



Innovative ENERPRO PVT. LTD.

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*World of Innovative
Energy Products*



SONIC SOOT BLOWER / ACOUSTIC HORN

What is sonic Soot Blower ?- Online Continuous Cleaning of Inaccessible Surfaces with New Low Frequency High intensity sound technology.

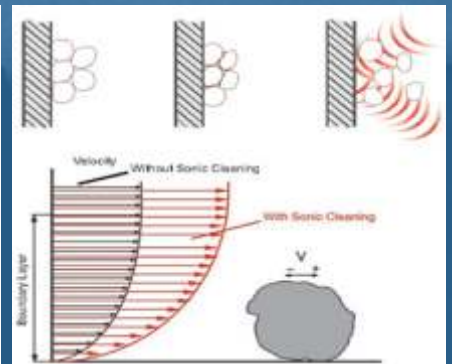
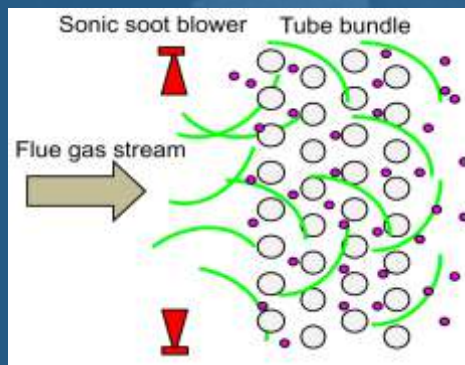
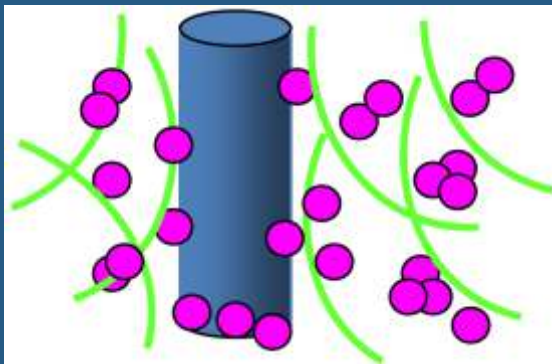
In conventional cleaning system, pressurised steam/water or compressed Air is used. Also at some place vibrators or shot cleaning is used. But not get satisfactory output from all these methods and also some of them needs shut down for cleaning the same and some methods are costly. But Sonic soot blower gives the best output at cheapest cost.

Working Principle

CLANUS Sonic Soot Blower is based on the principle of kinetic energy activation of the dust particles. The Sound generator generate powerful sound signals of low frequency (120-240 Hz) and high intensity (140 Db) at suitable intervals. This Sound generator is mounted on boilers or other equipments at which it impart the kinetic energy to the dust particles and cause them to vibrates and break their bonds with surface at which they are cling. These fluidized particles are then dispersed by gravity or by gas stream pressure.

The sound waves are generated in a special sound generator which is designed to withstand high temperatures so that it can be mounted almost at any point on the boiler wall. A complete installation for Sonic Soot Blower consists of a number of sound generators and an automatic control unit, which is programmed for both, the duration of the sound and the length the interval between isolations.

1. The sound energy vibrates the ash particles and thus tears them away from each other.
2. A high enough sound pressure level collapses the boundary layer above a surface. When this happens flue gas velocity will pass extremely close to the surface and thus blow away all ash particles.



History of Sonic Soot Blowing

Long time ago a young marine engineer working inside a shipboard boiler in dry dock somewhere in Northern Europe found that every time when the ship's whistle was tested nearby, soot would be raining down on him. It is unclear exactly when and where sonic soot blowing in industrial boilers began, but has since then spread itself across major industrial countries as an important tool in power plant boiler fuel economy and air pollution preventive measure.

Sonic soot blowing is now a global industrial phenomenon.

Physical Damage/Corrosion & Erosion - Sonic Soot Blowers will not cause any physical damage or wear to tube bundles or boiler structures. They operate at frequencies very much higher than the resonance frequency of steel, ceramic lining, concrete etc. and are therefore guaranteed not to cause any vibrational damage to any vessel or structure or tube bundles. Also because they do not use any high pressure steam or water they will not cause any corrosion or erosion problems and are Eco Friendly.

Cleaning Efficiency - because Sonic Soot Blowers use powerful sonic sound waves, these sound waves travel at a speed of 344 metres per second and in a 360° radius. This means that the entire circumference of the tubes and internal structure can be easily reached instead of just the leading edge of the tubes as with a steam soot blower. A periodic "sonic sounding" is all that is required to achieve these goals Typically 5-10 seconds every 10 -20 minutes.

Can Sonic Soot Blowers be easily retrofitted?

Indeed they can, in fact most of our sales are to end users or engineering companies who wish to install Sonic Soot Blowers to replace either unreliable or inefficient steam/water soot blowers. Therefore we can usually use the access point left vacant by the removal of the rotary or retractable steam soot blowers where possible or else mount the Sonic Soot Blowers on any available hatches. Installation of Sonic Soot Blowers is quick and easy.

Which type of Fuels/dusts easily clean by Sonic Soot Blowers ?

Sonic cleaning have successfully been used with the following fuels/dusts:

❖ Imported Coal ❖ Indian Coal ❖ Lignite ❖ oil ❖ red liquor coal ❖ waste wood ❖ cement dust ❖ peat o sintering dust ❖ straw o ore dust ❖ black liquor o etc.

What Sonic soot blowing cannot do

1. It cannot remove slags
2. It cannot remove clinkers
3. It cannot remove sticky ash caused by acid drops.
4. It can only be used in dry areas.

Benefits of sonic soot blowing In Boilers

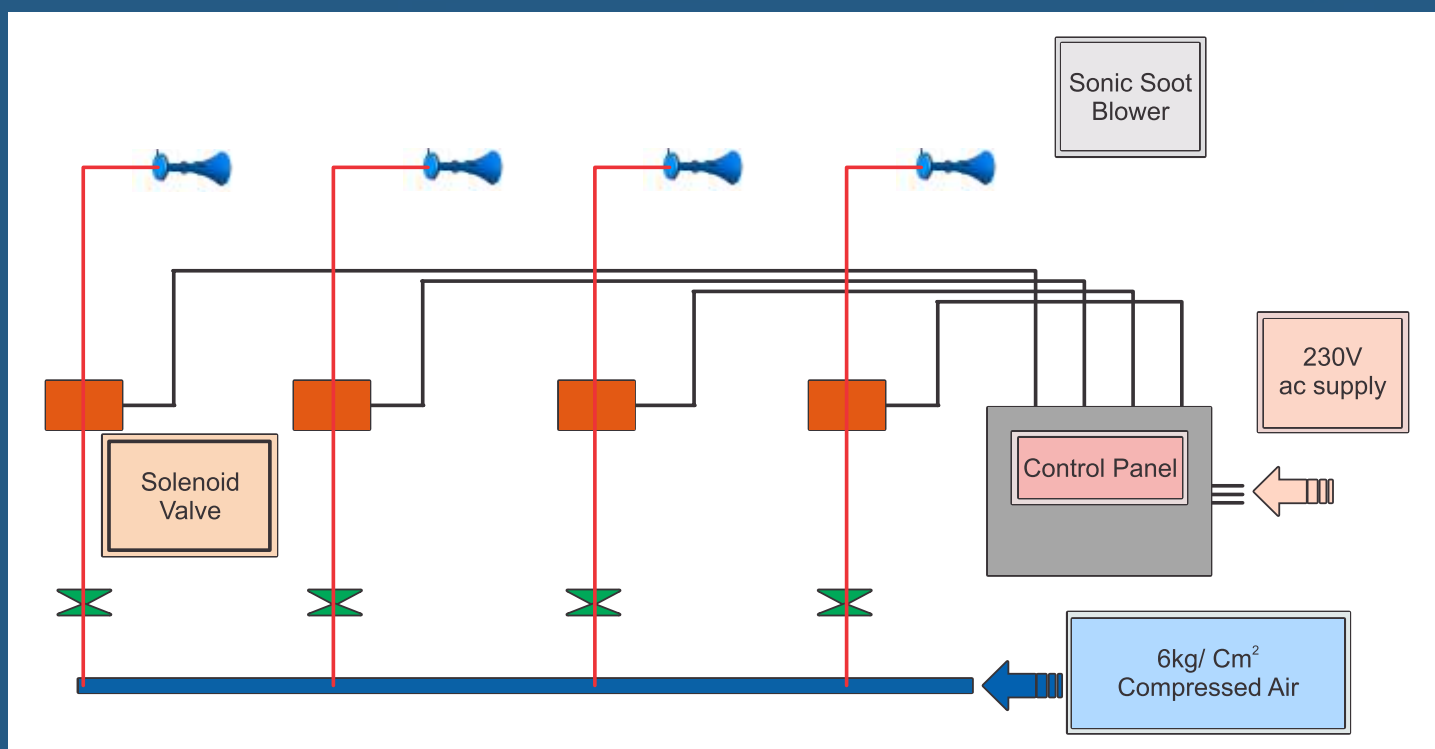
1. **Facilitate energy management:** reduce unscheduled breakdown, boiler damages, and increase overall plant safety, availability, reliability, and production stability.
2. **Improve operation economy:** better boiler efficiency, less capacity reduction, and sustains superheated steam temperature to improve turbine performance.
3. **Reduce consumption:** of steam, ID Fan power, and less system maintenance needs.
4. **Reduce air pollution:** through successive short cycle cleaning to level out soot discharge peaks.

Benefits of sonic soot blowing In Bag Filters




- reduce or eliminate the high cost of high pressure compressed air cleaning
- significantly increase filter bag life
- reduce pressure drop across the filter • eliminate hopper pluggage



Clanus Sonic Soot Blower System



TECHNICAL SPECIFICATION OF CLANUS SONIC SOOT BLOWER

Model		CSSB-240A	CSSB-240B	CSSB-240C	CSSB-120A	CSSB-120B	CSSB-120C	CSSB-75A
Frequency Hz		240	240	240	120	120	120	75
Sound level db		140	140	140	140	140	140	140
Pressure during		6	6	6	6	6	6	6
Air consumption Liter during signal (10 Sec) Ft ³		250 9	250 9	250 9	350 12.5	350 12.5	350 12.5	450 16
Horn material		AISI 304	AISI 316	AISI 310	AISI 304	AISI 316	AISI 310	MS
Max temp °c	Horn	600	800	1200	600	800	1200	400
	Diapharm housing	400	400	400	400	400	400	400
	Solenoid valve	80	80	80	80	80	80	80
Dimension (mm)		318*690			317*1056			410*2350
								

Comparison Sonic Soot Blowing of Steam Soot Blowing

Sonic Soot Blowing



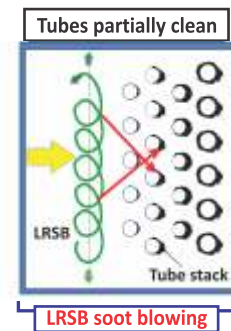
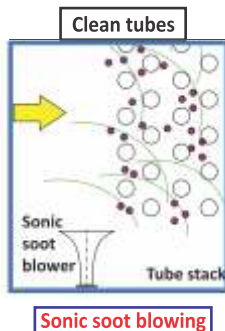
Steam Soot Blowing



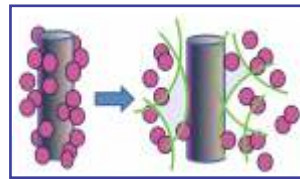
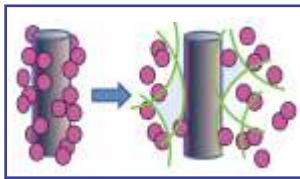
Technical Consideration

More reliable operation

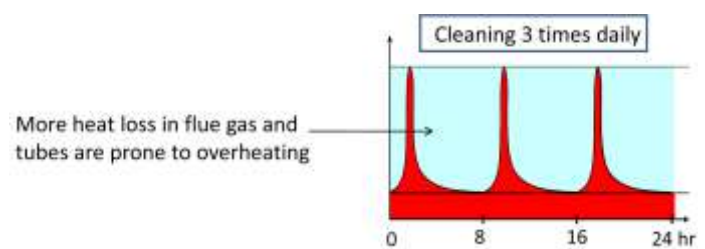
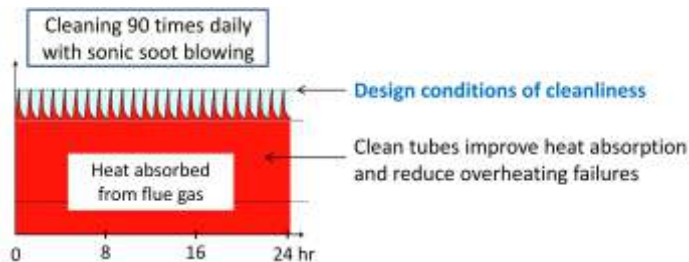
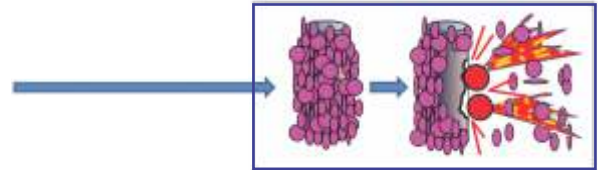
Sonic soot blowing cleans entire tube stack



soft sweeping forces vs. Hard impact



Improve cleaning result

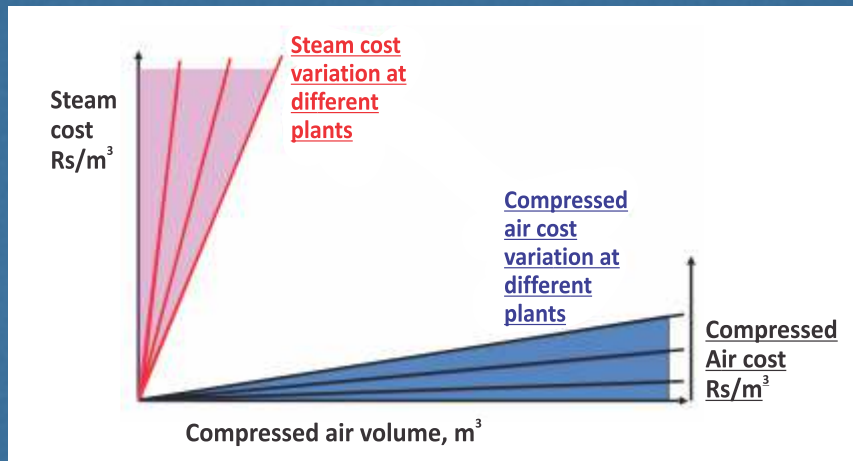


- Increases boiler availability.
- Increases boiler reliability.
- Maintains boiler stability.
- Optimizes boiler operating conditions.
- Suitable for all boiler types and user friendly.
- Very versatile, can be used in ESP, SCR, bag filters, cyclones, silos, hoppers, I.D. Fans etc.
- Simple and reliable construction.
- Simple maintenance workload, less spares.
- Can cope with changing boiler condition.

- Creates problems on boiler operation.
- Brings about unplanned boiler down time.
- Creates boiler load fluctuations.
- Prevents operating conditions from worsening.
- Suitable for limited boiler types.
- Restricted application, can only be used in boiler.
- Complicated construction, easy for trouble.
- Demanding maintenance workload, more spaces.
- Rigid configuration, difficult to change.

Low operation cost

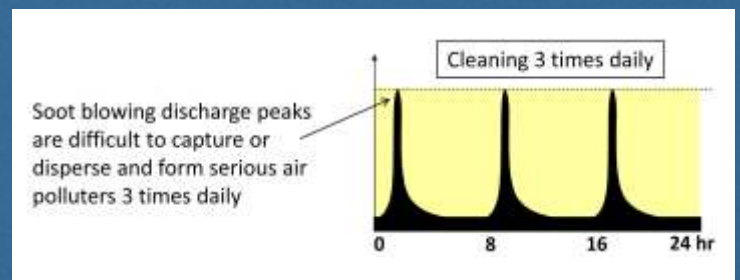
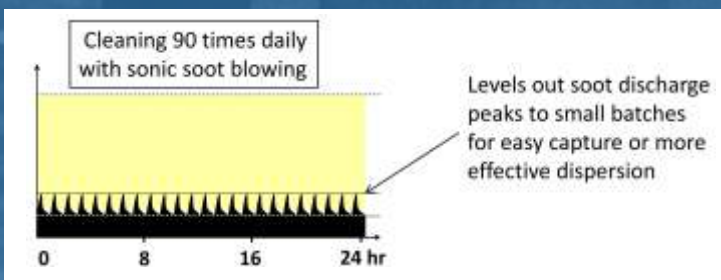
Compressed air is cheaper than steam



Economic Consideration

- Low investment cost, fast payback period.
- Achieves fuel economy in boiler operation.
- System operation and maintenance cost low.
- Possible to reduce pollution penalties.
- Return on investment usually short.
- High investment cost, low payback period.
- Slightly increases fuel consumption.
- System operation and maintenance cost high.
- Can lead to heavy pollution penalties.
- Usually much longer return on investment period.

Environmental Consideration



- Reduces air pollution, on soot discharge peaks.
- Reduces CO₂, SO_x, NO_x release.
- Less noise pollution.
- 3 soot discharge peaks daily with black smoke.
- Increases CO₂, SO_x, NO_x release.
- Noise pollution cannot be abated.

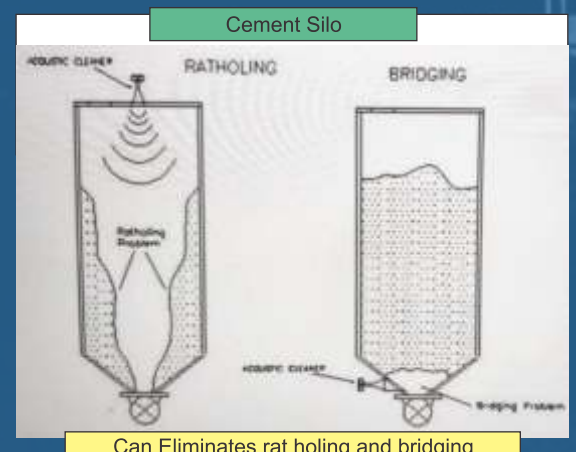
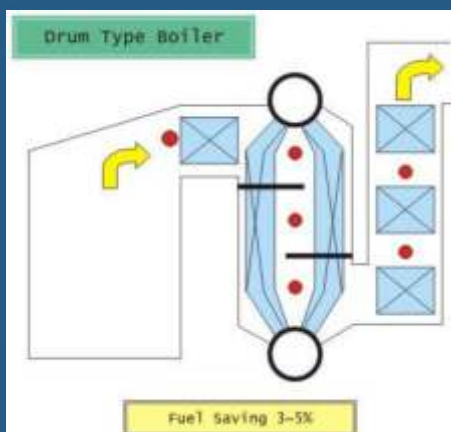
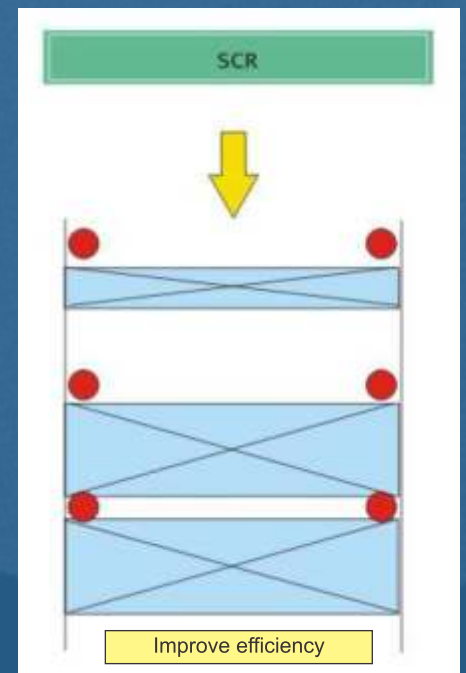
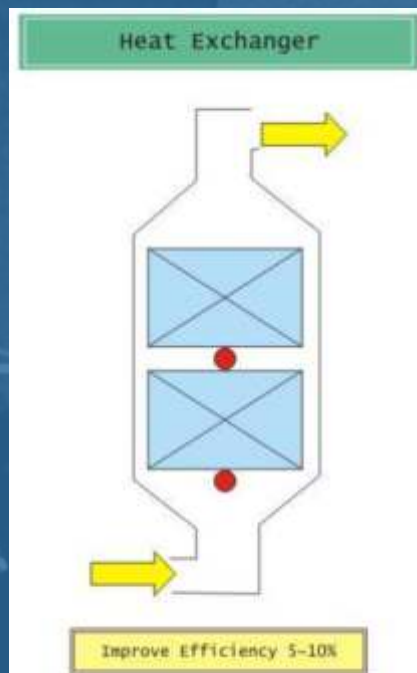
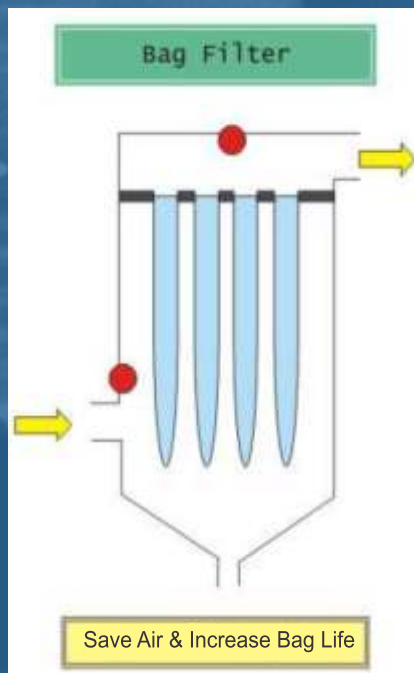
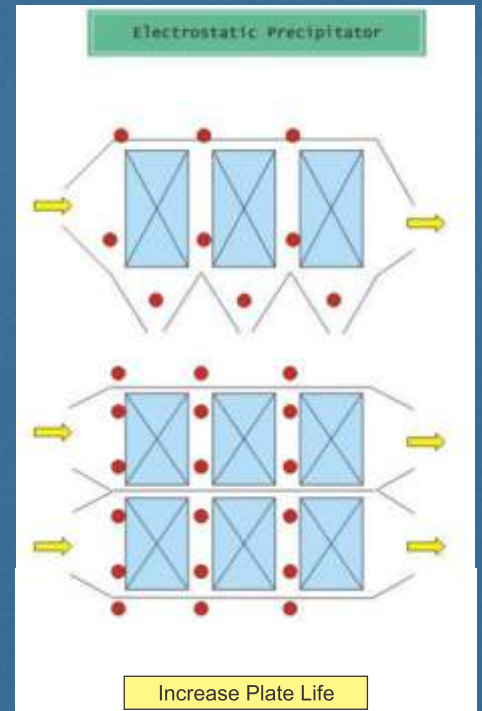
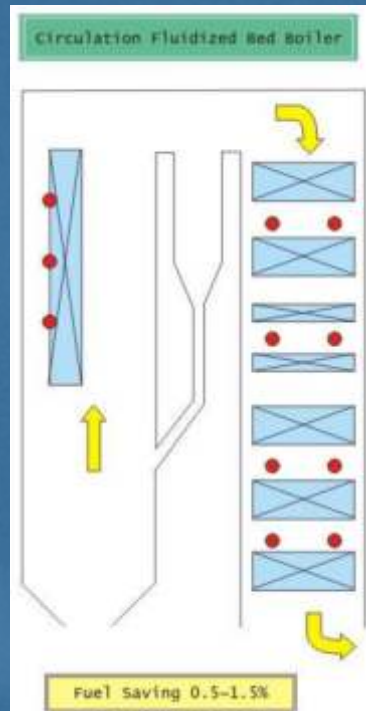
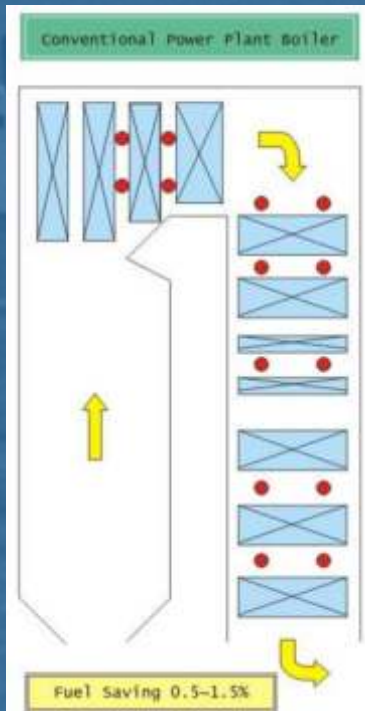
Clanus Sonic Soot Blower Application						
Industries Suitable For Clanus Sonic Soot Blower Application	Boiler Economizer APH	Electrostatic Precipitator	Bag filter	Cyclone Generator	Heat exchanger	Hopper , Spray dryer, Silo
Utility power Generation Industry	*	*	*	*	*	*
Co-generation Industry	*	*	*	*	*	*
Steam and heat production Industry	*	*	*		*	*
Petro-chmeical Industry	*	*	*		*	*
Chemical Industry	*	*	*		*	*
Steel production Industry	*	*	*		*	*
Ferrous Metal Production industry	*	*	*		*	*
Non-Ferrous Metal Production industry	*	*	*		*	*
Cement Industry	*	*	*		*	*
Paper Mill Industry	*	*	*		*	*
Textile Industry	*	*	*		*	*
Food Production & Processing Industry	*	*	*	*	*	*
Sugar Industry	*	*		*		*
Pharma Industry	*			*		
Wine & Alcohol Industry	*				*	
Tobacco Production Industry	*				*	
Waste incineration Industry	*	*	*	*	*	*

Application

1. Boilers : In boiler super heater, Economsier, APH etc to Increase heat transfer efficiency
2. Bag House : Save air consumption in purging and extend bag life 1.5 to 2 times
3. Precipitators : Eleminates rapping system and increase plate lifes
4. Silos : Eliminates rat holing and bridging

Clanus Sonic Soot Blower Application

●=  SONIC SOOT BLOWER



PRACTICAL EXAMPLES OF SONIC SOOT BLOWERS IN ACTION

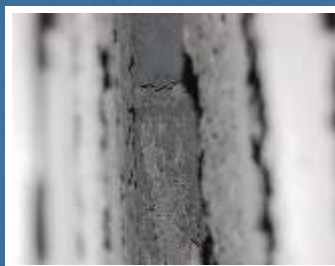
**Without Sonic
Soot Blower**



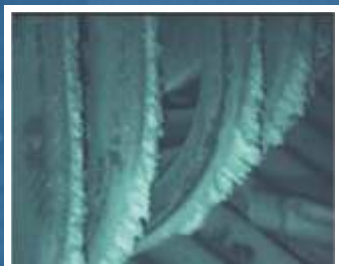
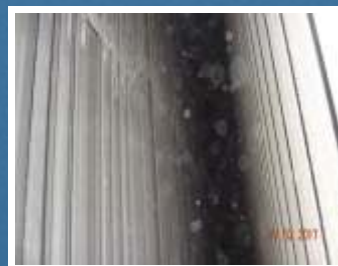
**With Sonic
Soot Blower**



**Without Sonic
Soot Blower**



**With Sonic
Soot Blower**



Economizer

Air Preheater



PRACTICAL INSTALLATION OF SONIC SOOT BLOWER



First Pass



Bag Filter



ESP



Super Heater



Economizer



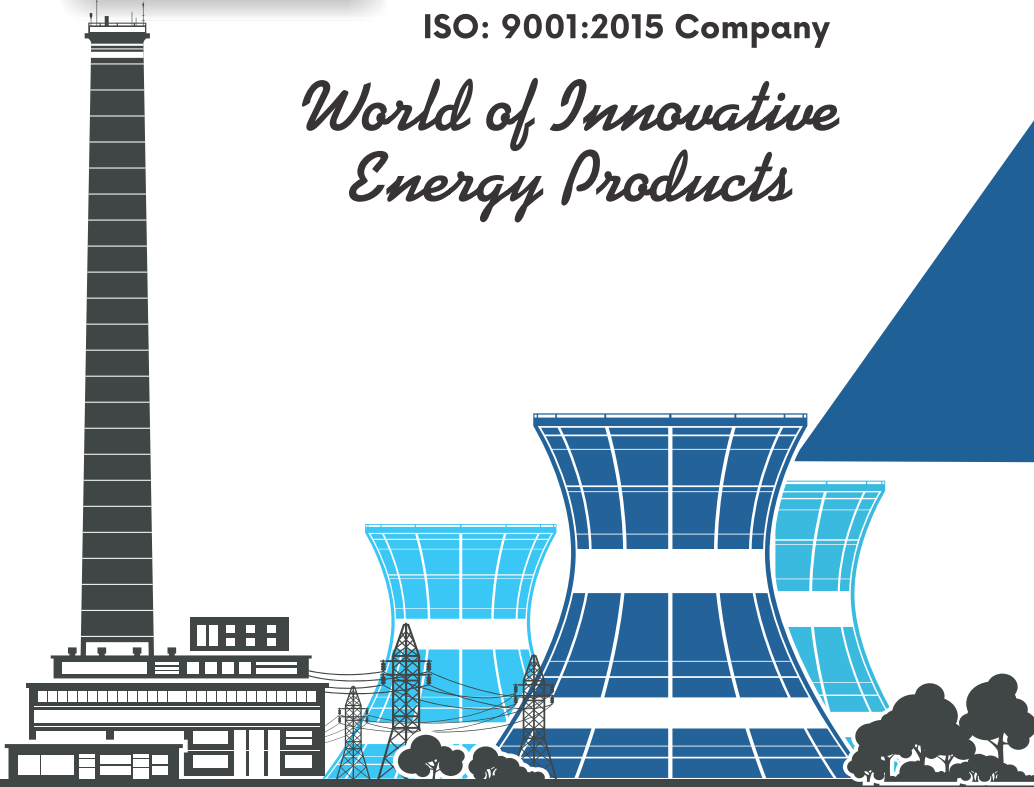
Cement Silo



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Opposite AMCO Bank, Phase I,
G.I.D.C Vatva, Ahmedabad,
Gujarat 382445

Email : info@ienerpro.com
Website : www.ienerpro.com

