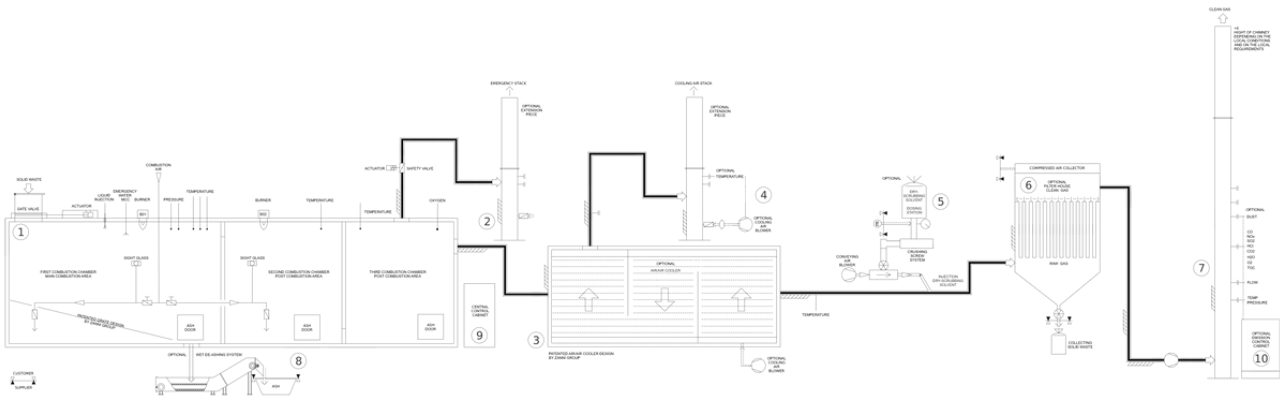
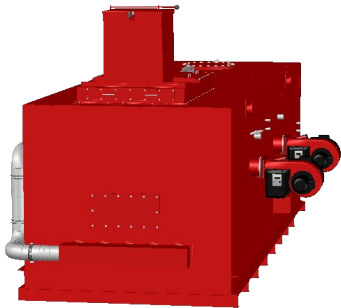


International tender specification (EN)  
Internationale Ausschreibungsspezifikation (EN)

Stationary incineration plant



1) Combustion furnace



The heart of every plant is of course the combustion chamber, with its grate and combustion system philosophy.

For this, all parameters of the combustible material need to be taken into account, as well as the question of sustainability in dealing with the waste.

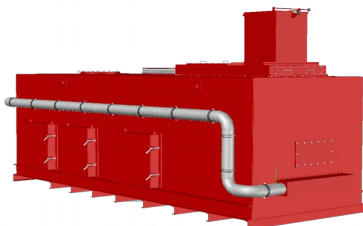
The combustion furnace should have a two-chamber ceiling loading system consisting of a manual or optionally automatic chamber opening, together with a driven slide system to separate the combustion chamber.

Two burner systems should to be used to heat up the system and to support the firing at low calorific values of the waste. One burner system for the main combustion chamber and one burner system for the afterburner chamber. This should be divided in not less than two chambers and should be big enough to ensure the dwell time of the flue gas not less than two seconds.

Depending on the setting, the combustion chamber temperature have to reach 850 - 950 °C in the main combustion chamber and 950 - 1150 °C in the afterburner chamber. The firing temperatures should be automatically controlled according to local specifications. An emergency system (pressure and temperature dependent) is recommended depending on the size of the combustion system.

A ventilation of the grate in the main chamber is required to ensure a good outburn of the combustible materials on the grate. The grate should be easy to maintain and to replaced, as combustion gratings are wearing parts.

The afterburner chambers need to be ventilated as well. Ventilation has to be provided by one or more combustion air fans, controled and regulated by corresponding oxygen measurements to ensure sufficient oxygen enrichment and thus complete combustion.



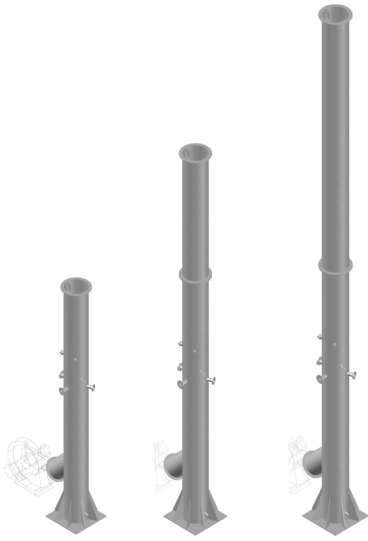
The system should contain 2 sight glasses into the combustion chamber as well as numerous connections and connection possibilities for necessary and additional measuring instruments.

The ash have to be removed manually via 2-3 large ash removal doors or optionally via an automatic wet ash removal system (8) depending on the size of the combustion furnace.

**International tender specification (EN)  
Internationale Ausschreibungsspezifikation (EN)**

**Stationary incineration plant**

**2) Emergency chimney**



The emergency chimney should contain a ventilation and non-return flap as well as 2 measuring points which can either be optionally equipped with measuring instruments or used for own purposes. The chimney can be insulated on the outside by client or optional by the supplier.

**Standard execution**

Materials: Depending on the media. Carbon and stainless steel of various classes.

Construction height: 6, 9, and 12 m. Others on request.

Diameter: 356, 508, 559 mm. Others on request.

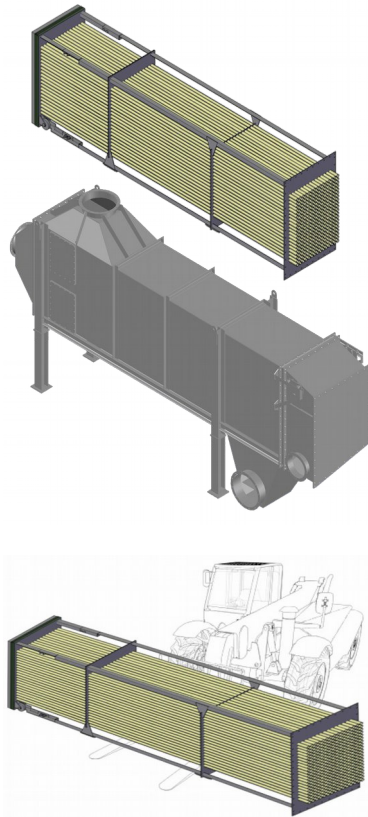
Wall thicknesses: Determined by design

Gas measuring connection: Up to 6 pieces

Insulation: External insulation possible

### Stationary incineration plant

#### 3) Flue gas cooler



The required type of flue gas cooler need to be very easy to maintain. It's design has to be long resistant against heat, abration and acids which is naturally dependent on selected materials.

An Air/Air cooler is the preferred system type, since the cooling circuit is shielded from the flue gas and the heat and thus energy transfer to the cooling air is due to the engineering enormous, it is nearly inevitable that this cooling air can be used further and thus the efficiency of a plant can be increased. In the design phase, the flue gas and cooling air side are considered as independent systems.

One system, the flue gas side, must be resistant to heat, abrasion and corrosion and the other, the clean cooling air side, to sometimes enormous temperatures, depending on the design of the plant. The thermal, mechanical problems that arise on the cooling air side been constructively implemented .

Of course, the flue gas pipes are still exposed to a great deal of stress and their durability can be increased by using special steels, but they are still nothing more than wearing parts from a classical point of view. The entire rear chamber part need to be easily removed and the cooling tubes easy to replaced. The cooling system should significantly reduces downtime and keeps maintenance costs to a minimum.

The temperature ranges for the flue gas side are, depending on the design of the upstream plant, between 850 - 1200 °C and the cooling

air side between 300 - 650 °C.

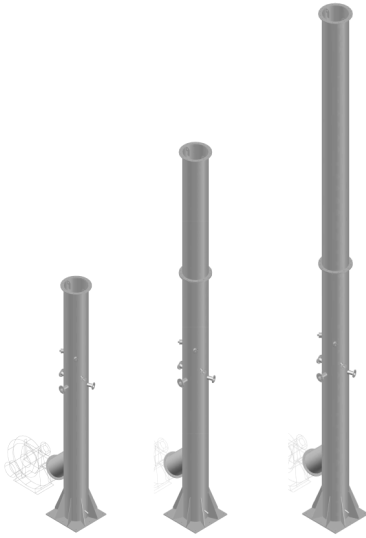
Deviations are of course possible depending on the individual design of each plant.

Requirement to the cooler design:

- Easy to maintain.
- Long resistant against heat.
- Long resistant against acids.
- Long resistant against abration.
- Heat recovery via clean cooling air possible.
- No material attack of the secondary air cooling circuit by aggressive media.
- Long service life.

**Stationary incineration plant**

**4) Cooling air chimney**



The cooling air chimney should contain a ventilation and non-return flap as well as 2 measuring points which can either be optionally equipped with measuring instruments or used for own purposes. The chimney can be insulated on the outside by client or optional by the supplier.

Depending on the operating conditions and use of the cooling air, which can also be used for heat recovery, it may be necessary to equip the system with an additional chimney cooling air fan to mix cold ambient air into the clean hot cooling air.

Therefore, a connection of this optional system via the non-return flap should be provided.

**Standard execution**

Materials: Depending on the media. Carbon and stainless steel of various classes.

Construction height: 6, 9, and 12 m. Others on request.

Diameter: 356, 508, 559 mm. Others on request.

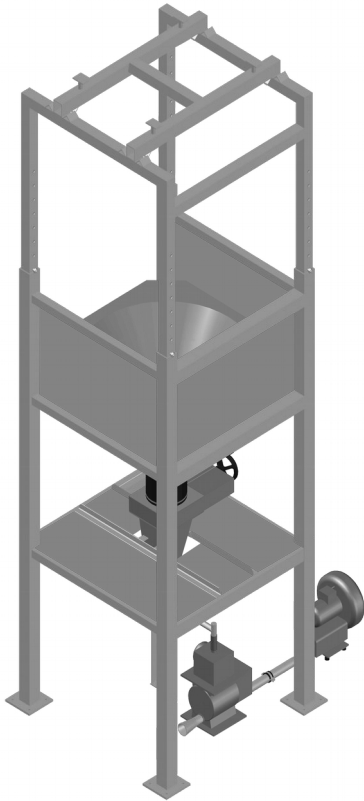
Wall thicknesses: Determined by design

Gas measuring connection: Up to 6 pieces

Insulation: External insulation possible

Stationary incineration plant

5) Dry-scrubbing-solvent system



A dry-scrubbing-solvent injection system by means of a dosing station is required to remove particles and gases from the exhaust gas streams via dusted air filters.

These dry scrubbing systems are used to remove corrosive and toxic gases (for example SO<sub>2</sub> and HCl) from the exhaust gas. They are very effective with low investment and operating costs.

Many acid gases, such as ammonia and hydrogen chloride are water soluble and react aggressively when moisture is added to the gas.

Dry gas scrubbers add either no or very little liquid to the exhaust gas they are cleaning. This means that they are less prone to corrosion. This means that they do not require waste water disposal procedures or steam plumes - common scrubber accessories.

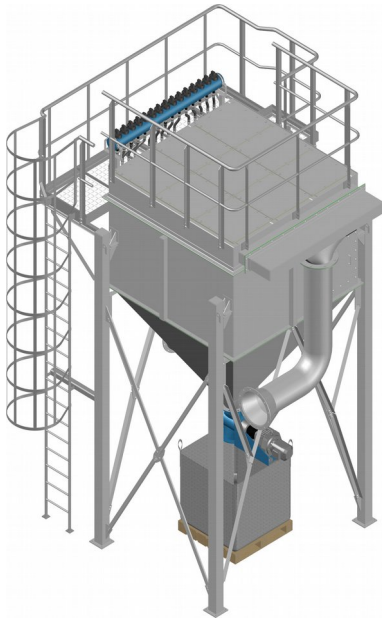
The dry gas scrubber simply injects a sorbent that efficiently captures and absorbs acid gases.

Odorous, corrosive gas by-products can be additionally removed from the exhaust gas by adding activated compounds that treat certain pollutants. Once it has absorbed all harmful compounds, it is removed from the filter elements together with excess sorbent by a control device.

A dry scrubbing system is required as an important part of gas phase filtration and is therefore best suited for maintaining high environmental standards.

## Stationary incineration plant

### 6) Filter system



For the dry washing technology ceramic filters or fabric filters has to be used.

Ceramic filters are the preferred filters for furnaces up to 400 kg/h, as these have a very high filter efficiency on the one hand and a very long service life on the other.

But of course which of these both filter technologies is suitable is mainly a question of the amount of exhaust gas and the media itself.

The filter units should be of modular design.  
Several modules can thus form a filter system.  
The design of a plant is based on its operating data.

For the dry-washing systems it is recommended to use a dry-scrubbing-solvent injection system. These dry scrubbing systems are used to remove corrosive and toxic gases (for example SO<sub>2</sub> and HCl) from the exhaust gas. They are very effective with low investment and operating costs. The temperature range for the dry-scrubbing solvent should be from 170°C up to 300°C. In this range the dry-scrubbing solvent can transfer the contents. Flue gas mixed with dry-scrubbing solvent create a layer on outside surface of the filter and accumulate during operation.

The dust layer causes a pressure drop and a differential pressure measurement has to indicate necessary cleaning steps.

At a certain differential pressure level the filter will be cleaned by pressure air with a reverse jet cleaning system which clean the filter by a jet impulse and the dust layer on the outside surface of the filter will fall down.

At the bottom of the filter the ash feed by a rotary valve to a big bag or ash container or fed by a feeding system to a central collecting

vessel.

A required insulation at the outside of filter body keeps it from corrosion, during shut down periods. The dust inside could be contaminated with sulphur and other components. If the temperature falls below the dew point, corrosion could be happen.

Therefore a standstill heater is additionally recommended to protect the housing from corrosion, but this heater is only an option, because if it is necessary depends always only on local conditions.

The filter elements has to be easily removed when necessary by operation staff after training.

**International tender specification (EN)  
Internationale Ausschreibungsspezifikation (EN)**

**Stationary incineration plant**

**7) Main (clean gas) chimney**



The main stack have to equiped with 6 measuring points which can either be optionally occupied with measuring instruments, for example for continuous emission measurement, or used for own purposes. The chimney can be insulated on the outside either by client or optionally by the supplier.

All chimneys should be offered in a standard construction height of minimum 6 m, with the possibility of an extension to 9 or 12 m.

**Standard execution**

Materials: Depending on the media. Carbon and stainless steel of various classes.

Construction height: 6, 9, and 12 m. Others on request.

Diameter: 356, 508, 559 mm. Others on request.

Wall thicknesses: Determined by design

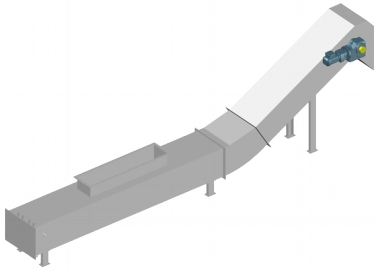
Gas measuring connection: Up to 6 pieces

Insulation: External insulation possible

**International tender specification (EN)**  
**Internationale Ausschreibungsspezifikation (EN)**

**Stationary incineration plant**

**8) De-Ashing system**



The ash has to be removed manually via 2 or more large ash removal doors or optionally via an automatic wet ash removal system.

In this case the burnt-out ash falls behind the last grate zone through a foreseen ash shaft into the water bath of the wet de-asher and is cooled down there.

From the de-asher bath the material will be transported via a scraper conveyor to a collecting container or other requested system.

Other ash removal systems, such as dry ash removal systems, are of course also possible, whereby the wet ash removal systems have proven themselves.

For the use of an ash removal system, the plant must be jacked up according to the ash removal system height.

Necessary components should be optionally offered.



**International tender specification (EN)**  
**Internationale Ausschreibungsspezifikation (EN)**

**Stationary incineration plant**

**9) Control cabinet**



The control cabinet of a plant is a complex system that always has to be adapted to each individual plant, as the requirements and designs of a plant correspond to local needs.

It also includes the logical, i.e. software solution for each individual plant.

Therefore this item is always considered as an independent component.

The design of a control cabinet includes everything that belongs to it.

The control panel is fitted to the control cabinet door with necessary keys and/or touch screens for operation.

The control panel can also be supplied remotely as a separate "key" panel, or as a PC solution.

Necessary components should be optionally offered.

**International tender specification (EN)**  
**Internationale Ausschreibungsspezifikation (EN)**

**Stationary incineration plant**

**10) Continuous emission monitoring system (CEMS)**



CEMS are used as a tool to monitor flue gas for oxygen, carbon monoxide and carbon dioxide to provide information for combustion control in industrial settings.

They are currently used as a means to comply with air emission standards.

Facilities employ the use of CEMS to continuously collect, record and report the required emissions data, that could be for example:

- HCl (hydrogen chloride),
- Cl<sub>2</sub> (chlorine),
- NO<sub>x</sub> (nitrogen oxides),
- SO<sub>x</sub> (sulfur oxide),
- CO (carbon monoxide),
- TOC (total organic carbon).

Necessary components should be optionally offered.

**International tender specification (EN)  
Internationale Ausschreibungsspezifikation (EN)**

**Stationary incineration plant**

**Generally note for the items 1 - 10**

Please note that each system requires an individual configuration.  
Calculate your system individually according to the specifications and requirements.