

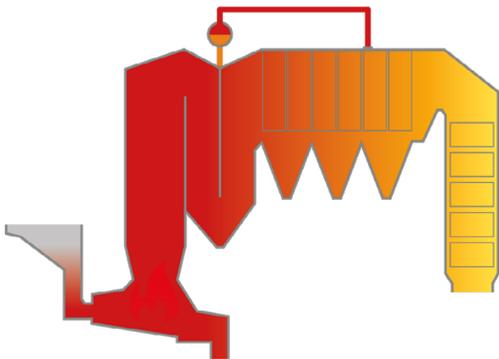
# Technology Portrait:

## Doosan Lentjes Steam Generator

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For a long time, waste incineration focussed solely on the safe and environmentally friendly disposal of the delivered fuel. Today, however, it is becoming increasingly important to utilise the energy contained in the waste as effectively as possible. Increasingly stringent requirements in this respect therefore make careful planning of the steam generator essential.

Our knowledge gained from several decades of boiler construction and operating experience in thermal waste treatment has led to the development of selected boiler concepts that are characterised by high efficiency and flexibility with regard to the individual project-specific framework conditions.



### The function

From a thermodynamic point of view, the function of the boiler - regardless of the chosen concept - is to transfer the heat from combustion to water, which is heated (economiser), vaporised (evaporator) and then superheated (superheater).

The heat transfer cools the flue gas from the combustion temperature to a flue gas temperature that is suitable for operating a flue gas cleaning system downstream of the boiler. The heat from the combustion is utilised in a water steam cycle, for example.

An important aspect for the operation of boilers for the incineration of residual waste is the minimisation of soiling of the heating surfaces. This influences the heat transfer between flue gas and water and leads to a significant shift in heat absorption in the boiler during operation. Despite this shift, the process engineering parameters such as the fuel mass flow, the preferably low flue gas temperature and the superheated steam parameters should be kept as constant as possible over the entire boiler operating time.

### Optimised design

The requirements that need to be taken into account in the thermal design of a modern steam generator are diverse and have a significant impact on the boiler concept. Overall, these can be summarised as follows:

- ▶ Compliance with legal regulations and ordinances - if possible without the use of auxiliary firing,
- ▶ Development of a reliable process engineering concept, such as generously designed radiant spaces with low flue gas velocities to reduce dust entrainment from the firing and preferably low flue gas temperature upstream of the convection heating surfaces, good flue gas mixing before entering the superheater heating surfaces, avoidance of temperature and flue gas velocity peaks or imbalances, small and easy-to-clean superheater heating surfaces and generously dimensioned pipe partitions in the convection heating surfaces,
- ▶ Minimisation of investment and operating costs, i.e. use of materials that are as simple and inexpensive as possible, long service life of the refractory lining, simple manufacture and assembly as well as ease of maintenance.

**DOOSAN**  
Lentjes

# **DOOSAN** Lentjes

## **The advantages of our Doosan Lentjes steam generators at a glance:**

- ▶ Maximum flexibility with regard to individual customer requirements
- ▶ Consideration of the respective project and site-specific conditions
- ▶ Optimisation using computational fluid dynamics (CFD) to harmonise the steam generator with the combustion system and combustion chamber design
- ▶ Reliable and cost-effective components
- ▶ Long-term and reliable fulfilment of tasks with high efficiency and minimum maintenance requirements

