

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION**

June 18, 2018

**PERMIT TO INSTALL**  
101-18

**ISSUED TO**  
Kimberly Lighting, LLC

**LOCATED AT**  
5827 Terex  
Clarkston, Michigan

**IN THE COUNTY OF**  
Oakland

**STATE REGISTRATION NUMBER**  
A4420

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:

**June 12, 2018**

DATE PERMIT TO INSTALL APPROVED:

**June 18, 2018**

SIGNATURE:

DATE PERMIT VOIDED:

SIGNATURE:

DATE PERMIT REVOKED:

SIGNATURE:

**PERMIT TO INSTALL**

**Table of Contents**

<b>Section</b>	<b>Page</b>
Alphabetical Listing of Common Abbreviations / Acronyms .....	2
General Conditions .....	3
Special Conditions .....	5
Emission Unit Summary Table.....	5
Special Conditions for EU-BULBCRUSHER.....	5
Appendix 1 .....	8
Appendix 2 .....	9
Appendix 3 .....	10

**Common Abbreviations / Acronyms**

<b>Common Acronyms</b>		<b>Pollutant / Measurement Abbreviations</b>	
AQD	Air Quality Division	acfm	Actual cubic feet per minute
BACT	Best Available Control Technology	BTU	British Thermal Unit
CAA	Clean Air Act	°C	Degrees Celsius
CAM	Compliance Assurance Monitoring	CO	Carbon Monoxide
CEM	Continuous Emission Monitoring	CO <sub>2e</sub>	Carbon Dioxide Equivalent
CFR	Code of Federal Regulations	dscf	Dry standard cubic foot
COM	Continuous Opacity Monitoring	dscm	Dry standard cubic meter
Department/ department	Michigan Department of Environmental Quality	°F	Degrees Fahrenheit
EU	Emission Unit	gr	Grains
FG	Flexible Group	HAP	Hazardous Air Pollutant
GACS	Gallons of Applied Coating Solids	Hg	Mercury
GC	General Condition	hr	Hour
GHGs	Greenhouse Gases	HP	Horsepower
HVLP	High Volume Low Pressure*	H <sub>2</sub> S	Hydrogen Sulfide
ID	Identification	kW	Kilowatt
IRSL	Initial Risk Screening Level	lb	Pound
ITSL	Initial Threshold Screening Level	m	Meter
LAER	Lowest Achievable Emission Rate	mg	Milligram
MACT	Maximum Achievable Control Technology	mm	Millimeter
MAERS	Michigan Air Emissions Reporting System	MM	Million
MAP	Malfunction Abatement Plan	MW	Megawatts
MDEQ	Michigan Department of Environmental Quality	NMOC	Non-methane Organic Compounds
MSDS	Material Safety Data Sheet	NO <sub>x</sub>	Oxides of Nitrogen
NA	Not Applicable	ng	Nanogram
NAAQS	National Ambient Air Quality Standards	PM	Particulate Matter
NESHAP	National Emission Standard for Hazardous Air Pollutants	PM10	Particulate Matter equal to or less than 10 microns in diameter
NSPS	New Source Performance Standards	PM2.5	Particulate Matter equal to or less than 2.5 microns in diameter
NSR	New Source Review	pph	Pounds per hour
PS	Performance Specification	ppm	Parts per million
PSD	Prevention of Significant Deterioration	ppmv	Parts per million by volume
PTE	Permanent Total Enclosure	ppmw	Parts per million by weight
PTI	Permit to Install	psia	Pounds per square inch absolute
RACT	Reasonable Available Control Technology	psig	Pounds per square inch gauge
ROP	Renewable Operating Permit	scf	Standard cubic feet
SC	Special Condition	sec	Seconds
SCR	Selective Catalytic Reduction	SO <sub>2</sub>	Sulfur Dioxide
SNCR	Selective Non-Catalytic Reduction	TAC	Toxic Air Contaminant
SRN	State Registration Number	Temp	Temperature
TEQ	Toxicity Equivalence Quotient	THC	Total Hydrocarbons
USEPA/EPA	United States Environmental Protection Agency	tpy	Tons per year
VE	Visible Emissions	µg	Microgram
		µm	Micrometer or Micron
		VOC	Volatile Organic Compounds
		yr	Year

\*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 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.

<b>Emission Unit ID</b>	<b>Emission Unit Description (Process Equipment &amp; Control Devices)</b>	<b>Installation Date / Modification Date</b>	<b>Flexible Group ID</b>
EU-BULBCRUSHER	One 55-gallon drum-top fluorescent light bulb crusher, controlled by a cartridge filter followed in series by a HEPA filter, an activated carbon filter, and a HEPA filter.	June, 2018	NA
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.			

**The following conditions apply to: EU-BULBCRUSHER**

**DESCRIPTION:** One enclosed 55-gallon drum-top fluorescent light bulb crusher.

**Flexible Group ID:** NA

**POLLUTION CONTROL EQUIPMENT:** Cartridge filter followed in series by a HEPA filter, an activated carbon filter, and a HEPA filter.

**I. EMISSION LIMITS**

NA

**II. MATERIAL LIMITS**

1. The permittee shall not crush more than the equivalent of 1,430 four-foot fluorescent light bulbs in EU-BULBCRUSHER per calendar day. **(R 336.1224, R 336.1225)**
2. The permittee shall not crush more than the equivalent of 16,500 four-foot fluorescent light bulbs in EU-BULBCRUSHER per 12-month rolling time period. **(R 336.1224, R 336.1225)**

**III. PROCESS/OPERATIONAL RESTRICTIONS**

1. EU-BULBCRUSHER shall be installed, maintained, and operated in a satisfactory manner to minimize emissions to the ambient air. Recommended Best Management Practices for Drum-top Crushers and Recommended Best Management Practices for Lamp Handling & Storage are specified in Appendices 1 and 2. **(R 336.1224, R 336.1225, R 336.1910)**
2. The permittee shall maintain and operate EU-BULBCRUSHER according to the manufacturer's specifications and procedures. **(R 336.1224, R 336.1225, R 336.1910)**
3. EU-BULBCRUSHER shall be located a minimum of 50 feet from the property line; 300 feet from any existing places of residence or private or public assembly; 500 feet from a school, apartment building, or institutional occupancy; and not less than 1000 feet from a hospital or nursing home. **(R 336.1225)**

4. The permittee shall minimize the time necessary to change-out the 55-gallon drum portion of EU-BULBCRUSHER. All drum change-outs shall be performed according to the manufacturer's specifications and procedures. **(R 336.1224, R 336.1225)**
5. The permittee shall completely replace the carbon within the activated carbon filter or replace the entire activated carbon filter, a minimum of once every two calendar years. Alternatively, the permittee may demonstrate at the end of two years, and at least once per year thereafter, that the activated carbon filter is still effective. **(R 336.1224, R 336.1225)**
6. All broken glass and metal pieces collected in the 55-gallon drum portion of EU-BULBCRUSHER shall be properly handled, transported, and disposed of in accordance with all applicable State rules and federal regulations. **(R 336.1224, R 336.1225)**

#### **IV. DESIGN/EQUIPMENT PARAMETERS**

1. The permittee shall not operate EU-BULBCRUSHER unless the cartridge filter followed in series by a HEPA filter, an activated carbon filter, and a HEPA filter are installed, maintained, and operated in a satisfactory manner. **(R 336.1224, R 336.1225, R 336.1910)**
2. The permittee shall not operate EU-BULBCRUSHER with a warped drum that prevents the crushing unit from sealing flush with the drum top. The permittee shall verify that the seal between the crusher unit and the drum is tight before each use, according to manufacturer's recommended procedures. **(R 336.1224, R 336.1225)**
3. The permittee shall seal the feed chute of EU-BULBCRUSHER with a cap or other similar device whenever the unit is not in use. **(R 336.1224, R 336.1225)**

#### **V. TESTING/SAMPLING**

1. If the activated carbon filter or the carbon within the filter is not replaced at the end of two calendar years, the permittee shall demonstrate, to the satisfaction of the AQD, the effectiveness of the activated carbon filter. If control device destruction efficiency testing is required in order to complete this demonstration, the permittee shall submit to the AQD a methodology outlining how the testing will be performed, no less than 60 days prior to completing the demonstration. The AQD must approve the testing methodology prior to completing the demonstration. Submittal of a complete report of the demonstration results shall be submitted to the AQD within 60 days following the last date of the demonstration. **(R 336.1224, R 336.1225, 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 keep the following information on a monthly basis for EU-BULBCRUSHER:
  - a) The number and size of fluorescent light bulbs crushed per calendar day.
  - b) The number and size of fluorescent light bulbs crushed per calendar month.
  - c) The number and size of fluorescent light bulbs crushed per 12-month rolling time period as determined at the end of each calendar month.

The permittee shall keep the records in the format specified in Appendix 3. **(R 336.1224, R 336.1225)**

2. The permittee shall keep, in a satisfactory manner, records indicating when a HEPA filter, the carbon or the entire activated carbon filter was replaced. **(R 336.1224, R 336.1225)**
3. The permittee shall keep, in a satisfactory manner, transportation, and disposal records of all broken glass and metal pieces collected in the 55-gallon drum portion of EU-BULBCRUSHER. **(R 336.1224, R 336.1225)**

4. The permittee shall monitor and record, in a satisfactory manner, the room temperature, on a daily basis, while EU-BULBCRUSHER is operating. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1224, R 336.1225)**

**VII. REPORTING**

NA

**VIII. STACK/VENT RESTRICTIONS**

NA

**IX. OTHER REQUIREMENTS**

NA

## APPENDIX 1

### RECOMMENDED BEST MANAGEMENT PRACTICES FOR DRUM-TOP CRUSHERS (DTC)

1. The DTC should be commercially manufactured by a reliable manufacturer. The unit should have a vacuum pump to create negative internal pressure and well designed and tightly fitted seals at all connection points. The DTC must include a bag filter followed in series by a HEPA filter and an activated carbon filter to control particulate emissions.
2. The DTC should be used and stored in a room completely segregated from other parts of the building, with a dedicated ventilation/exhaust system that discharges to the ambient air. The DTC should not be used or stored in areas where the temperature is elevated (e.g., a boiler room). Use workroom ventilation to create a slight negative pressure throughout the entire work area, so any fugitive emissions are captured by the facility's air filtration system. Workroom ventilation/exhaust or exhaust from the DTC should be located away from air intakes.
3. If the DTC must be moved, all ports should be covered or plugged and movement should be done in a manner to avoid disturbing the contents of the drum. Ports should also be plugged or sealed when the DTC is not in use.
4. All operators should be trained in the proper assembly, maintenance and operation of the DTC. This includes training in the proper use of Personal Protective Equipment (PPE); inspection of the DTC to determine proper assembly, damage or wear; feeding spent lamps into the DTC; changing filters and carbon; drum change-outs; and proper clean up of broken lamps.
5. All operators should wear appropriate Personal Protective Equipment (PPE) when operating the DTC. PPE includes puncture-resistant gloves, safety glasses or a face shield, dedicated uniforms or disposable coveralls and booties, and a fit-tested respirator with cartridges designed specifically for use with mercury. Clothing and PPE worn while operating the DTC should not be worn outside the areas designated for DTC use.
6. Before each use, the operator should inspect the DTC for damage or worn components; improper assembly; missing, damaged or improperly fitted seals; seal integrity between the crusher unit and the drum; proper vacuum (negative pressure); and proper air flow.
7. The DTC should be operated according to manufacturer's recommendations. This includes not crushing more than the manufacturer-recommended number of lamps per drum and not using the DTC continually for longer than the manufacturer recommends. The DTC should not be opened to put debris into the drum.
8. The manufacturer's recommended maintenance schedule should be followed for carbon filter and drum change outs. A maintenance log should be kept with the DTC recording all carbon filter changes, drum change outs and other maintenance.
9. Drum change-outs should be performed according to the manufacturer's specifications and procedures, and operators conducting change-outs should wear appropriate PPE. Before changing a drum, allow the contents to settle for at least 15 minutes before removing the DTC from the drum. The drum should be changed by two trained operators, and the full drum should be covered as quickly as possible and tightly sealed. Crushed lamps should not be removed from the drum.
10. The DTC should not be used if there is phosphor (white powder) on or around the DTC; there is any damage to the DTC, especially the vacuum system, seals or filters; or the DTC has been incorrectly assembled or modified in any way.
11. Drums containing crushed lamps should be managed according to applicable federal and state regulations and sent to a commercial recycler. Crushed lamp drums should be structurally sound and well sealed. Crushed lamps should not be transferred to a different container. Drums containing crushed lamps should not be stored in an area where the temperature is elevated (e.g., boiler room) or in the direct sun. A cleanup plan should be developed in the event a drum containing crushed lamps is spilled. The plan should incorporate procedures recommended by the equipment manufacturer, as well as standard industry practices.

## APPENDIX 2

### RECOMMENDED BEST MANAGEMENT PRACTICES FOR LAMP HANDLING & STORAGE

#### 1. **Storage of Lamps - Designate an area within your facility to store lamps.**

- Storage locations should be away from high-traffic areas.
- Larger facilities may need more than one location for easier access.
- Storage rooms should be clean, dry and free of broken lamp debris.
- Areas should ideally have an air handling system that is independent from the rest of the building that does not re-circulate air or reintroduce air through vents and intakes.

#### 2. **Handling Spent Lamps – Employees should know whom to call if a lamp is burned out.**

- Trained employees should remove lamps carefully to prevent breakage.
- Spent lamps should immediately be stored in a sturdy container.
- Spent lamps should not be left in a position or in an area where they can be easily broken.

#### 3. **Storage of Spent Lamps - Spent lamps can be put back into original boxes, or specially made lamp containers can be purchased for spent lamp storage.**

- Containers should be closed, structurally sound, and constructed to provide protection from breakage during storage and transportation.
- Containers should lack evidence of leaks, spills or damage that could cause leaks or a release of mercury.
- Containers should be stable and stored in such a way that they will not easily tip over.
- Do not pack too many lamps into a container - the pressure could lead to breakage.
- Do not stack containers too high – addition weight of the pile could crush lamps on the bottom.
- Do not tape lamps together or use rubber bands.
- Clearly identify containers of spent lamps (e.g., Waste Lamps or Used Lamps)
- Close and securely seal containers with tape.

#### 4. **Handling Broken Lamps – Broken lamps release mercury and may present health hazards. Follow MIOSHA, EPA, and state regulations when managing broken lamps.**

- Create procedures for reporting and managing broken lamps. Post these procedures in areas where fluorescent lamps are handled or stored.
- Follow the clean-up procedure at [www.epa.gov/mercury/spills/index.htm#fluorescent](http://www.epa.gov/mercury/spills/index.htm#fluorescent). Clean-up procedures (specific instructions and clean-up contact) should be posted in areas where fluorescent lamps are handled or stored.
- Keep broken lamps in a sealed container, and keep the container in a cool place, away from high-traffic areas, preferably outdoors.
- Keep cleaning implements used for broken lamps in the room or area and do not use them elsewhere in the facility.
- Do not open containers of broken lamps to add or remove broken lamps.

