

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

P103458544

FACILITY: ALD Thermal Treatment		SRN / ID: P1034
LOCATION: 2656 24th Street, PORT HURON		DISTRICT: Warren
CITY: PORT HURON		COUNTY: SAINT CLAIR
CONTACT:		ACTIVITY DATE: 06/07/2021
STAFF: Iranna Konanahalli	COMPLIANCE STATUS: Compliance	SOURCE CLASS:
SUBJECT: FY2021 scheduled inspection (off-site) of ALD Thermal Treatment Inc. ("ALDTT" or "the company")		
RESOLVED COMPLAINTS:		

ALD Thermal Treatment, Inc. – USA (P1034)
2656 24th St.
Port Huron, MI 48060-6419

Active PTI: PTI No. 100-19 (Engineer: Jeff Khaled, P1034) dated August 5, 2019 (FGNITRIDING (EU0001 thru EU0004) for four (4) ammonia nitriding machines as follows: .

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device (s))	Installation Date / Modification Date	Flexible Group ID
EU0001	Ammonia nitriding machine used for nitriding metal components in an electrically powered vacuum purged furnace (ALD model F1-00004-Tech NIH 9912). Furnace emissions are controlled by a low flow natural gas fed burner ring.	Aug 2020	FGNITRIDING
EU0002	Ammonia nitriding machine used for nitriding metal components in an electrically powered vacuum furnace (KGO model VAN 18-12-10). Furnace emissions are controlled by two low flow natural gas fed 2-stage burner rings.	Aug 2020	FGNITRIDING
EU0003	Ammonia nitriding machine used for nitriding metal components in an electrically powered vacuum furnace (KGO model VAN 18-12-10). Furnace emissions are controlled by two low flow natural gas fed 2-stage burner rings.	Aug 2020	FGNITRIDING
EU0004	Ammonia nitriding machine used for nitriding metal components in an electrically powered vacuum furnace (KGO model VAN 18-12-10). Furnace emissions are controlled by two low flow natural gas fed 2-stage burner rings.	Aug 2020	FGNITRIDING

While EU0002, EU0003 & EU0004 are controlled by low flow natural gas fed 2-stage burner rings, EU0001 is controlled by a low flow natural gas fed burner ring. Principal requirement of the permit is: "the permittee shall not operate any emission unit unless the respective burner rings are installed, maintained and operated in a satisfactory manner", (PTI No. 100-19, FGNITRIDING, III.1-2). The three larger nitriding furnaces (EU0002, EU0003 & EU0004) have low pressure natural gas 2-stage burner rings that operate at 30 kW max, and normally operate at 6-7 kW. All these burner rings at maximum would be 0.8 mmBTU and emit under 1 tpy NOx. The NOx emissions from the smaller nitriding furnace (EU0001) with a single low flow burner ring are anticipated to be less than the three larger nitriding furnaces. The burner rings burn off hydrogen (H2) gas from NH3 upon cracking (a device cracks NH3 to release N2

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device (s))	Installation Date / Modification Date	Flexible Group ID
	and H2). Nitriding diffuses nitrogen (N2) onto the metal surface to harden. As free hydrogen is highly explosive, an alarm sounds off at certain concentration threshold. All process equipment from old, leased building (P0782) have been moved to new owned building (P1034).		

GPTI (NH3): General PTI No. 6-17 (P0782, leased, old bldg.) for anhydrous ammonia storage and handling and GPTI No. 98-19 (P1034, owned, new bldg.) for 1,000-gallon Anhydrous Ammonia Tank. The old leak detection system (PTI No. 6-17), upon shutdown, has been transferred to the new 1,000-gallon tank (98-19). Also, the old tank has been returned to the vendor.

On June 07, 2021, I conducted a level-2 **FY2021 scheduled inspection (off-site)** of ALD Thermal Treatment Inc. ("ALDTT" or "the company"), located at 2656 24th St., Port Huron, MI 48060-6419. . 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; and Michigan Department of Environment, Great Lakes & Energy, Air Quality Division (EGLE-AQD) administrative rules.

ALDTT operated at two adjoining properties, 2626 (SRN P0782, PTI Nos. 6-17 & 103-18, old, leased building) and 2656 (SRN P1034, PTI Nos. 98-19 & 100-19, new, owned building) 24th Street in Port Huron, Michigan. Potential-to-Emit (PTE), based upon 8,760 hours per year operation, from the nitriding furnaces, nitrogen oxides and carbon monoxide emissions would be just over 1 tpy NOx and 15 tpy CO.

During the FY 2021 inspection, Matt Gilbert (Phone: (810) 357-0522; Fax: (810) 357-0699; Mobile: (810) 333-3079; E-mail: mGilbert@aldtt.net), Environmental, Health, & Safety Manager, assisted me.

Founded in 2006, ALD Thermal Treatment Inc. (ALDTT) is the premier source for Vacuum Heat Treatment Services to the Precision Manufactured Component Segment in USA. ALDTT is providing the following services:

1. Low Pressure Carburizing (LPC)
2. Neutral hardening in vacuum
3. High Pressure Gas Quenching (HPGQ) with N2/He
4. Nitriding
5. Vacuum brazing at high temperatures
6. Annealing in vacuum
7. Thermal de-oiling
8. Pre-cleaning
9. Cryogenics
10. Tempering
11. Shot peening
12. Shot blasting for burr removal
13. Rust protection after treatment

14. Additional Services
15. Metallography and related analysis
16. Geometrical inspection (distortion analysis)
17. Heat treatment consultancy
18. 6 ModulTherm® systems with 37 treatment chambers
19. 2 DualTherm® chamber furnaces
20. 3 Gas Nitride/Ferritic Nitro-Carburizing furnaces
21. Various other pre- & post processing facilities
22. Production Record
23. More than 6 million automatic transmissions

Based upon the August 24, 2020, letter to EGLE-AQD, Lansing, from Mr. Gilbert, ALD TT moved all equipment from a leased building, 2626 (SRN P0782) 24th Street in Port Huron, Michigan, to owned building 2656 (SRN P1034) 24th Street in Port Huron, Michigan. Also, ALD TT installed all process equipment at new owned location (PTI Nos. 98-19 for 1,000-gallon anhydrous ammonia tank and 100-19 for four gas nitride/ferric nitrocarburizing (nitride/FNC) furnaces).

ALD TT constructed a new concrete pad storage area at 2656 for NH₃ storage tank (PTI No. 98-19) and disconnected and removed all ammonia facilities at 2626 (GPTI No. 6-17).

Last year (CY 2020), ALD TT purchased and used 15,966 pounds (≈ 8 tons) of anhydrous ammonia per year (about 6 tank fills worth). Natural gas is only used in emissions reduction (principally, highly explosive hydrogen) post process in the two dual stage ring burners on each of the three nitride/FNC machines (2 ring burners per machine, EU0002 thru EU0004). In addition, one ring burner is present (1 ring burner per machine, EU0001).

ALD TT has 32 pieces of heat treatment equipment at ALD Thermal Treatment 2656, of which all (including nitride/FNC) are vacuum heat treatment chambers, electrically heated, using nitrogen as a control gas (includes nitriders); those furnaces which are used for tempering or pre-oxidation are sometimes using ambient air or nitrogen as control gas mediums. Most of ALD TT's business is low pressure carburizing using helium gas as a quenchant, though some neutral hardening is done using nitrogen gas as a quenchant (the helium is recycled post process for reuse with manufacturer quoted 98% recycling efficiency. Nitrogen gas is also used for cryogenic freezer thermal treatment of customer product to aid in martensitic transformation. About 20-30% of the heat treatment chamber equipment is currently in use due to economic conditions at present.

Ammonia Safety measures for handling and working with Anhydrous ammonia include but are not limited to: emergency breathing apparatus at the tank, emergency rescue mouthbit respirators at every workstation, training on ammonia hazards and emergency response plans, membership on the local emergency planning commission EHS committee/hazards workgroup, spring and fall inspections of the tank site per regulatory requirements (e.g. check for corrosion, paint, weeds, over-pressure relief devices, rescue equipment, etc.) outdoor and indoor multi gas detectors at office area, point of use, and at tank site, security inspections, elevated & locked concrete enclosure with bollards

Conclusion

ALDTT is in compliance with NH3 safety procedures and the burner rings for the furnaces.

NAME *J. S. Marshall*

DATE June 18, 2021

SUPERVISOR *Joyce*