

NORAM's Clean Combustion® technology includes start and load burners together with incinerators and multifuel burners. The burners can be used in district heat boilers, bark boilers, rotary kilns among others. Over 80 installations have been completed in several parts of the world such as Sweden, Poland, Brazil and India.

The problem

Traditional designs of liquid fuel nozzles comes with a risk of plugging due to a mixing zone with the fuel and atomization media inside the nozzle.

This can lower the atomization degree and alter the flame, resulting in a longer startup. The combustion will be incomplete and the emissions levels will be higher.

The solution

The Clean Combustion® technology can be used for both start and load burners with liquid or gaseous fuels depending on the requirements. The nozzles and turbulator for the combustion air are carefully designed to optimize the atomization and thereby the combustion.

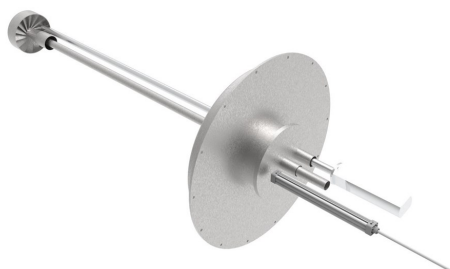


Figure 1 Example of a start burner

How it works

The liquid fuel will be atomized either by steam or pressurised air, with the Clean Combustion® nozzles the mixing area will be outside of the nozzle. See Figure 2.

The combustion air is set in a rotation by vanes in the turbulator, creating an underpressure in the flame center which helps mixing the oil mist with the air.

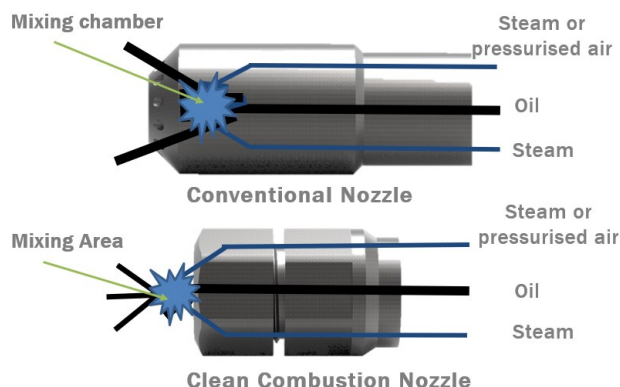


Figure 2 Conventional nozzle vs Clean Combustion nozzle

The benefits

The Clean Combustion® nozzle offers higher reliability with decreased risk of plugging. This results in reduced maintenance and required cleaning.

The high atomization degree together with the air turbulator design contribute to achieve a complete combustion. This decreases harmful emissions and lowers the fuel required.

In addition, faster startups and smoother operation with a varying load or composition is achieved with a stable flame.

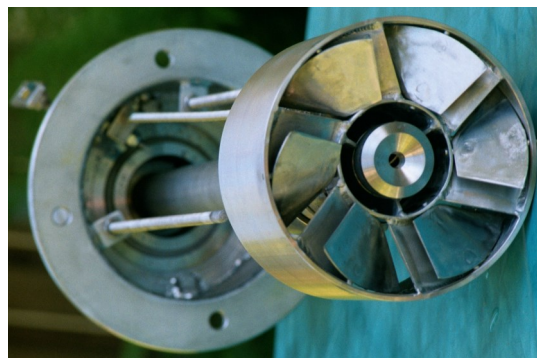


Figure 3 A load burner

Injection systems

Additionally, NORAM can also supply injection systems of urea or water for SNCR systems. The complexity can vary depending on the request, either as in Figure 4 or simpler consisting of only the lance. The nozzle is designed specifically to achieve an optimal dispersion as with the atomization for start and load burners.

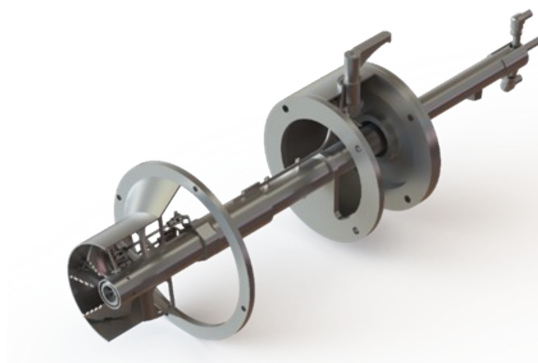


Figure 4 A SNCR injector