

WOOD-FIRED BOILERS

Maximize Wood Burning Boiler Efficiency with
Fuel Efficiency / B.E.T. Automatic Tube Cleaners



Improving Heat Transfer Efficiency At The Least Cost

Clean Wood Burning Boilers, Save Fuel & Maximize Efficiency

Wood fired boiler equipment is common in the lumber processing industry. Many facilities will use wood waste boilers as an integral part of the production process. Steam or hot water is generated for lumber drying and process requirements.

Wood burning boilers however, normally create considerable ash and soot build-up in the firetubes, resulting in inefficient heat transfer and a loss of steam pressure. Most wood-fired boilers require manual tube brushing. This means shutting down the boiler for hours while mill personnel brush the ash build-up from the firetubes.

The trade-off for not continually cleaning the firetubes is excessive fuel usage, loss of energy and boiler inefficiency. Frequent manual cleaning means a loss of time and productivity so that the dirty and time-consuming job of tube brushing can be done.

Clean Firetubes Mean Efficient Boiler Operation

Soot has five times the insulating value of asbestos. Allowing it to accumulate in boiler firetubes wastes fuel - a 3/16" accumulation in the firetubes will waste more than 20% of the boilers fuel. Even as little as 1/16" build-up of ash can reduce boiler efficiency by over 25%.

FUEL LOSS DUE TO SOOT

Thickness of soot in firetubes	Loss of efficiency in firetubes	Average Fuel Loss
0"	0.0%	0.0%
1/32	9.5	2.9
1/16	26.2	7.8
3/32	35.7	10.7
1/8	45.3	13.6
3/16	69.0	20.7

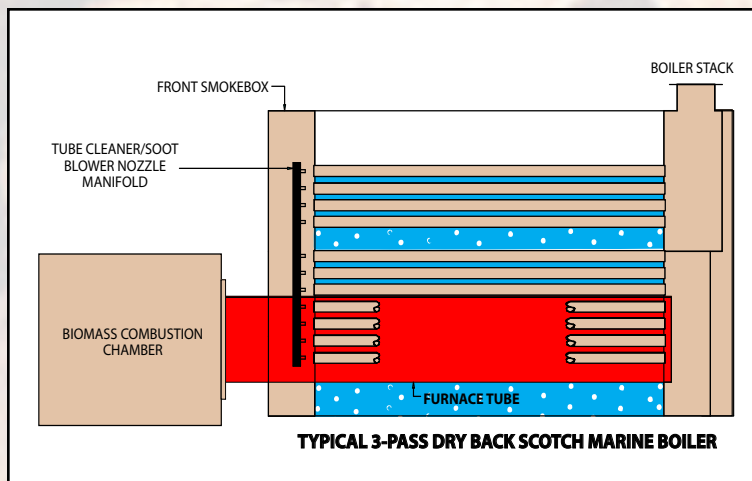
Cleaning Tubes by Hand is *Inefficient*

- A dirty, messy job that's often put-off or avoided
- Not practical when done manually. Boiler would have to be cleaned at least 3 to 4 times per day to maintain peak efficiency.
- Costly in terms of labor. Often scheduled "after-hours" at overtime rates.



Fuel Efficiency / B.E.T Automatic Tube Cleaners

The Fuel Efficiency / B.E.T. Automatic Tube Cleaning System eliminates all of the problems associated with manually cleaning firetubes. It has fully automatic controls to provide regular, timed cleaning. It requires no attendant or supervision. It removes soot and ash accumulations and cleans every boiler tube at least once during each hour of boiler operation. With Fuel Efficiency / B.E.T. Automatic Tube Cleaners, boilers run near peak efficiency at all times...24 hours per day, 365 days per year. Actual improvement in boiler efficiency when compared to manual tube cleaning is typically 8% to 10%. Stack gas temperatures, the measure of wasted heat, typically fall 75°F to 125°F after installing our automatic tube cleaners.



How the Fuel Efficiency / B.E.T Automatic Tube Cleaner Works

Fuel Efficiency / B.E.T. Automatic Tube Cleaner uses timed puffs of compressed air (or steam) to clean boiler firetubes. One-fourth or less of the tubes are cleaned at a time, but every tube is cleaned at least once per hour of boiler operation. And because the tube cleaner controls are tied into the boiler controls, the cleaning parallels boiler demand.

Reduced Operating Cost and Fuel Usage

The labor of cleaning a boiler manually as frequently and as well as the B.E.T. Automatic System would be extremely expensive. Lost production would increase the cost considerably.

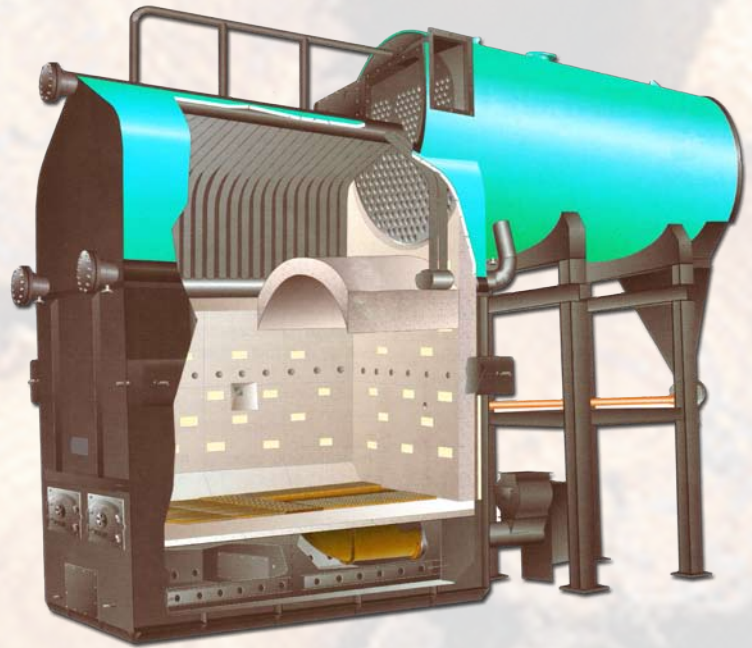
There is no loss of production from down-time with a Fuel Efficiency / B.E.T. Automatic Tube Cleaning System.

Easy Installation

Fuel Efficiency / B.E.T. Tube Cleaners are built specifically for the boilers in which they'll be installed. Boiler downtime during installation is usually no more than a day.

Increased Boiler Output

When keeping firetubes clean automatically, users have reported an increase in boiler output from 6% to 20% with no additional increase in fuel consumption.

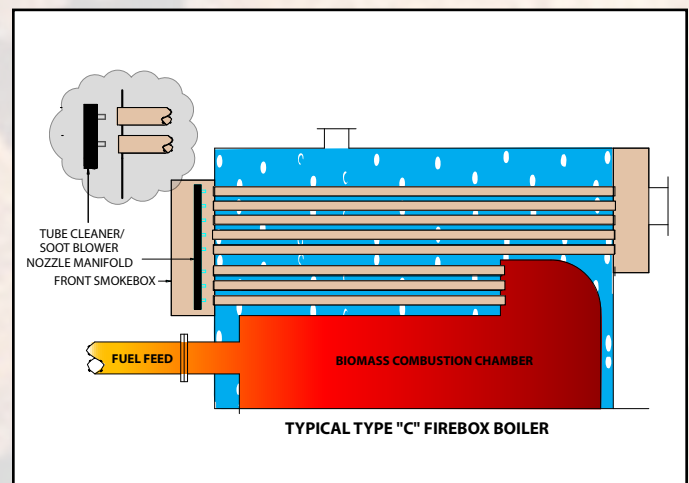
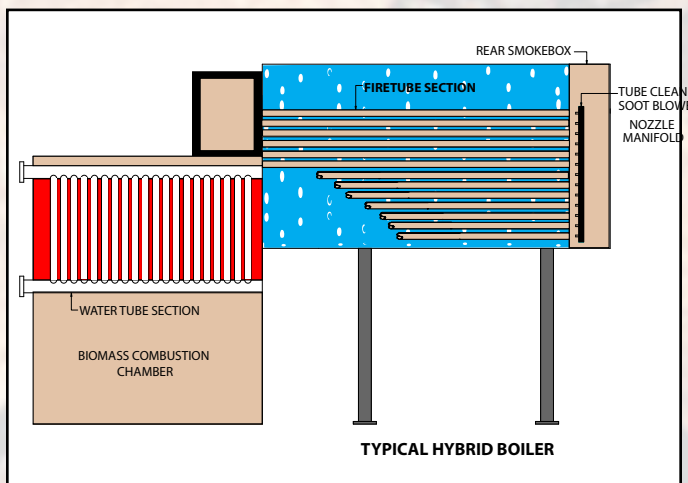


Customer Service

Fuel Efficiency / B.E.T. means complete customer service. Automatic tube cleaners are individually engineered to your specific application with components of the highest quality.

Call Today

Fuel Efficiency / B.E.T. products will help you to reduce costs and improve boiler efficiency. Your boiler facility will be more cost effective with reduced fuel usage, lower stack temperatures, increased combustion efficiency and lower maintenance costs.



Increase Boiler Output & Reduce Operating Costs With Automatic Tube Cleaning Systems

FUEL EFFICIENCY/BET AUTOMATIC TUBE CLEANERS FOR WOOD-FIRED BOILERS

- * Reduce Boiler Downtime
- * Increase Boiler Output
- * Save Labor/Maintenance Costs
- * Increase Boiler Efficiency

FOR ALL TYPES OF FIRETUBE BOILERS

- * 2, 3 and 4-pass
- * HRT, Firebox or Scotch Marine
- * Induced or Natural Draft

TYPICAL APPLICATIONS

- * Wood/Biomass
- * Coal
- * Heavy Oil
- * Waste Heat Recovery
- * Any Residual Fuel

HERE'S WHAT CUSTOMERS HAVE TO SAY:

"By installing the Automatic Tube Cleaner, we get all the heat we need. We inspect the boiler once a year, but don't need to do any manual cleaning." *Shipsbawana Hardwoods*

"We had been running for about six months before looking at our tubes. The August shut-down was amazing in that our tubes were VERY clean. We have now been running for a year without cleaning our tubes." *Wolf River Lumber, Inc.*

"The first system we installed in the older, 150-horsepower boiler still operates as efficiently as the day it was purchased. The mill recently purchased a second, 300-horsepower boiler. Even before the boiler was on-line, a B.E.T. system was installed to automatically handle the tube cleaning operation." *Frank Miller Lumber*

"We are very pleased with the operation of the tube cleaning system we purchased from you. Our boiler is much more efficient and has not required any down time for cleaning. It performs exactly as we had hoped and as you had represented the product.." *Marks - Miller Post & Pole, Inc.*



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