MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY AIR QUALITY DIVISION

October 1, 2020

PERMIT TO INSTALL 103-14B

ISSUED TO TIAL Cast Corporation

LOCATED AT 450 South Shiawassee Street Owosso, Michigan 48867

IN THE COUNTY OF

Shiawassee County

STATE REGISTRATION NUMBER P0531

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environment, Great Lakes, and Energy. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:

September 28, 2020

DATE PERMIT TO INSTALL APPROVED:	SIGNATURE:
October 1, 2020	
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

PERMIT TO INSTALL

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COMMON ACRONYMS

AQD BACT CAA CAM CEMS CFR COMS Department/department/EGLE EU FG GACS GC GHGS HVLP ID IRSL ITSL LAER MACT MAERS MAP MSDS NA NAAQS NESHAP NSPS NSR PS NSR PS PSD PTE PTI RACT ROP SC SCR SCR SCR SCR SCR SCR SCR SCR SCR	Air Quality Division Best Available Control Technology Clean Air Act Compliance Assurance Monitoring Continuous Emission Monitoring System Code of Federal Regulations Continuous Opacity Monitoring System Michigan Department of Environment, Great Lakes, and Energy Emission Unit Flexible Group Gallons of Applied Coating Solids General Condition Greenhouse Gases High Volume Low Pressure* Identification Initial Risk Screening Level Lowest Achievable Emission Rate Maximum Achievable Control Technology Michigan Air Emissions Reporting System Malfunction Abatement Plan Material Safety Data Sheet Not Applicable National Ambient Air Quality Standards National Ambient Air Quality Standards National Emission Standard for Hazardous Air Pollutants New Source Review Performance Specification Prevention of Significant Deterioration Permanent Total Enclosure Permit to Install Reasonable Available Control Technology Renewable Operating Permit Special Condition Selective Catalytic Reduction Selective Non-Catalytic Reduction Selective Non-Catalytic Reduction State Registration Number To Be Determined Toxicity Equivalence Quotient United States Environmental Protection Agency
VE	Visible Emissions

POLLUTANT / MEASUREMENT ABBREVIATIONS

acfm BTU °C CO CO ₂ e dscf	Actual cubic feet per minute British Thermal Unit Degrees Celsius Carbon Monoxide Carbon Dioxide Equivalent Dry standard cubic foot
dscm °F	Dry standard cubic meter Degrees Fahrenheit
gr	Grains
HAP	Hazardous Air Pollutant
Hg	Mercury
hr HD	Hour
HP	Horsepower
H₂S kW	Hydrogen Sulfide Kilowatt
lb	Pound
m	Meter
mg	Milligram
mm	Millimeter
MM	Million
MW	Megawatts
NMOC	Non-Methane Organic Compounds
NOx	Oxides of Nitrogen
ng	Nanogram
PM	Particulate Matter
PM10	Particulate Matter equal to or less than 10 microns in diameter
PM2.5	Particulate Matter equal to or less than 2.5 microns in diameter
pph	Pounds per hour
ppm	Parts per million
ppmv	Parts per million by volume
ppmw	Parts per million by weight
psia	Pounds per square inch absolute
psig	Pounds per square inch gauge
scf	Standard cubic feet
Sec	Seconds Sulfur Dioxide
SO2 TAC	Toxic Air Contaminant
Temp	Temperature
THC	Total Hydrocarbons
tpy	Tons per year
hð	Microgram
hw	Micrometer or Micron
VOC	Volatile Organic Compounds
yr	Year
-	

GENERAL CONDITIONS

- 1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. (R 336.1201(1))
- 2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. (R 336.1201(4))
- 3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to Rule 210 (R 336.1210), operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. (R 336.1201(6)(b))
- 4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. (R 336.1201(8), Section 5510 of Act 451, PA 1994)
- 5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to Rule 219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of Rule 219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy. (R 336.1219)
- 6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. (R 336.1901)
- 7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
- 8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
- 9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
- 10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

- 11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of Rule 301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with Rule 303 (R 336.1303). (R 336.1301)
 - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
 - b) A visible emission limit specified by an applicable federal new source performance standard.
 - c) A visible emission limit specified as a condition of this Permit to Install.
- 12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). (R 336.1370)
- 13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001. (R 336.2001)

EMISSION UNIT SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

	Emission Unit Description	
Emission Unit ID	(Including Process Equipment & Control Device(s))	Flexible Group ID
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.	FG-Foundry
EU-DewaxFurnace2	The dewaxing furnace (nominal 670,000 BTU/hr heat input rating) and afterburner (nominal 703,500 BTU/hr) burn natural gas and operate in two modes. In wax melting mode, the afterburner does not operate, and in wax burnout and mold preheat mode, the afterburner operates.	FG-Foundry
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.	FG-Foundry
EU-Melt1	Induction melting furnace with a nominal capacity of 300 pounds.	FG-Foundry
EU-Melt2	Induction melting furnace with a nominal capacity of 100 pounds.	FG-Foundry
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.	FG-Foundry
EU-SurfaceTreat	Miscellaneous surface treatment operations exhausted to the general in-plant environment, such as a citric acid leaching	FG-Foundry

Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1291.

FLEXIBLE GROUP SPECIAL CONDITIONS

FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

		Associated
Flexible Group ID	Flexible Group Description	Emission Unit IDs
	Investment casting operation consisting of wax	EU-BurnoutPreHeat,
	injection presses to mold wax patterns, slip casting of	EU-DewaxFurnace2,
EC Foundry	ceramic molds from the wax patterns, dewaxing/wax	EU-MoldForming,
FG-Foundry	burnout of the molds, melting of metal in induction	EU-Melt1, EU-Melt2,
	furnaces, casting, removal of the metal part from the	EU-Shakeout,
	mold in shakeout and surface treatments of castings	EU-SurfaceTreat
FGMACTZZZZZ	The affected source is a new or existing iron and steel	EU-BurnoutPreHeat,
	foundry, that is (or is part of) an area source of	EU-DewaxFurnace2,
	hazardous air pollutant (HAP) emissions. The affected	EU MoldForming,
	source is a new small foundry as defined by	EU Melt1,
	40 CFR Part 63 Subpart ZZZZZ.	EU Melt2,
		EU Shakeout,
		EU SurfaceTreat

FG-Foundry FLEXIBLE GROUP CONDITIONS

DESCRIPTION

Investment casting operation consisting of wax injection presses to mold wax patterns, slip casting of ceramic molds from the wax patterns, dewaxing/wax burnout of the molds, melting of metal in induction furnaces, casting, removal of the metal part from the mold in shakeout and surface treatments of castings.

Emission Unit: EU-BurnoutPreHeat, EU-DewaxFurnace2, EU-MoldForming, EU-Melt1, EU-Melt2, EU-Shakeout, EU-SurfaceTreat.

POLLUTION CONTROL EQUIPMENT

Afterburner operated during wax burnout operations in EU-BurnoutPreHeat and EU-DewaxFurnace2.

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. Visible Emissions	10% opacity	Six-Minute Average	EU-BurnoutPreHeat and EU-DewaxFurnace2	SC V.1	R 336.1301(1)(c)

II. MATERIAL LIMIT(S)

Material	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. Steel melted	400 tpy	12-month rolling time period as determined at the end of each calendar month	FG-Foundry	SC VI.2	R 336.1702(a)
2. Wax burnout	Seven (7) wax burnout cycles per shift ¹		FG-Foundry	SC VI.3	R 336.1225

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall only combust natural gas in the afterburners for EU-BurnoutPreHeat and EU-DewaxFurnace2. (R 336.1205(1)(a))

IV. DESIGN/EQUIPMENT PARAMETER(S)

 The permittee shall not operate EU-BurnoutPreHeat and EU-DewaxFurnace2 in burnout mode unless the afterburners are installed, maintained, and operated in a satisfactory manner. Satisfactory operation of the afterburner includes a minimum VOC destruction efficiency of 99 percent (by weight), maintaining a minimum temperature of 1500 °F, and a minimum retention time of 0.5 seconds. (R 336.1225, R 336.1702(a), R 336.1910) The permittee shall install, calibrate, maintain and operate in a satisfactory manner, a temperature monitoring device in the combustion chamber of the afterburner to monitor and record the temperature, on a continuous basis, during operation of EU-BurnoutPreHeat and EU-DewaxFurnace2 in burnout mode. (R 336.1225, R 336.1702(a))

V. TESTING/SAMPLING

1. Upon request of the AQD District Supervisor, the permittee shall verify visible emissions from EU-BurnoutPreHeat and EU-DewaxFurnace2 by testing at owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in:

Pollutant	Test Method Reference	
Visible Emission	40 CFR Part 51, Appendix M; 40 CFR Part 60, Appendix A and B;	

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD-approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. The permittee must submit a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1301, R 336.2001, R 336.2003, R 336.2004)**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. (R 336.1201(3))

- 1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor by the end of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. (R 336.1225, R 336.1702(a))
- 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. The permittee shall keep all records on file at the facility and make them available to the Department upon request. (R 336.1702(a))
- 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 permittee shall keep all records on file at the facility and make them available to the Department upon request.¹ (R 336.1225)
- 4. The permittee shall monitor and record, in a satisfactory manner, the temperature in the combustion chamber of the afterburners, on a per shift basis, during operation of EU-BurnoutPreHeat and EU-DewaxFurnace2 in burnout mode. The permittee shall keep all records on file at the facility and make them available to the Department upon request. (R 336.1225, R 336.1702(a), R 336.1910)

VII. <u>REPORTING</u>

NA

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

	Stack & Vent ID	Maximum Exhaust Diameter / Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1.	SV-Afterburner1	18x18	33.5	R 336.1225,
				40 CFR 52.21(c) & (d)
2.	SV-Afterburner2	18x18	33.5	R 336.1225,
				40 CFR 52.21(c) & (d)

Stack & Vent ID	Maximum Exhaust Diameter / Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
3. SV-Melt1*	12	20	40 CFR 52.21(c) & (d)
4. SV-Melt2*	12	20	40 CFR 52.21(c) & (d)

*Discharge towards the ground

IX. OTHER REQUIREMENT(S)

 The permittee shall comply with all provisions of the National Emission Standards for Hazardous Air Pollutants as specified in 40 CFR Part 63, Subparts A and ZZZZZ, as they apply to FG-Foundry. (40 CFR Part 63, Subparts A & ZZZZZ)

Footnotes:

¹ This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

FGMACTZZZZ FLEXIBLE GROUP CONDITIONS

DESCRIPTION

The affected source is a new or existing iron and steel foundry, that is (or is part of) an area source of hazardous air pollutant (HAP) emissions. The affected source is a new small foundry as defined by 40 CFR Part 63, Subpart ZZZZ.

Emission Unit: NA

POLLUTION CONTROL EQUIPMENT

NA

I. EMISSION LIMIT(S)

NA

II. MATERIAL LIMIT(S)

1. If applicable, the permittee shall not utilize a binder chemical formulation that uses methanol as a specific ingredient of the catalyst formulation for a warm box mold or core making line. This requirement does not apply to the resin portion of the binder system. (40 CFR 63.10886)

III. PROCESS/OPERATIONAL RESTRICTION(S)

- 1. The permittee shall implement and maintain an approved plan to address the pollution prevention management practices for metallic scrap and mercury. The plan shall include the following:
 - a) Metallic scrap management program. (40 CFR 63.10885(a))
 - b) Mercury requirements. (40 CFR 63.10885(b))

The permittee shall revise the plan within 30 days after a change occurs. (40 CFR 63.10885)

2. At all times, the permittee must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. (40 CFR 63.10890(i))

IV. DESIGN/EQUIPMENT PARAMETER(S)

NA

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. (R 336.1201(3))

NA

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. (R 336.1201(3))

- 1. The permittee shall keep records on a monthly basis as required below according to 40 CFR 63.10(b)(1):
 - Records supporting the permittee's initial notification of applicability and the permittee's notification of compliance status according to 40 CFR 63.10(b)(2)(xiv).
 - b) Records of the permittee's written materials specifications according to 40 CFR 63.10885(a) and records that demonstrate compliance with the requirements for restricted metallic scrap in 40 CFR 63.10885(a)(1) and/or for the use of general scrap in 40 CFR 63.10885(a)(2) and for mercury in 40 CFR 63.10885(b)(1)

through (3), as applicable. The permittee must keep records documenting compliance with 40 CFR 63.10885(b)(4) for scrap that does not contain motor vehicle scrap.

- c) If the permittee is subject to the requirements for a site-specific plan for mercury switch removal under 40 CFR 63.10885(b)(1), the permittee must maintain records of the number of mercury switches removed or the weight of mercury recovered from the switches and properly managed, the estimated number of vehicles processed, and an estimate of the percent of mercury switches recovered.
- d) If the permittee is subject to the option for approved mercury programs under 40 CFR 63.10885(b)(2), the permittee must maintain records identifying each scrap provider and documenting the scrap provider's participation in an approved mercury switch removal program. If the permittee purchase motor vehicle scrap from a broker, the permittee must maintain records identifying each broker and documentation that all scrap provided by the broker was obtained from other scrap providers who participate in an approved mercury switch removal program.
- e) Records to document use of binder chemical formulation that does not contain methanol as a specific ingredient of the catalyst formulation for each furfuryl alcohol warm box mold or core making line as required by 40 CFR 63.10886. These records must be the Material Safety Data Sheet (provided that it contains appropriate information), a certified product data sheet, or a manufacturer's hazardous air pollutant data sheet.
- f) Records of the annual quantity and composition of each HAP-containing chemical binder or coating material used to make molds and cores. These records must be copies of purchasing records, Material Safety Data Sheets, or other documentation that provides information on the binder or coating materials used.
- g) Records of metal melt production for each calendar year.

The permittee shall keep all records on file at the facility and make them available to the Department upon request. (40 CFR 63.10890(e))

VII. <u>REPORTING</u>

- Prior to March 9, 2021, the permittee must submit semiannual compliance reports to the Administrator according to the requirements in 40 CFR 63.13. Beginning on March 9, 2021, the permittee must submit all subsequent semiannual compliance reports to the EPA via the CEDRI, which can be accessed through the EPA's Central Data Exchange (CDX) (https://cdx.epa.gov/). The reports must include the information specified in a, b, and c below and, as applicable, the information specified in d, e, f, and g below. (40 CFR 10890(f), 40 CFR 10899(c))
 - a) Company name and address.
 - b) Statement by a responsible official, with that official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report.
 - c) Date of report and beginning and ending dates of the reporting period.
 - d) If there were no deviations from any emissions limitations (including operating limits, pollution prevention management practices, or operation and maintenance requirements), a statement that there were no deviations from the emissions limitations, pollution prevention management practices, or operation and maintenance requirements during the reporting period.
 - e) The permittee must keep records of monthly metal melt production for each calendar year.
 - f) If the permittee uses emissions averaging, the permittee must keep records of the monthly metal melting rate for each furnace at the permittee's iron and steel foundry, and records of the calculated pounds of PM or total metal HAP per ton of metal melted for the group of all metal melting furnaces required by 40 CFR 63.10897(h).
 - g) If applicable, the permittee must keep records for bag leak detection systems as follows:
 - i) Records of the bag leak detection system output;
 - ii) Records of bag leak detection system adjustments, including the date and time of the adjustment, the initial bag leak detection system settings, and the final bag leak detection system settings; and
 - iii) The date and time of all bag leak detection system alarms, and for each valid alarm, the time the permittee initiated corrective action, the corrective action taken, and the date on which corrective action was completed.

VIII. STACK/VENT RESTRICTION(S)

IX. OTHER REQUIREMENT(S)

1. The permittee shall comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart ZZZZZ for Iron and Steel Foundries by the initial compliance date. **(40 CFR Part 63, Subparts A and ZZZZZ)**