

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

N270266657

FACILITY: Kay Automotive Graphics		SRN / ID: N2702
LOCATION: 57 Kay Industrial Dr., LAKE ORION		DISTRICT: Warren
CITY: LAKE ORION		COUNTY: OAKLAND
CONTACT: Joshua Flood , EHS Compliance Admin		ACTIVITY DATE: 11/04/2022
STAFF: Iranna Konanahalli	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: ROP Opt-out and MACT Synthetic Minor, CMS scheduled FY 2023 inspection of Kay Automotive Graphics ("Kay") located at 57 Kay Industrial Dr., Lake Orion, MI 48359-1832.		
RESOLVED COMPLAINTS:		

Kay Automotive Graphics (N2702)**57 Kay Industrial Dr.****Lake Orion, MI 48359-1832****NAIC Code: 323113 Commercial Screen Printing without publishing****Contacts:**

1. **Joshua Flood** EHS Compliance Manager

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Active Permits

1. **PTI No. 46-13 (KPMF, 67 Kay Industrial Dr.)** dated May 17, 2013, for new single (1) reverse roll coating line (EUCoatingLn). Rule 702 VOC BACT: **non-fugitive enclosure (NFE)** with 100 percent VOC capture efficiency (100% CE) and a **regenerative thermal oxidizer (RTO)** with 98 percent VOC destruction efficiency

(98% RTO DE). The RTO is equipped with two (2) high heat capacity ceramic packing chambers, which switch back and forth based upon time (about 5 minutes). NFE is equipped with an alarm system: **GREEN** light = negative pressure. **ORANGE** light = near zero or positive pressure. The permit was issued to KPMF USA INVESTMENT, LLC for a plastic film casting/coating line.

2. **PTI No. 305-05J (Kay, 57 Kay Industrial Dr.)** dated December 21, 2016, modification replacing two printing presses. The modification increased VOC emissions of FG-SCREENWASH from 10.0 tons per year (tpy) to 18.0 tpy. The permit was issued to Kay Automotive Graphics for screen printing and washing print screens. The permit was issued to Kay Automotive Graphics

June 04, 2015, Stack Test (PTI No. 46-13 (KPMF))

On June 04,2015, Stack Test Group, Inc. (STG) (Phone: 815-433-0545; Project No. 15-2656) of Ottawa, IL 61350, conducted a stack test for RTO VOC destruction efficiency. STG reported the results as follows:

1. RTO Inlet VOC: 1775.7 ppm and 137.960 pounds per hour as propane
2. RTO Outlet VOC: 2 ppm and 0.210 pounds per hour as propane
3. RTO destruction efficiency: **98.8** percent (DE 98.8% > 98%, PTI No. 46-13, EUCoatingLn, IV.2: DE > 98%) at 1560 °F.

On November 04, 2022, I conducted a level-2 ROP Opt-out and MACT Synthetic Minor, CMS scheduled FY 2023 inspection of Kay Automotive Graphics (“Kay”) located at 57 Kay Industrial Dr., Lake Orion, MI 48359-1832. The inspection was conducted to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994, PA 451; Michigan Department of Environment, Great Lakes and Energy, Air Quality Division (EGLE-AQD) administrative rules; and the permits (PTI No. 46-13 (KPMF) & PTI No. 305-05J (Kay)).

During the inspection, Joshua, EHS Compliance Manager, and Amy Kemp EHS Compliance Administrator, assisted me.

Michael Kozik, EHS Compliance Administrator, was not present.

Since 1991, Kay Premium Marking Films (KPMF) has been manufacturing high quality self-adhesive vinyl films in South Wales, United Kingdom (initially, Premium Marking Films (PMF)). In July of 1995, PMF was acquired by Kay Automotive Graphics (KAG) of Michigan, a premier supplier of graphics to the automotive industry. At this time, PMF changed the trading name to Kay Premium Marking Films (KPMF) Ltd. Kay Automotive Graphics was acquired by ORAFOL in September 2019. Kay Automotive Graphics and KPMF subsidiaries continue to operate under their respective names as wholly owned subsidiaries of ORAFOL International Inc. of Black Creek, Georgia.

Kay Automotive Graphics (Kay, 57 Kay Industrial Dr., PTI No. 305-05J for printing lines) operates 24 hours a day, Monday through Friday, producing original equipment manufacturer (OEM) decals for vehicles. Designs are printed on PVC film or urethane using printing presses equipped with electric infrared dryers. On the other hand, KPMF USA INVESTMENT, LLC (KPMF, 67 Kay Industrial Dr. , PTI No. 46-13 for coating with an RTO for VOC destruction) operates Monday through Friday 5:25 AM - 9:35 PM. At KPMF, the coating applicators are used to cast plastic film rolls and to apply adhesive or urethane clear topcoat to plastic film. Film manufactured by KPMF is purchased by Kay Automotive Graphics. Kay Automotive Graphics and KPMF USA INVESTMENT, LLC are located in the northeast quadrant of Oakland County, Michigan.

PTI No. 305-05J is issued to Kay Automotive Graphics with ROP (PTI No. 305-05J, FGFACILITY, I.4: VOC < 89.9 tpy) and MACT (PTI No. 305-05J, FGFACILITY, I.1-2: Single HAP < 8.9 tpy & Aggregate HAPs < 22.4 tpy) Synthetic Minor limits per the US EPA Policy (federally, legally, and practicably enforceable synthetic minor limits).

PTI No. 46-13 (KPMF, 67 Kay Industrial Dr.)

PTI No. 46-13, Emission Unit (EU)

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date/ Modification Date	Flexible Group ID
EUCoatingLn	Manufacturing of plastic casted film rolls using coating applicators such as reverse roll, rotary screen, knife over roller or slot die. In addition to the manufacture of plastic film, the coating line applies adhesive, ink, or urethane clear topcoat to various plastic film	Installed	PTI No. 305-05G (FGFACILITY)

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date/ Modification Date	Flexible Group ID
	surfaces. Regenerative thermal oxidizer (RTO) will control VOC emissions from this emission unit.		

Only one coating line is present at KPMF (KPMF, 67 Kay Industrial Dr.). The coating room is in negative pressure with respect to its surroundings. Pressure differential ΔP is maintained at negative ≈ 0.01 inches of water. Four (4) of six (6) doors are equipped with air-locks. Two (2) (Maintenance and Personnel doors) of six (6) doors are kept closed during the coating operation; not for regular use but to be used when process is not running. Both Maintenance and Personnel doors are not equipped with air-locks. Visible alarms are present: GREEN = negative pressure & ORANGE = Zero or positive pressure. Either KNIFE-OVER or REVERSE ROLL is used at any given time; never both simultaneously. Maximum operating temperature of the oven is 383 °F depending upon the materials.

As the coated substrate leaves the application station, it enters an indirect heated dryer comprised of seven (7) sections / zones. The dryer sections are heated by pre-heated oil which provides a uniform heat at a temperature not to exceed 240 °C.

The coating operation is performed in a clean room atmosphere (for the purpose of product quality) equipped with air lock chambers to provide access to the room. The clean room environment is under slightly negative pressure. There is a pressure differential reading instrument that is verified daily to ensure a slightly negative pressure before any coating operations begin. The instrument is also equipped with a visual light indicator system in the coating room, which is illuminated GREEN when the room is under slightly negative pressure.

During the inspection of November 04, 2022, RTO temperatures were: Chamber1 = 1661 & Chamber2 = 1636 degrees Fahrenheit (>1560 °F, June 2015 stack test temperature). RTO chambers switch between two high heat capacity ceramic packing chambers based upon time (every ≈ 6 minutes) thus retaining heat of combustion of VOC within the RTO. Also, the coating room was in negative pressure (negative 0.014 inches of water).

RTO is equipped with an operating computer system which monitors the parameters (combustion chamber temperature (°F), compressed air pressure (psig), fuel pressure (inches of water), etc.), as well as fan motor running rpm, RTO cold face temperatures, burner operation, valve positions, natural gas pressure, hydraulic fluid flow, hydraulic fluid levels and hydraulic fluid temperatures, etc.

RTO destruction efficiency: 98.8 percent (DE 98.8% $>$ 98%, PTI No. 46-13, EUCoatingLn, IV.2: DE $>$ 98%) at 1560 °F per June 04, 2015, Stack Test. RTO operating temperature is customarily $>$ 1600 °F.

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date/ Modification Date	Flexible Group ID
<p>KPMF is planning to install two more lines with one shared / communal RTO about June 2023. It may be an opportunity to consolidate all permits into one synthetic minor permit.</p>			
<p>Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.</p>			

PTI No. 46-13, EUCoatingLn (KPMF)

Manufacturing of plastic casted film rolls using coating applicators such as reverse roll, rotary screen, knife over roller or slot die. In addition to the manufacture of plastic film, the coating line applies adhesive, ink, or urethane clear topcoat to various plastic film surfaces.

VOC Control Equipment: VOC emissions from this line (EUCoatingLn) are controlled through Non-Fugitive Enclosure (NFE) as a VOC capture device and by a regenerative thermal oxidizer (RTO) as a VOC thermal destruction device.

PTI No. 46-13, EUCoatingLn, I.1

Pollutant	Limit	Time Period / Operating Scenario	Equipment	CY 2021 each month	
1. VOCs	16.7 tpy	12-month rolling time period as determined at the end of each calendar month	EUCoatingLn	<3.6 tpy	

PTI No. 46-13, EUCoatingLn, III.1-3

KPMF captures all solvent containing materials (including rags) stores them in closed containers (as observed by me during the inspection) and disposes of as RCRA Haz Waste via RCRA Manifest. (PTI No. 46-13, EUCoatingLn, III.1-2). KPMF submitted a malfunction abatement plan (MAP) (#4201-548, Rev. C, effective September 28, 2021) for the RTO as required by PTI No. 46-13, EUCoatingLn, III.3: malfunction abatement plan (MAP).

PTI No. 46-13, EUCoatingLn, IV.1-4

KPMF has equipped the coating line with roller applicators providing 100 percent transfer efficiency (100% TE), a NFE enclosure providing 100 percent capture efficiency (100% CE), an RTO with minimum 98 percent destruction efficiency (>98% RTO DE at 1550 °F), RTO combustion chamber temperature monitoring device, an alarm system to ensure air flows into the NFE through all natural draft openings (NDOs). (PTI No. 46-13, EUCoatingLn, IV.1-4). Based upon CY 2021 temperature summary data, RTO operated at > 1610 °F. In June 2015 Tom Gaslioli, of EGLE-AQD-TPU verified NFE using Method 204 (Criteria for and Verification of a Permanent or Temporary Total Enclosure) at negative 0.007 inches of water.

Based upon the MS Excel spreadsheets submitted, the required calculations are performed, VOC content information is kept, monthly records are maintained, RTO temperatures are recorded continuously. (PTI No. 46-13, EUCoatingLn, VI.1-4).

PTI No. 305-05J (Kay, 57 Kay Industrial Dr.)

PTI No. 305-05J, Emission Units (EUs)

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
EU-PRINT001	Printing Line 1 - One stationary semi-automatic screen printing press, and one electric infrared dryer.	04-2011 / 12-21-2016	FG-LINES/OVENS FG-SCREENWASH
EU-PRINT002	Printing Line 2 - One semi-automatic screen printing press and one electric infrared dryer.	12-21-2016	FG-LINES/OVENS FG-SCREENWASH

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
EU-PRINT003	Printing Line 3 - One semi-automatic screen printing press and one electric infrared dryer.	11-1988 / 01-2014 / 12-21-2016	FG-LINES/OVENS FG-SCREENWASH
EU-PRINT004	Printing Line 4 - One stationary semi-automatic screen printing press and one electric infrared dryer. Note: Press 4 and Press 12 will not operate simultaneously.	04-1995 / 12-21-2016	FG-LINES/OVENS FG-SCREENWASH
EU-PRINT005	Printing Line 5 - One stationary semi-automatic screen printing press and one infrared/electric dryer.	01-2011 / 04-2011	FG-LINES/OVENS FG-SCREENWASH
EU-PRINT006	Printing Line 6 - One automatic printing press and one electric infrared/electric dryer.	01-2014	FG-LINES/OVENS FG-SCREENWASH
EU-PRINT007	Printing Line 7 - One semi-automatic screen printing press and one infrared/electric dryer.	02-1993 / 08-2012 / 12-21-2016	FG-LINES/OVENS FG-SCREENWASH
EU-PRINT008	Printing Line 8 - One automatic screen printing press and one electric infrared dryer.	08-2011 / 12-21-2016	FG-LINES/OVENS FG-SCREENWASH
EU-PRINT012	Printing Line 12 - One semi-automatic screen printing press that utilizes the electric infrared dryer on EU-PRINT004. Note: Press 4 and Press 12 will not operate simultaneously.	03-01-2013 / 12-21-2016	FG-LINES/OVENS FG-SCREENWASH
<p>At Kay Automotive (Kay, 57 Kay Industrial Dr.), Print12 is not usually used. But Print12 is, occasionally, used for magnetic ink printing process together with Print4 which serves solely as magnetism device. During this magnetic period, obviously, Print4 is not coating. Eight (8) printing lines are not identical in size and speed. Each printer is equipped with its own dedicated electric dryer. 99 percent (99%) of jobs get clearcoat (CC). Some jobs get only CC. Only CC jobs are baked in the ovens (2). 3 mobile presses do not have their own oven but use existing two ovens.</p>			
EU-MOBILPRINT		12-21-2016	FG-LINES/OVENS

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
	Three mobile screen-printing presses utilized on any of the stationary print lines.		FG-SCREENWASH
EU-OVENLARGE	Natural gas fired large Dispatch oven	01-1987	FG-LINES/OVENS
EU-OVENSMALL	Natural gas fired small Dispatch oven	01-1987	FG-LINES/OVENS
EU-SWROOM	Screen Washroom: Screen washing process of the printing screens used in the printing process. Printing screens are solvent washed on either the printing line itself or in the screen washroom.	01-1987	FG-SCREENWASH

In the screen washroom, solvents are used to clean screens, tools, utensils, etc. Print lines VOC emissions are not controlled by a thermal oxidizer or any such VOC control device. Even print oven emissions are uncontrolled. Only clearcoats are baked in the ovens. No solvent immersion cleaning takes place but only with wet rags. Screen washing occurs either in the printing line itself or in a special room called the screen washroom.

Rags are centrifuged to recover solvents and to remove solvents from rags. Solvents are stored in an air-tight holding tank. The containers with lids, also, are used for storing solvent laden rags.

30-gallon solvent distillation unit (D.W. Renzmann 30-gallon unit, operating at 225-250 ° F) is present to recover solvent. Heat Transfer Fluid (HTF) is electrically heated. HTF is circulated to evaporate solvent. The condensed solvent is recovered and reconstituted with acetone to reuse.

10% IPA used in solvent washer is disposed of as RCRA non-hazardous liquid industrial waste via RCRA Manifest.

Mr. Flood stated that Kay Automotive Graphics uses acetone/PM acetate to wash the print screens. The amount of cleaning solvent used is determined by measuring the liquid level in the solvent container with a ruler before and after use each day and subtracting the amount of solvent reclaimed. Mr. Flood stated that 100 percent of the cleaning solvent reclaimed is re-used in the screen wash process. Mr. Flood showed me measuring stick used to measure the solvent in the containers.

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
<p>Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.</p>			

PTI No. 305-05J, Flexible Groups (FGs) (Kay)

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
<p>FG-SCREENWASH</p>	<p>Screen washing process of the printing screens used in the printing process. Printing screens are solvent washed on either the printing line itself or in a special room called the screen wash room.</p>	<p>EU-PRINT001 EU-PRINT002 EU-PRINT003 EU-PRINT004 EU-PRINT005 EU-PRINT006 EU-PRINT007 EU-PRINT008 EU-PRINT012 EU-MOBILPRINT EU- SWROOM</p>
<p>Screens are cleaned in screen wash room as well as at the presses using solvents.</p>		
<p>FG-LINES/OVENS</p>	<p>Consists of the ten printing lines and the large and small Despatch ovens. Each printing line includes one infrared electric dryer and one stationary and/or mobile printing press.</p>	<p>EU-OVENLARGE EU-OVENSMALL EU-PRINT001 EU-PRINT002</p>

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
		EU-PRINT003 EU-PRINT004 EU-PRINT005 EU-PRINT006 EU-PRINT007 EU-PRINT008 EU-PRINT012 EU-MOBILPRINT
FG-FACILITY	All process equipment at the stationary source including equipment covered by other permits, grandfathered equipment and exempt equipment.	All emission units at the stationary source.

PTI No. 305-05J, FG-SCREENWASH (Kay)

Screen washing process of the printing screens used in the printing process. Printing screens are solvent washed on either the printing line itself or in a special room called the screen washroom.

PTI No. 305-05J, FG-SCREENWASH, I.1 (Kay)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	CY 2021	
1. VOC	18.0 tpy	12-month rolling time period as determined at the end of the calendar month	FG-SCREENWASH	< 4.2 each month	

PTI No. 305-05J, FG-SCREENWASH, II.1 (Kay)

Material	Maximum VOC Content, As Applied	Annual Usage Limit	Time Period / Operating Scenario	Equipment	CY 2021	
1. Screen Wash Solvent	4.03 pounds per gallon	8,950 gallons	12-month rolling time period as determined at the end of the calendar month	FG-SCREENWASH	< 2,051 each month	
Screen wash solvent contains 55% acetone (an exempt compound from VOC). Hydrometer is used for reconstitution process to precisely 55% acetone.						

PTI No. 305-05J, FG-SCREENWASH, III.1-2 (Kay)

All solvents and rags are kept in close containers and handle properly and disposed as RCRA non-hazardous liquid industrial waste or RCRA hazardous solid waste (as the case may be) via RCRA Manifest. (PTI No. 305-05J, FG-SCREENWASH, III.1-2)

PTI No. 305-05J, FG-SCREENWASH, VI.1-4 (Kay)

Materials and VOC records kept, the required calculations are performed, etc. (PTI No. 305-05J, FG-SCREENWASH, VI.1-4)

PTI No. 305-05J, FG-LINES/OVENS (Kay)

PTI No. 305-05J, FG-LINES/OVENS, I.1-3

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	CY 2021 Each month	
	47.5 tpy		FG-LINES/OVENS	< 20.1	

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	CY 2021 Each month	
1. VOC		12-month rolling time period as determined at the end of each calendar month			
2. VOC	6.5 lb/gal (minus water) ^a , as applied	Calendar day	FG-LINES/OVENS when using ink	< 6.5 (≈6.2 avg)	
3. VOC	4.8 lb/gal (minus water) ^a , as applied	Calendar day	FG-LINES/OVENS when using clearcoat	< 4.8 (≈4.6 avg)	
<p>^a The phrase “minus water” shall also include compounds which are used as organic solvents and which are excluded from the definition of volatile organic compound. (R 336.1602(4))</p>					

PTI No. 305-05J, FG-LINES/OVENS, II.1-2

Material	Maximum VOC Content, As Applied	Annual Usage Limit	Time Period / Operating Scenario	Equipment	CY 2021 Each month	
1. Clearcoat	4.8 pounds per gallon	8,791 gallons	12-month rolling time period as determined at the end of the calendar month	FG-LINES/OVENS	< 4,848.8 gallons < 4.8 ≈4.6 avg pounds per gallon	
2. Ink	6.5 pounds	8,115 gallons	12-month rolling time period as	FG-LINES/OVENS	< 3810.9	

	per gallon		determined at the end of the calendar month		gallons < 6.5 ≈6.2 avg pounds per gallon	
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PTI No. 305-05J, FG-LINES/OVENS, III.1-3

EU-PRINT004 and EU-PRINT012 cannot be operated simultaneously as PRINT4 is magnetic mode. All solvent-bearing materials and rags are kept in closed containers. (PTI No. 305-05J, FG-LINES/OVENS, III.1-3)

PTI No. 305-05J, FG-LINES/OVENS, VI.1-4

VOC content, material information, usage etc. records are kept, the required calculations are performed using MS Excel Spreadsheet. (PTI No. 305-05J, FG-LINES/OVENS, VI.1-4)

PTI No. 305-05J, FGFACILITY (Kay)

PTI No. 305-05J, FGFACILITY, I.1-4

Pollutant	Limit	Time Period / Operating Scenario	Equipment	CY2021 Each month	
1. Each Individual HAP	8.9 tpy	12-month rolling time period as determined at the end of each calendar month.	FGFACILITY	< 5	
2. Aggregate HAPs	22.4 tpy	12-month rolling time period as determined at the end of each calendar month.	FGFACILITY	< 7.335	

Pollutant	Limit	Time Period / Operating Scenario	Equipment	CY2021 Each month	
3. VOC	7.7 tpy	12-month rolling time period as determined at the end of each calendar month.	All exempt equipment (current and future) at the stationary source	< 4	
4. VOC	89.9 tpy	12-month rolling time period as determined at the end of each calendar month.		< 31.28	

PTI No. 305-05J, FGFACILITY, VI.1-4

VOC, HAP, materials information and records are kept, VOC & HAPs emissions calculations are performed. (PTI No. 305-05J, FGFACILITY, VI.1-4).

Emergency generators

Two emergency generators are present:

1. DLK (Doosan Engine Model: 21.9L) 400 kW (0.4 MW) emergency backup generator. Natural gas fired SI RICE engine.
2. DND (Cummins Engine Model: QSB7-G5 NR3) 100 kW (0.1 MW) emergency backup generator. Diesel CI RICE engine. Installed about 2010. NSPS Certificate not verified.

Both engines auto exercise once per week. I did not inspect the engines.

CONCLUSION

Kay Automotive Graphics and KPMF USA LLC are compliance with the PTI Nos. 305-05J (Synthetic Minor, Kay) and 46-13 (KPMF) and Clean Air Act. Both are under common ownership and adjacent under one common SRN N2702.

NAME *J. S. Marshall*

DATE March 14, 2023 SUPERVISOR *Joyce*