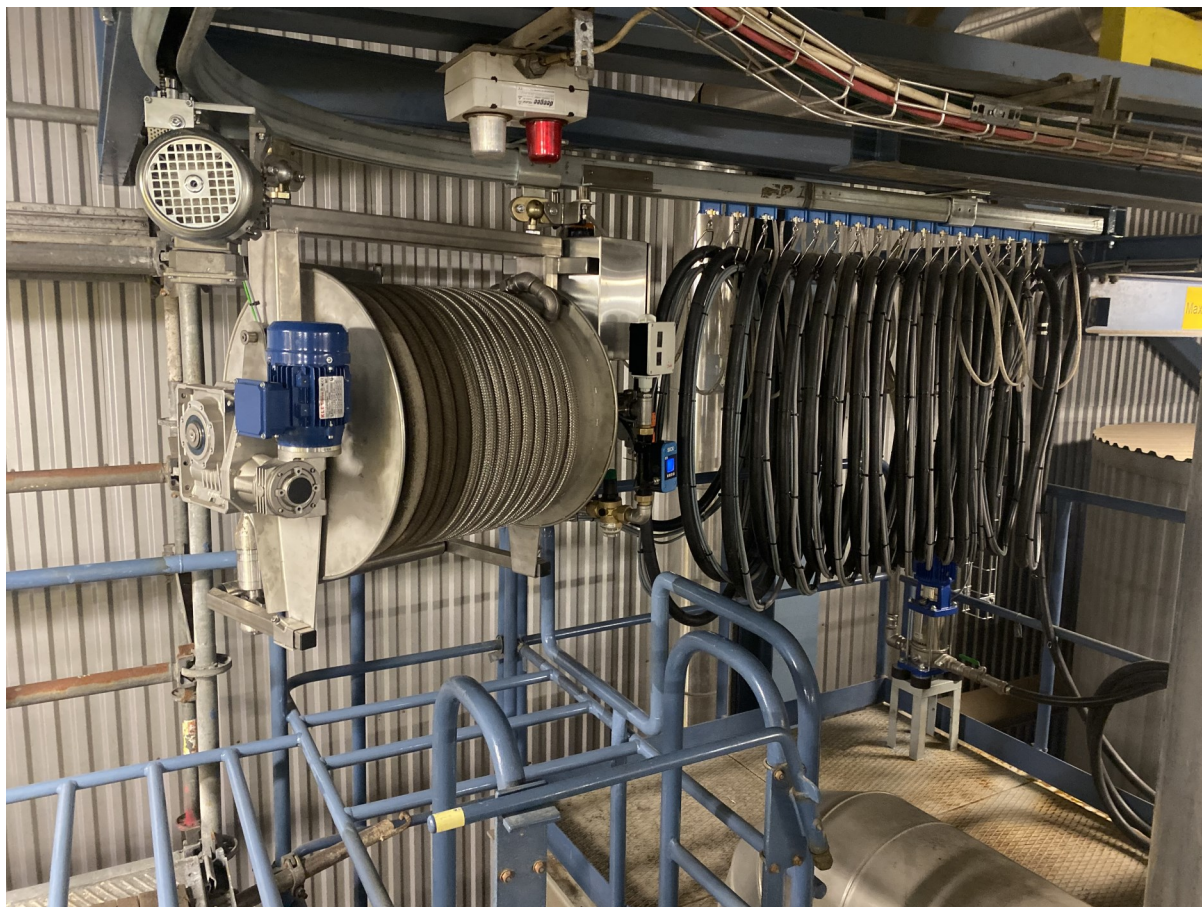


# The world's most reliable and safe boiler cleaning system

>>Limited water consumption per cleaning<<

## Waste and Biomass combustion Boilers DD-Jet Cleaning System



One DD-Jet system can serve to boilers in  
Waste to Energy and Biomass plants

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# The Boiler Cleaning Challenge

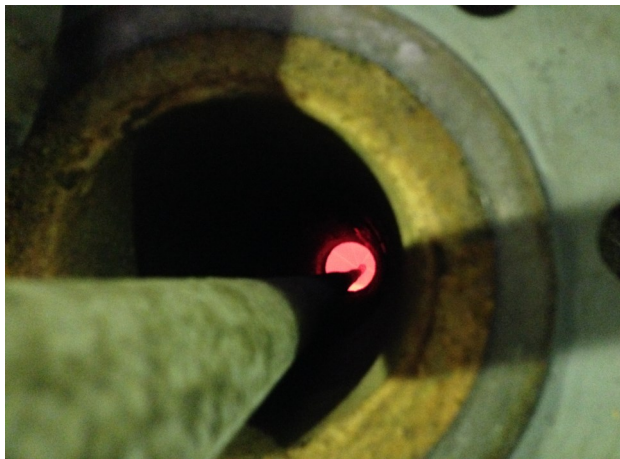
« DD-Jet Cleaning System is for on-line cleaning during operation »

## Introduction

The DD-Jet cleaning system is for on-line cleaning of the open pass of boilers in waste-to-energy incinerators and biomass combustion plants.

The DD-Jet cleaning solution is a unique rotating nozzle system designed to clean the boiler during full-load operation of the incinerator.

The DD-Jet system operates at high temperatures normally seen in the first and second passes in waste-to-energy plants (600-1250°C). The system is provided with a safe and reliable cooling feature using the jet water as the cooling medium. A safety retraction system is integrated into the system activating in case of too low water pressure. The components operating inside the furnace i.e. a flexible water hose and the nozzle system itself are of stainless steel. The system operates in a semi-automatic or automatic mode: the re-positioning of the cleaning device over the boiler part to be cleaned is done manually, or 100% automatically. The operation can be supervised from the control room.



The injection into the boiler through the roof is done in automatic mode and controlled by a PLC system, executing an individually defined cleaning sequence for each injection hole. The interactive display gives you status information, so that you can follow the cleaning sequence and see if it is done correctly.

The controlled functions are: depth of boiler to be cleaned, speed of the cleaning process, and water amount necessary for the different parts of the boiler surface.

## Technical Data

**Cleaning media:**  
The system uses normal tap water at a pressure of minimum 2 bar (30 psi US).

**Water consumption:**  
30 - 60 liters/minute (7-15 gal US).

**Operation periods:**  
5-10 minutes per cleaning sequence.

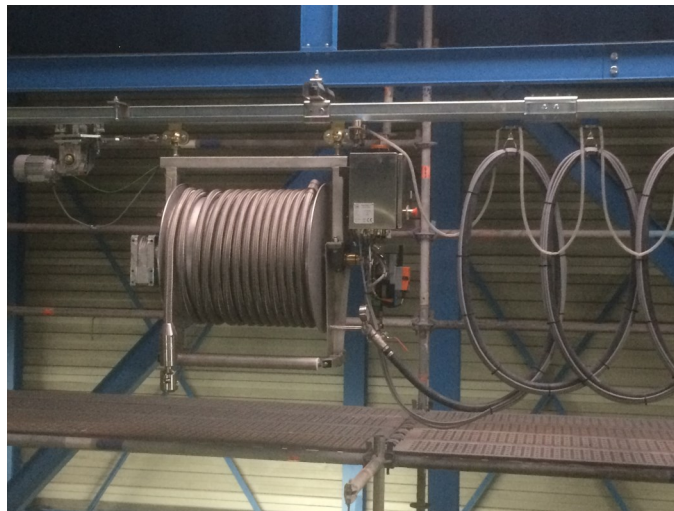
**Power supply:**  
400 VAC 500 Watt, on emergency power if available.

**Weight of water hose and nozzle:**  
250 kg (550 lb US).

**Installation:**  
Roof mounted on steel rails for easy movement to each cleaning position.

**Installation height:**  
Minimum 2 meters (6.6 ft US) free space above boiler roof required.

**Nozzle head injection hole:**  
Minimum 10 cm (4 inches US).



DD-Jet easy to install at low space

# Implementation of the DD-Jet Cleaning System

« Reduces the flue gas temperature at boiler outlet by 80 to 120C° »

## FAQ

**How large an area can be cleaned by the DD-Jet system?**  
Due to the efficiency of the DD-Jet Nozzle Head it is possible to clean large boilers sections with a horizontal distance of more than 4 meters from the cleaning hole

**How often should the DD-Jet system operate in order to keep the boiler outlet flue gas temperature effectively low?**  
A typical operating sequence of less than twice per week per cleaning hole is necessary in order to keep the outlet flue gas temperature effectively low.

**Is special cooling needed?**  
No special cooling required for the water hose and the DD-Jet nozzle, these are cooled by the cleaning media only (water). The Control Cubicle can be cooled if the temperature is above 45° C at the boiler roof.

**Are there any cleaning residues?**  
The cleaning water is evaporated immediately. Part of the debris flies to the flue gas cleaning and dust filters; other parts fall down and are treated as boiler ash.

**What happens if the water pressure is too low?**  
The cleaning process must not be initiated. If the water pressure drops during cleaning, fast retraction of the hose should be initiated. For the automatic DD-Jet system this will be controlled automatically.

**Can the DD-Jet system also clean the boiler roof?**  
Yes, The water is sprayed from the installed 4-6 nozzles and releases concentrated water beams in horizontal and vertical (45° upwards) directions. By using two 45° nozzles, the system is also able to clean the roof section.

**Can the DD-Jet system operate with zero cleaning in some parts of the boiler eventually parts with refractory**  
Yes, the DD-Jet system is also capable to stop the cleaning in sections containing refractory or for other reasons. The DD-Jet System can be programmed to move the DD-Jet Nozzle Head down to the next area to be cleaned. During the periods of no cleaning the water amount applied to the DD-Jet head is reduced to cooling level, the cleaning commences again when the right depth has been reached.

**Can the DD-Jet system operate during full load of the plant?**  
Yes, the DD-Jet system can operate during full load, however other restrictions such as the capacity of the flue gas cleaning system, draft fans etc. might restrict the amount of water injected into the boiler passes.

**Can the DD-Jet system operate through several boiler top holes?**  
Yes, the DD-Jet system can operate through several holes in the boiler roof in order to clean different compartments in the boiler. An automatic motion control providing the movement from hole to hole can be provided.

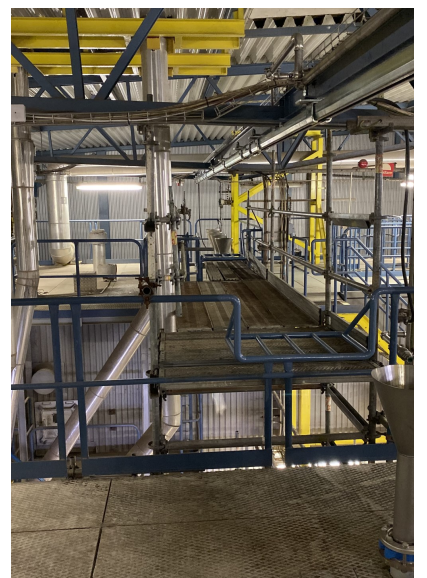
**What are the DD-Jet cleaning effects on boiler outlet flue gas temperature?**  
The soft and careful cleaning of a single boiler pass reduces the boiler outlet temperature in the range of 60° C depending on the level of fouling prior to the cleaning sequence.

**Does the DD-Jet require special tuning and adjustment after installation?**  
No special adjustment is required. The system is tested and is put online in full operation during a period of 2-3 days on site, and normally does not require any modification afterwards.

**What is the lifetime of the water hoses and nozzle head in the DD-Jet system?**  
A typical lifetime of the water hose, and the DD-Jet nozzle head is typical more than 300 cleaning sequences i.e. more than 2 years of operation.

**Is it possible to make a test of the DD-Jet system functions prior to the real installation?**  
Yes, if holes are already made in the boiler roof, a DD-Jet Mobile Unit (picture on the left) is available to carry out on-site tests.

**Where is the DD-Jet installed?**  
The DD-Jet has been delivered to a number of very demanding WtE plants in Europe and in Asia. Please contact us for a detailed reference list.



One DD-Jet system serving two boilers