



SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING AND COMPLIANCE OFFICE

APPLICATION PROCESSING AND CALCULATIONS

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De Minimis Permit Revision
Section D (PC/PO)
Five-Color UV Screen Printing System

Legal Owner
or Operator: SOLUTIONS UNLIMITED, WILSON'S ART STUDIO DBA
501 S. ACACIA AVE.
FULLERTON, CA 92831 ID: 114083

Equipment
Location: SAME AS ABOVE

Equipment Description:
A/N 484042 (New Construction, PC/PO)
FIVE-COLOR SCREEN PRINTING SYSTEM CONSISTING OF:

1. SCREEN PRINTING PRESS, THIEME, MODEL NO. 5070XL, 106-INCH WIDTH, 5-COLOR UNIT.
2. FIVE UV DRYERS, THIEME, DRYTECH UV COLD-AIR MODULE, EACH WITH TWO 300-WATT/INCH ELECTRICALLY POWERED UV LAMPS.

A/N 484095
De minimus Significant Title V Permit Revision

History

In this project, the company is proposing to add a new 5-color UV screen printing system, which will not result in any emission increases facility wide. The company will manage its ink and solvent usage to stay below the existing facility-wide limit of 152 pounds of VOC per day. In addition, the company has also agreed to an equipment-specific VOC limit of 30 pounds per day so that this project will not be subject to the public notice requirements of Rule 212(g).

At the above address, the company operates a facility that is Title V and non-RECLAIM. The current renewed Title V Permit is valid until 6-17-2011. This project is considered a De minimus Significant Permit Revision, the first revision to the Renewed Title V Permit.

Based on District compliance records, the company is currently operating in compliance with all applicable rules and regulations and has not caused any public nuisance.



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Process Description

The company conducts silk-screen printing 6 days per week (maximum), 5 days per week (average), 20 hours per day (average), 24 hours per day (maximum), and 52 weeks per year. The proposed press is used for printing decals and posters.

General Screen Printing Operation:

In typical screen printing, a porous screen of fine silk, Nylon, Dacron, or stainless steel is mounted on a frame. First, a stencil is made from the porous screen. A negative image is created manually or photomechanically on the stencil, which is used to block inks from getting through to printed materials. Next, substrates to be printed are placed under the screen. Then, a rubber squeegee is used to spread and force a paint-like ink through the screen fine mesh openings on to substrates underneath. Because of the heavy ink film, the printed sheets must be racked separately until dry or passed through a heated tunnel or drier before they can be stacked. Please note that at this facility, almost all printing inks are UV types that can be dried quickly when exposed to UV light, thus simplifying the typical screen-printing drying process.

Printing inks generally consist of pigments, binders, and solvents. Pigments are composed of finely divided organic and inorganic materials, which produce desired colors. Binders are composed of organic resins and polymers or oils and resins, which lock pigments to the substrate. Solvents are usually composed of organic compounds, which dissolve and disperse the pigments and binders. During the ink drying process, small portions of organic materials are released to the atmosphere.

UV inks consist of liquid prepolymers and initiators. When UV inks are exposed to large doses of UV radiation, the initiators release radicals that polymerize the prepolymers to form a thermosetting resin. Cured UV inks are dried almost instantaneously with very little organic-materials releases to the atmosphere.

The company is proposing to install a new UV screen printing line with five color stations. Each station consist of a screen printing press and an associated UV dryer, dedicated for printing and drying one color layer. Multiple color layers, up to five different layers, can be printed on the same sheet of a substrate, which is being automatically conveyed through each station.



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Emission Calculations

Emissions from this facility are mostly ROG. The emission sources are primarily organic solvents contained in inks and other related equipment cleaners. The emissions from this new unit will be bubbled under the existing facility VOC limit of 152 pounds per day. Also, in order not to trigger the public notice requirements of Rule 212(g), the company has agreed to an equipment-specific VOC limit of 30 pounds per day. Therefore, the following data has been entered for NSR and AEIS:

NSR

$$\begin{aligned}\text{ROG (R1 = R2)} &= 30 \text{ lb/dy} \\ &= (30 \text{ lb/dy}) / (24 \text{ hr/dy}) = 1.25 \text{ lb/hr}\end{aligned}$$

ROG (30DA) is manually set to zero for this project.

AEIS

$$\begin{aligned}\text{ROG (R1 = R2)} &= 30 \text{ lb/dy} \\ &= (30 \text{ lb/dy}) / (24 \text{ hr/dy}) = 1.25 \text{ lb/hr}\end{aligned}$$

Toxic Evaluation

Based on the application deemed completion date, this project is subject to Rule 1401 as amended 3-7-2008.

From MSDS's submitted with this application, two UV screen printing inks, REV-G50 and REV-O50, contain trace amount of ethyl benzene (CAS 100-41-4) and toluene (CAS 108-88-3), 0.03 and 0.01779 weight percent respectively. The company is proposing to use up to 200 gallons of inks per day.

Ethyl benzene (MHU=MHC):

$$= (8.9979 \text{ lb/gal})(200 \text{ gal/dy})(0.03\%) / (24 \text{ hr/dy}) = 2.250\text{E-}2 \text{ lb/hr}$$

Toluene (MHU=MHC):

$$= (8.9979 \text{ lb/gal})(200 \text{ gal/dy})(0.01779\%) / (24 \text{ hr/dy}) = 1.334\text{E-}2 \text{ lb/hr}$$

MICRs, HIAs and HICs at both receptors as calculated in the attached Excel worksheet are less than 1E-6, 1, and 1 respectively, in compliance with Rule 1401.



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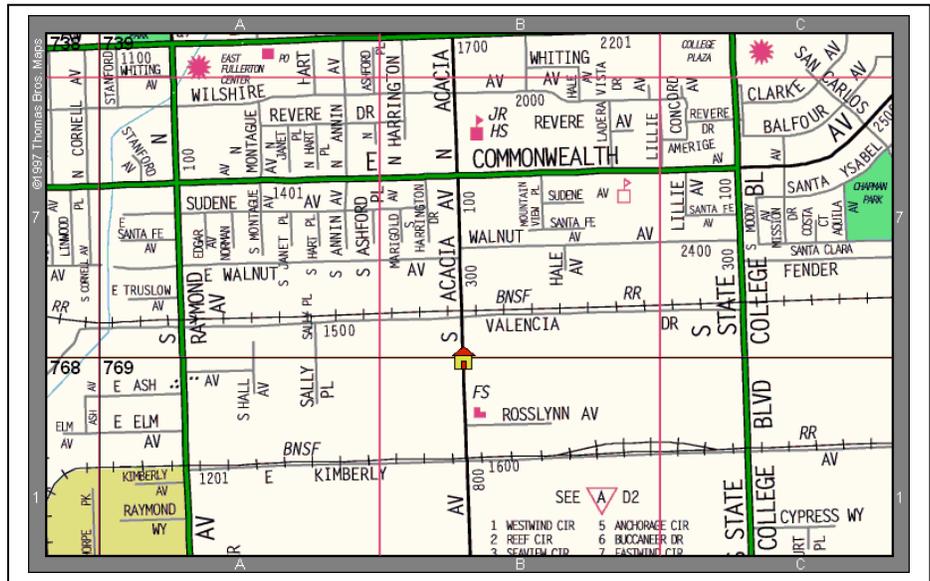
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Rule Evaluation

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.



Since no school is located within 1,000 ft, a public notice will not be required.

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 will not result in any on-site emission increases. Therefore, a public notice will not be required.

Rule 212(c)(3):

The proposed project will result in TAC emission increases. However, the calculated MICR is less than $1E-6$. Therefore, a public notice will not be required.

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 company has agreed to an equipment-specific VOC limit of 30 pounds per day. Therefore, a public notice will not be required.



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- 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 has been no complaint history for this facility, which is surrounded by other industrial buildings.
- Rules 1130.1: Compliance is expected. UV inks contain a maximum of 0.5 lb/gal (5% by weight) of VOC, thus in compliance with the Rule most stringent limit of 3.3 lb/gal of VOC.
- Rules 1171: Compliance is expected. Based on the MSDS, the proposed SAATIChem Remove IR9 contains 75 g/L (or 0.625 lb/gal), in compliance with the VOC limit of 0.83 lb/gal.
- Rule 1303(a): Compliance with BACT is expected. The use of UV curable inks is considered BACT for screen printing operations. A permit condition requiring the use of only UV curable inks is proposed to ensure future compliance with BACT.
- Rule 1303(b)(1): Further air quality modeling analysis will not be needed since the proposed project has no potential to effect emissions of NO_x, CO, and PM₁₀. Therefore, compliance is expected.
- Rule 1303(b)(2): Compliance is expected. Emission offsets will not be needed for this project since the company will manage its ink and solvent usage to stay below the facility cap of 152 pounds of VOC per day.
- Rule 1401: MICRs, HIAs and HICs at both receptors as calculated in the attached Excel worksheet are less than 1E-6, 1, and 1 respectively, in compliance with Rule 1401.



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Regulation XXX

This facility is not in the RECLAIM program. The proposed project is considered as a "de minimis significant permit revision" to the Title V permit for this facility.

Rule 3000(b)(6) defines a "de minimis significant permit revision" as any Title V permit revision where the cumulative emission increases of non-RECLAIM pollutants or hazardous air pollutants (HAPs) from these permit revisions during the term of the permit are not greater than any of the following emission threshold levels:

Air Contaminant	Daily Maximum (lbs/day)
HAP	30
VOC	30
NOx	40
PM10	30
SOx	60
CO	220

To determine if a project is considered as a "de minimis significant permit revision" for non-RECLAIM pollutants or HAPs, emission increases for non-RECLAIM pollutants or HAPs resulting from all permit revisions that are made after the issuance of the Title V renewal permit shall be accumulated and compared to the above threshold levels. This proposed project is the first permit revision to the Title V renewal permit issued to this facility on June 18, 2006. The following table summarizes the cumulative emission increases resulting from all permit revisions since the renewal Title V permit was issued:

Revision	HAP	VOC	NOx	PM ₁₀	SOx	CO
1 st Permit Revision: Add a new screen printing system	0	0	0	0	0	0
Net Emission Total	0	0	0	0	0	0
Maximum Daily	30	30	40	30	60	220

Since the cumulative emission increases resulting from all permit revisions are not greater than any of the emission threshold levels, this proposed project is considered as a "de minimis significant permit revision".



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Recommendation

The proposed project is expected to comply with all applicable District Rules and Regulations. Since the proposed project is considered as a "de minimis significant permit revision", it is exempt from the public participation requirements under Rule 3006(b). A proposed permit incorporating this permit revision will be submitted to EPA for a 45-day review pursuant to Rule 3003(j). If EPA does not have any objections within the review period, a revised Title V permit will be issued to this facility.