37.0 Graphic Arts Systems

(2010 revision, draft 1)

~~11/29/1994~~ xx/xx/2010

37.1 Applicability

37.1.1 The provisions of 37.0 of this regulation apply to any packaging rotogravure, publication rotogravure, or flexographic printing press at any facility whose maximum theoretical emissions of volatile organic compounds (VOCs) (including solvents used to clean each of these printing presses) without control devices from all printing presses are greater than or equal to 7.7 tons per year~~.~~ on and after [insert effective date of this regulation], and

37.1.2 Transition period for existing permitted sources. Every owner or operator of press that is subject to 37.5.1.2.2 of this regulation and that is covered by a permit issued pursuant to 7 DE Admin Code 1102 or 1130 containing all applicable conditions of 37.0 of this regulation, as that regulation existed on November 29, 1994, shall comply with those permit conditions until December 31, 2010. On and after January 1, 2011, every such owner or operator of any flexible package printing facility shall comply with the provisions of 37.0 of this regulation.

37.1.3~~2~~ An owner or operator of a facility whose emissions are below the applicability threshold**s** in 37.1.1 and 37.5.1.2.2 of this regulation shall comply with the certification, recordkeeping, and reporting requirements of 37.7.1 of this regulation.

37.1.4~~3~~ Any facility that becomes or is currently subject to the provisions of 37.0 of this regulation by exceeding the applicability threshold**s** in 37.1.1 and 37.5.1.2.2 of this regulation will remain subject to these provisions even if its emissions later fall below the applicability threshold**s**.

37.1.5~~4~~ Any facility that is currently subject to a state or federal rule promulgated pursuant to the Clean Air Act Amendments of 1977 by exceeding an applicability threshold is and will remain subject to these provisions, even if its throughput or emissions have fallen or later fall below the applicability threshold.

37.2 Definitions. As used in 37.0 of this regulation, all terms not defined herein shall have the meaning given them in the November 15, 1990 Clean Air Act Amendments, or in 2.0 of this regulation.

"Add-on air pollution control device (APCD)" means an emission control device or system that is originally separated from an emission source but can be later added or installed to the emission source to reduce emission from the source.

"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.

"Flexible packaging printing" means printing, coating and laminating activities being performed on or in-line with a flexible packaging printing press.

“Flexographic printing press” means a printing press that uses 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.

“Packaging rotogravure printing press” means a rotogravure printing press used to print on paper, paper board, metal foil, plastic film, and other substrates that are, in subsequent operations, formed into packaging products and labels, and other non-publication products.

“Press-Ready Ink” means ink, as applied to a substrate, after all solvents and diluents have been added.

“Printing press” means equipment used to apply words, pictures, or graphic designs to either a continuous substrate or a sheet. A continuous substrate consists of paper, plastic, or other material that is unwound from a roll, passed through coating or ink applicators and any associated drying areas. The press includes all coating and ink applicators and drying areas between unwind and rewind of the continuous substrate. A sheet consists of paper, plastic, or other material that is carried through the process on a moving belt. The press includes all coating and ink applicators and drying operations between the time that the sheet is put on the moving belt until it is taken off.

“Publication rotogravure printing press” means a rotogravure printing press on which the following paper products are printed:

1. Catalogues, including mail order and premium.
2. Direct mail advertisements, including circulars, letters, pamphlets, cards, and printed envelopes.
3. Display advertisements, including general posters, outdoor advertisements, car cards, window posters; counter and floor displays; points-of-purchase, and other printed display material.
4. Magazines, books.
5. Miscellaneous advertisements, including brochures, pamphlets, catalogue sheets, circular folders, announcements, package inserts, book jackets, market circulars magazine inserts, and shopping news.
6. Newspapers, magazine and comic supplements for newspapers, and preprinted newspaper inserts, including hi-fi and spectacolor rolls and Sections.
7. Periodicals.
8. Telephone and other directories, including business reference services.

“Roll printing” means the application of words, designs, and pictures to a substrate, usually by means of a series of rolls each with only partial coverage.

“Rotogravure printing press” means any printing press designed to print on a substrate using a gravure cylinder.

37.3 Standards

37.3.1 No owner or operator of a packaging rotogravure or flexographic printing press subject to 37.0 of this regulation shall apply any coating or ink unless the VOC content is equal to or less than one of the following:

37.3.1.1 40% VOC by volume of the coating or ink, excluding water and exempt compounds, as applied.

37.3.1.2 25% VOC by volume of the volatile content in the coating or ink, as applied.

37.3.1.3 0.5 kilogram (kg) VOC per kg (0.5 pound [lb] VOC per lb) coating solids, as applied.

37.3.2 No owner or operator of a publication rotogravure printing press subject to 37.0 of this regulation shall apply any coating or ink unless the VOC content is equal to or less than one of the following:

37.3.2.1 40% VOC by volume of the coating or ink, excluding water and exempt compounds, as applied.

37.3.2.2 25% VOC by volume of the volatile content in the coating or ink, as applied.

37.3.3 As an alternative to compliance with the limits in 37.3.1 or 37.3.2 of this regulation, an owner or operator of a packaging rotogravure, publication rotogravure, or flexographic printing press may comply with the requirements of this regulation by meeting the requirements of 37.4 or 37.5 of this regulation.

37.4 Daily-weighted average limitations

37.4.1 No owner or operator of a packaging rotogravure, publication rotogravure, or flexographic printing press shall apply, during any day, coatings or inks on the subject printing press unless the daily-weighted average, by volume, VOC content of all coatings and inks, as applied, each day on the subject printing press is equal to or less than the limitation specified in either 37.3.1.1 or 37.3.2.1 (as determined by 37.4.4); 37.3.1.2 or 37.3.2.2 (as determined by 37.4.5); or, in the case of packaging rotogravure or flexographic printing, 37.3.1.3 (as determined by 37.4.6) of this regulation.

37.4.2 An owner or operator may comply with the daily-weighted average limitation by grouping coatings or inks used on a printing press into two categories that meet the conditions in 37.4.2.1 and 37.4.2.2 of this regulation. Any use of averaging between the two categories of coating or inks used on a packaging rotogravure press or on a flexographic press requires compliance with the emission standard in 37.3.1.3 of this regulation, as determined by the equation in 37.4.6 of this regulation.

37.4.2.1 The daily-weighted average VOC content for the first category shall comply with 37.3.1.1 or 37.3.2.1 of this regulation, as determined by applying the equation in 37.4.4 of this regulation to the coatings or inks in this first category.

37.4.2.2 The daily weighted-average VOC content for the second category shall comply with 37.3.1.2 or 37.3.2.2 of this regulation, as determined by applying the equation in 37.4.5 of this regulation to the coatings or inks in this second category.

37.4.3 Compliance with 37.0 of this regulation shall be demonstrated through the applicable coating or ink analysis test methods and procedures specified in **Appendix B** of this regulation and the recordkeeping and reporting requirements specified in 37.7.3 of this regulation.

37.4.4 The following equation shall be used to determine if the weighted average VOC content of all coatings and inks, as applied, each day on the subject printing press exceeds the limitation specified in 37.3.1.1 or 37.3.2.1 of this regulation:

$$VOC_{(i)(A)} = \frac{\sum_{i=1}^{n} L_i V_{VOCi}}{\sum_{i=1}^{n} L_i (V_{si} + V_{VOCi})} \times 100$$

(37-1)

where:

$VOC_{(i)(A)}$ = The weighted average VOC content in units of percent VOC by volume of all coatings and inks (excluding water and exempt compounds) used each day.

i = Subscript denoting a specific coating or ink, as applied.

n = The number of different coatings or inks, as applied, each day on a printing press.

L_i = The liquid volume of each coating or ink, as applied, used that day in units of liters (L) (gallons [gal]).

V_{si} = The volume fraction of solids in each coating or ink, as applied.

V_{VOCi} = The volume fraction of VOC in each coating or ink, as applied.

37.4.5 The following equation shall be used to determine if the weighted average VOC content of all coatings and inks, as applied, each day on the subject printing press exceeds the limitation specified in 37.3.1.2 or 37.3.2.2 of this regulation:

$$VOC_{(i)(B)} = \frac{\sum_{i=1}^{n} L_i V_{VOCi}}{\sum_{i=1}^{n} L_i (V_{VCi})} \times 100$$

(37-2)

where:

$VOC_{(i)(B)}$ = The weighted average VOC content in units of percent VOC by volume of the volatile content of all coatings and inks used each day.

i = Subscript denoting a specific coating or ink, as applied.

n = The number of different coatings or inks, as applied, each day on each printing press.

L_i = The liquid volume of each coating or ink, as applied, in units of L (gal).

V_{VOCi} = The volume fraction of VOC in each coating or ink, as applied.

V_{VCi} = The volume fraction of volatile matter in each coating or ink, as applied.

37.4.6 The following equation shall be used to determine if the weighted average VOC content of all coatings and inks, as applied, each day on the subject printing press exceeds the limitation specified in 37.3.1.3 of this regulation:

$$VOC_{(i)(C)} = \frac{\sum_{i=1}^{n} L_i D_i W_{VOCi}}{\sum_{i=1}^{n} L_i D_i W_{si}}$$

(37-3)

where:

$VOC_{(i)(C)}$ = The weighted average VOC content in units of mass of VOC per mass of coating solids.

i = Subscript denoting a specific coating or ink, as applied.

n = The number of different coatings or inks, as applied, each day on a printing press.

L_i = The liquid volume of each coating or ink, as applied, used on the day in units of L (gal).

D_i = The density of each, as applied, in units of mass of coating or ink per unit volume of coating or ink.

W_{VOCi} = The weight fraction of VOC in each coating or ink, as applied.

W_{si} = The weight fraction of solids in each coating or ink, as applied.

37.5 Control devices

37.5.1 No owner or operator of a packaging rotogravure, publication rotogravure, or flexographic printing press equipped with a control system shall operate the printing press unless the owner or operator meets one of the requirements under 37.5.1.1 and 37.5.1.2 of this regulation.

37.5.1.1 Control device efficiency

37.5.1.1.1 A carbon adsorption control device is used that reduces the VOC emissions delivered from the capture system to the control device by at least 90% by weight.

37.5.1.1.2 An incineration control device is used to reduce VOC emissions delivered from the capture system to the control device by at least 90%, by weight.

37.5.1.1.3 Any other VOC emission control device is used to reduce the VOC emissions delivered from the capture system to the control device by at least 90%.

37.5.1.2 Overall control efficiency. The printing press is equipped with a capture system and control device that provides ~~an overall emission reduction efficiency of at least~~:

37.5.1.2.1 For any press not subject to 37.5.1.2.2 of this regulation, an overall emission reduction efficiency of at least:

37.5.1.2.1.1 75% for a publication rotogravure printing press.

37.5.1.2.1.2 65% for a packaging rotogravure printing press.

37.5.1.2.1.3 60% for a flexographic printing press.

37.5.1.2.2 For any individual flexible packing printing press with the potential-to-emit before controls greater than 25 tons of VOC per year, an overall emission reduction efficiency specified in 37.5.1.2.1, or specified in 37.5.1.2.2.1 through 37.5.1.2.2.4 below, whichever is higher:

37.5.1.2.2.1 80% for any press that was first installed on or after March 14, 1995 and that is controlled by an APCD whose first installation date was on or after (insert the effective date of this revision).

37.5.1.2.2.2 75% for any press that was first installed on or after March 14, 1995 and that is controlled by an APCD whose first installation date was prior to (insert the effective date of this revision).

37.5.1.2.2.3 70% for any press that was first installed prior to March 14, 1995 and that is controlled by an APCD whose first installation date was on or after (insert the effective date of this revision).

37.5.1.2.2.4 65% for any press that was first installed prior to March 14, 1995 and that is controlled by an APCD whose first installation date was prior to (insert the effective date of this revision).

37.5.2 An owner or operator of a packaging rotogravure, publication rotogravure, or flexographic printing press equipped with a control system shall ensure that:

37.5.2.1 A capture system and control device are operated at all times that the printing press is in operation, and the owner or operator demonstrates compliance with 37.0 of this regulation through the applicable coating analysis and capture system and control device efficiency test methods specified in **Appendix B**, **Appendix D** and **Appendix E** of this regulation and in accordance with the capture efficiency test methods in **Appendix D** of this regulation.

37.5.2.2 The control device is equipped with the applicable monitoring equipment specified in 2.0 of **Appendix D** of this regulation, and the monitoring equipment is installed, calibrated, operated, and maintained according to the vendor's specifications at all times the control device is in use.

37.6 Test methods. The VOC content of each coating and ink and the efficiency of each capture system and control device shall be determined by the applicable test methods and procedures specified in **Appendix A** through **Appendix D** of this regulation to establish the records required under 37.7 of this regulation.

37.7 Recordkeeping and reporting

37.7.1 Requirements for exempt sources. Within six months after [insert the effective date of this revision of 37.0], ~~By November 15, 1993~~, any owner or operator of a printing press that is exempt from the requirements of 37.0 of this regulation because of the criteria in 37.1 of this regulation shall comply with the following:

37.7.1.1 Initial certification. The owner or operator shall certify to the Department that the facility is exempt under the provisions of 37.1 of this regulation. Such certification shall include:

37.7.1.1.1 The name and location of the facility.

37.7.1.1.2 The address and telephone number of the person responsible for the facility.

37.7.1.1.3 A declaration that the facility is exempt from 37.0 of this regulation because of the criteria in 37.1 of this regulation.

37.7.1.1.4 Calculations demonstrating that total potential emissions of VOC from all flexographic and rotogravure printing presses at the facility are and will be less than 7.7 tons per year of press-ready ink, before the application of capture systems and control devices. Total potential emissions of VOC for a flexographic or rotogravure printing facility is the sum of potential emissions of VOC from each flexographic and rotogravure printing press at the facility. The following equation shall be used to calculate total potential emissions of VOC per calendar year before the application of capture systems and control devices for each flexographic and rotogravure printing press at the facility:

$$E_P = A \times B \qquad (37\text{-}4)$$

where:

E_P = Total potential emissions of VOC from one flexographic or rotogravure printing press in units of kilograms per year (kg/yr) (pounds per year [lb/ yr]).

A = Weight of VOC per volume of solids of the coating or ink with the highest VOC content, as applied, each year on the printing press in units of kilograms VOC per liter (kg VOC/L) (pounds of VOC per gallon [lb VOC/gal]) of coating or ink solids.

B = Total volume of solids for all coatings and inks that can potentially be applied each year on the printing press in units of liters per year (L/yr) (gallons per year [gal/yr]). The instrument or method by which the owner or operator accurately measured or calculated the volume of coating and ink solids applied and the amount that can potentially be applied each year on the printing press shall be described in the certification to the Department.

37.7.1.2 Recordkeeping. The owner or operator shall collect and record all of the following information each year for each printing press and maintain the information at the facility for a period of five years:

37.7.1.2.1 The name and identification number of each coating and ink, as applied, each year on each printing press.

37.7.1.2.2 The weight of VOC per volume of coating solids and the volume of solids of each coating and ink, as applied, each year on each printing press.

37.7.1.2.3 The total potential emissions as calculated in 37.7.1.1.4 of this regulation using VOC content for that year.

37.7.1.3 Reporting. Any record showing that total potential emissions of VOC from all printing presses exceed 7.7 tons per year of press-ready ink in any calendar year before the application of capture systems and control devices shall be reported by sending a copy of such record to the Department within 45 calendar days after the exceedance occurs. This requirement is in addition to any other State of Delaware exceedance reporting requirements.

37.7.2 Requirements for sources using complying coatings or inks. Any owner or operator of a printing press subject to 37.0 of this regulation and complying by means of use of complying coatings or inks, shall comply with the following:

37.7.2.1 Initial certification. Within six months after [insert the effective date of this revision of 37.0] ~~By November 15, 1993~~, or upon initial startup of a new printing press, or upon changing the method of compliance for an existing subject printing press from daily-weighted averaging or control devices to use of complying coatings or inks, the owner or operator of a subject printing press shall certify to the Department that the printing press will be in compliance with 37.3.1 or 37.3.2 of this regulation on and after [insert the effective date of this revision of 37.0] ~~November 15, 1993~~, or on and after the initial startup date. Such certification shall include:

37.7.2.1.1 The name and location of the facility.

37.7.2.1.2 The address and telephone number of the person responsible for the facility.

37.7.2.1.3 Identification of subject sources.

37.7.2.1.4 The name and identification number of each coating and ink, as applied.

37.7.2.1.5 The VOC content of all coatings and inks, as applied.

37.7.2.2 Recordkeeping. On and after [insert the effective date of this revision of 37.0] ~~By November 15, 1993~~, or on and after the initial startup date, the owner or operator of a printing press subject to the limitations of 37.0 of this regulation and complying by means of 37.3.1.1 or 37.3.2.1 of this regulation shall collect and record all of the following information each day for each printing press and maintain the information at the facility for a period of five years

37.7.2.2.1 The name and identification number of each coating and ink, as applied.

37.7.2.2.2 The VOC content of each coating and ink, as applied, expressed in units necessary to determine compliance.

37.7.2.3 Reporting.

37.7.2.3.1 Any record showing an exceedance of the VOC contents of 37.3.1 or 37.3.2 of this regulation shall be reported by the owner or operator of the subject printing press to the Department within 45 calendar days following the exceedance, in addition to complying with any other applicable reporting requirements.

37.7.2.3.2 At least 30 calendar days before changing the method of compliance with 37.0 of this regulation from the use of complying coatings to daily-weighted averaging or control devices, the owner or operator shall comply with all requirements of 37.7.3.1 or 37.7.4.1 of this regulation, respectively, as well as the requirements of **7 DE Admin. Code** 1102. Upon changing the method of compliance with 37.0 of this regulation from the use of complying coatings to daily-weighted averaging or control devices, the owner or operator shall comply with all requirements of 37.7.3 or 37.7.4 of this regulation, respectively.

37.7.3 Requirements for sources using daily-weighted averaging. Any owner or operator of a printing press subject to the limitations of 37.0 of this regulation and complying by means of daily-weighted averaging shall comply with the following:

37.7.3.1 Initial certification. Within six months after [insert the effective date of this revision of 37.0] ~~By November 15, 1993~~, or upon initial startup of a new printing press, or upon changing the method of compliance for an existing subject press from use of complying coating or control devices to daily-weighted averaging, the owner or operator of the subject printing press shall certify to the Department that the printing press will be in compliance with 37.4 of this regulation on and after [insert the effective date of this revision of 37.0] ~~November 15, 1993~~, or on and after the initial startup date. Such certification shall include:

37.7.3.1.1 The name and location of the facility.

37.7.3.1.2 The address and telephone number of the person responsible for the facility.

37.7.3.1.3 The name and identification of each printing press that will comply by means of 37.4 of this regulation.

37.7.3.1.5 The name and identification number of each coating and ink available for use on each printing press.

37.7.3.1.6 The VOC content of each coating and ink, as applied, each day on each printing press, expressed in units necessary to determine compliance.

37.7.3.1.7 The instrument or method by which the owner or operator will accurately measure or calculate the volume of each coating and ink, as applied, each day on each printing press.

37.7.3.1.8 The method by which the owner or operator will create and maintain records each day as required in 37.7.3.2 of this regulation.

37.7.3.1.9 An example of the format in which the records required in 37.7.3.2 of this regulation will be kept.

37.7.3.2 Recordkeeping. On and after [insert the effective date of this revision of 37.0] ~~November 15, 1993~~, or on and after the initial startup date, the owner or operator of a printing press subject to the limitations of 37.0 of this regulation and complying by means of daily-weighted averaging shall collect and record all of the following information each day for each printing press and maintain the information at the facility for a period of five years:

37.7.3.2.1 The name and identification number of each coating and ink, as applied, on each printing press.

37.7.3.2.2 The VOC content and the volume of each coating and ink, as applied, each day on each printing press, expressed in units necessary to determine compliance.

37.7.3.2.3 The daily-weighted average VOC content of all coatings and inks, as applied, on each printing press.

37.7.3.3 Reporting. On and after [insert the effective date of this revision of 37.0] ~~November 15, 1993~~, the owner or operator of a subject printing press shall notify the Department in the following instances:

37.7.3.3.1 Any record showing noncompliance with 37.4 of this regulation shall be reported by sending a copy of such record to the Department within 45 calendar days following the occurrence. This requirement is in addition to any other State of Delaware exceedance reporting requirements.

37.7.3.3.2 At least 30 calendar days before changing the method of compliance with 37.0 of this regulation from daily-weighted averaging to use of complying coatings or control devices, the owner or operator shall comply with all requirements of this regulation, respectively, as well as 7 DE Admin. Code 1102. Upon changing the method of compliance with 37.0 of this regulation from daily-weighted averaging to use of complying coatings or control devices, the owner or operator shall comply with all requirements of 37.7.2 or 37.7.4 of this regulation, respectively.

37.7.4 Requirements for sources using control devices. Any owner or operator of a printing press subject to 37.0 of this regulation and complying by means of control devices shall comply with 4.5 of this regulation and the following:

37.7.4.1 Initial certification. Within six months after [insert the effective date of this revision of 37.0] ~~By November 15, 1993~~, or upon initial startup of a new printing press, or upon changing the method of compliance for an existing printing press from use of complying coatings or daily-weighted averaging to control devices, the owner or operator of the subject printing press shall perform all tests and submit to the Department the results of all tests and calculations necessary to demonstrate that the subject printing press will be in compliance with 37.5 of this regulation, on and after [insert the effective date of this revision of 37.0] ~~November 15, 1993~~, or on and after the initial startup date.

37.7.4.2 Recordkeeping. On and after [insert the effective date of this revision of 37.0] ~~November 15, 1993~~, or on and after the initial startup date, the owner or operator of a printing press subject to the limitations of 37.0 of this regulation and complying by means of control devices shall collect and record all of the following information each day for each printing press and maintain the information at the facility for a period of five years:

37.7.4.2.1 Control device monitoring data.

37.7.4.2.2 A log of operating time for the capture system, control device, monitoring equipment and the associated printing press.

37.7.4.2.3 A maintenance log for the capture system, control device, and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

37.7.4.3 Reporting. On and after [insert the effective date of this revision of 37.0] ~~November 15, 1993~~, the owner or operator of a subject printing press shall notify the Department in the following instances:

37.7.4.3.1 Any record showing non-compliance with 37.5 of this regulation shall be reported by sending a copy of such record to the Department within 45 calendar days following the occurrence. This requirement is in addition to any other State of Delaware exceedance reporting requirements.

37.7.4.3.2 At least 30 calendar days before changing the method of compliance with 37.0 of this regulation from control devices to use of complying coatings or daily-weighted averaging, the owner or operator shall comply with all requirements of 37.7.2.1 or 37.7.3.1 of this regulation, respectively, as well as **7 DE Admin. Code** 1102. Upon changing the method of compliance with 37.0 of this regulation from control devices to use of complying coatings or daily-weighted averaging, the owner or operator shall comply with all requirements of 37.7.2 or 37.7.3 of this regulation, respectively.