

**NIRAFON**

acoustic cleaning systems

**The most energy  
efficient cleaning  
for various industries**



# Key benefits of the Nirafon® system

## Cost-saving Nirafon acoustic cleaning systems

### NIRAFON PNEUMATIC ACOUSTIC CLEANERS

The Nirafon pneumatic/air-driven acoustic cleaners for lower temperatures cleaning. They keep the super heaters, economisers, air preheaters, flues, filters and fans of the boiler plants clean and prevents vaulting of particles in the silos and cyclones

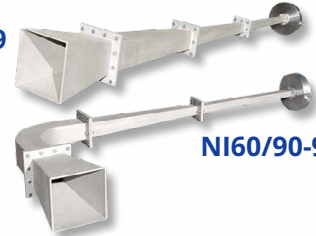
NI-250-99



NI100-55



NI60-99



NI100/90-99

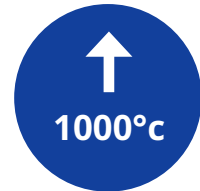
NI-250/90-99

NI60/90-99



### NCSD®

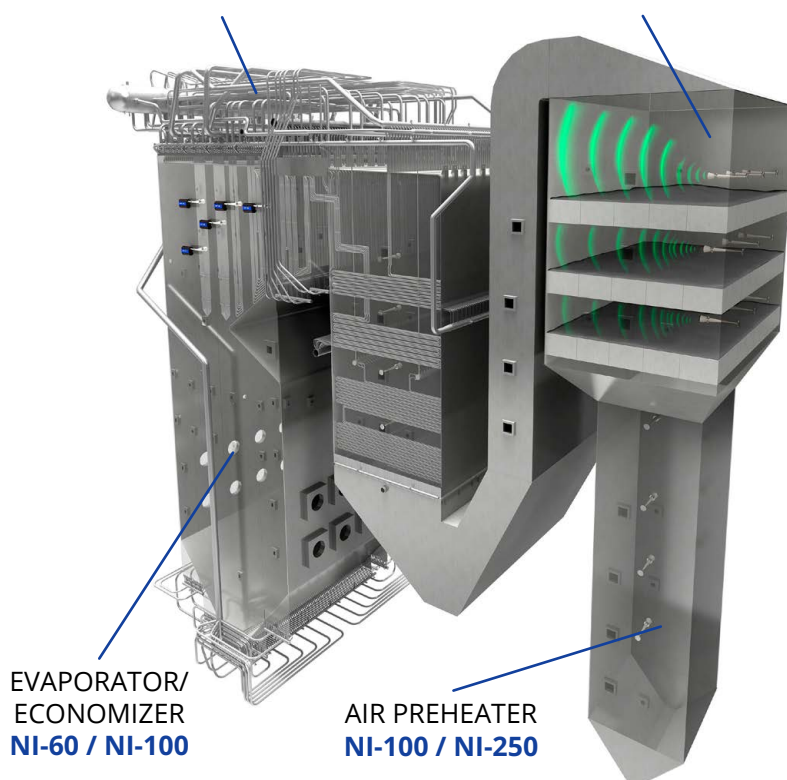
Nirafon Cleaning Sound Device (NCSD®) is an innovation for the acoustic cleaning of the high temperature areas of boiler plants.



## Nirafon® acoustic cleaning systems

SUPERHEATER/FURNACE  
NCSD

SELECTIVE CATALYTIC REDUCTION  
NI-60 / NI-100 / NI-250



EVAPORATOR/  
ECONOMIZER  
NI-60 / NI-100

AIR PREHEATER  
NI-100 / NI-250



ESP  
NI-60 / NI-100



BAG HOUSE  
NI-100 / NI-250

## Key benefits of the Nirafon® system



**NIRAFON IS THE ONLY ONE ON THE MARKET TO PROVIDE ACOUSTIC CLEANING OF IMPURITIES IN BOTH MOLTEN AND SOLID FORMS**

### Cost saving acoustic cleaners

Nirafon® acoustic cleaning system removes particles from the surfaces by an acoustic pressure shock. The pressure shock is repeated until the required results for the cleaning have been achieved. Nirafon® acoustic cleaning system is a combination of sonic horns, selected for each application separately, and automatic control equipment that optimizes the cleaning results. The desired level of cleanliness is constantly maintained and the process can continue without any interruptions.



#### **NIRAFON® AIR-DRIVEN/PNEUMATIC ACOUSTIC CLEANERS**

The Nirafon® acoustic cleaning system keeps the super heaters, economizers, air preheaters, flues, filters and fans of the boiler plants clean and prevents vaulting of particles in the silos and cyclones.

#### **OPTIONS FOR AIR-DRIVEN ACOUSTIC CLEANERS:**

Nirafon® 250-SS and 250/90-SS

Nirafon® 100-SS and 100/90-SS

Nirafon® 60-SS and 60/90-SS

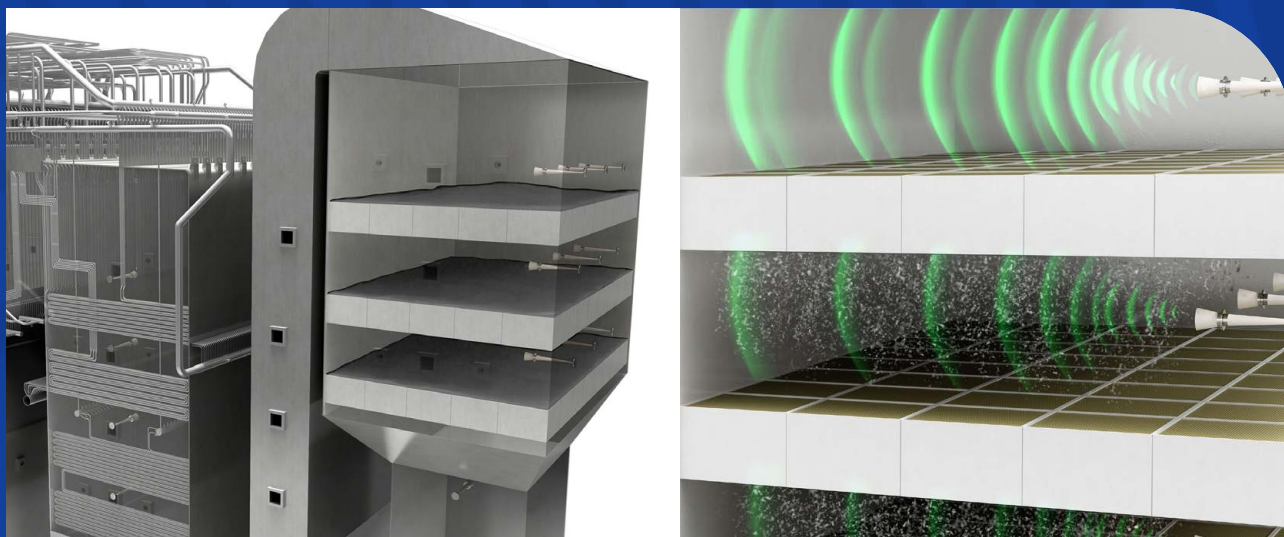


#### **NCS D®**

Nirafon Cleaning Sound Device is an innovation for the acoustic cleaning of the high temperature areas of boiler plants. This third generation acoustic cleaner keeps the heat transfer surfaces clean even at spots where ashes are present in both molten and solid forms.

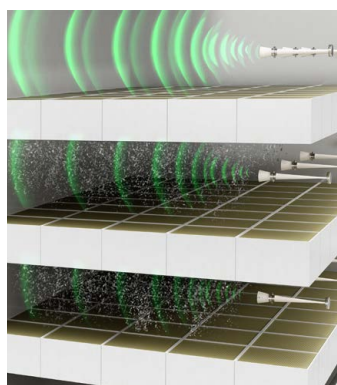


## Key benefits of the Nirafon® system



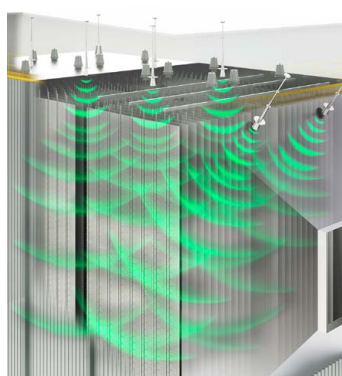
### Keeping emission reduction technologies clean

Nirafon systems ensure that catalyst in Selective Catalytic Reduction (SCR) systems act as intended and that impurities don't accumulate on the surfaces. Without the Nirafon system, the catalytic components could become clogged and break down, in which case the whole plant would have to be shut down for the repairs.



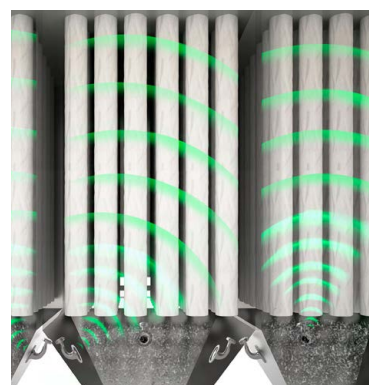
#### **MAINTAINING PLANT EFFICIENCY HIGH KEEPING SCR SYSTEMS CLEAN**

- Prevent the catalysts become clogged and break down
- Eliminate the risk of plant downtime
- Ensure the correct operation of SCR systems, while maintaining high plant efficiency



#### **CLEANING WITHOUT DAMAGING ESP – ELIMINATING THE WEAKNESSES OF RAPPERS**

- Continual prevention of particle buildup
- Better overall cleaning, also cleans hoppers and walls
- No mechanical stress or damage caused by rappers
- Hopper blockage eliminated
- Steady material flow from hoppers
  - no sudden overloading
- Low maintenance cost



#### **SAVING ENERGY AND MONEY BAGHOUSE – OVERCOMING COMPRESSED AIR PULSE SYSTEMS**

- Continuously clean bags, longer bag lifetime
- The whole bag is cleaned – not just the upper part
- Considerably lower air consumption
- Less electricity use of fans, thanks to lower pressure difference and reduced need for suction
- Can be used in high temperatures and with moist air/exhaust gases
- No wear to bags - no abrasion and flexing of the fibers.

## Key benefits of the Nirafon® system



### Continuous cleaning during the process

- **MAINTAINS PLANT EFFICIENCY AT A HIGH LEVEL**

Nirafon® Acoustic Cleaning continuously removes soot, ash and particulate matter deposits from surfaces maintaining heat transfer efficiency in boilers, pressure drops etc. at desired levels.

- **CLEANING WITHOUT INTERRUPTING PLANT PROCESS/ PRODUCTION**

- **AUTOMATIC OPERATION**

These all lead to fewer down times, improved operation efficiency and that way also to reduced emissions.



### Cleaning without damaging

- **NO EROSION**

Conventional cleaning methods such as sootblowing with steam or shot cleaning in boilers are known to cause erosion to the heating surfaces leading to their premature failure.

- **NO MECHANICAL WEAR**

The Nirafon® Acoustic Cleaning System performs the cleaning operation gently without causing damage, thereby enhancing the life of the mother equipment.

- **NO CORROSION**

### Cleans also the shadow areas

- Sound travels as a wave in space reflecting from the surfaces; consequently, the Nirafon® Acoustic Cleaning system is also effective in fringe areas and around corners, enabling the cleaning of surfaces that are inaccessible by other means.

## Key benefits of the Nirafon® system



### Economical solution

- **LOWER INITIAL CAPITAL INVESTMENT**

Nirafon® Acoustic Cleaning System offers an extremely cost effective solution from the viewpoint of capital cost.

- **LOW OPERATING COSTS**

Nirafon® Acoustic Cleaning Systems require compressed air for their operation leading to much lower operating costs compared to traditional cleaning systems such as steam sootblowers which consume substantial quantities of steam having significant cost implications.

- **LOW MAINTENANCE COSTS**

Having minimal moving parts, Nirafon® Acoustic Cleaning System requires negligible maintenance, service and spare part costs.

- **REDUCES THE NEED OF WATER AT THE PLANT**

- **LESSER SPACE REQUIREMENT**

Nirafon® Acoustic Cleaning Systems are compact and occupy much less space compared to conventional cleaning devices such as long retractable soot blowers. This adds further to the cost effectiveness of the Nirafon® system.



### Nirafon® acoustic cleaning system keeps the surfaces clean

The principle of acoustic cleaning is to keep the surfaces continuously clean, this means that the best result is achieved when we can start from clean surfaces. When started with clean surfaces and Nirafon® Acoustic Cleaning used frequently enough the deposits won't stick to the surfaces. This is particularly important in the high temperature areas of the boiler such as furnace and superheater where the ash can be partly in molten form and after sticking to the tubes gets very hard.



### The Nirafon® system can be used in combination with existing cleaning system

The system can also be used to minimize the use of sootblowing or shot cleaning, to save steam and minimize the wear of tubes caused by the ash particles with the steam or shots.

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