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Boiler and Energy Technology
Process Equipment Construction

Combined-Cycle / Cogeneration HRSG
Electricity and Heat from Gas and Oil

Solid Fuel Boiler Plants
Combined-Cycle / Cogeneration HRSG
Waste Heat Recovery Boilers
Process Heat Recovery Systems and Pressure Equipment
Service

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Boiler systems in a modular design with and without secondary firing

Gas turbine boiler systems are the connecting link between gas turbines and steam turbines. Our customised solutions meet highest expectations in terms of operational flexibility and availability of the entire system.

Performance range

Gas turbine performance	5 - 100 Mw_{el}
Flue gas flow	20 - 260 kg/s
Secondary firing	up to 850 °C
Steam parameter	up to 250 t/ h, 560 °C, 150 bar

Fuel firing

Gaseous fuels (natural gas, waste gas, special gases)

Boiler technology

- Natural circulation boiler, single- and multi-pressure systems, reheating
- Vertical flue gas path in top-supported design (preferred)
- Horizontal flue gas path in bottom-supported design
- Live steam temperature regulation with spray attemporators arranged between the superheaters or drum coolers
- Secondary firing via surface or duct burners in a ceramic-lined combustion chamber
- Internal insulation with ceramic fibre modules in areas with flue gas temperatures greater than 400°C

Systems technology

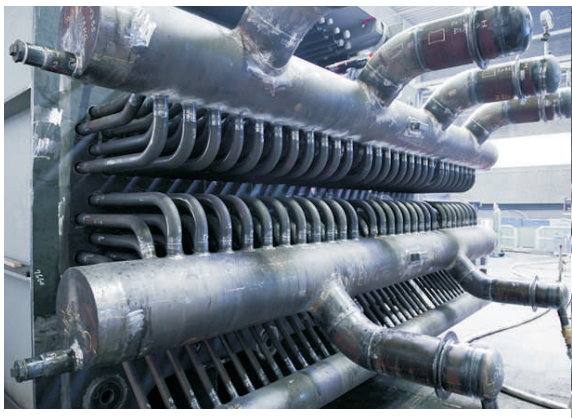
- Bypass system for gas turbines in simple cycle operation
- Connection of several gas turbines with one boiler

Installation concept

- Delivery of prefabricated and pressure-tested heating surface modules for highest manufacturing quality and minimal assembly requirements
- Top-supported structure in a steel construction to facilitate unrestricted expansion

Scope of delivery

- Boiler
- Burner technology
- Feed water system
- Steam turbine connection incl. bypass station
- Process control incl. integration of gas and steam turbine controls
- Electrical system
- Building incl. building services



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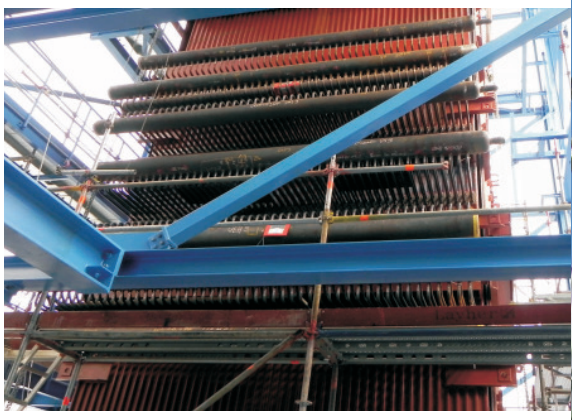
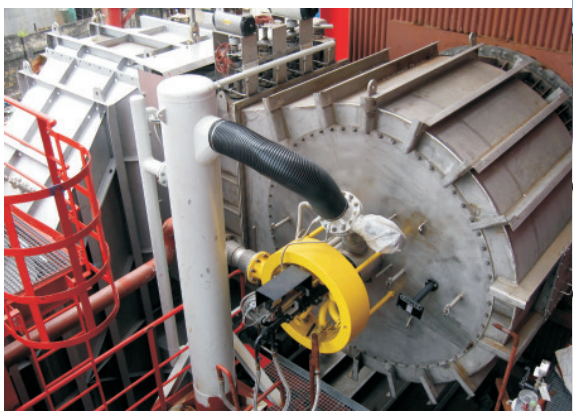
Boiler systems with membrane wall design with optional fresh air operation

To achieve highest operating flexibility with high-performance secondary firing or optionally fresh air operation in case of a gas turbine standstill, it is preferable to use boiler concepts with cooled combustion chambers.





Performance range

Gas turbine performance	5 - 70 MW_{el}
Flue gas flow	20 - 150 kg/s
Secondary firing	up to a residual oxygen level of typically 10%, min 3%
Steam parameter	up to 250 t/h, 560 °C, 150 bar
Fresh air operation	as fully adequate operating mode

Fuel firing
Liquid and gaseous fuels

Boiler technology
- Natural circulation boiler, single- and multi-pressure systems, reheating
- Vertical flue gas path in top-supported design
- Horizontal flue gas path in bottom-supported design
- Live steam temperature regulation with spray attemporators arranged between the superheaters or drum coolers
- Secondary firing or fresh air firing with duct or register burner in cooled combustion chamber
- Suspended heating surfaces via cooled suspension tubes

Systems technology
- Bypass system for gas turbines in simple cycle operation and seamless switch to fresh air operation

Installation concept
- Delivery of prefabricated and pressure-tested heating surface parts for highest manufacturing quality and reduced installation time
- Top- or bottom-supported structure in a steel construction

Scope of delivery
- Boiler
- Burner technology
- Fresh air supply and recirculation systems
- Feed water system
- Steam turbine connection incl. bypass station
- Control system incl. integration of gas and steam turbine controls
- Electrical system
- Building incl. building services

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HRSG (Heat Recovery Steam Generator) downstream 2 x 52 MW_{el} gas turbines

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