Poly Print, Inc.
Air Quality Permit #671
Technical Support Document (TSD)

1. GENERAL COMMENTS:

A. Company Information

Source Location: Poly Print, Inc., 2300 W. Wetmore Road, Tucson, AZ 85705

B. Background

PDEQ received an application for a Significant Revision to the existing Class III air quality permit (#671) for Poly Print, Inc (herein known as the facility). This TSD has been updated for this modification.

The objective of the proposed revision submittal was to revise the capture efficiency requirement of the printing presses' Central Impression Drums (CIDs) in the current permit from requiring 100% volatile organic compounds (VOC) capture efficiency to requiring 98% VOC capture efficiency and thereby removing the requirement to maintain and operate the CIDs as permanent total enclosures that meet the criteria of EPA Method 204 – Criteria and Verification of a Permanent or Temporary Enclosure.

On, October 20, 2021, The facility contracted with Bison Engineering, Inc.(Bison), a 3rd party testing company, to verify the three ink rooms and the three CIDs met the requirements of EPA Method 204 – Criteria and Verification of a Permanent or Temporary Enclosure. As presented in the test report included as Attachment 1 of the TSD, dated November 2, 2021. Bison was able to confirm the three ink rooms met the requirements of EPA Method 204. Bison could not verify the CID enclosures met the criteria of EPA Method 204 due to the inability to locate and/or access the natural draft openings in each CID.

The facility contacted Uteco, the manufacturer of the presses, to discuss the capture efficiency of the CIDs. The facility was advised, by Uteco, that the CID rooms were designed to capture 98% VOCs (Attachment 2). As a result, the facility decided to revise their permit by requesting removal of the 100% capture efficiency requirement for the CIDs and adding a 98% VOC capture efficiency for the CIDs based on the manufacturer's 98% VOC capture efficiency design parameter for the CID. Refer to the email from Uteco to Poly Print included as Attachment 2 of the TSD.

The facility's current permit limits VOC emissions from the facility to 90 tons per year (TPY), 22.5 TPY of total Hazardous Air Pollutants (HAPs) and 9 TPY of a single HAP. These limits will remain unchanged.

The facility will be required to include the 2% of VOCs that are not captured in the CIDs in there rolling 12 month total VOC emissions calculations.

The Table below summarizes the permit actions taken since the last permit renewal, on October 11, 2021.

Summary of Permit Actions Within the Current Permit Term

Date Received/Approved	Permit Action
Received 01/07/2022 **Approved 03/22/2022**	**671-106P Significant Permit Revision:** The facility requested revision of the capture efficiency requirement for the Central Impression Drum's from 100% to 98% capture efficiency.

C. Attainment Classification

The source is located in an area that is in attainment for all pollutants.

2. SOURCE DESCRIPTION

The facility operates a specialty printing operation at 2300 West Wetmore Road, Tucson Arizona. The materials used in the printing operation generate both volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions. The HAP emissions from such operations are also typically VOC emissions.

The facility currently has a voluntary VOC emission limit of 90 tons/year on a 12-month rolling total basis. This is established to ensure the facility's potential to emit pollutants remains below the applicable major source thresholds and thus avoiding triggering Title V permitting requirements. This voluntary accepted limitation effectively designates the facility a synthetic minor stationary source.

A. Process Description

The facility is a specialty printing company that produces custom prints on plastic film to produce labeling media, many of which are designed to contain food products (SIC Code 2671). Currently, the facility utilizes three printing presses; two 10-color Uteco Onyx Model 108 flexographic printing presses (ID 2605 and ID 2990), and a 10-color Uteco Emerald Model 130 flexographic printing press (ID 1953). These presses are equipped with accessory equipment including treaters and dryers.

There are seven corona treatment units that generate ozone; each printing press has a corona treatment unit and each laminator has two corona treatment units that generates ozone for treating the surface of certain types of materials for the printing process. Ozone emissions form the Corona treatment units will exhaust directly into the atmosphere. The Uteco laminator is capable of using water-based adhesives for the lamination process as well as solvent-based adhesives. The Nordmeccanica laminator is a solvent free laminator which does not emit VOCs.

The hours of operation depend on the workload which changes weekly and monthly, depending on the contracts obtained by the business. Currently, the facility's production schedule is 24 hours a day, Monday through Friday with the ability to work seven days a week, 24 hours a day if needed, to fulfill contracts.

The facility no longer uses solvent free water white inks in their printing lines and PDEQ removed the permit conditions allowing the exhaust from the water white ink decks to bypass the RTO and vent directly to the atmosphere.

The facility has accepted to voluntarily limit VOC emissions to 90 tons/year on a 12-month rolling total basis. The facility is a synthetic minor for VOCs and a true minor source for all other pollutants.

B. Air Pollution Control Equipment

All emissions from the presses and the ink rooms are vented to exhaust ducts that are routed to a 30,000 standard cubic feet per minute (SCFM) Regenerative Thermal Oxidizer (RTO), retrofitted with a hot gas bypass stack and damper, that has a manufacturer guarantied VOC destruction efficiency of 98%.

The performance test conducted by Bison Engineering, Inc, on October 21, 2021, reported a VOC destruction efficiency of 99%.

The RTO is equipped with twin heat exchanger beds and low NO_X, natural gas fired, burners designed to maintain a minimum operating temperature of 1500°F. The RTO is equipped with a hot gas bypass as a safety measure.

C. Permanent Total Enclosure

The Central Impression Drum of each press is enclosed maintaining a manufacturer designed emissions collection efficiency of 98%. The Central Impression Drum of each printing press is equipped with a self-closing door and an interlock that would cause the press to shut down if the door was opened at any time while the press was operating.

All three printing presses are connected to their own self-contained ink compartment that is under negative pressure and attached to the press. Inks and solvents are pumped from the ink compartment to the press. Each ink compartment was installed or retrofitted as a permanent total enclosure with self-closing doors.

3. COMPLIANCE HISTORY

The last Full Compliance Evaluation (FCE) was conducted on October 3, 2019. One deficiency was noted for failure to maintain the 5-point criteria for the Permanent Total Enclosure, required in the permit, for the room surrounding the Sirio press and Uteco Emerald press. The facility was issued an Opportunity to Correct for the deficiency on January 7, 2020. No Notice of Violation actions have been issued by PDEQ to the facility.

Since the last FCE, PDEQ has not received any excess emissions reports from the facility.

4. EMISSIONS ESTIMATES

The facility continues to use a proven method to track chemical inventory and emissions as used under the existing air permit. Each ink, solvent or additive is called a part and is assigned a unique part number which is used to track its purchases, inventory and consumption every month. The inks and solvents used by the facility contain a variety of VOCs including hazardous air pollutants (HAPs). The identity (CAS number) and various VOC weight percent in each part are identified on Safety Data Sheets (SDSs) or manufacturer provided product data.

The Potential to Emit of the facility is based on operation 24 hours/day 365 days per year. The PTE was calculated based on the rolling twelve-month total of VOC and HAP usage with all three presses operating during that period of December 31, 2019 through December 30, 2021 and scaled up for maximum hours of operation during an 8760 hours per year operating schedule. Also, taking into consideration, the capture efficiency of the enclosed CIDs is 98%. The 2% of VOCs that are not captured by the enclosed CIDs are added to the monthly rolling total of VOC emissions. Based on the hours of operation and the amount of VOC and HAP usage recorded during the same time period, the uncontrolled VOC emission factor for each press when the press is running was calculated on average as 98.7 pounds per hour run time and the uncontrolled HAP emission factor was calculated as 0.01 pounds per run hour. Currently, the facility does not operate on the weekends.

Pollutant	Emissions (tons/yr)			
	VOCs	Single HAP	Total HAPs	Ozone
Uncontrolled Potential To Emit	925.00	0.050	0.094	16.79
Controlled Potential To Emit	68.0	0.003	0.006	16.79
Emissions Limitation	90.00	9.0	22.50	-

The annual allowable emission limits apply to any 12-consecutive calendar month period. The emission limitations for VOC and HAP are held at 90% of major source threshold.

Since the uncontrolled potential to emit is above major source levels for VOC, the facility has proposed a synthetic minor limitation of 90 tons per year of VOC and have volunteered to operate an RTO that has a minimum 95% destruction efficiency of VOCs routed to the RTO. Based on the estimates, the source's permit class is a Synthetic Minor, Class III Permit. The synthetic minor limitation only applies to VOCs. The source is a True Minor for all other pollutants.

Insignificant Activities and Equipment

The following equipment has been determined to be insignificant pursuant to Pima County Code 17.04.340.A.114.j;

Plant ID #	Equipment Name	Model	Fuel Type	Serial Number
3	Uteco Laminator	Horizon D/ TH, Model 130	Natural Gas	1959
4	Nordmeccanica Laminator	Super Simplex SL 1300	Electric	2008
NA	Plate Cleaner	NA	NA	NA
-	Natural Gas Fuel Burning Equipment	Not Applicable	Natural Gas	Not Applicable

NA – Not Available

Emissions from the combustion of natural gas fuel burning equipment located at The facility has been determined to be insignificant. The greatest amount of natural gas usage by the facility, in a rolling 12-month period over the past 5 years, was 141,833 therms or 14,183 MMBtu[1]. The total emissions for all regulated air pollutants generated from the combustion of 14,183 MMBtu is less than 2 tons. The greatest individual regulated air pollutant from the combustion of 14,183 MMBtu of natural gas is less than 1 ton. These emissions were calculated using emission factors from AP-42, Chapter 1.4, "Combustion of Natural Gas", Tables 1.4-1 and 1.4-2 (See Table Below).

Emission Factor 1[2] (lb/MMBtu)	PM 0.0075	PM_{10} 0.0075	$PM_{2.5}$ 0.0075	SO_2 0.0006	NOx 0.098	CO 0.082	VOC 0.0054
Emissions from combustion of 14,183 MMBtu NG in Tons	0.053	0.053	0.053	0.004	0.70	0.58	0.04

Purelam 6000 and Purelam 6050 are mixed together and used as an adhesive in the Nordmeccanica Laminator. Purelam 6000 contains methylene diphenyl diisocyanate (MDI) (CAS#101-68-8) which is a HAP. However, according to the manufacturer, the chemical is bound within the product and due to MDI's very low vapor pressure, does not emit to the atmosphere. Therefore, the Purelam adhesives have no emissions.

Even though the Uteco Laminator is capable of operating with water-based or solvent based adhesives, the facility only uses water-based adhesives in the Uteco Laminator.

5. PREVIOUS PERMIT CONDITIONS

The following section of the TSD refers to the specific conditions of the permit that have been revised, removed or added to the previous permit as a result of the significant permit revision under Permit Action 671-106P listed in the "Summary of Permit Actions Within the Current Permit" table in section B of the TSD. The requirement for the CID of each printing press to be maintained as a Permanent Total Enclosure and meet the requirements of EPA Method 204 – Criteria and Verification of a Permanent or Temporary Enclosure were removed from the permit. Edits were made to permit conditions in the permit that required the CID, of each printing press, to be maintained as a Permanent Total Enclosure. The following specific permit conditions were revised:

[1] The NG usage was reported in therms. Ten therms is equal to 1 MMBtu. The facility's highest therm usage in a rolling 12-month period was 141,833 therms or 14,183.3 MMBtu.

[2] PM, PM10 an PM2.5 emission factors were assumed to be the same.

Permit Condition 23:

Pre-Revision:

The Central Impression drums on all three presses are to be enclosed, with 100% of VOC captured and directed through a closed vent system to the RTO by meeting the criteria of a Permanent Total Enclosure specified in permit condition 39.

Post-Revision:

The Central Impression Drum of each printing press:

a. Is to be enclosed, with 98% of VOC captured and directed through a closed vent system to the RTO.
b. Shall be installed with an interlock that automatically shuts off the press when the door to the printing press drum enclosure is opened.

Permit Condition 31.e:

Pre-Revision:

i. taking the control efficiency, determined by the most recent performance test and capture efficiency into consideration for the VOC emissions vented to a control device;

Post-Revision:

i. the efficiency of VOC emissions captured and vented to the control device. (The efficiency is determined by the most recent performance test and the manufacture rated capture efficiency of the enclosed printing presses.);

Permit Condition 40:

Pre-Revision:

Semiannually, the permittee shall perform an inspection of the total permanent enclosures and the exhaust ductwork venting to the RTO. The permanent enclosure inspections should consist of confirming the seals and the self-closing mechanisms of the doors to the enclosures are still in good working order. The exhaust ductwork inspection should confirm the ducts are still intact with no exhaust leaks between the permanent total enclosures and the RTO.

Post-Revision:

Semiannually, the permittee shall perform an inspection of the total permanent enclosures, the central impression drum enclosures and the exhaust ductwork venting to the RTO. The permanent enclosure inspections and the central impression drum enclosures should consist of confirming the seals and the self-closing mechanisms of the doors to the enclosures are still in good working order. The exhaust ductwork inspection should confirm the ducts are still intact with no exhaust leaks between the permanent total enclosures and the RTO and between the printing presses' exhaust and the RTO.

6. APPLICABLE REQUIREMENTS

Code of Federal Regulations (CFR)

40 CFR, Part 60 New Source Performance Standards NSPS

No NSPS rules apply to the source.

40 CFR, Part 63 National Emission Standards for Hazardous Air Pollutants NESHAP

No NESHAP rules apply to the source. The following NESHAP rules could but do not apply for the following reasons:

40 CFR Part 63 Subpart KK (Printing and Publishing Industry)

This rule is only applicable to facilities that are a major source for HAPs. The facility is a true minor (area) source for HAPs (the PTE for all HAPS is 0.53 tons per year); as a result, the facility is not subject to 40 CFR Subpart KK (see EPA Determination Detail M980042). If the facility were a major source for HAPs, a synthetic minor limitation could be chosen to restrict the PTE to an area source and as a result The facility would only be subject to reporting requirements in 63.829 (d) and 63.830 (b)(i).

40 CFR Part 63 Subpart JJJJ (Paper and Other Web Coating)

This rule does not apply because it is only applicable to facilities that are a major source for HAPs. This is true minor (area) source for HAPs, and therefore not subject to 40 CFR 63 Subpart JJJJ.

EPA-452/F-03-033, Test Method 204 – Permanent Total Enclosure

Pima County Code (PCC) Title 17, Chapter 17.11 General Provisions for Permits

17.11.010 Statutory authority
17.11.020 Planning, constructing, or operating without a permit
17.11.060 Permit display or posting
17.11.120 Material Permit Condition
17.11.160 Test methods and procedures
17.11.190 Permits containing synthetic emission limitations and standards
17.11.210 Performance tests

Pima County Code (PCC) Title 17, Chapter 17.13 Permits and Permit Revisions

17.13.010 Permit application processing procedures for Class II and Class III permits
17.13.020 Permit contents for Class II and Class III permits
17.13.070 Establishment of an emissions cap for Class II and Class III permits
17.13.100 Facility changes that require a permit revision for Class II or Class III permits
17.13.130 Minor revisions for Class II or Class III permits
17.13.140 Significant revisions for Class II or Class III permits
17.13.180 Annual emissions inventory questionnaire for Class II or Class III permits
17.13.190 Reporting requirements
17.13.240 Fees related to Class II permits

Pima County Code (PCC) Title 17, Chapter 17.16 Emission Limiting Standards

17.16.010 Local rules and standards - Applicability of more than one standard
17.16.020 Noncompliance with applicable standards
17.16.040 Standards and applicability (Includes NESHAP)
17.16.050 Visibility limiting standard
17.16.130 Applicability
17.16.165 Standards of performance for fossil-fuel fired industrial and commercial equipment
17.16.400 Organic solvents and other organic materials.
17.16.430 Standards of performance for unclassified sources

Pima County Code (PCC) Title 17, Chapter 17.20 Emission Source Testing and Monitoring

17.20.010 Source sampling, monitoring, and testing

Pima County Code (PCC) Title 17, Chapter 17.24 Emission Source Recordkeeping and Reporting

17.24.20 Recordkeeping for compliance determinations

7. ALTERNATE OPERATING SCENARIOS

The applicant has not requested any alternate operating scenarios in this permit.

8. IMPACTS TO AMBIENT AIR QUALITY

Not a major source and so no studies are required.

9. CONTROL TECHNOLOGY DETERMINATION

No control technologies needed to be determined. This facility is in an area of attainment and is not a new PSD source.

ATTACHMENT 1: EMISSIONS TEST REPORT, POLYPRINT, INC.; Dated November 2, 2022

ATTACHMENT 2: EMAIL FROM UTECO TO POLY PRINT; Dated December 1, 2021