minus water and exempt solvents (compounds not classified as VOC as defined in R307-101-2))

<u>Graphic Art Material</u>	<u>VOC Limit (g/L)</u>
<u>Adhesive</u>	<u>150</u>
<u>Coating</u>	<u>300</u>
<u>Flexographic Fluorescent Ink</u>	<u>300</u>
<u>Flexographic Ink-Non-Porous Substrate</u>	<u>300</u>
<u>Flexographic Ink-Porous Substrate</u>	<u>225</u>
<u>Gravure Ink</u>	<u>300</u>
<u>Letterpress Ink</u>	<u>300</u>
<u>Offset Lithographic Ink</u>	<u>300</u>
<u>Heatset Web Offset Litographic ink</u>	<u>300</u>
<u>Heatset Web Offset Lithographic Ink:</u>	
<u>Used on Book Presses and Presses</u>	
<u>Less Than 22 Inches in Diameter</u>	<u>400</u>
<u>Used on Presses With Potential to Emit Less</u>	
<u>Than 10 Tons/Year</u>	<u>400</u>

(2) No owner or operator shall apply fountain solution, including additives with a VOC content greater than the amounts specified in Table 2, unless the owner or operator uses an add-on control device as specified in R307-351-6.

TABLE 2

VOC Limits

(values in gram of VOC per liter, minus water and exempt solvents (compounds not classified as VOC as defined in R307-101-2))

<u>Graphic Art Material</u>	<u>VOC Limit (g/L)</u>
<u>Heatset Web-Fed</u>	
<u>Alcohol without Refrigerated Chiller</u>	<u>16</u>
<u>Alcohol with Refrigerated Chiller</u>	<u>30</u>
<u>Alcohol Substitute</u>	<u>50</u>
<u>Sheet-Fed</u>	
<u>Alcohol without Refrigerated Chiller</u>	<u>50</u>
<u>Alcohol with Refrigerated Chiller</u>	<u>85</u>
<u>Alcohol Substitute</u>	<u>50</u>
<u>Non-Heatset Web-Fed</u>	

(3) Alcohol containing fountain solutions shall not be used in non-heatset web-fed operations.

(4) Cleaning materials with a VOC composite vapor pressure of less than 10 mm Hg at 68 degrees Fahrenheit or cleaning materials containing less than 50 percent VOC by weight shall be used.

R307-351-6. Add-on Controls Systems Operations.

(1) If an add-on control system is used, the owner or operator shall install and maintain the add-on emission control system in accordance with the manufacturer recommendations.

(a) Control devices for individual heatset web offset lithographic printing presses and individual heatset web letterpress printing press dryers that were installed prior to January 1, 2017, must maintain a 90% or greater control efficiency. Similar control devices installed after January 1, 2017, must maintain a 95% or greater control efficiency.

(b) Control devices for individual flexographic printing presses and individual rotogravure printing presses shall comply with a 90% or greater overall control efficiency.

(c) As an alternative to the control efficiency, the control device outlet concentration may be reduced to 20 ppmv as hexane on a dry basis to accommodate situations where the inlet VOC concentration is low or there is no identifiable measurable inlet. The control outlet concentration shall be determined using EPA Method 25A.

(d) The capture efficiency of a VOC emission control system's VOC collection device for flexographic and rotogravure presses shall be determined according to EPA's "Guidelines for Determining Capture Efficiency," January 9, 1995 and 40 CFR Part 51, Appendix M, Methods 204-204F, as applicable.

(e) The capture efficiency of a VOC emission control system's VOC collection device for a heatset web offset press shall be determined by demonstrating that the airflow in the dryer is negative to the surrounding pressroom during the initial test using an air flow direction indicator, such as a smoke stick or aluminum ribbons, or differential pressure gauge.

(f) The control efficiency of a VOC emission control system's VOC control device shall be determined using test methods in Appendices A-1, A-6, and A-7 to 40 CFR Part 60, for measuring flow rates, total gaseous organic concentrations, or emissions of exempt compounds, as applicable.

(g) An alternative test method may be substituted for the preceding test methods after review and approval by the EPA Administrator.

R307-351-7. Work Practices.

(1) Control techniques and work practices shall be implemented at all times to reduce VOC emissions. Control techniques and work practices include:

(a) Keeping cleaning materials, used shop towels, and solvent wiping cloths in closed containers; and

(b) Minimizing spills of VOC-containing cleaning materials.

R307-351-8. Recordkeeping.

(1) The owner or operator shall maintain records of the following:

(a) Records that demonstrate compliance with R307-351. Records must include, but are

not limited to, inventory and product data sheets of all graphic arts materials and cleaning solutions subject to R307-351.

(b) If an add-on control device is used, records of key system parameters necessary to ensure compliance with R307-351-6. Key system parameters include, but are not limited to, temperature, pressure, flow rates, and an inspection schedule. Key inspection parameters shall be in accordance with the manufacturer's recommendations, and as required to demonstrate that operations provide continuous emission reduction from the source during all periods that the operations cause emissions from the source.

(2) All records shall be maintained for a minimum of 2 years.

(3) Records shall be made available to the director upon request.

KEY: air pollution, graphic arts, VOC, printing operations

Date of Enactment or Last Substantive Amendment:

Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)