

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Self Initiated Inspection

N2440
FY 2019 Insp-

N244047824

FACILITY: ND Industries, Inc.		SRN / ID: N2440
LOCATION: 1893 Barrett Rd, TROY		DISTRICT: Southeast Michigan
CITY: TROY		COUNTY: OAKLAND
CONTACT:		ACTIVITY DATE: 01/08/2019
STAFF: Iranna Konanahalli	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: FY 2019 inspection of ND Industries, 1893 Barrett Road, Troy		
RESOLVED COMPLAINTS:		

ND Industries (N2440)
1893 Barrett Road
Troy, Michigan 48084

www.ndindustries.com
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Permit Install No. 601-95B dated July 24, 2006 - Active
Voided on July 25, 2006: Permit Install No. 601-95A dated April 23, 2004.
Voided on April 23, 2004: Permit Install No. 601-95
Voided on January 12, 2006: PTI #585-89 dated November 5, 1990.
Voided on September 03, 1996: PTI #602-95 application

VNs: AQD issued Violation Notices (VNs) dated August 16, 1995 (Rule 201: ND Microsphere Manufacturing Process), March 29, 2002 (Permit-to-Install (PTI) No. 601-95, Special Condition (SC) 21, microencapsulated epoxy adhesive process: ND failed to comply with production limit 65 batches per year) and January 26, 2006 (PTI No. 601-95A, SC Nos. 1.2, 1.6, 1.8 & 1.9: ND Industries produced 160 batches in CY 2005 exceeding the limit of 150 batches per year and failed to perform the required calculations). The current PTI No. 601-95B allows up to 300 batches per year (SC 1.2: 300 batches per year is an increase from 160 (PTI No. 601-95B), which in turn increased from 65 (PTI No. 601-95).

On ~~and~~ January 08, 2019, I conducted a level 2 self-initiated annual **FY 2019 inspection** of ND Industries located at 1893 Barrett Road, Troy, Michigan. 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 Environmental Quality, Air Quality Division (MDEQ-AQD) rules; and PTI No. 601-95B dated July 24, 2006.

Mr. Rob Chraska (pronounced Kraska) (Phone: 248-288-0000-ext. 1228 / 248-655-2557-Direct; Cell: 248-535-9480; Fax: 248-649-7730; Email: rChraska@ndindustries.com), GSP, Environmental, Health and Safety Manager, and Mr. Mike Vettraino (Cell: 586-524-8762; Email: mVettraino@ndindustries.com), Chemical Blender and Microcap Specialist, assisted me during the inspection.

Mr. Michael H. Tohlman (Phone: 248-288-0000 / 248-655-2526, Cell: 248-321-8655, Fax: 248-655-2562, mtohlman@ndindustries.com), General Manager, Separated about January 2016.

Ms. Kim Frazier (Phone: 248-288-0000-ext. 1228 / 248-655-2557, Cell: 248-321-9690, Fax: 248-655-2581, kfrazier@ndindustries.com), CSP, Environmental, Health and Safety Manager, separated (retired) from the company about June 2012.

Ms. Susanna Tong (Phone: 248-655-2587; E-mail: stong@ndindustries.com), Supervisor of Compliance and Safety, separated in 2008. Ms. Kristina Berger (Phone: 248-288-0000, Fax: 248-288-0022, kBerger@ndindustries.com), Jr. VP of Corporate Operations and Sales, did not handle Environmental and Safety issues just before she separated about 2013.

Mr. Jim Bar (246-655-2567), Chemical Blending Plant Director, former R & D Division Manager, separated about February 2018.

Mr. Frank Nachtman (Phone: 248-655-2590), Production Division Manager, quit the company after burnt fish odor incident of September 2006. The Troy Fire Dept. investigated the incident. MDEQ-AQD did not receive any complaint regarding the burnt fish odor incident. Mr. Mitch Symonds replaced Nachtman.

ND Industries makes chemicals for fastener locking, bonding and sealing applications for threaded fasteners. At Chemical Blending Plant (adjacent to Barrett Rd), ND Patch System is not applied anymore; about CY 2000, the operations were moved to other plants such as Clawson plant at Crooks Road. Equipment that involved applying a proprietary powder coating (dry and hot fusion of powdered product – ND Patch -- to fasteners) to threaded fasteners of all sizes and configurations, male or female threads, self-locking and self-sealing, while leaving them fully adjustable, has been removed. Based upon on contracts, on again and off again, the Clawson plant applies powder coatings.

Based upon March 27, 2002 inspection, PTI No, 585-89, which AQD voided on January 12, 2006, epoxy coating has not been done since 2000.

The Chemical Blending consists of two areas: Chemical Blending and Chemical Reaction. Both Chemical Formulation Laboratory and Bottling Plant moved to 1896 Barrett Dr. and 1903 Barrett Dr., Troy, respectively.

Chemical Reaction (PTI No. 601-95B)

Emission Unit ID	Emission Unit Description	Stack Identification
EU-MICROCAP	<p>Process equipment includes three (3) heated process kettles with mixers, one (1) heated prepolymer reaction vessel (55 gal drum with mixer), two (2) batch fluidized bed dryers with corresponding fabric filters, and one (1) continuous fluidized bed dryer with corresponding fabric filter.</p> <p>The controls include a Dual air filter with medium efficiency rigid air filters for TSP emissions from process kettles and reaction vessel, while TSP emissions from dryers are controlled by individual fabric filters.</p>	SV-DRYER1, SV-DRYER2, SV-MIXER
<p>While Fitz Aire Fluid Bed Dryer FA500 (big) has been removed since 2013, Fitz Aire Fluid Bed Dryer FA250 (small) has been removed since February 2018. Instead, Kason dryer, with one cyclone and one MAC filter (8 cartridges), is used.</p>		
<p>Changes to the equipment described in this table are subject to the requirements of R336.1201, except as allowed by R336.1278 to R336.1290.</p>		

Emission Limits

	Pollutant	Equipment	Limit	Time Period	Testing/ Monitoring Method	Applicable Requirements
1.1a	VOCs	EU- MICROCAP	4.0 tpy	12-month rolling time period as determined at the end of each calendar month.	SC 1.9	R336.1702(a)
1.1b	Acetone	EU- MICROCAP	10.4 tpy	12-month rolling time period as determined at the end of each calendar month.	SC 1.9	R336.1224
1.1c	Formaldehyde (CAS No. 50- 00-0)	EU- MICROCAP	1,203 pounds per year	12-month rolling time period as determined at the end of each calendar month.	SC 1.10	R336.1225

Chemical Blending manufactures ND Microspheres, which are 50 micron (micrometer or μm , human hair diameter = $75 \mu\text{m}$) spherical particles. The manufacturing plant consists of two areas: Chemical Blending and Chemical Reaction. While an individual particle is called **Microcap**, the formulation liquid is called **Microsphere**. It is accomplished by one Microencapsulated Epoxy Resin Manufacturing process. Of three reactor kettles, one is not used although usable; however, the kettle is used occasionally. The reactor kettle is used to make the Microspheres. The reactants are weighed and pumped into Kettle No. 1 or 2; No. 3 is hardly used. All reactor kettles are spherical in shape. The reactants used are formaldehyde, resin, urea, epoxy, acetone, surfactants, water. Epoxy resin is emulsified in water base (Kettle). Add three compound polymer mixture (formaldehyde, urea, melamine) to the kettle and allow the reaction to take place at 115 degrees Fahrenheit. pH is adjusted to 4 using HCl and allowed to react overnight (Kettle). Then the mixture is base catalyzed to pH of 12 using liquid caustic (NaOH) and allowed to react for four (4) hours (Kettle). The product is brought back to neutral using HCl (Kettle). The product suspended in a liquid and is rinsed for one (1: reduced from three hours) hour using DI water. The product is no longer vacuum dried (one vacuum dryer).

The product used to be transferred to one fluid bed dryer operating at 140-150 degrees Fahrenheit but no more since about 2016. Now only Kason dryer is used. Exhaust from Kason dryer is discharged after particulate matter removal using an air pollution control system consisting of a cyclone with 55-gallons drum as a hopper for collected large particles by centrifugal forces and one MAC filter equipped with eight (8) cartridges and one 55-gallon hopper for collected fine particles; two 55-gallon hoppers in all.

While Fitz Aire Fluid Bed Dryer FA500 (big) has been removed since 2013, Fitz Aire Fluid Bed Dryer FA250 (small) has been removed since February 2018.

Exhaust from operating reactors goes to roof top (16-foot tall building) via Dual Air Filter and

discharged vertically upwards.

Continuous feed dryer

PTI No. 601-95B, in addition to increasing the production to 300 batches per year from 150 batches per year, allowed the installation of a continuous feed fluidized bed dryers: Fitz-FA-250 (small) & Fitz-FA-500 (big). Both Fitz dryers have been removed. Currently (FY 2019), only Kason dryer is operating.

The Kason dryer has a cyclone to reuse / recycle usable product. Following the cyclone recovery, a MAC cartridge filter system (eight (8) cartridges) filters the air. When pressure drop across the filters increases to a set-point (1 inch H₂O), the cartridge filters are automatically shaken to drop the accumulated material, which is disposed of as waste according to RCRA. Pressure differential across the filters (ΔP) is monitored using a PLC.

Chemical Blending Plant

The finished product is packaged according to particle size of cut-off (e.g., Taylor No. 200). There is one Dust Hog Cartridge Filter (4 cartridges with pulse-jet cleaning), which is exhausted outside, for chemical blending area. Chemical Blending area has 55-gallon drum mixers (about 7). The finished product is stored as a dry material, which is formulated to a liquid using solvents on as needed basis. The mixing of the product into a formulation takes place in chemical blending area.

Emissions (PTI No. 601-95B, EU-MICROCAP)

PTI No. 601-95B	Pollutant	Equipment	12-month Limit	Actual emissions CY 2014-2018 OR Corresponding annual batches		
1.1a	VOCs	EU-MICROCAP	4.0 tpy	2.4 2.6 2.6 2.9 2.8		
1.1b	Acetone	EU-MICROCAP	10.4 tpy	7 7.7 7.8 8.7 8.2		
1.1c	Formaldehyde (CAS No. 50-00-0)	EU-MICROCAP	1,203 pounds per year	591 652 655 705 690		
1.2	Yearly number of batches	EU-MICROCAP	300 420 pounds per batch	200 222 223 250 235		

Based upon CY 2018 records, VOC, Acetone, Formaldehyde emissions are **2.8** tons per year (PTI No. 601-95B, EU-MICROCAP, SC1.1a limit: 4 tpy VOC), **8.2** tons per year (PTI No. 601-95B, EU-MICROCAP, SC1.1b limit: 10.4 tpy Acetone) and **690** pounds per year (PTI No. 601-95B, EU-MICROCAP, SC1.1c limit: 1,203 ppy Formaldehyde). The emissions correspond to

235 batches per year (PTI No. 601-95B, EU-MICROCAP, SC 1.2 limit: 300 batches per year; maximum 420 pounds per batch).

The records of number of batches are kept on file (PTI No. 601-95B, EU-MICROCAP, SC1.2). The capsules are made in a batch reactor through the polymerization process. MAC filter is operating properly and PLC monitors pressure differential across the filters (PTI No. 601-95B, EU-MICROCAP, SC1.5).

Audible alarm system (PTI No. 601-95B, EU-MICROCAP, SC 1.6) is present and working properly. The required records are kept and monthly calculations are performed (PTI No. 601-95B, EU-MICROCAP, SC 1.7-1.10).

235 batches per 12-month rolling period (CY 2018) were made (PTI No. 601-95B, SC 1.2 limit: 300 batches per year). 300 batches per year limit of PTI No. 601-65B was revised from 150 batches per year limit of PTI No. 601-65A due to January 26, 2006, letter of violation. PTI No. 601-95 (limit: 65 batches/year) was also revised to PTI No. 601-65A (limit: 150 batches/year) due to compliance problems.

History of non-compliance and PTI modifications

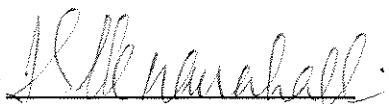
This facility was not in compliance with PTI No. 601-95A as CY 2005 production of 158 batches per year exceeded the limit of 150 batches per year (SC1.2 of 601-95A). 601-95A → 601-95B modification increased the limit to 300 (SC1.2 of 601-95B) batches per year from 150 (SC1.2 of 601-95A). ND did not comply with production limit 65 batches / year of PTI 601-95 either; non-compliance was discovered during May 2003 inspection. Hence, the modification 601-95 → 601-95A increased the production limit from 65 to 150 batches per year.

AQD issued January 26, 2006, Violation Notice for exceeding 150 batches per year limit (601-95A, SC1.2) and for failure to keep records and perform the required emission calculations (601-95A, SC1.6, 1.8, 1.9)

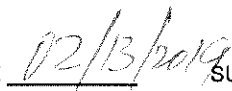
Conclusion

Due to history of non-compliance, follow-up inspections will be conducted to ensure compliance with the permit. ND is in compliance with its permit.

NAME



DATE



SUPERVISOR

