Miracle Cube

Innovation for Waste, Ecology, Energy & Climate Challenges

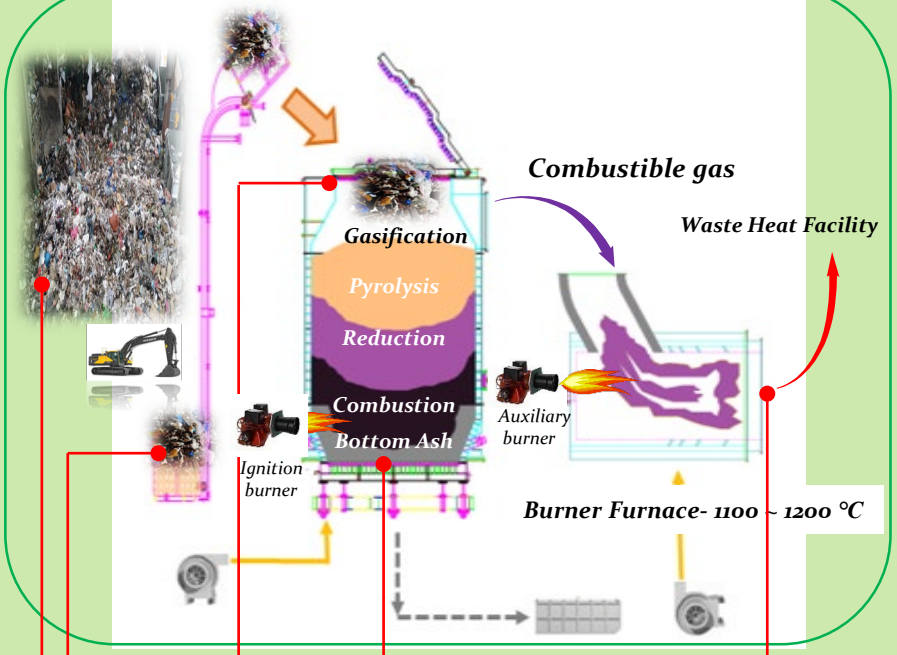
Hanki Industrial Co.

Environmental Care & Energy Saving

HANKI INDUSTRIAL CO., Ltd .

Comparison of incinerator Type

Low-temperature gasification type



* Skid Hoist - Batch type operation method (twice a day - / 12Hr) makes operation easy and easy

Pyrolysis Furnace

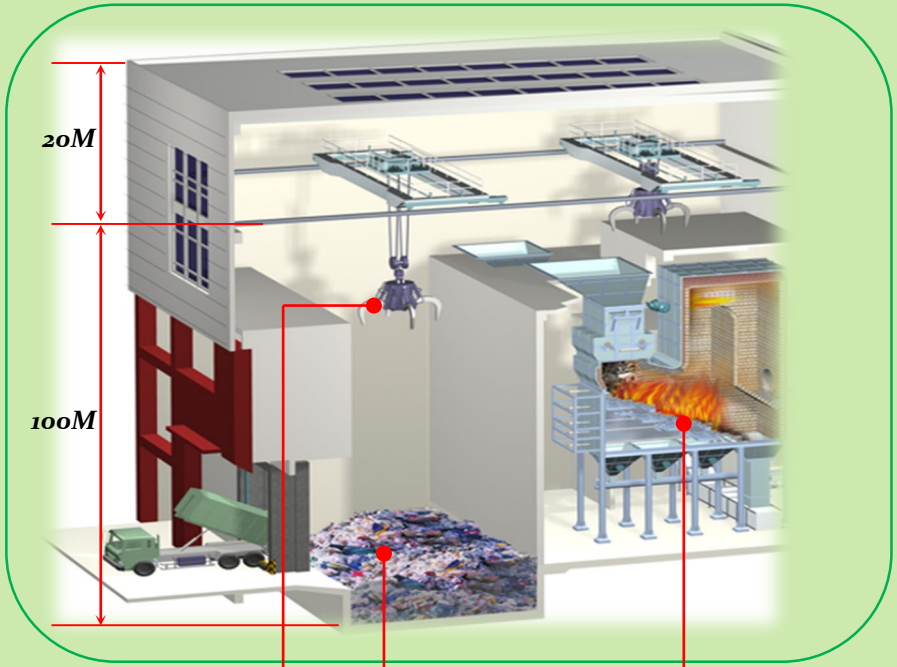
* It is a method that burns garbage to the silo and then burns it locally by applying heat of 250 degrees Celsius from the bottom of decomposition furnace to gradually decompose the garbage to generate combustible gas in medium and low molecular

- ✓ Operating Personnel : 0.5 0.7 (Relative to Stoker type)
- ✓ Outlet side temp : **1100~1200℃**
- ✓ Exhaust Gas : 0.5 ~0.7(Relative to Stoker type)
- ✓ Dioxin Generated : **0.01ng-TEQ/Nm³**

Bottom & Fly Ashes

✓ **2~3% of Wastes**

Stoker type



*Because the waste is continuously injected for one day (24 hours),the operation condition must be adjusted according to the combustion condition, so a period of practical training is necessary.

Stoker

*The waste is supplied to the stoker and the air is supplied from the lower part of the grate to burn at 850 degrees (980 metric tons using a large amount of auxiliary fuel LNG)

Outlet side temp : **1100~850℃**

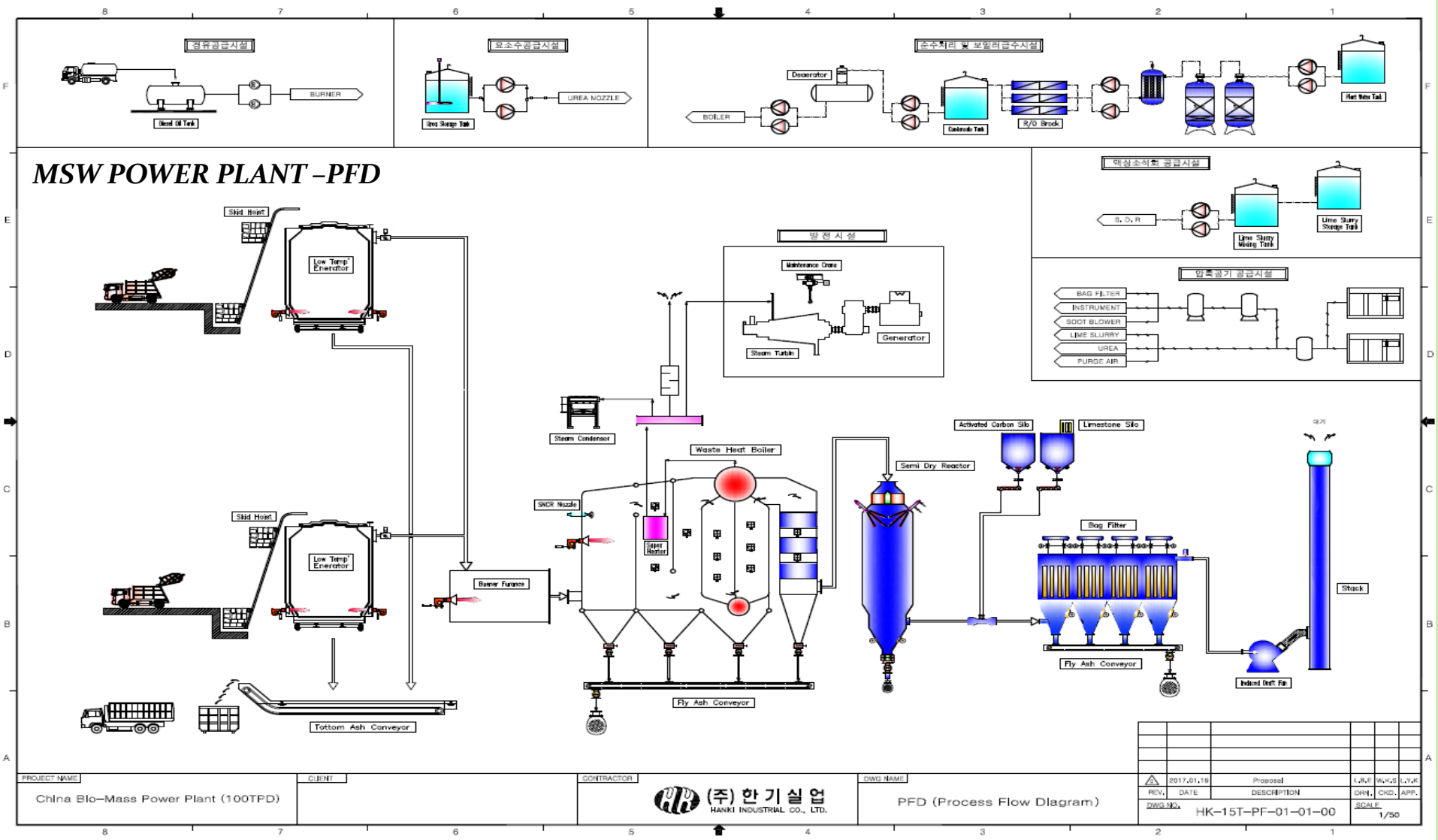
Exhaust Gas : 1

Dioxin Generated : **0.1ng-TEQ/Nm³**

Bottom & Fly Ashes

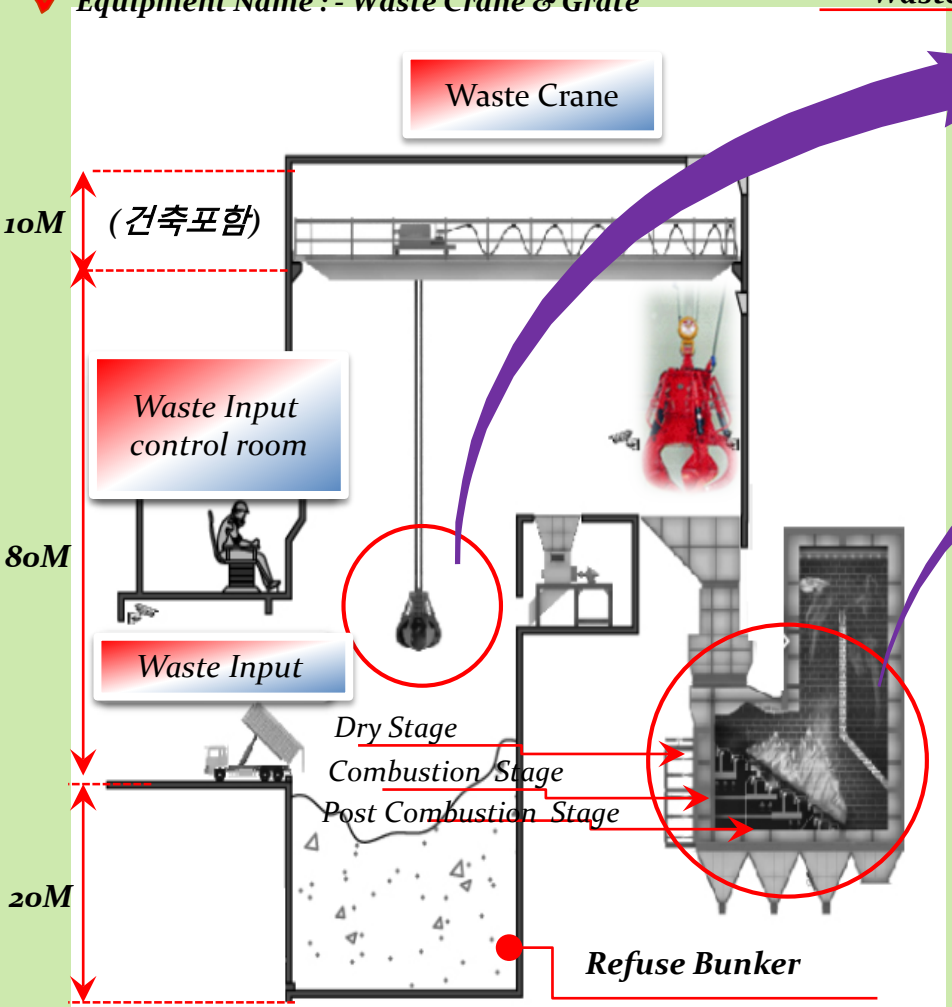
✓ **5~10% of Wastes**

4. 시설구성도



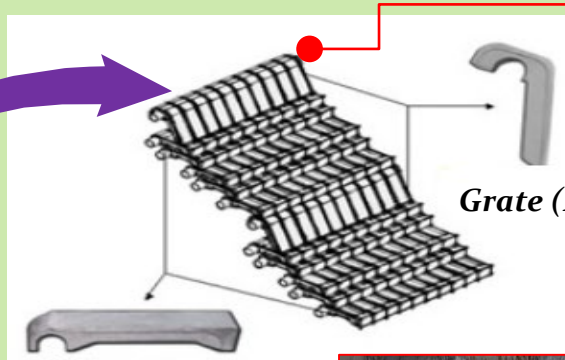
1. Incinerator (Moving Stoker) Type Problem

✓ Equipment Name : - Waste Crane & Grate

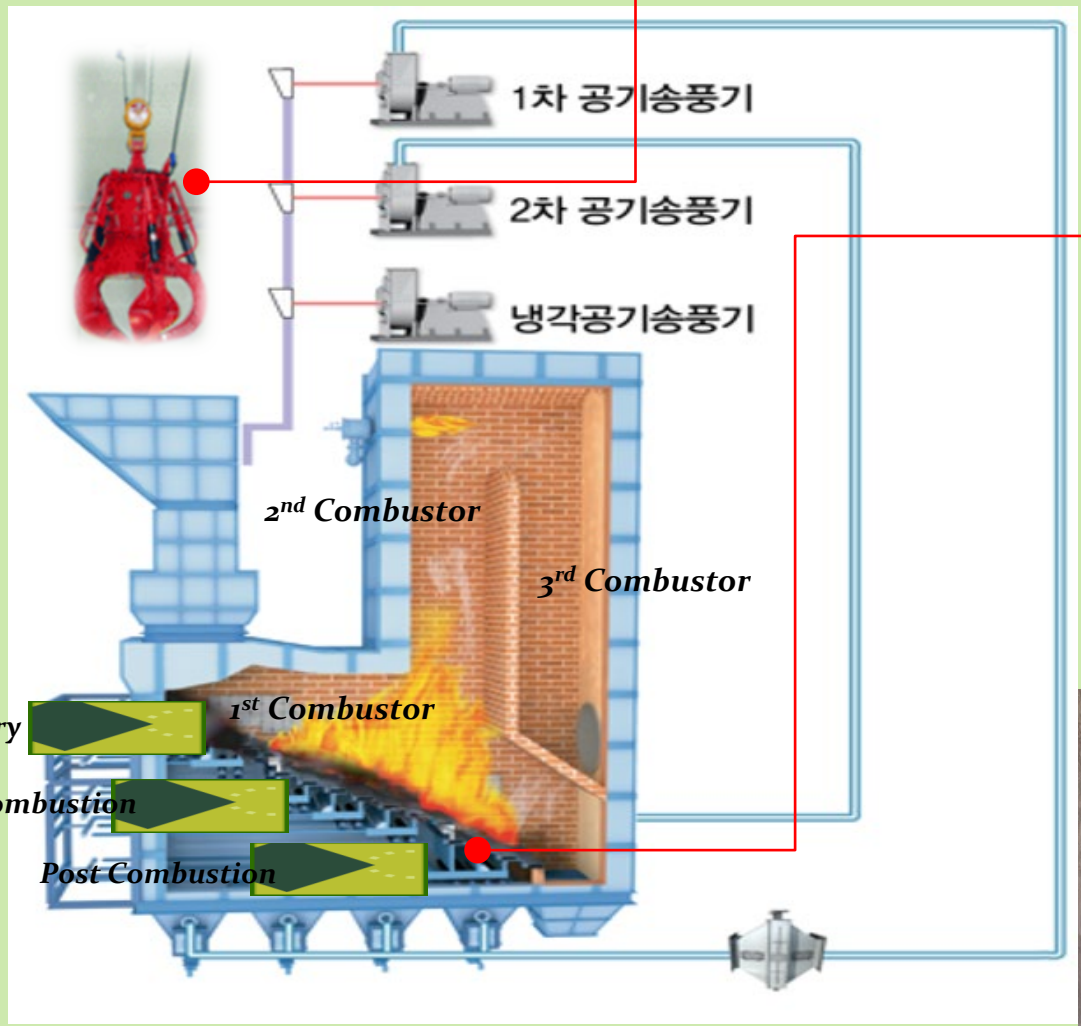


Waste Crane

Moving Stoker

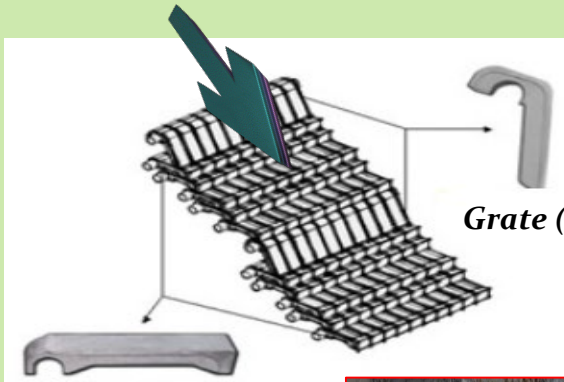


3. 소각로 Stoker 구조 및 화격자 크랭크 이상발생



✓ Refuse Crane

✓ Moving Stoker Type



Pyrolysis vs Stoker

	Low-temperature pyrolysis Gasification	Stoker Incineration
Fundamental difference of Operation	Pyrolysis Gasification is composed of 2 steps; 1. Gasification of waste by Furnace, 2. Combustion of syngas by Gas Burner: Pyrolysis system is composed of two furnaces that operates in rotation; while one furnace is gasifying waste, the other furnace stands by with loaded wastes. Supplementary fuel not needed as the Furnace operates at low temperature of 250℃ while gas burner operates at 1100℃	Stoker furnace directly incinerates the waste and generates energy. System consists of moving and stationary grates to mix and stir up waste for maximum efficiency of burning. Supplementary fuel needed to maintain the incineration temperature at 850℃. Maximum care and manual operation is needed to mix and stir up the waste for high efficiency of incineration. .
Waste feeding	Waste feeding by bucket once every 12hours. No manual crane operation needed.	Waste has to be manually supplied by worker operating crane 24 hours a day.
Waste type	Gasify all types of waste in the same furnace from domestic, medical to industrial waste: from low calorie waste including wet sewage sludge to high calorie industrial waste.	Each furnace can incinerate only 1 type of waste either municipal or industrial waste.
Advantage over Stoker incineration	30 to 50% less exhaust gas, Less NOX Complete decomposition of dioxin, (1/10th of Japanese standard) 30% more energy generation 50% less land space needed final ash only 1/3 of stocker incineration (ash is safe to be used for road construction) Longer durability more than 20 years, (stocker 15 year max) 70% less maintenance cost, 40% less operation cost Operation day: more than 330 days per year while stoker is 300 days. No repair needed for cranks and grates as in the case of stoker	