

DRAFT

ENGINEERING EVALUATION Tinsley Laboratories Inc., Plant No. 7234 Application No. 15064

BACKGROUND

Tinsley Laboratories has submitted an application to:

- Allow the use of new cutting lubricants at its Glass Shape Generating sources, S8, and S9; Beryllium Grinding Operations, S20 and S21,
- To allow the use of a protective coating at its Glass Shape Generating sources, S8, and S9; Beryllium Grinding Operations, S20 and S21,
- To improve control of beryllium particles at S20 and S21, and
- To install a new booth to coat materials with silver (silvering booth).

Tinsley is also moving the beryllium operation to a contiguous building.

One new cutting lubricant is a combination of methyl alcohol and propylene glycol. The other is ethylene glycol.

The cutting lubricant permit will require public school notification because there will be an increase in methyl alcohol and ethylene glycol, which are TACs, and the facility is close to the schools below.

Pacific Academy, 2925 Technology Court, San Pablo
California Autism Foundation, 4138 Lakeside Drive, Richmond
La Petite Academy, 3891 Lakeside Dr., Richmond

The silvering booth also uses TACs, but does not require notification because it is exempt pursuant to BAAQMD Regulation 2-1-103. Nonetheless, a calculation of the emissions at the silvering booth will be included here.

It is expected that control of beryllium at S20 and S21 will be improved by the use of A8, and A9, Cyclones, to collect particles from the grinding prior to control by A6, and A7, HEPA filters.

EMISSIONS

S8, S9, Glass Shape Generating, and S20, S21, Beryllium Polishing

The applicant has requested usage of 750 gal/yr of "Red Lube" as a cutting fluid. The density is 8.49 lb/gal. It can contain up to 30% methanol and up to 95% propylene glycol. It is 100% POC. Methanol is a TAC. Propylene glycol is not a TAC.

POC:

$$750 \text{ gal/yr} \times 8.49 \text{ lb/gal} = 6,368 \text{ lb/yr or } 3.184 \text{ tpy}$$

Worst-case Methanol emissions if all is evaporated:

$$750 \text{ gal/yr} \times 8.49 \text{ lb/gal} \times 30\% = 1,910 \text{ lb/yr}$$

This amount is much lower than the annual trigger level of 150,000 lb/yr. The hourly trigger level is 62 lb/hr. The source will have permit conditions that limit the emissions to less than 62 lb/hr.

The applicant has requested usage of 100 gal/yr of ethylene glycol as a cutting fluid. The density is 9.2 lb/gal.

POC and ethylene glycol:

$$100 \text{ gal POC/yr} \times 9.2 \text{ lb/gal} = 920 \text{ lb POC/yr or } 0.46 \text{ tpy POC} = 0.46 \text{ tpy ethylene glycol}$$

This amount is much lower than the trigger level of 15,000 lb/yr. There is no hourly trigger level.

The applicant has also requested usage of 35 gal/yr of "AZ 1500 thinner" and 35 gal/yr of AZ(R) P150 Protective Coating. The thinner is 100% Propylene glycol monomethyl ether acetate (PGMEA) and the coating is 68% PGMEA. The density is 8.1 for the thinner and 8.6 for the coating. PGMEA is an acetate of polypropylene glycol methyl ether, which is a TAC. The acetate dissociates readily, so 68% of the PGMEA emissions will be considered to be emissions of the glycol ether. This is based on a molecular weight of 130.16 for PGMEA and a molecular weight of 90.12 for the glycol ether.

POC and PGMEA:

$$\text{Thinner: } 35 \text{ gal/yr} \times 8.1 \text{ lb/gal} = 283.5 \text{ lb/yr}$$

$$\text{Coating: } 35 \text{ gal/yr} \times 8.6 \text{ lb/gal} \times 0.68 \text{ lb POC/lb coating} = 204.7 \text{ lb/yr}$$

$$\text{Total POC from coating and thinner: } 488.2 \text{ lb/yr} = 0.244 \text{ tpy}$$

Propylene glycol monomethyl ether:

$$488.2 \text{ lb/yr} \times 0.68 = 331 \text{ lb/yr}$$

This amount is much lower than the annual trigger level of 270,000 lb/yr. There is no hourly trigger level.

The facility previously used up to 90 gal/yr of a glycerol-sorbitol or isopropanol-palm oil mixture. Instead, the facility will use 90 gal/yr of ethanolamine mixtures. These are not toxic and will be considered to be equivalent. The permit condition has been revised.

The beryllium polishing operation is an existing operation. Emissions of beryllium will not increase. The trigger level for toxic risk screening for beryllium is 0.08 lb/yr. The database calculates that 6.3 E-10 lb/yr or 2.9 E-7 g/yr are emitted. The limit in BAAQMD Regulation 11, Rule 3, Beryllium, and 40 CFR 61, Subpart C, Beryllium, is 10 g/day.

S27, Silvering Booth

The applicant has stated that 6 pints/yr of each of the following materials will be used:

HE-300C Reducer: 1% formaldehyde, 1% non-disclosed hazardous ingredient

#93 Sensitizer: 20% propanol; 5% HCL; 5% non-disclosed hazardous ingredient

HE-300 Activator: non-TAC; inorganic
HE-300A Silver Solution: non-TAC; inorganic

Formaldehyde emissions:

$$1\% \times 0.75 \text{ gal} \times 10.68 \text{ lb/gal} = 0.08 \text{ lb formaldehyde/yr}$$

The toxic trigger levels are 30 lb/yr and 0.021 lb/hr. The emissions will be below the trigger levels.

Propanol emissions:

$$20\% \times 0.75 \text{ gal} \times 10.01 \text{ lb/gal} = 1.52 \text{ lb propanol/yr}$$

The toxic trigger levels are 270,000 lb/yr and 7.1 lb/hr. The emissions will be below the trigger levels.

At these emission rates, the source is exempt from permits pursuant to BAAQMD Regulation 2-1-103, which exempts sources subject to BAAQMD Regulation 8, Rule 4 that emit less than 10 lb/day of POC, NPOC, CO, PM10, SO2, or NOx.

The total increase in POC emissions is 3.888 tpy.

The facility will also use the following materials, which either are not regulated or will not cause emissions.

- Zirconium oxide powder
- Potassium hydroxide
- Pitch
- Citrus oil
- Diamond powder
- Grinding fluid
- Grit
- Aluminum oxide
- Cerium oxide
- Olive oil
- Detergent
- Wax
- Aero-duster (aerosol cans)
- Acrylic Conformal Coating (aerosol cans-contains up to 4% MEK, 15% toluene)

PLANT CUMULATIVE INCREASE, OFFSETS

	Current (ton/yr)	Ap 15064 (ton/yr)	new total (ton/yr)
POC:	4.723	3.888	8.611

Pursuant to BAAQMD Regulation 2-2-302, offsets are required if the facility emits more than 10 tpy of POC or has a permit to emit more than 10 tpy of POC. The database states that the facility emitted about 3.6 tons POC in 2005. A review of the existing

permit conditions (attached) shows that all sources have or will have existing POC limits as follows except for the exempt silvering booths. The two silvering booths are exempt pursuant to BAAQMD Regulation 2-1-103 because they have POC emissions that are less than 10 lb/day and are not subject to any rules of Regulation 8 except Rules 1 through 4. The potential to emit for these sources is insignificant.

Condition	Sources	Usage Gal/yr	Density Lb/gal	Approx. Emissions Lb/yr
6243:	S8, S9, S20, S21:	90 gals "coolant"	10	900
		"red lube"		6,368
		ethylene glycol coating and thinner		920
17386	S22	10 gal MeOH	6.6	66
		210 gal IPA	6.5	1365
20850	S26	500 gal "Lenium"	11	5,500
	Silvering booths	POC		<u>0</u>
Total				15450

Calculated in this manner, the total potential to emit for POC is 15,450 lb/yr or 7.725 tpy and the facility is exempt from offsets.

TOXIC RISK SCREENING ANALYSIS

Since the emissions of all toxic air contaminants are below the triggers in BAAQMD Regulation 2, Rule 5, no toxic risk analysis is required.

BACT

Sources S8, S9, S20 and S21 are not subject to BACT for POC because they will not emit more than 10 lb POC/day. The applicant will be required to keep records to show that the emissions do not exceed the limit.

STATEMENT OF COMPLIANCE

S8, S9, S20, S21, and S27 are subject to BAAQMD Regulation 8, Rule 4, General Solvent and Surface Coating Operations. They will comply with the standard in Section 8-4-302.1, which limits the emissions from each source to less than 5 tons VOC in any calendar year. They will also comply with the Solvent Evaporative Loss Minimization standard in Section 8-4-312 and the recordkeeping requirements in Section 8-4-501.

Sources S20 and S21, Beryllium Polishing, have been designated as exempt in the District database. They may have been designated as exempt pursuant to BAAQMD Regulation 2-1-121.1, which exempts the following types of sources:

Equipment used for buffing, carving, cutting, drilling, grinding, machining, planing, routing, sanding, sawing, shredding, stamping or turning of wood, ceramic artwork, ceramic precision parts, leather, metals, plastics, rubber, fiberboard, masonry, glass, silicon, semiconductor wafers, carbon or graphite, provided that organic emissions from the use of coolant, lubricant, or cutting oil are 5 ton/yr or less.

However, beryllium is none of these materials and is a hazardous air contaminant with a trigger level of 0.08 lb/yr. Therefore, the beryllium polishing sources are not entitled to an exemption and will be permitted.

Sources S8, S9, and S27, Silvering Booth, are exempt pursuant to BAAQMD Regulation 2-1-103.

The use of solvent as cutting fluid at these sources is very similar to solvent wipe cleaning. The sources can be considered to be described by Permit Handbook Chapter 6.3. Therefore, 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 6.3.

Sources S20 and S21 are subject to the Beryllium NESHAPS in 40 CFR 61, Subpart C and the corresponding District Regulation 11, Rule 3. The existing permit does not acknowledge this applicability determination, but the facility should comply because the sources are controlled with HEPA filters. A permit condition requiring compliance will be added to the permit. A performance test is required by these standards. Tinsley will be required to have a performance test after re-assembly of the abatement devices.

PSD is not triggered because the facility is not a major facility.

PERMIT CONDITIONS

Condition 6243 for sources S8, S9, S20, and S21 originally only mentioned the cutting fluid for metal machining and glass shaping at S8 and S9. The provisions of the condition have been amended to make clear which parts apply to each source.

The basis for each condition has been added as is the District's current practice.

Condition 6243 -----

These are the conditions for S8 and S9, Glass Shape Generating, and S20, and S21, Beryllium Polishing.

1. All metal machining and glass shaping at S8 and S9 must be done under wet conditions. The coolant fluids used shall be a ethylene glycol/water or ethanolamine/water mixtures. (2-1-305)

2. The owner/operator shall ensure that no more than 90 gallons Aqua Syn 100, Aqua Syn 160, or Jokish NBK Concentrate are used on a facility wide basis in any consecutive 12-month period. (Cumulative increase, 2-1-305)

3. The owner/operator shall ensure that the usage of "Red Lube" for lubrication of beryllium grinding at S20 and S21 does not exceed 750 gallons per any consecutive 12-month period. (Cumulative increase)
4. The owner/operator shall ensure that the usage of ethylene glycol for lubrication of beryllium or glass grinding at S8, S9, S20 and S21 does not exceed 100 gallons per any consecutive 12-month period. (Cumulative increase)
5. The owner/operator shall ensure that the usage of AZ(R) P150 protective coating at sources S8, S9, S20, and S21 does not exceed 35 gal/12 consecutive months. (Cumulative increase)
6. The owner/operator shall ensure that the usage of AZ 1500 thinner protective coating at sources S8, S9, S20, and S21 does not exceed 35 gal/12 consecutive months. (Cumulative increase)
7. The owner/operator shall ensure that emissions of POC at the each of the following sources does not exceed 10 lb/day: S8, S9, S20, S21, S27. The owner/operator shall keep daily records of usage at each source to ensure compliance. (2-1-103, 2-2-301, cumulative increase)
8. The owner/operator shall ensure that all beryllium grinding at S20 and S21 is done under wet conditions. (2-1-305)
9. The owner/operator shall ensure that S20 is abated at all times of operation by A8, Cyclones, and A6, HEPA filter. (11-3-301, 40 CFR 61.32(a))
10. The owner/operator shall ensure that S21 is abated at all times of operation by A9, Cyclones, and A7, HEPA filter. (11-3-301, 40 CFR 61.32(a))
11. The owner/operator shall conduct performance tests in accordance with 40 CFR 61.33 and BAAQMD Regulation 11, Rule 3 within 90 days of installation of the cyclones and re-assembly of the HEPA filters. If the District performs a performance test, this test may be used to fulfill the requirement. The District shall be notified at least 30 days prior to an emission test in order to have the option to conduct or observe the test. Within 45 days of test completion, a comprehensive report of the test results shall be submitted to the Manager of the District's Source Test Section for review and disposition. Prior to the commencement of construction, the owner/operator shall submit plans to the District's Source Test Division to obtain approval of the design and location of the source test ports. (1-501, 2-1-403, 11-3-404, 40 CFR 61.33)
9. The owner/operator may use other materials at S8, S9, S20, and S21 if the new materials fulfill the following conditions:
 - a. The new materials are not non-precursor organic compounds as defined in BAAQMD Regulation 1, and
 - b. The new materials contain no hazardous air pollutants found in Table 2-5-1 in BAAQMD Regulation 2, Rule 5. and.

c. The owner/operator ensures that the resulting emissions of POC are less than 10 lb/day at each source, and

d. The owner/operator ensures that the resulting emissions of POC are less than 3.951 tons per any consecutive 12-month period for sources S8, S9, S20, and S21.

(2-1-305, 2-1-412, Cumulative Increase)

10. All coolants shall be stored and disposed of in sealed containers. Spills should be cleaned up rapidly and soiled clean-up rags, sponges, etc. must be stored in sealed containers. (8-4-312)

411 Records must be kept on purchase and disposal volumes. All records shall be retained for a period of two years from date of entry. All log books shall be kept on site and made available to District staff upon request. (8-4-501)

RECOMMENDATION

Issue a change in conditions for:

S8 and S9, Glass Shape Generating

Issue an authority to construct:

S20, Beryllium Polishing abated by A8, Cyclones, and A6, HEPA filter

S21, Beryllium Polishing abated by A9, Cyclones, and A7, HEPA filter

A8, Cyclones

A9, Cyclones

Issue a conditional letter of exemption to:

S27, Silvering Booth

(Source is exempt pursuant to BAAQMD Regulation 2-1-103 as long as POC emissions are under 10 lb/day and no toxic trigger in BAAQMD Regulation 2, Rule 5, is exceeded. Therefore, no more than 280 gal/yr of 1% formaldehyde solution may be used at both silvering booths, S25 and S27.)

By: _____

Brenda Cabral
Senior Air Quality Engineer

Date: 10/31/06_____

PERMIT CONDITIONS ON August 29, 2006

COND# 6243 -----

These are the conditions for S-8, S-9, S-20 and S-21.

1. All metal machining and glass shaping must be done under wet conditions. The two coolant fluids used shall be a glycerol-sorbitol or isopropanol-palm oil mixture.
2. No more than 20% by volume of the isopropanol-palm oil coolant shall be isopropanol, nor shall more than 90 gallons of this coolant be used on a facility wide basis in any consecutive twelve month period.
3. All coolants shall be stored and disposed of in sealed containers. Spills should be cleaned up rapidly and soiled clean-up rags, sponges, etc. must be stored in sealed containers.
4. Records must be kept on purchase and disposal volumes.

All records shall be retained for a period of two years from date of entry. All log books shall be kept on site and made available to District staff upon request.

list condition NUMBER >> 17386

COND# 17386 -----

Tinsley Laboratories
Plant 7234

Conditions for S22

1. Net solvent usage at S22 Facility-Wide Wipe-Cleaning Operation shall not exceed the following quantities totaled over any consecutive twelve month period:

Acetone	480 gallons per year
Methyl alcohol	10 gallons per year
Isopropyl alcohol	210 gallons per year

(basis: cumulative increase)

2. Materials other than those specified in Condition 1 may be used at S22, provided that the owner/operator can demonstrate that all of the following requirements are satisfied:
 - a. Total precursor organic compound (POC) emissions from S22 do not exceed 1,437 pounds in any consecutive 12-month period.
 - b. Total non-precursor organic compound (NPOC) emissions from S22 do not exceed 3,163 pounds in any consecutive 12-month period.
 - c. The use of these materials does not result in

increases toxic air contaminant emissions above any risk screening trigger level specified in Table 2-1-316 of Regulation 2, Rule 1.

(Basis: cumulative increase)

3. In order to minimize solvent losses, the owner/operator of S22 shall only use squeeze bottles to dispense solvent for wipe cleaning. In addition, all solvent impregnated cloths or papers not in active use shall be kept in closed containers. (Basis: Regulation 8, Rule 1)
4. To determine compliance with the above conditions, the owner/operator shall maintain the following records as necessary to demonstrate compliance with the above conditions:
 - a. Type and monthly usage of all POC and NPOC containing materials used.
 - b. For the usage of alternate materials per condition 2: POC, NPOC and toxic component contents of each material used and mass emission calculations to demonstrate compliance with Condition 2, on a monthly basis.
 - c. Monthly usage and/or emission calculations shall be totaled for each consecutive 12-month period.

All records shall be retained on-site for a minimum of 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, 8-16-501)

list condition NUMBER >> 20850

COND# 20850 -----

Tinsley Laboratories, Inc
Application #7831
Plant #7234
PERMIT CONDITIONS

1. The owner/operator of S-26 shall not exceed a net solvent usage of 500 gallons during any consecutive 12 month period.
2. If a solvent other than Lenium GS (trademark name) is to be used in S-26, the owner or operator of S-26 shall first notify the District Engineering Division of any changes in the solvent.
3. In order to demonstrate compliance with the above conditions, the owner/operator shall maintain monthly records of the net usage of cleaning

solution (S-26) in a District approved logbook. These records shall be kept on site and made available for District inspection for a period of at least 24 months from the date on which a record is made. The type and quantity of solvent added to, and removed from, this unit. The difference in these solvent quantities shall be considered the net solvent usage. This quantity shall be documented on a monthly basis.