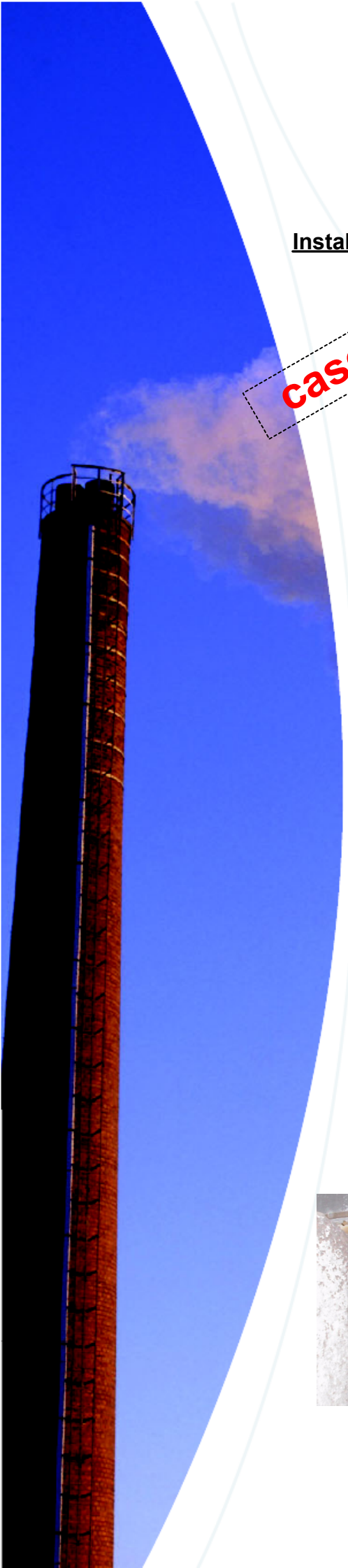


Kockum Sonics - Let us add value to your process

SONIC CLEANING

Installation of 1pc IKT150/250 sonic horns in Järnforsen biomass boiler.

case study

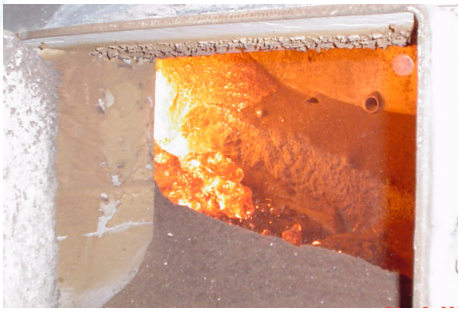
(Järnforsen 1,5MW Integral biomass boiler)

BACKGROUND / INSTALLATION

Växjö Energy (VEAB) is producing district heating and electric power supply to their consumers. VEAB has three boilers equipped with sonic cleaners, which are delivered by boiler manufacturer Järnforsen AB during 1996 to 1999. All boilers factory made with Kockum Sonics sonic cleaning system at delivery.

This study illustrates one of the boilers; a 1,5MW integral type boiler delivered 1998, equipped with one sonic cleaner model IKT150/250 to enhance the operation.

The outcome by introducing compressed air into the sonic cleaner is a high intensity sound. This creates a sound wave carrying an energy level exceeding the forces that tend to make particles suspended in a gas flow to adhere to each other and surrounding surfaces, i. e. preventing build up by breaking up the particles before they can form a hard layer.



(Owen during operation.)

(Sonic Cleaner installation)

Kockum Sonics

OPERATION / ECONOMY

The exhaust gas temperature leaving the 1,5MW boiler is 150ºC with the sonic cleaner in normal operation. If the sonic cleaner is shut off the exhaust gases raises 25ºC within 48 hrs. When the sonic cleaner is put back into operation again the exhaust gas temperature is reduced back to 150ºC within 48hrs without manual cleaning.

The boiler is manually cleaned one time per year during shut down and the sonic cleaning system is the only soot cleaning system available apart from manual cleaning one time per year.

Biggest Saving:

-Personnel gets away from the trouble with manually soot cleaning, further more there is no need to change fuel from wood to oil during shut down and start ups.

Bonus saving:

-Exhaust gas temperature losses, increase in efficiency by 25ºC will give an energy saving by 1.3% > Total energy input 2003 was 8500MWh > saving from the sonic cleaner equals to approx 113MWh/year (Mega Watt Hour per year).

System Payback time considered less than 10 month based upon above.

The purchase and maintenance cost for the sonic cleaning system is very low compared to other methods available giving the same result. It is also the fact that the sound waves will not leave blind spots unclean since the sound waves cannot be shadowed of by the internal construction. Further more, cleaning boilers with sound will not cause any wear on the tube packages.

FUEL / OPERATION

The fuel used in the boiler is wooden sawdust with a moist content of 10% and is introduced automatic depending boiler load.

The sonic cleaner is operated via timer with an activating time of 5 seconds every 10 min.