HEAT MANAGEMENT

Creating value with infrasound™

INFRASOUND SOOT CLEANING SYSTEM

Increasing boiler availability, efficiency and lifetime

By harnessing the power of infrasound, Heat Management offers soot cleaning solutions that prevent soot build-up on economizers, air pre-heaters, catalysts, precipitators and ducts. In this way we contribute to a more efficient and environmentally friendly energy production.

This is Heat Management

Our driving force is to help our customers to increase efficiency, availability and lifetime of industrial boilers through optimization of soot cleaning. In a world with increasing focus on energy management, every step towards a more efficient and environmentally friendly energy production counts.

We are passionate about pioneering infrasound soot cleaning technology. We carried out our first installation in 1978. The objective of that project was to prevent soot accumulation in an MgO boiler at a paper mill at Stora Enso in Hylte-bruk, Sweden. The success of the installation taught us about the power of infrasound. The experience obtained over the intervening years has taught us how to create value for our customers with infrasound.

Today, we have an established network of representatives worldwide. Together we are a trusted partner of our customers by focusing on a high return on investment in our projects with them. With our customers standing at the center of everything we do, we have had many successfull installations.

Customer benefits

Infrasound is a non-abrasive, cost-effective way of preventing soot accumulation.
Our expertise in this field has brought our customers numerous benefits such as:

Increased boiler availability.
Cleaner economizers, air pre-heaters, catalysts, precipitators and ducts, which means fewer outages for manual cleaning. This leads to lower cleaning costs and reduced need of operating other boilers to compensate the production loss due to cleaning outages.

Increased boiler efficiency.
Cleaner heat transfer surfaces and the reduction or elimination of steam soot blowing means that more heat is converted into useful energy.

Increased lifetime of the boiler and reduced maintenance costs.
The usage reduction or elimination of traditional soot cleaning methods such as steam soot blowing or shot cleaning, as well as a more even flue gas flow distribution across the area to keep clean prevents erosion and corrosion.

Higher and more stable production output as well as lower electricity usage costs of the ID fan. Cleaner heat transfer surfaces leads to a lower and more stable differential pressure across the tube bundles, allowing high boiler output.

Improved working environment.
The automatic operation of the system means that unnecessary safety risks related to manual cleaning are avoided.

More efficient ESP thanks to cleaner collecting electrodes and gas distribution screens.

Industries and applications

We have a wide range of experience within the power generation and process industry sectors. Our Infrasound Soot Cleaning System achieves a consistent cleaning effect, in boilers utilising coal, oil, biomass, black liquor and waste, among others.

Within the power generation sector our reference list ranges from big power plants to small heating plants. Within the process industry, we have references in the paper and oil refinery industries. The areas within the boiler where we apply our technology successfully are:

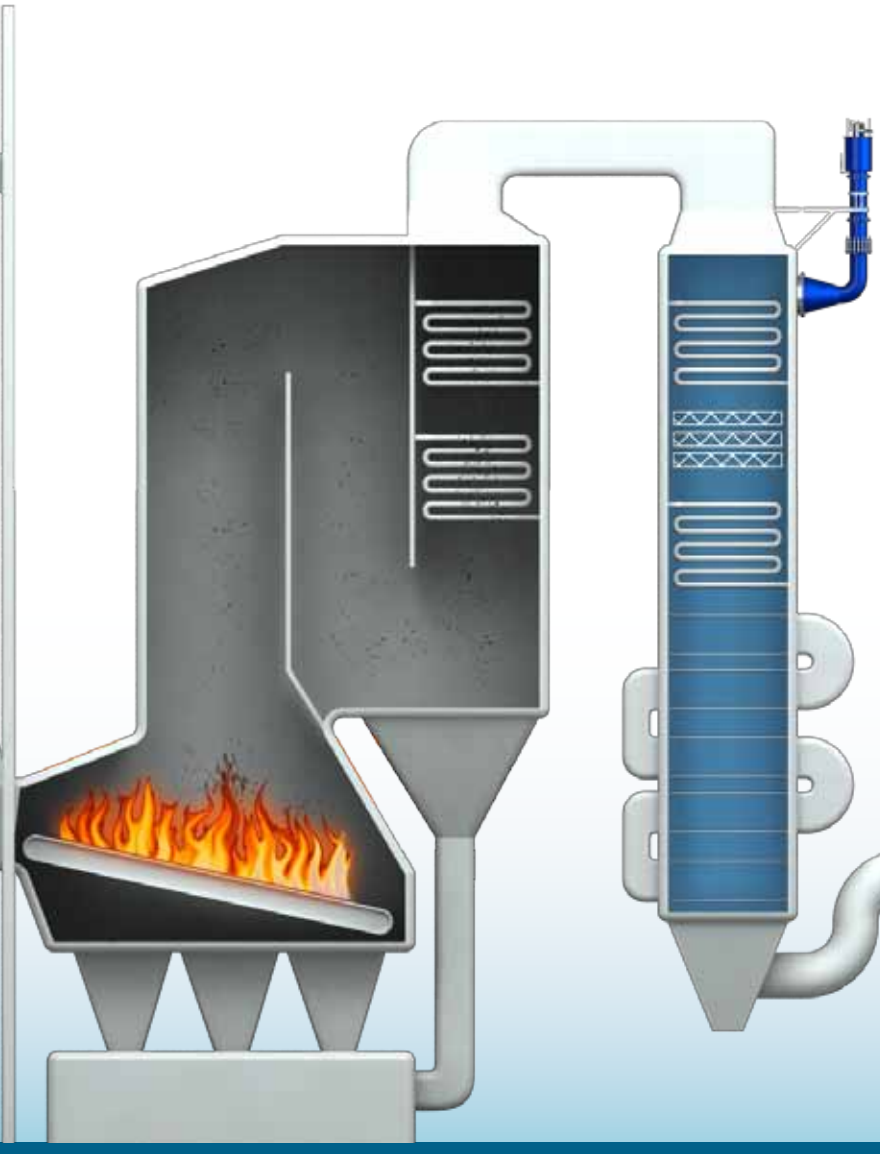
Economizers, with or without finned tubes and with in-line or staggered tube arrangement.

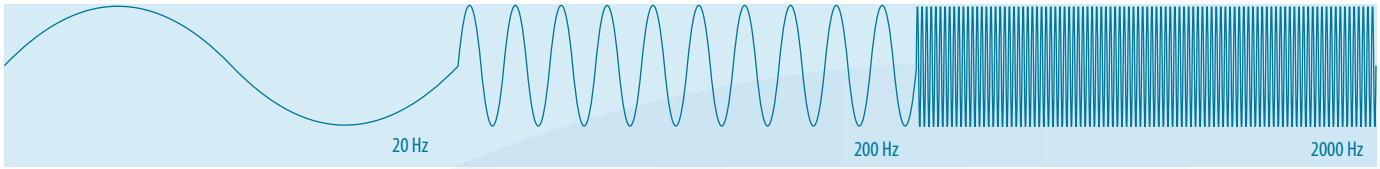
Air-preheaters, tubular and rotatory air-preheaters, both Rothemuhle and Ljungstrom type.

Catalysts, on both biomass and coal-fired boilers.

ESP, gas distribution screens and collecting electrodes.

Ducts and goose necks are kept free from soot build-up.





Heat Management Infrasound Soot Cleaning System

When engineering and designing our system, three terms are crucial: optimization of infrasound power, user-friendliness and low operational and maintenance costs.

Optimization of infrasound power

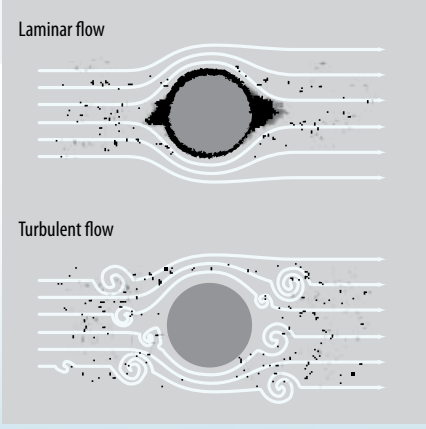
Our technology is based on taking advantage of the properties of infrasound, since our system operates within a frequency range from 15 Hz to 30 Hz.

Sound can be divided into infrasound, audible sound and ultrasound. The sound properties differ substantially depending on the frequency range.

Infrasound is suitable for soot cleaning applications for several reasons. It reaches areas far away from the acoustic source, unlike conventional soot cleaning methods or even audible sound cleaning methods. It spreads in all directions with the same intensity, and the energy loss of infrasound across the space is rather low. In short, **this means that even boilers with big crossectional areas, boilers with compact tube bundles or even finned tube bundles are suitable applications for our technology. The energy of infrasound is far reaching and will affect even the innermost areas.**

Besides, space constraints for the installation of the system are seldom an obstacle due to the flexibility that the infrasound properties give us.

The infrasound energy, when properly engineered and applied, causes oscillations within the flue gas flow. The turbulence created by the oscillations prevents accumulation of soot deposits on heat exchange surfaces.

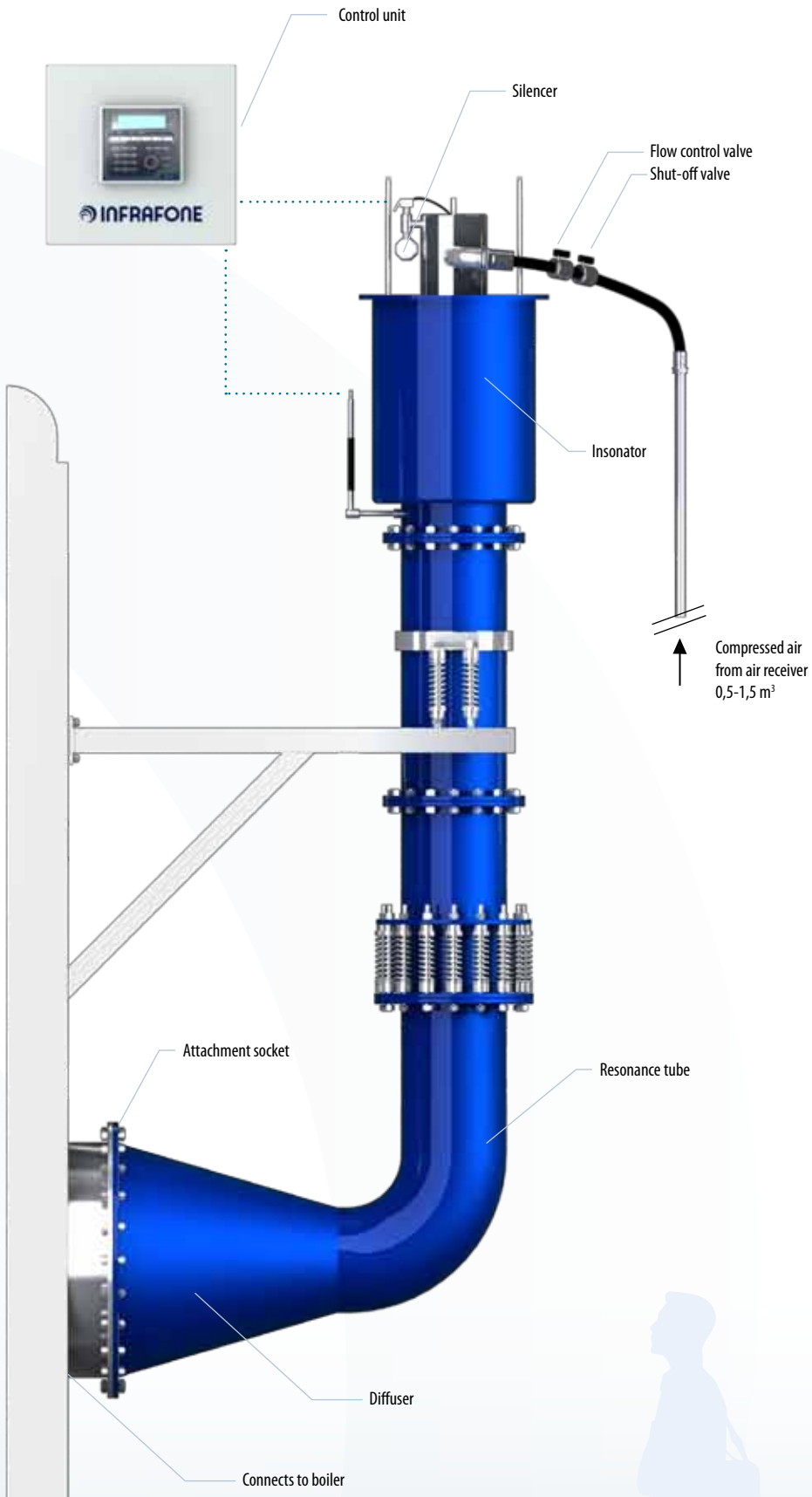


User-friendliness

With the end-user in mind, we have transformed advanced knowledge into simple operation. Our Soot Cleaning System is a dry, automatic and continuous cleaning system. This means that it operates automatically with high mechanical reliability.

Low operational and maintenance costs

We offer our customers high value at low operational and maintenance costs. Our system is operated by compressed air, and the mechanical design allows high acoustic power with low air consumption. The only moving part is the piston-spring system, which minimizes the maintenance costs.



System operation

The Heat Management Soot Cleaner works in three to four minute cycles, insonating (generating short sound blasts) for just one to three seconds. It is operated by compressed air at 5 to 8 bar (70 to 115 psi).

The insonating and cycle time are regulated by a control unit, which also measures the sound pressure that is generated.

The main parts of the Infrasound Soot Cleaner are the Insonator, which is the heart of the system, the Resonance tube, and the Diffuser.

The Insonator is fed with compressed air, which is then converted into infrasound waves. This conversion is controlled by a patented system.

The powerful infrasound waves are then transfered into the flue gas flow, building up a sound pattern that prevents soot build-up in the targeted area of the boiler.

The Infrasound Soot Cleaner is equipped with a vibration damper, which reduces structure borne sound.

Ensuring customer satisfaction

We work together with our customers all the way from the first meeting where we establish a clear picture of their needs to the performance evaluation meeting, where we review meeting those needs.

We aim to establish long term beneficial relationships with our customers.

Our knowledge

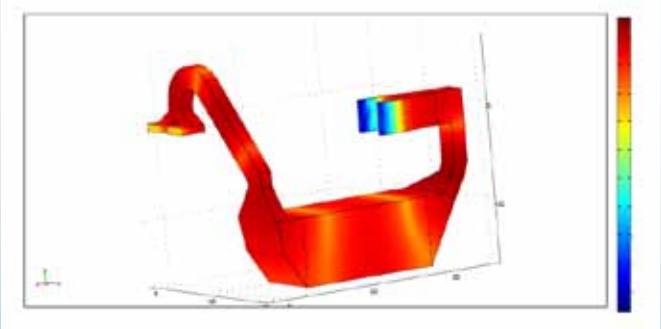
Generating infrasound is not enough to obtain the desired cleaning effect. You need to know how to take advantage of it. Our continuing development has ultimately led to unique acoustic modeling software which simulates the behavior of infrasound waves in the customer's application and calculates the optimal installation location and parameter settings of each unit. Therefore every Infrasound Soot Cleaner is tailor-made for each specific application.

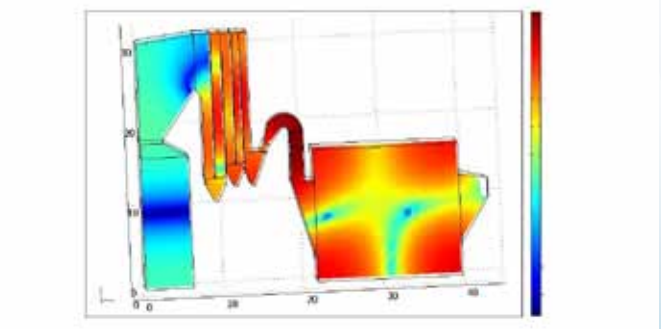
Our quality

We believe that our customers define quality. Customers buy on perceived value, measuring benefits against costs and selecting a product that provides superior value in a cost effective way. That is why, to us, quality means to delivering products and services that address our customer needs and live up to their expectations regarding high return on investment, functionality, reliability, in-time delivery, environmental friendliness and excellent service.

Our team

Being experts in infrasound soot cleaning is not enough. Understanding our customer's business and challenges is at least as important. Our team has a deep knowledge in infrasound cleaning and a wide experience in helping energy producers to improve boiler efficiency, availability and lifetime. We work together with our customers, every step of the way, to ensure that the process moves smoothly forward.





Plant Daniel, USA, Power Plant, Coal
2 x 535 MWel Economizer and Ljungström APH

SYSAV, Sweden, Heating Plant, WtE
2 x 20 MWthGrate Boiler, Economizer

Mälarenergi P6, Sweden, CHP Plant, WtE
167 MWth CFB, Economizer

RockTenn, Stevenson, USA, Corrugating Medium Mill
1,43 M lbs. DS/day Black liquor recovery boiler, Gooseneck and ESP

EEW Delfzijl, Netherlands, CHP plant, WtE
30 MWth Boiler, Application Honeycomb SCR

Druskininkai Veolia, Lithuania, Heating Plant, Biomass
15 MWth, Application Smoke Tube Boiler