

Waste Heat Recovery



**Comprehensive solutions from Gresham's
since 1986.**

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. To date, 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 Co-Generation 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, Sri Lanka, 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, Watertube, Forced circulation Steam Generators, Waste Heat Recovery Units, Power plant boilers, Themic oil Boilers, Hot air generators, RO & Water Treatment Plants, Heat Exchangers, Equipment for oil and gas industries, Portable accomodation systems, Filtration 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 originated 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, -- commitment to energy conservation, -- commitment to deliver a safe reliable product.



ASME Codes used for manufacturing all Boilers.



The Firetube Range: Revolution FT

Gresham's FT range designs originated from Johnston Boilers, USA. With new trends in Computer aided designs and Finite Element Stress Analysis evolving, Gresham's boilers are at the leading edge of industrial waste heat boilers.

Gresham's acquired patented softwares from Europe for designing all types of Waste Heat Recovery Boilers which also incorporate FES, assuring you, the customer of a design which will meet the stated capacities from your waste heat energy source while at the same time ensuring safety of design.

Over the past 30 years Gresham's exciting range of Waste Heat Recovery Boilers have been used in applications with Waste Heat sources from Engines, Gas Turbines, Furnaces, Process Heat.



Gresham's have developed Duct Burners for fire tube Waste Heat Boilers applications, and patented an innovative System to utilize the Waste Stream Carbon Monoxide and available excess Oxygen to enhance the capacity of the waste heat recovery modules producing free energy and increasing efficiency by upto 30%. Maximus Condensing Economisers are incorporated to capture low temperature waste heat—an important innovation where condensate recovery is low and steam must be used for pre-heating water for boiler. Or in a Combined Cycle Operation to pre-heat the low temperature condensate of 45 C.



Simplex



Duplex



Triplex



Quadplex

COMBI WASTE HEAT BOILERS AT:

Siddiq Sons, Artistic Denim, Popular Juice & others Herald the future trend of waste heat recovery boilers.



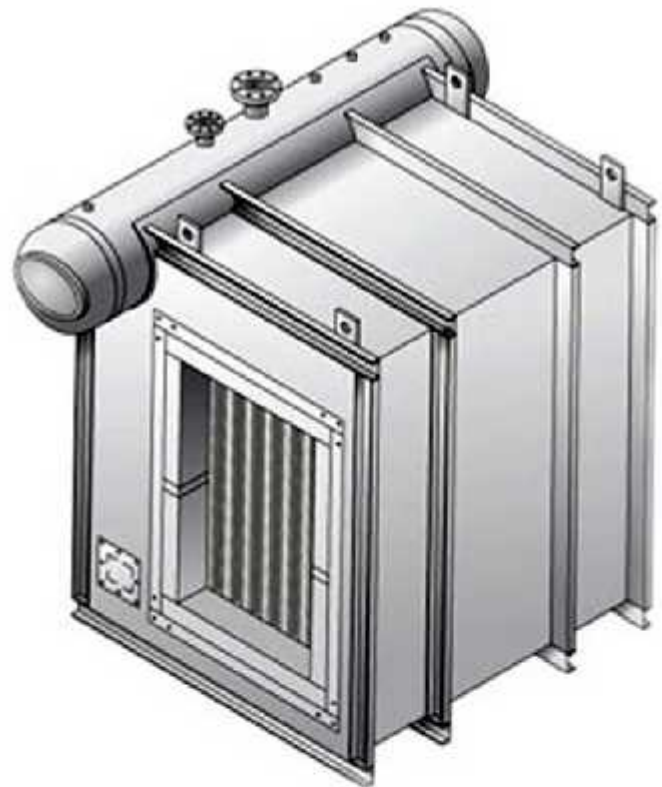
Gas turbine waste heat boilers

Gresham's Waste Heat Boilers for Gas Turbines and Process gases are of the WaterTube design obtained from Johnston Boilers and Hamon Dellak, USA.

The SD Range:

A Slant design Watertube Waste Heat Recovery Boiler most suitable for limited space applications where typically Economisers are mounted in the stack.

Capacities: kg/hr:	2000 ~ 35,000
Pressures (upto) bar(g)	60
Superheat (upto) C	500
Gas Flow upto Kg.hr.	80,000
Temperatures (upto) C	750
Downcomers (upto)	4 nos
Casing Pressure(upto) WG	200 mm .



Completely encased with hardener finished CeramicFibre Bricks.Stainless steel covers and ducting,ecpnomiser casings,chimney with additional 50 mm glass fibre insulation and necessary manholes with easy access to all areas.

The VC design:

The Vertical Cross Flow design is a 2 Drum unit ideally suited for applications where the operating Philosophy will require:

Additional Fuel Firing,
 Additional Fuel firing with additional air.
 Stand alone steam generation requirements.

Typically, the VC is equipped with :

Duct Burners which substantially utilize the available Oxygen in the flue gas stream.
 Where additional Air is needed to reach Process steam needs, additional Forced Draft fans are provided.
 Stand alone fresh air firing systems.

Capacities: kg.hr.	10,000 to 200,000
Pressures (upto)bar(g)	120
Temperatures (upto) C	550
Gas Flow (upto) kg.hr.	150,000
Temperatures (upto) C	650
Downcomers (upto)	6 nos
Casing Pressure(upto) WG	200 mm

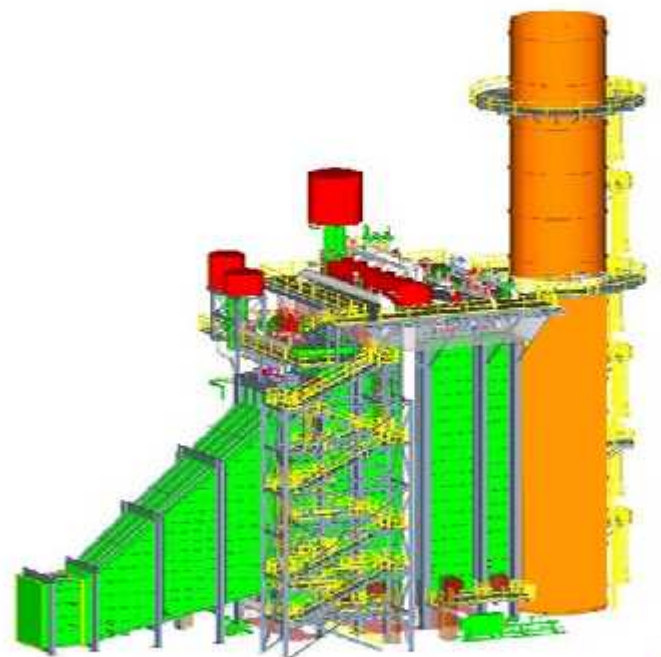
The Side plates are with membrane wall construction of High Temperature "Corten" steel and facewall of 100 mm hardened Ceramic Bricks. Assuring a gas tight unit.

Manholes conveniently placed provides servicing at all areas.

VC Models are also available with Condensate Preheating systems and Recovery of low temperature exhaust gases to achieve maximum recovery of energy.

Manufactured for:

Sooty Denim Mills, Karachi,
 Gatron Industries, Hub City,
 Shashe Power Plant, France
 Florence Hospital, Italy.



The ST Range:

The ST Range Design was initially acquired from Johnston Boilers Company, USA for our client: Sitara Textile Mills and subsequently developed using sophisticated European design software in addition to Finite Element Stress Analysis and features:

Membrane Wall Gas tight Construction.
Fin Tube design to suit operating needs and back pressure from well known manufacturers.

Steam Production from 5,000 to 75,000 kg.hr.
Working Pressures upto 55 Bar(g)
Steam Temperatures upto 475 C.
Gas Flow Rates upto 400,000 kg/hr.
Duct Burner capability.
Economiser.
Condensing Economiser.

ASME Code Design & Manufacturing .

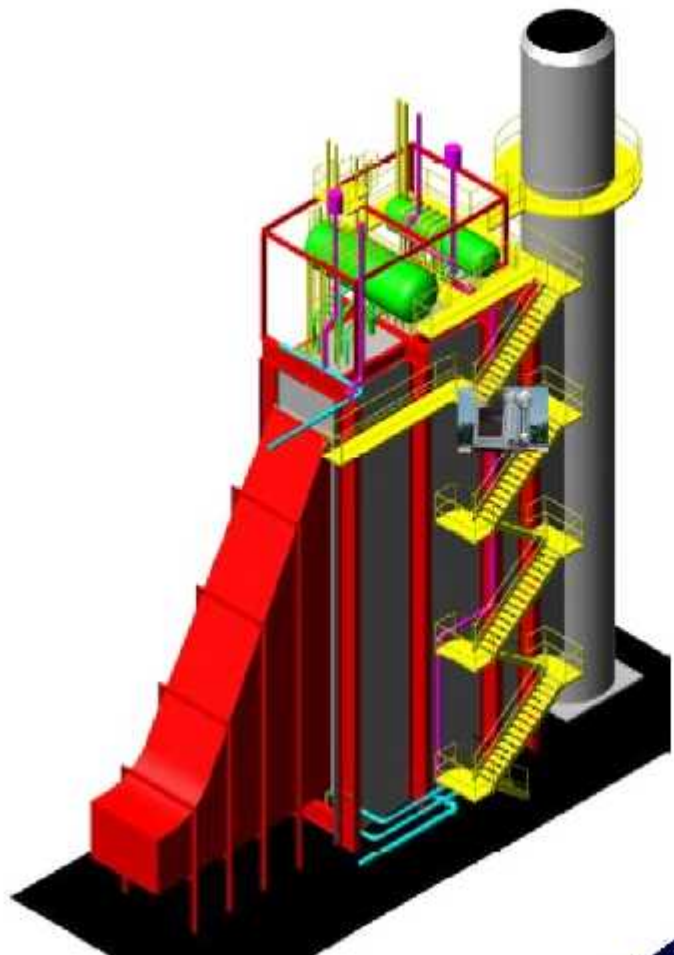
The HD Design:

Gresham acquired design of large Watertube Cross Drum, Header construction for Waste Heat Recovery of Large Frame Industrial Gas Turbines from Hamon Deltak, USA.
Subsequently, using sophisticated European Software with Finite Element Stress Analysis,

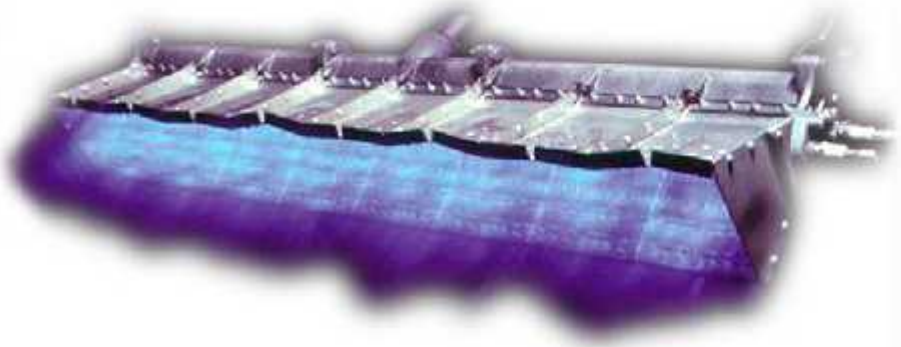
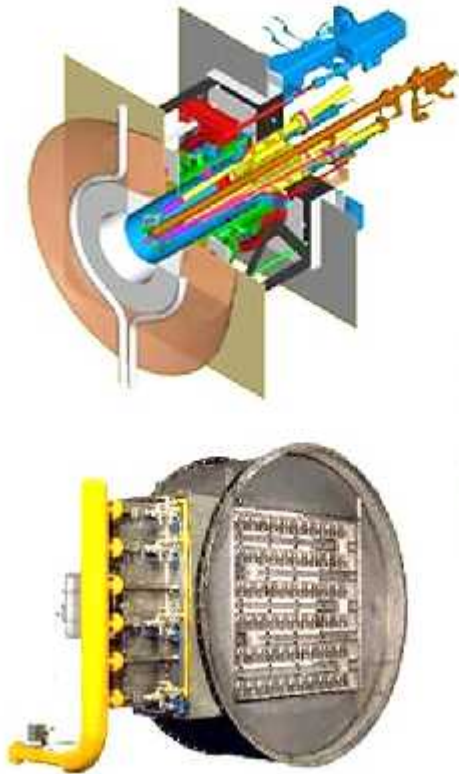


Sitara Textiles and Alhamd Chemicals, Pakistan

- Easy access to heating surfaces.
- Corten Steel ductwork.
- Cerabrick hardened insulation.
- Stainless steel corrugated covers.
- PLC Control System.
- Fresh Air firing and supplemental air firing to meet operational requirements.



A range of duct burners:



To suit every application



ControMax (Boiler Management System)

A PLC based system for visualization & control of all boiler parameters.

- Burner management system with integrated burner operations system including flamer failure system in compliance with EN298 & EN1646.
- Boiler control system.
- (Human machine interface, with high definition, touch screen control panel).
- Flame protection gas valve proving system (VPS).

- Inline oxygen monitoring system with micro modulation to EN 12067/2.
- Boiler water with field installed magnetic level system.
- Control management of inverter for the fan & feed pumps to achieve maximum energy savings.
- Heat exhaust gas management.
- RJ45 ports for remote control & supervision.
- Data recoding alerts & notification via GPRS/Internet.
- Water & fuel consumption with related steam production & efficiency indicator cost of steam.
- Communication to SCADA & DCS systems via MODBUS or PROFIBUS.

Reliable single-source supplier

Gresham's proven expertise in boilers, burners and controls makes us a reliable and responsive single source for packaged boilers and auxiliary equipment. From system engineering and manufacturer to start-up and operations, our knowhow makes it all work together for maximum operating efficiency and dependability, and in compliance with environmental regulations.

- Deaerator Systems /Dosing systems.
- Water Treatment Systems
- Feed water Systems
- Blowdown systems
- Instrumentation
- Stacks
- Economizers / condensing economisers /Air heaters.

