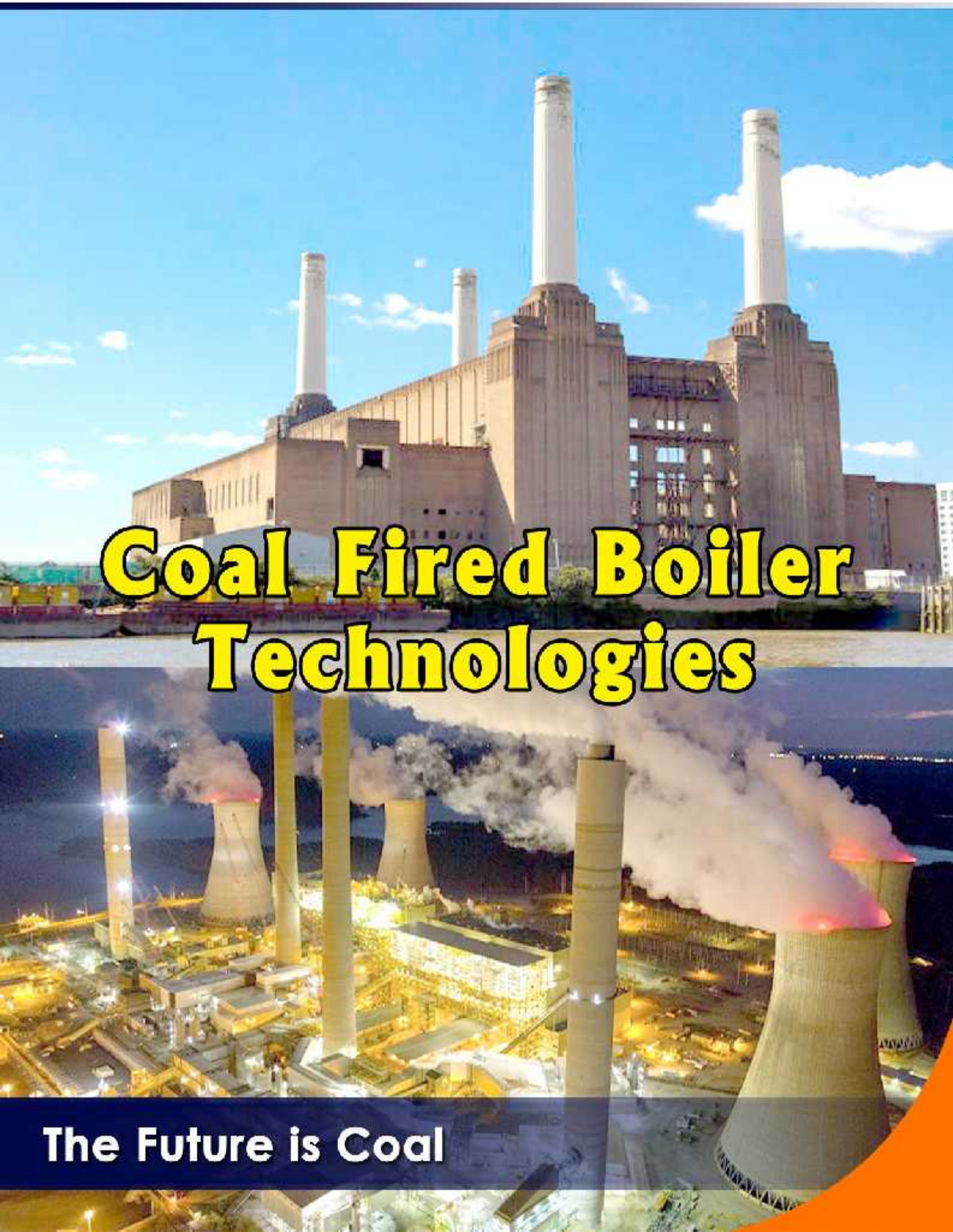
ADVANTAGE GUARANTEED

GRESHAM'S

THE ENERGY-ENVIRO SPECIALISTS

Boiler manufacturer
since 1971



Coal Fired Boiler Technologies

The Future is Coal

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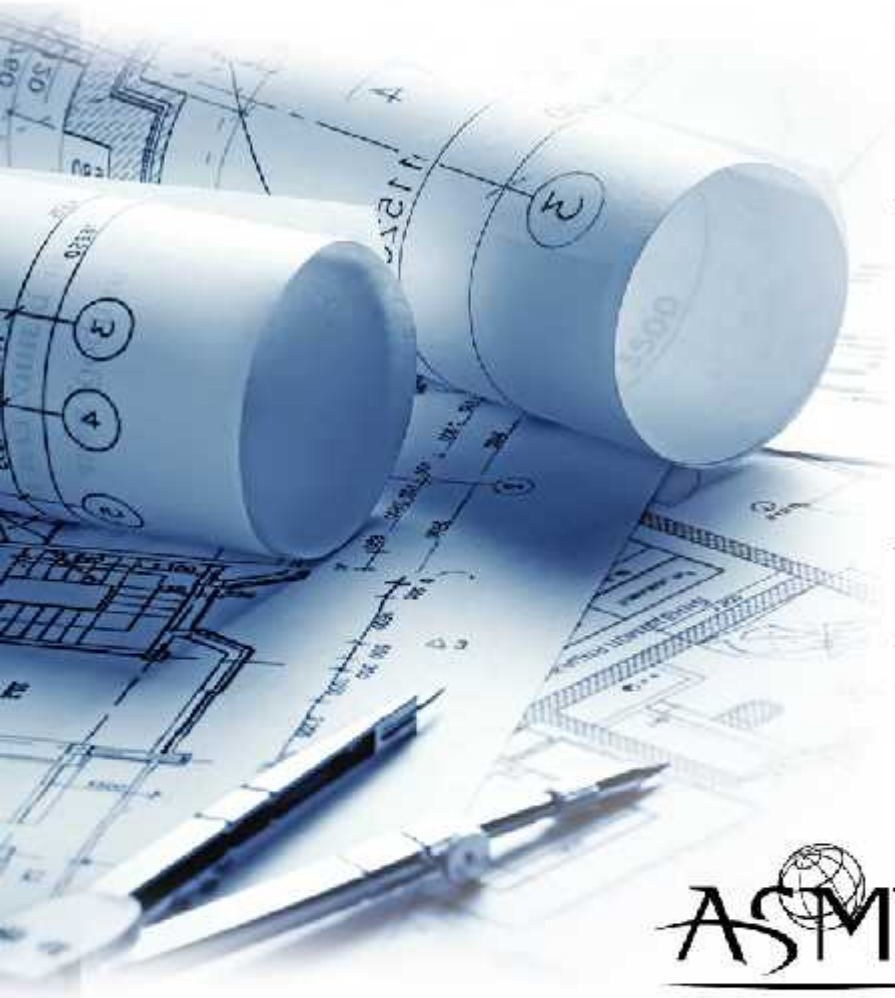
THE GRESHAM'S STORY

Gresham's started boiler manufacturing in 1971 in an association with Karachi Shipyard & Engineering Works Limited as a pioneering project for Pakistan. Todate, we have manufactured over 1200 boilers of various designs for customers ranging from food processors to power plant boilers We have been the first in CoGeneration and EPC Projects. Notable installations include the Finance & Trade Centre at Karachi, The MCB Towers, the SNGPL Head Office Building and many others.

Gresham's Boilers exported to France,Italy,Algeria,Iraq, UAE,Saudi Arabia,SriLanka,Bangladesh,Myanmar and Afghanistan are a testimony of our quality.



Quality Inspiration.

William Edwards Deming
was an American engineer,
statistician, professor, author,
lecturer, Quality Expert.
Mr.Deming inspired Toyota
to quality manufacture in 1954.

Boilers of Firetube,Waterlube,Forced circulation Steam Generators,Waste Heat Recovery Units, Power plant boilers,Thermic oil Boilers, Hot air generators ,RO & Water Treatment Plants,Heat Exchangers,Equipment for oil and gas industries. Portable accomodation systems,Filteration Plants are manufactured under licence agreements from world renowned brands such as Powermaster Keeler,Wanson,Ygnis,Alpha boilers..... to give you a highly engineered, safe & efficient products built to ASME Standards and Inspected by Germanischer Lloyds,TUV,SGS....

In 1982 we orignated the idea of energy conservation and were behind the Boilers in Pakistan study done by the Ministry of Production which study led to the creation of ENERCON.

Gresham's -- dedicated to boiler manufacture since 1971. -- committment to energy conservation. -- committment to deliver a safe reliable product.

Innovation | Integrity | Value

1947-2047 100

BS EN ISO 9001 QUALITY ASSURED

ASME

ASME Codes used for manufacturing all Boilers.

SGS

GL Germanischer Lloyd

TÜV

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Introduction to Hi-tech Coal & Solid Fuel Boiler Technology:

Gresham's - Pakistan's pioneer boiler manufacturer, obtained boiler manufacturing technology from Orr Sembower inc., USA. in 1971 for natural gas and oil fired boilers.
Powermaster, UK-Parkinson Cowan GWB, UK extended the Wetback and Coal/Biomass boiler technology to **Gresham** in 1976.
The natural gas fuel crisis in Pakistan has led **Gresham** to start manufacture of the vekos Powermaster range of coal/wood & biomass fired boilers in a wide variety of sizes from
2.5 - 20 TPH/hr with operating pressures upto 20 bar. A 20 TPH/20 bar boiler was exported to Myanmar in 2014 and some imported Vekos Powermaster Boilers operating on Coal in Pakistan are available for your inspection.
Gresham environmentally Friendly Boiler with High Fuel Efficiency, a modern design that works with coal of upto 40mm lumps, ash content as high as 40%, high sulphur and low calorific values typically found in Pakistan origin coal.

Model	tph Capacity	Dimensions (m)	Coal consumption kg/ton/stm
250	2.5	5.0 x 2.76 x 2.95	100 - 105
450	4.5	6.2 x 3.15 x 3.35	100 - 105
650	6.5	6.8 x 3.50 x 3.80	102 - 107
850	8.5	6.9 x 4.8 x 4.2	105 - 108
1000	10.0	7.1 x 4.9 x 4.8	105 - 108
1500	15.0	7.8 x 5.7 x 5.8	102 - 105

Coal consumption based on 6500 kcal/kg.

Advantages of the vekos Powermaster® coal boiler

- ASME code construction with inspection by German LLoyd.
- Design permits installation in your existing boiler room.
- High efficiency steam production from any grade coal – local or imported.
- In built ash collectors in the boiler eliminates any ash from the boiler chimney.
- On line soot blowing system.
- **Quick start up on coal within 10~15 minutes.**
- **Commissioning by Gresham's trained team.**
- **vekos Powermaster is supplied with a Powerful vacuum system to clean the boiler internals within a short time from residual ash.**

Boiler Construction

1- Air Inlet

2- Primary air supply (under grate)

3- Secondary air supply **4-** Grit transporting air

5- Products of combustion leaving furnace

6- Products of combustion in fast pass smoke tube

7- Products of combustion in second pass smoke tube.

8- Products of combustion entering grit arrester

9- Products of combustion leaving grit arrester.

A- Front of boiler **B-** Furnace **C-** 1st pass (tubes)

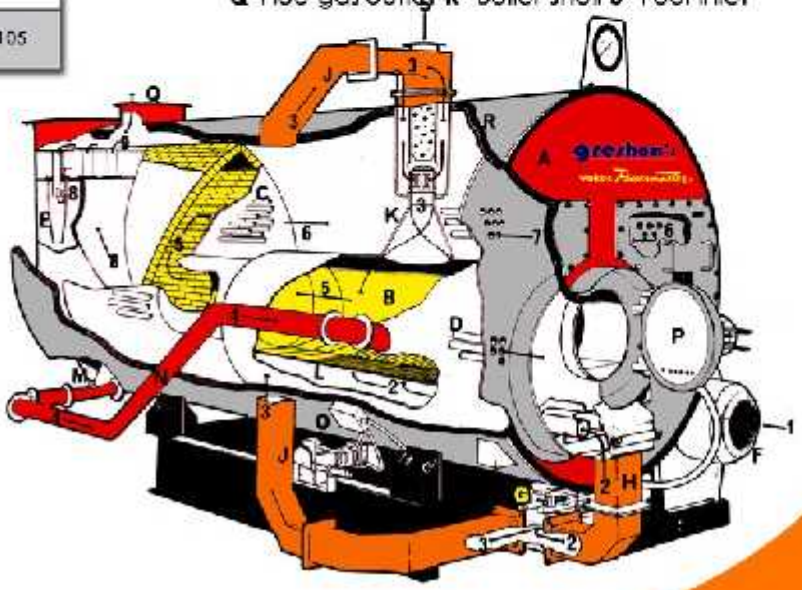
D- 2nd pass (tubes) **E-** Grit arrester **F-** Fan

G- Modulating dampers **H-** Underline all

J- Overtime air **K-** Fuel / air tube **L-** Grate

M- Ventura **N-** Grit re-firing tube **O-** Master modulating control **P-** Fire door

Q- Flue gas outlet **R-** Boiler shell **S-** Fuel inlet



No Induced Draught fan Required: saving millions of rupees in annual costs.

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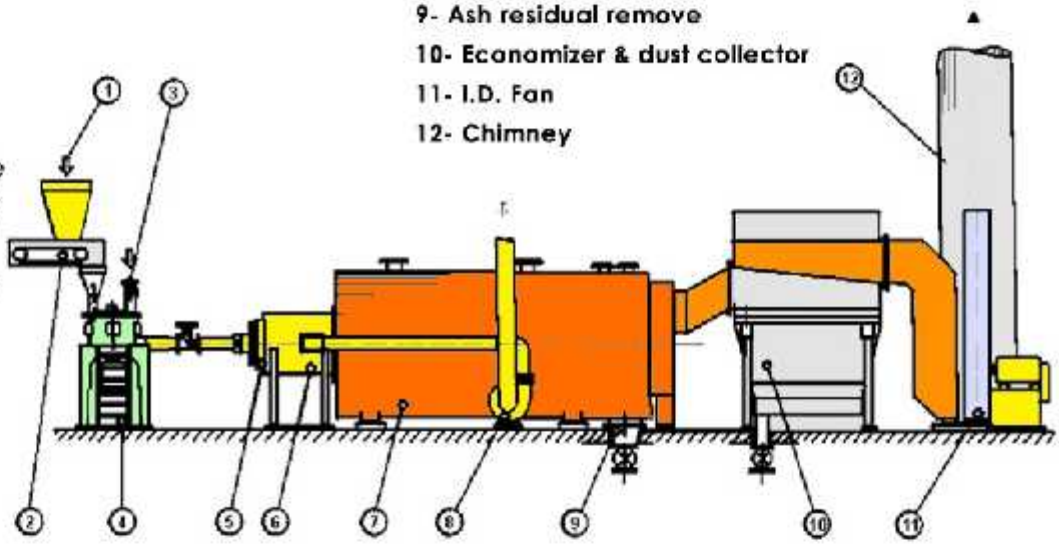
Boiler manufacturer since 1971

Pulverized Coal Fired 3-pass boiler For industry
Revolutionary Coal Boiler

Boilers are available as firetube or watertube types in capacities from 1tph to 125tph.
Low cost coal is the ideal solution for Pakistan industry and **Gresham`s**, always the pioneer, introduces the Revolutionary Pulverized Coal Fired Boiler for the first time in Pakistan.
Optional fuel: Oil/Gas.
The **Gresham`s**, combustion system is not a mini power plant, it is a simple and fully automatic PCF system which can be operated by non specialized personal, just after a few hour of training .Contrary to other PCF application, such as power plants and cement plant where the necessary heat radiation comes from the multi-burner installations or the enormous area of refractory, the mono burner application is some what different, since there is no radiation in an insulated boiler.

Gresham`s Advantage:

Gresham`s experience since 1971 in Boiler manufacturing with inspections by reputed international surveyors is your guarantee for quality manufacturing without compromise.



1- Coal hopper
2- Automatic coal feeder
3- Primary air
4- Direct firing pulverized
5- P.C Burner
6- Pre-combustion chamber
7- Shell type boiler, 3 pass
8- Secondary air fan
9- Ash residual remove
10- Economizer & dust collector
11- I.D. Fan
12- Chimney

Technical Description:

The Pulverized coal firing system, comprises the basic equipment:

- A direct firing coal pulverizer
- A Variable geometry burner.
- A special pre –combustion chamber

The direct firing pulverizer is a vibration free machine, which dries, pulverizes and transports the coal powder to the burner .The Machine is fitted with a wear compensator system in order to keep the maintenance cost down to a minimum. The coal powder granulometry averages 55 microns.

The turbulence variation is fully automatic and provides tercy air to the combustion chamber.
The pre-combustion chamber, which is part of the burner, is an air cooled type, it provides hot combustion air to the burner.

The coal powder granulometry, which means, the particle size,is much finer, in order to obtain a proper steady combustion and to be able to throttle between minimum and maximum power.

With the **Gresham`s** Coalmax Boiler high efficiencies of upto 82% can be attained without economizer.

Technical Advantages:

Immediate response when increasing or decreasing fuel capacity. Full efficiency of the heart radiations around the boiler furnace. less excess air. Full efficiency of the boiler furnace area since the coal swelling index does not matter anymore in PCF application. Complete combustion and maximum performance results .Efficient pollution control. Pulverized coal direct firing is an economical solution for steam energy.

Cost:

Due to the simplicity of the system, the complete plant can be amortized in a matter of months, in spite of being entirely automatic.

Safety:

Compared to other fuels one of the greatest advantages is safety .No risk of coal powder explosions during handling or transportation. Since the direct firing pulverize fitted in the system produces only the amount coal powder required for immediate combustion.

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The Energy Intelligent Solution

High & low pressure steam systems

2000 kg/hr. ~ 122,000 kg/hr,

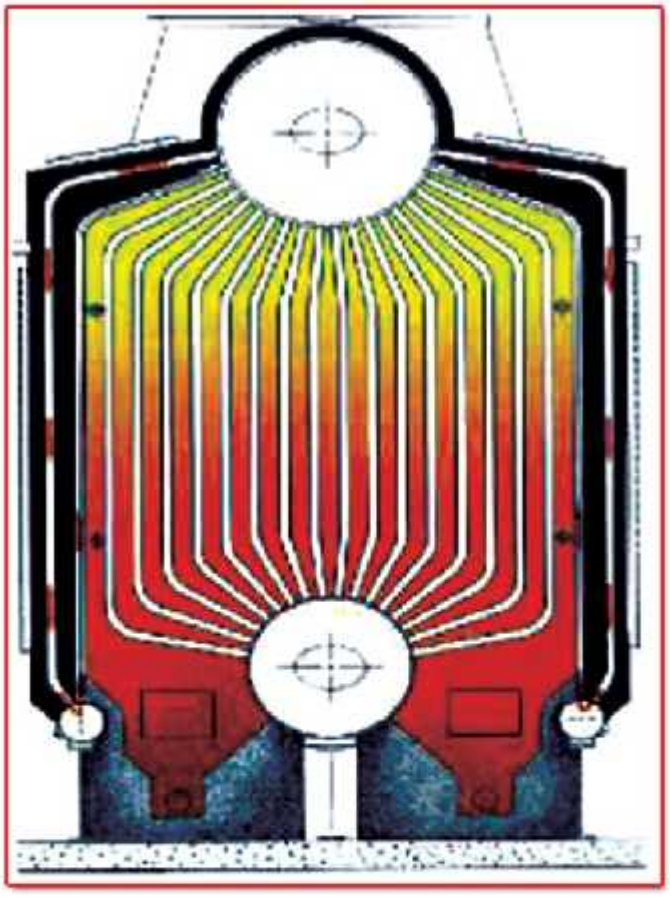
1.0~9.5 mpa & temperatures~540 C

Coal and solid fuel biomass boilers
Performance by design

01- Large steam & mud drums
02- Casing expansion seal
03- 10 gauge reinforced casing roof & sides
04- I-beam structural steel base
05- Automatic coal feeding
06- Adequate spacing for good soot-blowing
07- Unheated down corners
08- Serrated tube seating
09- 1000 F blanket insulation
10- 1000 F ceramic wool insulation
11- Membrane wall construction
12- Fires any kind of coal or solid fuels
13- Guaranteed compliance with all environment laws including ISO-14000
14- Fully automatic & totally packaged unit

Quality assured design & construction

1- Designed & manufactured to ASME boiler and pressure vessel code
2- Independent international third party inspection by reputable agencies
3- Consistency and quality built through **Gresham's** quality management system GQUAL-designed to ISO 9000 standards.
4- Standard quality assurance activities.



System Options

Gresham's offers an array of matched accessories to fulfil all your needs.

1. Water Softening Systems
2. Feed Water System
3. Bottom & Surface
4. DUAL Firing Burners
5. Instrumentation
6. Stacks
7. Economizers
8. Deaerator Systems
9. Chemical Feed Systems
10. Condensate Recovery Systems
11. Turkey Feed & Ash Removal System
12. Ladders & Platforms
13. Heat Exchangers
14. Other Power Block Accessories

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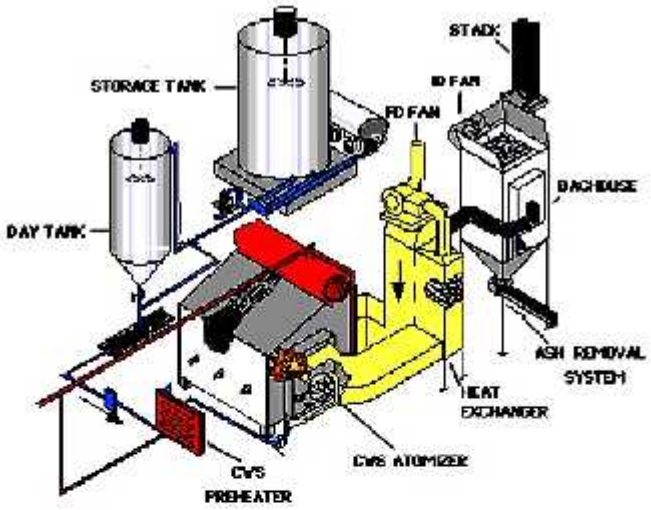
CWS: coal water slurry the new environmentally friendly way to burn coal

Ecologically clean liquid fuel from coal

Technology Description

CWS consists of fine-dispersive mixture of micronised coal, water & additive with coal % upto 70%.
CWS is very similar to heavy furnace oil by viscosity and density and can be used on existing coal and gas (or oil) boilers or power stations.
Combustion of coal in a form of CWS allows to utilize coal upto 99.6%.
Combustion efficiency. High efficiency reduces the cost price of produced energy and reduces emissions into the atmosphere.



compared to other forms of coal cobustion CWS reduces NoX & SoX formation & reduces fuel consumption by upto 10%.

660 MWe CWS NANHAI POWER PLANT IN CHINA

A typical CWS system

our partner company:
Beijing Huawei Enginering construction Company China
World acknowledged Clean Coal Technology Company

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Innovation | Integrity | Value
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