



**COST SAVING
ACOUSTIC CLEANERS**

***4 pcs Natural Gas operated Nirafon Cleaning Sound Device CLEANERS
at Peat and Wood Chip fired Naistenlahti power plant in Tampere***



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NCSO Operating Principle

The acoustic cleaning effect of the NCSO is obtained by quickly burning a small amount of LP gas in the firing chamber of the device and leading an acoustic pressure shock through a horn into the space to be cleaned. LP gas is used to fuel the device, obtainable e.g. out of the LP gas network for the ignition burner.

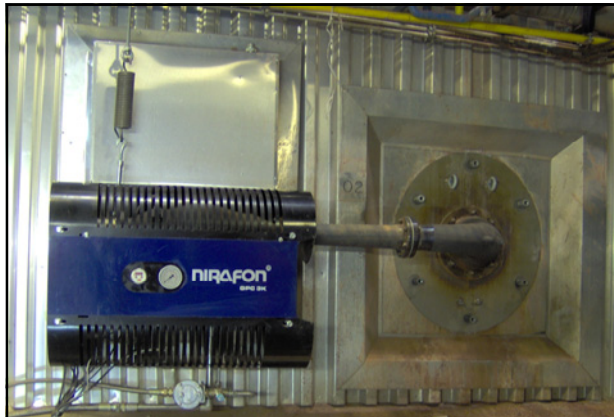
The NCSO cleaner produces 1 to 15 cleaning pulses per second. One cleaning pulse consumes about 0.4 g of gas. Additionally, the device uses approx. 80 Ndm³/s of compressed air as combustion air.

The particles soiling the surfaces stick to each other as well as adhering to the surfaces of the structures. The change in the speed of the gas flow brought about by the NCSO detaches the particles as the force it exerts on the particle is greater than the adhesive force retaining it. Once the particles have been detached, the pulses of the cleaner quickly following each other prevent them from clinking again onto the structures. Instead, they continue their passage in the flow, propelled by the stream of exhaust gases.

The advantages of the Nirafon system:

The new NCSO enables acoustic cleaning of the entire boiler plant. When the new NCSO cleaner is used at temperatures exceeding 800 °C and traditional pneumatic Nirafon acoustic cleaning in areas of lower temperatures, the advantages of acoustic cleaning are achieved in the entire plant:

- heat transfer and other surfaces to be cleaned stay permanently clean and the process can continue without interruptions
- acoustic cleaning drastically reduces the use of water at the plant, without causing corrosion or erosion.
- the acoustic cleaners require little space, the maintenance and operating costs are low
- the refund time of the system is short
- a tailor-made plan is always drawn up by Nirafon Oy according to the buyer's need and application



Fuel mix of Peat and Wood Chips

Naistenlahti power plant in Tampere, Finland, burns peat and wood chips, which leads to fouling of superheater tubes. Especially, when the amount of wood chips is increased the need for cleaning increases.

In the end of year 2005 two LP-gas operated Nirafon Cleaning Sound Device gas pulse cleaners were installed to manholes on the other wall of the boiler. After the following running season it could be seen that Nirafon Cleaning Sound Device is well suited for keeping the superheater tubes clean from deposits.

Fall 2006 two new NCSO cleaners were installed to the other wall as well. At the same time the existing NCSO cleaners were modified to operate with natural gas. With the four Nirafon Cleaning Sound Device cleaners being in use the boiler has been considerably cleaner and it has been possible to increase the amount of wood chips in the fuel mix.

The need for maintenance of Nirafon Cleaning Sound Device is very small. The first maintenance check for the cleaners at Naistenlahti power plant was done in the fall 2008.



ACOUSTIC CLEANING SYSTEMS

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