

ENGINEERING EVALUATION
Space Systems/Loral, Plant: 6061
3825 Fabian Way, Palo Alto, CA 94303
Application: 25574

Background

Space Systems/Loral is applying for an Authority to Construct/Permit to Operate for the following proposed new source:

S-319 Photoresist Coater with Electric Oven, PRISM Ultracoat 350 with Ultra-Cure UV Curing Module 970-2

S-319 is a spray coating machine with an attached oven. At S-319, ceramic substrates are coated with photoresist, and then are baked in the attached UV curing oven for 15 to 30 minutes. The ceramic substrates are then removed from S-319 and are processed at other locations. This facility proposes to use the following coatings and solvents at S-319:

| Materials used at S-319 | Type | Composition | Density |
|-------------------------|-----------------|---|---------------------|
| SC 100 Resist | Photoresist | Xylene (75% maximum) Ethylbenzene (18% maximum) | 7.34 lb/gal maximum |
| AZ P4110 Photoresist | Photoresist | 1-Methoxy-2-propanol acetate (80% maximum) Diazonaphthoquinonesulfonic esters (5% maximum) Cresol novolak resin (25% maximum) | 8.34 lb/gal |
| Acetone | Thinner/Solvent | Acetone | 6.59 lb/gal |
| AZ C-260 (CN) Rinse | Thinner/Solvent | 1-Methoxy-2-propanol acetate (80% maximum) | 8.05 lb/gal |
| Xylenes | Thinner/Solvent | m-Xylene (65% maximum) o-Xylene (20% maximum) p-Xylene (20% maximum) Ethylbenzene (25% maximum) | 7.17 lb/gal |

S-319 serves the same function and will use the same materials as existing S-318 Photoresist Coater with Electric Oven. S-319 will reside in the same room location as S-318. Similar to S-318, S-319 will not be used for semiconductor manufacturing, but instead is used to produce small-scale features on precision aerospace (satellite) components.

In accordance with the District grouping policy for drying ovens, the electric oven at S-319 shall be grouped as part of S-319, since the oven is electrically powered and therefore does not exceed the Regulation 2-1-114.1 exemption threshold of 1 mmbtu/hr rated heat input.

Emissions Calculations

The maximum coating and solvent usage levels at S-319 are as follows:

| Materials used at S-319 | Maximum Hourly Usage (gal/hr) | Maximum Daily Usage (gal/day) | Maximum Annual Usage (gal/yr) |
|-------------------------|-------------------------------|-------------------------------|-------------------------------|
| SC 100 Resist | 0.007 | 0.06 | 15 |
| AZ P4110 Photoresist | 0.007 | 0.06 | 20 |
| Acetone | 0.005 | 0.04 | 15 |
| AZ C-260 (CN) Rinse | 0.005 | 0.04 | 15 |
| Xylenes | 0.005 | 0.04 | 10 |

The annual emissions are summarized below. Calculations are shown in Attachment A.

| Materials used at S-319 | Maximum Hourly POC Emissions (lb/hr) | Maximum Daily POC Emissions (lb/highest day) | Maximum Annual POC Emissions (lb/yr) | Maximum Hourly NPOC Emissions (lb/hr) | Maximum Daily NPOC Emissions (lb/highest day) | Maximum Annual NPOC Emissions (lb/yr) |
|-------------------------|--------------------------------------|--|--------------------------------------|---------------------------------------|---|---------------------------------------|
| SC 100 Resist | 0.051 | 0.44 | 110.1 | | | |
| AZ P4110 Photoresist | 0.058 | 0.5 | 166.8 | | | |
| Acetone | | | | 0.033 | 0.264 | 98.85 |
| AZ C-260 (CN) Rinse | 0.04 | 0.322 | 120.75 | | | |
| Xylenes | 0.036 | 0.287 | 71.7 | | | |
| TOTAL | 0.186 lb/hr POC | 1.54 lb/highest day POC | 469.35 lb/yr POC | 0.033 lb/hr NPOC | 0.264 lb/highest day NPOC | 98.85 lb/yr NPOC |

BACT Review and Determination

In accordance with Regulation 2, Rule 2, Section 301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO_x, CO, SO₂ or PM₁₀. As shown above, BACT is not triggered since daily maximum emissions will not exceed 10 pounds per highest day for POC and for NPOC for S-319.

Plant Cumulative Increase and Offsets

The table below summarizes the cumulative increase in criteria pollutant emissions that will result at Plant 6061 from the operation of S-319. The emission increases from Applications 25539 and 25789 (the other two pending applications for this facility) are also shown below.

Plant Cumulative Emissions Increase

| Pollutant | Existing Emissions, Post 4/5/91 (TPY) | New Increase with Application 25539 (TPY) | New Increase with this Application 25574 (TPY) | New Increase with Application 25789 (TPY) | Cumulative Emissions (TPY) |
|------------------|---------------------------------------|---|--|---|----------------------------|
| NO _x | 0 | 0.119 | 0.000 | 0.314 | 0.433 |
| POC | 0 | 0.006 | 0.235 | 0.017 | 0.258 |
| CO | 0.072 | 0.010 | 0.000 | 0.043 | 0.125 |
| PM ₁₀ | 0.018 | 0.002 | 0.000 | 0.007 | 0.027 |
| SO ₂ | 0.002 | 0.000 | 0.000 | 0.000 | 0.002 |
| NPOC | 5.56 | 0.000 | 0.000 | 0 | 5.56 |

The table below shows the grandfathered sources at Plant 6061 and the corresponding Potential to Emit for each source. S-221 and S-250 are the only grandfathered sources with existing permit condition limits. For S-3, S-308, S-314, and S-315, maximum annual usages and POC contents are provided by the applicant. The applicant has agreed to accept enforceable permit condition limits (see Condition 25698 under Application 25539) based on the maximum usages in the table below in order to remain eligible for offsets from the Small Facilities Bank.

Potential to Emit (PTE) from Grandfathered Sources

| Source | Description | Maximum Annual Usage (gal/yr) | POC Content (lb/gal) | Maximum Annual POC Emissions (lb/yr) | Maximum Annual POC Emissions (TPY) |
|--------|--|--|----------------------|--------------------------------------|------------------------------------|
| S-3 | Paint Spray Booth/Electric Ovens | 243 | 6.7 | 1628.1 | 0.814 |
| S-221 | Urethane Foam Encapsulation/Electric Ovens | 5125 lb/yr of Stathane 817-2C Component 1 and 5125 lb/yr of Stathane 817-2C Component 2* | | 46.3 | 0.023 |
| S-250 | Wipe Cleaning Operation Bldg #2 | 300** | 6.6 | 1980 | 0.99 |
| S-308 | Multiple Silk Screen Tables/Electric Ovens | 89.7 | 6.5 | 583.050 | 0.292 |
| S-314 | Strip Station | 36 | 6.5 | 234 | 0.117 |
| S-315 | Photoresist Station/Electric Ovens | 15.03 | 6.5 | 97.695 | 0.049 |
| | | | | TOTAL | 2.285 |

* Usage limit in Permit Condition 12325 Parts 1 and 2 for "Stathane 817-2C Component 1" (0.5% wt. POC) and "Stathane 817-2C Component 2" (0.405% wt. POC)

** Solvent usage limit in Permit Condition 4216 Part 1

The table below summarizes the total PTE for this facility.

Facility PTE for POC

| | Emissions (TPY) |
|--|-----------------|
| Pre-4/5/91 Cumulative Increase (as Plant 722) | 7.483 |
| Pre-4/5/91 Cumulative Increase (as Plant 6061) | 0.474 |
| Post-4/5/91 Permitted Emissions | 8.886 |
| PTE of Grandfathered Sources | 2.285 |
| New Increase with Application 25539 | 0.006 |
| New Increase with Application 25574 | 0.235 |
| New Increase with Application 25789 | 0.017 |
| Total Facility PTE | 19.386 |

BAAQMD Regulation 2-2-302 was amended on December 21, 2004, so that facilities with a potential to emit of 35 tons or more of POC or NOx could not use offsets from the Small Facilities Bank. Facilities with a potential to emit between 10 and 35 tons of POC or NOx can use offsets from the Small Facilities Bank. Therefore, 0.235 tons POC per year will be charged to the Small Facilities Bank for this application. Offsets are not required for NOx because the PTE of NOx for this facility is well below 10 TPY.

Statement of Compliance

Toxics NSR/TBACT

TAC emissions will not exceed the TAC thresholds in Table 2-5-1 of Regulation 2-5, as shown in the table below (calculations are shown in Attachment A).

| TACs | Maximum Hourly Emissions (lb/hr) | Maximum Annual Emissions (lb/yr) | Regulation 2-5 trigger (lb/hr) | Regulation 2-5 trigger (lb/yr) | HRSA triggered? (Y/N) |
|--------------|----------------------------------|----------------------------------|--------------------------------|--------------------------------|-----------------------|
| xylene | 0.076 | 157.86 | 49 | 27000 | N |
| ethylbenzene | 0.018 | 37.74 | | 43 | N |

However, there are two other pending applications (Applications 25539 and 25789, each for an emergency standby diesel generator) at this facility, and Regulation 2-5-216 requires all three applications to be considered a single project for the purpose of determining whether a Health Risk Screening Analysis is required. Regulation 2-5-216 states that *“a project shall include those new or modified sources of TACs at a facility that have been permitted within the two-year period immediately preceding the date a complete application is received, unless the applicant demonstrates to the satisfaction of the APCO that construction or modification of the sources included in the current application was neither (1) a reasonably foreseeable consequence of the previous project, nor (2) a critical element or integral part of the previous project.”* Therefore, an HRSA is required for this application because the diesel particulate emissions under Applications 25539 and 25789 exceed the respective toxic trigger level.

Per the attached 2/4/2014 memo from Judith Cutino, results from the health risk screening analysis indicate that the project cancer risk to the maximally exposed receptor is 9.7 in a million and the chronic hazard index is 0.0034.

In accordance with Regulation 2-5, these risk levels are acceptable.

District Rules

Per Regulation 8-29-121 (Exemption, Satellite Coatings), S-319 is exempt from the coating VOC limits in Regulation 8-29-302 because S-319 is a satellite coating operation. Regulation 8-29-121 states that such coatings are subject to Regulation 8-4. Regulation 8-29-121 also requires recordkeeping per Regulation 8-29-501 to demonstrate compliance with this exemption.

Similar to S-318, S-319 is subject to the operating standards of Regulation 8-1 (Organic Compounds, General Provisions) and 8-4 (Organic Compounds, General Solvent and Surface Coating Operations). The standards in Regulation 8-1 and 8-4 require that closed containers be used for disposal of cloth or paper impregnated with organic compounds; that closed containers be used for storage of organic compounds; and that evaporation of organic compounds during the cleaning of spray equipment be minimized. Additionally, Regulation 8-4 requires that emissions be limited to 5 TPY per source.

In accordance with the District grouping policy for drying ovens, the electric oven at S-319 shall be grouped as part of S-319, since the oven is electrically powered and therefore does not exceed the Regulation 2-1-114.1 exemption threshold of 1 mmbtu/hr rated heat input.

Federal Rules

PSD, NSPS, and NESHAPS are not triggered for S-319.

CEQA

This application is considered to be ministerial under the District's Regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 5.1.

Public Notices

This application is subject to public notification pursuant to Regulation 2-1-412, Public Notice, School because this facility is located within 1000 feet of the nearest school.

Recommendation

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source will be located within 1000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412.6. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct for the following source:

S-319 Photoresist Coater with Electric Oven, PRISM Ultracoat 350 with Ultra-Cure UV Curing Module 970-2

Permit Conditions (Condition #25715)

Space Systems/Loral, Plant: 6061
Application 25574 for:

S-319 Photoresist Coater with Electric Oven, PRISM Ultracoat 350 with Ultra-Cure UV Curing Module 970-2

1. The owner/operator of S-319 shall not exceed the following usage limits during any consecutive twelve-month period:

| | |
|----------------------|------------|
| SC 100 Resist | 15 Gallons |
| AZ P4110 Photoresist | 20 Gallons |
| Acetone | 15 Gallons |

AZ C-260 (CN) Rinse 15 Gallons
Xylenes 10 Gallons
(Basis: Cumulative Increase)

2. The owner/operator may use an alternate coating(s) or cleanup solvent(s) other than the materials specified in Part 1 and/or usages in excess of those specified in Part 1, provided that the owner/operator can demonstrate that all of the following are satisfied:
- a) Total POC emissions from S-319 do not exceed 470 pounds in any consecutive twelve month period;
 - b) Total NPOC emissions from S-319 do not exceed 99 pounds in any consecutive twelve month period; and
 - c) The use of these materials does not increase toxic emissions above any risk screening trigger level of Table 2-5-1 in Regulation 2-5.

(Basis: Cumulative Increase; Toxics)

3. To determine compliance with the above parts, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above parts, including the following information:
- a) Quantities of each type of coating and cleanup solvent used at this source on a monthly basis.
 - b) If a material other than those specified in Part 1 is used, POC/NPOC and toxic component contents of each material used; and mass emission calculations to demonstrate compliance with Part 2, on a monthly basis;
 - c) Monthly usage and/or emission calculations shall be totaled for each consecutive twelve-month period.

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

(Basis: Cumulative Increase; Toxics)

By: _____
Jimmy Cheng
Air Quality Engineer

Date: _____