Founded more than 130 years ago and operating in over 100 countries around the world, Cochran are the internationally acknowledged experts in the provision of packaged steam, hot water generation and heat transfer systems, combustion and ancillary technology constructed to meet the most stringent UK, European and international standards. Cochran offers the range and flexibility to deliver solutions that match the application; backed-up by a complete package of technical advice and design and manufacture, from the smallest system through to the planning, management and delivery of the largest turnkey projects.

The total Cochran offering extends to include servicing, spares and planned maintenance solutions, combined with in-depth technical support throughout the long operational life of a Cochran boiler and the ancillary equipment.

Cochran custom designed industrial Water Tube Boilers are suitable for firing on all commercially available oil and gaseous fuels, as well as a range of biomass and biogas fired boilers. Cochran is also able to offer bespoke designs of heat recovery steam generators, Waste Heat Boilers and specialist heat recovery solutions.

Cochran’s wide range of Water Tube Boilers designed for a variety of applications:

- **Fired Boilers (Type A, D and O designs):**
  - Applications include Process Steam, Industrial Process, Refineries and Petrochemical.
- **Waste Heat Boilers:** Recovering heat from diesel engines, gas engines or the waste heat from industrial processes, such as Thermal Oxidisers, Biomass Boilers and CHP.
- **Heat Recovery Steam Generators (HRSG’s):**
  - Installed in co-generation plants recovering heat from Gas Turbines.
- **Specialist Biomass Combustion Systems and Conversions for Fibrous Fuels:**
  - Including bagasse-fired boilers for the sugarcane industry and palm waste.
- **Finned Tube Economisers for both New and Retrofit Boilers.**

www.cochran.co.uk

+44(0) 1461 202 111
## Products, Outputs and Pressures

<table>
<thead>
<tr>
<th>Product</th>
<th>Steam Capacity (tonne per hour)</th>
<th>Fuel Types</th>
<th>Design Pressure (Bar)</th>
<th>Temperatures (ºC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Type Fired Boiler</td>
<td>20-120</td>
<td>Natural Gas, Fuel Oils, Process Gas</td>
<td>Up to 80</td>
<td>Up To 500</td>
</tr>
<tr>
<td>D Type Fired Boiler</td>
<td>20-120</td>
<td>Natural Gas, Fuel Oils, Process Gas</td>
<td>Up to 80</td>
<td>Up To 500</td>
</tr>
<tr>
<td>O Type Fired Boiler</td>
<td>10-60</td>
<td>Natural Gas, Fuel Oils, Process Gas</td>
<td>Up to 80</td>
<td>Up To 500</td>
</tr>
<tr>
<td>Waste Heat Boiler</td>
<td>Designed to suit client requirements</td>
<td>Waste Heat from Process or Engine</td>
<td>Up to 100</td>
<td>Up To 500</td>
</tr>
<tr>
<td>HRSG</td>
<td>Designed to suit client requirements</td>
<td>Waste Gas from Turbine</td>
<td>Up to 100</td>
<td>Up To 500</td>
</tr>
<tr>
<td>Biomass-Fired Boiler</td>
<td>Designed to suit client requirements</td>
<td>Bagasse, Palm waste, Wood or similar</td>
<td>Up to 80</td>
<td>Up To 500</td>
</tr>
</tbody>
</table>

Please Note: The steam outputs, pressures and temperatures above are typical for package boilers. Modular and site-assembled boilers can be designed according to individual requirements.
Type A, D and O Fired Boilers

Type A, D and O Fired Boilers are custom-built to suit a variety of applications and site-specific requirements. Fired boiler systems can be supplied and shipped as packages that are fully shop assembled and factory tested; partially assembled as modular units; or as separate components for site erection. Package boilers can also be delivered insulated or un-insulated.

Automated combustion controls, fuel handling equipment, control panels and choice of burners to suit the fuel at site. Dual fuel burners and low NOx burners available.

Fired boilers can be supplied with a full package of Cochran ancillary equipment, including Valves And Mountings, Water Level Controls, Feed Water Pumps, Manual Or Automatic Soot Blowers, Steam Attemperator/Desuperheater, Deaerator And Storage Vessel, Condensate Tanks, Water Treatment, Blow Down Equipment and Blow Down Vessels.

Features of Cochran’s Type A, D and O Fired Boilers:

- Generate either saturated or superheated steam to drive a steam turbine or for process use.
- Natural circulation design.
- Water-Cooled Furnace from Membrane Wall Tubes.
- The Convection Bank is composed of plain tubes, offering ease of maintenance and cleaning.
- The Outer Wall is formed from Membrane Wall Tubes, providing a gas tight construction.
- Upper Cylindrical Steam Drum with drum internals for separating water from the steam.
- Lower Cylindrical Water Drum(s).
- Observation Ports and Access Doors for Offload Cleaning.
- Cochran Economisers are included in the supply package, ensuring maximum boiler efficiency.
- Boilers can be designed to meet BS, EN, ASME, or a range of other International Boiler Codes.
- Pressure Equipment Directive (PED) and ASME ‘S’ and ‘U’ stamps are provided where required.
Waste Heat Boilers and HRSGs

These custom-designed units recover valuable heat from engines, gas turbines, thermal oxidisers, biomass boilers, and process heat.

Waste heat boilers and HRSG’s can be supplied with a full package of Cochran ancillary equipment, including Valves and Mountings, Water Level Controls, Feed Water Pumps, Manual or Automatic Soot Blowers, Steam Attemperator/Desuperheater, Deaerator and Storage Vessels, Condensate Tanks and Water Treatment, as well as Blow Down Equipment and Blow Down Vessels.

Features of Cochran’s Waste Heat Boilers and HRSGs:

- Thermal fluid or hot water options to match plant requirements for flow, pressure and temperature.
- Generating saturated or superheated steam to drive a Steam Turbine or for process use.
- Natural or forced circulation.
- Can be formatted to a horizontal or vertical layout.
- Radiant section membrane walls fitted where required.
- Convection Bank utilising plain tubes or Extended Surface (finned) Tubes to suit the properties of the waste gas.
- Separate cylindrical Steam Drum with drum internals for separating water from the steam.
- Cochran Economisers are available to ensure maximum boiler efficiency.
- Where steam demand exceeds that available from the exhaust heat, Supplementary or Auxiliary Firing is available as an option using variety of gas, liquid or process fuels.
- Manual or Automatic Soot Blowers available for online cleaning solutions.
- Access doors on the gas and water side for offload cleaning.
- Boilers can be designed to meet BS, EN, ASME or a range of other International Boiler Codes.
- Pressure Equipment Directive (PED) and ASME ‘S’ and ‘U’ stamps available where required.
Biomass Combustion
and conversion of existing systems
to suspension firing

Cochran supplies Dump Grate and Steam Cleaned Static Grate systems for suspension firing of biomass and other fibrous fuels. These systems enable finer and wetter biomass to be combusted compared with conventional firing systems, increasing flexibility and reducing fuel costs. Suspension Fired boilers combine ease maintenance and simplicity of operation with increased efficiency.

Biomass boilers can be supplied with either Extended Surface (finned) Tube Economisers or a Steam Air Heater to improve both efficiency and combustion. Ancillary plant, such as Rotary Drum or Chain Conveyor Feeders, Pulsating Air Dampers and Distributors and Air Fans are also available.

Cochran experts can undertake an on-site boiler plant feasibility study to assess the viability of conversion of an existing boiler to burn Biomass and other Fibrous Fuels.

Pictured above: Bagasse fuel feeder unit.

Cochran Economisers

The use of an Economiser can eliminate or greatly reduce fuel consumption by providing hot water for process services. Cochran design and manufacture highly efficient Economisers. Systems are supplied complete with all the associated equipment required, including Discharge Transition Hood, Safety Valve, Water and Gas Bypass, to raise feed or returns water from a heating system. Cochran systems are either supplied integrated within a complete new boiler package, or can be retrofitted to any make of boiler.

6%+ Fuel Savings with Cochran Economisers

Simply completion of the Cochran Heat Recovery & Economiser survey will enable our experts to determine the level of waste heat recoverable from your plant. Cochran Economisers have been developed to recover the traditionally wasted heat that escapes from a Boiler in exhaust gases, transferring into the incoming Boiler feed water, increasing the overall Boiler Thermal Efficiency by pre-heating the water.

Economisers are normally fitted to Natural Gas-Fired Boilers, though specially designed units may be fitted to Liquid Fuelled Boilers.

Design Features

Cochran manufacture Economisers which increase the thermal efficiency of the Boiler by up to 5.0%. This improved efficiency represents a fuel saving in the order of 6.0%.

Cochran Economisers can be CE marked in accordance with the Pressure Equipment Directive (97/23/EC) and manufactured from Extended Surface Tubing, within a carbon steel casing. Removable covers provide simple access to the tubes, which can easily be removed if necessary.

Different heating surfaces and tube configurations are selected for a variety of fuels from clean natural gas to oil or dirty fuels. The units may be supplied with an integral gas bypass or incorporate a water bypass in the feed pipe work, thus allowing the units to ‘run dry’.

The Economiser Units are ideally arranged for a vertical gas flow, however they may be used with a horizontal gas flow to suit existing site layouts.