

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

P053137906

FACILITY: TiAL Cast	SRN / ID: P0531
LOCATION: 450 South Shiawassee Street, OWOSSO	DISTRICT: Lansing
CITY: OWOSSO	COUNTY: SHIAWASSEE
CONTACT: Keith Tuthill , Foundry Manager	ACTIVITY DATE: 11/29/2016
STAFF: Julie Brunner	COMPLIANCE STATUS: Compliance
SUBJECT: Scheduled Compliance Inspection of TiAL Cast and TiAL Sport/Product	SOURCE CLASS: MINOR
RESOLVED COMPLAINTS:	

On November 29, 2016, I conducted an unannounced, scheduled inspection of TiAL Cast and TiAL Products (TiAL Sport) in Owosso. This facility was last inspected on May 13, 2015. At the time of the last inspection, TiAL Cast was not operational and was still under construction.

SRN, Facility Name, and Address:

P0531 - TiAL Sport/Products
450 S. Shiawassee St. (M52)
Owosso, Michigan 48867

Facility Contacts:

Mr. Keith Tuthill, TiAL Cast, Foundry Manager, 989-729-8553, keith@tialsport.com
Mr. Eric Schultz, TiAL Products, VP of Operations, 989-729-8553, eric@tialsport.com

Facility Description and Regulatory Review:

TiAL Cast is a casting operation residing within the same facility of TiAL Sport/Products. TiAL Sport is a manufacturer of aftermarket high performance automobile turbo boosters. TiAL Sport purchased steel castings and machined them into their product. With the addition of the casting operation, TiAL Sport has eliminated the outside supplier for castings.

TiAL Sport/Products is located in central Owosso. The area surrounding the plant is mixed use with residential and commercial properties surrounding it.

The facility is a minor source of any regulated air contaminants including hazardous air pollutants (HAPs) and not subject to the Title V Renewable Operating Permit (ROP) program.

Commencement of Operations: Casting operations up and operational, email dated: 10/28/2015

TiAL Cast Staff: 4 + couple of part time Shifts/Day: 1 (6:00 AM to 4:30 PM) Days of Operation/Week: Monday to Friday

TiAL Products Staff: 48-49
Monday to Friday

Shifts/Day: 2 (8-hours)

Days of Operation/Week:

Boilers for Facility Heat? NoEmergency Generators? NoCold Cleaners? Yes

TiAL Products has a small parts degreaser.

List of Active Air Use Permits:

Permit to Install (PTI) 103-14A for a small casting operation.

Flexible Group (FG) / Emission Unit (EG) ID	FG / EG Description	Associated EU IDs
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Flexible Group (FG) / Emission Unit (EG) ID	FG / EG Description	Associated EU IDs
FG-Foundry	Investment casting operation with an afterburner-controlled dewaxing furnace.	EU-BurnoutPreHeat, EU-DewaxFurnace2, EU-MoldForming, EU-Melt1, EU-Melt2, EU-VacuumMelt, EU-Shakeout, EU-SurfaceTreat
EU-BurnoutPreHeat	The burnout pre-heat furnace (nominal 500,000 Btu/hr) heat input rating and afterburner (nominal 871,000 Btu/hr) burn natural gas and operates in one mode. While in wax burnout and pre-heat mode, the afterburner operates.	
EU-DewaxFurnace2 (Not installed yet)	The dewaxing furnace (nominal 670,000 Btu/hr heat input rating) with afterburner (nominal 703,500 Btu/hr) burn natural gas operates in two modes. In wax melting mode, the afterburner does not operate, and in wax burnout and mold preheat mode, the afterburner operates.	
EU-MoldForming	Ceramic shells/molds are formed to the desired thickness on wax patterns as alternating layers of ceramic and sand. Ceramic layers are applied by dipping the pattern into a ceramic slurry. Rainfall sanders are used to apply sand layers between the ceramic layers. A dust collector that exhausts to the general in-plant environment controls particulate matter emissions from the rainfall sander area.	
EU-Melt1	Induction melting furnace with a nominal capacity of 300 pounds.	
EU-Melt2	Induction melting furnace with a nominal capacity of 100 pounds.	
EU-VacuumMelt (Not installed yet)	A vacuum melting/casting process, inside an enclosure, used to cast small parts.	
EU-Shakeout	Ceramic molds are broken from cooled castings, and a grinder and cut-off saw are used to remove excess metal from the castings. The grinder and cut-off saw are exhausted to the in-plant environment through a particulate matter control system.	
EU-SurfaceTreat (electric)	Miscellaneous surface treatment operations exhausted to the general in-plant environment, such as a citric acid leaching and rinse tank and a heated caustic tank (caustic not currently being used).	

Michigan Air Emissions Reporting System (MAERS):

The TIAL facilities are now required to pay an annual air quality fee as a Category III source. The notification email was sent on November 4, 2016 as 2016 will be the first year that this facility has been assessed a fee. Emission information is not required to be reported to MAERS nor does it appear that they need to report it.

Applicable Federal Regulations:

40 CFR 63 Subpart ZZZZZ, National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources – TIAL Cast is subject as a new small foundry.

§63.10880(b)(2) New if constructed after September 17, 2007.

§63.10880(g).....If the annual metal melting capacity is 10,000 tons or less, your area source is a small foundry. If the annual metal melting capacity is greater than 10,000 tons, your area source is a large foundry. You must submit a written notification to the Administrator that identifies your area source as a small foundry or a large foundry no later than 120 days after startup.

Inspection:

Arrived: 9:10 AM

Departed: 12:10 PM

Weather: ~50°F, Light wind, Clear

No visible emissions were observed from any of the facility exhaust stacks upon arrival. No odors were identified surrounding the facility.

TiAL Cast:

A pre-inspection meeting was conducted with Mr. Keith Tuthill (TiAL Cast, Foundry Manager). The purpose of my visit and the status of the facility operations were discussed. Two emission units from PTI 103-14A, EU-DewaxFurnace2 and EU-VacuumMelt, are not installed yet. Then a tour was taken of the new casting operation.

1st Step – Five (5) wax injection presses are used to mold the wax patterns. The wax is heated to 125°F to a paste-like consistency to inject into the mold. The wax injection presses are not listed on the permit and are considered to have no air emissions.

2nd Step – Assembly of wax patterns for slip casting.

3rd Step – Ceramic molds are slip cast from the wax patterns in EU-MoldForming. Three (3) layers of ceramic are applied and dried at 70°F between each layer. Sand is applied in rainfall sanders between each application of ceramic. There are two (2) tanks of ceramic slurry and one (1) tank of binder solution that the wax patterns are dipped in to form the ceramic mold. This process is not vented to the ambient air.

4th Step – Dewaxing of the ceramic mold is done in an electric heated autoclave furnace. The autoclave uses steam to melt the wax out of the molds. The melted wax is collected in a pan and sent back to the supplier. The wax is melted out at 356°F, not burned out. This process has no air emissions and is not on the permit. It may also be replaced by EU-DewaxFurnace2 which is not installed yet.

5th Step – Wax burnout from the molds is done in EU-BurnoutPreHeat which has an afterburner for control. Emissions from this process are vented through a vertical square exhaust stack.

6th Step – Pouring of molten metal into the molds. Metal ingots are heated in induction furnaces (EU-Melt1 & 2) which are vented out the sidewall by a horizontal stack. The stack requirements are not on the permit. This was looked at for the last inspection and was deemed not to be an issue. If the permit is modified, I would recommend that the horizontal stack parameters be added to the permit since the permit should match what was installed to eliminate future questions.

7th Step and 8th Step – This step is the removal of the metal part from the mold. This is done in EU-Shakeout. Ceramic molds are broken from the cooled castings, and a grinder and cut-off saw are used to remove excess metal from the castings. The grinder and cut-off saw are exhausted to the in-plant environment through a dust collector (DC). The DC does have a pressure gauge to show that it is operating properly.

The metal steel used in the casting process comes in the form of ingots in 55-gallon drums. Metal cut off from the castings is stored inside in 55-gallon drums and reused in the process. The records are kept in paper form and logged daily by the operators.

The stacks on the permit are for EU-BurnoutPreHeat and EU-DewaxFurnace2. EU-BurnoutPreHeat (SV-Afterburner1) has a square stack that Keith estimated was 18" x 18" with the internal refractory stack liner. The stack was also built to 34' tall. The permit requirement is an equivalent diameter of 26" which is an area of 530.9 in². The 18" x 18" vent has an area of 324 in² so it is less than the maximum requirements of the permit. The stack meets the minimum required height but it has a stack cap. The permit requirement is for vertically unobstructed, and the stack cap counts as an obstruction. Keith agreed to remove the cap.

40 CFR 63, Subpart ZZZZZ – TiAL Cast became subject to 40 CFR 63, Subpart ZZZZZ upon start-up. All requirements for this Area Source MACT are not on PTI 103-14A, and the state has taken delegation for this regulation. The requirements for initial notification and notification of compliance status are listed in §63.10890.

§63.10890 What are my management practices and compliance requirements?

(a) You must comply with the pollution prevention management practices for metallic scrap and mercury switches in §63.10885 and binder formulations in §63.10886.

(b) You must submit an initial notification of applicability according to §63.9(b)(2).

(c) You must submit a notification of compliance status according to §63.9(h)(1)(i). You must send the notification of compliance status before the close of business on the 30th day after the applicable compliance date specified in §63.10881....

TiAL Cast receives their metal from an out of state supplier and does not take in scrap metal. The binder used does not contain furfural alcohol, resin or methanol and is in compliance with §63.10886. The facility provided notice on October 28, 2015 that their casting operations were up and operational, but did not provide all the details as required in §63.9(b)(2) and §63.9(h)(1)(i). So they are going to provide more information in support of the October 28, 2015 notification.

Records Review:

Paper copies of the following records were obtained and are attached to this report:

1. Afterburner temperature chart recordings for 10/25/16, 10/26/16, 10/27/16, 11/16/16, and 11/17/16.
2. Process information listing dates, times, oven temperature, afterburner temperature, and metal melted for 10/3/16 to 10/21/16, 10/25/16 to 11/4/16, and 11/9/16 to 11/25/16. A new recordkeeping sheet is started with each crucible liner change.

SC VI.2. The permittee shall record the quantity of steel melted in FG-Foundry monthly, for the preceding 12-month rolling time period, in a manner acceptable to the AQD District Supervisor.

- For the month of October, there were 10,475 lb (5.2 tons) of metal melted.
- For the month of November (up to 11/25), there were 8,480 lb (4.2 tons) of metal melted.

The paper logs do need to be added up monthly and for the preceding 12-months in order to show compliance with the 400 tpy metal melted limit. The facility appears to be operating well below the metal melted permit limit.

SC VI.3. The permittee shall keep, in a satisfactory manner, a log of the number of wax burnout cycles conducted during each shift that burnout cycles are conducted in FG-Foundry.

- The records show that they are doing at most two (2) wax burnouts per shift.

They are permitted for seven (7) wax burnouts per shift.

SC VI.4. The permittee shall keep, in a satisfactory manner, a monthly record of the afterburner temperature during each wax burnout cycle.

- The records show that the afterburner is operating at 1500°F or greater.

The afterburner is being operated at 1500°F or greater, and based on proper operation and the vender guarantee it is assumed that the permit requirement for 99% destruction efficiency of volatile organic compounds (VOC) is being achieved.

TiAL Products/Sport:

A pre-inspection meeting was conducted with Mr. Eric Schultz (TiAL Products, VP of Operations) after the TiAL Cast inspection. TiAL Cast and TiAL Products are two separate companies. The operations at TiAL Products include machining of metal rods or billets and metal castings, and assembly to manufacture turbo systems, blow-off valves, and waste gates. They make aftermarket parts for sport cars and racing cars, and sale to distributors.

Current production of blow-off valves is 800 per month and ~9600 per year, production of waste gates is about 15,000 to 18,000 per year, and Eric could not remember approximately how many turbo systems they were producing.

TiAL Products has a large number of manual and automated lathes for parts production. Metal machining processes that are not vented outside the building appear exempt under Rule 285(l)(vi)(B). Many of the metal machining processes use cutting fluids that are mainly water containing approximately 6% of organic glycol-based materials. Hand grinding of castings is done on down-draft tables with built in dust collectors meeting the exemption under Rule 285(l)(vi)(B). Sand blasters with dust collectors that vent internally also meet the permit exemption under Rule 285(l)(vi)(B).

Hand TIG welding is used in the assembly of parts. Welding is exempt under Rule 285(i).

Shot blast machines are used to clean off metal castings and remove the ceramic residuals. The media used to clean the parts is ceramic. The machines have small dust collectors that vent internally. This equipment is exempt under Rule 285(I)(vi)(B).

Water jet cutters and band saws are used to cut metal parts and rods. There are 5-axis, 4-axis, and 3-axis mills used to cut metal parts and vibratory mills to polish parts. An EDM machine is used to drill holes in metal. All are exempt per Rule 285(I)(vi)(B).

A new HVOF plasma system in a booth is being installed. The system is automated and will spray a metal coating on parts to create a hard coating. The system has a dust collector that vents outside and is exempt per Rule 285(i).

Maintenance Shop - There is grinding, milling, manual saws, cutters, routers, drill presses, and lathes in the maintenance areas. These processes are not vented to the ambient air and qualify for exemption per Rule 285(I)(vi)(B).

In the parts assemble areas is a laser engraver for logos, and there is quality control and storage in the facility.

All metal scrap, turnings, etc. are sent out for recycling by a contracted hauler.

There are a couple of parts washers. One uses a water-based detergent and is exempt per Rule 281(e). There is a small parts degreaser that is serviced by Safety-Clean that uses an organic solvent (petroleum distillate). The parts degreaser is exempt per Rule 281(h). The lid was open on the unit and Eric closed the lid as required.

All equipment in the TiAL Products/Sport facility appears to be exempt from permitting or not a source of air pollution.

Summary:

The TiAL facilities appeared to be in compliance with all applicable rules, regulations, and PTI 103-14A. All process equipment at TiAL Products is operating under permit exemptions.

TiAL Cast does need to remove the stack cap on SV-Afterburner1 and provide clarification on the notices required by 40 CFR 63, Subpart ZZZZZ. I asked that this be completed by December 27th and that Keith send me written notification of when these are complete.

NAME Julie P. Bruner

DATE 12/12/16

SUPERVISOR B.M.

