

N6693
MATTN

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

N669344999

FACILITY: COOPER HEAT TREATING LLC		SRN / ID: N6693
LOCATION: 20251 SHERWOOD AVENUE, DETROIT		DISTRICT: Detroit
CITY: DETROIT		COUNTY: WAYNE
CONTACT: Dave Prebola , Owner		ACTIVITY DATE: 07/10/2018
STAFF: Terseer Hemben	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Degreaser operation VOC compliance		
RESOLVED COMPLAINTS:		

INSPECTED BY : Terseer Hemben, MDEQ
 PERSONNEL PRESENT : Matthew Cooper
 CONTACT PHONE NUMBER : (313)-891-1440
 FACILITY FAX : (313) 891-2630
 DATES OF INSPECTION : 07/10/2018
 SRN: N6693

FACILITY BACKGROUND: The Cooper Heat Treating Inc. (CHTI).

The Cooper Heat Treating Inc. (CHTI), located at 20251 Sherwood Avenue, Detroit was formerly registered and permitted under Woodworth Group Inc. The name and ownership change to CHTI came in 2013. The facility is now solely owned by Matthew Cooper. The business continues as metal finishing and cleaning operations. Heat treatment of metals is performed in heat treating furnaces.

Five (5) of the furnaces are operated at atmospheric conditions. Atmospheric conditions support 'nitriding', whereby metals are heated to temperatures ranging 925-1050 F and held for 5 to 40 hours while gaseous Nitrogen is introduced into the surface of ferrous solid alloy in presence of Ammonia gas. No quenching is involved in the process, but a Methane (CH₄) atmosphere is needed to control the process of metal hardening. Gases that are not absorbed during the process are burned off and exhausted through the stack. Gaseous components that include VOCs are combusted in the heating stream and products discharged inside the manufacturing area.

Three (3) of the natural gas fired furnaces are vacuum type and are used to perform various annealing or softening and hardening of steels in an atmosphere devoid of Oxygen. The vacuum furnaces operate under temperatures ranging from 960-2050 F. Ferrous metals are introduced into the furnaces and processed. Nitrogen is used for cooling the process, while the jacket of the furnace is cooled with a closed loop system of tempered water. All emissions are discharged inside the plant.

Five (5) of the furnaces are used for steam oxide treatment of metals in replacement of the 4 previously used natural gas furnaces that were fired only once a month. Steam oxide treatment is performed on ferrous metals to produce a surface and internal oxide that decreases the base material porosity, increases material compressive strength, wear, and corrosion. Operating temperatures range from 700 - 1000 F. The furnaces are used for tempering whereby previously hardened steel is heated to a temperature below the lower critical temperature and cooled at a suitable rate for increase of ductility, toughness, and the grain size of the matrix (draw). The rest of furnaces/ovens are electrically heated.

CHTI operates Degreaser¹ whose gaseous stream is vented through the exhaust stack. The degreaser uses N-Propyl Bromide (NpB) solvent for metal cleaning. The facility's Techtride NPB degreaser is a single open top batch vapor degreaser model BACT-120A equipped with a Rite-Temp water chiller and operates under permit No. 34-03A. The chiller provides a cooling function for the 125% freeboard height chilling coils larger than the Degreaser requirement for solvent-air interface of 47.25 square feet. Parts requiring degreasing are racked to minimize solvent

cupping. The rack is slowly lowered into the degreaser using an automated process. The automated system on the new degreasing equipment controls timing of lowering and opening clearance for every operational event. The heater located at the bottom of equipment provides heat that causes the degreaser solvent to rise to the top of the freeboard. The degreaser is equipped with an exhaust hood, which draws surrounding air into exhaust stack. Literature detailing the degreaser exhaust stack operation is in the AQD file. Permit No. 34-03A requires CHTI to recover the solvent from sump filtration at a minimum efficiency 80 percent.

The CHTI installed a new Spray Wash system that utilizes aqueous surfactant solution for metal cleaning. The Spray wash equipment holds 14000 pounds of wash liquid per batch. Spent liquid is pumped into an oil and water separator where the solvent floats and is recovered. Spent wash solvent is sent to a newly installed pressure filter, where metal particles are reclaimed and sold to customers. The precleaning unit met the exempt status from permit under Rule 281(2)(k).

Nitrogen and ammonia are stored in small cylindrical tanks on the site. Ammonia is used in heat treating process. Nitrogen is used to control temperature in heat treating equipment chamber. The gases are piped into the heating chamber for dispensing when necessary. Emissions from the gases are discharged inside the plant. These equipment are not permitted under Rule 201(1); their regulatory status will be determined during the next inspection.

INSPECTION NARRATIVE

I arrived at the CHTI facility on July 10, 2018 at 1220 hours. The purpose of visit was to conduct an annual inspection for emissions compliance. Temperature at the hour was 84 F with wind speed 9 mph coming from the NNE. Humidity was 38%.

I held a pre-inspection conference with Mr. Cooper. Mr. Prebola was off-site. Mr. Cooper conducted me around the facility for inspection. We inspected the furnaces, water wash, automated open-top degreaser, waste recovery area, waste storage practice, and natural gas supply meters. Finally, we went up on the roof and inspected the stacks. We held a post-inspection conference, shared and discussed the observations. I requested relevant records from CHTI, and asked that the records be forwarded to AQD office, Detroit, within seven (7) working calendar days. The records were forwarded timely via email by Dave Prebola.

COMPLAINT/COMPLIANCE HISTORY:

CHTI facility has not been a source of citizen air quality complaints.

OUTSTANDING CONSENT ORDERS:

None

OUTSTANDING LOV'S:

None

OPERATING SCHEDULE/PRODUCTION RATE:

The CHTI facility is designed to operate 24 hours per day, and 7 days per week. Currently, the facility only operates 24 hours, five days per week.

PROCESS DESCRIPTION:

Metal parts are shipped to the Company as pre-cut and shaped parts. CHTI pre-cleans and degreases parts supplied to the facility. The parts are heated before coating is done. Cleaning is performed using either an aqueous Spray Wash (PH 7-9) for water based soluble contaminants, or open top batch vapor degreaser for organic contaminants. The wash system meets exemption from Rule 201 (1) under Rule 281(2)(k). Practically, parts arrive from machine shops coated with grease and wrap for processing. The parts are directly introduced into the Degreaser1. Nitrogen and anhydrous ammonia are dispensed into the plant for heat treatment.

The heat-treating furnaces temper, harden and nitride metals as desired. Four of these furnaces are gas fired and the others are electric furnaces. Sand blasting of parts is carried out in two stations. The

regulatory rule covering the operation of these furnaces will be determined during the next compliance inspection.

APPLICABLE RULES/PERMIT # 34-03A SPECIAL CONDITIONS:

Based on the permit conditions and guidelines of State Rules, NESHAP and MACT guidelines, Staff determined:

1. Rule 201 (1): The CHTI stated there has not been modification or change to the process or EUDEGREASER1 since the permit was modified in 2013. [Attachment Pg.1, item# 1]
2. SC. 1.1: CHTI's emissions report indicated the maximum VOC emissions from the EUDEGREASER1 did not exceed 15.0 TPY based on a 12-month rolling period as determined at the end of each calendar month. Records of VOC emissions calculations submitted by CHTI showed the highest emission occurred was 14 tons per year [Attachment, Pg. 3].
3. SC. II.1: CHTI used 2478 gallons of vapor degreaser solvents which compares less than 2725 gallons of vapor degreaser solvents, hereinafter "solvent", per year based on a 12-month rolling period as determined at the end of each calendar month [Pg. 1, item 2, and Pg. 3].
4. SC. III.1: CHTI contracted a company to recover and reclaim, recycle, or dispose of, in accordance with all applicable state rules and federal regulations, the solvents used for EUDEGREASER1. Records submitted by CHTI showed that Parts Cleaning technologies performed the recovery and disposal of waste generated at the facility [Attachments Pgs. 1, item 4, and Pg. 5].
5. SC. III.2: CHTI captured all waste solvents and stored them in closed containers. The permittee disposed of all waste solvents in a manner such that not more than 20% by weight was allowed to evaporate into the atmosphere [Attachment Pg. 1, item 5 and Pg. 10].
6. SC. III.3: CHTI developed written procedures in accordance with SC IV.1 for the operation of EUDEGREASER1, and such procedures were posted in an accessible, conspicuous location near the vapor degreaser. [Attachment Pg. 1, item 6 and Pgs. 11-13].
7. SC. III.4: CHTI uses N-Propyl Bromide solvents in EUDEGREASER1. Permittee applied for permit in 2013 and was permitted to use NpB vapor degreaser solvent. The halogenated solvent is not listed in 40 CFR 63, Subpart T [Attachment Pg. 1, item 7].
8. SC. IV.1: CHTI operates a EUDEGREASER1 was equipped with at least one of the followings:
 - a. The freeboard height to the width ratio of the degreaser was equal to 1.25, which is greater than 0.75. The degreaser has 125% freeboard height with a fully automated cover [Attachment pg. 1, item 8, and Pgs. 14-17]. Staff verified the dimensions of the equipment an operability during the inspection.
9. SC. IV.2: CHTI operated EUDEGREASER1 with all the following conditions met during the inspection:
 - a. A cover was installed that was designed to be opened and closed easily without disturbing the vapor zone. The cover remained closed, except when processing workloads through the degreaser. Staff observed during the inspection the cover was closed while the degreaser was in operation. The degreaser design was automated to open and close easily with timed loading and parts removal events without disturbing vapor zone.
 - b. A procedure was developed to minimize solvent carryout by doing all the following:
 - i. Racking parts to allow complete drainage. During the inspection, staff confirmed CHTI racked parts to enable automated drainage operation and timed operational events according to the manufacturer's specifications.
 - ii. Moving parts in and out of the degreaser at a vertical speed of less than 11 feet per minute when a powered hoist is used to raise or lower the parts. Staff observed automated movement of parts in and out, and timely hoisting of stacked parts. The program allowed movement of parts in and out of the equipment at programmed speed 9 feet per minute which compared less than 11 feet per minute.

iii. Holding parts in the vapor zone not less than 30 seconds or until condensation ceased. Staff observed automated control of parts residence time and drip capture was more than 30 seconds while watching the demonstration of degreaser parts movement at a speed 9 feet per minute and held in delay motion in the vapor zone during the timed operation.

iv. Tipping or tumbling parts in a manner such that no pools of organic solvent remained on the cleaned parts before removal. Staff observed the full automation of tipping or tumbling of parts for avoidance of pool of organic residual solvent emissions to the surrounding. All operations were conducted under the coordination of air draft generated by draft pressure induced with fan.

v. Allowing parts to dry within the degreaser for not less than 15 seconds or until visually dry. Staff observed demonstration of the automated operation allowing parts to dry within the degreaser for greater than 15 seconds using programmed logic for timing process movement.

c. Staff observed the following control devices were installed during the inspection:

i. Visual demonstration during the inspection confirmed the degreaser was equipped with condenser flow switch that shut off the sump heat automatically when the coolant was not circulating or was too warm.

ii. Demonstration indicated the degreaser sump was equipped with spray, a spray safety switch that automatically shuts off the spray pump when the vapor level dropped excessively.

iii. The degreaser was equipped with automatic vapor level control device that instantaneously shuts off the sump heat if the solvent vapor level rose above the normal design level.

d. Staff observed the total workload at the instance of inspection did not occupy more than ½ of the degreaser's open top area when the demonstration was performed. The rack was designed with good clearance for ease of loading and unloading without causing turbulence in the vapor zone.

e. Staff observed the automated degreaser operation demonstration, which remained closed while in operation while solvent was automatically metered, loaded and delivered below vapor level. There was no evidence of solvent spray above the vapor level.

f. The manager informed there has not been solvent leaks from the NpB open top degreaser since installed; and there were no solvent leaks at the time of inspection.

g. Visual inspection of the sump/separator system did not observe water- solvent mixture exiting the effluent stream.

10. SC. VI.1: CHTI completed all required calculations in a format acceptable to the AQD District Supervisor by the 15th day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. Records kept were performed in the 12-month rolling period as required in SC I.1 and SC II.1. [Attachment 1, Pgs. 2-3]

11. SC. VI.2: CHTI maintained a current listing from the manufacturer of the chemical composition of each vapor degreaser solvent, including the weight percent of each component. The data may consist of Material Safety Data Sheets, manufacturer's formulation data, or both as deemed acceptable by the AQD District Supervisor, and the permittee should have kept all records on file and made them available to the Department upon request. CHTI submitted copies of Material Safety Data Sheet in 2017 for examination. Records are on file.

12. SC. VI.3: CHTI kept the following information monthly for the use of vapor degreaser solvents associated with EUDEGREASER1:

a. Gallons of each solvent used and removed as waste- CHTI submitted records showing compliance for keeping each solvent used and removed as waste in units of gallons [Attachment Pgs. 2-3].

b. Solvent usage calculations determining the monthly "net usage" rate in gallons per calendar month - Records submitted for compliance with solvent usage calculations determining the monthly net usage

rate in gallons per month are listed per calendar month [Attachment Pgs. 2-3].

c. Solvent usage calculations determining the annual “net usage” rate in gallons per 12-month rolling period as determined at the end of each calendar month. The permittee kept the records on file in a format acceptable to the AQD District Supervisor and made them available to the Department upon request- Records submitted for this requirement are listed- CHTI calculated the solvent usage in the correct 12-month rolling period format. [Attachment Pgs. 2-3].

13. SC. VI.4: CHTI kept, in a satisfactory manner, monthly and a 12-month rolling period VOC emission calculation records for EUDEGREASER, as required by SC I.1. The permittee kept all records on file at the facility and made them available to the Department upon request - Records submitted for this requirement are recorded in a 12-month rolling period format as required. AQD response is same as in Question 12(c).

14. SC. VIII.1: CHTI demonstrated the exhaust gases from the stacks listed in the table below were discharged unobstructed vertically upwards to the ambient air unless otherwise noted -Visual inspection of stack discharge point observed the stack vertically discharged exhaust gases and was free of rain cap.

Regulatory Summary

Rule 201 (1)

The process used by CHTI was permitted under the Rule 201(1). The previous degreaser system was modified and installed under PTI# 34-03A.

CHTI presented results of the required health-based screening level analysis that is maintained in AQD file. The rule requirement was met with the use of modified degreaser solvent NpB.

NESHAP

The batch open-top vapor degreaser was previously affected by requirements of the National Emission Standards for Halogenated Solvent Cleaning codified at 40 CFR 63, Subpart T. However, the solvent now used by CHTI does not include any of the listed compounds in the federal rule, therefore the batch open-top vapor degreaser is no longer affected by the requirements of 40 CFR 63, Subpart T.

Michigan Rule 901

The CHTI was in compliance with the Rule 901. There have not been odors, opacity or fallout complaints from citizens attributed to the CHTI process operations.

New Source Review (NSR)

The modification permit application submitted by the CHTI in 2013 subjected the facility to the NSR review. Permit No. 34-03A was issued.

During the inspection, it was observed the alkaline spray wash for pre-cleaning of water-soluble objected materials off metal parts, such as the spray wash, oil, water separator, and wet filter were kept in a satisfactory order.

Ovens/furnaces and stacks – Staff climbed the roof and inspected stacks areas around the furnaces/ovens were satisfactorily maintained. Ducts connecting the furnaces with the stack looked satisfactorily maintained. The stacks had no rain caps installed.

Hygiene and Safety -Areas around the NPB and vapor degreaser designated for pre-cleaning non-water soluble contaminants on metal parts that were supplied by customers for polymer coating were satisfactorily maintained.

The proprietary water-soluble polymer dip that is applied in post thermal processing for enhanced corrosion resistance was connected to flare systems that burn off VOCs inside the plant area. The twin flare stacks are located inside the building. Products of combustion are discharged through the stacks into the manufacturing area.

There were no particulates or open containers holding organic liquid on site.

FINAL COMPLIANCE DETERMINATION:

Based on the evaluation of inspection and records submitted by The Cooper Heat Treating Inc. facility, AQD has determined that CHTI facility operated the open top degreaser process in compliance with the Air pollution regulatory requirements listed in the permit #34-03A. Staff plans to evaluate the applicable rule compliance on heat treat furnaces that use free ammonia and nitrogen, and the corresponding tanks that store pressurized ammonia and nitrogen on the site in the next compliance inspection.

NAME hr DATE 12/11/2018 SUPERVISOR JK