



ENGINEERING AND COMPLIANCE

APPLICATION PROCESSING AND CALCULATIONS

APPL. NO.

560735 & -36

DATE:

May 7, 2014

PROCESSED BY

S. JIANG

CHECKED BY

D. GORDON

EVALUATION REPORT FOR PERMIT TO CONSTRUCT

Applicant's Name: ABBOTT CARDIOVASCULAR SYSTEM, INC. Facility ID: 045489

Mailing Address: 26531 YNEZ ROAD
TEMECULA, CALIFORNIA 92591

Equipment Location: SAME

EQUIPMENT DESCRIPTION

Appl. No. 560736 – Spray Booth

Equipment Description:

SPRAY BOOTH, COAST INDUSTRIAL SYSTEMS, FLOOR TYPE, 10'-4" W. × 19'-2"D. × 14'-4" H., WITH FOUR-STAGE FILTER SYSTEM CONSISTING OF THIRTY 20"×20"×1" PRE-FILTERS, THIRTY 20"×20"×2" PANEL FILTER, THIRTY 20"×20"×15" BAG POCKET FILTERS, SIXTEEN 24"×24"×12" HEPA FILTERS AND ONE 15-HP EXHAUST FAN.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT WAS ISSUED, UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS SPRAY BOOTH SHALL NOT BE OPERATED UNLESS ALL EXHAUST AIR PASSES THROUGH THE PRE-FILTERS, BAG-TYPE FILTERS AND HEPA FILTERS.
[RULE 1303(A)(1) – BACT]
4. THE OPERATIONS CONDUCTED IN THIS SPRAY BOOTH SHALL COMPLY WITH RULE 1107 AND 1469.1.
[RULE 1107, RULE 1469.1]
5. THE OPERATOR SHALL INSTALL THE HEPA FILTERS RATED AT 99.97% OR MORE EFFICIENT IN COLLECTING PARTICLE SIZES 0.3 MICRONS OR GREATER IN SIZE.
[RULE 1303(A)(1) – BACT, RULE 1469.1]
6. THE OPERATOR SHALL NOT TURN OFF THE EXHAUST FAN OF THIS EQUIPMENT UNTIL 5 MINUTES AFTER SPRAYING OPERATIONS HAVE CEASED WHEN COATINGS CONTAINING HEXAVALENT CHROME HAVE BEEN SPRAYED. THE OPERATOR



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SHALL MAINTAIN RECORDS IN A MANNER APPROVED BY THE DISTRICT, TO DEMONSTRATE COMPLIANCE WITH THIS CONDITION.

[RULE 1469.1]

- 7. THE OPERATOR SHALL INSTALL AND MAINTAIN A MECHANICAL GAUGE TO INDICATE, IN INCHES WATER COLUMN, THE STATIC PRESSURE DIFFERENTIAL ACROSS THE HEPA FILTERS.

[RULE 1303(A)(1) – BACT]

- 8. THE PRESSURE DROP ACROSS THE HEPA FILTERS SHALL NOT EXCEED 5 INCHES WATER COLUMN.

[RULE 1303(A)(1) – BACT]

- 9. THE OPERATOR SHALL LIMIT THE AMOUNT OF COATING MATERIALS USED IN THIS EQUIPMENT TO NO MORE THAN 440 POUNDS PER MONTH.

[RULE 1303(B)(2) – OFFSET]

- 10. MATERIALS USED IN THIS EQUIPMENT SHALL NOT CONTAIN ANY TOXIC AIR CONTAMINANTS IDENTIFIED IN RULE 1401, TABLE I, WITH AN EFFECTIVE DATE OF SEPTEMBER 10, 2010 OR EARLIER, EXCEPT FOR THE FOLLOWING AT THE ANNUAL USAGE LIMITS AS SHOWN BELOW:

TOXIC AIR CONTAMINANT	CAS NO.	ANNUAL USAGE (LBS/YR)
CHROMIC ACID	1333-82-0	396
PHOSPHORIC ACID	7664-38-2	316.8

[RULE 1401]

- 11. THE OWNER OR OPERATOR OF THIS EQUIPMENT SHALL CONDUCT SOURCE TEST(S) UNDER THE FOLLOWING CONDITIONS:

- A. THE SOURCE TEST(S) SHALL BE CONDUCTED NO LATER THAN 180 DAYS AFTER THE INITIAL START-UP OF THIS EQUIPMENT UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT.

- B. THE SOURCE TEST(S) SHALL BE PERFORMED TO MEASURE HEXAVALENT AND TOTAL CHROME EMISSION LEVELS.

- C. DURING THE SOURCE TEST, THE FOLLOWING OPERATING PARAMETERS AND MATERIAL USAGES, BUT NOT BE LIMITED TO, SHALL BE RECORDED:

- (1) TOTAL AND HEXAVALENT CHROME EMISSIONS AT THE EXHAUST, IN LBS/HR,
- (2) DIFFERENTIAL PRESSURES ACROSS HEPA FILTERS, IN INCHES OF WATER,
- (3) USAGE OF THE COATING MATERIAL(S), IN GALLONS AND POUNDS,
- (4) AMOUNT OF ACID ACCELERATOR (CHROMIC AND PHOSPHORIC ACID) ADDED TO THE COATING MIXTURE, IN WT%,



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- (5) EXHAUST FLOW RATE, AND
- (6) TEMPERATURE.

- D. THE TESTS SHALL BE CONDUCTED WHILE THE SPRAY GUN IS OPERATING AT MAXIMUM SPRAYING RATES.

- E. THE TEST SHALL BE CONDUCTED USING CARB METHOD 425.

- F. TWO COMPLETE COPIES OF THE SOURCE TEST REPORTS SHALL BE SUBMITTED TO THE DISTRICT (ADDRESSED TO SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, ATTN: STEPHEN JIANG, P.O. BOX 4941, DIAMOND BAR, CA 91765) WITHIN 45 DAYS AFTER THE SOURCE TEST DATE.

- G. A TESTING LABORATORY CERTIFIED BY THE CALIFORNIA AIR RESOURCES BOARD AND/OR THE SCAQMD LABORATORY APPROVAL PROGRAM, AND IN COMPLIANCE WITH DISTRICT RULE 304 (NO CONFLICT OF INTEREST) SHALL CONDUCT THE TEST.

- H. SAMPLING FACILITIES SHALL COMPLY WITH THE DISTRICT GUIDELINES FOR CONSTRUCTION OF SAMPLING AND TESTING FACILITIES, PURSUANT TO RULE 217.

[RULE 1401; RULE 212]

Periodic Monitoring

- 12. MATERIAL SAFETY DATA SHEETS FOR ALL MATERIALS USED IN THIS EQUIPMENT SHALL BE KEPT CURRENT AND BE MADE AVAILABLE TO THE EXECUTIVE OFFICER OR HIS REPRESENTATIVE UPON REQUEST.
[RULE 3004 (A)(4)]

- 13. THE OPERATOR SHALL MAINTAIN ADEQUATE RECORDS TO VERIFY COMPLIANCE WITH CONDITION NOS. 4, 6, 7, 8 AND 9 ABOVE. SUCH RECORDS SHALL BE KEPT ON THE PREMISES FOR AT LEAST FIVE YEARS AND BE MADE AVAILABLE TO THE EXECUTIVE OFFICER OR HIS REPRESENTATIVE UPON REQUEST.
[RULE 3004 (A)(4)]

Emissions and Requirements:

- 14. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

VOC: RULE 1107
Cr⁶⁺: RULE 1469.1



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Appl. No. 560735 – De Minimis Significant Title V Facility Permit Revision

Revision of Title V Facility Permit per Rule 301(m)(7).

BACKGROUND/HISTORY

Abbott Cardiovascular Systems, Inc. (ACS) designs and manufactures therapeutic medical devices used in the treatment of atherosclerotic disease of the coronary and peripheral arteries. These devices include angioplasty balloon catheters, guide wires, wire-mesh stents and accessories. ACS currently operates laser cutting machines, plastic extruders, ethylene oxide sterilizers, seven boilers, three emergency IC engines. The ethylene oxide emissions are controlled by two catalytic oxidizers. The acid mists generated from the bench-type acid polishing bays are controlled by the 5 scrubbers.

ACS facility type:

<u>RECLAIM</u>		<u>Title V</u>
SO _x	NO _x	
No	No	Yes

ACS is a Title V facility. The existing Title V Permit for the facility will expire on January 10, 2017.

On February 25, 2014, ACS submitted the following permit applications:

<u>Appl. No.</u>	<u>Type</u>	<u>Previous P/O</u>	<u>Equipment</u>	<u>Fee Sch.</u>	<u>Expedited?</u>
560736	New	N/A	Spray Booth	Sch. B	Yes
560735	Plan	N/A	N/A	Title V Rev.	N/A

Appl. No. 560736 is submitted to apply for a new spray booth. The new spray booth will be used to apply coatings onto guide wires.

Appl. No. 560735 is submitted as a plan application for the De Minimis Significant permit revision of the Title V permit as specified in Rule 301.

PROCESS DESCRIPTION

The coating is a water-based coating product. It consists of three component mixes, including: a primer, an acid accelerator and water. The makeup of each component is listed as follows:

Coating	Approximate Coating Weight %	Toxic Ingredients	CAS Number	Toxic Ingredient Weight %	Density, lbs/gal
Primer	60	N/A	N/A	N/A	11.98
Acid Accelerator	30	Chromic Acid	1332-82-0	20-25	8.34
		Phosphoric Acid	7664-38-2	15-20	
Water	10	N/A	N/A	N/A	N/A



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The primer contains Teflon. The acid accelerator contains chromic acid in concentration ranging from 20 to 25%, and phosphoric acid in concentration ranging from 15 to 20%. Chromic and phosphoric acids are on the Rule 1401 list. The Teflon is coated onto guide by the adhesion on the substrate results from a chemical reaction of the acid accelerator with the metal.

Per MSDS, the primer contains 51.39% w/w solids. In addition, the primer contains surfactants which may be considered as VOCs. According to MSDS, the VOC contents are 0.5 lb/gal.

Inside the spray booth, the coating is applied on guide wires via electrostatic spray guns. Venting from the booth is first directed to the booth filters, then to a filter system consisting of HEPA filters. The spray booth is housed inside an enclosed room.

Emissions:

The spray booth is expected to emit PM10 and VOC. PM10 emissions come from the solids contained in the coatings and acid accelerators dispersed during spraying operation. VOC emissions are from the surfactants in the primer formulation.

EMISSION CALCULATIONS

Data:

Operating Schedule: 16 hrs/day, 7 days/week, 52 weeks/yr
 Acid Accelerator Throughput (Max.): 60 Kg Acid Accelerator /month,
 or 132 lb Acid Accelerator /month

Coating	Approximate Coating Weight %	Toxic Ingredients	CAS Number	Toxic Ingredient Weight %	Density, lbs/gal
Primer	60	N/A	N/A	N/A	11.98
Acid Accelerator	30	Chromic Acid	1332-82-0	20-25	8.34
		Phosphoric Acid	7664-38-2	15-20	
Water	10	N/A	N/A	N/A	N/A

Primer Usage: (132 lb/month) (60%/30%) = 264 lb/month
 Acid Accelerator Usage: 132 lb/month
Water Content: 44 lb/month
 Total Coating Material Usage: 440 lb/month

PM₁₀ Emissions

Solids from primer: (264 lb/month) (51.39% solids) = 135.67 lb/month
 Chromic Acid from Acid Accelerator: (132 lb/month) (25%) = 33 lb/month
 Phosphoric Acid from Acid Accelerator: (132 lb/month) (20%) = 26.4 lb/month

Total PM10 contents = 135.67 lb/month + 33 lb/month + 26.4 lb/month = 195.07 lb/month

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Assumptions:

- Transfer Efficiency = 65%
- No Fall-Out
- $PM_{10} = PM$
- Enclosure HEPA Filter PM_{10} Control Efficiency = 99.97%

$$R1 = (195.07 \text{ lb/month}) (1-0.65) / (30 \text{ day/month}) = 2.28 \text{ lb/day, or } 0.142 \text{ lb/hr}$$

$$R2 = (2.28 \text{ lb/day}) (1 - 99.97\%) = 0.000683 \text{ lb/day, or } 0.0000427 \text{ lb/hr}$$

VOC Emissions

VOC content: 0.5 lb/gal primer.

Primer Density = 1.44 Kg/L

$$R1=R2 = [(60 \text{ Kg/month}) (60\%/30\%) (0.5 \text{ lb/gal})] / [(1.44 \text{ Kg/L}) (3.785 \text{ L/gal}) (30 \text{ day/month})]$$
$$= 0.367 \text{ lb/day, or } 0.023 \text{ lb/hr}$$

Chromic Acid Emissions:

$$R1 = (33 \text{ lb/month}) (1-0.65) / (30 \text{ day/month}) = 0.385 \text{ lb/day, or } 0.0241 \text{ lb/hr}$$

$$R2 = (0.385 \text{ lb/day}) (1 - 99.97\%) = 0.000116 \text{ lb/day, or } 0.00000722 \text{ lb/hr}$$

Phosphoric Acid Emissions:

$$R1 = (26.4 \text{ lb/month}) (1-0.65) / (30 \text{ day/month}) = 0.308 \text{ lb/day, or } 0.0193 \text{ lb/hr}$$

$$R2 = (0.308 \text{ lb/day}) (1 - 99.97\%) = 0.0000924 \text{ lb/day, or } 0.00000578 \text{ lb/hr}$$

Inward Airflow Face Velocity:Data

Spray Booth Inlet Pre-filters: (30) 20"×20" pre-filters

Exhaust Air Flow: 12,000 cfm

$$\text{Cross Section Area} = 30 \times (20 \text{ in} \times 20 \text{ in}) / (144 \text{ in}^2/\text{ft}^2) = 83.33 \text{ ft}^2$$

$$\text{The inward face velocity} = (12,000 \text{ ft}^3/\text{min}) / (83.33 \text{ ft}^2) = 144 \text{ ft/min} > 100 \text{ ft/min required by R1469.1}$$



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EMISSION SUMMARY:

A/N 560736		Hourly (lbs/hr)	Daily (lbs/day)	Annually (lbs/yr)	30 day ave. (lbs/day)	30day NSR (lbs/day)
PM10	R1	0.143	2.281	821.0	2.28	2
	R2	4.28E-05	6.84E-04	0.2	0.00	0
VOC	R1=R2	2.29E-02	3.67E-01	132.1	0.37	0
Chromic Acid	R1	2.41E-02	3.86E-01	138.9	0.39	0
	R2	7.23E-06	1.16E-04	4.17E-02	0.00	0
Phosphoric Acid	R1	1.93E-02	3.09E-01	111.1	0.31	0
	R2	5.79E-06	9.26E-05	3.33E-02	0.00	0

HEALTH RISK ASSESSMENT- TIER I ANALYSIS:

Excel program results (see attached) show Cancer/Chronic ASI is greater than 1, Tier II analysis is required.

HEALTH RISK ASSESSMENT- TIER II ANALYSIS:

Excel program results (see attached) show MICR's are less than ten (10) in a million, HIA and HIC are less than one. Since the spray booth is equipped with HEPA filters, which are considered as T-BACT; thus, no further analysis is required for Rule 1401. However, Rule 212 requires public notification per section (c)(3)(A)(i). Therefore, Tier III analysis is conducted as follows:

HEALTH RISK ASSESSMENT- TIER III ANALYSIS:

Excel program results (see attached) show MICR's are less than one (1) in a million, HIA and HIC are less than one; thus, no further analysis is required.

RULES AND REGULATIONS EVALUATION

Rule 212: **Standards for Approving Permits** – The facility is not located within 1,000 feet of a K-12 school (a map is attached). In addition, there are no TAC's emissions for this project which will cause an individual cancer risk greater than, or equal to, one (1) in a million. A Public Notice is not required.

Section (g)

Item	Lb/dy daily maximum	Allow limit-lb/dy	Trigger Public notice
NOx	+0	40	No
ROG	+0.367	30	No
CO	+0	220	No
PM10	+0.000706	30	No
SOx	+0	60	No



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Rule 401: **Visible Emissions** – Compliance is expected from well maintained and properly operated equipment.

Rule 402: **Public Nuisance** – The potential for public nuisance from the operation of this equipment is minimal. The facility is located in a commercial/industrial area.

Rule 1107: Coating of Metal Parts and Products

(c)(1) – HVLP spray gun will be used; therefore, compliance is expected.

(c)(2) – The MSDS submitted with the application complies with the requirements of this rule:

Coating	Rule 1107 Requirement	Value
DuPont 850G-314	Coating VOC < 2.8 lb/gal	0.5 lb/gal

Rule 1155: Particulate Matter (PM) Control Devices

Spray booth is exempt from this rule per section (e)(9).

Rule 1303: BACT

The PM10 emissions will be controlled by pre-filters, bag-type filters and HEPA filters. BACT is achieved. The VOC emissions will be less than 1 lb/day; thus, BACT is not required for VOC emissions.

Rule 1303(b)(1): Modeling: The NOx, CO and PM10 emissions from this equipment are below the rule limits (specified in the table A1). Therefore, no further screening analysis is required.

	Actual emissions (lb/hr)	Allowable Emissions – for Non-combustion Source (lb/hr)
NOx	-	0.068
CO	-	3.7
PM10	0.000044	0.41

Rule 1303(b)(2): Offsets: Offsets are not required for this facility since the criteria contaminant emissions will not exceed the limits in table A (rule 1304(d))

	VOC (lb/day)	PM10 (lb/day)	NOX (lb/day)	CO (lb/day)	SOX (lb/day)
Current NSR (PTE)	7	7	30	95	0
A/N 560736	+0.367	+0.000706	+0	+0	+0
Total PTE	7.367	7.000706	30	95	0
Threshold limit	22	22	22	159	22
Offset required	0	0	0	0	0



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Rule 1401: New Source Review of Toxic Air Contaminants

Tier III Excel program results (attached to this report) show MICR is less than one in one million (1.0×10^{-6}), and chronic and acute hazard indexes are (CHI and AHI) are less than one (1); therefore, no further analysis is required. Compliance is expected.

Rule 1469.1: Spraying Operations Using Coatings Containing Chromium

(d)(1) – Control System Capture Efficiency and Enclosure Standards

- (A) This section requires continuous inward flow of air is maintained at all air openings during spraying operations. The spray booth will meet all criteria of this section. Compliance is expected. Condition Nos. 3 and 4 are added to ensure compliance with this rule.
- (B) The calculation results indicated an inward air flow velocity of 140 ft/min, which is greater than the requirement of 100 ft/min. Compliance is expected. Condition No. 4 is added to ensure compliance with this rule.
- (C) The operator will exhaust the spray booth for additional 5 minutes after the spraying operations have ceased. Compliance is expected. Condition Nos. 4 and 6 are added to ensure compliance with this rule.

(d)(2) – Transfer Efficiency

The facility will apply coatings by use of a High-Volume, Low-Pressure (HVLP) spray gun; thus, compliance is expected.

(d)(3) – Requirements for the New or Existing Sources

Option (B) – requires the HEPA filters with control efficiency of 99.97% or greater for particulate matter 0.3 microns and larger. The HEPA filter manufacturer certifies a control efficiency of 99.97% or higher, for particulate matter 0.3 microns and larger. Compliance is expected. Condition No. 5 is added to ensure compliance with this rule.

(d)(4) – Compliance Plan for the Existing Sources

This will be a new source and it is not subject to this section.

Reg XXX: Title V Permit

ACS (Facility ID: 45489) is a Title V facility. The existing Title V Permit for the facility will expire on January 10, 2017.

Application no. 560736 is to install a spray booth to apply coatings onto guide wires. The project will increase PM10 emissions for 0.000706 lb/day and VOC emissions for 0.367 lb/day. Therefore, application no. 560736 is considered “De Minimis Significant Permit Revision” of Title V Facility Permit and it is subject to a 45-day EPA review prior to final revision of the Title V Facility Permit (Application No. 560735).



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CONCLUSION AND RECOMMENDATIONS

Based on this evaluation, it is expected that the subject equipment will be operated in compliance with all applicable District Rules and Regulations. The Permit to Construct is recommended to be issued.