



QUATTROSONICS

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QUATTROSONICS SONIC SOOT BLOWERS
a cost-effective and non-destructive way to
prevent particulate build-up



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COST EFFECTIVE, HIGH PERFORMANCE & 'GREEN'

Sonic Soot Blowers are a proven alternative to conventional steam soot blowers in power generation plants which burn a range of fossil fuels and other waste fuels including bio fuels. Depending on the application and boiler plant design, Sonic Soot Blowers usually totally replace existing high maintenance steam soot blowers whether retractable or rotary. In a few cases, Sonic Soot Blowers can be used to supplement steam soot blowers and reduce their usage.

The main advantages that Sonic Soot Blowers have over the steam soot blowers are:-

- *Elimination of opacity spikes due to more regular, more efficient cleaning*
- *Guaranteed not to damage tube bundles or boiler structure*
- *Elimination of tube corrosion and erosion problems caused by water/steam cleaning regimes*
- *360° cleaning of all tube surfaces – not harsh leading edge tube cleaning as with steam soot blowers*
- *Prevention of ash build up and sintering on boiler*

- tubes due to more effective operation of Sonic Soot Blowers & 360° effective particulate de-bonding*
- *No costly repair, maintenance or operational costs*
- *Eco Friendly – helps to combat global climate change and the effect of global warming.*

Unlike Steam Soot Blowers and Water Cannons, Sonic Soot Blowers are sounded for a few seconds every few minutes thus preventing ash from remaining on heat transfer surfaces and sintering. Sound waves are extremely safe and do not cause any physical damage to either the tube bundles or structure - corrosion, erosion and water based effluent streams are therefore eliminated and boiler thermal efficiency maintained.

WHAT ARE QUATTROSONICS SONIC SOOT BLOWERS?

Sonic soot blowing encompasses the realm of sound transmission through particulate and solids. It is best described by the creation of rapid pressure fluctuations. These pressure fluctuations are transmitted into the particulate or "bonded" dry material causing the solid particles to resonate and dislodge from the surface they are deposited on or bonded to, without causing any structural damage to the plant. Once dislodged, the material is removed, either due to gravity or carried away by the gas stream within the process.

SONIC SOOTBLOWER APPLICATIONS

The Quattro range is primarily aimed at preventing particulate build up within the power generation industry where there is a demand for volume units of this innovative sonic cleaning technology for:-

Boilers - Ash deposited on the heat transfer surfaces of a boiler acts as a heat insulator, thus significantly reducing thermal efficiency. The result is that less heat is transferred to the water to raise steam and more heat is wasted up the flue. This leads to higher fuel consumption and/or poor steaming.

Until recent years, the cleaning system most commonly used was a steam soot blower. The media used in these types of soot blowers may be saturated steam, superheated steam, compressed air or water or a combination of these. There is certainly a greater risk of tube erosion and corrosion due to the moisture contained within saturated steam and water.

SCR's - In power generation plants one increasingly popular method for the removal of NOx from the flue gas is by the SCR (selective catalytic reduction) method. The SCR unit is usually located between the economizer and air heater sections of the plant and is generally a honeycomb structure. Here ammonia is injected into the catalyst chamber via an ammonia injection grid, thus converting the NOx gases into nitrogen and water.

The effectiveness of the SCR can be significantly affected due to the build up of a number of types of particulate, ranging from fine fly ash to ammonium sulphate and ammonium bisulphate.

The installation of Quattrosonics Sonic Soot Blowers has been proven to prevent these particulates from building up within the honeycomb structure and ensure that the SCR unit performs at maximum efficiency without loss of performance.

ESPs - Due to the continual, mechanical force of a mechanical or pneumatic rapping system, damage can be caused to the internal electrodes which can break, rendering sections of the collecting plates inoperative and thus significantly reducing the on-going efficiency of the ESP. Quattrosonics Sonic Soot Blowers are now installed as alternatives improving efficiency, increasing precipitator uptime and reducing precipitator maintenance.

Filters - Baghouse filters come in a range of types and models, shaker filters, reverse air, reverse jet with cylindrical filter bags and reverse jet with envelope filter bags. All can benefit greatly from the installation of Quattrosonics Sonic Soot Blowers and their sonic horn acoustic cleaning power. The main problems experienced with these filter plants are:-

- *Ineffective bag cleaning leading to poor bag life*
- *Reduced differential pressure drop across the filter bags*

The powerful sound waves are produced when the short bursts of standard plant compressed air enters the Sonic Soot Blower's wave generator and forces the only moving part, an aerospace grade titanium diaphragm to flex creating the powerful "base" sound wave. This "base" tone is then transmitted by a range of different horn sections into selected fundamental frequencies between 75 - 350Hz in our Quattrosonics acoustic cleaner range.

Using high energy, low frequency sound waves, they provide effective 360° cleaning coverage without risk of corrosion, erosion or mechanical damage to equipment and structures. Sonic Soot Blowers are a recognised, proven alternative to conventional steam soot blowers in a wide range of industrial applications, particularly where fossil fuels and other waste fuels are burned.

Working to ISO 9000 standards the Quattro range is manufactured from tapered, fabricated 5mm 316 grade stainless steel as standard and equipped with a new breed of Wave Generator.

MODEL EVALUTION & INSTALLATION

It is our policy never to recommend Sonic Soot Blowers unless we believe they will deliver effective results. The efficiency of Sonic Soot Blowers is influenced by many factors such as particle size and

moisture content which means that there are some applications for which the system may be unsuitable. Using your own data, along with our cutting edge finite element modelling and many years of technical knowledge, we will quickly identify the system, installation options and control regime appropriate to your application.

To help us identify the best solution for your plant simply complete the relevant questionnaire on our website & return it to us together with a dimensional drawing. Where systems are particularly large, complex or challenging we will be pleased to arrange a site visit by a member of our team or one of our highly experienced international agents.



- *Unscheduled shutdowns necessary for manual cleaning*
- *Material bridging between filter bags*
- *Material build up on internal side walls leading to cross contamination*
- *Higher usage of compressed air in order to try to clean the filter bags*
- *Material build up and bridging in hopper section causing blockages*
- *Increased power usage of filter fan*

All these problems can be overcome by the installation of the correct model and appropriate number of Quattrosonics Sonic Soot Blowers. They provide a simple, cost effective means to achieve:-

- *Significant increase in filter bag life*
- *Elimination of material hang up between filter bags*
- *Elimination of material build up on side walls and hoppers, thus increasing filter hygiene*

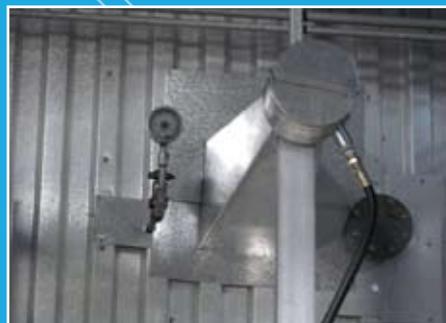
- *Elimination of the need for manual cleaning or unscheduled shutdowns*
- *Maintenance of low pressure drop across filter bags*
- *Reduced compressed air consumption and fan power*

Marine Boilers - On any marine vessel, the formation of particulate (ash & soot) from the combustion of fossil fuels, especially heavy oil, can build up on the heating surfaces of all types of boiler plant. Until recent years, the cleaning system most commonly used was a 'steam' soot blower. The media used in soot blowers may be saturated steam, superheated steam, compressed air or water or a combination of these. This method creates a greater risk of tube erosion and corrosion due to the moisture contained within saturated steam and water.

Installing Quattrosonics Sonic Soot Blowers provide the following key benefits for marine boilers:-

- *cheaper alternative to steam soot blowers*
- *more effective cleaning and prevention compared to steam soot blowers*
- *more effective at preventing soot fires from occurring*
- *virtually maintenance free and no need for expensive spare parts*

The Quattro range was designed in order to fulfil these requirements, providing economically priced, prime performance acoustic cleaners without compromising on our valued reputation for innovative design and superior build and performance.





QUATTROSONICS SONIC SOOT BLOWERS RANGE

Q1: Fundamental Frequency: 350 Hz
Q2: Fundamental Frequency: 230 Hz

Q3: Fundamental Frequency: 120 Hz
Q4: Fundamental Frequency: 75 Hz



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