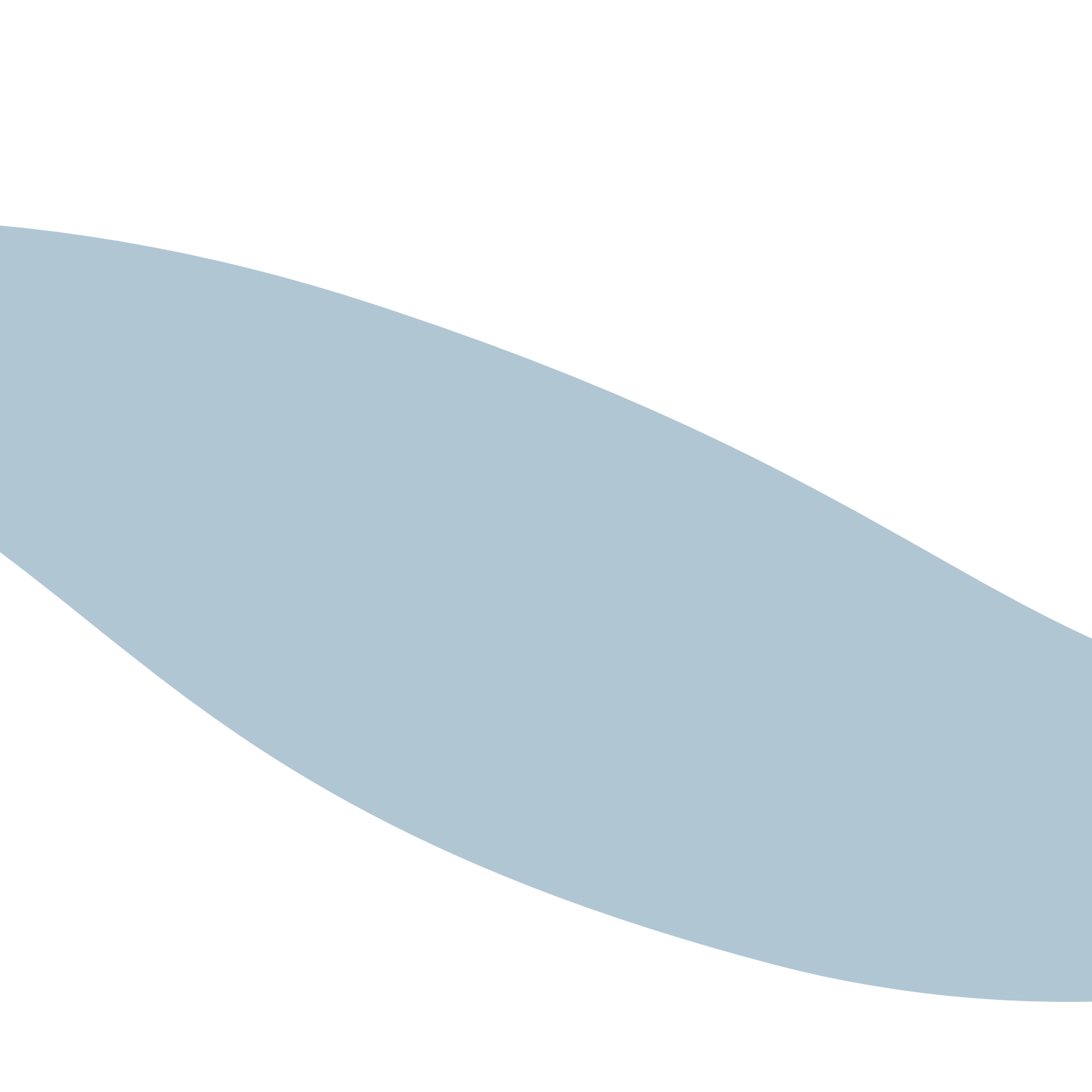


MACCHI

STEAM & POWER GENERATION

a division of **Sofinter**





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MACCHI

in the Energy Evolution

Customized Thermal-Systems for Oil & Gas and Petrochemical Industry Solutions

Today's projects live in an environment of very severe cost, time and environmental limitations.

In the Project planning phases, it is of vital importance to carefully choose the Boilers, one of the most critical and important equipment, of all, in the Oil & Gas and Petrochemical industrial complexes.

In the largest plants, environmentally compliant Continued Cycle Operation Equipment is essential for profitable operations.

MACCHI has provided, provides and will provide certainty with its Future-Ready, Customized Thermal-Systems.

Recognized Steady Performance

- Intensive in-house R&D, as well as at SOFINTER CCA SpA – the largest Combustion R&D European Center – allows for BAT Energy Efficiency & Emissions
- Recognized technological excellence of MACCHI Boilers make them a safer choice for plant's profitability

Customized Engineering Approach

- MACCHI provides customized, integrated boiler and combustion system solutions
- MACCHI Plug & Play deliveries optimize cost and time reduction for the fastest Time-To-Steam-Production

Wide Operation Experience

- After 60 years of experience, we have installed more than 1200 units in over 60 countries
- MACCHI Capabilities are suitable for Very Large Size Projects, proven by a wide track record



No. 4 MVF Industrial Boilers

each rated 363 t/h

42 bara, 355°C

Fuel Gas Firing

INDUSTRIAL BOILERS

For the largest Oil & Gas and Petrochemical Plants

TITAN M

Package Boiler

- Steam capacity up to **300 t/h – 660,000 lb/h**
- Steam op. pressure up to **110 barg – 1,600 psig**
- Steam op. temperature up to **520 °C – 970 °F**
- Gas, Oil & Crude Oil fired



MAIN FEATURES

- Bidrum** type
- Natural** circulation
- Horizontal** gas path
- Bottom** supported

MVF

Vertical Gas Flow Boiler

- Steam capacity up to **500 t/h – 1,100,000 lb/h**
- Steam op. pressure up to **110 barg – 1,600 psig**
- Steam op. temperature up to **520 °C – 970 °F**
- Gas, Oil & Crude Oil fired



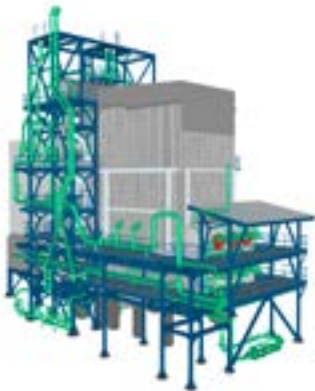
MAIN FEATURES

- Bidrum** type
- Natural** circulation
- Vertical** gas path
- Bottom** supported

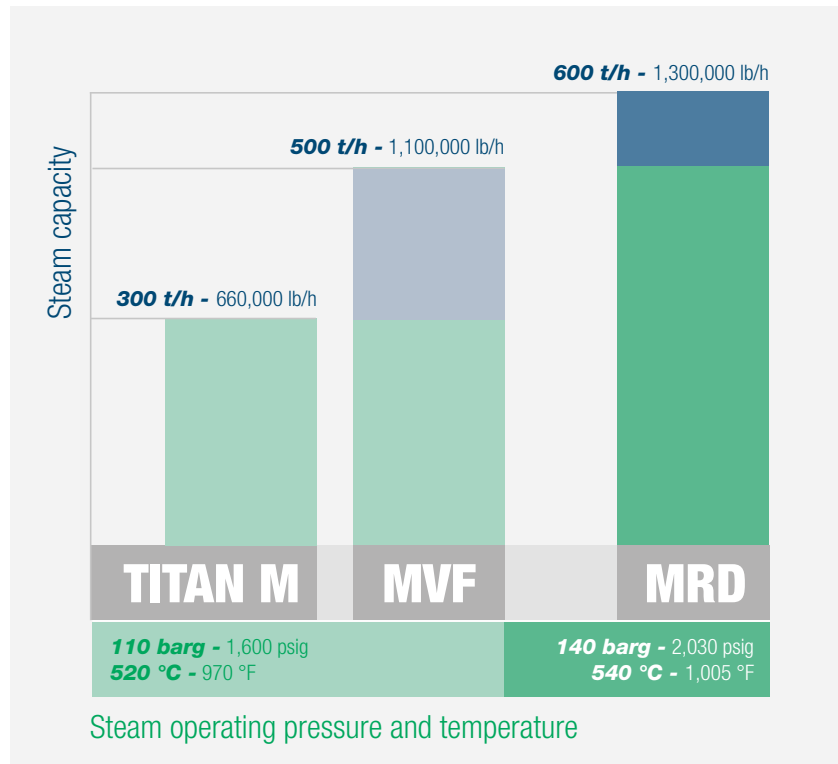
MRD

HHP Radiant Boiler

- Steam capacity up to **600 t/h - 1,300,000 lb/h**
- Steam op. pressure up to **140 barg - 2,030 psig**
- Steam op. temperature up to **540 °C - 1,005 °F**
- Gas, Oil & Crude Oil fired



COMPARATIVE TABLE



MAIN FEATURES

Radiant boiler
Single drum type
Fully-welded

Natural circulation
Vertical gas path
Bottom or **top** supported

HEAT RECOVERY STEAM GENERATORS

For the largest Oil & Gas and Petrochemical Plants

HRSG

Downstream Gas Turbine

- Steam capacity up to **300 t/h – 660,000 lb/h**
- Steam op. pressure up to **140 barg – 2,030 psig**
- Steam op. temperature up to **520 °C – 970 °F**

MAIN FEATURES

Horizontal and **Vertical** design

Natural circulation and **Assisted** circulation

Multiple pressure levels

Supplementary and **Fresh-Air** firing mode
with **Automatic Changeover**

WHB

for Industrial Process
Heat Recovery

- Steam capacity up to **300 t/h – 660,000 lb/h**
- Steam op. pressure up to **140 barg – 2,030 psig**
- Steam op. temperature up to **520 °C – 970 °F**

MAIN FEATURES

Horizontal and **Vertical** design

Natural circulation and **Assisted** circulation



No. 4 HRSG
behind 28 MW GT



**No. 6 TITAN M Boilers,
Plug & Play Delivery**

each rated 173 t/h
65 bara, 460°C
Fuel Oil / Gas Firing

MODULARIZATION

Degree of pre-fabrication

MACCHI provides different modularization solutions based on time, cost and logistic constraints.

MACCHI «Plug & Play» delivery solutions enable a more streamlined site management and coordination thanks to an almost complete pre-assembly and hydro-test of the Boilers.

«Plug & Play» modularization degree grants the following advantages at the Construction site:

- Reduced storage periods / costs
- Decreased traffic and congestion
- Reduced unfavourable weather contingency
- Reduced Erection Costs

OFFSHORE THERMAL SYSTEMS

Steam For Offshore Oil&Gas Production

On demand, MACCHI provides Turn-key Industrial Boilers – firing Gas, Oil and Crude Oil – and Integrated Heat Recovery Modules suitable for Offshore Applications, including:

- Fixed Production Platforms
- Floating Production Storage and Offloading Platforms (FPSO's)
- Floating Liquefied Natural Gas Platforms (FLNG's)



No. 2 HRSG Modules

Direct installation
on existing platform
in North Sea

BOILER SERVICES

SOFINTER Group offers a full range of boiler services, spanning from full Rehabilitations to Spare Parts procurement.

Regulations & Environment

Emission

- Low Emission Burners
- In-Furnace Emission Reduction Systems

Operation

Flexibility

- Fuel Conversions & Multi-Fuel Applications
- Flexible Load & Cycling Mode Adjustments

Availability

- Pressure Part Replacement
- Material Change

Efficiency

- Combustion Optimization
- Efficiency Improvement

Performance

- Restoration to Design Output
- Steam Flow Increase, Boiler Up-Grade

Maintenance

Reliability

- OEM Spare Part Manufacturing
- Spare Part Supply Management

Intervention

- Failure Analysis & Improvement Studies
- Material & Design Modifications

Improvement

- Inspection, Diagnostics & Expertise
- Outage Planning, Repairs, Supervision

Lifecycle

Status Extension

- Equipment Condition Analysis
- Remaining Lifetime Assessment
- Full Rehabilitation Projects

Experience & Expertise

- Supervision of Erection, Commissioning & Start-Up
- Operator Training

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- Countries with Sofinter Installed Units
- Sofinter Headquarters
- Sofinter Companies and Branches

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