

Clean Combustion® Incinerators

NORAM's Clean Combustion® technology not only includes multifuel burners, start– and load burners but also incinerators. These can be supplied with the burner, combustion chamber and steam boiler if requested.

The problem

Within plants there is often a production of auxiliary gases for example SOG (stripper-of-gases) and CNCG (concentrated non-condensable gases) or unwanted liquids such as methanol and turpentine. In order to avoid environmental pollution these are required to be incinerated while keeping the NOx emissions low in line with governmental policies.

The solution

The Clean Combustion® incinerators consists of the burner with similar design as the multifuel burners. A temperature of above 650°C is required to achieve a satisfying incineration while avoiding thermal NOx generation.



Figure 1: The top of an incinerator, in this case placed vertically

How it works

In order to achieve the correct temperature for incineration, the burner is usually designed to use a primary fuel with a higher heating value compared to SOG and NCG. With the Clean Combustion® design, only one burner is still required despite several fuels. To keep the low NOx levels, a separate combustion chamber and different air injections are used to have a longer retention time and lower temperature (<1200°C).



Figure 2:

A burner designed for a combustion chamber

The benefits

The **low NOx** design of the Clean Combustion® incinerators is achieved through various parameters such as **control of partial pressure** and **retention time**. There is also **control over the excessive air supply** to the combustion zones through different injection points. The **combustion zone temperature** is controlled by recirculating oxygen deprived flue-gases into the combustion chamber. For the liquid fuels, the Clean Combustion® nozzle is used with a **high atomization degree, reducing emissions**.



Figure 3: The flame from the incinerator burner

Steam boiler

Additionally, the hot gases from the incinerator can be utilised to **create steam** and **recover the energy**. This will cool the flue gases to become **less demanding** to upstream material and equipment. Figure 4 shows a horizontal fire-tube boiler.

The boiler-feed water can also be preheated by an economizer at the boiler outlet to further cool the flue gases.



Figure 4: An installed steam boiler

