

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

B171668081

FACILITY: BETZ INDUSTRIES INC		SRN / ID: B1716
LOCATION: 2121 BRISTOL AVE NW, GRAND RAPIDS		DISTRICT: Grand Rapids
CITY: GRAND RAPIDS		COUNTY: KENT
CONTACT: Mark Kraak , Environmental Manager		ACTIVITY DATE: 07/11/2023
STAFF: Eric Grinstern	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: On-site Compliance Inspection		
RESOLVED COMPLAINTS:		

## FACILITY DESCRIPTION

Betz Industries is an iron foundry that primarily produces castings for the machine tool, industrial tool and stamping die industries. The facility has three electric induction furnaces and utilizes a furan sand binder system in a lost foam casting operation.

## REGULATORY ANALYSIS

The facility is an opt-out source that holds two permits, 278-98D and 939-90. PTI 939-90 covers a small painting process; 278-98D is an opt-out permit that covers the rest of the foundry operations at the facility. PTI No. 278-98D addresses the three induction furnaces (EU-INDUCTION), all of the foundry processes with baghouse control (FGFOUNDRY), and FGFACILITY, which includes all process equipment source-wide, including the uncontrolled emission units EG-CHIPPING, EG-POURING and EG-CASTING COOL. The facility is subject to and considered a "large" existing area source under the federal Iron and Steel Foundry Area Source National Emission Standard for Hazardous Air Pollutants (NESHAP), 40 CFR Part 63, Subpart ZZZZZ under the Clean Air Act.

## COMPLIANCE EVALUATION

An off-site survey was performed during the daytime and at night just prior to the inspection. No unusual odors or opacity was observed. The on-site inspection started at 10:30 p.m. to coincide with the melting and pouring operations that only occur during the overnight hours. At the facility EG met with Mark Kraak, EHS Manger. Mr. Kraak accompanied EG on a tour of the facility and provided requested records/documents.

The facility can be divided into four areas/buildings, Building 1 - Pattern Shop, Building 2 - Finishing and Coating, Building 3 - Pattern coating, Melting, Pouring/Cooling, Shakeout and Sand System, and Building 4, Machine Shop.

### Pattern Shop (EU-POLYMILL)

The facility has a pattern shop where polystyrene plastic foam blocks are machined/milled to produce the patterns used in the lost foam casting processing. Approximately 50% of the patterns used in the casting process are produced on-site.

Polystyrene fines are controlled by six baghouse collectors. All six of the units are Hoffman brand. All of the baghouses are located in the plant and exhausted to the

ambient air through two stacks, each with a fan located adjacent to the stacks on the northside of the building. Observation of the stacks showed no emissions.

Captured fines along with pieces of scrap polystyrene are ground up and fed into a compactor. Compacted polystyrene is shipped off-site.

EU-POLYMILL is part of FGFOUNDRY, which limits PM, PM10 and VE from the baghouse.

#### Pattern Coating

The Styrofoam patterns are coated adjacent to mold making and the sand system. Pattern coating is conducted without capture or control. Emissions from the coating process are released into the general in-plant environment. Coated patterns are dried in one of three ovens that contain two sections each. The ovens are exempt from permitting under Rule 282(2)(b)(i).

Emissions associated with pattern coating are part of the facility wide limitations under FG FACILITY.

#### Sand System (EU-EQUIP-A) (EU-EQUIP-B) (EU-MISC-E)

The sand system, Didion, lump crushers, feeders, separators, elevators, silos, etc. are all located in the west end of the facility and are controlled by dust collectors, DSTCOLL-C, DSTCOLL-D and DSTCOLL-E.

Emissions associated with the sand system are accounted for as part of the limitations under FGFOUNDRY.

The sand system was not fully operating at the time of the inspection. Pressure drops were observed to be the following: DSTCOLL-C (3.0"), DSTCOLL-D (1.5") and DSTCOLL-E (0.0").

#### Mold Making (EU-MISC-E)

Mold making is included in EU-MISC-E. The facility utilizes a furan-based sand binder system. The facility has four sand mixers, each with a 2,000 pound per minute capacity. The baghouse controlling emissions from all four mixers is Baghouse East (30,000 cfm).

Emissions associated with mold making are accounted for as part of the limitations under FGFOUNDRY.

The sand mixers were not operating at the time of the inspection.

#### Core Making (EU-MIXER2)

The facility uses very few cores. The core making area is primarily used to produce pour dishes. Cores and pour dishes are produced with the same furan resin bound sand that is used in mold making. One sand mixer (Mixer No. 2) is used in the core making area. The mixer is currently controlled by baghouse DSTCOLL- MIX.

Emissions associated with core making are accounted for as part of the limitations under FGFOUNDRY.

The core mixer was not operating at the time of the inspection.

#### **Melting (EU-INDUCTION)**

The facility's charge material is contained in bunkers located inside the building adjacent to the induction furnaces. The facility charges pig iron, stampings and internal runaround. Observation of the stampings showed it to be clean with minimal lubricating fluids and no foreign material. Also adjacent to the induction furnaces are hoppers that contain the alloying elements.

The facility has three 20-ton furnaces, each with an approximate melt rate of 15-tons per hour.

Emissions associated with melting are addressed in EU-INDUCTION and accounted for as part of the limitations under FGFOUNDRY.

See EU-INDUCTION below for compliance evaluation.

#### **Pouring/Cooling (EU-POURING) (EU-CASTING COOLING)**

The furnaces are tapped into ladles that are poured via a hoist system. The facility is a "floor pouring operation" that does not have capture or control for emissions from pouring or cooling. Emissions are released to the in-plant environment.

During the inspection mold pouring was occurring. Pouring emits a large amount of visible emissions into the in-plant atmosphere that is emitted to the outside atmosphere through powered roof fans.

Emissions from EU-POURING AND EU-CASTING COOLING are limited as part of the facility wide limitations under FGFACILITY.

#### **Shakeout (EU-14X16 SHAKE1) (EU-14X16 SHAKE2)**

The facility has two shakeout tables that are adjacent to each other (Shakeout No. 1 and Shakeout No.2) Shakeout No. 1 is controlled by Baghouse A, while Shakeout No.2 is controlled by Baghouse B. Each of the baghouses are rated at 50,000 cfm.

Emissions associated with shakeout are accounted for as part of the limitations under FGFOUNDRY.

The shakeout system was not operating at the time of the inspection.

#### **Finishing (EU-CHIPPING)(EU-WHL-SHOTBLAST)(EU-PNB-SHOTBLAST)**

Finishing operations consist of hand grinders, chisels and shot blast units.

EU-CHIPPING includes the hand grinders and chisels. These units are operated without capture or control, venting to the general in-plant environment.

Emissions associated with EU-CHIPPING are part of the facility wide limitations under FGFACILITY.

The facility operates four shot blast units. EU-WHL-SHOTBLAST covers a Wheelabrator shot blast unit. There were originally two blast units associated with the emission unit. EU-PNB-SHOTBLAST covers two Pangborne shot blasters. Additionally, there is a BCT blast unit that was installed under a Rule 285(2)(vi)(c) exemption.

EU-WHL-SHOTBLAST – the Wheelabrator shot blast unit is the smallest of the shot blast at the facility. The Wheelabrator is located in the northeast corner of the building and is controlled by a Waltz Holtz baghouse, located outside on the northeast corner of the building. The blast unit was not operating at the time of the inspection. The baghouse controlling the shotblast unit is DSTCOLL-WHL.

EU-PNB-SHOTBLAST – The facility has two Pangborne shot blast units that are located in the southeast portion of the building. The Pangbornes were originally controlled by a single 18,000 cfm Pangborne baghouse. Control was switched to the baghouse that was previously associated with melting. The baghouse (DSTCOLL-PANG) is a 20,000 cfm baghouse that is located on the south side of the building, west of the DSTCOLL-BCT baghouse. The shotblast unit was not operating at the time of the inspection.

The BCT shot blast unit is a large unit that was installed under Rule 285(2)(vi)(c) exemption.

The unit is controlled by the baghouse that was previously labeled the West Baghouse. The baghouse is now labeled DSTCOLL-BCT. The baghouse has a rating of 30,000 cfm. The baghouse is located on the south side of the building, east of the DSTCOLL-PANG baghouse. The shotblast unit was not operating at the time of the inspection.

Emissions associated with EU-WHL-SHOTBLAST and EU-PNB-SHOTBLAST are part of the limitations under FGFOUNDRY.

### EU-INDUCTION

The facility has three electric induction furnaces, each with a 20-ton holding capacity. Each of the furnaces is controlled by a separate lime injected baghouse (DSTCOLL-INDUCTION-010, DSTCOLL-INDUCTION-020, DSTCOLL-INDUCTION-030) that exhaust through a single combined stack. The total exhaust flow is rated at 80,000 cfm. In addition to the furnaces, the same baghouses control the emissions from a charge pre-heater unit and hood for ductile inoculation. At the time of inspection the facility was melting and tapping Furnace No. 2. Observation of the furnace showed fugitive emissions during tapping. Staff estimated about 20% of emissions resulting from tapping are not captured by the hood.

### EMISSION LIMITS

Limits the emission of PM, PM10, PM2.5, Lead, Manganese and Visible Emissions.

Initial compliance with the PM/Metal HAP and visible emissions limit was demonstrated via testing conducted in June 2012. The most recent retesting was completed on May 17-18, 2022. to demonstrate compliance under Subpart ZZZZZ (PM and VE). The PM limit under Subpart ZZZZZ is 0.8 pounds per ton of charge. Test

results documented a PM emission rate of 0.0154 pounds per ton of metal charged. Method 9 VE observations for fugitive VE emissions also documented compliance.

Compliance with the emission limits for the remaining pollutants is demonstrated through proper operation of the baghouses and compliance with the scrap management requirements of Subpart ZZZZZ.

#### **Process/Operational Restrictions**

Requires the facility to prepare and operate according to an O&M Plan in accordance with Subpart ZZZZZ and PTI No. 278-98D

The facility previously submitted an O&M Plan and was previously requested to submit a copy of the most current version of the Plan. The facility provided a revised copy of the Plan dated May 2019. Review of the Plan showed that it appeared to meet the requirements of Subpart ZZZZZ and PTI No. 278-98D.

#### **Design/Equipment Parameters**

Requires that EU-INDUCTION be equipped with a capture and collection system in accordance with ACGIH.

The furnaces are equipped with Tornado hoods that completely cover the furnace during melting operations. Each furnace is ducted to an individual baghouse.

Requires the facility to conduct monthly visible inspections of the PM control equipment and record the results. The facility provided documentation of conducting the monthly PMs along with the semi-annual PMs for 2022 and 2023.

#### **Testing**

Requires PM and opacity testing in accordance with Subpart ZZZZZ. The facility conducted initial compliance testing on the previous furnace system in 2011 and on the current furnace system in June 2012. Ongoing opacity testing is required no less than every 6 months under Subpart ZZZZZ. Retesting for PM is required every 5 years. The facility tested and demonstrated compliance with the PM limit in 2022. The facility previously provided the most recent Method 9 test reports for observations conducted on June 6, 2023. The reports show compliance with the opacity limit, with a reading of 0% opacity reported.

#### **Monitoring/Recordkeeping**

Requires initial and subsequent inspections of the PM control devices for EU-INDUCTION in accordance with Subpart ZZZZZ.

The facility provided records demonstrating compliance with the baghouse inspection requirements of Subpart ZZZZZ for 2022 and 2023.

#### **Stack**

Visual observation of the stacks showed that they appeared to meet the required dimensions of 80" maximum diameter and 80' minimum height.

#### **FGFOUNDRY**

EU-14x16 SHAKE1, EU-14x16 SHAKE2, EU-EQUIP-A, EU-EQUIP-B, EU-MISC-E, EU-MISC-WEST (Equipment removed), EU-MISC-EAST, EU-INDUCTION, EU-WHL-SHOTBLAST, EU-PNB-SHOTBLAST, EU-MIXER2, and EU-POLYMILL.

Flex group that essentially covers all foundry processes that have baghouse control. Establishes PM, PM10 and visible emission limits as well as Subpart ZZZZZ requirements.

PM is limited to 0.01 pounds per 1,000 pounds of exhaust gas and PM10 is limited to 0.005 gr/dscf. Visible emissions are limited to 10%.

#### **EMISSION LIMITS**

Limits the emission of PM, PM10, and Visible Emissions. Compliance with the emission limits is demonstrated through proper operation of the baghouses. The facility previously provided a list of the daily, monthly, quarterly, semi-annual and annual PMs conducted.

#### **Process/Operational Restrictions**

Requires the facility to prepare and operate according to an O&M Plan in accordance with Subpart ZZZZZ.

The facility previously submitted an O&M Plan and was requested to submit a copy of the most current version of the Plan. The facility previously provided a revised copy of the Plan dated May 2019. Review of the Plan showed that it appeared to meet the requirements of Subpart ZZZZZ and PTI No. 278-98D.

#### **Testing**

Requires opacity testing in accordance with Subpart ZZZZZ. The facility previously provided Method 9 test reports for observations conducted. The reports showed compliance with the opacity limit.

#### **Stack**

Visual observation of the stacks showed that they appeared to meet the required dimensions.

#### **FGFACILITY**

Flex group includes all process equipment source-wide.

FGFACILITY establishes facility-wide PM, PM10, CO, and VOC limits, as well as opt-out limits for HAP emissions. The flex group also incorporates some of the requirements of Subpart ZZZZZ.

#### **Emission Limits**

Restricts emission of PM, PM10, CO, VOC and HAP emissions. Compliance with the emission limits is demonstrated via the requirement that the facility calculate and maintain monthly and 12-month rolling time period records of emissions.

The facility provided records demonstrating compliance with the emission limits. Below are the highest TPY for the previous 12-month period.

<b>Emission</b>	<b>Recorded</b>	<b>Limit</b>	<b>Emissions</b>
1. PM		98.1 tpy	37.0 tpy
2. PM10		98.1 tpy	37.0 tpy
3. CO		99 tpy	25.6 tpy
4. VOC		45 tpy	4.9 tpy
5. Individual HAP		9 tpy	0.098 tpy
6. Aggregate HAPs		22.5 tpy	0.24 tpy

#### **Material Limits**

Restricts metal throughput to 65,000 tons melted/year and sand throughput to 325,000 tons/year. Compliance is demonstrated via the requirement that the facility calculate and maintain monthly records of sand and metal throughput.

The facility provided records demonstrating compliance with the material limits. The facility recorded a peak metal throughput rate of 24,928 tons of metal and 79,783 tons of sand for the previous 12-month totals.

**PTI No. 939-90 – EUSPRAYER**

#### **Casting coating process**

The facility has a small casting coating operation located in the finishing area of the facility.

The coating process is not captured or controlled. Emissions are vented into the in-plant environment. Castings are coated as a rust preventative and not all of the castings produced are coated.

#### **Emission Limits**

Restricts VOC emissions to 22.5 pound per hour and 0.8 tons per calendar month.

Restricts visible emissions from the building housing the spray area to no VE.

Compliance with the VOC limit is demonstrated through the requirement that the facility maintain monthly records of material usage. Mass balance calculations are used to demonstrate compliance with the emission limits.

The facility recorded a monthly usage high of 340 gallons of coating use for any single month over the previous 12-months.

The highest monthly VOC emission amount was 0.6 tons.

No visible emissions were observed from the building during the inspection or during the pre-inspection off-site observations. Additionally, Subpart ZZZZZ requires fugitive emission readings from the buildings every 6 months. No fugitive emissions have been documented from the building housing the casting coating area.

#### **Material Limits**

Restricts VOC content to 4.5 pounds per gallon minus water.

Restricts coating usage to 5 gallons per hour and 363 gallons per month.

Compliance with the material limits is demonstrated through the requirement that the facility maintain records of coating VOC content and monthly material usage.

Review of the supplied SDS for each of the coatings showed compliance with the VOC content limit. Two coatings are used, one has a VOC content of 3.31 lbs/gallon, while the other coating has a VOC content of 2.80lbs/gallon.

#### **Machine Shop**

The facility has a new building that houses a single, large CNC machine. The CNC machine appears to be exempt from permitting under Rule 285(2)(vi)(B).

Subpart ZZZZZ, Area Source Iron and Steel Foundry NESHAP

#### **Notification/Reporting**

The facility has submitted all required notifications and semi-annual compliance certification reports required by Subpart ZZZZZ by the deadlines.

#### **Metallic Management Practices**

The facility melts pig iron, stamping scrap and internal returns. This material is in compliance with the certified scrap option of the NESHAP. The facility has previously verified that they have specs regarding scrap that have been conveyed to suppliers as required by the NESHAP. The facility does not melt any auto frag or other shredded scrap.

#### **Operation & Maintenance**

The facility previously submitted an O&M Plan and was previously requested to submit a copy of the most current version of the Plan. The facility provided a revised copy of the Plan dated May 2019. Review of the Plan showed that it appeared to meet the requirements of Subpart ZZZZZ.

Requires initial and subsequent inspections of the PM control devices for melting furnaces in accordance with Subpart ZZZZZ.

The facility provided records demonstrating compliance with the baghouse inspection requirements of Subpart ZZZZZ for 2022 and 2023.



### Testing

Since the facility is a “large” area source facility they are subject to compliance testing for the furnaces. The facility conducted compliance testing in April 2011 and June 2012, at which time they demonstrated compliance with both the PM and Total Metal HAP limits. Retesting was most recently conducted in May 2022; at which time they demonstrated compliance with the PM limit. The facility provides Method 9 test reports subsequent to the testing. The reports show compliance with the opacity limit.

### Records

The facility supplied records of annual melt production, as required by Subpart ZZZZZ.

The facility recorded 24,928 tons of melt base on a 12-month period. This was the highest melt total for the previous year of melt records reviewed.

The facility supplied copies of the SDSs for the binders and coatings used. The facility uses a Furfuryl Alcohol based binder with an acid catalyst (Toluene Sulfonic Acid). The facility also supplied records of the quantity of resins used. Additionally, copies of the SDSs for the refractory coatings used on the patterns were supplied.

The facility is currently in compliance with all applicable requirement of Subpart ZZZZZ.

### Conclusion

Based on this inspection, the facility appears to be in compliance with applicable air quality rules and regulations at this time.

NAME Eric Grinstern

DATE 7/31/2023

SUPERVISOR 