

Waste Heat Recovery Incinerator (WHRI)

Even though industry has made great strides to reduce, reuse and recycle, there is still waste generated that needs to be disposed of in a way that protects the public health and the environment. Among the current methods for managing wastes (landfill, incineration and chemical and biological treatment), incineration remains the preferred EPA method of destruction for wastes of the type produced at Lubrizol. High temperature incineration, in a properly designed and operated unit, can provide thorough and permanent destruction of hazardous waste.

The Lubrizol Painesville Township facility has utilized a state-of-the-art incinerator since 1972. Our incinerator undergoes rigorous testing and is equipped with operating controls and monitoring systems, which ensure air emissions standards are maintained during operation. Our employees responsible for operation and maintenance are highly trained and experienced in its operation and the regulations that govern it. In 2016, approximately 60% of wastes were incinerated on site.

The incinerator is regulated and complies with the following permits and regulations:

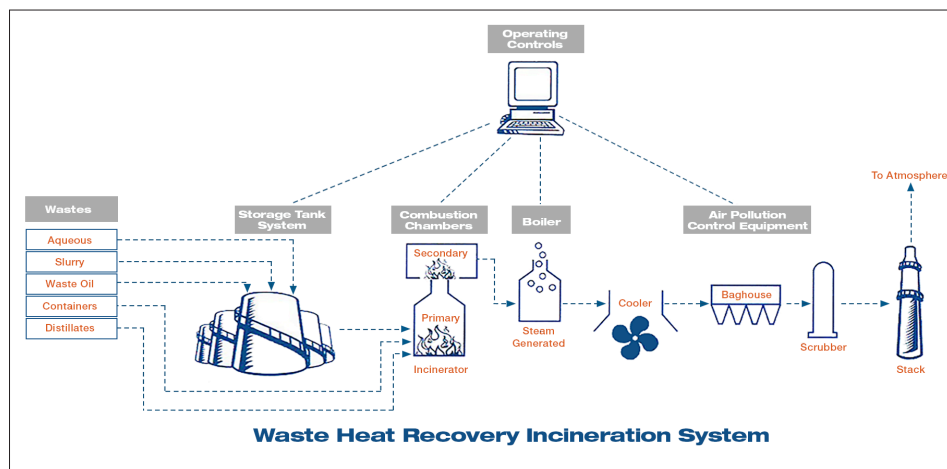
- Clean Air Act (Air permit)
- Resource Conservation and Recovery Act permit (waste regulation).
- National Emissions Standards for Hazardous Waste Combustors

Lubrizol has an exemplary compliance record with these regulations. Next, come with us on a tour of our Waste Heat Recovery Incinerator!

• Wastes

What gets burned? Waste Oil and Aqueous.

Waste oil and aqueous are generated when we flush equipment between product changes and during steps in making our product. Inside special storage tanks we



Lubrizol's state-of-the-art air pollution control equipment

separate the oil based from the water based wastes since they must be managed in different ways to facilitate thorough management of our waste.

• Slurry

Solid wastes are generally produced when filtering our products. This waste is placed in large hoppers. Hoppers are transferred to a storage tank, where liquid waste is added to create a slurry (water mixture like mud). The slurry is then pumped to a tank and fed to the primary combustion chamber.

• Containers

Solid wastes like soiled rags, used filters, etc. are also put into containers and fed into the incinerator through a hydraulic drop chute. Very little of this waste is produced.

• Distillates

Some of the liquid waste produced in manufacturing is very odorous and therefore is pumped directly to the incinerator through dedicated lines as it is produced.

Combustion Chambers

The incinerator is made up of two combustion chambers – primary and secondary. Wastes are fed into the combustion chambers. The operating temperature of the primary combustion chamber ranges from 1369°F to 1600°F based on what is being fed. Ash from this chamber falls into a chute and is carried into a container for off-site disposal. This ash is non-hazardous. From the primary chamber the hot gases flow up through a pipe to the secondary combustion chamber where temperatures are kept at 1650°F to 1700°F. This is where final destruction occurs.

Boiler

Hot gases then pass through the boiler section where this heat is used to boil water and generate steam, helping the natural gas steam boilers that produce the majority of the plants' steam needs. Approximately 15-20% of the plant's steam is generated by the incinerator! Generating the steam reduces the hot gas temperature to about 600°F.

Did you know? "...incineration remains the preferred EPA method of destruction for wastes..."



Kirk Oswald, utilities superintendent, stands in front of a combustion chamber of the Waste Heat Recovery Incinerator Unit he supervises.

Waste Heat Recovery Incinerator (Continued)

Cooler – The gases are cooled almost immediately by a water spray that reduces the temperature below 500°F.

Baghouse – The gases then continue into the baghouse, containing a total of 546 fabric filters that remove fine particles that are too light to be removed with the ash leaving the primary combustion chamber. Air pulses knock the particles off the bags where they fall into a container for off-site disposal. This material is non-hazardous.

Scrubber – The gas stream then enters the wet scrubber portion of the unit which cools the gases to approximately 150°F and uses wet packing to effectively scrub any gases going up the stack.

Stack (visible from highway) – The gases then enter the 110 foot stack for discharge to the atmosphere. There is a plume or vapor trail seen near the stack top as a result of the water vapor contacting the air.

Operating Controls – A centralized control room monitors and controls the destruction of the waste as it goes through the incineration process. A single operator can oversee the incinerator operations from several computer terminals which give him instant readouts on temperatures, flow rates and air pollution control equipment performance. Alarms and automatic shutdown of waste feeds are programmed to happen should anything abnormal occur. Extensive performance data is kept by computer for review by incinerator operators or EPA representatives. Our incinerator operators hold a Third Class Stationary Engineer license from the State.

Monitoring – During combustion in the incinerator, carbon monoxide is given off, much like your car or furnace. As a safety measure CO monitors are built in and automatically shut off the waste feed to the unit if the level of CO should ever exceed its limit.

Waste Heat Recovery Incinerator:

What are the benefits to Lubrizol and the environment?

1. Confidence that waste is handled responsibly
2. Reduces waste to landfill – saves money while helping the environment
3. Steam generated reduces our purchase of natural gas, *saving us \$500,000 to \$1 million per year*
4. Since it is an on-site treatment, it lowers the likelihood of a spill or incident during transportation
5. Destruction *efficiency of our waste incinerator is 99.999%*



Lubrizol Painesville
Waste Heat Recovery
Incinerator

Did you know?

“ In 2016 approximately 60% of facility wastes were incinerated (wastes that would have otherwise been sent offsite for disposal). ”