

Difference Between Mass Incineration and Water Wall Incineration of MSW

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Key Difference - Mass Incineration vs Water Wall Incineration of MSW

The term MSW stands for Municipal Solid Waste. The disposal of MSW is one of the more serious and controversial urban issues that any local government or country face. Despite modern technologies, better management of solid waste is challenged due to increasing population, the increase of per capita income and development of the country. There are three main strategies to process solid waste; [composting](#), incineration and landfilling. Incineration involves the burning of solid waste by reducing volumes and producing energy in the form of steam, heat, hot water or electricity. Mass incineration technology and water wall incineration technology are two major types of incineration strategies used for MSW. The **key difference** between mass incineration and water wall incineration is that **mass incineration is the direct burning of MSW to generate electricity whereas water wall incineration is the direct burning of MSW in water wall furnaces to generate steam.**

What is MSW?

MSW is Municipal Solid Waste. It has a broad compositional and size distribution containing [organic matter](#) (combustible materials) and non-organic matter (non-combustible materials). Particle size range of MSW can be from dust to large bulky material such as furniture.



Figure 01: MSW

The average energy content of typical MSW is about 10,000 kJ/kg. a typical incineration electricity generating plant needs about 50 tons of MSW to generate 1 MW of electricity power for 24 hours.

What is Mass Incineration in MSW?

Mass incineration or mass burning is the simplest and the oldest method of MSW incineration. This method typically utilizes of all types of waste without any separation of MSW. However, successful [combustion](#) of waste material depends on the time of burning, temperature and the degree of turbulence. When we design a mass incinerator, we need to consider the above-mentioned parameters. Generally, MSW is burnt in mass incinerators to generate electricity and other energy forms.



Figure 02: Landfilling

This method is an economically viable method. Unburnt materials are used for landfillings after incineration. Landfilling is the terminal approach to waste management. But, landfillings are also environmentally challenging, since they contain significant contaminants capable of polluting underground and surface water bodies.

What is Water Wall Incineration of MSW?

Water wall incineration is a type of mass incineration. This technology also uses MSW without separating or any pre-processing to incinerate directly in a furnace. The primary product is steam, which can be converted to hot water and electricity. as with all combustion technologies, a solid waste residue or ash generated in this method is used for land fillings.

In water wall incineration, MSW is burnt directly in large furnaces known as water wall furnaces. In some installations, shredding is done in order to reduce the size of waste particles. For example, metal components can be separated using magnetic separation techniques. This separation can be done before or after the incineration process.

Small-scale Incineration Units:

Small-scale modular incineration can produce steam/hot water much efficiently. They generally do not need material processing or separation before the incineration, because these units use waste that is more homogeneous than MSW. Small-scale incinerators are used for waste coming from hospitals, schools, educational institutes, small-scale industries, etc.

What are the Similarities Between Mass Incineration and Water Wall Incineration of MSW?

- Both Mass Incineration and Water Wall Incineration are incineration processes
- Water wall incineration is a form of mass incineration
- Both Mass Incineration and Water Wall Incineration processes do not use pre-processing steps or separations.

What is the Difference Between Mass Incineration and Water Wall Incineration of MSW?

Mass Incineration vs Water Wall Incineration of MSW	
Mass incineration is the direct burning of MSW.	Water wall incineration is the direct burning of MSW in water wall furnaces.
Primary Product	
Mass incineration is used to generate electricity and other energy forms.	Water wall incineration gives steam as the primary product, and this steam can be converted into hot water and electricity.

Summary - Mass Incineration vs Water Wall Incineration of MSW

MSW is a municipal solid waste. There are many ways that have been discovered to process these waste before releasing to the environment. Mass incineration is one such method. Water wall incineration is a form of mass incineration. The difference between mass incineration and water wall incineration is that mass incineration is the direct burning of MSW to generate electricity whereas water wall incineration is the direct burning of MSW in water wall furnaces to generate steam.

Reference:

1. "Materials and energy from municipal waste : resource recovery and recycling from municipal solid waste and beverage container deposit legislation." Google Books. [Available here](#)
2. "Read "Waste Incineration and Public Health" at NAP.Edu." National Academies Press: OpenBook. [Available here](#)

Image Courtesy:

1. 'Rifiuti solidi urbani (Municipal solid waste) - Stazione di Aversa - Province of Caserta, Italy - 11 Feb. 2008' By Adriano Amalfi from Rome ma pure Orta di Atella (CE), Italy - Munnezz!!, ([CC BY 2.0](#)) via [Commons Wikimedia](#)
2. 'US Navy 090717-N-6865V-001 An excavator removes hazardous waste from an old landfill during a restoration project at Naval Base Ventura County, Point Mugu' By U.S. Navy photo (Public Domain) via [Commons Wikimedia](#)

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