ACTIVE SMAQMD BACT CLEARINGHOUSE

CATEGORY: **PRINTING PROCESS**

BACT Size: Minor Source BACT **GITAL PRINTING - LIQUID ELCTROPHOTOGRAPHY**

BACT Determination Number:	147	**BACT Determination Date:**	**1/3/2018**

Equipment Information

Permit Number: 24724
Equipment Description: DIGITAL PRINTING - LIQUID ELCTROPHOTOGRAPHY
Unit Size/Rating/Capacity: < 8,663 lbs uncontrolled VOC/year
Equipment Location: OFFICE OF STATE PUBLISHING
1050 RICHARDS BLVD
SACRAMENTO, CA

BACT Determination Information

ROCs	**Standard:**	VOC Control System. SMAQMD Rules 466 & 441.
	Technology Description:	1. Integral air pollution control system, consisting of an oil/water separator and refigerated condenser, with an assumed control efficiency of 80% or equivalent system. Comply with SMAQMD rules 466 & 411.
	Basis:	Achieved in Practice
NOx	**Standard:**	No Standard
	Technology Description:	
	Basis:	
SOx	**Standard:**	No Standard
	Technology Description:	
	Basis:	
PM10	**Standard:**	No Standard
	Technology Description:	
	Basis:	
PM2.5	**Standard:**	No Standard
	Technology Description:	
	Basis:	
CO	**Standard:**	No Standard
	Technology Description:	
	Basis:	
LEAD	**Standard:**	
	Technology Description:	
	Basis:	

Comments: T-BACT is the following:
1.A VOC control device that has an overall system efficiency (collection and destruction) of at least 98.5% for VOC.
2.Comply with SMAQMD Rule 466 - Solvent Cleaning & SMAQMD Rule 441 - Organic Solvents.
For projects also involving publication rotogravure presses, product and packaging rotogravure presses, or wide-web flexographic printing presses, T-BACT will be determined on a case-by-case basis.

District Contact: Jeff Quok Phone No.: (916) 874-4863 email: jquok@airquality.org

Printed: 1/3/2018

CATEGORY: **PRINTING PROCESS**

BACT Size: Minor Source BACT **GITAL PRINTING - LIQUID ELCTROPHOTOGRAPHY**

BACT Determination Number: 180	**BACT Determination Date:** 1/3/2018

Equipment Information

Permit Number: N/A -- Generic BACT Determination
Equipment Description: DIGITAL PRINTING - LIQUID ELCTROPHOTOGRAPHY
Unit Size/Rating/Capacity: ≥ 8,683 lbs uncontrolled VOC/year
Equipment Location:

BACT Determination Information

ROCs	**Standard:**	Overall system efficiency of at least 98.5% VOC
	Technology Description:	1. VOC control device with overall efficiency of 98.5%. 2. Use of materials compliant with SMAQMD Rule 466. 3. Comply with VOC emission standards of SMAQMD Rule 411.
	Basis:	Cost Effective
NOx	**Standard:**	No Standard
	Technology Description:	
	Basis:	
SOx	**Standard:**	No Standard
	Technology Description:	
	Basis:	
PM10	**Standard:**	No Standard
	Technology Description:	
	Basis:	
PM2.5	**Standard:**	No Standard
	Technology Description:	
	Basis:	
CO	**Standard:**	No Standard
	Technology Description:	
	Basis:	
LEAD	**Standard:**	
	Technology Description:	
	Basis:	

Comments: T-BACT will be the same as BACT for VOCs. For projects also involving publication rotogravure presses, product and packaging rotogravure presses, or wide-web flexographic printing presses, T-BACT will be determined on a case-by-case basis.

District Contact:

777 12th Street, Third Floor

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Sacramento, CA 95814

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

DETERMINATION NO.: 147 & 180

DATE: 1/3/18

ENGINEER: Jeffrey Quok

Category/General Equip Description: Printing Process

Equipment Specific Description: Digital Printing – Liquid Electrophotography

Equipment Size/Rating: Minor Source BACT

Previous BACT Det. No.: N/A

This BACT/T-BACT determination will be made for digital printing – liquid electrophotography.

BACT/T-BACT ANALYSIS

A: ACHIEVED IN PRACTICE (Rule 202, §205.1a)

The following control technologies are currently employed as BACT for digital printing – liquid electrophotography by the following air pollution control districts:

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>US EPA</td><td>BACT
Source: EPA RACT/BACT/LAER Clearinghouse

<table>
<tr><td colspan="2">For Digital Printing - Liquid Electrophotography</td></tr>
<tr><td>Pollutant</td><td>Standard</td></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>US EPA</td><td>

T-BACT
There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:
40 CFR 63 Subpart KK – National Emission Standards for the Printing and Publishing Industry (Amended 4/21/11)
This regulation applies to new and existing facilities that are a major source of hazardous air pollutants at which publication rotogravure, product and packaging rotogravure, or wide-web flexographic printing presses are operated. [40 CFR §63.820]

Since liquid electrophotography does not qualify as publication rotogravure, product and packaging rotogravure, or wide-web flexographic printing presses, this rule will not generally be considered T-BACT for this source category. However, for projects that include digital printing as well as one of the affected printing processes, compliance with 40 CFR, 63, Subpart KK will be considered technologically feasible T-BACT for the project.

</td></tr>
<tr><td>ARB</td><td>

BACT
Source: ARB BACT Clearinghouse

<table>
<tr><td colspan="2">For Digital Printing - Liquid Electrophotography</td></tr>
<tr><th>Pollutant</th><th>Standard</th></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>

T-BACT
There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:
None.

</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>SMAQMD</td><td>

BACT
Source: SMAQMD BACT Clearinghouse

<table>
<tr><td colspan="2">For Digital Printing - Liquid Electrophotography</td></tr>
<tr><td>Pollutant</td><td>Standard</td></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>

T-BACT
There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:
Rule 450 – Graphic Arts Operations (Amended 10/23/08)
This rule applies to graphic arts operations. Graphic arts operations is defined as any gravure, screen printing, flexographic, lithographic, or letterpress printing operation, or any coating or laminating operation that manufactures flexible packaging material for the packing industry. Liquid electrophotography does not meet this definition and therefore this rule does not apply.

Rule 466 – Solvent Cleaning (Amended 10/28/10)
This rule applies to all persons who use VOC-containing materials in solvent cleaning operations during the production, repair, maintenance or servicing of parts, products, tools, machinery, or equipment, or in general work areas, and to all persons who store and dispose of VOC-containing materials used in solvent cleaning.

Section 301 VOC Standards:

<table>
<tr><td>Solvent Cleaning Activity</td><td>VOC limits g/l (lb/gal)</td></tr>
<tr><td>(A) General (wipe cleaning, maintenance cleaning)</td><td>25 (0.21)</td></tr>
<tr><td>(B) Product cleaning during manufacturing process or surface preparation for coating, adhesive, or ink application</td><td></td></tr>
<tr><td>(i) General</td><td>25 (0.21)</td></tr>
<tr><td>(ii) Electrical apparatus components & electronic components</td><td>100 (0.83)</td></tr>
<tr><td>(iii) Medical Devices & pharmaceuticals</td><td>800 (6.7)</td></tr>
</table>

</td></tr>
</table>

District/Agency	Best Available Control Technology (BACT)/Requirements
SMAQMD	(C) Repair and Maintenance Cleaning — VOC limits g/l (lb/gal) (i) General — 25 (0.21) (ii) Electrical apparatus components & electronic components — 100 (0.83)

As an alternative to complying with the Solvent VOC limits, a person may use air pollution control equipment provided it satisfies all of the following:

1. The air pollution control equipment is approved by the Air Pollution Control Officer pursuant to Rule 201, General Permit Requirements,
2. The air pollution control equipment is designed and operated with:
   a. A control device efficiency of at least 95% on a mass basis, as determined pursuant to Sections 402 and 502.3, and
   b. An emission collection efficiency of at least 90% on a mass basis of the emissions generated by the solvent cleaning operations, as determined pursuant to Section 502.4, or
   c. An output of less than 50 parts per million calculated as carbon with no dilution.
3. The air pollution control equipment shall result in VOC emissions per calendar quarter no greater than would have resulted from compliance with Section 301, as calculated by the following equation:

$$\left[1-\left(\frac{CE}{100}\right)\left(\frac{CL}{100}\right)\right]\sum_{i=1}^{n} ACT_i(U_i) \le \sum_{i=1}^{n} LIM_i(U_i)$$

Where:
CE = Control device efficiency, % by mass
CL = Collection efficiency, % by mass
ACT_i = Actual VOC content of material "i," grams per liter
LIM_i = Applicable VOC limit for material "i" in Section 301, grams per liter
U_i = Usage of material "i," liters per calendar quarter.

Since the costs and feasibility of installing control equipment depend on the operation and type of control equipment, this alternative isn't considered achieved in practice. Alternative emissions control equipment options are addressed in the cost effective analysis.

Rule 441 – Organic Solvents (Adopted 12/6/78)
This rule limits the emissions of organic solvents into the atmosphere that may result from the use of organic solvents.

Standards

For Organic Materials
A person shall not discharge into the atmosphere more than 6.8 kilograms (15 pounds) of organic materials in any one day, nor more than 1.4 kilograms (3.1 pounds) in any one hour, from any article, machine, equipment or other contrivance, in which any organic solvent or any material containing organic solvent comes into contact with flame or is baked, heat-cured or heat-polymerized, in the presence of oxygen, unless said discharge has been reduced

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>SMAQMD</td><td>
by at least 85%. Those portions of any series of articles, machines, equipment or other contrivances designed for processing a continuous web, strip or wire which emit organic materials and using operations described in this section shall be collectively subject to compliance with this section.

<u>For Photochemically Reactive Solvents</u>
A person shall not discharge into the atmosphere more than 18 kilograms (39.7 pounds) of organic materials in any one day, no more than 3.6 kilograms (7.9 pounds) in any one hour, from any article, machine, equipment or other contrivance used under conditions other than described in Section 301 for employing, or applying, any photochemically reactive solvent, as defined in Section 203, or material containing such photochemically reactive solvent, unless said discharge has been reduced by at least 85%. Emissions of organic materials into the atmosphere resulting from air or heated drying of products for the first 12 hours after their removal from any article, machine, equipment, or other contrivance described in this section shall be included in determining compliance with this section. Emissions resulting from baking, heat-curing, or heat-polymerizing as described in Section 201 shall be excluded from determination of compliance with this section. Those portions of any series of articles, machines, equipment or other contrivances designed for processing for a continuous web, strip, or wire which emit organic materials and using operations described in this section shall be collectively subject to compliance with this section.

<u>For Non-Photochemically Reactive Solvents</u>
A person shall not discharge into the atmosphere more than 1350 kilograms (441 pounds) in any one hour, from any article, machine, equipment or other contrivance which any non-photochemically reactive organic solvent or any material containing such solvent is employed or applied, unless said discharge has been reduced by at least 85%. Emissions of organic materials into the atmosphere resulting from air or heated drying of products for the first 12 hours after their removal from any article, machine, equipment, or other contrivance described in this section shall be included in determining compliance with this section. Emissions resulting from baking, heat-curing, or heat-polymerizing as described in Section 301 shall be excluded from determination of compliance with this section. Those portions of any series of articles, machines, equipment, or other contrivance designed for processing a continuous web, strip or wire which emit organic materials and using operations described in this section shall be collectively subject to compliance with this section.

<table>
<tr><th>Material</th><th>Hourly Emission Limit [kg/hr] (lbs/hr)</th><th>Daily Emission Limit [kg/day] (lbs/day)</th></tr>
<tr><td>Organic Materials
Organic Materials which come into contact with a flame or is baked, heat-cured or heat-polymerized, in the presence of oxygen</td><td>[1.4] (3.1)</td><td>[6.8] (15)</td></tr>
<tr><td>Photochemically Reactive Solvents</td><td>[3.6] (7.9)</td><td>[18] (39.7)</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>SMAQMD</td><td>
<table>
<tr><th>Material</th><th>Hourly Emission Limit [kg/hr] (lbs/hr)</th><th>Daily Emission Limit [kg/day] (lbs/day)</th></tr>
<tr><td>Non-photochemically reactive solvents</td><td>[200] (441)</td><td>[1,350] (2,970)</td></tr>
</table>
<u>Solvent Disposal:</u>
A person shall not, during any one day, dispose of a total of more than 5 liters (1.3 gallons) of any photochemically reactive solvent, as defined in section 203 or of any material containing more than 5 liters (1.3 gallons) of any such photochemically reactive solvent by any means which will permit the evaporation of such solvent into the atmosphere.

<u>Cleanup</u>
Emissions of organic materials into the atmosphere from cleanup with cleanup with photochemically reactive solvent as defined in Section 203 of any article, machine, equipment or other contrivance described in Sections 301, 302 or 303 shall be included with the other emissions of organic materials from that article, machine, equipment or other contrivance for determining compliance with this rule.

<u>Required Reductions</u>
Emissions of organic materials into the atmosphere required to be controlled by Sections 301, 302 or 303 shall be reduced by:
1. Incineration, provided that 90% or more of the carbon in the organic material being incinerated is oxidized to carbon dioxide, or
2. Absorption, or
3. Processing in a manner determined by the Air Pollution Control Office to be not less effective than incineration or absorption.
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</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>South Coast AQMD</td><td>

BACT
Source:
SCAQMD Evaluation A/N 562397 (See Attachment C)

<table>
<tr><td colspan="2">For Digital Printing - Liquid Electrophotography</td></tr>
<tr><td>Pollutant</td><td>Standard</td></tr>
<tr><td>VOC</td><td>Integral air pollution control system, consisting of an oil/water separator and a refrigeration condenser.</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>

T-BACT
There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:
Rule 1130 – Graphic Arts (Amended 5/2/14)
This rule applies to any person performing graphic arts operations or who supplies, sells, offers for sale, markets, manufactures, blends, repackages, stores at a worksite, distributes, applies or solicits the application of graphic arts materials for use in the District. Graphics arts operations is define as gravure, letterpress, flexographic, and offset lithographic printing processes or related coating or laminating processes. Liquid electrophotography does not meet this definition and therefore this rule does not apply.

Rule 1171 – Solvent Cleaning Operations (Last amended 5/1/2009)
This rule applies to all persons who use solvent materials in solvent cleaning operations during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas; all persons who store and dispose of these materials used in solvent cleaning operations; and all solvent suppliers who supply, sell, or offer for sale solvent cleaning materials for use in solvent cleaning operations.

This rule does not apply to cleaning operations in printing pre-press or graphic arts pre-press areas, including the cleaning of film processors, color scanners, plate processors, film cleaning, and plate cleaning.

</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>South Coast AQMD</td><td>
Solvent Requirements:
<table>
<tr><th>Solvent Cleaning Activity</th><th>VOC limits
g/l (lb/gal)</th></tr>
<tr><td>(A) Product cleaning during manufacturing process or surface preparation for coating, adhesive, or ink application</td><td></td></tr>
<tr><td>(i) General</td><td>25 (0.21)</td></tr>
<tr><td>(ii) Electrical apparatus components & electronic components</td><td>100 (0.83)</td></tr>
<tr><td>(iii) Medical Devices & pharmaceuticals</td><td>800 (6.7)</td></tr>
<tr><td>(B) Repair and Maintenance Cleaning</td><td></td></tr>
<tr><td>(i) General</td><td>25 (0.21)</td></tr>
<tr><td>(ii) Electrical apparatus components & electronic components</td><td>100 (0.83)</td></tr>
<tr><td>(C) Cleaning of coatings or adhesives application equipment</td><td>25 (0.1)</td></tr>
<tr><td>(D) Cleaning of Ink Application Equipment</td><td></td></tr>
<tr><td>(i) General</td><td>25 (0.1)</td></tr>
</table>
In lieu of complying with the above solvent requirements, a person may comply by using a VOC emission collection and control system in association with the solvent cleaning operation provided:
(A) The emission control system shall collect at least 90%, by weight, of the emissions generated by the solvent cleaning operation and
i. Have a destruction efficiency of at least 95%, by weight, or
ii. Have an output of less than 50 parts per million (ppm) calculated as carbon with no dilution;
(B) The emission control system meets the requirements of the applicable source rule of the District’s Regulation XI. The collection system for cleaning in graphic arts and screen printing and cleaning of application equipment used for graphic arts materials and screen printing materials, shall collect at least 70%, by weight, of emissions generated. This control system shall reduce emissions from the emission collection system by at least 95%.
</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>San Diego County APCD</td><td>

BACT
Source: NSR Requirements for BACT

<table>
<tr><td colspan="2">For Digital Printing - Liquid Electrophotography</td></tr>
<tr><td>Pollutant</td><td>Standard</td></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>

T-BACT
There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:
Rule 67.16 – Graphic Arts Operations (Effective 5/9/12)
This rule applies to all continuous web or single sheet fed graphic arts printing, processing, laminating or drying operations and digital printing operations. This rule has an exemption for digital printing operations. Digital printing operations are exempt from provisions of this rule. However, digital printing operations that meet the definition of a “Large digital printing operation” are required to maintain records. Large digital printing operation is defined as a commercial digital printing operation where a print capacity of any individual printer that uses solvent based inks is 1,000 ft^2/hr or higher; or an operation where a print capacity of any individual printer that uses water based or UV inks is 10,000 ft^2/hr or higher.

Standards
For Large Commercial Digital Printing Operations
1. Maintain a current list of graphic arts materials and cleaning materials used;
2. Provide documentation containing the VOC content, less water and exempt compounds of each graphic arts material (excluding thinner), as applied and VOC content of each thinner and cleaning material and/or total VOC vapor pressure, as used
3. Keep monthly records of the type and amount of graphic arts material cleaning material used.

Rule 66.1 Miscellaneous Surface Coating Operations and Other Processes Emitting Volatile Organic Compounds (Adopted 2/24/10)
This rule is applicable to all surface coating, solvent cleaning or other operations or processes that may result in emissions of VOCs and are not subject to or exempt from, the following rules… (See Rule 66.1 for full list).

Exemptions
This rule does not apply to digital printing operations [Section(b)(1)(X)].

</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>Bay Area AQMD</td><td>

BACT
Source: BAAQMD Application # 28111 (See Attachment D)

<table>
<tr><td colspan="2">For Digital Printing - Liquid Electrophotography</td></tr>
<tr><th>Pollutant</th><th>Standard</th></tr>
<tr><td>VOC</td><td>Collect and control emissions with an overall emission rate equivalent to 2.5 lb/gal</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>

T-BACT
There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:
Reg. 8, Rule 20 Graphic Arts Printing and Coating Operations (Amended 4/12/80)
This rule applies to graphic arts operations which is defined as a gravure, publication gravure, flexographic printing, digital printing, screen printing, letterpress, or lithographic printing operation; an associated coating, laminating, or adhesive operation to produce a printed product; and the use of solvents for any surface preparation or cleanup for any of the operations stated above. However, per Section 8-20-120, Digital Printing is exempt from the flexographic, gravure, publication gravure, letterpress, and lithographic product limit requirements (Section 8-20-302) and the cleaning product requirements (Section 8-20-309) of this rule.

Solvent Evaporative Loss Minimization: Per Section 8-20-320, the requirements of this Section shall apply to the use of solvent for surface preparation and cleanup and to the use, mixing, storage, and disposal of ink, coating or adhesive:

1. An owner or operator shall not use open containers for the storage or disposal of cloth or paper impregnated with organic compounds that are used for surface preparation, cleanup or ink, coating or adhesive removal.
2. An owner or operator shall not store in open containers spent or fresh organic compounds used for surface preparation, cleanup or removal of inks, coatings, or adhesives.
3. An owner or operator shall not leave containers of ink, coating, adhesive or fountain solution open when not in use.

Reg. 8, Rule 4 General Solvent and Surface Coating Operations (Amended

</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>Bay Area AQMD</td><td>10/16/02)
This rule applies to the use of solvents and surface coatings in any operation other than those specified by other Rules of Regulation 8. Digital printing is regulated by Reg. 8 Rule 20 Graphics Art Printing. Therefore, Digital printing would be exempt from the requirements of this rule.</td></tr>
<tr><td>San Joaquin Valley APCD</td><td><u>BACT</u>
Source: SJVUAPCD BACT Clearinghouse

<table>
<tr><td colspan="2">For Digital Printing - Liquid Electrophotography</td></tr>
<tr><td>Pollutant</td><td>Standard</td></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
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<tr><td>CO</td><td>No standard</td></tr>
</table>
<u>T-BACT</u>
There are no T-BACT standards published in the clearinghouse for this category.

<u>RULE REQUIREMENTS</u>:
Rule 4607 Graphic Arts and Paper, Film, Foil and Fabric Coatings (Amended 12/18/08)
This rule applies to any graphics arts printing operation, to digital printing operations, and to any paper, film, foil, or fabric coating operation and to the organic solvent cleaning materials and processes associated with such operations.

According to Section 4.0, the requirements of this rule, except for the recordkeeping requirements of Section 6.1, shall not apply to digital printers and digital printing operations.

Rule 4663 Organic Solvent Cleaning, Storage, and Disposal (Amended 9/20/07)
The purpose of this rule is to limit the emissions of volatile organic compounds (VOCs) from organic solvent cleaning and from the storage and disposal of solvents and waste solvent materials.

This rule exempts any source that is subject to or specifically exempted from the Rules listed in Section 4.3. Section 4.3 lists Rule 4607 (Graphic Arts). Therefore, digital printing is exempt from Rule 4663 Organic Solvent Cleaning, Storage, and Disposal.</td></tr>
</table>

The following control technologies have been identified and are ranked based on stringency:

SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES	
Pollutant	**Standard**
VOC	For Printing Operations: 1. Integral air pollution control system, consisting of an oil/water separator and refrigerated condenser, with an assumed control efficiency of 80%(A) [SCAQMD] 2. Collect and control equipment with an overall emission rate equivalent to 2.5 lb/gal [BAAQMD] 3. Comply with VOC emission standards of SMAQMD Rule 466. [SMAQMD] 4. Comply with VOC emission standards of SCAQMD Rule 1171. [SCAQMD] 5. Comply with VOC emission standards BAAQMD Regulation 8, Rule 20, Sections 8-20-320 and 8-20-308. [BAAQMD] For Organic Solvent Operations: Comply with VOC emission standards of SMAQMD Rule 441. [SMAQMD]
NOx	N/A – [SMAQMD, SCAQMD, SDCAPCD, BAAQMD, SJVAPCD, ARB, EPA]
SOx	N/A – [SMAQMD, SCAQMD, SDCAPCD, BAAQMD, SJVAPCD, ARB, EPA]
PM10	N/A – [SMAQMD, SCAQMD, SDCAPCD, BAAQMD, SJVAPCD, ARB, EPA]
PM2.5	N/A – [SMAQMD, SCAQMD, SDCAPCD, BAAQMD, SJVAPCD, ARB, EPA]
CO	N/A – [SMAQMD, SCAQMD, SDCAPCD, BAAQMD, SJVAPCD, ARB, EPA]
T-BACT (VOC)	N/A – [SMAQMD, SCAQMD, SDCAPCD, BAAQMD, SJVAPCD, ARB, EPA]

(A) A control efficiency of 80% is based on EPA's Air Pollution Control Cost Manual for Refrigerated Condensers, pg 2-15 (https://www3.epa.gov/ttn/catc/dir1/cs3-1ch2.pdf).

An integral air pollution control system consisting of an oil/water separator and refrigeration condenser is considered the most stringent control. Both SCAQMD and BAAQMD performed an evaluation on HP Indigo model printers which use the integral air pollution control system. SCAQMD determined that the control system is considered BACT while BAAQMD considers BACT to be an overall emission control system equivalent to less than 2.5 lb/gal. In BAAQMD's evaluation the integral air pollution system was calculated to have an overall emission control system equivalent to 0.55 lb/gal (see Attachment D). Since there is limited test data on these control systems, a standard percent control will be reevaluated as more systems as more test data becomes available. For now, an estimation of a 80% control efficiency will be used based on EPA's Air Pollution Control Cost Manual for Refrigerated Condensers.

Digital printing is exempt from all districts' graphic art rules and only requires record keeping for solvent and ink/coating usage. However, the digital printing operations would still be subject to solvent cleaning rules of SCAQMD, SMAQMD, and BAAQMD. The emission limits for solvent cleaning activities related to digital printing are consistent across SCAQMD Rule 1171 and SMAQMD Rule 466. Although the emission limits for solvent cleaning are the same for SCAQMD and SMAQMD Rules, the SCAQMD Rule exempts printing pre-press or graphic arts pre-press areas from the solvent cleaning limits and SMAQMD does not. Therefore, SMAQMD's rule is considered more stringent than SCAQMD's Rule. BAAQMD's solvent

cleaning rule is less stringent with a surface preparation solvent VOC limit of 50 g/l (0.42 lbs/gal) compared to SCAQMD & SMAQMD general solvent cleaning VOC limit of 25 g/l (0.21 lbs/gal).

The following control technologies have been identified as the most stringent, achieved in practice control technologies:

BEST CONTROL TECHNOLOGIES ACHIEVED IN PRACTICE		
Pollutant	**Standard**	**Source**
VOC	For Digital Printing Operations: 1. Integral air pollution control system, consisting of an oil/water separator and refrigerated condenser, with an assumed control efficiency of 80%(A) or equivalent system. 2. For Organic Solvents used with inks, comply with VOC emission limits of SMAQMD Rule 441 (See Table Below) For Solvent Cleaning Operations: Use of materials compliant with SMAQMD Rule 466.	SCAQMD & SMAQMD
NOx	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
SOx	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
PM10	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
PM2.5	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
CO	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
VOC (T-BACT)	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB

(A) A control efficiency of 80% is based on EPA's Air Pollution Control Cost Manual for Refrigerated Condensers, pg 2-15 (https://www3.epa.gov/ttn/catc/dir1/cs3-1ch2.pdf). This assumed control efficiency is subject to change as more test data becomes available.

SMAQMD Rule 441 Emission Limits

Material	Hourly Emission Limit [kg/hr] (lbs/hr)	Daily Emission Limit [kg/day] (lbs/day)
Organic Materials which come into contact with a flame or is baked, heat-cured or heat-polymerized, in the presence of oxygen	[1.4] (3.1)	[6.8] (15)
Photochemically Reactive Solvents	[3.6] (7.9)	[18] (39.7)
Non-photochemically reactive solvents	[200] (441)	[1,350] (2,970)

B: TECHNOLOGICALLY FEASIBLE AND COST EFFECTIVE (Rule 202, §205.1.b.)

Technologically Feasible Alternatives:

Any alternative basic equipment, fuel, process, emission control device or technique, singly or in combination, determined to be technologically feasible by the Air Pollution Control Officer.

Low VOC Ink Discussion

BAAQMD released the *Bay Area 2010 Clean Air Plan* and discussed possible control techniques. The possibility of low VOC inks were discussed but it was found that no low VOC inks are currently available. BAAQMD states that "Lower VOC inks may be able to be developed, although the necessary properties of inks for some types of digital printing may preclude low-VOC formulations." Therefore, low VOC inks currently aren't technologically feasible.

The table below shows the technologically feasible alternatives identified as capable of reducing emissions beyond the levels determined to be "Achieved in Practice" as per Rule 202, §205.1.a.

Pollutant	Technologically Feasible Alternatives
VOC	VOC control device with 98.5% overall system efficiency(A)
NOx	No other technologically feasible option identified
SOx	No other technologically feasible option identified
PM10	No other technologically feasible option identified
PM2.5	No other technologically feasible option identified
CO	No other technologically feasible option identified
VOC (T-BACT)	No other technologically feasible option identified

(A) An overall system efficiency of 98.5% is based on technologies such as carbon adsorbers and thermal oxidizers.

Cost Effective Determination:

After identifying the technologically feasible control options, a cost analysis is performed to take into consideration economic impacts for all technologically feasible controls identified.

Maximum Cost per Ton of Air Pollutants Controlled

1. A control technology is considered to be cost-effective if the cost of controlling one ton of that air pollutant is less than the limits specified below:

Pollutant	Maximum Cost ($/ton)
VOC	17,500
NO_X	24,500
PM10	11,400
SO_X	18,300
CO	TBD if BACT triggered

Cost Effectiveness Analysis Summary
The cost analysis was processed in accordance with the EPA OAQPS Air Pollution Control Cost Manual (Sixth Edition). The sales tax rate was based on the District's standard rate of 8.5% as approved on 10/17/16. The electricity (11.24 cents/kWh) and natural gas (6.41 dollars/1,000 cubic feet) rates were based on an industrial application as approved by the District on 10/17/16. The life of the equipment was based on the EPA cost manual recommendation. The interest rate was based on the previous 6-month average interest rate on United States Treasury Securities (based on the life of the equipment) and addition of two percentage points and rounding up to the next higher integer rate. The labor (Occupation Code 51-5112: Printing press operators) and maintenance (Occupation Code 49-9099: Installation, maintenance, and repair workers, all other) rates were based on data from the Bureau of Labor Statistics.

Background:

The digital printing operation will be reviewed by using the pressroom as the emission source and updating the cost inputs in accordance with the EPA OAQPS Air Pollution Control Cost Manual (Sixth Edition). This BACT will only look at the price of the control systems. This will ensure that a single digital printer enclosed in a small enough room to not require the addition of a hood or a permanent total enclosure to be covered under this BACT. The addition of a hood would increase the cost of the system due to the cost of the hood and associated equipment (ducting, louvers, dampers, air make-up units, etc.). Section 2 Chapter 1 Hoods, Ductwork and Stacks of the Cost Manual includes cost estimating methods that would increase the cost of the system. The addition of the hood would also require an increase in flowrate. A 6 ft x 6 ft hood (assumed to just cover the printing section of the printer) and 5 feet above the printing mechanism, would require a flowrate of 33,600 ft^3/min (based on equation 1.24 ($Q = 1.4Pxu_c$) of this section). This would require bigger and more expensive emissions control system. Operational costs of the system would also be higher.

Section 2, Chapter 3, Permanent Total Enclosures (PTE) of the Cost Manual, includes cost estimating information for enclosing a unit. This section of the Cost Manual includes cost information (cost of walls/ft^2, installation costs of walls, rollup door costs, makeup air fans,

etc.) that would increase the cost of the control system. The PTE would also require additional ducting work to handle the higher air flow to the control device, which would further increase the cost. Therefore, the cost of just the control device is a conservative estimate.

Basic assumptions:

1) Single digital printing press.
2) Press room dimensions: 40'W x 60'L x 20'H (because the press room is relatively small, a hood or smaller full enclosure is not necessary)
3) The press room is assumed to be the enclosure with a collection efficiency of 100%, venting through a general ventilation system to a control device capable of achieving a 98.5% control efficiency. Therefore, the carbon adsorption system will have an over-all collection/control efficiency of 98.5%. This is similar to the collection/control efficiency listed as technologically feasible in the BAAQMD BACT Guideline 83.1.
4) General ventilation with an 8,000 CFM blower (10 air changes per hour).
5) Cost calculations and assumptions are based on the EPA Air Pollution Control Cost Manual.

Carbon Adsorption System

Equipment Life = 10 years

Total Capital Investment = $231,299.51

Annualized Total Capital Investment = $43,556.61 per year

Direct Annual Cost = $18,801.19 per year

Indirect Annual Cost = $12,482.97 per year

Total Annual Cost = $74,840.77 per year

VOC Removed = 4.28 tons per year

Cost of VOC Removal = $17,500.97 per ton reduced

A detailed calculation of the cost effectiveness for VOC removal with a carbon absorber is shown in Attachment A. Uncontrolled VOC emissions of 8,683 lb/year or greater is the cost-effective threshold for control equipment using carbon absorption control technology.

Thermal Oxidizer:

Equipment Life = 10 years

Total Capital Investment = $401,329

Direct Annual Cost = $152,437.41 per year

Indirect Annual Cost = $94,909.62 per year

Total Annual Cost = $247,347.02 per year

VOC Removed = 14.13 tons per year

Cost of VOC Removal = $17,500.43 per ton reduced

A detailed calculation of the cost effectiveness for VOC removal with a thermal oxidizer is shown in Attachment B. Uncontrolled VOC emissions of 28,698 lb/year or greater is the cost-effective threshold for control equipment using thermal oxidation control technology.

Conclusion: In this analysis, different emission operating levels are presented with the corresponding total cost per ton of VOC controlled using either a carbon adsorption control or a thermal oxidizer. Uncontrolled VOC emission level of 8,683 lb per year or greater must be reached in order for the carbon absorption control option to be cost effective. Uncontrolled VOC emission level of 28,698 lb per year or greater must be reached in order for a thermal oxidizer to be cost effective. The emissions level for the cost effectiveness of controls is based on the District cost effective limit for VOC of $17,500 per ton controlled.

C: SELECTION OF BACT

TABLE 1: BACT (#147) FOR DIGITAL PRINTING – LIQUID ELECTROPHOTOGRAPHY < 8,683 LBS UNCONTROLLED VOC PER YEAR

Pollutant	Standard	Source
VOC	1. Integral air pollution control system, consisting of an oil/water separator and refrigerated condenser, with an assumed control efficiency of 80%(A) or equivalent system. 2. Use of materials compliant with SMAQMD Rule 466 – Solvent Cleaning. 3. Comply with VOC emission standards of SMAQMD Rule 441 – Organic Solvents.	SMAQMD,SCAQMD, BAAQMD
NOx	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
SOx	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
PM10	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
PM2.5	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
CO	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB

(A) A control efficiency of 80% is based on EPA's Air Pollution Control Cost Manual for Refrigerated Condensers, pg 2-15 (https://www3.epa.gov/ttn/catc/dir1/cs3-1ch2.pdf). This assumed control efficiency is subject to change as more test data becomes available.

TABLE 2: BACT (#180) FOR DIGITAL PRINTING – LIQUID ELECTROPHOTOGRAPHY ≥ 8,683 LBS UNCONTROLLED VOC PER YEAR		
Pollutant	**Standard**	**Source**
VOC	1. A VOC control device that has an overall system efficiency (collection and destruction) of at least 98.5% for VOC. 2. Use of materials compliant with SMAQMD Rule 466 – Solvent Cleaning. 3. Comply with VOC emission standards of SMAQMD Rule 441 – Organic Solvents.	SMAQMD
NOx	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
SOx	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
PM10	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
PM2.5	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB
CO	No Standard	SMAQMD, SCAQMD, SJVUAPCD, SDCAPCD, BAAQMD, EPA, ARB

D: SELECTION OF T-BACT

For this category of equipment T-BACT will be compliance with BACT for VOCs with add on control. For projects also involving publication rotogravure presses, product and packaging rotogravure presses, or wide-web flexographic printing presses, T-BACT will be determined on a case-by-case basis.

T-BACT FOR DIGITAL PRINTING – LIQUID ELECTROPHOTOGRAPHY		
Pollutant	**Standard**	**Source**
Organic HAP/VHAP	1. A VOC control device that has an overall system efficiency (collection and destruction) of at least 98.5% for VOC. 2. Use of materials compliant with SMAQMD Rule 466 – Solvent Cleaning. 3. Comply with VOC emission standards of SMAQMD Rule 441 – Organic Solvents. 4. For projects also involving publication rotogravure presses, product and packaging rotogravure presses, or wide-web flexographic printing presses, T-BACT will be determined on a case-by-case basis.	SMAQMD

REVIEWED BY: _____ **DATE:** 1-3-2018

APPROVED BY: _____ **DATE:** 1-3-18

Attachment A

Cost Effectiveness Analysis for Carbon Adsorption

E

COST EFFECTIVENESS ANALYSIS FOR CARBON ADSORPTION

This cost effectiveness analysis was performed using EPA's OAQPS Control Cost Manual EPA Publication No. 452/B-02-001 Carbon Adsorbers (9/1999)

FACILITY NAME: Office of State Publishing
LOCATION: 1050 Richards Blvd., Sacramento, CA 95811
PERMIT NO.: 24724
EQUIPMENT DESCRIPTION:

VOC Parameters

VOC of concern (using the physical properties of toluene)	Various
Cost of pure VOC ($/ton)	100
Molecular weight of VOC (Refer to Control Cost Manual, pg 3-63)	92.13
Emission rate (lbs/hr - inlet)	4.17
Emission rate (lbs/yr - inlet)	8683
Inlet concentration (ppm)	38
k factor (Refer to Control Cost Manual, Table 1.1 pg 1-9)	0.551
m factor (Refer to Control Cost Manual, Table 1.1 pg 1-9)	0.11
Partial pressure (psi)	0.000552279

Gas Parameters

Total gas flow rate (acfm - inlet)	8,000
Total gas pressure (psi - inlet)	14.7

Equipment Parameters

Removal efficiency (%)	98.5%
Adsorption time (hours)	8
Desorption time (hours)	8
Number of adsorbing beds	1
Number of Desorbing beds	1
Equipment life (years)	10

Operating Parameters

Hours per day	8
Days per week	5
Weeks per year	52

Carbon Requirements

Carbon working capacity (lb VOC/lb carbon)	(k factor)*((partial pressure)^(m factor))/2	0.121
Amount of carbon needed (lbs)	(Emission Rate)*(hrs/day)/(Carbon Working Capacity)	553

Carbon cost	($1/lb carbon)*(lbs of carbon needed)	$1,107
Carbon life (years)		5
Adsorber Vessel Dimension and Cost		
Superficial bed velocity (ft/min)		75
Diameter of each vessel (ft)		0.33
Length of each vessel (ft)		324
Surface area (sq. ft)		335
Fm factor (see Control Cost Manual, Table 1.2, p. 1-21 - Stainless Steel)		1.3
Cost per vessel		$32,471.47
Adsorber Equipment Cost		$116,327.36
Direct Costs:		
Purchased Equipment Cost		
Adsorber and auxiliary equipment	To be conservative assume auxiliary costs = $0	$116,327.36
Instrumentation	1% of equipment cost	$11,632.74
Sales taxes	8.5% of equipment cost	$9,887.83
Freight	5% of equipment cost	$5,816.37
Total Purchased Equipment Cost		$143,664.29
Direct installation costs		
Foundations & supports	8% of total equipment cost	$11,493.14
Handling & erection	14% of total equipment cost	$20,113.00
Electrical	4% of total equipment cost	$5,746.57
Piping	2% of total equipment cost	$2,873.29
Insulation	1% of total equipment cost	$1,436.64
Painting	1% of total equipment cost	$1,436.64
Direct installation costs		$43,099.29
Total Direct Cost	Total equipment cost + Direct installation costs	$186,763.58
Indirect Costs:		
Indirect Costs (installation)		
Engineering	10% of total equipment cost	$14,366.43
Construction and field expenses	5% of total equipment cost	$7,183.21
Contractor fees	10% of total equipment cost	$14,366.43
Start-up	2% of total equipment cost	$2,873.29
Performance test	1% of total equipment cost	$1,436.64
Contingencies	3% of total equipment cost	$4,309.93
Total Indirect Costs		$44,535.93

Total Capital Investment	total direct cost + total indirect costs	$231,299.51
Interest Rate		0.05
Equipment Life (years)		10
Capital Recovery Factor (CRF)		0.1295
Capital recovery cost	(total capital investment)*(CRF)	$29,954.34
Capital Recovery Inflation adjustment	(capital recovery cost)*[(1+0.0199)^19]	$43,556.61
(Avg. interest rate is from the Bureau of Labor Statistics website)		
Direct Annual Costs		
Operator wage ($/hr)		18.01
Maintenance wage ($/hr)		20.13
operator hour (hrs/shift)		0.5
shifts per day (shift/day)		2
days of work per year (days/year)		260
Operator labor		
Operator	(labor wage)*(hours/shift)*(shifts/day)*(days/year)	$4,682.60
Supervisor	15% of operator labor	$702.39
Maintenance		
Maintenance labor	(labor wage)*(hours/shift)*(shifts/day)*(days/year)	$5,233.80
Materials	100% of maintenance labor	$5,233.80
Utilities		
System Fan (kWh/yr)	Refer to EPA cost manual	4917
Bed drying/cooling fan (kWh/yr)	Refer to EPA cost manual	42
Cooling water pump (kWh/yr)	Refer to EPA cost manual	52
Total Power Used (kWh/yr)		5011
Electricity Cost	0.138 $/kWh = District Practice	$691.52
Steam Cost		$1,770.32
Cooling water		$202.41
Carbon Replacement		
Interest Rate		0.05
Carbon Life (yrs)		5
Capital Recovery Factor		0.2310
Replacement Labor	CRF*$0.05/lb*carbon needed	$6.39

Carbon Cost	CRF*initial carbon cost*1.0875	$277.97
Total Direct Annual Costs		$18,801.19
Indirect Annual Costs		
Overhead	60% of maintenance labor and materials	$3,230.99
Administrative Charges	2% of Total Capital Investment	$4,625.99
Property Tax	1% of Total Capital Investment	$2,313.00
Insurance	1% of Total Capital Investment	$2,313.00
Total Indirect Annual Costs		$12,482.97
Total Annual Costs	CRC and Inflation Total Capital Investment + Total Direct Annual Costs + Total Indirect Annual Costs	$74,840.77
Tons VOC reduced	(Emission Rate)*(reduction efficiency)*(hrs/yr)/2000	4.28
Cost of VOC Removal	(Total Annual Costs)/(Tons VOC Controlled)	$17,500.97

Attachment B

Cost Effectiveness Analysis for Thermal Oxidizers

COST EFFECTIVENESS ANALYSIS FOR THERMAL INCINERATION

This cost effectiveness analysis was performed using EPA's OAQPS Control Cost Manual
EPA publication No. 452/B-02-001 Incinerators (9/2000)

FACILITY NAME: Office of State Publishing
LOCATION: 1050 Richards Blvd., Sacramento, CA 95811
PERMIT NO.: 24724
EQUIPMENT DESCRIPTION: Digital Printing Press

VOC Parameters

VOC of concern (Using the physical properties of toluene)	Various
Molecular weight of VOC	92.13
Heat of combustion (Btu/lb)	17,601
Heating value of VOC (Btu/scf)	4,074
Emission rate (lbs/hr - inlet)	13.8
Emission rate (lbs/year - inlet)	28,698
Inlet concentration (ppm)	120

Gas Parameters

Total gas flow rate (scfm - inlet)	8000
Total gas pressure (psi - inlet)	14.7
Inlet gas temperature (deg F)	71

Equipment Parameters

Level of energy recovery (0%, 35%, 50% or 70%)	70%
Control efficiency (%)	98.5%
Equipment life (years)	10

Operating Parameters

Hours per day	8
Days per week	5
Weeks per year	52
Shifts per day	1

Incinerator Parameters

Volumetric heat of combustion of effluent (Btu/scf)	0.49
Heat of combustion per pound of effluent (Btu/lb)	6.62
Temperature Required for incineration (deg F)	1,500.00
Gas temperature at exit of pre-heater (deg F)	1,071.30
Effluent gas temperature (deg F)	499.7

Electricity Usage

Price of electricity ($/kWh)	$0.11
System fan (kWh/yr)	61,651.20
Total Power Used (kWh/yr)	61,651.20

Gas Usage

Price of gas ($/1000 cu.ft.)	$6.41

Auxiliary fuel required (scfm)	171.98

CAPITAL COST

Direct Costs:

Incinerator	$201,840
Auxiliary equipment (if not included above)	$0
Equipment Cost (A)	**$201,840**
Instrumentation (0.1A if not included above)	$20,184
Sales taxes (0.085A)	$17,156
Freight (0.05A)	$10,092
Total Equipment Cost (B)	**$249,273**

Direct Installation Costs:

Foundation & Supports (0.08B)	$19,942
Handling & erection (0.14B)	$34,898
Electrical (0.04B)	$9,971
Piping (0.02B)	$4,985
Insulation for duct work (0.01B)	$2,493
Painting (0.01B)	$2,493
Direct Installation Cost	**$74,782**
Site preparation	$0
Facilities & buildings	$0
Total Direct Costs	**$324,054**

Indirect Costs (installation)

Engineering (0.10B)	$24,927
Construction & field expenses (0.05B)	$12,464
Contractor fees (0.10B)	$24,927
Start-up (0.02B)	$4,985
Performance test (0.01B)	$2,493
Contingencies (0.03B)	$7,478
Total Indirect Costs	**$77,275**
TOTAL CAPITAL INVESTMENT	**$401,329**

ANNUAL COST

Direct Annual Costs

Operating Cost

	Operator (@ $18.01/hr & .5 hr per shift)	$2,341.30
	Supervisor (15% of operator)	$351.20
	Operating materials	$0.00
Maintenance		
	Labor (@20.13/hr & .5 hr per shift)	$2,616.90
	Material (same as labor)	$2,616.90
Utilities		
	Price of electricity ($/kWh)	$0.11
	Price of gas ($/1000 cu.ft.)	$6.41
	Electricity ($/yr)	$6,929.59
	Natural Gas ($/yr)	$137,581.52
	Total Direct Costs	**$152,437.41**

Indirect Annual Costs

Overhead	$4,755.78
Administrative charges	$8,026.58
Property taxes	$4,013.29
Insurance	$4,013.29
Interest rate (%)	5%
Equipment life (years)	10
CRF	0.1295
Capital recovery	$51,973.93
Capital Recovery Inflation Adjustment	$74,100.68
Total Indirect Costs	**$94,909.62**

TOTAL ANNUAL COST	**$247,347.02**

Annual Cost ($/yr)	$247,347.02
Annual Emissions Reductions (tons/yr) (annual emissions based on BACT determination limit for add-on controls)	14.13

COST PER TON OF VOCs REDUCED ($/ton)	**$17,500.43**

Attachment C

SCAQMD Evaluation A/N 2562397

PO no PC
Digital Printing Press

Legal Owner or Operator: SOUTHERN CALIFORNIA GRAPHICS
8432 STELLER DR
CULVER CITY, CA 90232-2489

ID 62280

Equipment Location: SAME AS ABOVE

Equipment Description:
A/N 562397 (PO no PC, previously R219 Exempt)
Digital Laser Offset Printing, Hewlett Packard, Model HP Indigo 10000, S/N I15000132, 6-Color Units, 21.5-Inch Sheet Width.

History

The company is currently operating two sheet-fed IR-dried lithographic printing presses with a facility limit of 2038 pounds VOC per month per facility. The company has also accepted a 10-ton per year limit of VOC to be excluded from the Title V program.

In this project, the company is adding a laser offset printer as described above. This printer was installed in 2012 and had been operated under Rule 219 exemption status for low usages of VOC materials. The company is expecting higher usages, which will not be qualified for the Rule 219 exemption.

Based on the District compliance database, the facility has been operating at the above facility without creating any public nuisance and without receiving any NC or NOV.

Process Description

The company prints reports, inserts, magazines, brochures, and other printed items, using lithographic and digital printing technology. The following are its normal and maximum operating schedules:

	Hr/dy	dy/wk	wk/yr
Normal	24	7	52
Maximum	24	7	52

In this project, a new type of offsetting printing technology by HP is proposed. In the HP Indigo printing process, a laser beam creates an image on a smooth surface plate (called a PIP). Then, proprietary HP ink (called ElectroInk) adheres to the plate. Then,

the wet image is transferred to a heated blanket, before being printed on a final substrate

This added offset step enhances the creation of high image resolution, much better than conventional direct laser printing, since normal paper surfaces are either just too porous, too rough or too glossy, not an ideal surface for a high resolution image that a laser beam is capable to produce on a PIP. In addition, special ElectroInk, that is semi-transparent, can be used to adapt to different final substrate surfaces, forming as an intermediary base layer, to be followed by final printing layers. As a result, indigo printing output is much closer in appearance to conventional offset lithography.

The ElectroInk is currently not regulated, not subject to Rule 1130. However, these inks contain above 5 pounds of VOC per gallon. With high usage throughputs, VOC emissions above the Rule 219 exemption thresholds, 3 pounds per day or 66 pounds per calendar month, are expected from each printing unit. Therefore, each printing unit is then subject to Rule 201 and 203. In this project, the equipment was already installed and initially operated with low usage throughputs below Rule 219 exemption.

Emission Calculations

The emission sources are primarily organic solvents contained in ElectroInks and thinners (called imaging oil). The applicant estimates an average and maximum daily usage of 2.5 and 3.75 gallons respectively of ElectroInks and 0.5 and 0.75 gallons respectively of an imaging oil. ElectroInks contain a maximum VOC of 5.39 pounds per gallon. The imaging oil contains 6.34 pound of VOC per gallon. The following are the estimate VOC emissions from this printer:

MAXIMUM VOC (R1=R2) = (6.34X0.75)+(5.39X3.75) lbs/day = 24.97 lbs/day

AVERAGE VOC (R1=R2) = (6.34X0.5)+(5.39X2.5) lbs/day = 16.65 lbs/day

The following are AEI and NSR entries for this project:

AEIS:

VOC (R1=R2) = 16.65/24 lbs/hr = 0.69 lbs/hr

NSR:

VOC (R1=R2) = 24.97/24 lbs/hr = 1.04 lbs/hr

Please note that since the company proposes to bubble the above emissions into the monthly limit of 2038 pounds of ROG, the 30-DA in NSR is manually set to zero.

BACT Evaluation

The proposed equipment is equipped with an integral air pollution control (APC) system, consisting of an oil/water separator and a refrigeration condenser.

Spent water from the press contains a small amount of imaging oil. The built-in separator separates the imaging oil from spent water. The recycled water is safe and legal to discharge in the city waste water stream. The recycled oil is being re-used in the press.

VOC emissions from the use of imaging oil in this press are captured and passing through a built-in refrigeration condenser. The condensed VOC is being re-used in the press without the need to constantly adding imaging oil as compared to older models of laser offset printing presses manufactured by HP.

The equipment, including the press and the built-in APC, is not vented outside the building. The APC is working in a closed-loop system, without any stack opening. Fugitive emissions from the equipment are negligible, without creating any odors around the equipment.

The built-in APC system is therefore considered BACT to control VOC emissions from this type of digital printing press.

Rule Evaluation

Rule 212(c)(1): This section requires a public notice for all new or modified permit units that may emit air contaminants located within 1,000 feet from the outer boundary of a school.

A Rule 212(c) (1) notice will be triggered since there is a school within 1,000 ft from the facility.

Rule 212(c)(2): This section requires a public notice for all new or modified facilities that have on-site emission increases exceeding any of the daily maximums as specified by Rule 212(g).

The proposed project results in no net emission increases facility-wide. Therefore, a Rule 212(c)(2) public notice will not be triggered.

Rule 212(c)(3): This section requires a public notice for all new or modified permit unit with increases in emissions of toxic air contaminants listed in Table I of Rule 1401 resulted in MICR greater than 1E-6 per permit unit or greater than 10E-6 per facility.

The proposed project does not result in any emission increases of TACs. A Rule 212(c)(3) public notice will not be triggered.

Rule 212(g): This section requires a public notice for all new or modified sources that have equipment emission increases exceeding any of the daily maximums as specified by Rule 212(g).

The proposed project results in emission increases of VOC emissions. The proposed condition No. 8 limits the monthly emissions from all digital printing operations to less than 833 pounds per month, equivalent to less than 30 pounds of VOC per day. Therefore, a Rule 212(g) public notice will not be triggered.

Rule 401: Visible emissions are not expected with the proper operation of the equipment.

Rule 402: Nuisance is not expected with the proper operation of the equipment. There is no complaint history for this company at this location based on the District computer database.

Rule 442: All VOC emissions from digital printing operations at this facility shall be conditioned to a maximum limit of not more 833 pounds per month, in compliance with Rule 442 (Condition No. 8).

Rule 1130: Graphic art materials as defined in Rule 1130 are not used in the proposed digital printer. Therefore, this project is not subject to Rule 1130 requirements.

Rule 1171: VOC-containing materials are not used for cleaning in the proposed project. Therefore, this project is expected to be in compliance with Rule 1171 requirements.

Rule 1401: Based on the supplied MSDS, ElectroInks and image oil do not contain any Rule 1401 TACs. Therefore, compliance with this rule is expected.

Recommendation

The proposed project is expected to comply with all applicable District Rules and Regulations. Approval of a permit to operate with the following conditions is recommended:

1. Operation of this equipment shall be conducted in accordance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be properly maintained and kept in good operating condition at al times.

3. This equipment shall be operated in compliance with Rules 442 and 1171.

4. The owner/operator shall maintain all press doors in the closed position at all times when the press is operating. The owner/operator shall only open the doors to change consumables, repair paper jams, or conduct urgent maintenance. Once the doors opened, the press shall be automatically shut down.

5. The owner/operator shall operate the integral VOC recovery systems of the press at all times in accordance with the HP Indigo owner's manual.

6. The owner/operator shall not leave containers of ElectroInk, Imaging Oil, or any other VOC-containing materials open when not in use.

7. The owner/operator shall store all ElectroInk, Imaging Oil, and any other VOC-containing materials in vapor tight containers.

8. Materials used in this equipment shall not contain any toxic air contaminants identified in Rule 1401, Table 1 with an effective date of September 10, 2010 or earlier.

9. The total quantity of volatile organic compounds (VOC) emissions released to the atmosphere from this facility shall be less than 2038 pounds in any calendar month.

10. The total quantity of volatile organic compounds (VOC) emissions released to the atmosphere from all digital printing operations at this facility shall be less than 833 pounds in any calendar month.

11. In addition to the record keeping requirements in Rule 109, the operator shall keep adequate records for this facility to verify the following:

A. Density of each ink in pounds per gallon.

B. The percentage by weight of lithographic oils in each ink.

C. The ink absorption factor as specified by current District guidelines.

D. The VOC content of fountain solutions, wash materials, and any other

materials used in pounds per gallon as applied, including water and exempt compounds, and in volume percent (fountain solution only).

E. Other data as required to verify compliance with conditions specified in this permit.

12. To maintain exemption from the Title V requirements, the total quantity of VOC emissions from this facility shall be less than 10 tons (20,000 pounds) in any 12 calendar month period. If the records generated after the end of any calendar month show that the total facility VOC emissions for the previous 12 calendar months exceed the emission limit of this condition, the operator shall submit an initial Title V permit application and obtain a Title V permit pursuant to the requirements specified in Rule 3003. Exceedance of the VOC emission limit of this condition shall not subject any equipment at this facility to new source review requirements if the operator complies with all other permit conditions that are applicable to such equipment.

13. To ensure compliance with the emission limits of this permit, the operator shall:
A. In addition to the recordkeeping requirements of Rule 109, the operator shall keep adequate records for all equipment and operations that are required to have written permits or are exempt from written permits pursuant to Rule 219 at this facility to verify VOC emission in pounds and the VOC content of each material as applied (including water and exempt compounds)..
B. Within 14 calendar days after the end of each calendar month, total and record VOC emissions for the calendar month and for the previous 12 calendar month period from all equipment and operations that are required to have written permits or are exempt from written permits pursuant to Rule 219. The record shall include any procedures used to account for control device efficiencies and/or waste disposal. It shall be signed and certified for accuracy by the highest ranking individual responsible for compliance with District Rules.
C. Maintain a single list which includes only the name and address of each person from whom the facility acquired VOC-containing material regulated by the District that was used or stored at the facility during the preceding 12 months.
D. Retain all purchase invoices for all VOC-containing material used or stored at the facility, and all waste manifests for all waste VOC-containing material removed from the facility.

14 . Material safety data sheets for all materials used at this facility shall be kept current and made available to District personnel upon request.

15 . All records required by this permit shall be prepared in a format which is acceptable to the District, retained at the facility for a minimum of five years, and made available to any District representative upon request.

Attachment D

BAAQMD Evaluation Application #28111

EVALUATION REPORT

Company Collotype Labels International Inc.
Application # 28111
Plant # 17834

1. Background:

Collotype Labels International Inc. (CLII) has applied for an Authority to Construct and/or Permit to Operate the following equipment:

S-22 UV Press-Sheetfed Press UV Coaters, Heidelberg, SM74
S-23 CO2 Multi Coatings Printing Press, Heidelberg, CD74
S-24 6000 Indigo, HP Indigo 6000 Digital Press
S-25 6600 Indigo, HP Indigo 6600 Digital Press
S-26 6800 Indigo, HP Indigo 6800 Digital Press
S-27 UV Presses (2 Digicon Series 2 and 1 Digicon Series 3), Omega Digicon Series 2 and 3

CLII is preparing to install and operate two lithographic presses, three digital presses and three flexographic UV presses in the Fall of 2016. These presses are being installed as part of an expansion project at their location at 21 Executive Way, Napa, CA.

Because the estimated emissions from the flexographic presses which only use ultraviolet coatings are less than 3,000 lbs/yr, the UV Presses are grouped as one source as allowed in the District's grouping policy (Grouping of Coating, Adhesive, or Printing Operations into a Single Permitted Source) and identified as S-27.

2. Emission Calculations:

S-22 and S-23 Heidelberg Presses
Based on the proposed new permit conditions for the S-22 and S-23, the following emissions are estimated:

Table I – Emission Calculations for S-22 and S-23

Material Name	Material Manufacturer	Usage (lb/yr)	Usage (gal/yr)	VOC (lb/gal)	Retention Factor [2] (%)	POC (lb/yr)	POC [1] (lb/day)
Ink							
Soy-Based Offset	Great Western Ink	21000	2488	0.81	95	100.8	0.4
UV Offset Ink	Siegwerk	3500	415	0	95	0.0	0.0
Varnish							
Rub Resistant	Great Western Ink	15000	1777	1.18	95	104.9	0.4
Aqueous Varnish	Nicoat		6000	0.74	95	222.0	0.9
UV Flexo Varnish	Siegwerk	23500	2784	0	95	0.0	0.0
UV Anti Scuff	Varnish	8000	948	0	95	0.0	0.0

[1] 260 days/yr of operation
[2] Retention Factor of 95% for Non-Heatset Lithographic Printing Operations per Regulation 8-20-409.

Material Name	Material Manufacturer	Usage (lb/yr)	Usage (gal/yr)	VOC (lb/gal)	Retention Factor [2](%)	POC (lb/yr)	POC[1] (lb/day)
Clean-up							
Alpha 8	Explorer Press Solutions		1050	0.8		840.0	3.2
California Wash	Bottcher Systems		700	0.48		336.0	1.3
VOC Exempt Motor Cleaner	Nora Products		800	0.81		648.0	2.5
Fountain Solution Concentrate							
Supreme 8168	Varn International		65	3.97		258.1	1.0
Druck Fount	Siegwerk		65	1.29		83.9	0.3
TOTAL COMBINED EMISSIONS FOR S-22 and S-23						2593.5	**10.0**

For operating flexibility in the event that the POCs in the inks and cleanup solvents can be replaced with NPOCs, an equal amount of NPOC emissions is estimated from S-22 and S-23.

NPOC = 2593.5 lb/yr
NPOC = 10 lb/day

S-24, S-25, and S-26 HP Digital Presses

S-24 6000 Indigo Digital Press is a pre-certified source (Application # 24060), per 2-1-415.3. S-25 and S-26 6600 and 6800 Digital Presses are second and third generation models of the same pre-certified 6000 model. Enhancements have been made to the newer presses to improve capture, control, and reuse of VOC materials. Hence, the emissions profile of the pre-certified 6000 press are a conservative estimate for the 6600 and 6800 models.

Emissions of a digital press depend on the print job. The 2010 performance test of the HP Indigo 6000 press was conducted over a variety of operations. It was concluded that the worst case print job (one that has high coverage using the highest amount of ink for a 24-hour period) results in an organic emissions rate of 0.63 lb/hr. To reduce their facility potential to emit, the applicant agreed to limit operation of all three digital presses to 240 days per year of operation per press. Assuming the organic emissions are POC, the total emissions for a 24 hour, 240 day per year operation are as follows:

TABLE II – Emissions for 6000 Indigo Digital Press (Application 24060, P# 21086)

Pollutant	Lb/hr	Lb/day	Lb/year	Tons/year
POC	0.63	15.12	3629	1.81

The emissions above are for all materials used for the press. Based on the performance test that estimated worst case emissions, the throughputs of the materials used in this press are the following:

HP ElectroInks	44465 lb/yr
HP Recycle Agent	118 gal/yr
HP Imaging Oil	215 gal/yr
HP Imaging Agent	24 gal/yr

Because the facility agreed to 240 days per year of operation for each digital press, the pre-certified press template permit condition will not be imposed. Instead, the permit conditions for the digital press will be similar to the template conditions adjusted to reflect the less operating days.

S-27 UV Presses

The ultraviolet coatings used at S-27 have no VOC content. But there is solvent cleanup of the presses. The following emissions are estimated from the solvent cleanup (CeramClean Solv-It) at S-27:

POC = 100 gal/yr(2.10 lb/gal) = 210 lbs/yr
NPOC = 210 lb/yr

NPOC is estimated to be same as POC to allow for operating flexibility. Their daily emissions (operating 260 days/yr) is estimated to be the following:

POC = 210 lb/yr/260 days/yr = 0.8 lb/day
NPOC = 0.8 lb/day

TABLE III – Application Cumulative Increase Summary

Source	POC (lb/yr)	POC (TPY)	NPOC (lb/yr)	NPOC (TPY)
S-22 & S-23	2594	1.30	2594	1.30
S-24	3629	1.81		
S-25	3629	1.81		
S-26	3629	1.81		
S-27	210	0.11	210	0.11
TOTAL	**13,691**	**6.85**	**2804**	**1.41**

TOXICS

Review of the Material Safety Data Sheets for printing operation indicates the existence of butyl glycol ethers from S-22, S-23 (CAS# 112-3-4 of Nicoat Aqueous Varnish and CAS# 111-76-2 of Druck Fount, VOC Exempt Metering Roller Cleaner, Supreme 8168), and S-27 (CAS# 111-76-2 in CeramClean Solv-It MSDS). Comparing total POC Emissions to the screening level shows that total POC emissions are below screening trigger level:

Table IV – Toxic Emissions

Toxic	POC (lb/yr)	POC (lb/hr)*	Trigger Level (lb/hr)
Glycol Ether	2594 + 210 = 2,804	3	31

* Assumes worst-case operation of 260 days per year and 4 hours per day.

Hence, a Health Risk Screening Analysis (HRSA) is not required.

3. **Statement of Compliance:**

The new printing presses (S-22 through S-27) are subject to and will comply with District Regulation 8, Rule 20, and Section 302 and Section 309. Regulation 8-20-302 identifies the VOC standards for inks, coatings, and adhesives, while Regulation 8-20-309 identifies the VOC standards for cleaning products. The ink used by CLII is either UV or very low in VOC's if any. In addition, the cleaning products are also very low in VOC's.

Best Available Control Technology (BACT)

Because the daily emissions from S-22 through S-26 will exceed 10 pounds per worst-case day (See Table I and II), BACT review is required.

BACT 1 for POC and NPOC abatement has been determined to emissions controlled to an overall capture and destruction efficiency of at least 90% by weight. BACT 1 requires an overall capture and destruction efficiency of VOC by at least 90%.

Sources S-22 through S-26 are housed in the same building. To collectively abate S-22 through S-26 to a single abatement device would require at least a 5,000 cfm regenerative thermal oxidizer. Anguil provided an Equipment Cost (EC) of $265,000 for a 5000 cfm thermal oxidizer (not including installation, ducting, utilities, or taxes). Using the EPA Control Cost Manual, Table 2.8 (Capital Cost Factors for Thermal and Catalytic Incinerators), the purchased equipment cost (PEC) was estimated to be:

PEC = Oxidizer EC + Sales Tax (0.09 EC) + Freight (0.05 EC)*
PEC = EC(1.14)
PEC = $265,000(1.14) = $302,100

Note: * Instrumentation is included with Oxidizer and already included in cost.

Ductwork and stack installation would be required to collect the emissions from the S-22 through S-26. Review of the EPA Control Cost Manual, Chapter 1 provides a cost of approximately $36,000 for the ductwork and stack installation. With the oxidizer's PEC, the following total equipment cost (TEC) is estimated to be:

TEC = 302,100 + 36,000 = 338,100

The Total Capital Investment is made up of the direct and indirect equipment costs. Per Table 2.8 of EPA Control Cost Manual, the Total Capital Investment (TCC) was estimated from the TEC:

TCC = 1.61TEC
TCC = 1.61($338,100) = $544,341

The annualized cost of abatement was estimated adding the direct and indirect annual costs:

Table V – Annualized Cost of Abatement

	Formula	Reference	Annual Cost ($)
Direct Annual Cost			
Labor			
Operator	0.5 hr per day at $20/hr	Bay Area Estimate	3,650
Supervisor	15% of operator cost	EPA Cost Manual	548
Maintenance			
Labor	0.5 hr per day at $30/hr	District Estimate	5,475
Materials	100% of Maintenance Labor	EPA Cost Manual	5,475
Utilities			
Natural Gas & Elec	$0.82/hr (gas + elec)}	Anguil Estimate	4723 (24 hrs/day, 240 days/yr)
Total Direct Annual Cost (DAC)			**19,871**

	Formula	Reference	Annual Cost ($)
Indirect Annual Cost (IAC)			
Capital Recovery	0.136 TCC	BAAQMD BACT Workbook	74,030
Property Tax	0.01 TCC	BAAQMD BACT Workbook	5,443
Insurance	0.02 TCC	BAAQMD BACT Workbook	10,887
General and Administrative	0.02 TCC	BAAQMD BACT Workbook	10,887
Operation & Maintenance	0.05 TCC	BAAQMD BACT Workbook	27,217
Total Indirect Annual Cost (IAC)			**128,464**
Total Annualized Cost (TAC)	**TAC = DAC + IAC**		**148,335**

For 90% abatement of the emissions from S-22 through S-26 to be abated would result in the following emissions reduction:

Emissions Reduced = (1.30 + 1.81 + 1.81 + 1.81) (90%) = 6.06 TPY

Hence, the cost-effectiveness of abating S-22 through S-26 is estimated to be:

Cost-Effectiveness = $148,335/6.06 TPY = $24,478/ton of emissions reduced

The cost of abatement for S-22 through S-26 exceeds the BACT1 cost-effectiveness threshold of $17,500. Therefore it is not cost effective to implement add-on abatement (BACT1). BACT has been determined to compliance with existing Regulation 8-20 requirements.

BACT2 requirements for graphic arts operations is met, because the applicant will use UV inks and cleaning products which meet the Regulation 8-20-309 standards. The use of ultra-low or no-VOCs in the UV inks and cleaning materials is considered BACT for graphic arts operations.

The HP Indigo presses each have an integrated VOC recovery system that includes a vapor collection system and condenser that recovers and reuses organic liquids and reduces usage and emissions. The VOC recovery system is considered BACT for digital presses (per Application # 24060). In Application # 24060, District review also found BACT1 not to be justified for the HP Indigo Press.

BACT 2 for digital presses is not included in the BACT guidelines. Most printing press BACT 2 is the use of low VOC materials. However, this technology is not extendable to digital presses, where the electrophotography technology requires the ElectroInk materials. One BACT 2 technology is to collect and control emissions such that the overall emission would effectively be less than 2.5 lb/gal (Document 146.1, Rotogravure Printing). The HP Indigo 6000 press collection/condensing system complies with this requirement, as demonstrated in the following table:

TABLE VI – Collection/Condensing Summary

Total Ink lb/yr	Typical Ink Density lb/gal	Total Ink gal/yr	Typical Ink VOC lb/gal	Total Ink VOC lb/yr	Total Ink VOC lb/day
44,465	6.8	6,539	5.3	34,657	144
			Permitted POC Limit:		15.12
			Effective VOC lb/gal:		0.55
			Effective abatement:		89.6%

Note: Effective VOC lb/gal = 15.12 lb/day / (6,539 gal / 240 day/yr) = 0.55 lb/gal
Effective abatement = (5.3-0.55)/5.3 = 89.6%

The HP Indigo Digital Printing Press complies with BACT and is considered to have a BACT 2 level of control.

Offsets

The facility emissions are the following:

Table VII – POC Cumulative Increases

post 4/5/91 P O C increases as of 07-27-16 .
Collotype Label USA, Inc [plant: 17834]

Application	incr.	contemp	reduction	ratio	offsets	Bank No.
14706	5.080		1.00	5.080	157	
15121	.590		1.00	.590	157	
15423	1.180		1.00	1.180	157	
15979	.800		1.00	.800	157	
17181	1.720		1.00	1.720	157	
24435	.400		1.00	.400	157	
25237	.500		1.00	.500	157	
25891	1.200		1.00	1.200	157	

11.470 tpy POC permitted since 4/5/91(*)
.000 tpy POC currently subject to offsets
4.043 tpy POC in 2016 emissions inventory

Offsets are triggered because facility POC emissions are greater than 10 TPY. Adding the existing cumulative, this application would result in a total cumulative increase of 18.32to b TPY:

POC Cumulative Increase = 11.47 (existing) + 6.85 TPY (new) = 18.32 TPY

The facility owns no offsets. Because facility emissions are less than 35 tons per year, they qualify for offsets from the small facility bank per Regulation 2-4-414:

Offsets from SFB = 6.85 TPY

NSPS & NESHAP

S-22 through S-27 are not subject to NSPS Subpart QQ "Standards of Performance for the Graphic Arts Industry: Publication Rotogravure Printing" which apply to rotogravure presses. S-22 through S-27 are not located at a major source of HAPs and therefore, are not subject to NESHAP Subpart KK "National Emission Standards for the Printing and Publishing Industry" which apply to printing operations which are major sources of HAPs.

This application is ministerial (Permit Handbook Chapter 5.4); the requirements of the California Environmental Quality Act (CEQA) are not triggered. The facility is not located within 1000 feet of any K-12 school. As a result, no public notification requirements are triggered.

4. Conditions

I recommend that the following conditions for S-22 and S-23 (Condition # 26372):

1. The owner/operator shall ensure the combined usage of the following materials at S-22 and S-23 does not exceed the following usage limits during any consecutive twelve-month period:

Great Western Soy-Based Ink	21000 Pounds
Great Western Rub Resistant Ink	15000 Pounds
UV Ink	No Limit
Nicoat Aqueous Varnish	6000 Gallons
Explorer Press Solutions Alpha 8	1050 Gallons
Bottcher Systems California Wash	700 Gallons
Nora Products VOC Exempt Meter Cleaner	800 Gallons
Varn International Supreme 8168	65 Gallons
Siegwerk Druch Fount	65 Gallons

(Basis: Cumulative Increase)

2. The owner/operator may use an alternate coating(s) or cleanup solvent(s) other than the materials specified in Part 1 and/or usages in excess of those specified in Part 1, provided that the owner/operator can demonstrate that all of the following are satisfied:
   a. Total POC emissions from S-27 do not exceed 2,594 pounds in any consecutive twelve month period;
   b. Total NPOC emissions from S-27 do not exceed 2,594 pounds in any consecutive twelve month period; and
   c. The use of these materials does not increase toxic emissions above any risk screening trigger level of Table 2-5-1 in Regulation 2-5.

   (Basis: Cumulative Increase; Toxics)

3. To determine compliance with the above parts, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above parts, including the following information:
   a. Quantities of each type of coating and cleanup solvent used at this source on a monthly basis.
   b. If a material other than those specified in Part 1 is used, POC/NPOC and toxic component contents of each material used; and mass emission calculations to demonstrate compliance with Part 2, on a monthly basis;
   c. Monthly usage and/or emission calculations shall be totaled for each consecutive twelve-month period.
   d. Demonstration that any toxic air contaminants in new solvents in the coating and cleanup materials in Part 2, do not exceed the acute and chronic trigger levels by calculating toxic air contaminant emissions on a lb/hour and lb/year basis, respectively.

   All records shall be retained on-site for two years, from the date of entry, and made available for inspection by District staff upon request. These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable District Regulations.
   (Basis: Cumulative Increase; Toxics)

I recommend the following permit condition for S-24, S-25, and S-26 (Condition # 26377):

1. The Owner/Operator of the HP Indigo 6000-series Digital Printing Presses S-24, S-25, and S-26 shall not exceed the following limits of gross material usage for each consecutive 12-month period per press:
    a. HP ElectroInks 44,465 pounds
    b. HP Imaging Oil 118 gallons
    c. HP Recycle Agent 215 gallons
    d. HP Imaging Agent 24 gallons
    (Basis: Cumulative Increase)

2. The Owner/Operator of S-24, S-25 and S-26 shall not exceed the following limits:
    a. 15.12 pounds of organic emissions per day at each of the above presses, based on a calendar month average.
    b. Each press shall not operate for more than 240 days in any consecutive 12-month period.
    (Basis: Cumulative Increase, BACT)

3. The Owner/Operator of S-24, S-25 and S-26 shall not operate any of the above presses within 1000 feet of any school or school grounds unless there are no Toxic Air Contaminant emissions. "School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, athletic field, or other areas of school property but does not include unimproved school property. (Basis: Regulations 2-1-106, 2-1-412)

4. The owner/operator of S-24, S-25 and S-26 shall maintain all press doors at each of the above presses in the closed position at all times when the press is operating. The owner/operator of S-24, S-25 and S-26 may open the doors to change consumables, repair paper jams, or conduct urgent maintenance. However, once the doors at the presses are opened, the press is designed to be unable to operate and the owner/operator must not defeat or in any way compromise this shutdown feature. (Basis: Cumulative Increase, BACT)

5. The owner/operator of S-24, S-25 and S-26 shall operate the integral oil recovery systems of the press at all times in accordance with the HP Indigo owner's manual. (Basis: Cumulative Increase, BACT)

6. The owner/operator of S-24, S-25 and S-26 shall not use open containers for the storage or disposal of cloth or paper impregnated with organic compounds that are used for surface preparation, cleanup or ink removal. (Basis: Regulation 8-20-320.1)

7. The owner/operator of S-24, S-25 and S-26 shall not store in open containers spent or fresh organic compounds used for surface preparation, cleanup or removal of inks. (Basis: Regulation 8-20-320.2)

8. The owner/operator of S-24, S-25 and S-26 shall not leave containers of ink, Imaging Oil, Imaging Agent, Recycle Agent or waste/spent organic material open when not in use. (Basis: Regulation 8-20-320.3)

9. The owner/operator of S-24, S-25 and S-26 shall maintain the following records for each press in a District-approved log book, and shall make the records available to District staff upon request:

a. Maintain a list of all inks, coatings, adhesives, makeup solvents, and cleaning products currently in use and document the VOC content and density of each material.
b. Record and add up on a monthly basis the type and amount (in pounds) of each ink, coating, adhesive, makeup solvent, surface preparation solvent, and cleaning product used during that month. In order to determine compliance with Part 1, HP Imaging Oil, HP Recycle Agent and HP Imaging Agent shall also be recorded in gallons.
c. Record the total pounds of VOC of each ink, coating, adhesive, makeup solvent, surface preparation solvent, and cleaning product used during that month.
d. Record the amount of organic material that is collected and sent off site or accumulated prior to being sent off site.
e. For each calendar month, the owner/operator of S-24, S-25 and S-26 shall determine compliance with Part 2 by subtracting the total pounds of organic material recorded in Part 9d from the total pounds of VOC recorded in Part 9c, and dividing the difference by the number of operating days in the month.
f. The owner/operator of S-24, S-25 and S-26 shall retain all records for a period of 24-months from the last date of entry. (Basis: Regulation 8-20-503, Cumulative Increase)

I recommend the following conditions for S-27 (Condition # 26371):

1. The owner/operator of S-27 shall not exceed the following usage limits during any consecutive twelve-month period:

UV Ink	No Limit
CeramClean Solv-It	100 Gallons

(Basis: Cumulative Increase)

2. The owner/operator may use an alternate coating(s) or cleanup solvent(s) other than the materials specified in Part 1 and/or usages in excess of those specified in Part 1, provided that the owner/operator can demonstrate that all of the following are satisfied:
   a. Total POC emissions from S-27 do not exceed 210 pounds in any consecutive twelve month period;
   b. Total NPOC emissions from S-27 do not exceed 210 pounds in any consecutive twelve month period; and
   c. The use of these materials does not increase toxic emissions above any risk screening trigger level of Table 2-5-1 in Regulation 2-5.

   (Basis: Cumulative Increase; Toxics)

3. To determine compliance with the above parts, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above parts, including the following information:
   a. Quantities of each type of coating and cleanup solvent used at this source on a monthly basis.
   b. If a material other than those specified in Part 1 is used, POC/NPOC and toxic component contents of each material used; and mass emission calculations to demonstrate compliance with Part 2, on a monthly basis;
   c. Monthly usage and/or emission calculations shall be totaled for each consecutive twelve-month period.
   d. Demonstration that any toxic air contaminants in new solvents in the coating and cleanup materials in Part 2, do not exceed the acute and chronic trigger levels by calculating toxic air contaminant emissions on a lb/hour and lb/year basis, respectively.

   All records shall be retained on-site for two years, from the date of entry, and made available for inspection by District staff upon request. These recordkeeping requirements shall not

replace the recordkeeping requirements contained in any applicable District Regulations. (Basis: Cumulative Increase; Toxics)

5. Authority to Construct:

I recommend that the Authority to Construct issued to CLII for the following:

S-22 UV Press-Sheetfed Press UV Coaters, Heidelberg, SM74
S-23 CO2 Multi Coatings Printing Press, Heidelberg, CD74
S-24 6000 Indigo, HP Indigo 6000 Digital Press
S-25 6600 Indigo, HP Indigo 6600 Digital Press
S-26 6800 Indigo, HP Indigo 6800 Digital Press
S-27 UV Presses (2 Digicon Series 2 and 1 Digicon Series 3), Omega Digicon Series 2 and 3

6. Exemptions:

None.

12/80-ER1

By M.K. Carol Lee
Senior Air Quality Engineer

Date

Attachment E

Public Notice Comment Memo

SACRAMENTO METROPOLITAN
AIR QUALITY
MANAGEMENT DISTRICT

Intra-Office Memo

To : FILE (BACT Determinations #147 & #180)

From : Jeffrey Quok

Date : January 3, 2018

Subject : Public Notice for BACT Determinations #147 & #180

No comments were received during the public noticing period (12/1/17-1/2/18).