DDFC

Innovative Engineering Solutions

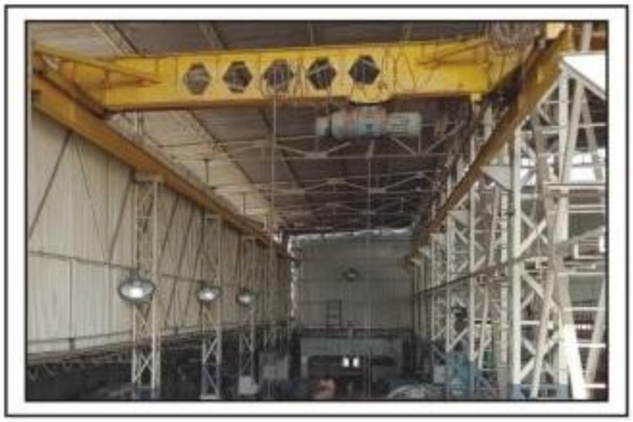
- Textile
- Power Generation
- Steel
- Chemicals
- Dairy & Food
- Pulp & Paper

DDFC Innovative Engineering Solutions

History

DDFC

DDFC is a private limited company founded in 1980 as Design Development Fabrication Company. Initially, the company's product range was limited to Stainless Steel Equipment including Hygienic Vessels and customized fabrication for the process industry. After a few years, the increasing brand recognition coupled with the expertise of the management team was leveraged to expand the manufacturing program to include carbon steel products including Fired Boilers, Heat Exchangers, and Pressure Vessels. Moreover, the growing world-wide environmental consciousness was harnessed in launching the pioneering efforts for pollution abatement in Pakistan as Waste Water Treatment Plants.



Towards the mid-nineties customer concerns regarding increasing fuel costs were an impetus for another effort this time in energy efficiency. Hence another pioneering effort in Pakistan in terms of Waste Heat Recovery Boilers was introduced. Later on new technologies for using waste heat to produce superheated steam and run a steam turbine for power generation were introduced.

In order to address those companies whose power houses are relatively small and exhaust gases from their engines can produce 4-6 Tons/hr steam, DDFC has proudly introduced Expander technology which utilizes saturated steam and delivers 320 kw at 400V 50 HZ through a generator.

Now, after a quarter of a century of national industrial experience in heavy engineering and growing export initiatives, DDFC is a national market leader in Waste Heat Recovery Boilers. In the process of continuously striving for innovative engineering manufacturing solutions for the local industry, DDFC has cultivated an extensive customer base that consists of multinationals such as Glaxo Smith Kline, Coca-Cola, Pfizer and Unilever and National conglomerates such as the Nishat, Sapphire, Fazal Group, Interloop, Umer Group, Gulahmed and Ibrahim Fibres Groups and companies in all major industrial sectors including Textiles, Power, Cement, Food & Dairy, Chemicals, Pharmaceuticals and Oil & Gas.

FIRED STEAM BOILER

31 TPH @ 12 Bar (G) Smoke Tube Fired Steam Boiler

15 TPH @ 10 Bar (G) Smoke Tube Fired Steam Boiler

05 TPH @ 10 Bar (G) Smoke Tube Fired Steam Boiler

DDFC (Pvt.) Ltd. is amongst the leading engineering & fabrication companies manufacturing steam boilers to British standards BS 2790 latest addendum. DDFC manufactures smoke tube boilers in the following capacities and pressure ratings.

Capacity:

1 tons per hour to 32 tons per hour. Capacities beyond 20 TPH utilize twin furnace design.

Pressure Rating:

Upto 25 bars (depending upon capacity)

Design Verification:

DDFC designs its boilers which are verified by a UK based consultant. The final design is checked and approved by Royal Sun Alliance Insurance Co. Of UK, when required.

3 Pass Wet Back Design:

Proven and time tested 3 pass wet back design with full submerged reversal chamber is considered the work horse of the industry.

Product Features:

- European design
- Maximum Efficiency
- Minimum Maintenance
- Multi fuel firing
- Quality assured
- Enabled full customization

Custom Engineered & Manufactured:

Every DDFC boiler is specifically engineered and built to the customer's needs & specifications. Special features, fuel and auxiliary equipment are provided according to requirements.

DDFC Innovative Engineering Solutions

Energy Recovery Solutions

FIRED STEAM BOILER

10 TPH @ 10 Bar (G) Smoke Tube Fired Steam Boiler

08 TPH @ 10 Bar (G) Smoke Tube Fired Steam Boiler

01 TPH @ 07 Bar (G) Smoke Tube Fired Steam Boiler

No Proprietary Components:
The majority of DDFC boiler controls or instrumentation are "off the shelf" items from international manufacturers which eliminates stocking of proprietary parts and lengthy down time in the event of control malfunction.

Instrumentation and Control:
The boiler is provided with an electric control panel that houses all boiler controls, burner control, equipment's tartars, circuit breakers and main isolating switch. The panel is powder coated steel constructed to IP42 standard. Higher enclosure ratings are also available. PLC based control system is also available as an option.

Ease of Fire Side Inspection :
Front & rear doors are hinged to provide full access to fire side tube surfaces, which eliminates the necessity of disconnecting the burner and fuel piping.

Ease of Water Side Inspection:
Man hole on top of the shell and sedimentation holes on the shell's lower part provide easy access for inspection of water side surface.

Blow Down:
Each boiler is equipped with a connection where a manual or automatic Blowdown system can be installed for maintaining proper TDS in the boiler water.

Raw Materials & Components:
Certified raw materials and components are procured from leading international manufacturers to ensure quality, reliability and trouble free operation.

Combustion Systems:
DDFC provides a wide range of single or dual fuel burners in nozzle or rotary cup designs to satisfy customer needs and budgets. Low NOx & SOx burners for stringent environmental requirements are also available.

FIRED STEAM BOILER

3 TPH @ 10 Bar (G) Smoke Tube Fired Steam Boiler

04 TPH @ 10 Bar (G) Smoke Tube Fired Steam Boiler

20 TPH @ 10 Bar (G) Smoke Tube Fired Steam Boiler

Oxygen Trim System :

DDFC supplied combustion system for large boilers can be fitted with an oxygen trim system which reduces the excess air in the exhaust gases thus reducing heat losses and improving fuel efficiency.

Ancillary Equipment :

The following ancillary equipment is offered for the complete package. The customer has the option to furnish these items himself which do not adversely affect the performance or the warranty of equipment.

* Feed water tank with deaerator head for non-pressurized system. The feed water tank is equipped with heating coils, spargers, temperature control system and optional level control probes. The same system can be offered in pressurized tank configuration as well.
* Feed water pumping system with one operation & one stand by pump is normally provided along with necessary valves & controls.
* Fuel oil storage & pumping system for heavy fuel oil/diesel oil can be designed & provided upon customer's request.
* Economizers help improve the thermal efficiency by capturing additional heat form exhaust gasses using them to heat feed water. This in turn reduces fuel consumption of the boiler. These units are offered as a standard with all natural gas fired boilers with capacity of 1 TPH or larger.

Specially designed imported fined tubes are utilized according to fuel used.

Measuring instruments for steam, water, fuel oil can be provided on request for local or remote application. PLC based system are also available.

DDFC Innovative Engineering Solutions

Energy Recovery Solutions

WASTE HEAT RECOVERY BOILER

Financial & Environmental Benefits of Industrial Heat Recovery Applications:

18 TPH @ 20 Bar (G) Waste Heat Recovery Boiler

2.85 TPH @ 10 Bar (G) Waste Heat Recovery Boiler

7.65 TPH @ 10 Bar (G) Waste Heat Recovery Boiler

DDFC waste heat recovery systems for exhaust stream temperatures of up to 1000°C are the best choice for any industry. For h gher temperatures, specialized and more sophisticated designs are also available. Waste heat systems make possible the recovery of heat being discharged into the atmosphere as supplemental energy for another process. As energy costs rise, the demand for more efficient and cost effective energy utilization increases.

DDFC proudly presents its experience in products and services, gathered in this field over two and half decades and provides an extensive portfolio of customized and standardized solutions for waste heat recovery to ensure long-term optimization of plant performance, quality, and productivity. Each waste heat recovery system is custom engineered for a specific re quirement.

Multi-Generation Systems:

DDFC specializes in heat recovery from internal combustion (I/C) engines. Steam or hot water can be produced by utilizing energy in the exhaust. This steam / hot water is used in the process or to run an absorption chiller for producing chilled water. Similarly heat energy in the engine jacket, lube oil system can be recovered in the form of hot water for process use or operating absorption chillers. Therefore with one input three outputs viz, electricity, steam and hot water are generated which is appropriately known as **Tri-generation system**

* Heat Recovery from Gas Turbine exhaust provides large quantity of process steam or high pressure steam for running steam turbine for further power generation.
* Industries using thermal oil heating systems can generate hot water from exhaust of these heaters.

High Return on Investment:

Waste Heat Recovery Boilers present an ideal opportunity for investment since the payback period is quite attractive being less than one year if process steam is produced and utilized round the clock.

DDFC Innovative Engineering Solutions

WASTE HEAT RECOVERY BOILER

Financial & Environmental Benefits of Industrial Heat Recovery Applications:

1.6 TPH @ 10 Bar (G) Waste Heat Recovery Boiler

5.25 TPH @ 10 Bar (G) Each Waste Heat Recovery Boiler

1.9 TPH @ 10 Bar (G) Waste Heat Recovery Boiler

DDFC manufacturers Smoke Tube type Waste Heat Recovery Boilers in various capacities & pressure ratings.

Capacity:

The capacity of a Waste Heat Recovery System/Boiler is dependent upon the mass flow rate and temperature of the available exhaust gases. Multiple engines can be connected to a single WHRB. DDFC offers Pentax boiler for use with five engines.

Pressure Rating:

Up to 25 bars(g).(Depending on size)

Design Verification & Third Party Insurance:

DDFC boiler design is verified by a UK based consultant. The final design is also checked & verified by Royal Sun Alliance Insurance Co. of UK, if so desired by the customer.

Single and Two Pass Designs:

DDFC offers the two pass design to customers with limited footprint requirements. Space permitting, a single pass design is preferred since it produces lesser back pressure on the prime mover.

SAILENT FEATURES:

Customized Solutions:

Each DDFC Waste Heat Recovery Boiler is specifically engineered & built to the customer's needs & specifications. Special features & auxiliary equipment are provided as required by the customer.

Raw material & components:

Certified materials and components are procured from leading manufacturers to ensure quality, reliability & trouble free operation.

WASTE HEAT RECOVERY BOILER

Damper for Exhaust Gas Flow Control:

The pressure in WHRB is controlled through a damper which allows the exhaust gases to pass through the boiler or vent to the atmosphere.

Dampers are generally ON/OFF type for most duties. Modulating dampers are available for special applications requiring minimum variation in pressure e.g. steam turbines. Dampers are electric motor actuated with provision for manual operation. Pneumatic actuators can also be supplied on request

Instrumentation & Control:

Each WHRB is provided with an electric control panel, which is either floor or wall mounted for indoor application. It houses all boiler controls, electrics, and main isolating switches. The control panel also displays various boiler parameters and alarms. PLC based control systems are also available on request.

Capacity Enhancement through Supplementary Firing System:

Exhaust from turbines containing more than 10% oxygen can be utilized by supplementary fired burner to further heat the exhaust gases which increases the steam output capacity of the WHRB. Special burners suitable for I/C engine exhaust containing 4-6% oxygen can also be provided.

Power Generation Through Waste Heat Recovery:

If engine based power plant has a working capacity of 8MW or more, then an economic solution for power generation through production of super heated steam and a steam turbine generator set is feasible. For saturated steam application, a new expender technology has been introduced.

ANCILLARY EQUIPMENT:

The following ancillary equipment is offered for the complete package.

* Feed water tank with dearator for non-pressurized systems. It is equipped with heating coils, spargers, temperature control system. The same system can be offered in a pressurized tank configuration as well.
* Feed Water Pumping system with operational/standby pumps. It is normally provided with necessary valves & controls.
* Economizers help improve efficiency by increasing temperature of feed water by capturing additional heat from the exhaust gases in the stack. This increases the steam output of the WHRB. Depending upon location & application, WHRBs can be provided with independent or combined economizers.
* Measuring Instruments for steam and water can be provided on request for local or remote application. PLC based systems are also available.

1.6 Megawatt Steam Turbine (MAN)

ENERGY RECOVERY THROUGH STEAM TURBINE

In order to utilize heat in exhaust of engines usually recovery boilers are used to generate process steam. However in industries where steam cannot be used for process, there is a strong possibility that power at 400V & 50HZ can be generated through combined cycle route in following manner:

1. Generate superheated steam through waste heat recovery boiler and pass it through a steam turbine powering an Alternator. This type of project is feasible if the number of gas engines are such that 8-10 tons of superheated can be generated which can then deliver 1.0-1.6 MWe of power.

2. If steam quantity ranges between 4-8 tons per hour then utilizing a combination of Expander coupled to electric generator is viable solution. This system requires saturated steam preferably at 12.5 bar (g) which can generate 340 Kw/hr. This system is cost effective and simple to operate.

ENERGY RECOVERY THROUGH EXPANDER TECHNOLOGY

340KW Expander Technology

DDFC has engineered, manufactured & delivered 05 Nos. combined cycle projects. First one was for International Steels Ltd Karachi producing 1200 KW power while the latest project was completed in 2018 for Fazal Textile Mills Ltd. Muzzafar Garh utilizing exhaust from 07 engines. Superheated boilers delivering 10 TPH @ 17 bar (g), 370°C steam to MAN brand steam turbine producing 1600 KW power. DDFC has comissioned its first Expander unit at AA Spinning Mills Faisalabad. Waste Heat Recovery boiler connected to 05 engines produces 5 TPH saturated steam at 12.5 bar (g) Expander utilizes this steam to deliver 340 KW power.

STAINLESS STEEL & HIGHER ALLOYS FABRICATED EQUIPMENT

Steam Jacketed Vessel Capacity 10,000 Ltr

DDFC is one of the leading companies for the manufacturing of machinery and equipment in Stainless Steel and Higher Alloys, for the Chemical, Pharmaceutical, Food and Dairy industries. Long and trusted association with these industries has provided the organization with the insight into special needs of these industries including Hygienic design and manufacturing requirements enabling it to furnish equipment and machinery to standards required by the relevant industry.

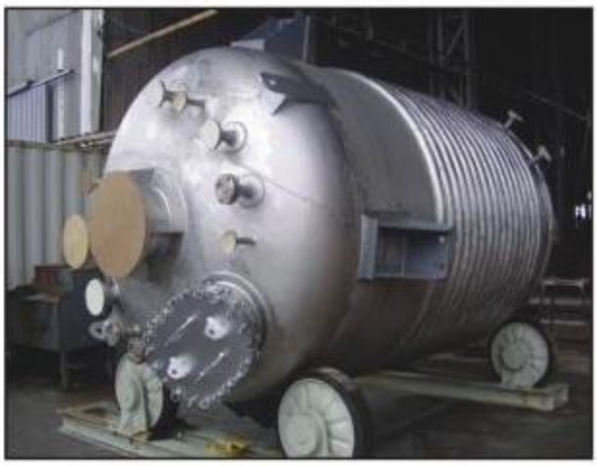
Design:

DDFC's has an in-house capability to design & carry out detailed engineering of individual pieces of equipment / machinery using American, British or German Design Codes and standards on latest CAD techniques. The customers may also supply their own basic or detailed design for manufacturing.

Materials of Construction:

Certified raw materials and components are procured from leading international suppliers, to meet the international standards. These include complete range of Austenitic Stainless Steels, Duplex and Super Duplex Stainless Steels, Incoloys, Hastelloys and other exotic metals.

STAINLESS STEEL & HIGHER ALLOYS FABRICATED EQUIPMENT



Steam Jacketed Vessel Capacity 10,000 Ltr

Customized Product Development:

DDFC's vast experience in customised product development enables it to cater for diversified client needs such as Stainless Steel Reactor Vessels with heating / cooling limpet jackets, Super-Heated Water Autoclaves, Semi Continuous Deodorizers, Distillation Tower, Multi Effect Evaporators, Continuous Pulp digesters, Hygienic Storage and Mixing Tanks / Pans and Kettles, Complete with drives and agitators.

Control Panel for Steam Jacketed Vessel

Energy Recovery Solutions

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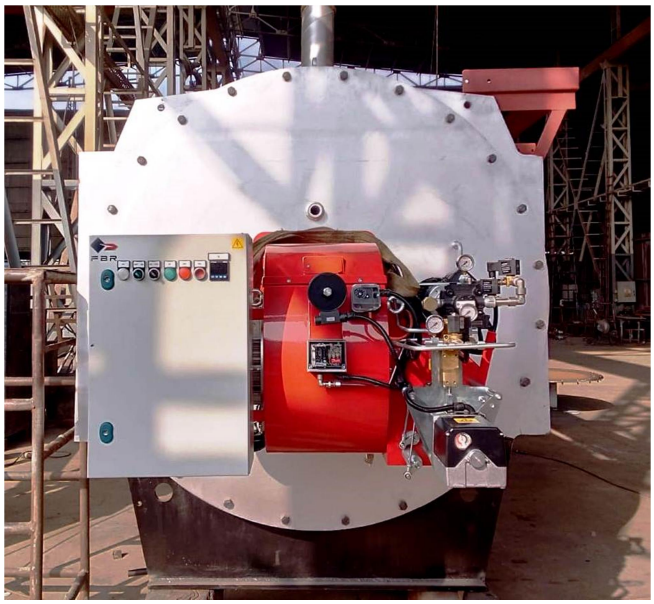
HOT WATER GENERATOR

FIRED HOT WATER GENERATOR 2,200 KW CAPCITY for Shaukat Khanum Karachi



FIRED HOT WATER GENERATOR CAPCITY 288 US GPM @ 5.50 Bar (G)

THE DDFC ADVANTAGE:

DDFC is amongst the leading engineering companies involved on the manufacture of Hot Water Generator (HWGs). Capable of producing hot water with temperatures up to 90'C. The HWG can operations multiple fuels & also on waste heat from flue gases.

HOT WATER GENERATOR BENEFITS

Saving in Fuel

The old practice of producing Hot Water in the industry was to pass steam through water (directly or indirectly) to heat it to the desired temperature. The energy wasted in this method is significant as heat is lost during Heating the water from ambient temperature to 100'C, and then to the required steam temperature & pressure.

Raising the steam temperature and pressure for transmission in plant lines heat transfer through various equipment. The DDFC Hot Water Generator avoids these losses by directly heating the water to the desired temperature. The thermal efficiency is higher & fuel consumption of a HWG is 10% ~20% lower as compared to a steam Boiler of similar capacity, as HWGs are operated at lower pressure and temperature as compared to steam boiler.

HOT WATER GENERATOR

HOT WATER GENERATOR BENEFITS (Continued)

Lower Capital Cost

The capital cost of a HWG is comparatively lesser.

Statutory Requirements for Boiler

Boilers are governed by special laws by the regulatory authorities in Pakistan resulting in the hiring of a specific person to operate and maintain them. These boilers also require several types of approvals and inspections by government agencies. However, the Hot Water Generator avoids these recurring expenditures and downtime.

Saving in Operational Expenditure

Unlike boilers which need to be kept running continuously, the HWG has a very short start up time (20-30 min) and the hot water can be obtained almost instantaneously from it. This results in precious operational expenditure savings.

INNOVATIVE DESIGN AND TECHANICAL SPECIFICATIONS

DDFC offers its HWG which are a proven UK based design as per BS 2790. Waste heat based HWGs can be designed for a single engine or on multiple engines.

CAPACITIES

Standard HWG unit can cover a range of 10-100 cubic meter per hour. However, for special application, customized unit can be built

APPLICATIONS

The HWG is ideally suited for industries like Dyeing, Bleaching, Garments Washing, Tanneries, Dairies, Pharmaceutical, Hotels & Laundries.

TURNKEY SERVICE

DDFC offers complete turnkey service i.e. from conception to commissioning for a complete Hot Water Generator system including detailed engineering of hot water distribution network.

THE DDFC ADVANTAGE

DDFC offers the following advantages to ensure high standards of customer satisfactions:

Warranty:

DDFC Provides warranty against defects of design, material and workmanship for a specified period.

Quality Assurance:

DDFC's quality management system are certified to ISO 9001:2015 by Lioyd's Register of Quality Assurance,the World's most respected institution in this field. It is an assurance to our customers that our quality standards are universally acceptable and at par with the international Standards.

After Sales Services:

DDFC's skilled personnel ensure prompt response to customer needs on 24/7 basis.

Turnkey Services:

DDFC offer complete turnkey services i.e. from concept to commissioning for a complete steam generation system including detailed engineering of steam distribution network.

Proven Track Record:

DDFC is proud to have manufactured, installed and commissioned energy recovery solutions for National and Multinational companies in the following industries.

- Textile
- Power Generation
- Steel
- Chemicals
- Dairy & Food
- Pulp & Paper


Coca-Cola


PPL


ENGRO FOODS


Shaukat Khanum
Memorial Cancer Hospital
and Research Center


FFC


AA


pepsi


BAYER


OIL & GAS DEVELOPMENT COMPANY LIMITED


interloop


DIN GROUP


ACS Textiles Ltd.
our fabric is our price


Fatima
Fertilizer Company Limited


CRESCENT
Bahúmán


Lucky
Energy


LUCKY
CEMENT


Servis


ISL
INTERNATIONAL
STEELS LIMITED
Shaping Tomorrow


Sapphire


GulAhmed


TREET
CORPORATION
LIMITED


JK
Group


Haleeb
Foods


crestex
The Crescent Textile Mills Limited


KOHINOOR
Mills Limited


Nishat Chunian Ltd.


Chenab


Abbott


Herbion
NATURALS


EMPORIUM


NIMIR


M.K. Sons (Pvt.) Ltd.


ICL


MITCHELL'S


Pfizer


JAMAT


FCM
FAZAL CLOTH
MILLS LIMITED


BH


CENTURY PAPER & BOARD MILLS LIMITED


UIL
United Industries Limited


of Companies


MAHMOOD GROUP

ISO 9001: 2015 Certified by LRQA

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