MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

January 26, 2015

PERMIT TO INSTALL
149-02M

ISSUED TO
Johnson Matthey Testing

LOCATED AT
12600 Universal Drive
Taylor, Michigan

IN THE COUNTY OF
Wayne

STATE REGISTRATION NUMBER
B8747

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. 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: **January 6, 2015**	
DATE PERMIT TO INSTALL APPROVED: **January 26, 2015**	SIGNATURE:
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

PERMIT TO INSTALL

Table of Contents

Section **Page**

Common Abbreviations / Acronyms

Common Acronyms		Pollutant / Measurement Abbreviations	
AQD	Air Quality Division	BTU	British Thermal Unit
BACT	Best Available Control Technology	°C	Degrees Celsius
CAA	Clean Air Act	CO	Carbon Monoxide
CEM	Continuous Emission Monitoring	dscf	Dry standard cubic foot
CFR	Code of Federal Regulations	dscm	Dry standard cubic meter
CO_2e	Carbon Dioxide Equivalent	°F	Degrees Fahrenheit
COM	Continuous Opacity Monitoring	gr	Grains
EPA	Environmental Protection Agency	Hg	Mercury
EU	Emission Unit	hr	Hour
FG	Flexible Group	H_2S	Hydrogen Sulfide
GACS	Gallon of Applied Coating Solids	hp	Horsepower
GC	General Condition	lb	Pound
GHGs	Greenhouse Gases	kW	Kilowatt
HAP	Hazardous Air Pollutant	m	Meter
HVLP	High Volume Low Pressure *	mg	Milligram
ID	Identification	mm	Millimeter
LAER	Lowest Achievable Emission Rate	MM	Million
MACT	Maximum Achievable Control Technology	MW	Megawatts
MAERS	Michigan Air Emissions Reporting System	ng	Nanogram
MAP	Malfunction Abatement Plan	NO_x	Oxides of Nitrogen
MDEQ	Michigan Department of Environmental Quality (Department)	PM	Particulate Matter
MSDS	Material Safety Data Sheet	PM10	PM with aerodynamic diameter ≤10 microns
NESHAP	National Emission Standard for Hazardous Air Pollutants	PM2.5	PM with aerodynamic diameter ≤ 2.5 microns
NSPS	New Source Performance Standards	pph	Pounds per hour
NSR	New Source Review	ppm	Parts per million
PS	Performance Specification	ppmv	Parts per million by volume
PSD	Prevention of Significant Deterioration	ppmw	Parts per million by weight
PTE	Permanent Total Enclosure	psia	Pounds per square inch absolute
PTI	Permit to Install	psig	Pounds per square inch gauge
RACT	Reasonably Available Control Technology	scf	Standard cubic feet
ROP	Renewable Operating Permit	sec	Seconds
SC	Special Condition	SO_2	Sulfur Dioxide
SCR	Selective Catalytic Reduction	THC	Total Hydrocarbons
SRN	State Registration Number	tpy	Tons per year
TAC	Toxic Air Contaminant	µg	Microgram
TEQ	Toxicity Equivalence Quotient	VOC	Volatile Organic Compound
VE	Visible Emissions	yr	Year

* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

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 Environmental Quality, 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 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 R 336.1219 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 R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **(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 R 336.1301, 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 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 R 336.1370(2). **(R 336.1370)**

13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

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

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
EU-TESTCELL1	Engine test cell #1 using gasoline, diesel fuel, natural gas, compressed natural gas, propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter.	5/2009	FG-TESTCELLS
EU-TESTCELL2	Engine test cell #2 using gasoline, diesel fuel, natural gas, compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter.	5/2009	FG-TESTCELLS
EU-TESTCELL3	Engine test cell #3 using gasoline, diesel fuel, natural gas, compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter.	5/2009	FG-TESTCELLS
EU-TESTCELL4	Engine test cell #4 using gasoline, diesel fuel, natural gas, compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter.	5/2009	FG-TESTCELLS
EU-TESTCELL5	Engine test cell #5 using gasoline, diesel fuel, natural gas, compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter. The after control emissions from this test cell may be discharged via a regular exhaust stack (SV-TESTCELL5) or via a dilution tunnel (SV-TESTCELL5-6b).	5/2009	FG-TESTCELLS
EU-TESTCELL6	Engine test cell #6 using gasoline, diesel fuel, natural gas, compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter. The after control emissions from this test cell may be discharged via a regular exhaust stack (SV-TESTCELL6) or via a dilution tunnel (SV-TESTCELL5-6b).	5/2009	FG-TESTCELLS
EU-TESTCELL7	Engine test cell #7 using gasoline, diesel fuel, natural gas, compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter.	5/2009	FG-TESTCELLS
EU-TESTCELL8	Engine test cell #8 using gasoline, diesel fuel, natural gas, compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter.	5/2009	FG-TESTCELLS
EU-TESTCELL9	Engine test cell #9 using gasoline, diesel fuel, natural gas, compressed natural gas compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter.	5/2009	FG-TESTCELLS
EU-TESTCELL10	Engine test cell #10 using gasoline, diesel fuel, natural gas, compressed natural gas compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter.	5/2009	FG-TESTCELLS

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
EU-TESTCELL11	Engine test cell #11 using gasoline, diesel fuel, natural gas, compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter.	5/2009	FG-TESTCELLS
EU-TESTCELL12	Engine test cell #12 using gasoline, diesel fuel, natural gas, compressed natural gas propane, and ethanol fuel. Emissions from the test cell are controlled by a catalytic converter.	5/2009	FG-TESTCELLS
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 336.1290.			

FLEXIBLE GROUP SUMMARY TABLE

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

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FG-TESTCELLS	• Twelve engine test cells using gasoline, diesel fuel, natural gas, compressed natural gas, propane, and ethanol fuel. Emissions from the test cells are controlled by a catalytic converter. • A natural gas compressor and storage system, consisting of a 75 hp compressor, one 250 gallon storage tank, one 500 gallon tank, and all associated piping, instrumentation, and pressure relief valve	EU-TESTCELL1 EU-TESTCELL2 EU-TESTCELL3 EU-TESTCELL4 EU-TESTCELL5 EU-TESTCELL6 EU-TESTCELL7 EU-TESTCELL8 EU-TESTCELL9 EU-TESTCELL10 EU-TESTCELL11 EU-TESTCELL12
FGFACILITY	All process equipment source-wide including equipment covered by other permits, grand-fathered equipment and exempt equipment.	

The following conditions apply to: FG-TESTCELLS

DESCRIPTION: Twelve engine test cells using gasoline, diesel fuel, natural gas, compressed natural gas, propane, and ethanol fuel. Emissions from the test cells are controlled by a catalytic converter.
A natural gas compressor and storage system, consisting of a 75 hp compressor, one 250 gallon storage tank, one 500 gallon tank, and all associated piping, instrumentation, and pressure relief valve

Emission Units: (see table above)

POLLUTION CONTROL EQUIPMENT: Catalytic converters

I. EMISSION LIMITS

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. NOx	35.9 tpy	12-month rolling time period, as determined at the end of each calendar month.	FG-TESTCELLS	See "Compliance Method" below and SC VI.2	R 336.1205(1)(a) & (3)
2. NOx	0.07 lb/gallon gasoline, with catalytic control	Test protocol*	FG-TESTCELLS	GC 13*	R 336.1205(1)(a) & (3)
3. NOx	0.35 lb/gallon gasoline, without catalytic control	Test protocol*	FG-TESTCELLS	GC 13*	R 336.1205(1)(a) & (3)
4. NOx	0.0250 lb/gallon diesel, with catalytic control	Test protocol*	FG-TESTCELLS	GC 13*	R 336.1205(1)(a) & (3)
5. NOx	0.0667 lb/gallon diesel, without catalytic control	Test protocol*	FG-TESTCELLS	GC 13*	R 336.1205(1)(a) & (3)
6. NOx	681.6 lb/ million cubic feet of natural gas with catalytic control	Test protocol*	FG-TESTCELLS	VI.2	R 336.1205(1)(a) & (3)
7. NOx	0.015 lb/gallon ethanol with catalytic control	Test protocol*	FG-TESTCELLS	GC 13*	R 336.1205(1)(a) & (3)
8. NOx	2.8 lb/1,000 gallons propane with catalytic control	Test protocol*	FG-TESTCELLS	GC 13*	R 336.1205(1)(a) & (3)
9. CO	20.5 pounds per hour	Monthly	FG-TESTCELLS	GC 13*	R 336.1205(1)(a) & (3)
10. CO	0.1752 lb/gallon gasoline, with catalytic control	Test protocol*	FG-TESTCELLS	GC 13	R 336.1205(1)(a) & (3)
11. CO	1.752 lb/gallon gasoline, without catalytic control	Test protocol*	FG-TESTCELLS	GC 13	R 336.1205(1)(a) & (3)
12. CO	39.9 lbs/MM cubic feet of natural gas, with catalytic control	Test protocol*	FG-TESTCELLS	VI.2	R 336.1205(1)(a) & (3)
13 CO	0.19 lb/1,000 gallons propane with catalytic control.	Test protocol*	FG-TESTCELLS	GC 13	R 336.1205(1)(a) & (3)
14. CO	0.23 lb/gallon Ethanol, with catalytic control.	Test protocol*	FG-TESTCELLS	GC 13	R 336.1205(1)(a) & (3)
15. CO	0.1434 lb/gallon diesel with catalytic control	Test protocol*	FG-TESTCELLS	GC 13	R 336.1205(1)(a) & (3)
16. CO	1.434 lb/gallon diesel without catalytic control	Test protocol*	FG-TESTCELLS	GC 13	R 336.1205(1)(a) & (3)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
17. SO_2	6.81 pounds per hour	Monthly	FG-TESTCELLS	GC 13	R 336.1205(1)(a) & (3), R 336.2803, R 336.2804, 40 CFR 52.21(c) & (d)
18. Benzene	740.0 lb per year	12-month rolling time period, as determined at the end of each calendar month.	FG-TESTCELLS	See "Compliance Method" below and SC VI.2	R 336.1225
19. Benzene	0.0047 lb/gallon gasoline with catalytic control	Test protocol*	FG-TESTCELLS	GC 13	R 336.1225
20. Benzene	0.031 lb/gallon gasoline without catalytic control	Test protocol*	FG-TESTCELLS	GC 13*	R 336.1225
21. Benzene	0.0038 lb/gallon diesel with catalytic control	Test protocol*	FG-TESTCELLS	GC 13*	R 336.1225
22. Benzene	.0253 lb/gallon diesel without catalytic control	Test protocol*	FG-TESTCELLS	GC 13*	R 336.1225
23. Benzene	0.0047 lb/gallon Ethanol with catalytic control	Test protocol*	FG-TESTCELLS	GC 13*	R 336.1225

* Test protocol specifies the averaging time.

Compliance Method—
Compliance with the NOx, CO and Benzene emission limits shall be determined using the emission factor for each fuel type and control scenario (with and without catalytic control and based on testing per GC 13) and multiplying that emission factor by the actual fuels used each month.

II. MATERIAL LIMITS

1. The permittee shall not use more than 1,000 gallons per rolling 12-month time period in test cells which have no catalytic control. The permittee shall use no more than 2,000 gallons of diesel fuel per rolling 12-month time period in test cells which have no catalytic control. **(R 336.1205(1)(a) & (3), R 336.1225, R 336.2803, R 336.2804, 40 CFR 52.21(c) & (d))**

2. The sulfur content of all gasoline used in FG-TESTCELLS shall not exceed 0.085 percent by weight, and the sulfur content of all diesel used in FG-TESTCELLS shall not exceed 0.28 percent by weight. **(R 336.1205(1)(a) & (3), R 336.2803, R 336.2804, 40 CFR 52.21(c) & (d))**

III. PROCESS/OPERATIONAL RESTRICTIONS

N/A

IV. DESIGN/EQUIPMENT PARAMETERS

1. The permittee shall equip and maintain each emission unit included in FG-TESTCELLS with a catalytic converter. Except as provided by special condition II.1, the permittee shall not operate the test stands unless the catalytic converters are installed and operating properly. Satisfactory operation includes maintaining each catalytic converter at a minimum temperature of 600^{o} F based on an hourly average for gasoline and 450^{o} F based on an hourly average for diesel. **(R 336.1205(1)(a) & (3), R 336.1225, R 336.1910, R 336.2803, R 336.2804, 40 CFR 52.21(c) & (d))**

V. TESTING/SAMPLING

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

N/A

VI. MONITORING/RECORDKEEPING

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

1. The permittee shall monitor either electronically, using a strip chart recorder or by manual logging the exhaust gas temperature immediately before and after each catalytic bed. Temperature readings shall be recorded at least once every 15 minutes (4 per hour). **(R 336.1205(1)(a) & (3), R 336.1225, R 336.1910)**

2. The permittee shall maintain the following records for FG-TESTCELLS:
   a. The amount (in gallons) of diesel fuel used in FG-TESTCELLS without catalytic control and the average hourly usage rate of diesel fuel without catalytic control. This information shall be compiled on a monthly basis.
   b. Total aggregated operating hours for all test cells. This information shall be compiled on a monthly basis.
   c. The amount (in gallons) of gasoline fuel used in FG-TESTCELLS without catalytic control and the average hourly usage rate of gasoline without catalytic control. This information shall be compiled on a monthly basis.
   d. The amount (in gallons) of ethanol used in FG-TESTCELLS and the average hourly usage rate of ethanol. This information shall be compiled on a monthly basis.
   e. The amount (in cubic feet) of natural gas/compressed natural gas used in FG-TESTCELLS and the average hourly usage rate of natural gas/compressed natural gas. This information shall be compiled on a monthly basis.
   f. Total amount (in gallons) or propane fuel used in FG-TESTCELLS and the average hourly usage rate of propane fuel. This information shall be compiled on a monthly basis.
   g. Monthly NO_x emission calculation records for FG-TESTCELLS.
   h. Monthly CO emission calculation records for FG-TESTCELLS.
   i. Monthly SO_2 emission calculation records for FG-TESTCELLS.
   j. Monthly benzene emission calculation records for FG-TESTCELLS.
   k. Hourly records of the inlet and outlet temperatures in each catalytic converter.
   l. Records of the maximum sulfur content in the fuel for each delivery.

   All records shall be kept on file for a period of at least five years and made available to the Department upon request. **(R 336.1205(1)(a) & (3), R 336.1225, R 336.2803, R 336.2804, R 336.1910, 40 CFR 52.21(c) & (d))**

VII. REPORTING

N/A

VIII. STACK/VENT RESTRICTIONS

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-TESTCELL-1	12.0	45.0	R 336.1225
2. SV-TESTCELL-2	10.0	45.0	R 336.1225
3. SV-TESTCELL-3	10.0	45.0	R 336.1225
4. SV-TESTCELL-4	10.0	45.0	R 336.1225
5. SV-TESTCELL-5	10.0	45.0	R 336.1225
6. SV-TESTCELL-6	10.0	45.0	R 336.1225
7. SV-TESTCELL-5-6B	14.0	45.0	R 336.1225
8. SV-TESTCELL-7	8.0	45.0	R 336.1225
9. SV-TESTCELL-8	10.0	45.0	R 336.1225
10. SV-TESTCELL-9-1	6.0	45.0	R 336.1225
11. SV-TESTCELL-9-2	6.0	45.0	R 336.1225
12. SV-TESTCELL-9-3	6.0	45.0	R 336.1225
13. SV-TESTCELL-10-1	6.0	45.0	R 336.1225
14. SV-TESTCELL-10-2	6.0	45.0	R 336.1225
15. SV-TESTCELL-10-3	6.0	45.0	R 336.1225
16. SV-TESTCELL-11-1	8.0	45.0	R 336.1225
17. SV-TESTCELL-11-2	6.0	45.0	R 336.1225
18. SV-TESTCELL-11-3	8.0	45.0	R 336.1225
19. SV-TESTCELL-12A	6.0	45.0	R 336.1225
20. SV-TESTCELL-12B	16.0	45.0	R 336.1225

IX. OTHER REQUIREMENTS

N/A

Footnotes:

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