

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

N686754718

FACILITY: Jabil		SRN / ID: N6867
LOCATION: 3800 Giddings Road, AUBURN HILLS		DISTRICT: Warren
CITY: AUBURN HILLS		COUNTY: OAKLAND
CONTACT: Trevor Morgan , SR EHS Engineer		ACTIVITY DATE: 08/19/2020
STAFF: Kerry Kelly	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: FY 2020 Targeted inspection - Virtual		
RESOLVED COMPLAINTS:		

On August 19, 2020, I (Kerry Kelly, EGLE-AQD) conducted a targeted, virtual inspection at Jabil Circuit, Inc. located at 3800 Giddings Road in Auburn Hills, Michigan. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment, Great Lakes and Energy, Air Quality Division (EGLE-AQD) Rules; and the conditions of Permit To Install (PTI) Number 283-00A for circuit board manufacturing equipment.

I elected to conduct a virtual inspection at Jabil through Microsoft Teams because Jabil's facility contact is familiar with the AQD compliance inspection procedures, on-site access was limited due to the COVID-19 pandemic, the facility has been determined to be in compliance each of the last four AQD Full Compliance Evaluations, dating back to January 2009, and the process equipment is accessible.

The virtual inspection began at approximately 9:00 AM and was conducted through Microsoft Teams. Upon the start of the video conference, I introduced myself and showed my photo credentials to Mr. Trevor Morgan, SR EHS Engineer, Jabil, Mr. Rick Deleersnyder, Jabil, and Daniel Abbott, EHS Engineer, Jabil. I informed Mr. Morgan, Mr. Deleersnyder, and Mr. Abbott that the inspection contains confidential business information and is to be held confidential until further review from the FOIA Department determines it Non-Confidential and that notes, screenshots, or recordings may be taken. Mr. Morgan provided records electronically prior to the inspection. Mr. Morgan, Mr. Deleersnyder, and Mr. Abbott assisted me during the inspection.

SOURCE INFORMATION

Jabil Circuit, Inc is a circuit board manufacturer located in central Oakland County. Oakland County is currently designated by the United States Environmental Protection Agency (USEPA) as a non-attainment area with respect to the 8-hour ozone standard. The facility is surrounded by commercial and industrial properties. The nearest residence is approximately 0.5 miles southwest of Jabil. Jabil operates 24 hours a day Monday through Friday, and occasionally on Saturday.

Jabil is classified as a synthetic minor for hazardous air pollutants (HAP).

PROCESS DESCRIPTION

According to Mr. Deleersnyder, there are currently only two assembly lines for production (Bay 5 and Bay 3) and one line used for non-production at Jabil. According to Mr. Morgan, the facility plans to add another line in the next couple of months for the assembly of circuit boards for use in covid testing equipment.

In the circuit board assembly process, lead or silver solder paste is applied to specific areas

on one side of a pre-manufactured circuit board using a stencil (screen), small parts are placed on the solder paste then sent through an oven to cure the paste. Some boards may also require larger parts, called through-hole parts, that are placed through holes on the circuit board. The through-hole parts are placed by hand then the board is run through a machine that applies flux to clean the board before soldering the through-hole parts in a wave or ERSA machine. Waves apply flux and lead-free solder to one entire side of a board. Each wave can hold 1,800 lbs of solder. The solder in the waves only adheres to the holes. The ERSA machines apply flux and lead-based solder selectively only to the holes, not the entire side of the board. Each ERSA can hold 25 lbs of solder. On the Bay 3 line, there are also two machines used to apply silicone to the components and boards to protect against moisture. An additional oven on the Bay 3 line is used to cure the silicone. There are two machines used to clean screens and one machine used to clean pallets at the facility. Isopropyl alcohol is used in the screen cleaning machines and "Zestron" solution is used in the pallet cleaning machine.

FG-CIRCUITMFG

The description of FG-CIRCUITMFG states the circuit board manufacturing process includes 15 solder paste machines, 15 infrared reflow ovens, 15 wave solder machines, 2 pallet washers, and 2 stencil washers, however, there are only actually 3 solder paste machines (screens), 6 electric convection ovens, 5 wave/ERSA solder machines, 1 pallet washer, and 2 stencil washers currently at the facility. As stated in the process description, Jabil plans to add another assembly line in the near future.

Conditions in FG-CIRCUITMFG apply to the solder paste machines, ovens, wave and ERSA machines, stencil washers, and the pallet wash machine.

Particulate matter (PM) emissions from FG-CIRCUITMFG are limited to 0.10 lb per 1000 lbs of exhaust gases in SC I.1. Compliance with the PM limit, per the PTI, is determined via stack testing upon request of the AQD. The AQD has not requested Jabil perform stack testing to verify the PM limit. The equipment in FG-CIRCUITMFG vents to a common duct inside the building and exits to the atmosphere through one of four openings. Mr. Morgan took a picture of the stack during the inspection. No opacity was observed to be emanating from the stack in the picture.

Lead emissions from the solder wave and ERSA machines are limited to 10.2 lbs per month. The lead emission factor was determined via stack testing conducted on October 24-25, 2012 and February 14, 2013. The stack report indicates that the lead emissions rate from the oven that was tested was 0.00000162 lb/hour and the lead emissions from solder wave machine tested was 0.000365 lb/hour. Emission records provided by Mr. Morgan (Attachment 1) indicate Jabil is using the lead emission factors determined during the stack test to calculate lead emission from the ovens and solder wave machines. These records show the highest monthly lead emissions between January 2018 and July 2020 were 0.00002 lbs, which is less than the limit in SC I.2.

Volatile organic compound (VOC) emissions from FG-CIRCUITMFG are limited to 30.5 tons/year in SC I.3. Compliance with the VOC limit, per the PTI, is demonstrated through records of the amount of material used, the VOC content of the materials, material usage rate, and monthly and 12-month rolling VOC emissions calculations. Mr. Morgan indicated that the usage rate is determined by inventory. The monthly and 12-month rolling VOC emissions records provided by Mr. Morgan (Attachment 1) indicate the highest facility-wide 12-month rolling VOC emissions between January 2018 and July 2020 were 9.44 tons reported for July 2019.

PTI 283-00A contains the following material limits for FG-CIRCUITMFG:

Material	Limit
1. Solder Paste	2,149 pounds/month
2. Solder Bar	28,125 pounds/month
3. Flux	150 gallons/month
4. Thinner	500 gallons/month
5. Conformal Coating	300 gallons/month

Mr. Morgan provided monthly material usage records of solder paste, solder bar, flux, thinner, and conformal coating used between January 2018 and July 2020 (Attachment 2). The monthly usage reported for each material between January 2018 and July 2020 is listed below:

Material	Highest Usage Reported January 2018- July 2020
1. Solder Paste	403 pounds/month
2. Solder Bar	1,450 pounds/month
3. Flux	34 gallons/month
4. Thinner	25 gallons/month
5. Conformal Coating	85 gallons/month

FG-FACILITY

Individual and aggregate 12-month rolling HAP emission limits of 8.9 tons and 22.4 tons, respectively, are established for the entire facility in this flexible group.

According to the application for PTI 283-00A, one of the solder bars, Kester Ultrapure SAC 305, contained antimony. The PTI evaluation form contains calculations for antimony and butyl carbitol, however, the SDS for Kester Ultrapure SAC 305 does not list antimony or butyl carbitol. Antimony and butyl carbitol emissions were being calculated prior to the 2015 AQD inspection conducted by Eric Gurshaw. In the March 20, 2015 inspection report, Mr. Gurshaw noted "it was determined during the permitting process that only 1% of the antimony in the leaded solder paste and bars is actually emitted during the circuit board manufacturing process. Butyl carbitol comprises 2% of the leaded solder paste, but, once again, only 1% of the butyl carbitol in the solder paste is emitted during the manufacturing process. The highest combined 12-month rolling emission of antimony and butyl carbitol from December 2012 through February 2015 was 7.42 pounds." According to Mr. Morgan, Jabil interpreted Mr. Gurshaw's statements to mean they don't have to calculate antimony and butyl carbitol emissions due to the very low concentration. Information in the SDSs and from Mr. Morgan indicate there is not evidence butyl carbitol is being emitted.

Based on the SDSs for the materials used at the facility, conformal coating, leaded solder bar, and leaded solder paste contain HAPs. The SDSs for the conformal coatings indicate they contain at most 0.25% methanol and the leaded solder bars and pastes contain lead. The SDS for Alpha EF-8000 No Clean Flux indicates the product contains up to 10 percent glycol ether, however, a CAS is not listed for the glycol ether. Mr. Morgan contacted the

manufacturer to determine whether the glycol ether present in the product is considered a HAP. Mr. Morgan is still waiting for a response.

Currently, the only HAP Jabil is reporting is lead. I informed Mr. Morgan that Jabil should be calculating all HAP emissions from the facility including methanol, antimony, and glycol ethers that have not been determined to be excluded from the glycol ether category of HAP. Mr. Morgan indicated the HAP calculations will be updated and submitted when the company's environmental consultant returns from vacation the week of October 5, 2020.

Based on the usage information provided by Mr. Morgan for January 2017 through July 2020 and the information in the SDSs, I determined glycol ether is the individual HAP emitted in the greatest quantity from the facility. The highest 12-month rolling glycol ether emissions between January 2018 and July 2020, based on my calculations using the data provided by Mr. Morgan, would be 0.042 tons and the aggregate glycol ether, lead, and methanol emissions would be approximately 0.049 tons. Individual and aggregate HAP emissions from the facility appear to be well below the limits in PTI 293-00A.

CONCLUSION

Based on the information gathered during this inspection, Jabil appear to be in compliance with Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment, Great Lakes and Energy, Air Quality Division (EGLE-AQD) Rules; and the conditions of Permit To Install (PTI) Number 283-00A for circuit board manufacturing equipment.

NAME

K. Kelly

DATE

9/30/20

SUPERVISOR

Joyce