

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

P074657907

FACILITY: LENOX CREMATION SERVICES OF MICHIGAN, INC		SRN / ID: P0746
LOCATION: 10918 Gratiot Avenue, CASCO		DISTRICT: Warren
CITY: CASCO		COUNTY: SAINT CLAIR
CONTACT: Craig Harms , Owner		ACTIVITY DATE: 04/30/2021
STAFF: Robert Elmouchi	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Targeted inspection.		
RESOLVED COMPLAINTS:		

On April 30, 2021, I conducted a scheduled inspection of Lenox Cremation Services of Michigan (SRN: P0746), located at 10918 Gratiot Avenue, Casco, Michigan 48064. The purpose of this inspection was to determine the facility's compliance with the requirements of the Federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the administrative rules; and the conditions of Permit to Install (PTI) No. 155-16A.

Lenox Cremation Services of Michigan (Lenox) is permitted to conduct human cremations. PTI No. 155-16A was approved on August 27, 2020, for the installation of a second crematorium of identical capacity. This facility contains two human crematories, a walk-in refrigerator with a 24-body capacity, and an AP Lazer SN3024 90-watt laser engraving machine, which is used to engrave wood (oak, maple, and walnut) and marble urns.

I entered the facility and met with Mr. Craig Harms, owner. Mr. Harms answered questions, provided copies of documents, and escorted me throughout the inspection.

Mr. Harms opened the refrigeration unit per my request. Mr. Harms stated that the refrigerator is set at about 38 degrees F. We discussed the option of freezing corpses. Mr. Harms stated that the cremation unit manufacturer recommends not freezing bodies because rapid thawing in the primary combustion chamber can result in excessively rapid combustion. Furthermore, Mr. Harms stated that bodies received from a county morgue may be frozen, which can also cause fats and oils to leak from the cremation unit and drip into the ash collection tray. To prevent this problem, Lenox lets frozen bodies warm before cremation.

Mr. Harms has improved recordkeeping since the inspection conducted on August 4, 2020. Secondary combustion chamber temperatures are now electronically logged, and temperature records are printed in two-minute intervals along with the primary combustion chamber temperature and the exhaust stack inlet temperature. These three temperatures are also plotted on a graph for quick visual analysis. My records review appears to indicate compliance with the permittee maintaining a minimum secondary combustion chamber temperature of 1600 F.

At 11:22 a.m., I observed the start of a cremation in EUCREMATORY02. The charge was a 180-pound female. I was informed that female remains usually generate more visible emissions at the start of a cremation because women typically have more body fat. I did not observe visible emissions associated with this cremation. The secondary combustion chamber temperature varied from 1600 degrees F to almost 1700 degrees F.

EUCREMATORY01 and EUCREMATORY02

During this inspection I observed two (2) ATI Environmental UK Limited cremation units model number CR2000XL. The ATI CR2000XL is a large cremation unit with a maximum charge capacity of 1,100 pounds. These

cremation units can incinerate a 200-pound person in 90 minutes, whereas a typical cremation unit may take 120 minutes or more. Furthermore, the primary combustion burner flame is angled from the rear of the primary chamber towards the front. This design eliminates the need to rearrange the remains to complete the cremation. These emission units appear to be well constructed and maintained.

The manufacturer has instructed Lenox cremation to keep the primary combustion chamber door closed throughout the cremation cycle, which is a different procedure from other manufacturers. This procedure prevents a short-term temperature drop in the secondary combustion chamber and helps prevent intermittent visible emissions during the cremation. Mr. Harms showed me the viewing port at the rear of the primary combustion chamber, which the operator uses to determine if the cremation is complete (see photo). If the cremation is not complete, the operator can extend the cremation in 15-minute intervals.

The ATI Environmental UK Limited cremation unit model number CR2000XL has some notable features as compared to other cremation units I've observed. There is a water spray nozzle at the rear of the primary combustion chamber, which is activated when the primary combustion chamber is opened to insert a charge. The water spray is used to temporarily suppress the heat from the primary combustion chamber and reduce heat exposure to the operator. Mr. Harms also stated that the water spray is automatically activated for fire suppression when the temperature in the primary combustion chamber exceeds 2500 degrees F.

This cremation unit has three thermocouples to monitor operating temperatures. One thermocouple is located in the primary combustion chamber, the second thermocouple (PC1) is located at the rear of the secondary combustion chamber and the third thermocouple (PC2) is located where the exhaust stack is connected to the body of the cremation unit. Per a visual inspection of this cremation unit, PC1 (Post Combustion 1) appears to be the temperature sensor located in the secondary combustion chamber.

During charge insertion, the operator maintains control by using a scissor-lift table with a ram (see photo). Many crematory operators use thick cardboard tubes underneath the charge, which act as rollers, but this method can create a safety issue if the container veers off course and becomes lodged partway into the primary combustion chamber. If the container becomes lodged partway during insertion, the residual heat from the previous cremation can ignite the charge before it is completely inserted, which can result in an uncontrolled fire. The lift table latches to the front of the cremation unit to ensure the lift table does not move during insertion. The floor of the primary combustion chamber is covered with refractory tiles, which permits a relatively easy repair when portions of the floor wear out due to abrasion or thermal cycling. The scissor lift has a built-in scale to comply with recordkeeping requirements. Mr. Harms states that the scissors-lift table must be lowered to the bottom before an accurate charge weight can be measured.

Lenox uses a ball mill to process cremains and remove materials such as implants. The ball mill station uses a small baghouse, that vents to the general in-plant environment, to control particulate emissions from this process.

Per my review of Lenox Cremation's recordkeeping, the permittee appears to satisfy the recordkeeping requirements of maintaining daily records of the time (duration of burn), description and weight of the charge combusted in EUCREMATORY01 and EUCREMATORY02.

During this inspection I determined that the secondary combustion chamber temperature recordkeeping system had been corrected to indicate that the temperatures are recorded in degrees Fahrenheit (F).

During my review of the computer-based recordkeeping system, I observed that the emission unit names were juxtaposed. Mr. Harms explained that the installation technician thought it was appropriate the name the original emission unit as "02" because it is the older emission unit. This mismatch between the computer records and PTI emission unit names can cause confusion in recordkeeping and compliance reviews. Mr. Harms verbally committed to contacting the vendor and correct the names of emission units.

AP Lazer SN3024

Lenox uses an AP Lazer model SN3024 to engrave wood and marble urns. Per my previous inspection on August 4, 2020, it appeared this emission unit was not exempt from R 336.1201. A subsequent analysis per my April 30, 2021, inspection appears to indicate that this laser engraving emission unit is exempt from R 336.1201(1) per R 336.1291(2)(c) because my calculated potential to emit all toxic contaminants with screening levels less than 0.005 micrograms per cubic meter does not exceed 0.006 tons (12.0 pounds) per year. Per information provided by AP Lazer (ablation rate of 0.025 cubic inches per second) and a wood (oak) density of 0.41 ounces per cubic inch, and per AP-42 Table 1.10-3 I calculated an annual PTE of toxic contaminants with screening levels less than 0.005 micrograms per cubic meter at 7.37 pounds per year, which is less than the R 336.1291(2)(c) emission limit of 12.0 pounds (0.06 tons) per year.

It should also be noted that an internet search did not reveal emission factors associated with marble. Marble consists primarily of calcium carbonate (CaCO_3) and heat induced decomposition is not expected to release air toxics with a screening levels subject to R 336.1291(2)(c). Therefore, I have resolved the violation cited in the VN dated August 18, 2020.

CONCLUSION

Lenox Cremation Services of Michigan appears to be in compliance with the evaluated conditions of PTI No. 155-16A and the R 336.1291(2)(c) exemption from R 336.1201(1).



Image 1(IMG 0174.JPG) : Walk-in refrigeration unit with a 24-body capacity. The thermostat is set at 38-39 degrees F.

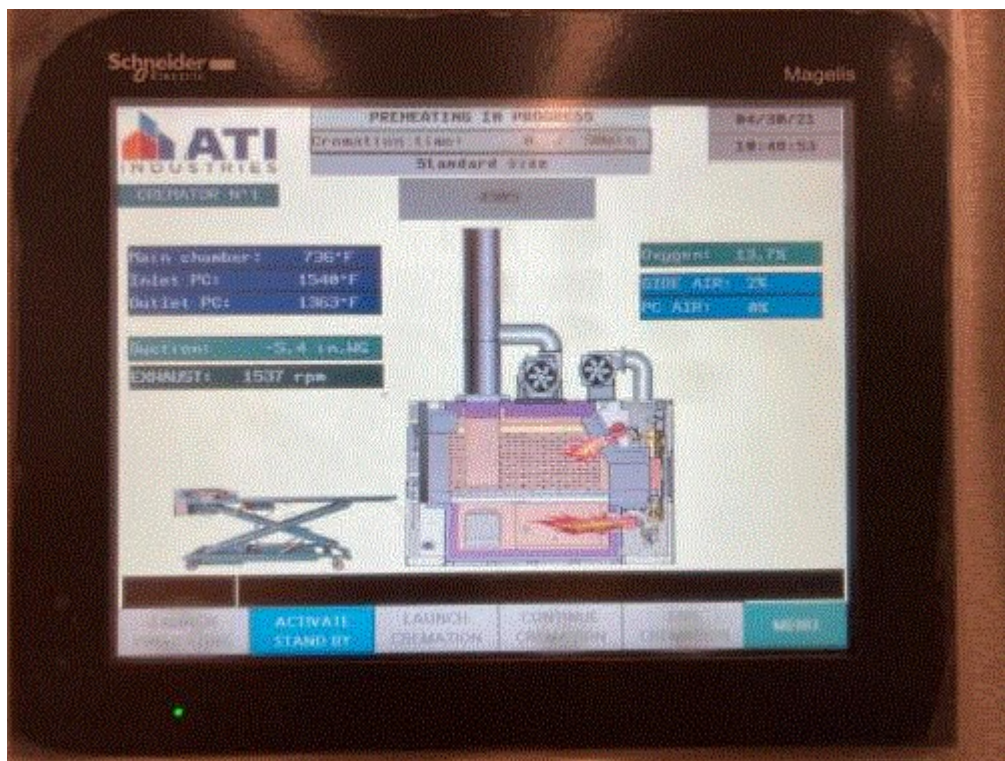


Image 2(IMG 0170.MOV) : Cremation unit control panel display.



Image 3(IMG_0191.JPG) : Lift table with scale and ram. Note: the lift table must be set to lowest position to measure the charge weight. To conceal personal information, a piece of wood was placed between the charge and ram. The wood is not required for normal operation.



Image 4(IMG_0183.JPG) : View of cremation in progress through a sight glass located at the rear of the primary combustion chamber.

NAME *Robert Elmarachi*

DATE 05/10/2021

SUPERVISOR *Joyce*