

**MARYLAND DEPARTMENT OF THE ENVIRONMENT**

**AIR AND RADIATION ADMINISTRATION  
APPLICATION FOR A PERMIT TO CONSTRUCT**

**DOCKET # 18-22**

COMPANY: Vac Pac, Incorporated

LOCATION: 917 Middle River Road  
Middle River, Maryland 21220

APPLICATION: One (1) Soma Optima2-8C, 8-color flexographic printing press equipped with 0.4 MMBtu/hr natural gas dryer (Print Press#3) to replace the existing Kidder Centraflex Model 434 flexographic printing press (Press # 2).

<u>ITEM</u>	<u>DESCRIPTION</u>
1	Notice of Application and Opportunity to Request an Informational Meeting
2	Permit to Construct Application Forms and Supporting Documents: Forms 5, 5T, 5EP, 6, 10

**DEPARTMENT OF THE ENVIRONMENT  
AIR AND RADIATION ADMINISTRATION**

**NOTICE OF APPLICATION AND  
OPPORTUNITY TO REQUEST AN INFORMATIONAL MEETING**

The Maryland Department of the Environment, Air and Radiation Administration (ARA) received a permit-to-construct application from Vac Pac Incorporated on September 19, 2022, for the installation of one (1) Soma Optima2-8C, 8-color flexographic printing press equipped with 0.4 MMBtu/hr natural gas dryer (Print Press #3) to replace the existing Kidder Centraflex Model 434 flexographic printing press (Press # 2). The proposed Print Press #3 will be located at 917 Middle River Road in Middle River, Maryland 21220.

Copies of the application and other supporting documents are available for public inspection on the Department's website. Look for Docket #18-22 at the following link:

<https://mde.maryland.gov/programs/Permits/AirManagementPermits/Pages/index.aspx>

Pursuant to the Environment Article, Section 1-603, Annotated Code of Maryland, the Department will hold an informational meeting to discuss the application and the permit review process if the Department receives a written request for a meeting within 10 working days from the date of the second publication of this notice. All requests for an informational meeting should be directed to the attention of Ms. Shannon Heafey, Air Quality Permits Program, Air and Radiation Administration, 1800 Washington Boulevard, Baltimore, Maryland 21230.

Further information may be obtained by calling Ms. Shannon Heafey at 410-537-4433.

Christopher R. Hoagland, Director  
Air and Radiation Administration

September 16, 2022

## **VACPAC, INC.**

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**917 Middle River Road  
Middle River, Maryland 21220**

*Permit to Construct Application*

Submitted To:  
**Maryland Department of the Environment  
1800 Washington Blvd  
Baltimore, Maryland 21230**



**PROJECT NUMBER:**  
177073

**PROJECT CONTACT:**  
Jennifer Seinfeld  
**EMAIL:**  
jennifer.seinfeld@powereng.com  
**PHONE:**  
410-312-7915



*Permit to Construct Application*

**PREPARED FOR:** VACPAC, INC.  
917 MIDDLE RIVER ROAD  
MIDDLE RIVER, MD 21220

**PREPARED BY:** POWER ENGINEERS, INC.  
10320 LITTLE PATUXENT PARKWAY, SUITE 200  
COLUMBIA, MD 21044  
JENNIFER SEINFELD  
410-312-7915  
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## 1.0 INTRODUCTION

VacPac Manufacturing Co., Inc. (VacPac) currently operates a flexible packaging converter facility at 917 Middle River Road, Middle River, in Baltimore County, that prints flexible packaging primarily for the food service industry. VacPac currently operates under Operating Permit No. 005-2824, expiring March 31, 2027.

VacPac plans to:

- Install a new Soma Optima2-8C, 8-color flexographic printing press (Print Press #3) with a natural gas dryer rated at 0.4 MMBtu/hr.
- Remove its current Kidder Centraflex Model 434 flexographic printing press (Print Press #2) equipped with two natural gas dryers rated at total of 2.3 MMBtu/hr.

## 2.0 PROJECT DESCRIPTION

VacPac requests authorization to operate Print Press #3 on a continuous basis. As such, the operating schedule reported on the attached Form 5 is for 24 hours per day, 7 days per week, and 52 weeks per year. Natural gas firing of dryers and the RTO is also based on 8760 hours per year. Realistically, VacPac will operate Print Press #3 somewhat less than continuously, likely for two 10-hr shifts/day. The 10-hr shift includes time required for startup, shutdown, and setup for changes in jobs and inks.

### 2.1 TAP emissions

VacPac's calendar year 2021 usage of materials (reported in pounds) was used as a basis to estimate TAP emissions from printing and adhesive application processes. The 2021 annual usage is found in attached *Table 1 – 2021 Inks, Solvents and Adhesive Products Used*. SDSs for inks, adhesives, and solvents that VacPac may use can be provided electronically upon request. Although not all of the inks were used in 2021, all of their SDSs were thoroughly reviewed and the formulation for the varying colors is very similar to the inks represented in the TAPs analysis. The products and constituents are found in *Table 2 – Toxic Air Pollutants (TAPs)*. None of the TAPs that are contained in the materials that will be used at VacPac have annual screening levels, only 1-hour and/or 8-hour screening levels. Therefore, projected maximum hourly emissions were the focus of the calculations. Also, it was determined that each piece of equipment, under the most conservative conditions, could operate for a maximum of eight continuous hours. Therefore, the 1-hour hourly emission rate was equivalent to the 8-hour average hourly emission rate.

VacPac ships waste solvents, inks and packing offsite as hazardous waste offsite. The total usage of solvents was reduced by 10% to account for waste; however, conservatively the ink usage was not reduced.

The new press (Print Press #3) will be capable of running at 1,640 ft/min versus the maximum speed of Print Press #2, which is being removed, at 600 ft/min. The new press will also be wider with more printing area, at 57 inches, compared to that of Print Press #2 at 47 inches. These increases were applied to the calculation of all inks and solvents that will be used on Print Press #3, as well as a conservative factor of 2. Print Press #3 will be routed to the existing RTO.

A conservative hourly emission rate was determined for each TAP. All products were evaluated to determine the highest concentrations of each TAP. These concentrations were multiplied by the maximum hourly product usage to calculate the highest hourly emissions rate for each TAP. The hourly rate was doubled, conservatively assuming both Print Presses #1 and #3 could be operated simultaneously during one hour (although Print Press #1 will primarily be used as a back-up to Print Press #3.). A 95% overall control efficiency was applied to the emissions that are routed to the RTO.

Two of the TAPs, methyl isobutyl ketone and toluene, are also Federal Hazardous Air Pollutants (HAPs). Neither of the HAPs exceeds 10 tons/year. (And, as such, in aggregate the HAP emissions do not exceed 25 tons/year.) Therefore, the site is not considered a major HAP source.

The projected hourly emissions of each of the non-combustion, related-TAPs for the facility were then totaled and compared to the Allowable Emission Rate (AER) as calculated based on the 1-hour and/or 8-hour screening levels for stacks with downwash or non-stacks. As shown in the attached *Table 3 – Toxic Air Pollutants (TAPs) Compliance Demonstration – Premise Wide*, the premise-wide projected TAPs emissions demonstrate compliance with MDE TAP regulations.

In accordance with an assessment done by the Environmental Protection Agency on flexographic ink options (EPA 744-R-02-001A, 2002), ink components with a vapor pressure greater than or equal to 0.001 millimeters of mercury (mmHg) at 25°C will volatilize during the flexographic printing process, but those with vapor pressures less than 0.001 mmHg will remain with the substrate. This methodology was likewise applied when calculating the emissions of the identified TAP components of inks and other printing materials used by VacPac in its flexographic printing process. These components are highlighted in grey on Table 3 and were not considered for further analysis.

## 2.2 Criteria Emissions

AP-42 emission factors were used to calculate criteria pollutant and TAP emissions from natural gas (NG) combustion in the RTO and the equipment dryers. The hourly firing rate of each piece of equipment was multiplied by 8760 hours per year to determine maximum criteria pollutant and TAP emissions. The combustion related-emissions are summarized in the attached *Table 4 – Criteria Emissions from NG Combustion*.

Although the flexographic presses may be run at full speed, the flexible packaging is never covered 100% with ink or adhesives. However, ink/adhesive (and solvent) usage was conservatively estimated by basing the hourly usage rates from VacPac production runs with high ink coverage/adhesive usage and thereby high associated solvent usage.

VOC emissions were then calculated using these hourly usage rates along with the associated VOC content of the applicable product. In the case of the inks, the ink in each category with the highest VOC content was selected. This is very conservative in that white ink is used more than any other ink, (historically approximately 40% of the total ink usage), and white ink has a VOC content of 35%, while the highest VOC content of the CAI inks is 73.9% and the highest VOC content of the Hercubond inks is 83.4%. Solvent emissions were decreased by 10% to account for waste and flexographic press emissions were decreased by 95% to account for control through the RTO. Annual emissions were calculated using 8,760 hours per year of operation. Emissions are summarized in *Table 5 – VOC Emissions as a Result of Printing and Adhesive Application Processes*.

The facility-wide VOC emissions, including those from natural gas combustion, are totaled for each piece of equipment in attached *Table 6 – Total VOC Emissions*. Emissions from products used on Mylar Press

#1 and Mylar Press #2 were divided equally between the two presses. Solvents used by both Print Press #1 and Mylar Press #1, were assigned 97% and 3% of the total usage, respectively, to correspond with the overall ink usage. The projected maximum VOC emissions for the facility using the above-described conservative assumptions are 19.5 tons per year.





## AIR QUALITY PERMIT TO CONSTRUCT APPLICATION CHECKLIST

OWNER OF EQUIPMENT/PROCESS	
COMPANY NAME:	VacPac, Inc.
COMPANY ADDRESS:	917 Middle River Road, Middle River, MD 21220
LOCATION OF EQUIPMENT/PROCESS	
PREMISES NAME:	VacPac, Inc.
PREMISES ADDRESS:	917 Middle River Road, Middle River, MD 21220
CONTACT INFORMATION FOR THIS PERMIT APPLICATION	
CONTACT NAME:	Matt Tary
JOB TITLE:	President
PHONE NUMBER:	410-690-8080 x 108
EMAIL ADDRESS:	matt.tary@vacpacinc.com
DESCRIPTION OF EQUIPMENT OR PROCESS	
Soma Optima2-8C, 8-color flexographic printing press, with 0.4 MMBtu/hr natural gas dryer (Print Press #3).	

Application is hereby made to the Department of the Environment for a Permit to Construct for the following equipment or process as required by the State of Maryland Air Quality Regulation, COMAR 26.11.02.09.

Check each item that you have submitted as part of your application package.

- Application package cover letter describing the proposed project
- Complete application forms (Note the number of forms included or NA if not applicable.)
  - No.   1   Form 5
  - No.   1   Form 5T
  - No.   1   Form 5EP
  - No.   1   Form 6
  - No.        Form 10
  - No.        Form 11
  - No.        Form 41
  - No.        Form 42
  - No.        Form 44
- Vendor/manufacturer specifications/guarantees
- Evidence of Workman's Compensation Insurance
- Process flow diagrams with emission points
- Site plan including the location of the proposed source and property boundary
- Material balance data and all emissions calculations
- Material Safety Data Sheets (MSDS) or equivalent information for materials processed and manufactured. (See information provided in Tables 1 and 2)
- Certificate of Public Convenience and Necessity (CPCN) waiver documentation from the Public Service Commission <sup>(1)</sup>
- Documentation that the proposed installation complies with local zoning and land use requirements <sup>(2)</sup>

<sup>(1)</sup> Required for emergency and non-emergency generators installed on or after October 1, 2001 and rated at 2001 kW or more.

<sup>(2)</sup> Required for applications subject to Expanded Public Participation Requirements.

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230  
 (410) 537-3230 ▪ 1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct

Registration Update

Initial Registration

1A. Owner of Equipment/Company Name

VacPac, Inc.

Mailing Address

917 Middle River Road  
 Street Address

Middle River MD 21220  
 City State Zip

Telephone Number

( 410 ) 690-8080

Signature



Matt Tary  
 Print Name and Title

DO NOT WRITE IN THIS BLOCK

2. REGISTRATION NUMBER

County No.

--	--

1-2

Premises No.

--	--	--	--

3-6

Registration Class

--

7

Equipment No.

--	--	--	--

8-11

Data Year

--	--

12-13

Application Date

9/19/2022  
 Date

1B. Equipment Location and Telephone Number (if different from above)

Street Number and Street Name

City/Town State Zip Telephone Number

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status	New Construction Begun (MM/YY)	New Construction Completed (MM/YY)	Existing Initial Operation (MM/YY)
A 15	1 2 2 2 16-19	1 2 2 2 20-23	 20-23

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)  
 Soma Optima2-8C 8-color flexographic printing press with 0.4 MMBtu/hr natural gas dryer

5. Workmen's Compensation Coverage 445083413 10/9/2022

Company Chesapeake Employers Insurance Binder/Policy Number Expiration Date

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment 1 (existing RTO)

**7. Person Installing this Equipment (if different from Number 1 on Page 1)**

Name \_\_\_\_\_ Title \_\_\_\_\_  
 Company \_\_\_\_\_  
 Mailing Address/Street \_\_\_\_\_  
 City/Town \_\_\_\_\_ State \_\_\_\_\_ Telephone (\_\_\_\_) \_\_\_\_\_

**8. Major Activity, Product or Service of Company at this Location**

Flexible packaging printing

**9. Control Devices Associated with this Equipment**

None  
  
 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

Describe Existing Regenerative Thermal Oxidizer (RTO)  
 24-9

**10. Annual Fuel Consumption for this Equipment**

OIL-1000 GALLONS <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 26-31	SULFUR % <input type="text"/> <input type="text"/> 32-33	GRADE <input type="text"/> 34	NATURAL GAS-1000 FT <sup>3</sup> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 35-41	LP GAS-100 GALLONS <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 42-45	GRADE <input type="text"/> 46-52
COAL- TONS <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 46-52	SULFUR % <input type="text"/> <input type="text"/> 53-55	ASH% <input type="text"/> <input type="text"/> 56-58	WOOD-TONS <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 59-63	MOISTURE % <input type="text"/> <input type="text"/> 64-65	

OTHER FUELS  ANNUAL AMOUNT CONSUMED OTHER FUEL  ANNUAL AMOUNT CONSUMED  
 (Specify Type) 66-1 (Specify Units of Measure) (Specify Type) 66-2 (Specify Units of Measure)  
 1=Coke 2=COG 3=BFG 4=Other

**11. Operating Schedule (for this Equipment)**

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:  
 No Variation  Winter Percent  Spring Percent  Summer Percent  Fall Percent   
 76 77-78 79-80 81-82 83-84 (Total Seasons= 100%)

12. Equivalent Stack Information- is Exhaust through Doors, Windows, etc. Only? (Y/N)

N  
85

If not, then

Height Above Ground (FT)

Inside Diameter at Top

Exit Temperature (°F)

Exit Velocity (FT/SEC)

3  5

6  5

2  6  0

3  3

86-88

89-91

92-95

96-98

**NOTE:**

Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)

Is any of this data to be considered confidential?  N (Y or N)

**INPUT RATE**

NAME	CAS NO. (IF APPLICABLE)	PER HOUR	INPUT RATE		UNITS
			UNITS	PER YEAR	
1. Unprinted flexible packaging					
2. Inks					
3. Solvents					
4.					
5.					
6.					
7.					
8.					
9.					

**TOTAL**

14. Output Materials (for this equipment)

Process/Product Stream

**OUTPUT RATE**

NAME	CAS NO. (IF APPLICABLE)	PER HOUR	OUTPUT RATE		UNITS
			UNITS	PER YEAR	
1. Printed flexible packaging					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					

**TOTAL**

15. Waste Streams- Solid and Liquid

**OUTPUT RATE**

NAME	CAS NO. (IF APPLICABLE)	PER HOUR	OUTPUT RATE		UNITS
			UNITS	PER YEAR	
1. Waste inks and solvents					
2. Waste flexible packaging					
3.					
4.					
5.					
6.					
7.					
8.					
9.					

**TOTAL**

**16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day**

Particulate Matter  
   0 . 1

99-104

Oxides of Sulfur  
  < 0 . 1

105-110

Oxides of Nitrogen  
   0 . 9

111-116

Carbon Monoxide  
   0 . 8

177-122

Volatile Organic Compounds  
   8 2

123-128

PM-10  
   0 . 1

129-134

**17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day**

Particulate Matter

135-139

Oxides of Sulfur

140-144

Oxides of Nitrogen

145-149

Carbon Monoxide

150-154

Volatile Organic Compounds

155-159

PM-10

160-164

**Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP  
 2

165

SOX  
 2

166

NOX  
 2

167

CO  
 2

168

VOC  
 1

169

PM10  
 2

170

**AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY**

18. Date Rec'd. Local \_\_\_\_\_

Date Rec'd. State \_\_\_\_\_

Return to Local Jurisdiction

Date \_\_\_\_\_ By \_\_\_\_\_

Reviewed by Local Jurisdiction

Date \_\_\_\_\_ By \_\_\_\_\_

Reviewed by State

Date \_\_\_\_\_ By \_\_\_\_\_

19. Inventory Date

Month/Year

171-174

Equipment Code

175-177

SCC Code

178-185

20. Annual

Operating Rate

186-192

Maximum Design

Hourly Rate

193-199

Permit to Operate

Month

200-201

Transaction Date

(MM/DD/YR)

202-207

Staff Code

208-210

VOC Code

211 212

SIP Code

213 214

Regulation Code

215-218

Confidentiality

219

Point Description

220-238

Action

A: Add  
C: Change

239

**MARYLAND DEPARTMENT OF THE ENVIRONMENT**  
 Air and Radiation Management Administration • Air Quality Permits Program  
 1800 Washington Boulevard • Baltimore, Maryland 21230  
 (410)537-3225 • 1-800-633-6101 • [www.mde.maryland.gov](http://www.mde.maryland.gov)

**FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration**

Applicant Name: VacPac, Inc

**Step 1: Quantify premises-wide emissions of Toxic Air Pollutants (TAP) from new and existing installations in accordance with COMAR 26.11.15.04. Attach supporting documentation as necessary.**

Toxic Air Pollutant (TAP)	CAS Number	Class I or Class II?	Screening Levels ( $\mu\text{g}/\text{m}^3$ )			Estimated Premises Wide Emissions of TAP			
						Actual Total Existing TAP Emissions	Projected TAP Emissions from Proposed Installation	Premises Wide Total TAP Emissions	
			1-hour	8-hour	Annual	(lb/hr)	(lb/hr)	(lb/hr)	(lb/yr)
<i>ex. ethanol</i>	64175	II	18843	3769	N/A	0.60	0.15	0.75	1500
<i>ex. benzene</i>	71432	I	80	16	0.13	0.5	0.75	1.00	400
See Attachment, Table 3									

(attach additional sheets as necessary.)

**Note: Screening levels can be obtained from the Department's website (<http://www.mde.maryland.gov>) or by calling the Department.**

**Step 2: Determine which TAPs are exempt from further review. A TAP that meets either of the following Class I or Class II small quantity emitter exemptions is exempt from further TAP compliance demonstration requirements under Step 3 and Step 4.**

**Class II TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(a))**

A Class II TAP is exempt from Step 3 and Step 4 if the Class II TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour, and any applicable 1-hour or 8-hour screening level for the TAP must be greater than  $200 \mu\text{g}/\text{m}^3$ .

**Class I TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(b))**

A Class I TAP is exempt from Step 3 and Step 4 if the Class I TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour and 350 pounds per year, any applicable 1-hour or 8-hour screening level for the TAP must be greater than  $200 \mu\text{g}/\text{m}^3$ , and any applicable annual screening level for the TAP must be greater than  $1 \mu\text{g}/\text{m}^3$ .

**If a TAP meets either the Class I or Class II TAP Small Quantity Emitter Exemption Requirements, no further review under Step 3 and Step 4 are required for that specific TAP.**

## FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

### Step 3: Best Available Control Technology for Toxics Requirement (T-BACT, COMAR 26.11.15.05)

In the following table, list all TAP emission reduction options considered when determining T-BACT for the proposed installation. The options should be listed in order beginning with the most effective control strategy to the least effective strategy. Attach supporting documentation as necessary.

Target Pollutants	Emission Control Option	% Emission Reduction	Costs		T-BACT Option Selected? (yes/no)
			Capital	Annual Operating	
<i>ex. ethanol and benzene</i>	<i>Thermal Oxidizer</i>	99	\$50,000	\$100,000	no
<i>ex. ethanol and benzene</i>	<i>Low VOC materials</i>	80	0	\$100,000	yes
VOC	RTO (existing)	95			

(attach additional sheets as necessary)

### Step 4: Demonstrating Compliance with the Ambient Impact Requirement (COMAR 26.11.15.06)

Each TAP not exempt in Step 2 must be individually evaluated to determine that the emissions of the TAP will not adversely impact public health. The evaluation consists of a series of increasingly non-conservative (and increasingly rigorous) tests. Once a TAP passes a test in the evaluation, no further analysis is required for that TAP. "Demonstrating Compliance with the Ambient Impact Requirement under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06)" provides guidance on conducting the evaluation. Summarize your results in the following table. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Screening Levels ( $\mu\text{g}/\text{m}^3$ )			Premises Wide Total TAP Emissions		Allowable Emissions Rate (AER) per COMAR 26.11.16.02A		Off-site Concentrations per Screening Analysis ( $\mu\text{g}/\text{m}^3$ )			Compliance Method Used?
		1-hour	8-hour	Annual	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	1-hour	8-hour	Annual	AER or Screen
<i>ex. ethanol</i>	64175	18843	3769	N/A	0.75	1500	0.89	N/A	N/A	N/A	N/A	AER
<i>ex. benzene</i>	71432	80	16	0.13	1.00	400	0.04	36.52	1.5	1.05	0.12	Screen
See Attachment.												
Table 3												

(attach additional sheets as necessary)

**If compliance with the ambient impact requirement cannot be met using the allowable emissions rate method or the screening analysis method, refined dispersion modeling techniques may be required. Please consult with the Department's Air Quality Permit Program prior to conducting dispersion modeling methods to demonstrate compliance.**

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 Air and Radiation Management Administration • Air Quality Permits Program  
 1800 Washington Boulevard • Baltimore, Maryland 21230  
 (410)537-3225 • 1-800-633-6101 • [www.mde.maryland.gov](http://www.mde.maryland.gov)

**FORM 5EP: Emission Point Data**

**Complete one (1) Form 5EP for EACH emission point** (stack or fugitive emissions) related to the proposed installation.

Applicant Name: VacPac, Inc

**1. Emission Point Identification Name/Number**

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:  
EP-1

**2. Emission Point Description**

Describe the emission point including all associated equipment and control devices:  
Existing RTO stack that controls the emissions associated with the flexographic presses used for printing and adhesive application

**3. Emissions Schedule for the Emission Point**

Continuous or Intermittent (C/I)?	I	Seasonal Variation Check box if none: <input checked="" type="checkbox"/> Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	24	Spring Percent	
Days per week:	7	Summer Percent	
Weeks per year:	52	Fall Percent	

**4. Emission Point Information**

Height above ground (ft):	35	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):	0		4.7	2.7	
Exit temperature (°F):	260	Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):		10	
Exhaust gas volumetric flow rate (acfm):	27,273	Building dimensions if emission point is located on building (ft)	Height	Length	Width
			35	225	170

**5. Control Devices Associated with the Emission Point**

Identify each control device associated with the emission point and indicate the number of devices. **A Form 6 is also required for each control device.** If none check none:

- |   |           |   |  |
|---|-----------|---|--|
| <input type="checkbox"/> None                     |           | <input checked="" type="checkbox"/> Thermal Oxidizer            | No. <u>1</u>                           |
| <input type="checkbox"/> Baghouse                 | No. _____ | <input checked="" type="checkbox"/> Regenerative (Existing RTO) |  |
| <input type="checkbox"/> Cyclone                  | No. _____ | <input type="checkbox"/> Catalytic Oxidizer                     | No. _____                              |
| <input type="checkbox"/> Elec. Precipitator (ESP) | No. _____ | <input type="checkbox"/> Nitrogen Oxides Reduction              | No. _____                              |
| <input type="checkbox"/> Dust Suppression System  | No. _____ | <input type="checkbox"/> Selective                              | <input type="checkbox"/> Non-Selective |
| <input type="checkbox"/> Venturi Scrubber         | No. _____ | <input type="checkbox"/> Catalytic                              | <input type="checkbox"/> Non-Catalytic |
| <input type="checkbox"/> Spray Tower/Packed Bed   | No. _____ | <input type="checkbox"/> Other                                  | No. _____                              |
| <input type="checkbox"/> Carbon Adsorber          | No. _____ | Specify:  |  |
| <input type="checkbox"/> Cartridge/Canister       |           |   |  |
| <input type="checkbox"/> Regenerative             |           |   |  |



**FORM 5EP: Emission Point Data**

**6. Estimated Emissions from the Emission Point**

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)			0.1	0.013
Particulate Matter (filterable as PM2.5)			0.1	0.013
Particulate Matter (condensables)			0.1	0.013
Volatile Organic Compounds (VOC)			81.7	7.50
Oxides of Sulfur (SOx)			0.0056	0.001
Oxides of Nitrogen (NOx)			0.9	0.171
Carbon Monoxide (CO)			0.8	0.144
Lead (Pb)			4.71E-6	0.004
Greenhouse Gases (GHG)	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Carbon Dioxide (CO <sub>2</sub> )			1129	206
Methane (CH <sub>4</sub> )			0.02	0.004
Nitrous Oxide (N <sub>2</sub> O)			0.02	0.004
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF <sub>6</sub> )				
Total GHG (as CO <sub>2</sub> e)				
List individual federal Hazardous Air Pollutants (HAP) below:	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
MIBK		0.113		0.49
Toluene		0.090		0.39


(Attach additional sheets as necessary.)

# MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230  
 (410) 537-3230 ▪ 1-800-633-6101 ▪ www.mde.state.md.us

## Air and Radiation Management Administration ▪ Air Quality Permits Program

### APPLICATION FOR PERMIT TO CONSTRUCT GAS CLEANING OR EMISSION CONTROL EQUIPMENT

1. Owner of Installation VacPac, Inc		Telephone No. 410-690-8080	Date of Application
2. Mailing Address 917 Middle River Road		City Middle River	Zip Code 21220
		County Baltimore	
3. Equipment Location 917 Middle River Road		City/Town or P.O. Middle River	Zip Code 21220
		County Baltimore	
4. Signature of Owner or Operator 		Title President	Print or Type Name Matt Tary
5. Application Type:		Alteration <input type="checkbox"/>	New Construction <input type="checkbox"/>
6. Date Construction is to Start: Existing equipment		Completion Date (Estimate):	
7. Type of Gas Cleaning or Emission Control Equipment:			
Simple Cyclone <input type="checkbox"/> Multiple Cyclone <input type="checkbox"/> Afterburner <input type="checkbox"/> Electrostatic Precipitator <input type="checkbox"/>			
Scrubber <input type="checkbox"/> _____ (type) Other <input checked="" type="checkbox"/> Existing Regenerative Thermal Oxidizer (RTO) (type)			
8. Gas Cleaning Equipment Manufacturer		Model No.	Collection Efficiency (Design Criteria)
9. Type of Equipment which Control Equipment is to Service: Printing presses and associated equipmnet			
10. Stack Test to be Conducted:			
Yes <input type="checkbox"/> No <input type="checkbox"/> _____ (Stack Test to be Conducted By) _____ (Date)			
11. Cost of Equipment _____			
Estimated Erection Cost _____			

**12. The Following Shall Be Design Criteria:**

	<u>INLET</u>	<u>OUTLET</u>
Gas Flow Rate	_____ ACFM*	27,273 _____ ACFM*
Gas Temperature	_____ °F	260 _____ °F
Gas Pressure	_____ INCHES W.G.	_____ INCHES W.G.
	PRESSURE DROP _____	
Dust Loading	_____ GRAINS/ACFD**	_____ GRAINS/ACFD**
Moisture Content	_____ %	_____ %
OR		
Wet Bulb Temperature	_____ °F	_____ °F
Liquid Flow Rate (Wet Scrubber)	_____ GALLONS/MINUTE	
	(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)	
	* = ACTUAL CUBIC FEET PER MINUTE	** = ACTUAL CUBIC FEET DRY

**WHEN APPLICATION INVOLVES THE REDUCTION OF GASEOUS POLLUTANTS, PROVIDE THE CONCENTRATION OF EACH POLLUTANT IN THE GAS STREAM IN VOLUME PERCENT. INCLUDE THE COMPOSITION OF THE GASES ENTERING THE CLEANING DEVICE AND THE COMPOSITION OF EXHAUSTED GASES BEING DISCHARGED INTO THE ATMOSPHERE. USE AVAILABLE SPACE IN ITEM 15 ON PAGE 3.**

**13. Particle Size Analysis**

<u>Size of Dust Particles Entering Cleaning Unit</u>	<u>% of Total Dust</u>	<u>% to be Collected</u>
0 to 10 Microns	_____	_____
10 to 44 Microns	_____	_____
Larger than 44 Microns	_____	_____

**14. For Afterburner Construction Only:**

Volume of Contaminated Air \_\_\_\_\_ CFM (DO NOT INCLUDE COMBUSTION AIR)

Gas Inlet Temperature \_\_\_\_\_ °F

Capacity of Afterburner \_\_\_\_\_ BTU/HR

Diameter (or area) of Afterburner Throat \_\_\_\_\_

Combustion Chamber \_\_\_\_\_ (diameter) \_\_\_\_\_ (length) Operating Temperature at Afterburner \_\_\_\_\_ °F

Retention Time of Gases \_\_\_\_\_

**15. Show Location of Dust Cleaning Equipment in the System. Draw or Sketch Flow Diagram Showing Emission Path from Source to Exhaust Point to Atmosphere.**

RTO to control VOC emissions at 95% control. See flow diagram for emission path from sources to exhaust to atmosphere.

Date Received: Local \_\_\_\_\_ State \_\_\_\_\_

Acknowledgement Date: \_\_\_\_\_

By \_\_\_\_\_

Reviewed By:

Local \_\_\_\_\_

State \_\_\_\_\_

Returned to Local:

Date \_\_\_\_\_

By \_\_\_\_\_

Application Returned to Applicant:

Date \_\_\_\_\_

By \_\_\_\_\_

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT:

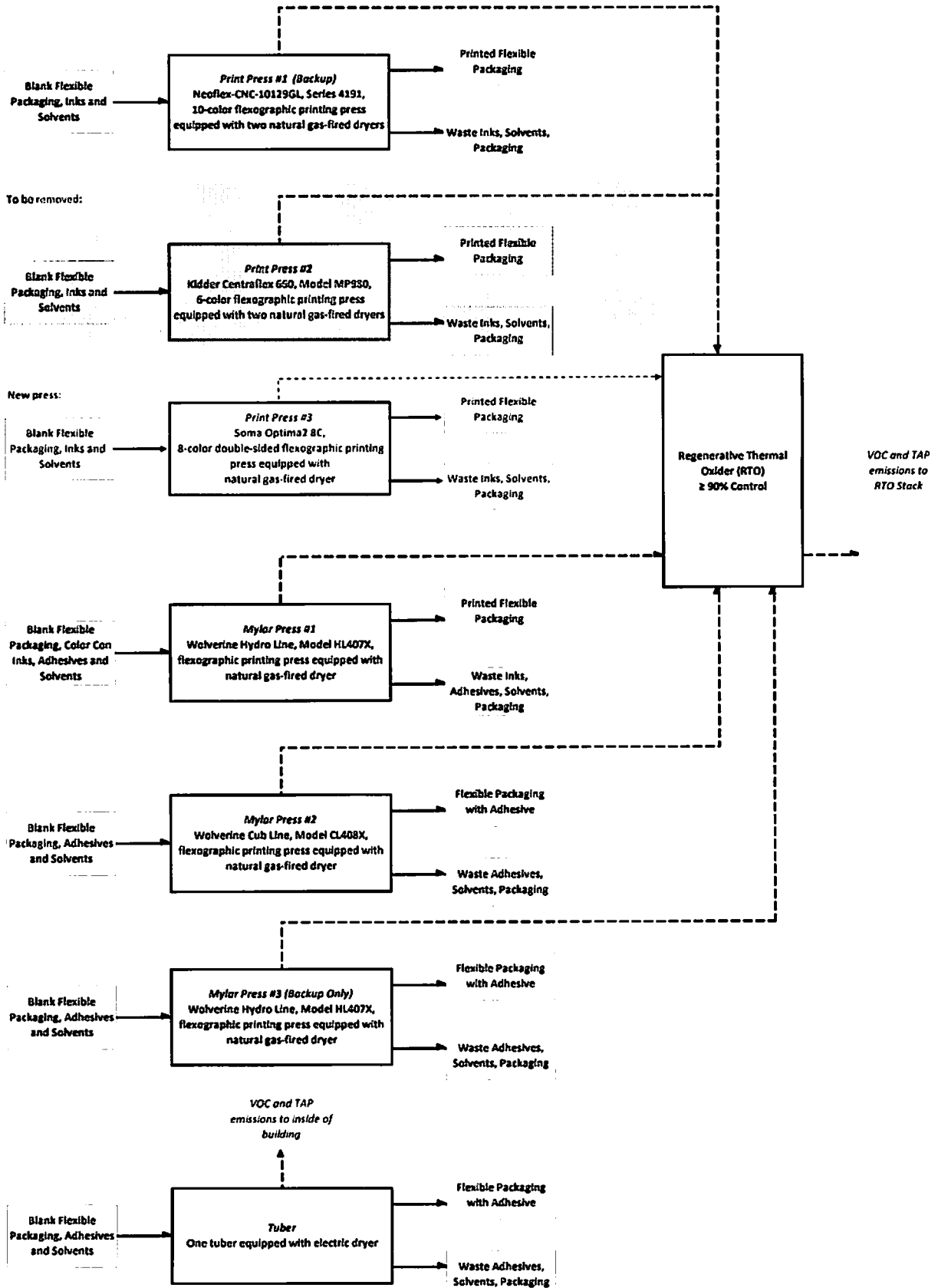
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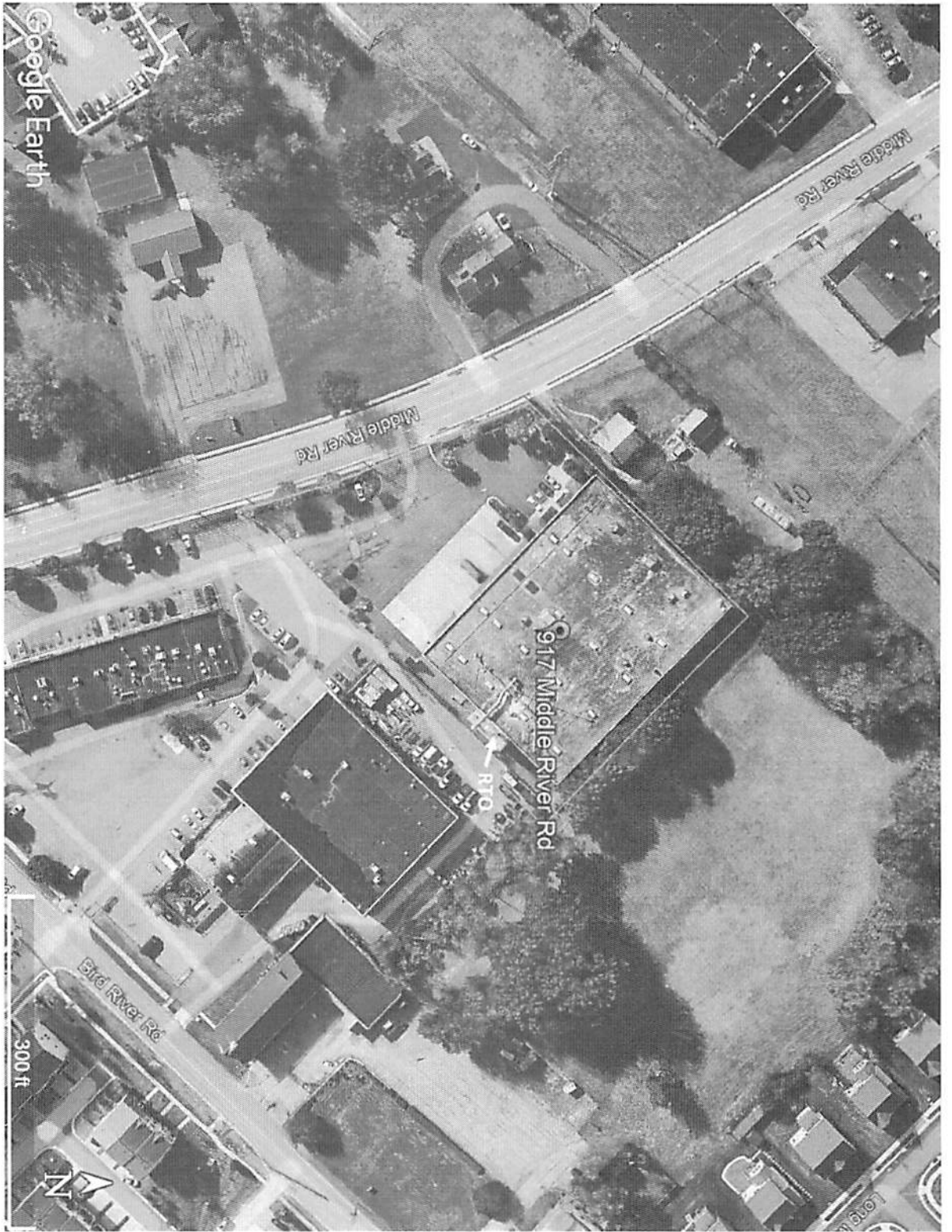
PREMISES NUMBER:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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Emission Calculations Revised By \_\_\_\_\_ Date \_\_\_\_\_

12. Block Diagram





Facility Plot Plan, indicating RTO stack (EP-1).

**Table 1**  
**2021 Ink, Solvents and Adhesive Products Used**

Material/Formular Number	Density	%wt. VOC	Usage (lb) Total	VOC Emissions (lb)	Type	Equipment
White 03-9015	10.47	35.1	9752	3422.952	CAI ink	Print Press 1 and 3
Black 03-6010	7.59	47.6	1708	813.008	CAI ink	Print Press 1 and 3
2995 Blue 03-6457	9.67	41.3	280	115.64	CAI ink	Print Press 1 and 3
Reflux Blue 03 6433	7.97	51.4	210	107.94	CAI ink	Print Press 1 and 3
Cyan Blue 03-6018	7.8	53.47	385	205.8595	CAI ink	Print Press 1 and 3
278 Blue 03-6706	10	39.2	140	54.88	CAI ink	Print Press 1 and 3
280 Blue 03-6819	7.84	60.4	245	147.98	CAI ink	Print Press 1 and 3
300 Blue 03-6036	7.8	65	405	263.25	CAI ink	Print Press 1 and 3
541 Blue 03-6302	7.8	70	70	49	CAI ink	Print Press 1 and 3
Purple 2592 03-6133	7.53	65.1	105	68.355	CAI ink	Print Press 1 and 3
Red 193 03-6534	7.89	57.08	335	191.218	CAI ink	Print Press 1 and 3
Red 199 03-6020	7.89	57.08	420	239.736	CAI ink	Print Press 1 and 3
Red 485 03-6039	7.59	61.6	420	258.72	CAI ink	Print Press 1 and 3
Red 485 HI STR 03-6275	7.72	52.6	70	36.82	CAI ink	Print Press 1 and 3
Red 032 03-6024	7.77	57.08	105	59.934	CAI ink	Print Press 1 and 3
Red 202 03-6136	9.96	45.5	140	63.7	CAI ink	Print Press 1 and 3
221 Maroon 04-04-0861	9.96	45.5	35	15.925	CAI ink	Print Press 1 and 3
Thermo Red Lake C 03 1118	7.72	57.95	35	20.2825	CAI ink	Print Press 1 and 3
Red 185 HI STR 03-6249	7.75	62.4	245	152.88	CAI ink	Print Press 1 and 3
Thermoplast Proc Megenta 03-1311	8.16	69.8	280	195.44	CAI ink	Print Press 1 and 3
Orange 021 03 6089	7.72	55.99	426	238.5174	CAI ink	Print Press 1 and 3
Orange 172 03-6031	7.72	70	143	100.1	CAI ink	Print Press 1 and 3
Orange 1665 03-6361	7.66	58.3	630	367.29	CAI ink	Print Press 1 and 3
Gold 873 03-8758	9.38	43.54	38	16.5452	CAI ink	Print Press 1 and 3
Brown 490 03-6084	7.89	55.19	745	411.1655	CAI ink	Print Press 1 and 3
464 Tan 03-6132	7.55	59.3	170	100.81	CAI ink	Print Press 1 and 3
Green 347 03-6057	7.59	55.8	70	39.06	CAI ink	Print Press 1 and 3
Green 340 03-6270	7.68	56.1	35	19.635	CAI ink	Print Press 1 and 3
Thermoplast Green 5743 03-1321	8.34	61.3	280	171.64	CAI ink	Print Press 1 and 3
Hercubond Surface 361 Green 17-01-1576	7.81	73.9	175	129.325	Hercubond ink	Print Press 1 and 3
Yellow 116 03-6011	7.84	54.3	639	346.977	CAI ink	Print Press 1 and 3
Diarylide Yellow 03-6002	7.5	59.9	114	68.286	CAI ink	Print Press 1 and 3
107 Yellow 03-6463	8.84	45.4	260	118.04	CAI ink	Print Press 1 and 3
Yellow 1235 03-6245	7.64	53.5	571	305.485	CAI ink	Print Press 1 and 3
Cream 1205 03-6085	9.94	40.1	225	90.225	CAI ink	Print Press 1 and 3
Hercubond Surface Ext/OP Varnish 17-01-0017	7.34	80.1	753	603.153	Hercubond ink	Print Press 1 and 3
Hercubond Surface Black 17-01-0018	7.59	72.9	112	81.648	Hercubond ink	Print Press 1 and 3
Hercubond Surface White High Heat 17-01-0080	10.25	42.6	665	283.29	Hercubond ink	Print Press 1 and 3
Hercubond Surface Process Black SD 17-01-0132	8.25	69.9	210	146.79	Hercubond ink	Print Press 1 and 3
Hercubond Surface HS Extender Varnish 17-01-0212	7.25	83.4	369	307.746	Hercubond ink	Print Press 1 and 3
Hercubond Surface HS Proc Blue SD 17-01-0297	8.25	68.2	35	23.87	Hercubond ink	Print Press 1 and 3
Hercubond Surface HS Proc Magenta SD 17-01-0298	8.25	68.2	245	167.09	Hercubond ink	Print Press 1 and 3
Hercubond Surface HS Proc Yellow SD 17-01-0299	8.00	67.9	175	118.825	Hercubond ink	Print Press 1 and 3
Hercubond Surface Line Black 17-01-0358	7.67	73.8	315	232.47	Hercubond ink	Print Press 1 and 3
Hercubond Surface 021 Orange 17-01-1322	7.53	76.3	70	53.41	Hercubond ink	Print Press 1 and 3
Hercubond Surface 287 Blue 17-01-1328	7.75	71.6	70	50.12	Hercubond ink	Print Press 1 and 3
Hercubond Surface 3135 Blue 17-01-1329	7.84	72.5	140	101.5	Hercubond ink	Print Press 1 and 3
Hercubond Surface 485 Red 17-01-1332	7.67	70.8	175	123.9	Hercubond ink	Print Press 1 and 3
Hercubond Surface 123 Yellow 17-01-1335	7.50	73.7	245	180.565	Hercubond ink	Print Press 1 and 3
Hercubond Surface 732 Brown 17-01-1336	7.75	69.8	105	73.29	Hercubond ink	Print Press 1 and 3
Hercubond Surface 7510 Light Brown 17-01-1351	7.52	75.5	35	26.425	Hercubond ink	Print Press 1 and 3
Hercubond Surface 199 Red 17-01-1353	7.62	73.7	35	25.795	Hercubond ink	Print Press 1 and 3
Hercubond Surface 130 Yellow 17-01-1357	7.67	71.4	140	99.96	Hercubond ink	Print Press 1 and 3
Hercubond Surface Combo 723 Brown 17-01-1372	7.81	68.2	35	23.87	Hercubond ink	Print Press 1 and 3
Hercubond Surface Combo 498 Brown 17-01-1373	7.87	68.2	70	47.74	Hercubond ink	Print Press 1 and 3
Hercubond Surface 145 Yellow 17-01-1376	7.55	74.3	40	29.72	Hercubond ink	Print Press 1 and 3
Hercubond Surface 185 Red 17-01-1380	7.64	71.2	70	49.84	Hercubond ink	Print Press 1 and 3
Hercubond Surface Cyan Blue 17-01-1381	7.75	72.3	140	101.22	Hercubond ink	Print Press 1 and 3
Hercubond Surface 368 Green 17-01-1382	7.48	76.7	735	563.745	Hercubond ink	Print Press 1 and 3
<b>Ink Totals:</b>			<b>24890</b>	<b>12522.60</b>		



**Table 1**  
**2021 Ink, Solvents and Adhesive Products Used**

<b>Material/Formular Number</b>	<b>Density</b>	<b>%wt. VOC</b>	<b>Usago (lb) Total</b>	<b>VOC Emissions (lb)</b>	<b>Type</b>	<b>Equipment</b>
Propanol 80/20 Blend 16076292 nex	6.86	100	46538	46538	Solvent	Print Press 1 and3, Mylar Press #1
Duplicating Fluid #5 123100	6.64	100	2835	2835	Solvent	Print Press 1 and 3
Valspar Adhesive 14S62AA.290	7.89	64.61	4758	3074.1438	Adhesive	Tuber
NP Adhesive 5660A09MK nas	7.51	49.24	3360	1654.464	Adhesive	Mylar Press 1 and 2 (and 3 as backup)
MIBK 134942	6.67	100	28	28	Solvent	Mylar Press 1 and 2 (and 3 as backup)
APV Blend 161429	6.69	100	8454	8454	Solvent	Mylar Press 1 and 2 (and 3 as backup), and Tuber
<b>Solvent and adhesive Totals:</b>			<b>65973</b>	<b>62583.6078</b>		
<b>Total Emissions Pre-Control (lb)</b>			<b>90863</b>	<b>75106.2109</b>		
<b>Total Emissions Pre-Control (Tons)</b>				<b>37.5531</b>		

**Table 2  
Toxic Air Pollutants (TAPs)**

Material/Formular Number	Usage (lb) Total	64-17-5		67-63-0		71-23-8	
		%	lb	%	lb	%	lb
White 03-9015	9752	21	2047.9		0	7	682.64
Black 03-6010	1708	22.5	384.3		0	5.2	88.816
2995 Blue 03-6457	280	25.3	70.84	1.1	3.08	4.2	11.76
Reflex Blue 03 6433	210	33.5	70.35	1.9	3.99	8.4	17.64
Cyan Blue 03-6018	385	33.2	127.82	1.9	7.315	6.9	26.565
278 Blue 03-6706	140	24.3	34.02	1	1.4	4.2	5.88
280 Blue 03-6819	245	31.2	76.44	2.1	5.145	8.5	20.825
300 Blue 03-6036	405	33.4	135.27	1.9	7.695	6.8	27.54
541 Blue 03-6302	70	33.4	23.38	1.9	1.33	6.8	4.76
Purple 2592 03-6133	105	39	40.95		0	5	5.25
Red 193 03-6534	335	33.1	110.89	2	6.7	9.6	32.16
Red 199 03-6020	420	39.4	165.48	2.1	8.82	6.2	26.04
Red 485 03-6039	420	39	163.8		0	5	21
Red 485 HI STR 03-6275	70	35.7	24.99	2	1.4	9	6.3
Red 032 03-6024	105	35	36.75		0	9	9.45
Red 202 03-6136	140	35	49	2	2.8	9	12.6
221 Maroon 04-04-0861	35	30.2	10.57	1.8	0.63	10.6	3.71
Thermo Red Lake C 03 1118	35	11.3	3.955	4.2	1.47	28.7	10.045
Red 185 HI STR 03-6249	245	32.6	79.87	1.8	4.41	10	24.5
Thermoplast Proc Megenta 03-1311	280	5	14		0	23	64.4
Orange 021 03 6089	426	37.3	158.9	2	8.52	7	29.82
Orange 172 03-6031	143	37.1	53.053	2	2.86	6.2	8.866
Orange 1665 03-6361	630	35	220.5		0	5	31.5
Gold 873 03-8758	38	24	9.12		0	3.4	1.292
Brown 490 03-6084	745	35.5	264.48	1.6	11.92	5.6	41.72
464 Tan 03-6132	170	37	62.9		0	5	8.5
Green 347 03-6057	70	32.6	22.82	1.3	0.91	5.8	4.06
Green 340 03-6270	35	33	11.55		0	7	2.45
Thermoplast Green 5743 03-1321	280	21.2	59.36	4.1	11.48	13.7	38.36
Hercubond Surface 361 Green 17-01-1576	175	37	64.75		0	15	26.25
Yellow 116 03-6011	639	30.3	193.62	1.3	8.307	7.5	47.925
Diarylide Yellow 03-6002	114	34.6	39.444	2	2.28	5.4	6.156
107 Yellow 03-6463	260	27.5	71.5	1	2.6	4.9	12.74
Yellow 1235 03-6245	571	37.5	214.13	2	11.42	7.6	43.396
Cream 1205 03-6085	225	27	60.75		0	5	11.25
Hercubond Surface Ext/OP Varnish 17-01-0017	753	35.6	268.07	3.8	28.614	18.9	142.32
Hercubond Surface Black 17-01-0018	112	30.4	34.048	2.3	2.576	18.9	21.168
Hercubond Surface White High Heat 17-01-0080	665	24.2	160.93	1.7	11.305	4.6	30.59
Hercubond Surface Process Black SD 17-01-0132	210	11.4	23.94	1.8	3.78		0
Hercubond Surface HS Extender Varnish 17-01-0212	369	36	132.84	3.4	12.546	11.4	42.066
Hercubond Surface HS Proc Blue SD 17-01-0297	35	9.3	3.255	2.4	0.84		0
Hercubond Surface HS Proc Magenta SD 17-01-0298	245	9.3	22.785	2.4	5.88		0
Hercubond Surface HS Proc Yellow SD 17-01-0299	175	9.2	16.1	2.4	4.2		0
Hercubond Surface Line Black 17-01-0358	315	29.3	92.295	2.9	9.135	18.9	59.535
Hercubond Surface 021 Orange 17-01-1322	70	43	30.1	3	2.1	17	11.9
Hercubond Surface 287 Blue 17-01-1328	70	34.9	24.43	2.8	1.96	9.7	6.79
Hercubond Surface 3135 Blue 17-01-1329	140	34.2	47.88	2.9	4.06	9.9	13.86
Hercubond Surface 485 Red 17-01-1332	175	32.7	57.225	2.6	4.55	11.4	19.95
Hercubond Surface 123 Yellow 17-01-1335	245	36.3	88.935	2.8	6.86	11.2	27.44
Hercubond Surface 732 Brown 17-01-1336	105	35.1	36.855	3	3.15	9.3	9.765
Hercubond Surface 7510 Light Brown 17-01-1351	35	35.8	12.53	3.5	1.225	13.2	4.62
Hercubond Surface 199 Red 17-01-1353	35	33.4	11.69	2.9	1.015	13.2	4.62

**Table 2  
Toxic Air Pollutants (TAPs)**

Material/Formular Number	Usage (lb) Total	64-17-5		67-63-0		71-23-8	
		%	lb	%	lb	%	lb
Hercubond Surface 130 Yellow 17-01-1357	140	32.7	45.78	2.6	3.64	11.4	15.96
Hercubond Surface Combo 723 Brown 17-01-1372	35	26.4	9.24	2.8	0.98	10.4	3.64
Hercubond Surface Combo 498 Brown 17-01-1373	70	29.3	20.51	3.2	2.24	7.1	4.97
Hercubond Surface 145 Yellow 17-01-1376	40	33.9	13.56	3.1	1.24	14.5	5.8
Hercubond Surface 185 Red 17-01-1380	70	32.6	22.82	3.1	2.17	15.1	10.57
Hercubond Surface Cyan Blue 17-01-1381	140	34.6	48.44	3	4.2	9	12.6
Hercubond Surface 368 Green 17-01-1382	735	34.6	254.31	3.4	24.99	15.9	116.87
<b>TOTAL INKS</b>	<b>24890</b>						
<b>Material/Formular Number</b>	<b>Usage (lb) Total</b>						
Propanol 80/20 Blend 16076292 nex	46538		0		0	80	37230
Duplicating Fluid #5 123100	2835	80	2268	2.5	70.875		0
Valspar Adhesive 14S62AA.290	4758		0		0		0
NP Adhesive 5660A09MK nas	3360		0		0		0
MIBK 134942	28		0		0		0
APV Blend 161429	8454		0		0		0
<b>TOTAL SOLVENTS and ADHESIVES</b>	<b>65973</b>						
<b>Total Emissions Pre Control (lb)</b>	<b>90863</b>		<b>8924</b>		<b>330.61</b>		<b>39212</b>
<b>Total Emissions Pre Control (Tons)</b>			<b>4.462</b>		<b>0.1653</b>		<b>19.606</b>

**Table 2  
Toxic Air Pollutants (TAPs)**

Material/Formular Number	78-93-3		107-98-2		108-10-1		108-65-6	
	Methyl Ethyl Ketone		1-methoxy-2-propanol		Methyl Isobutyl Ketone		Propylene Glycol Monoethyl Ether Acetate	
	%	lb	%	lb	%	lb	%	lb
White 03-9015		0		0		0		0
Black 03-6010		0		0		0		0
2995 Blue 03-6457		0		0		0		0
Reflex Blue 03 6433		0		0		0		0
Cyan Blue 03-6018		0		0		0		0
278 Blue 03-6706		0		0		0		0
280 Blue 03-6819		0		0		0		0
300 Blue 03-6036		0		0		0		0
541 Blue 03-6302		0		0		0		0
Purple 2592 03-6133		0		0		0		0
Red 193 03-6534		0		0		0		0
Red 199 03-6020		0		0		0		0
Red 485 03-6039		0		0		0		0
Red 485 HI STR 03-6275		0		0		0		0
Red 032 03-6024		0		0		0		0
Red 202 03-6136		0		0		0		0
221 Maroon 04-04-0861		0		0		0		0
Thermo Red Lake C 03 1118		0	9.7	3.395		0		0
Red 185 HI STR 03-6249		0		0		0		0
Thermoplast Proc Megenta 03-1311		0	9	25.2		0		0
Orange 021 03 6089		0		0		0		0
Orange 172 03-6031		0		0		0		0
Orange 1665 03-6361		0		0		0		0
Gold 873 03-8758		0		0		0		0
Brown 490 03-6084		0		0		0		0
464 Tan 03-6132		0		0		0		0
Green 347 03-6057		0		0		0		0
Green 340 03-6270		0		0		0		0
Thermoplast Green 5743 03-1321		0	7.9	22.12		0		0
Hercubond Surface 361 Green 17-01-1576		0		0		0		0
Yellow 116 03-6011		0		0		0		0
Diarylide Yellow 03-6002		0		0		0		0
107 Yellow 03-6463		0		0		0		0
Yellow 1235 03-6245		0		0		0		0
Cream 1205 03-6085		0		0		0		0
Hercubond Surface Ext/OP Varnish 17-01-0017		0		0		0		0
Hercubond Surface Black 17-01-0018		0		0		0		0
Hercubond Surface White High Heat 17-01-0080		0	1.4	9.31		0		0
Hercubond Surface Process Black SD 17-01-0132		0		0		0	5.4	11.34
Hercubond Surface HS Extender Varnish 17-01-0212		0	12.2	45.018		0		0
Hercubond Surface HS Proc Blue SD 17-01-0297		0		0		0	3.2	1.12
Hercubond Surface HS Proc Magenta SD 17-01-0298		0		0		0	3.2	7.84
Hercubond Surface HS Proc Yellow SD 17-01-0299		0		0		0	3.2	5.6
Hercubond Surface Line Black 17-01-0358		0		0		0		0
Hercubond Surface 021 Orange 17-01-1322		0		0		0		0
Hercubond Surface 287 Blue 17-01-1328		0		0		0		0
Hercubond Surface 3135 Blue 17-01-1329		0		0		0		0
Hercubond Surface 485 Red 17-01-1332		0		0		0		0
Hercubond Surface 123 Yellow 17-01-1335		0		0		0		0
Hercubond Surface 732 Brown 17-01-1336		0		0		0		0
Hercubond Surface 7510 Light Brown 17-01-1351		0		0		0		0
Hercubond Surface 199 Red 17-01-1353		0		0		0		0

**Table 2  
Toxic Air Pollutants (TAPs)**

Material/Formular Number	78-93-3		107-98-2		108-10-1		108-65-6	
	Methyl Ethyl Ketone		1-methoxy-2-propanol		Methyl Isobutyl Ketone		Propylene Glycol Monoethyl Ether Acetate	
	%	lb	%	lb	%	lb	%	lb
Hercubond Surface 130 Yellow 17-01-1357		0		0		0		0
Hercubond Surface Combo 723 Brown 17-01-1372		0		0		0		0
Hercubond Surface Combo 498 Brown 17-01-1373		0		0		0		0
Hercubond Surface 145 Yellow 17-01-1376		0		0		0		0
Hercubond Surface 185 Red 17-01-1380		0		0		0		0
Hercubond Surface Cyan Blue 17-01-1381		0		0		0		0
Hercubond Surface 368 Green 17-01-1382		0		0		0		0
<b>TOTAL INKS</b>								
<b>Material/Formular Number</b>								
Propanol 80/20 Blend 16076292 nex		0		0		0		0
Duplicating Fluid #5 123100		0		0		0		0
Valspar Adhesive 14S62AA.290	50	2379		0		0		0
NP Adhesive 5660A09MK nas		0		0	100	3360		0
MIBK 134942		0		0	100	28		0
APV Blend 161429	45	3804.3		0	55	4649.7		0
<b>TOTAL SOLVENTS and ADHESIVES</b>								
<b>Total Emissions Pre Control (lb)</b>		6183.3		105.04		8037.7		25.9
<b>Total Emissions Pre Control (Tons)</b>		3.0917		0.0525		4.0189		0.01295

**Table 2  
Toxic Air Pollutants (TAPs)**

Material/Formular Number	108-88-3		109-60-4		123-86-4		141-78-6	
	Toluene		n-propyl acetate		n-butyl acetate		Ethyl Acetate	
	%	lb	%	lb	%	lb	%	lb
White 03-9015		0	5	487.6		0		0
Black 03-6010		0		0		0		0
2995 Blue 03-6457		0	4.9	13.72		0		0
Reflex Blue 03 6433		0	13.7	28.77		0		0
Cyan Blue 03-6018		0	11.8	45.43		0		0
278 Blue 03-6706		0	3.7	5.18		0		0
280 Blue 03-6819		0	15.5	37.975		0		0
300 Blue 03-6036		0	11.9	48.195		0		0
541 Blue 03-6302		0	11.9	8.33		0		0
Purple 2592 03-6133		0	19	19.95		0		0
Red 193 03-6534		0	14.2	47.57		0		0
Red 199 03-6020		0	14.2	59.64		0		0
Red 485 03-6039		0	15	63		0		0
Red 485 HI STR 03-6275		0	14.7	10.29		0		0
Red 032 03-6024		0	13	13.65		0		0
Red 202 03-6136		0	13	18.2		0		0
221 Maroon 04-04-0861		0	14.2	4.97		0		0
Thermo Red Lake C 03 1118		0	11.6	4.06		0		0
Red 185 HI STR 03-6249		0	14.7	36.015		0		0
Thermoplast Proc Megenta 03-1311		0	9	25.2	3	8.4		0
Orange 021 03 6089		0	13.7	58.362		0		0
Orange 172 03-6031		0	13.2	18.876		0		0
Orange 1665 03-6361		0	15	94.5		0		0
Gold 873 03-8758		0		0		0		0
Brown 490 03-6084		0	10.3	76.735		0		0
464 Tan 03-6132		0	13	22.1		0		0
Green 347 03-6057		0	11.1	7.77		0		0
Green 340 03-6270		0	13	4.55		0		0
Thermoplast Green 5743 03-1321		0	14.4	40.32		0		0
Hercubond Surface 361 Green 17-01-1576		0	21	36.75		0	3	5.25
Yellow 116 03-6011		0	10.4	66.456		0		0
Diarylide Yellow 03-6002		0	13.4	15.276		0		0
107 Yellow 03-6463		0	6.2	16.12		0		0
Yellow 1235 03-6245		0	14.1	80.511		0		0
Cream 1205 03-6085		0	5	11.25		0		0
Hercubond Surface Ext/OP Varnish 17-01-0017		0	19.4	146.08		0	2.4	18.072
Hercubond Surface Black 17-01-0018		0	13	14.56		0	2.9	3.248
Hercubond Surface White High Heat 17-01-0080		0	7.8	51.87		0	2.9	19.285
Hercubond Surface Process Black SD 17-01-0132		0	22.8	47.88		0	1.5	3.15
Hercubond Surface HS Extender Varnish 17-01-0212		0	17.4	64.206		0	3	11.07
Hercubond Surface HS Proc Blue SD 17-01-0297		0	2.3	0.805		0	2.9	1.015
Hercubond Surface HS Proc Magenta SD 17-01-0298		0	2.3	5.635		0	2.9	7.105
Hercubond Surface HS Proc Yellow SD 17-01-0299		0	7.6	13.3		0	2.9	5.075
Hercubond Surface Line Black 17-01-0358		0	12.5	39.375		0	2.9	9.135
Hercubond Surface 021 Orange 17-01-1322		0	11	7.7		0	3	2.1
Hercubond Surface 287 Blue 17-01-1328		0	17.2	12.04		0	1.7	1.19
Hercubond Surface 3135 Blue 17-01-1329		0	19.1	26.74		0	1.7	2.38
Hercubond Surface 485 Red 17-01-1332		0	17.2	30.1		0	1.6	2.8
Hercubond Surface 123 Yellow 17-01-1335		0	15.4	37.73		0	2.1	5.145
Hercubond Surface 732 Brown 17-01-1336		0	15.7	16.485		0	1.6	1.68
Hercubond Surface 7510 Light Brown 17-01-1351		0	6.4	2.24		0	2	0.7
Hercubond Surface 199 Red 17-01-1353		0	12.8	4.48		0	1.7	0.595

**Table 2  
Toxic Air Pollutants (TAPs)**

	108-88-3		109-60-4		123-86-4		141-78-6	
	Toluene		n-propyl acetate		n-butyl acetate		Ethyl Acetate	
<b>Material/Formular Number</b>	%	lb	%	lb	%	lb	%	lb
Hercubond Surface 130 Yellow 17-01-1357		0	17.2	24.08		0	1.6	2.24
Hercubond Surface Combo 723 Brown 17-01-1372		0	15.2	5.32		0	1.6	0.56
Hercubond Surface Combo 498 Brown 17-01-1373		0	13	9.1		0	1.7	1.19
Hercubond Surface 145 Yellow 17-01-1376		0	18	7.2		0	2	0.8
Hercubond Surface 185 Red 17-01-1380		0	8.7	6.09		0	1.8	1.26
Hercubond Surface Cyan Blue 17-01-1381		0	18.2	25.48		0	1.8	2.52
Hercubond Surface 368 Green 17-01-1382		0	18.6	136.71		0	2.2	16.17
<b>TOTAL INKS</b>								
<b>Material/Formular Number</b>								
Propanol 80/20 Blend 16076292 nex		0	20	9307.6		0		0
Duplicating Fluid #5 123100		0	7.5	212.63		0		0
Valspar Adhesive 14S62AA.290	50	2379		0		0		0
NP Adhesive 5660A09MK nas		0		0		0		0
MIBK 134942		0		0		0		0
APV Blend 161429		0		0		0		0
<b>TOTAL SOLVENTS and ADHESIVES</b>								
<b>Total Emissions Pre Control (lb)</b>		2379		11783		8.4		123.74
<b>Total Emissions Pre Control (Tons)</b>		1.1895		5.8914		0.0042		0.0619

**Table 2  
Toxic Air Pollutants (TAPs)**

Material/Formular Number	1569-01-3		7440-50-8		7440-66-6		9004-70-0	
	Propylene Glycol N-Propyl Ether		Copper		Zinc		Nitorcellulose	
	%	lb	%	lb	%	lb	%	lb
White 03-9015		0		0		0	3	292.56
Black 03-6010		0		0		0		0
2995 Blue 03-6457		0		0		0	2.5	7
Reflex Blue 03 6433		0		0		0	3.9	8.19
Cyan Blue 03-6018		0		0		0	4.2	16.17
278 Blue 03-6706		0		0		0	2.4	3.36
280 Blue 03-6819		0		0		0	4.3	10.535
300 Blue 03-6036		0		0		0	4.1	16.605
541 Blue 03-6302		0		0		0	4.1	2.87
Purple 2592 03-6133		0		0		0	3	3.15
Red 193 03-6534		0		0		0	4.1	13.735
Red 199 03-6020		0		0		0	3.3	13.86
Red 485 03-6039		0		0		0	3	12.6
Red 485 HI STR 03-6275		0		0		0	3.8	2.66
Red 032 03-6024		0		0		0	3	3.15
Red 202 03-6136		0		0		0	3	4.2
221 Maroon 04-04-0861		0		0		0	3.7	1.295
Thermo Red Lake C 03 1118		0		0		0	8.6	3.01
Red 185 HI STR 03-6249		0		0		0	3.3	8.085
Thermoplast Proc Megenta 03-1311	25	70		0		0	7	19.6
Orange 021 03 6089		0		0		0	3.5	14.91
Orange 172 03-6031		0		0		0	3.7	5.291
Orange 1665 03-6361		0		0		0	5	31.5
Gold 873 03-8758		0	21.5	8.17	9	3.42		0
Brown 490 03-6084		0		0		0	2.5	18.625
464 Tan 03-6132		0		0		0	3	5.1
Green 347 03-6057		0		0		0	2.6	1.82
Green 340 03-6270		0		0		0	5	1.75
Thermoplast Green 5743 03-1321		0		0		0	9.2	25.76
Hercubond Surface 361 Green 17-01-1576	3	5.25		0		0	7	12.25
Yellow 116 03-6011		0		0		0	2.6	16.614
Diarylide Yellow 03-6002		0		0		0	3.3	3.762
107 Yellow 03-6463		0		0		0	2.2	5.72
Yellow 1235 03-6245		0		0		0	3.5	19.985
Cream 1205 03-6085		0		0		0	3	6.75
Hercubond Surface Ext/OP Varnish 17-01-0017		0		0		0	8.4	63.252
Hercubond Surface Black 17-01-0018	5.4	6.048		0		0	4.3	4.816
Hercubond Surface White High Heat 17-01-0080		0		0		0	3.1	20.615
Hercubond Surface Process Black SD 17-01-0132	5.8	12.18		0		0	4	8.4
Hercubond Surface HS Extender Varnish 17-01-0212		0		0		0	0.1	0.369
Hercubond Surface HS Proc Blue SD 17-01-0297	7.8	2.73		0		0	3.8	1.33
Hercubond Surface HS Proc Magenta SD 17-01-0298	7.8	19.11		0		0	3.8	9.31
Hercubond Surface HS Proc Yellow SD 17-01-0299		0		0		0	3.8	6.65
Hercubond Surface Line Black 17-01-0358	5.4	17.01		0		0	4	12.6
Hercubond Surface 021 Orange 17-01-1322	5	3.5		0		0	7	4.9
Hercubond Surface 287 Blue 17-01-1328	5.3	3.71		0		0	5	3.5
Hercubond Surface 3135 Blue 17-01-1329	4.7	6.58		0		0	5.2	7.28
Hercubond Surface 485 Red 17-01-1332	5.3	9.275		0		0	4.4	7.7
Hercubond Surface 123 Yellow 17-01-1335	5.9	14.455		0		0	4.7	11.515
Hercubond Surface 732 Brown 17-01-1336	5.1	5.355		0		0	4.9	5.145
Hercubond Surface 7510 Light Brown 17-01-1351	13.8	4.83		0		0	6.9	2.415
Hercubond Surface 199 Red 17-01-1353	8.9	3.115		0		0	5.4	1.89



**Table 2  
Toxic Air Pollutants (TAPs)**

Material/Formular Number	1569-01-3		7440-50-8		7440-66-6		9004-70-0	
	Propylene Glycol N-Propyl Ether		Copper		Zinc		Nitorcellulose	
	%	lb	%	lb	%	lb	%	lb
Hercubond Surface 130 Yellow 17-01-1357	5.3	7.42		0		0	4.4	6.16
Hercubond Surface Combo 723 Brown 17-01-1372	8.9	3.115		0		0	4.1	1.435
Hercubond Surface Combo 498 Brown 17-01-1373	9.6	6.72		0		0	4.5	3.15
Hercubond Surface 145 Yellow 17-01-1376	3	1.2		0		0	6.1	2.44
Hercubond Surface 185 Red 17-01-1380	10.1	7.07		0		0	6	4.2
Hercubond Surface Cyan Blue 17-01-1381	4.5	6.3		0		0	5.5	7.7
Hercubond Surface 368 Green 17-01-1382	1.9	13.965		0		0	7	51.45
<b>TOTAL INKS</b>								
<b>Material/Formular Number</b>								
Propanol 80/20 Blend 16076292 nex		0		0		0		0
Duplicating Fluid #5 123100		0		0		0		0
Valspar Adhesive 14S62AA.290		0		0		0		0
NP Adhesive 5660A09MK nas		0		0		0		0
MIBK 134942		0		0		0		0
APV Blend 161429		0		0		0		0
<b>TOTAL SOLVENTS and ADHESIVES</b>								
<b>Total Emissions Pre Control (lb)</b>		228.94		8.17		3.42		860.69
<b>Total Emissions Pre Control (Tons)</b>		0.1145		0.0041		0.0017		0.4303

**Table 2  
Toxic Air Pollutants (TAPs)**

Material/Formular Number	34590-94-8		64742-49-0		64742-89-8	
	Dipropylene Glycol Monomethyl Ether		Petroleum Distillates, Hydrotreated Light		Solvent Nahtha	
	%	lb	%	lb	%	lb
White 03-9015		0	7	682.64		0
Black 03-6010		0		0	19.9	339.89
2995 Blue 03-6457		0		0	5.8	16.24
Reflex Blue 03 6433		0		0		0
Cyan Blue 03-6018		0		0		0
278 Blue 03-6706		0		0	6	8.4
280 Blue 03-6819		0		0	3.1	7.595
300 Blue 03-6036		0		0		0
541 Blue 03-6302		0		0		0
Purple 2592 03-6133		0	5	5.25		0
Red 193 03-6534		0		0		0
Red 199 03-6020		0		0		0
Red 485 03-6039		0	5	21		0
Red 485 HI STR 03-6275		0		0		0
Red 032 03-6024		0	5	5.25		0
Red 202 03-6136		0	5	7		0
221 Maroon 04-04-0861		0		0	3.4	1.19
Thermo Red Lake C 03 1118		0		0		0
Red 185 HI STR 03-6249		0		0	3.3	8.085
Thermoplast Proc Megenta 03-1311		0	3	8.4		0
Orange 021 03 6089		0		0		0
Orange 172 03-6031		0		0		0
Orange 1665 03-6361		0	5	31.5		0
Gold 873 03-8758		0		0	14	5.32
Brown 490 03-6084		0		0	5.2	38.74
464 Tan 03-6132		0	7	11.9		0
Green 347 03-6057		0		0	5	3.5
Green 340 03-6270		0	5	1.75		0
Thermoplast Green 5743 03-1321		0		0		0
Hercubond Surface 361 Green 17-01-1576		0		0		0
Yellow 116 03-6011		0		0	4.8	30.672
Diarylide Yellow 03-6002		0		0	4.5	5.13
107 Yellow 03-6463		0		0	5.8	15.08
Yellow 1235 03-6245		0		0		0
Cream 1205 03-6085		0	7	15.75		0
Hercubond Surface Ext/OP Varnish 17-01-0017		0		0		0
Hercubond Surface Black 17-01-0018		0		0		0
Hercubond Surface White High Heat 17-01-0080		0		0		0
Hercubond Surface Process Black SD 17-01-0132	13.9	29.19		0		0
Hercubond Surface HS Extender Varnish 17-01-0212		0		0		0
Hercubond Surface HS Proc Blue SD 17-01-0297	6	2.1		0		0
Hercubond Surface HS Proc Magenta SD 17-01-0298	6	14.7		0		0
Hercubond Surface HS Proc Yellow SD 17-01-0299	6	10.5		0		0
Hercubond Surface Line Black 17-01-0358		0		0		0
Hercubond Surface 021 Orange 17-01-1322		0		0		0
Hercubond Surface 287 Blue 17-01-1328		0		0		0
Hercubond Surface 3135 Blue 17-01-1329		0		0		0
Hercubond Surface 485 Red 17-01-1332		0		0		0
Hercubond Surface 123 Yellow 17-01-1335		0		0		0
Hercubond Surface 732 Brown 17-01-1336		0		0		0
Hercubond Surface 7510 Light Brown 17-01-1351		0		0		0
Hercubond Surface 199 Red 17-01-1353		0		0		0

**Table 2  
Toxic Air Pollutants (TAPs)**

Material/Formular Number	34590-94-8 Dipropylene Glycol Monomethyl Ether		64742-49-0 Petroleum Distillates, Hydrotreated Light		64742-89-8 Solvent Naphtha	
	%	lb	%	lb	%	lb
Hercubond Surface 130 Yellow 17-01-1357		0		0		0
Hercubond Surface Combo 723 Brown 17-01-1372	4.4	1.54		0		0
Hercubond Surface Combo 498 Brown 17-01-1373	4.8	3.36		0		0
Hercubond Surface 145 Yellow 17-01-1376		0		0		0
Hercubond Surface 185 Red 17-01-1380		0		0		0
Hercubond Surface Cyan Blue 17-01-1381		0		0		0
Hercubond Surface 368 Green 17-01-1382		0		0		0
<b>TOTAL INKS</b>						
<b>Material/Formular Number</b>						
Propanol 80/20 Blend 16076292 nex		0		0		0
Duplicating Fluid #5 123100		0		0		0
Valspar Adhesive 14S62AA.290		0		0		0
NP Adhesive 5660A09MK nas		0		0		0
MIBK 134942		0		0		0
APV Blend 161429		0		0		0
<b>TOTAL SOLVENTS and ADHESIVES</b>						
<b>Total Emissions Pre Control (lb)</b>		61.39		790.44		479.84
<b>Total Emissions Pre Control (Tons)</b>		0.0307		0.39522		0.2399

**Table 3  
Toxic Air Pollutants (TAPs) Compliance Demonstration - Premise Wide**

Operating schedule:  
 hr/day 24  
 days/wk 7  
 wks/yr 52

Increase for size difference in 6 color (47") press to new 8 color (57") press 1.21  
 Increase for speed difference in 6 color (600 fpm) to new 8 color (1640 fpm) 2.73  
 Assume 2 times ink/solvent usage for new press, which can print both sides  
 Regenerative Thermal Oxidizer (RTO) control efficiency = 95 %

$$\text{AER} = \text{SL} \times 0.0163 \quad \text{for stacks} > 10\text{m}$$

TAP	CAS	Projected Controlled TAP Emissions		TAP Screening Levels (µg/m3)		AER (lb/hr)		Compliance Status
		lb/yr	lb/hr	1-hour	8-hour	1-hour	8-hour	
Ethanol	64-17-5	2963.471	2.043	18842.54	3768.51	307.13	61.43	In Compliance
Isopropyl Alcohol	67-63-0	109.789	0.051	9830.67	4915.34	160.24	80.12	In Compliance
n-Propyl Alcohol	71-23-8	13021.311	1.340		2457.67		40.06	In Compliance
Methyl Ethyl Ketone	78-93-3	2053.339	0.090	8846.63	5897.75	144.20	96.13	In Compliance
1-methoxy-2-propanol	107-98-2	34.882	0.149	5528.83	3685.89	90.12	60.08	In Compliance
Methyl Isobutyl Ketone	108-10-1	2669.144	0.113	3072.39	819.30	50.08	13.35	In Compliance
Propylene Glycol Monoethyl Ether Acetate	108-65-6	8.601	0.066		349.81		5.70	In Compliance
Toluene	108-88-3	790.014	0.090		753.62		12.28	In Compliance
n-propyl acetate	109-60-4	3912.795	0.279	10442.74	8354.19	170.22	136.17	In Compliance
n-butyl acetate	123-86-4	2.789	0.037	9501.84	7126.38	154.88	116.16	In Compliance
Ethyl Acetate	141-78-6	41.090	0.037		14413.09		234.93	In Compliance
Propylene Glycol N-Propyl Ether	1569-01-3	76.025	0.306		102.66		1.67	In Compliance
Copper	7440-50-8	2.713	0.263					
Zinc	7440-66-6	1.136	0.110	1000.00	500.00	16.30	8.15	In Compliance
Nitorcellulose	9004-70-0	285.818	0.113					
Dipropylene Glycol Monomethyl Ether	34590-94-8	20.386	0.170	9092.02	12122.70	148.20	197.60	In Compliance
Petroleum Distillates, Hydrotreated Light	64742-49-0	262.488	0.086	NL	NL			
Solvent Nahtha	64742-89-8	159.346	0.244	NL	NL			

NL = no values listed for this TAP in the MDE TAP Screening Levels file

None of the TAPs have an annual SL listed

TAPs 'greyed' out have vapor pressures <0.001 mmHg at 25oC and were presumed to remain with the substrate rather than volatilize, Environmental Protection Agency on flexographic ink options (EPA 744-R-02-001A, 2002)

**Table 4  
Criteria Emissions from NG Combustion**

Equipment	Rating (mmbtu/hr)	Maximum Hours per Year	Natural Gas Usage <sup>1</sup> (MMcft/yr)
Printing Press #1 - Dryer No. 1	1.0	8760	8.588
Printing Press #1 - Dryer No. 2	1.0	8760	8.588
Printing Press #2 - Dryer No. 1	Press #2 removed		
Printing Press #2 - Dryer No. 2			
Printing Press #3 Dryer	0.4	8760	3.435
Mylar Press #1 Dryer	0.5	8760	4.294
Mylar Press #2 Dryer	0.5	8760	4.294
RTO <sup>2</sup>	4.3	8760	36.929
<b>Total</b>	<b>7.7</b>		<b>66.1</b>

**Notes:**

<sup>1</sup> The average gross heating value of natural gas is 1,020 btu/scf

<sup>2</sup> Conservative rating for an RTO provided by a RTO vendor

Pollutant	Emission Factor	Unit	Reference	Printing Press #1 Dryers (lb/day)	Printing Press #3 Dryer (lb/day)	Mylar Press #1 Dryer (lb/day)	Mylar Press #2 Dryer (lb/day)	RTO (lb/day)	Total Emissions (lb/day)	Total Emissions (lb/hr)	Total Emissions (tpy)
NO <sub>x</sub>	100	lb/MMscf	AP-42 Table 1.4-1	4.7	0.9	1.2	1.2	10.1	18.1	0.8	3.3
CO	84	lb/MMscf	AP-42 Table 1.4-1	4.0	0.8	1.0	1.0	8.5	15.2	0.6	2.8
PM / PM <sub>10</sub> / PM <sub>2.5</sub>	7.6	lb/MMscf	AP-42 Table 1.4-2	0.36	0.1	0.09	0.09	0.77	1.38	0.06	0.25
SO <sub>2</sub>	0.6	lb/MMscf	AP-42 Table 1.4-2	0.03	5.6E-03	0.01	0.01	0.08	0.11	0.005	0.02
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	0.26	0.05	0.08	0.06	0.56	1.00	0.04	0.18

**Table 5**  
**Maximum VOC Emissions as a Result of Printing and Adhesive Application Processes**

Product	Equipment	Usage <sup>1</sup> (lb/hr)	VOC Content <sup>2</sup>	Equipment Operation (hr/yr)	Minimum Overall Control Efficiency	Waste Solvent (%)	Controlled VOC Emission (lb/yr)	Controlled VOC Emission (tpy)	Controlled VOC Emission <sup>3</sup> (lb/day)	Controlled VOC Emission <sup>3</sup> (lb/hr)
<b>Printing</b>										
Colorcon Ink	Mylar Press #1	0.6	66.7%	8760	95%	--	175	0.1	0.5	0.02
CAI Ink	Print Presses #1 and #3	24.5	73.9%	8760	95%	--	7,930	4.0	43.5	1.8
Hercubond Ink	Print Presses #1 and #3	24.5	83.4%	8760	95%	--	8,950	4.5	49.0	2.0
Propanol 80/20	Print Presses #1 and #3, Mylar Press #1	33.5	100%	8760	95%	10%	13,206	6.6	72.4	3.0
Ethyl Acetate	Mylar Press #1	0.75	100%	8760	95%	10%	296	0.1	0.8	0.03
Duplicating Fluid	Print Presses #1 and #3	7.5	100%	600	95%	--	203	0.1	0.6	0.34
<b>Adhesives</b>										
Microbond Adhesive - Hard	Mylar Presses #1, and #2 (and #3 as backup)	3.6	64.61%	8760	95%	--	1,019	0.5	2.8	0.1
Microbond Adhesive - Hard	Tuber	1	64.61%	8760	0%	--	5,582	2.8	15.3	0.6
Soft Adhesive	Mylar Presses #1, and #2 (and #3 as backup)	2.25	49.24%	8760	95%	--	485	0.2	1.3	0.1
Methyl Isobutyl Ketone	Mylar Presses #1, and #2 (and #3 as backup)	0.42	100%	8760	95%	--	184	0.1	0.5	0.02
APV Blend	Mylar Presses #1, and #2 (and #3 as backup)	0.55	100%	8760	95%	10%	217	0.1	0.6	0.02
APV Blend	Tuber	0.03	100%	8760	0%	10%	237	0.1	0.6	0.03
<b>TOTAL</b>							<b>38,482</b>	<b>19.2</b>	<b>187.9</b>	<b>8.1</b>

**Notes:**

<sup>1</sup> Usage based on VacPac production records for runs with high coverage, times factor of 2 to account for removing Press #2 and adding Press #3

<sup>2</sup> Ink with the highest VOC content selected

<sup>3</sup> Representative of both printing presses #1 and #3 operating simultaneously for the short term (lb/hr and lb/day)

**Table 6**  
**Total VOC Emissions**

Equipment	Printing and Adhesives		NG Combustion		Total		
	VOC Emission (tpy)	VOC Emission (lb/day)	VOC Emission (tpy)	VOC Emission (lb/day)	VOC Emission (tpy)	VOC Emission (lb/hr)	VOC Emission (lb/day)
Print Press #1	15.0	183.2	0.05	0.26	15.1	3.4	81.9
Print Press #3			0.01	0.05		3.4	81.7
Print Press #2 (removed)	0.0	0.0	0.00	0.00	0.0	0.0	0.0
Mylar Press #1	0.9	6.1	0.01	0.06	0.9	0.3	6.1
Mylar Press #2	0.5	2.6	0.01	0.06	0.5	0.1	2.7
Tuber	2.9	15.9	NA	NA	2.9	0.7	15.9
RTO	0.0	0.0	0.1	0.6	0.1	0.0	0.6
<b>TOTAL</b>	<b>19.3</b>	<b>187.9</b>	<b>0.08</b>	<b>1.0</b>	<b>19.5</b>	<b>7.9</b>	<b>188.9</b>

**Note2:**

- \* Assumed that 97% of the propanol was used on Print Presses #1 and #3, and 3% on Mylar Press #1 in accordance with the usage of CAI and Colorcon Inks, respectively
- \* Assumed that applicable products were used equally on Mylar Press #1 and #2

**Rewind roll diam.:**

- » max. roll diam **1000 mm**
- » inner core diam (cardboard) **76,2 mm (3"), [152,4 mm (6")]**
- » outer core diam. (cardboard) **95 mm, [181 mm]**
- » max. roll weight **1000 kg - air shafted flying splice 1000**

**Machine dimension (w x l x h)****6180 x 12870 x 4200 mm**

valid for the machine with basic unwind and rewind unit without ink pumping

**Weight****approx. 40 000 kg**

valid for the machine with basic unwind andrewind unit

**OTHER TECHNICAL PARAMETERS****Max. run-out of unwound roll**

diam. 1000 - 3,5 mm, diam. 800 - 2,5mm, diam. 100 - 1 mm, measured on roll circumference along its entire width

*Due to unstable unwinding tension it is not possible to guarantee the register when exceeding the values .*

**Max. unwound roll conicity****0,5% (measured at roll ends)****Acceptable web thickness allowance**corresponds to max. thickness of **0,16 mm ± 5%****Printing inks (lacquer)**

flexographic solvent-based inks

**Assembly of printing plates**

material - photopolymer soft assembly:

- a) printing form 1.14 mm +compressible adhesive tape th. 0.55 mm + sleeve
- b) printing form th. 1.14 mm, adhesive tape th. 0.1 mm + compressible sleeve
- c) thin sleeve (i.e. Cyrel Round) + adaptor
- d) direct laser engraved sleeves



**Min. printing sleeve wall thickness for ARUN** 4,668 mm

**Max. printing repeat length** 850 mm 33.46 *Adapters / Bridge*

**Printing repeat length setting** by 0,1 mm; correction of set print repeat length +/- 2%

**Anilox cylinder** inner diam. 175,187 mm  
 perimeter 625 mm,  
 sleeve length 1530 mm

**Max. mechanical speed** 500 m/min

**Working printing speed** depends on kind and quality of printed material, printing inks, ink transfer, printing repeat length, printing plates, kind of printed motive: cross lines - screen density, anilox rollers volume, dot gain, lacquer, surrounding temperature and type of doctor blades

**Printing web tension:**

- » NONSTOP flying splice 40 ÷ 400 N

**Side of operating staff** on the left from longitudinal axis from unwind to CI drum

**Unwind roll diam.:**

- » max. roll diam 1000 mm
- » inner core diam (cardboard) 76,2 mm (3"), [152,4 mm (6")]
- » outer core diam. (cardboard) 95 mm, [181 mm]
- » max. roll weight 1000 kg - air shafted flying splice 1000

**Min. roll diameter at flying splice unwind** 300 mm

**Max. speed at roll exchange at flying splice unwind** full printing speed

*Speed at automatic exchange is guaranteed with TESA tape - Easy Splice 3M - series 999x and depends on quality and type of printed material.*

## 4 TECHNICAL PARAMETERS

### PROCESSED MATERIAL

<b>LD PE</b>	0.020 - 0.160 mm
<b>HD PE / OPP</b>	0.010 - 0.150 mm
<b>CPP</b>	0.020 - 0.070 mm
<b>BOPP</b>	0.010 - 0.060 mm
<b>PET</b>	0.012 - 0.050 mm
<b>OPA</b>	0.015 - 0.050 mm
<b>Laminates</b>	0.020 - 0.150 mm
<b>Paper</b>	25 - 180 gsm

Processing of different materials is limited by maximum range of machine tension control. Material has to have the right value of surface tension for printing.

### BASIC TECHNICAL PARAMETERS

<b>Number of printing decks</b>	8
<b>Max. printing width</b>	1450 mm
<b>Max. print width for both-side printing</b>	700 mm
<b>Max. web width</b>	1500 mm
<b>Max. web width for both-side printing</b>	725 mm
<b>Min. web width</b>	400 mm - NONSTOP - air shafted 1000
<b>Min. web width for both-side printing</b>	100 mm - under condition of web guiding with 1 pc of ultrasonic sensor
<b>Min. print repeat length for printing plate thickness 1,14 mm</b>	400 mm unless otherwise stated in optional accessories air mandrels diam. 121,074 mm metal lock from printing length of 450 mm

*Min. print repeat length and air mandrel diameter must be discussed for other printing plate thickness and rubber creeping correction.*