EVALUATION REPORT
TE Connectivity
Application #28081 - Plant #13213

I. BACKGROUND

TE Connectivity is expanding manufacturing operations at its facility located at 501 Oakside Road in Redwood City, California. Expansion of the facility will include the installation of equipment related to its polymer tubing manufacturing operation which includes polymer based compounding, polymer extrusion, irradiation of polymer based products, and polymer tubing expansion operations. Most of the equipment is being moved from the Tyco Electronics facility located in Menlo Park (Plant # 13212) to the TE Connectivity facility in Redwood City (P# 13213).

TE Connectivity has applied for an Authority to Construct and/or Permit to Operate the following:

S-301 Weigh Up Booth, Raychem In House Design, 0.25 ton/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly

S-302 Self Contained Weigh Up Booth (2 Bays), Raychem In House Design, 0.25 ton/hr; abated by A-302 Self Contained Weigh Up Booth Integral Torit Filter, Model VLB, 14,000 CFM

S-303 ZSK83 Henschel, Prodex Henschel, Model 115 JSS, 0.008 ton/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly

S-304 F80 #2 Henschel, Thyssen Henschel, FM 200C, 0.006 ton/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly

S-305 K2A Intermixer, Farrel Ltd, K2A, 0.5 ton/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly and A-305 Mist Collector (F80 #2, K2A), United Air Specialist, F5000, 5000 CFM

S-306 Bulk Bag Weigh Up Feeder, Schenck, Type MODMC-IV-2A, 0.60 tons/hr; Abate by A-302 Self Contained Weigh Up Booth Integral Torit Filter, Model VLB, 14,000 CFM

S-307 Irradiation Beam Cell # 21, DRI, 1.5 MeV, 30 mA, 0.4 tons/hr

S-308 Lead Weigh Up Booth, Raychem (In house Design), 75 lbs/hr; abated by A-308 Lead Weigh Up Dust Collector, Torit, Model VS-1500, 1500 CFM

S-309 Talc Duster, Kason, Model KO-SSISP, Centri-Sifter, 0.002 ton/hr; abated by A-309 Talc Dust Filter Box, Nederman, Model 602263, 600 CFM

S-310 F80#2 Banbury Mixer, Farrell, F80, 0.5 tons/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly, and A-305 Mist Collector (F80 #2, K2A), United Air Specialist, F5000, 5000 CFM

S-311 ZSK83 Extruder, Werner & Pfleiderer, 83MM ZSK, 0.75 tons/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly and A-311 Mist Collector (ZSK83), Airflow Systems, Inc. 2400VOM, 2400 CFM

S-312 ZSK40 Twin Screw Extruder, Werner & Pfleiderer, ZSK40, 0.1 tons/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly, and A-312 Mist Collector (ZSK40), Airflow Systems, Inc., 1200VOM, 1200 CFM

S-313 Expander T-30, Hipp Welding, 23524-156A, 0.03 tons/hr; abated by A-313 Mist Collector (T-30), United Air Specialist, F5000, 5000 CFM

S-314 Expander T-35, Raychem, T-35, 0.03 ton/hr; abated by A-314 Mist Collector (T-35), United Air Specialist, F5000, 5000 CFM

S-315 Expander T-32, Raychem, T-32, 0.03 ton/hr; abated by A-315 Mist Collector (T-32), United Air Specialist, F5000, 5000 CFM
S-316 Expander T-51, Raychem, T-51, 0.03 ton/hr; abated by A-316 Mist Collector (T-51), United Air Specialist, F5000, 5000 CFM
S-317 Expander T-60, Raychem, T-60, 0.06 ton/hr; abated by A-317 Mist Collector (T-60), United Air Specialist, F5000, 5000 CFM
S-318 Extruder B, Davis Standard, 25 RT, 0.059 tons/hr; abated by A-318 Mist Collector (Ext B), Torit Donaldson, MC-4000, 4000 CFM
S-319 Extruder F, Davis Std. Thermatic, 20T, 2" 0.12 tons/hr; abated by A-319 Mist Collector (Ext I, F, and R), United Air Specialist, F7000, 7000 CFM
S-320 Extruder I, Davis Standard, 25 T, 0.141 tons/hr; abated by A-319 Mist Collector (Ext I, F, and R), United Air Specialist, F7000, 7000 CFM
S-321 Extruder R, Davis Standard, 20IN20, 0.12 tons/hr; abated by A-319 Mist Collector (Ext I, F, and R), United Air Specialist, F7000, 7000 CFM
S-322 Extruder S, Davis Standard, DS-10-H, 0.059 tons/hr; abated by A-322 Mist Collector (Ext S, T, Q), United Air Specialist, F5000, 5000 CFM
S-323 Extruder T, Davis Standard, DS-12H, 0.06 tons/hr; abated by A-322 Mist Collector (Ext S, T, Q), United Air Specialist, F5000, 5000 CFM
S-324 Extruder Q, Merrit Extruder Corp, 1 ½, 0.059 tons/hr; abated by A-322 Mist Collector (Ext S, T, Q), United Air Specialist, F5000, 5000 CFM
S-325 Printers, Tubing (5 printers), GEM, U-2/AMO, Printsafe Inks Jet Pritner Type A-11, 301, 500 ft/min
S-330 ESWB Closed Circuit Cooler #1, Evapco Inc., ESWB 9-46JB, 36,000 gal/hr
S-331 ESWB Closed Circuit Cooler #2, Evapco Inc., ESWB 9-46JB, 36,000 gal/hr
S-332 ESWB Closed Circuit Cooler #3, Evapco Inc., ESWB 9-46JB, 36,000 gal/hr

Process Description

1. Compounding

Raw materials are received at the facility by truck deliveries. Raw materials consist of various polymer resins, carbon black powders, liquids and solid additives to make a finished polymer compound. The desired characteristics include but are not limited to, color, flame resistance or mold resistance. Raw materials may be received in a variety of vendor supplied packaging such as super sacks weighing two tons, 55 gallon drums, or 50 lb sacks.

Weigh Up Operations:
Raw materials are repackaged from vendor supplied packaging into smaller packaging suitable for later processing at the facility. Raw materials are either weighed out by hand or may be metered from vendor supplied bulk packaging. Sources involved in weigh up operations include S-301 (Weigh Up Booth), S-302 (Self Contained Weigh Up Booth, 2 bays), and S-308 (Lead Weigh Up Booth). Bulk bags of raw materials are metered/weighed in S-302 by using of S-306 (Bulk Bag Feeder).

The Weigh Up Booth (S-301) will be used to manually weigh a variety of materials (including carbon black, copolymers, iron oxide) used in carbon black and polymer formulations. Materials will be transferred from vendor supplied packaging into smaller packaging and sealed for eventual use in mixing operations. All particulate emissions (PM10) from S-301 will be abated by a Dust Collector (A-300) and HEPA filter (A-303) in series.

The Self Contained Weigh Up Booth (S-302) is equipped with an integrally mounted HEPA filter. S-302 will be used to manually weigh a variety of materials used in polymer formulations. S-302 will also be used to house the metering of materials from the Bulk Bag Weigh Up Feeder (S-306). The Bulk Bag Weigh Up Feeder (S-306) is a device used to repackage materials from vendor supplied super sacks into smaller packaging specified by product formulation. Super sacks are elevated with a hoist and then metered out into smaller packaging and sealed in the Self-Contained Weigh Up Booth (S-302). Particulate emissions (PM10) from S-302 will be abated by A-302 Self Contained Weigh Up Booth Integral Torit Filter.

The Lead Weigh Up Booth (S-308) is a glove box type enclosure which is ventilated by a 1500 CFM fan drawing through a Torit cartridge dust collector (A-308). The lead powder in vendor-supplied packaging is opened and weighed into plastic bags and sealed in increments specified in product formulations being produced.

Mixing Operations:
Weighed material is further processed (mixed) in S-303 (ZSK83 Henschel), S-304 (F80#2 Henschel), S-305 (K2A Intermixer), or S-310 (F80 #2 Banbury Mixer).

The Henschels (S-303 and S-304) are high intensity mixers of solid pellets and/or various powders and liquids. S-303 and S-304 are very similar high intensity blender type mixers that use a blade/paddle device, like a large food processor. They are predominantly used to create pre-blends of raw materials, by doing such blending activities to reduce the number of steps in the final mix which allows automating the feed and hand weighing. S-303 and S-304 complement the main mixers (S-305 and S-310). S-303 and S-304 are only different in size with S304 being slightly larger. During operation, polymer pellets are charged into the mixer body, followed by other ingredients. After mixing, the composition is then discharged into a container. Particulate emissions from the loading of materials into the mixer are exhausted to and abated by a Dust Collector (A-300) and HEPA filter (A-303) in series. S-303 has a rated working capacity of 330 liters (87.2 gallons) while S-304 has a rated working capacity of 200 liters (52.8 gallons). Mixed compounds from S-303 will primarily be sent to S-311 (ZSK83 Extruder) and mixed compounds from S-304 will primarily be sent to S-310 (F80 #2 Banbury Mixer) for further processing (plastic extrusion).

S305 and S310 are both internal compounding machines that differ in design primarily with the rotor set up. Plastics and Elastomers are primarily mixed in Internal compounding machines that can have either Tangential rotor design (Banbury Mixers) or intermeshing rotor design (Intermix Mixers). Banbury style mixers typically run at higher rotor speeds than the Intermix mixers and this is due to the Intermeshing rotors generating higher shear at lower speeds. The Banbury mixers are used more in the rubber industry, whereas the Intermix lends itself more to processing plastics.

The K2A Intermixer (S-305) is an internal mixer with intermeshing rotors that are designed to mix elastomeric compounds. A ground floor feed system is used to feed the major ingredients into the mixer with some additional ingredients added by hand. The ingredients are mixed together with shear and heat by way of turning rotors via a large electrical motor. On top of the mix chamber is a weight, that acts as a plunger pushing down on the batch in order to maintain a uniform pressure inside the chamber so that during the mix cycle the dispersive and distributive phases take place to make the batch homogeneous. After the mix cycle is complete, a drop door opens, and the resulting material falls into the integral dump extruder below. The hot polymer mass is pushed through a multi-hole die on the extruder. As the resulting polymer strands come out from the die they are cut under water using a high speed blade into pellets. The pellets are then carried to an integral de-watering unit known as a spin drier. The pellets are then screened for size and shape and fall under their own weight into integral accumulation containers. S-305 has a rated working capacity of 40 liters (13 gallons). The dump extruder, spin drier, and accumulation containers are all part of S-305.

The Banbury Mixer (S-310) is an internal mixer with non-intermeshing rotors that is designed to mix elastomeric compounds. Ingredients are added at the top of the mixer. The ingredients are mixed together with shear and heat by way of turning rotors via a large electrical motor. On top of the mix chamber is a weight, that acts as a plunger pushing down on the batch in order to maintain a uniform pressure inside the chamber so that during the mix cycle the dispersive and distributive phases take place to make the batch homogeneous. After the mix cycle is complete, the resulting material is transferred to an integral adjacent extruder. The hot polymer mass is pushed through a multi-hole die on the extruder. After passing through the die, the polymer strands are cut under water using a high speed blade into pellets. The pellets are then carried to an integral centrifugal dryer. The pellets are then screened for size and shape and fall under their own weight into integral accumulation containers. S-310 has a rated working capacity of 80 liters (21 gallons). The adjacent extruder, spin drier, and accumulation containers are all part of S-310.

Pellet Extrusion:
In addition to the polymer pellets produced in S-305 (K2A Intermixer) and S-310 (Banbury Mixer), polymer pellets are also produced in S-311 (ZSK83 Extruder) and S-312 (ZSK40 Extruder). Polymer pellets produced from S-311 and S-312 may be coated with talc from S-309 (Talc Duster) to prevent the compounded pellets from sticking together in the shipping box and are free flowing when the compounded pellets are used as feed for the extrusion of tubing.

The Talc Duster (S-309) is used to dust talc on polymer pellets. The pellets are fed into a centrifugal screener with talc that causes the pellets to be lightly dusted with talc. Dusted pellets are discharged into an accumulation container, and particulate emissions from the dusting operation are abated by a Filter Box (A-309). The Talc Duster is a portable unit which can be moved where needed. Talc is only used on compound formulations which are classified as adhesive compounds to ensure pellets flow smoothly during extrusion. Dusted pellets would primarily be used on S-311 ZSK83 Extruder.

The ZSK83 and ZSK40 Extruders (S-311 and S-312) are 83 and 40 mm, respectively, co-rotating twin-screw extruders used for mixing a large variety of polymers with additives. Hoppers containing raw material are positioned above the gravimetric feeders. Raw materials are charged through a dust tight flexible connection into the feeders. A liquid injection system is used for liquid additives. Polymer and additives are metered at a preset rate into the twin-screw extruder. Particulate emissions are abated by dust collector (A-300) and HEPA filter (A-303) in series. Due to the shear generated by the extruder screws, the polymer is melted and mixed with additives to form a compound. The motion of the screws pressurizes the melt which is extruded in the form of strands through the round orifices in the extruder die. The emerging polymer strands are cooled with water, then pelletized by a rotating knife. The pellets are then carried to a centrifugal dryer. The pellets are then screened for size and shape and fall under their own weight into accumulation containers.

2. Extrusion
Polymer pellets generated during the compounding process are used as feed for the extruders to create tubing. Tubing of various size and thickness can be created through the extrusion process depending upon the die head used for the extruder.

The B, F, I, R, S, T, and Q Extruders (S-318, S-319, S-320, S-321, S-322, S-323, and S-324) produce polymer tubing. At each extruder, a hopper containing polymer pellets with additives are positioned above gravimetric feeders. Polymer pellets are charged through dust tight flexible connections into the gravimetric feeders and metered at a preset rate into the extruder. The temperature of the extruder is sufficient enough to cause the polymer to melt and is controlled by electric heaters. The motion of the extruder screw pressurizes the melted polymer which is then extruded through orifices in the extruder die to create polymer tubing. Once discharged from the extruder die, the emissions from the molten tubing is vented to a mist eliminator. The polymer tubing may be cooled through a use of a water trough before it wound onto a take up reel.

3. Beaming:
Extruded tubing is irradiated using an electron beam which generates crosslinks in the polymeric material to make heat shrinkable tubing.

The Irradiation Beam Cell (S-307) is used to irradiate the polymeric material. The electron beam is housed in a cell with four to five feet thick reinforced concrete walls to contain the radiation produced from escaping to the outside. Within the cell, a transport system carries the polymeric material back and forth under the beam. As the material is irradiated, a cross-linking of the polymer molecules within the material occurs.

All tubing will be irradiated except for tubing which is silicon rubber based which is produced at S-318 Extruder B and S-323 Extruder T.

4. Expansion
Extruded tubing may pass through an expansion process to increase the diameter of the tubing. As part of the expansion process, expanded tubing may be marked with a solvent based ink using an ink jet printer or high speed printer. Upon completion of all processes, polymer tubing is spooled or cut to length to produce the final product manufactured in the facility.

The purpose of the Expanders (S-313, S-314, S-315, S-316, S-317) is to increase the diameter of the polymer tubing from its original manufactured diameter. The expander consists of a payoff reel, a closed pressure vessel, a cooling trough, a printer (part of S-325), and a take-up reel. Virgin glycerin is heated to approximately 325ºF in a closed pressure vessel. Tween may be used in place of glycerin for polymer tubing which requires a higher running temperature of up to 400 ºF. Polymer based tubing is fed from a payoff reel through the closed pressure vessel. The polymer based tubing is softened by the glycerin or tween bath in the closed pressure vessel as the tubing passes through the vessel. Pressurized air is used to increase the diameter of the tubing. As the tubing passes out of the closed pressure vessel, it passes through a water trough for cooling and removal of glycerin or tween residual on the tubing.

Printers (S-325) may be used to mark and identify the tubing. Polymer based tubing is fed from a payoff reel through an expander, a water trough, and an air knife before it is marked with a solvent based ink at one of the printers. After being marked, the polymer based tubing is wound onto a take-up reel.

The Closed Circuit Coolers (S-330, S-331, and S-332) are induced draft closed circuit cooling units used to cool S-305 (K2A Intermixer), S-310 (F80# 2 Banbury Mixer), S-311 (ZSK83 Extruder) and S-312 (ZSK40 Twin Screw Extruder) process lines.

Sources Exempt from Permitting Requirements

The following sources are exempt from the permitting requirements of Regulation 2-1-301 (Authority to Construct) and 2-1-302 (Permit to Operate) because they qualify for the permit exemption listed:

Table I – Exempt Sources

S-# or A-#	Source Description	Permit Exemption	Additional Comments
S-304	F80 #2 Henschel	2-1-121.5	52.8 gallon rated working capacity
S-305	K2A Intermixer	2-1-121.5; 2-1-122.4	13 gallon rated working capacity
S-307	Irradiation Beam Cell # 21	2-1-103	All subsections of Regulations 2-1-103 are met.
S-309	Talc Duster	2-1-103	All subsections of Regulation 2-1-103 are met.
S-310	F80#2 Banbury Mixer	2-1-121.5; 2-1-122.4	21 gallon rated working capacity
S-311	ZSK83 Extruder	2-1-122.4	Used for the extrusion of plastic.
S-312	ZSK40 Extruder	2-1-122.4	Used for the extrusion of plastic.
S-313	Expander T-30	2-1-103	All subsections of Regulation 2-1-103 are met.
S-314	Expander T-35	2-1-103	All subsections of Regulation 2-1-103 are met.
S-315	Expander T-32	2-1-103	All subsections of Regulation 2-1-103 are met.
S-316	Expander T-51	2-1-103	All subsections of Regulation 2-1-103 are met.
S-317	Expander T-60	2-1-103	All subsections of Regulation 2-1-103 are met.
S-318	Extruder B	2-1-122.4	Used for the extrusion of plastic.
S-319	Extruder F	2-1-122.4	Used for the extrusion of plastic.
S-320	Extruder I	2-1-122.4	Used for the extrusion of plastic.

S-# or A-#	Source Description	Permit Exemption	Additional Comments
S-321	Extruder R	2-1-122.4	Used for the extrusion of plastic.
S-322	Extruder S	2-1-122.4	Used for the extrusion of plastic.
S-323	Extruder T	2-1-122.4	Used for the extrusion of plastic.
S-324	Extruder Q	2-1-122.4	Used for the extrusion of plastic.
S-330	ESWB Closed Circuit Cooler # 1	2-1-128.2	Closed Circuit Cooler
S-331	ESWB Closed Circuit Cooler # 2	2-1-128.2	Closed Circuit Cooler
S-332	ESWB Closed Circuit Cooler # 3	2-1-128.2	Closed Circuit Cooler
A-311	Mist Collector (ZSK83)	2-1-113.2.4	Abates S-311.
A-312	Mist Collector (ZSK40)	2-1-113.2.4	Abates S-312.
A-313	Mist Collector (T-30	2-1-113.2.4	Abates S-313.
A-314	Mist Collector (T-35)	2-1-113.2.4	Abates S-314.
A-315	Mist Collector (T-32)	2-1-113.2.4	Abates S-315.
A-316	Mist Collector (T-51)	2-1-113.2.4	Abates S-316.
A-317	Mist Collector (T-60)	2-1-113.2.4	Abates S-317.
A-318	Mist Collector (Ext B)	2-1-113.2.4	Abates S-318.
A-319	Mist Collector (Ext I, F, R)	2-1-113.2.4	Abates S-319, S-320, and S-321.
A-322	Mist Collector (Ext S, T, and Q)	2-1-113.2.4	Abates S-322, S-323, and S-324.

II. EMISSION CALCULATIONS

Weigh Up Operations:
Sources involved in weigh up operations include S-301 (Weigh Up Booth), S-302 (Self Contained Weigh Up Booth, 2 bays), and S-308 (Lead Weigh Up Booth).

In this application, a conservative emission factor from EPA AP-42, Table 11.12-2 Emission Factors for Concrete Batching will be used. Specifically, the 'Uncontrolled Total PM10' emission factor for 'cement supplement unloading to elevated storage silo (pneumatic)' will be used. This is a conservative estimate since this is the operation with the highest emission at concrete batch plants. Cement supplement is defined as fly ash, ground granulated blast furnace-slag, and silica fume, which are physically similar to the dry materials handled by the facility. An abatement efficiency of 99% will be used for A-300 and A-303 combined, although the manufacturer expects greater than 99.9% abatement efficiency.

Based on the maximum throughput proposed for each of the weigh up operation sources, the following emissions are estimated:

PM10 emission factor = 1.10 lb/ton
Abatement efficiency = 99%
Note: Worst-case daily emissions are assuming 24 hours per day of operation. Annual emissions are based on proposed annual throughput limits for the sources and specified in the proposed permit conditions for the sources.

Table II – Estimated Emissions from Weigh Up Operations

Source #	Maximum Throughput (ton/hr)	Annual Throughput (ton/yr)	Emission Factor (lb/ton)	Abatement Efficiency (%)	Abated Worst-Case Daily PM10 (lb/day)	Abated Annual PM10 (lb/yr)
301	0.25	200	1.1	99.00%	0.07	2.2
302	0.25	600	1.1	99.00%	0.07	6.6
306	0.6	300	1.1	99.00%	0.16	3.3
308	0.0375	0.15	1.1	99.00%	0.01	1.65E-03

Mixing Operations:
Weighed material is further processed in S-303 (ZSK83 Henschel), S-304 (F80#2 Henschel), S-305 (K2A Intermixer), or S-310 (F80 #2 Banbury Mixer).

In this application, a conservative emission factor from EPA AP-42 Table 6.6.4 Polypropylene will be used. This is a reasonable estimate since this polymer produced from this mixing operation is comparable to polypropylene. An abatement efficiency of 99% will be used for the PM10 controls, although the manufacturer expects greater than 99.9% abatement efficiency.

PM10 emission factor = 3 lb/ton
POC/NPOC emission factor = 0.7 lb/ton

Table III – Estimated Emissions from Mixing Operations

PM10

Source #	Maximum Throughput (ton/hr)	Annual Throughput (ton/yr)	Emission Factor (lb/ton)	Abatement Efficiency (%)	Worst-Case Daily PM10 (lb/day)*	Annual PM10 (lb/yr)
303	0.008	70	3	99	0.006	2.1
304	0.006	38	3	99	0.004	1.1
305	0.5	1700	3	99	0.4	51.0
310	0.5	700	3	99	0.4	21.0

POC/NPOC

Source #	Maximum Throughput (ton/hr)	Annual Throughput (ton/yr)	Emission Factor (lb/ton)*	Abatement Efficiency (%)	Worst-Case Daily POC/NPOC (lb/day)*	Annual POC/NPOC (lb/yr)
303	0.008	70	0.7	0	0.13	49
304	0.006	38	0.7	0	0.10	27
305	0.5	1700	0.7	0	8.4	1190
310	0.5	700	0.7	0	8.4	490

*** Assuming 260 days/yr (5 days/wk, 52 wks/yr). Emissions of POC = Propylene**

S-304 (F80#2 Henschel) has a maximum volume of 200 L (52.8 gallons), S-305 (K2A Intermixer) has a 40 liter (13 Gallons) mixing chamber and the S-310 (F80#2 Banbury Mixer) has an 80 liter (21 Gallon) mixing chamber. As a result, S-304, S-305, and S-310 are exempt from permitting requirements per Regulation 2-1-121.5, because their mixing capacities are each less than 55 gallons. In addition, the estimated emissions (see Table III) shows that they will not exceed he backstop of Regulation 2-1-319. There is no cumulative increase from the operation of these exempt sources.

Extrusion

Polymer pellets generated during the compounding process are used as feed for the extruders to create tubing. Tubing of various size and thickness can be created through the extrusion process depending upon the die head used for the extruder. All extrusion sources (S-311, S-312, S-318, S-319, S-320, S-321, S-322, S-323, and S-324) are exempt per Regulation 2-1-122.4. To estimate emissions from these exempt sources, the VOC emission factor for 'Polymerization Vacuum System' from EPA AP-42 Chapter 6.6.2 Poly(ethylene Terephthalate) was used:

VOC Emission Factor = 0.009 g/kg = 0.018 lb/ton

Table IV – Estimated Emissions from Extrusion Operations

Source #	Maximum Throughput (ton/hr)*	Annual Throughput (ton/yr)	Emission Factor (lb/ton)	Annual VOC (lb/yr)
311	0.75	142.3	0.018	2.6
312	0.1	40	0.018	0.7
318	0.059	4	0.018	0.07
319	0.12	27.5	0.018	0.5
320	0.141	30	0.018	0.5
321	0.12	21	0.018	0.4
322	0.059	10	0.018	0.2
323	0.06	12.5	0.018	0.2
324	0.059	2	0.018	0.04

* Basis for Maximum Throughput are the reported maximum throughputs from the G-form for each source.

The estimated emissions (see Table IV) shows that they will not exceed the backstop of Regulation 2-1-319. There is no cumulative increase estimated from the operation of these exempt sources.

Beaming:

Extruded tubing is irradiated using an electron beam which generates crosslinks in the polymeric material to make heat shrinkable tubing. Emission data from Application 27931 for Pentair Thermal Management (P# 21778) will be used to estimate emissions. Pentair (P# 21778) had a similar process of using an electron beam to crosslink polymeric material.

S-307 Irradiation Beam Cell #21 will generate NOx and ozone emissions. The engineering calculations of the ozone and NO_2 emission rates from the electron beam is described in a paper[1] presented at the '23rd International Conference on the Application of Accelerators in Research and Industry (CAARI)'.

To estimate emissions for their permit application (# 27931), Pentair had engaged the principle author (Marshall R. Cleland, Ph.D.) to produce specific, proprietary technical reports[2,3] defining the anticipated ozone and NO_2 emission rates during operation of the electron beam. Using the data and analyses shown in these technical reports the Ozone and NO_2 produced by the e-Beam has been calculated as a function of Beam Current (mA). The unabated ozone emission rate is shown to be 0.33 lb/hr. The NO_2 emission rate is shown to be 0.01425 lb/hr.

Table V summarizes unabated NOx and TAC (ozone) emissions from S-307. NO_2 emissions are unabated.

Table V – NOx and TAC Emissions from S-307
Basis: 365 days per year and 16 hours per day of operation

	Unabated Emissions					
CAP	**Hourly (lb/hr)**	**Daily (lb/day)**	**Annual (tpy)**			
NOx	1.43E-02	2.28E-01	4.16E-02			
		Uncontrolled Emissions				
TAC	**CAS #**	**Hourly (lb/hr)**	**Annual (lb/yr)**	**Acute Trigger Level (lb/hr)**	**Chronic Trigger Level (lb/yr)**	**HRSA Required (Yes/No)**
Ozone	10028-15-6	3.30E-01	1.93E+03	4.0E-01	N/A	No

The estimated emissions show that S-307 will not exceed the backstop of Regulation 2-1-319. The Irradiation Beam Cell # 21 (S-307) is exempt from the permitting requirements per Regulation 2-1-103. There is no cumulative increase from the operation of this exempt source.

Talc Duster:
Using the conservative uncontrolled Total PM10' emission factor previously discussed under Weigh Up Operations for 'cement supplement unloading to elevated storage silo (pneumatic)' from AP-42, Table 11.12-2 Emission Factors for Concrete Batching and assuming an abatement efficiency of 99% for its Filter Box (A-309), the following emissions are estimated for Talc Dusting:

$$PM10 = 1.10 \text{ lb/ton}(7.5 \text{ tons/yr})(1\text{-}99\%) = 0.08 \text{ lb/yr}$$

The estimated emissions show that the Talc Duster (S-309) will not exceed the backstop of Regulation 2-1-319. The Talc Duster (S-309) is exempt from the permitting requirements per Regulation 2-1-103. There is no cumulative increase from the operation of this exempt source.

Expansion:
Extruded tubing may pass through an expansion process to increase the diameter of the tubing. As part of the expansion process, expanded tubing may be marked with a solvent based ink using an

[1] 'Ozone Generation in Air during Electron beam Processing'
M.A.Cleland and R.A.Galloway, Physics Procedia 66 (2015) 586 – 594, CAARI 2014, San Antonio, Texas, May 2014
[2] 'Ozone Production in Air during Electron Beam Processing, TIS-01924 Rev A
[3] 'Production of Nitrogen Oxides in Air during Electron Beam Processing', TIS-01928 Rev 2

ink jet printer or high speed printer. Upon completion of all processes, polymer tubing is spooled or cut to length to produce the final product manufactured in the facility.

Emissions of the Expansion Process (S-313, S-314, S-315, S-316, and S-317) are based on source test results of the expansion process at their prior location in Menlo Park (Plant # 13212). The testing was conducted in 1989, and conducted strictly for informational purposes for TE (Raychem at the time). The expansion process and materials has not changed since that time. Using this data, the following emission factors are calculated for the expansion process:

POC Emission Factor for Changeout = 0.036 lb/change out (3 changeouts/day)
POC Emission Factor for Expansion = 0.022 lb/hr/expansion

Approximately 20 minutes per 8-hour work shift is spent changing product in the closed expansion vessel. During this time, the vessel lid is open and glycerin vapors evaporate from the expansion vessel. In 20 minutes, approximately 0.036 lbs of glycerin evaporate from the vessel inner surface (approximately 1900 sq in). Change out generally occurs once per shift.

Total Changeout POC = 0.036 lb/changeout(3/day) = 0.11 lbs/day
Total Expansion POC = 0.022 lb/hr(24 hr/day)(5 expanders) = 2.64 lb/day
Total POC per Expansion Source = 0.11 + 2.64 lb/day = 2.75 lb/day = 1004 lbs/year

Because the expansion source qualifies for permit exemption per Regulation 2-1-103, there is no cumulative increase for the expanders (S-313, S-314, S-315, S-316, and S-317).

The emissions from the grouping of printers (S-325) are estimated as follows:

Table VI – Estimated Emissions from Printers

S-325, GEM Printers (4), Ink Jet Printer (1) - POTENTIAL TO EMIT CALCULATIONS

Chemical Name	Component	%	Net Usage Max. (gal/mo.)	Density (lb/gal)	Max POC Emissions (lb/mo.)	Max. POC Emissions (ton/mo.)	Net Usage Max. (gal/yr.)	Density (lb/gal)	Max. POC Emissions (lb/yr.)	Max. POC Emissions (tons/yr.)
7100 GEM Inks (Used in GEM Printers)	Toluene	50%	7.8	8.27	32.253	0.0161265	93.6	8.27	387.036	0.193518
	Cyclohexanone	10%			6.4506	0.0032253			77.4072	0.038704
	Xylene	10%			6.4506	0.0032253			77.4072	0.038704
	Ethylbenzene	10%			6.4506	0.0032253			77.4072	0.038704
EX200 (Used in GEM Printers)	Toluene	100%	16	7.2	115.2	0.0576	192	7.2	1382.4	0.6912
Printsafe PS-12K (Used in InkJet Printer)	MEK (Butanone)	80%	1.95	7.0	10.92	0.00546	23.4	7.0	131.04	0.06552
	Monoazo chrome complex dye	2.5%			0.34125	0.0001706			4.095	0.002048
	Solvent Brown 44	2.5%			0.34125	0.0001706			4.095	0.002048

S-325, GEM Printers (4), Ink Jet Printer (1) - POTENTIAL TO EMIT CALCULATIONS

Chemical Name	Component	%	Net Usage Max. (gal/mo.)	Density (lb/gal)	Max POC Emissions (lb/mo.)	Max. POC Emissions (ton/mo.)	Net Usage Max. (gal/yr.)	Density (lb/gal)	Max. POC Emissions (lb/yr.)	Max. POC Emissions (tons/yr.)
	Chromate (III) complex dye	2.5%			0.34125	0.0001706			4.095	0.002048
	Acid Blue 317	2.5%			0.34125	0.0001706			4.095	0.002048
Makeup for MEK based Ink (Used in Inkjet Printer)	MEK (Butanone)	100%	4	6.7	26.8	0.0134	48	6.7	321.6	0.1608
PTE Total					205.8898	0.1029449			**2470.6776 (round up to 2500)**	1.235339

Worst-case Daily Emissions of S-325 = 2,500 lb/yr/260 days/yr = 9.6 lb/day
*** 260 days/yr =5 days/wk, 52 wks/yr.**

To allow for operating flexibility an equal amount of NPOC is estimated compared to POC.

Coolers:
The Closed Circuit Coolers (S-330, S-331, and S-332) are induced draft closed circuit cooling units used to cool S-305 (K2A Intermixer), S-310 (F80# 2 Banbury Mixer), S-311 (ZSK83 Extruder) and S-312 (ZSK40 Twin Screw Extruder) process lines. There is no air pollutants emitted from these closed systems. They are exempt per Regulation 2-1-128.2. There is no cumulative increase from the operation of these exempt sources.

Table VII - Summary of Cumulative Increase for Application # 28081

Source #	**PM10 (lb/yr)**	**POC (lb/yr)**	**NPOC (lb/yr)**
S-301 – AC/PO	2.2	0	
S-302 – AC/PO	6.6	0	
S-303 – AC/PO	2.1	49	0
S-304 – Exempt			
S-305 – Exempt			
S-306 – AC/PO	3.3	0	0
S-307 – Exempt			
S-308 – AC/PO	0.00165	0	0
S-309 – Exempt			
S-310 – Exempt			
S-311 – Exempt			
S-312 – Exempt			
S-313 – Exempt			
S-314 – Exempt			
S-315 – Exempt			
S-316 – Exempt			
S-317 – Exempt			
S-318 – Exempt			

Source #	PM10 (lb/yr)	POC (lb/yr)	NPOC (lb/yr)
S-319 – Exempt			
S-320 – Exempt			
S-321 – Exempt			
S-322 – Exempt			
S-323 – Exempt			
S-324 - Exempt			
S-325 – AC/PO	0	2500	2500
S-330 – Exempt			
S-331 – Exempt			
S-332 – Exempt			
TOTAL (lb/yr)	14.20	2549	2500
TOTAL (TPY)	**0.007**	**1.28**	**1.25**

TOXICS

Annual emissions of toxics from the polymer tubing manufacturing and printing operation exceeds the District's Chronic Trigger Level for Ethyl benzene (from S-325 Printers). Hence, a Risk Screening Analysis was required. (* Hourly emissions assumed operation of 260 days/year and 4 hrs/day).

TABLE VIII – Estimated Toxic Emissions

	Emission Rates		Risk Screening Triggers	
Toxic Pollutant	**(lb/hr)***	**(lb/yr)**	**Acute (lb/hr)**	**Chronic (lb/yr)**
Manganese and compounds	NA	2.09	NA	3.5
Lead	NA	1.65E-03	NA	3.2
Methyl ethyl ketone (MEK)	0.43	452.64	29	39,000
Xylene	0.07	77.41	49	27,000
Ethyl benzene	NA	77.41	NA	43.0
Toluene	1.7	1,769.44	82	12,000
Propylene (propene)	NA	1.756E+03	NA	2.7E+05

The AERMOD risk modeling results are as follows:

Table VIIII – AERMOD Risk Modeling Results

	Max Cancer Risk (per million)	Chemical Driver	Max Chronic HI	Chemical Driver
RESIDENT	0.85	Ethyl Benzene	0.0157	Toluene
WORKER	0.67	Ethyl Benzene	0.1080	Toluene
STUDENT	0.08	Ethyl Benzene	0.0033	Toluene

Because source (S-325) has a cancer risk less than 1.0 in a million and a hazard index less than 1, it passes the risk screening and TBACT is not required.

III. STATEMENT OF COMPLIANCE

The polymer tubing manufacturing operation is subject to Regulation 6, Rule 1 – Particulate Matter, General Requirements and Regulation 8, Rule 2 – Organic Compounds, Miscellaneous Operations. In general, all sources are expected to meet applicable requirements of Regulation 6-1 and Regulation 8-2. Particulate emissions (as PM10) are expected to comply with the Ringelmann 1.0, per Regulation 6-1-301. District Compliance and Enforcement staff will certify compliance with Ringlemann during their routine inspections. A violation of Regulation 8-2-301 requires both emissions greater than 15 pounds per day AND an exceedance of 300 ppmv. All sources will

be less than 15 pounds per day of POC/NPOCs. Hence, even without estimating the concentration of POC/NPOC, the sources will comply with Regulation 8-2-301.

The 5 Printers (S-325) used to print on heat shrinkable tubing and wire insulation are exempt from the Regulation 8-20 (Graphic Arts Printing and Coating Operations), per Regulation 8-20-117. Hence, S-325 is subject to and in compliance with Regulation 8-4 (General Solvent and Surface Coating Operations), because VOC emissions are less than 5 tons per year (refer to Table VI and VII).

BACT
Best Available Control Technology: 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, NOx, CO, SO2 or PM10. The worst-case daily emissions of PM10 and POC/NPOC for this application are each estimated to be below 10 pounds per day. Hence, BACT is not triggered.

Offsets
Offsets must be provided for any new or modified source at a facility that emits more than 10tons/yr of POC or NOx. The District may provide offsets from the Small Facility Banking Account for a facility with emissions between 10 and 35 tons/yr of POC or NOx, provided that facility has no available offsets, and all existing sources of POC and/or NOx are equipped with Best Available Retrofit Control Technology (BARCT).

Based on the estimated POC cumulative increase for the facility including the POC cumulative increase of this application, offsets are not required, because total POC emissions will be less than 10 TPY.

Table X – Summary of Cumulative Increase

Current POC Cumulative Increase (TPY)	Application POC Cumulative Increase (TPY)	Total POC Cumulative Increase (TPY)
2.423	1.28	3.703

PSD
Regulation 2-2-304: District PSD requirements apply to emissions of SO_2, NO_2, CO, and PM10. Since this facility is not a major facility for any of these pollutants, the PSD requirements do not apply.

CEQA
The facility has completed an Appendix H form. This project is considered to be categorically exempt under the District's CEQA Regulation 2-1-312-11.3:

312.11 Permit applications for a proposed new or modified source or sources or for process changes which will satisfy the “No Net Emission Increase" provisions of District Regulation 2, Rule 2, and for which there is no possibility that the project may have any significant environmental effect in connection with any environmental media or resources other than air quality. Examples of such projects include, but are not necessarily limited to, the following:

11.3 A proposed new source or stationary source at a small facility for which full offsets are provided from a small facility bank established by the APCO pursuant to Regulation 2-4-414, and for which there will be no other significant environmental effect;

Water's Bill
The facility is within 1000 feet of Fair Oaks Elementary School (2950 Fair Oaks Avenue, Redwood City, CA), Everst Public High School (455 Fifth Avenue, Redwood City, CA), and Connect Community Charter (635 Oakside Avenue, Redwood City, CA). As a result, this application is subject to the public notification requirements of Regulation 2-1-412.

Regulation 3 – Fees
The company has complied with fee requirements for this permit application.

IV. CONDITIONS

I recommend the following conditions for S-301:

1. The owner/operator shall not exceed a combined material throughput of more than 200 tons of materials weighed at S-301 during any 12-month period. (basis: Cumulative increase)

2. The owner/operator shall abate emissions from S-301 by the properly operated and properly maintained A-300 Dust Collector and A-303 DC1 HEPA Filter Assembly, configured in series, at all times that S-301 operates. (basis: Cumulative Increase)

3. The owner/operator shall equip A-300 and A-303 with a device for measuring the pressure drop across the baghouse and HEPA Filter Assembly. Each device shall be checked for plugging at least every week. (basis: Regulation 6-1-301, 6-1-310, 6-1-311, 2-1-403)

4. The owner/operator shall inspect A-300 and A-303 weekly to ensure proper operation. The following items shall be checked:
   a. The pressure drop across the baghouse/filter shall be checked weekly. The pressure drop shall be no lower than 2 inches of water and no greater than 12 inches of water.
   b. The baghouse/filter exhaust shall be checked weekly for evidence of particulate matter breakthrough. If breakthrough is evident from plume observations, dust buildup near the stack outlet, or abnormal pressure drops, the filter bags shall be checked for any tears, holes, abrasions, and scuffs, and replaced as needed.
   c. All hoppers shall be discharged in a timely manner to maintain compliance with 4(a) above.
   d. The pulsejet, shaker cleaning system shall be maintained and operated at sufficient intervals to maintain compliance with 4(a) above.

   (basis: Regulation 2-1-403)

5. To determine compliance with the above conditions, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including, but not necessarily limited to, the following information:
   a. Daily throughput, summarized on a monthly basis.
   b. Monthly throughput totaled on a rolling 12-month basis.
   c. Dated records of all inspections and all maintenance work including bag/filter replacement for A-300 and A-303.
   d. Records of each inspection shall consist of a log containing the date of inspection and the initials of the personnel that inspects A-300 and A-303.

   The owner/operator shall keep all records in a District-approved log. The owner/operator shall retain all records on-site for two years, from the date of entry, and make them available for inspection by District staff upon request. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District Regulations. (basis: Cumulative Increase, Recordkeeping Regulation 1-441)

I recommend the following conditions for S-302:

1. The owner/operator shall not exceed a combined material throughput of more than 600 tons of materials weighed at S-302 during any 12-month period. (basis: Cumulative increase)

2. The owner/operator shall abate emissions from S-302 by the properly operated and properly maintained A-302 Self Contained Weigh Up Booth Integral Torit Filter at all times that S-302 operates. (basis: Cumulative Increase)

3. The owner/operator shall equip A-302 with a device for measuring the pressure drop across the Filter Assembly. The device shall be checked for plugging at least every week. (basis: Regulation 6-1-301, 6-1-310, 6-1-311, 2-1-403)

4. The owner/operator shall inspect A-302 weekly to ensure proper operation. The following items shall be checked:
   a. The pressure drop across the filter shall be checked weekly. The pressure drop shall be no lower than 2 inches of water and no greater than 12 inches of water.
   b. The filter exhaust shall be checked weekly for evidence of particulate matter breakthrough. If breakthrough is evident from plume observations, dust buildup near the stack outlet, or abnormal pressure drops, the filter bags shall be checked for any tears, holes, abrasions, and scuffs, and replaced as needed.
   c. All hoppers shall be discharged in a timely manner to maintain compliance with 4(a) above.
   d. The pulsejet, shaker cleaning system shall be maintained and operated at sufficient intervals to maintain compliance with 4(a) above.

   (basis: Regulation 2-1-403)

5. To determine compliance with the above conditions, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including, but not necessarily limited to, the following information:
   a. Daily throughput, summarized on a monthly basis.
   b. Monthly throughput totaled on a rolling 12-month basis.
   c. Dated records of all inspections and all maintenance work including filter replacement for the A-302.
   d. Records of each inspection shall consist of a log containing the date of inspection and the initials of the personnel that inspected A-302.

   The owner/operator shall keep all records in a District-approved log. The owner/operator shall retain all records on-site for two years, from the date of entry, and make them available for inspection by District staff upon request. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District Regulations. (basis: Cumulative Increase, Recordkeeping Regulation 1-441)

I recommend the following conditions for S-303:

1. The owner/operator shall not exceed a combined material throughput of more than 70 tons of materials mixed at S-303 during any 12-month period. (basis: Cumulative increase)

2. The owner/operator shall abate emissions from S-303 by the properly operated and properly maintained A-300 Dust Collector and A-303 DC1 HEPA Filter Assembly, configured in series, at all times that S-303 operates. (basis: Cumulative Increase)

3. The owner/operator shall equip A-300 and A-303 with a device for measuring the pressure drop across the baghouse and HEPA Filter Assembly. Each device shall be checked for plugging at least every week. (basis: Regulation 6-1-301, 6-1-310, 6-1-311, 2-1-403)

4. The owner/operator shall inspect A-300 and A-303 weekly to ensure proper operation. The following items shall be checked:
   a. The pressure drop across the baghouse/filter shall be checked weekly. The pressure drop shall be no lower than 2 inches of water and no greater than 12 inches of water.
   b. The baghouse/filter exhaust shall be checked weekly for evidence of particulate breakthrough. If breakthrough is evident from plume observations, dust buildup near the stack outlet, or abnormal pressure drops, the filter bags shall be checked for any tears, holes, abrasions, and scuffs, and replaced as needed.
   c. All hoppers shall be discharged in a timely manner to maintain compliance with 4(a) above.
   d. The pulsejet, shaker cleaning system shall be maintained and operated at sufficient intervals to maintain compliance with 4(a) above.

   (basis: Regulation 2-1-403)

5. To determine compliance with the above conditions, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including, but not necessarily limited to, the following information:
   a. Daily throughput, summarized on a monthly basis.
   b. Monthly throughput totaled on a rolling 12-month basis.
   c. Dated records of all inspections and all maintenance work including bag/filter replacement for A-300 and A-303.
   d. Records of each inspection shall consist of a log containing the date of inspection and the initials of the personnel that inspects A-300 and A-303.

   The owner/operator shall keep all records in a District-approved log. The owner/operator shall retain all records on-site for two years, from the date of entry, and make them available for inspection by District staff upon request. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District Regulations. (basis: Cumulative Increase, Recordkeeping Regulation 1-441)

I recommend the following conditions for S-306:

1. The owner/operator shall not exceed a combined material throughput of more than 300 tons of materials weighed at S-306 during any 12-month period. (basis: Cumulative increase)

2. The owner/operator shall abate emissions from S-306 by the properly operated and properly maintained A-302 Self Contained Weigh Up Booth Integral Torit Filter at all times that S-306 operates. (basis: Cumulative Increase)

3. The owner/operator shall equip A-306 with a device for measuring the pressure drop across the Filter Assembly. The device shall be checked for plugging at least every week. (basis: Regulation 6-1-301, 6-1-310, 6-1-311, 2-1-403)

4. The owner/operator shall inspect A-302 weekly to ensure proper operation. The following items shall be checked:
   a. The pressure drop across the filter shall be checked weekly. The pressure drop shall be no lower than 2 inches of water and no greater than 12 inches of water.
   b. The filter exhaust shall be checked weekly for evidence of particulate breakthrough. If breakthrough is evident from plume observations, dust buildup near the stack outlet, or abnormal pressure drops, the filter bags shall be checked for any tears, holes, abrasions, and scuffs, and replaced as needed.
   c. All hoppers shall be discharged in a timely manner to maintain compliance with 4(a) above.

d. The pulsejet, shaker cleaning system shall be maintained and operated at sufficient intervals to maintain compliance with 4(a) above.

(basis: Regulation 2-1-403)

5. To determine compliance with the above conditions, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including, but not necessarily limited to, the following information:
   a. Daily throughput, summarized on a monthly basis.
   b. Monthly throughput totaled on a rolling 12-month basis.
   c. Dated records of all inspections and all maintenance work including filter replacement for the A-302.
   d. Records of each inspection shall consist of a log containing the date of inspection and the initials of the personnel that inspects A-302.

   The owner/operator shall keep all records in a District-approved log. The owner/operator shall retain all records on-site for two years, from the date of entry, and make them available for inspection by District staff upon request. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District Regulations. (basis: Cumulative Increase, Recordkeeping Regulation 1-441)

I recommend the following conditions for S-308:

1. The owner/operator shall not exceed a throughput of more than 0.15 tons (300 pounds) of lead at S-302 during any 12-month period. (basis: Cumulative increase)

2. The owner/operator shall abate emissions from S-308 by the properly operated and properly maintained A-308 Lead Weigh Up Dust Collector at all times that S-308 operates. (basis: Cumulative Increase)

3. The owner/operator shall equip A-308 with a device for measuring the pressure drop across the Filter Assembly. The device shall be checked for plugging at least every week. (basis: Regulation 6-1-301, 6-1-310, 6-1-311, 2-1-403)

4. The owner/operator shall inspect A-308 weekly to ensure proper operation. The following items shall be checked:
   a. The pressure drop across the filter shall be checked weekly. The pressure drop shall be no lower than 2 inches of water and no greater than 12 inches of water.
   b. The filter exhaust shall be checked weekly for evidence of particulate breakthrough. If breakthrough is evident from plume observations, dust buildup near the stack outlet, or abnormal pressure drops, the filter bags shall be checked for any tears, holes, abrasions, and scuffs, and replaced as needed.
   c. All hoppers shall be discharged in a timely manner to maintain compliance with 4(a) above.
   d. The pulsejet, shaker cleaning system shall be maintained and operated at sufficient intervals to maintain compliance with 4(a) above.

   (basis: Regulation 2-1-403)

5. To determine compliance with the above conditions, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including, but not necessarily limited to, the following information:
   a. Daily throughput, summarized on a monthly basis.
   b. Monthly throughput totaled on a rolling 12-month basis.
   c. Dated records of all inspections and all maintenance work including filter replacement for the A-308.

d. Records of each inspection shall consist of a log containing the date of inspection and the initials of the personnel that inspects A-308.

The owner/operator shall keep all records in a District-approved log. The owner/operator shall retain all records on-site for two years, from the date of entry, and make them available for inspection by District staff upon request. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District Regulations. (basis: Cumulative Increase, Recordkeeping Regulation 1-441)

I recommend the following condition for S-325:

1. The owner/operator of S-325 shall not exceed the following usage limits during any consecutive twelve-month period:

7100 GEM Inks	94 Gallons
EX200	192 Gallons
Printsafe PS-12K	24 Gallons
MEK Makeup	48 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-325 do not exceed 2,500 pounds in any consecutive twelve month period;
   b. Total NPOC emissions from S-325 do not exceed 2,500 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.
   d. Demonstration that any toxic air contaminates in new solvents in the coating and cleanup materials in part 1.b, do not exceed the acute and chronic trigger levels by calculating toxic air contaminant emissions on a lb/hour and lb/year basis, respectively.

   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)

IV. 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 sources:

- **S-301 Weigh Up Booth, Raychem In House Design, 0.25 ton/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly**
- **S-302 Self Contained Weigh Up Booth (2 Bays), Raychem In House Design, 0.25 ton/hr; abated by A-302 Self Contained Weigh Up Booth Integral Torit Filter, Model VLB, 14,000 CFM**
- **S-303 ZSK83 Henschel, Prodex Henschel, Model 115 JSS, 0.008 ton/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly**
- **S-306 Bulk Bag Weigh Up Feeder, Schenck, Type MODMC-IV-2A, 0.60 tons/hr; Abate by A-302 Self Contained Weigh Up Booth Integral Torit Filter, Model VLB, 14,000 CFM**
- **S-308 Lead Weigh Up Booth, Raychem (In house Design), 75 lbs/hr; abated by A-308 Lead Weigh Up Dust Collector, Torit, Model VS-1500, 1500 CFM**
- **S-325 Printers, Tubing (5 printers), GEM, U-2/AMO, Printsafe Inks Jet Pritner Type A-11, 301, 500 ft/min**

and exemption status for the following:

- **S-304 F80 #2 Henschel, Thyssen Henschel, FM 200C, 0.006 ton/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly [exempt per 2-1-121.5]**
- **S-305 K2A Intermixer, Farrel Ltd, K2A, 0.5 ton/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly and A-305 Mist Collector (F80 #2, K2A), United Air Specialist, F5000, 5000 CFM [exempt by 2-1-121.4; 2-1-122.4]**
- **S-307 Irradiation Beam Cell # 21, DRI, 1.5 MeV, 30 mA, 0.4 tons/hr [exempt by 2-1-103]**
- **S-309 Talc Duster, Kason, Model KO-SSISP, Centri-Sifter, 0.002 ton/hr; abated by A-309 Talc Dust Filter Box, Nederman, Model 602263, 600 CFM [exempt by 2-1-103]**
- **S-310 F80#2 Banbury Mixer, Farrell, F80, 0.5 tons/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly, and A-305 Mist Collector (F80 #2, K2A), United Air Specialist, F5000, 5000 CFM [exempt by 2-1-121.5; 2-1-122.4]**
- **S-311 ZSK83 Extruder, Werner & Pfleiderer, 83MM ZSK, 0.75 tons/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly and A-311 Mist Collector (ZSK83), Airflow Systems, Inc. 2400VOM, 2400 CFM [exempt by 2-1-122.4]**

S-312 ZSK40 Twin Screw Extruder, Werner & Pfleiderer, ZSK40, 0.1 tons/hr; abated by A-300 DC-1 Compounding Dust Collector, Donaldson Torit, DFE 4-64 Evolution Dust Collector, 36,000 ACFM and A-303 DC1 HEPA Filter Assembly (2 Units), Donaldson Torit, Ultra-Lok 3H X3W Filter Assembly, and A-312 Mist Collector (ZSK40), Airflow Systems, Inc., 1200VOM, 1200 CFM [exempt by 2-1-122.4]

S-313 Expander T-30, Hipp Welding, 23524-156A, 0.03 tons/hr; abated by A-313 Mist Collector (T-30), United Air Specialist, F5000, 5000 CFM [exempt by 2-1-103]

S-314 Expander T-35, Raychem, T-35, 0.03 ton/hr; abated by A-314 Mist Collector (T-35), United Air Specialist, F5000, 5000 CFM [exempt by 2-1-103]

S-315 Expander T-32, Raychem, T-32, 0.03 ton/hr; abated by A-315 Mist Collector (T-32), United Air Specialist, F5000, 5000 CFM [exempt by 2-1-103]

S-316 Expander T-51, Raychem, T-51, 0.03 ton/hr; abated by A-316 Mist Collector (T-51), United Air Specialist, F5000, 5000 CFM [exempt by 2-1-103]

S-317 Expander T-60, Raychem, T-60, 0.06 ton/hr; abated by A-317 Mist Collector (T-60), United Air Specialist, F5000, 5000 CFM [exempt by 2-1-103]

S-318 Extruder B, Davis Standard, 25 RT, 0.059 tons/hr; abated by A-318 Mist Collector (Ext B), Torit Donaldson, MC-4000, 4000 CFM [exempt 2-1-122.4]

S-319 Extruder F, Davis Std. Thermatic, 20T, 2" 0.12 tons/hr; abated by A-319 Mist Collector (Ext I, F, and R), United Air Specialist, F7000, 7000 CFM [exempt by 2-1-122.4]

S-320 Extruder I, Davis Standard, 25 T, 0.141 tons/hr; abated by A-319 Mist Collector (Ext I, F, and R), United Air Specialist, F7000, 7000 CFM [exempt by 2-1-122.4]

S-321 Extruder R, Davis Standard, 20IN20, 0.12 tons/hr; abated by A-319 Mist Collector (Ext I, F, and R), United Air Specialist, F7000, 7000 CFM [exempt by 2-1-122.4]

S-322 Extruder S, Davis Standard, DS-10-H, 0.059 tons/hr; abated by A-322 Mist Collector (Ext S, T, Q), United Air Specialist, F5000, 5000 CFM [exempt by 2-1-122.4]

S-323 Extruder T, Davis Standard, DS-12H, 0.06 tons/hr; abated by A-322 Mist Collector (Ext S, T, Q), United Air Specialist, F5000, 5000 CFM [exempt by 2-1-122.4]

S-324 Extruder Q, Merrit Extruder Corp, 1 ½, 0.059 tons/hr; abated by A-322 Mist Collector (Ext S, T, Q), United Air Specialist, F5000, 5000 CFM [exempt by 2-1-122.4]

S-330 ESWB Closed Circuit Cooler #1, Evapco Inc., ESWB 9-46JB, 36,000 gal/hr [exempt by 2-1-128.2]

S-331 ESWB Closed Circuit Cooler #2, Evapco Inc., ESWB 9-46JB, 36,000 gal/hr [exempt by 2-1-128.2]

S-332 ESWB Closed Circuit Cooler #3, Evapco Inc., ESWB 9-46JB, 36,000 gal/hr [exempt by 2-1-128.2]

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Carol Lee
Senior Air Quality Engineer

Date: _____