

VOC Emission Controls for Printing Operations

Presented By:

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125 YEARS

VOC Emission Controls for Printing Operations

Today's Agenda

1. What is a CTG?
2. Why was a CTG issued?
3. Who does it apply to?
4. What are the requirements?
5. State implementation



What is a CTG?

Control Techniques Guideline

- Guidance containing “recommendations” by EPA to States on how to control VOC emissions
 - *Sets Reasonably Available Control Technology limits*
- States with ozone nonattainment areas must adopt new regulations or revise existing ones.
- Final CTGs released October 5, 2006
 - *Offset Lithography and Letterpress*
 - *Flexible Packaging Materials*
 - *Industrial Solvent Cleaning*



Who Does The CTGs Apply To?

- Printers in ozone nonattainment areas
 - *Moderate, Serious, Severe, and Extreme*
 - *Ozone transport region (Northern VA to Maine)*
 - *Can be nonattainment area only or statewide*
- 15 lb/day **actual** VOC emissions before controls
 - *Ink, Fountain Solutions, Coatings, Cleaning Solvents*
- EPA said states could use 450 lbs/mo or 3 tpy
 - *Unless monthly or annual-then daily recordkeeping*
- States must have any other threshold approved



Lithographic/Letterpress CTG

Inks, Varnishes, and Coatings



- Sheetfed and Nonheatset Web
 - *UV/EB cured classified as “nonheatset”*
 - *No VOC content limits or reformulation required*
 - *95% VOC retention factor for conventional inks and varnishes*
- Heatset Web
 - *No VOC content limits or reformation required*
 - *Reduce VOC emissions add-on control device*
 - *20% VOC retention factor for conventional inks and 100% capture in dryer*

Lithographic/Letterpress CTG

Inks, Varnishes, and Coatings



- Heatset Web Add-On Controls
 - *Any press with **potential** ink oil emissions greater than 25 tons per year*
 - 31.25 tons per year considering 20% retention
 - *Book and presses 22 inches in width or less are exempt*
 - *Control efficiency*
 - 90% for all existing control devices
 - 95% for all new control devices installed after state rule date
 - VOC outlet concentration of 20 ppmv (hexane) or less

Lithographic/Letterpress CTG

Inks, Varnishes, and Coatings

- Varnishes
 - *Unpigmented inks and treated the same as inks*
- Water-based & UV/EB cured
 - *Minimal VOC emissions*
 - *No VOC content limits or reformulation required*
 - *Considered part of printing process not subject to paper coating regulations*



Lithographic/Letterpress CTG

Fountain Solution



- Sheetfed
 - *VOC limit of 5% by weight VOC with no refrigeration or*
 - *VOC limit of 8.5% by weight if refrigerated below 60° F*
 - *Limits are on an “as applied” basis (press ready)*
- Nonheatset Web
 - *No IPA*
 - *Alcohol substitute limit of 5% by weight*
 - *Limits are on an “as applied” basis (press ready)*

Lithographic/Letterpress CTG

Fountain Solution

- Heatset Web
 - *IPA limit of 1.6% by weight with no refrigeration or*
 - *IPA limit of 3% by weight if refrigerated below 60° F*
 - *Alcohol substitute limit of 5% by weight*
 - *Limits are on an “as applied” basis (press ready)*
 - *Allows 70% carryover of substitutes into HSWO dryers*



Lithographic/Letterpress CTG

Cleaning Solutions

- Applies to all printing press cleaning activities
 - *Blanket wash, roller wash, metering roller, etc.*
- Limits
 - *70% weight VOC content limit, or*
 - *VOC composite vapor pressure limit of 10 mm Hg at 20°C*
- Requires closed containers for towels and solutions
- Allows 50% shop towel retention factor for washes meeting low vapor pressure limit
- Allows 40% carryover for ABW into HSWO dryers



Flexible Package Printing CTG

Applicability

- Modifies 1978 CTG for rotogravure and flexographic printing (aka graphic arts)
- Flexible package printing operations
 - *Convert bags, pouches, liners, and wraps utilizing paper, plastic, film, aluminum foil, metalized or coated paper or film*
- Cleaning materials
 - *Limits for operations that emit at least 15 lbs/day (6.8 kg/day) actual VOC emissions before controls*
- Inks, coatings and adhesives
 - *Limits for presses with potential VOC emissions greater than 25 TPY*



Flexible Package Printing CTG

Inks, Coatings, and Adhesives

- VOC content, as applied, for each one per printing press must meet one of the following
 - *0.16 lb VOC per lb material as applied*
 - *0.8 lb VOC per lb material solids as applied*
- Daily weighted-average VOC content of all combined used on a single press must meet one or both of the VOC content limits
 - *Not allowed to average across multiple presses*



Flexible Packaging CTG

Inks, Coatings, and Adhesives

Control System Overall Efficiency Requirement	Printing Press First Installation Date		Air Pollution Control Device First Installation Date	
	Prior to	On or after	Prior to	On or after
	March 14, 1995*	March 14, 1995	Date of Rule	Date of Rule
≥= 65%	X		X	
≥= 70%	X			X
≥= 75%		X	X	
≥= 80%		X		X

* March 14, 1995 date of proposed 1996 NESHAP for printing and publishing

Flexible Package Printing CTG

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Flexible Packaging CTG

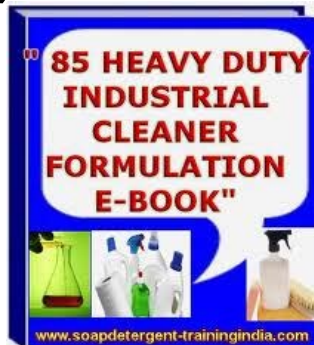
Cleaning Solvent Requirements

- Keep cleaning materials and used shop towels in closed containers
- Convey cleaning materials from one location to another in closed containers or pipes.



Industrial Solvent CTG

- Any industry using an organic solvent for cleaning unit operations such as mixing vessels (tanks), spray booths, and parts cleaners
- Cleaning activities for removal of foreign material from substrate being cleaned include actions (activities) such as wiping, flushing, or spraying
- Emits before control at least 15 lbs/day (6.8 kg/day) (15 lb/day) of VOC



Industrial Solvent Cleaning CTG

Exemptions

- Cleaning operations for digital printing presses
- Lithographic printing materials
- Letterpress printing materials
- Janitorial cleaning
- Stripping of cured coatings, inks, and/or adhesives
- Cleaning of metering and dampening rollers
- Cleaning of printing plates



Industrial Solvent Cleaning CTG

Options

- Meet specific VOC content requirements
 - *Based on material and cleaning application*
- Use low vapor pressure products
 - *Vapor pressure at or below 8 mm Hg at 20°C*
- Add-on control equipment
 - *Capture efficiency of at least 90%*
 - *Destruction efficiency of at least 90%*



VOC Control Requirements

Solvent Cleaning Operation	VOC Limit, as applied, pounds/gallon
Product Cleaning during the manufacturing process	0.42
Repair and Maintenance Cleaning	0.42
Cleaning of coating or adhesive application equipment	0.42
Cleaning of ink application equipment:	
<ul style="list-style-type: none"> • Flexographic 	0.42
<ul style="list-style-type: none"> • Screen printing 	4.2
<ul style="list-style-type: none"> • UV and electron beam ink, EXCEPT screen printing 	4.2
<ul style="list-style-type: none"> • Specialty Flexographic printing 	0.83

Industrial Solvent Cleaning CTG

Required Work Practices

- Cover open containers
- Minimize air circulation around cleaning operations
- Properly dispose of used solvents and shop towels
- Implement equipment practices to minimize emissions



States With Existing/Revised Litho Rules

Arizona	Connecticut	District of Columbia
Delaware	Georgia	Illinois
Indiana	Kansas	Louisiana
Massachusetts	Maryland	Maine
Missouri	North Carolina	New Hampshire
New Jersey	New York	Ohio
Tennessee	Texas	Wisconsin
	<p>California</p> <ul style="list-style-type: none"> • <i>Bay Area Air Quality Management District</i> • <i>San Joaquin Valley Unified Air Pollution Control District</i> • <i>San Diego County Air Pollution Control District</i> • <i>South Coast Air Quality Management District</i> 	

States without Final Litho RACT Rules

Pennsylvania	Proposed rule published 02/2012, reviewing comments
Virginia	Proposed rule published, 08/2009, currently undergoing secretary review.
Vermont	Plan to publish a proposed rule in 2012.
Kentucky	No Proposed Rule
Florida	No Proposed Rule
Michigan	No Proposed Rule
Rhode Island	Plan to publish a proposed rule in 2013.
South Carolina	No Proposed Rule

Thank you for listening!

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