



Process Heating



**COMBLOC™**

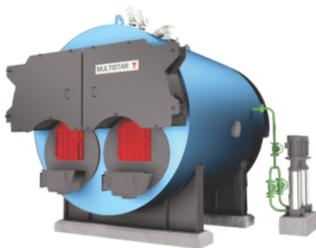
Ultra Compact, High Performance Boiler

# Conserving resources, Preserving the future.

Thermax provides systems and solutions in the critical domains of energy and environment. The products and services developed by Thermax help industries achieve better resource productivity and improved bottom lines, while maintaining a cleaner environment. The company's vision for the future is firmly anchored in the belief that, to stay competitive, business houses need to adopt sustainable practices.

Thermax's product portfolio covers the heating, cooling, water and waste management, and specialty chemicals. The company also designs, builds and commissions large boilers for steam and power generation, turnkey power plants, waste-to-energy systems and air pollution control projects.

## Genesis

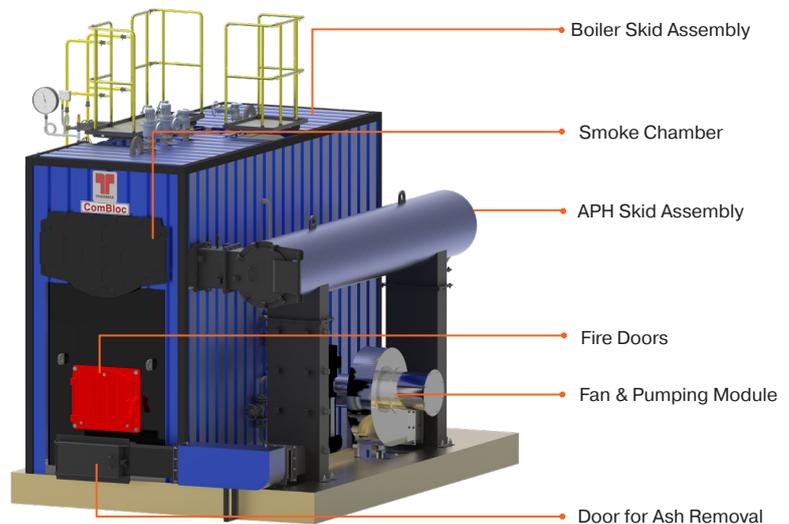


INTEGRAL  
FURNACE BOILER



CONVENTIONAL  
HYBRID BOILER

## COMBLOC™



For decades the two major options for a solid fuel-fired steam boiler were the integrated furnace boiler and the conventional hybrid boiler. This led to a difficult choice between reduced site work yet better response to load of the integrated furnace boiler or the promise of high efficiency & fuel flexibility of the conventional Hybrid boiler. There was a

need of an ideal solution which will support the best of both the designs packaged into one boiler - Thermax made this reality with Combloc which is an amalgam of the best of these two designs. It represents the future of packaged boilers. A multifuel-fired steam boiler which is robust, compact and efficient.

## Unique Design Features

Pre-insulated and factory assembled - up to 80% reduction in site work

Flexibility of fuels (Biomass / Fossil) and combustors

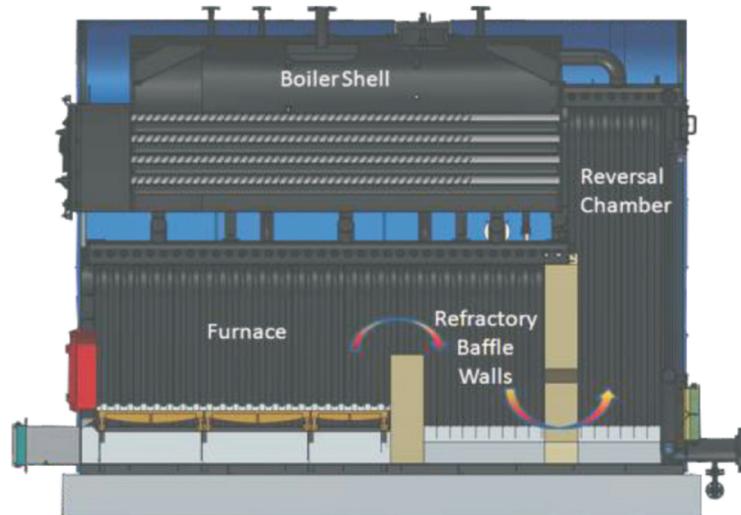
Easy ash removal and better accessibility for maintenance

Multi-pass hybrid construction with high combustion volume-better efficiency

Quick startup and better response to load fluctuations

Compact, skid mounted and modular construction - up to 40% reduction in foot print

## The Internal Arrangement



Ultra Compact	Pre-insulated
Multi Fuel	High Performance
Packaged	Best Aesthetics

## Design Comparison

Parameters	Integral Furnace Boiler	Conventional Hybrid Boiler	ComBloc
<b>Efficiency</b>			
Steam to Fuel Ratio	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★ ★
Combustion Volume	★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Residence time	★ ★	★ ★ ★ ★	★ ★ ★ ★ ★
Less air ingress & radiation losses	★ ★ ★ ★ ★	★ ★	★ ★ ★ ★ ★
<b>Construction / Erection of Boiler</b>			
Lesser foot print	★ ★ ★ ★	★	★ ★ ★ ★ ★
Less Ducting & refractory	★ ★ ★ ★ ★	★ ★	★ ★ ★ ★ ★
Lower Boiler House height	★ ★ ★ ★ ★	★	★ ★ ★ ★
Better Boiler Aesthetics	★ ★ ★	★ ★	★ ★ ★ ★ ★
Modular Construction	★ ★ ★	★	★ ★ ★ ★ ★
Flexibility of combustors	★	★ ★	★ ★ ★ ★ ★
<b>Operation and Maintenance</b>			
Fuel Flexibility	★ ★ ★	★ ★ ★ ★ ★	★ ★ ★ ★ ★
Start up time	★ ★ ★	★ ★ ★	★ ★ ★ ★ ★
Refractory Maintenance	★ ★ ★ ★	★	★ ★ ★ ★
Emission	★ ★	★ ★ ★	★ ★ ★ ★

## COMBLOC™ with different combustors

### Stationary Grate

- Robust triplex grate combustor for high reliability
- Higher grate area with better combustion volume
- Large fire doors for easy fuel charging
- Better accessibility to boiler internals

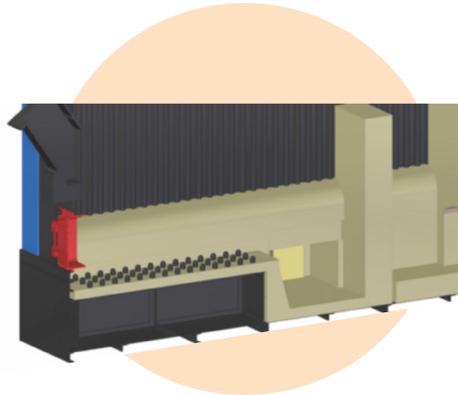


### Fuel and Efficiency

- Indian Coal 83% n
- Woodlogs 83% n
- Briquettes 82% n

### Bubbling Bed

- Automatic fuel feeding
- Unique nozzle design using CFD
- Refractory baffle walls to ensure less carryover of fuel
- Turbulent combustion and high furnace volume ensure combustion efficiency



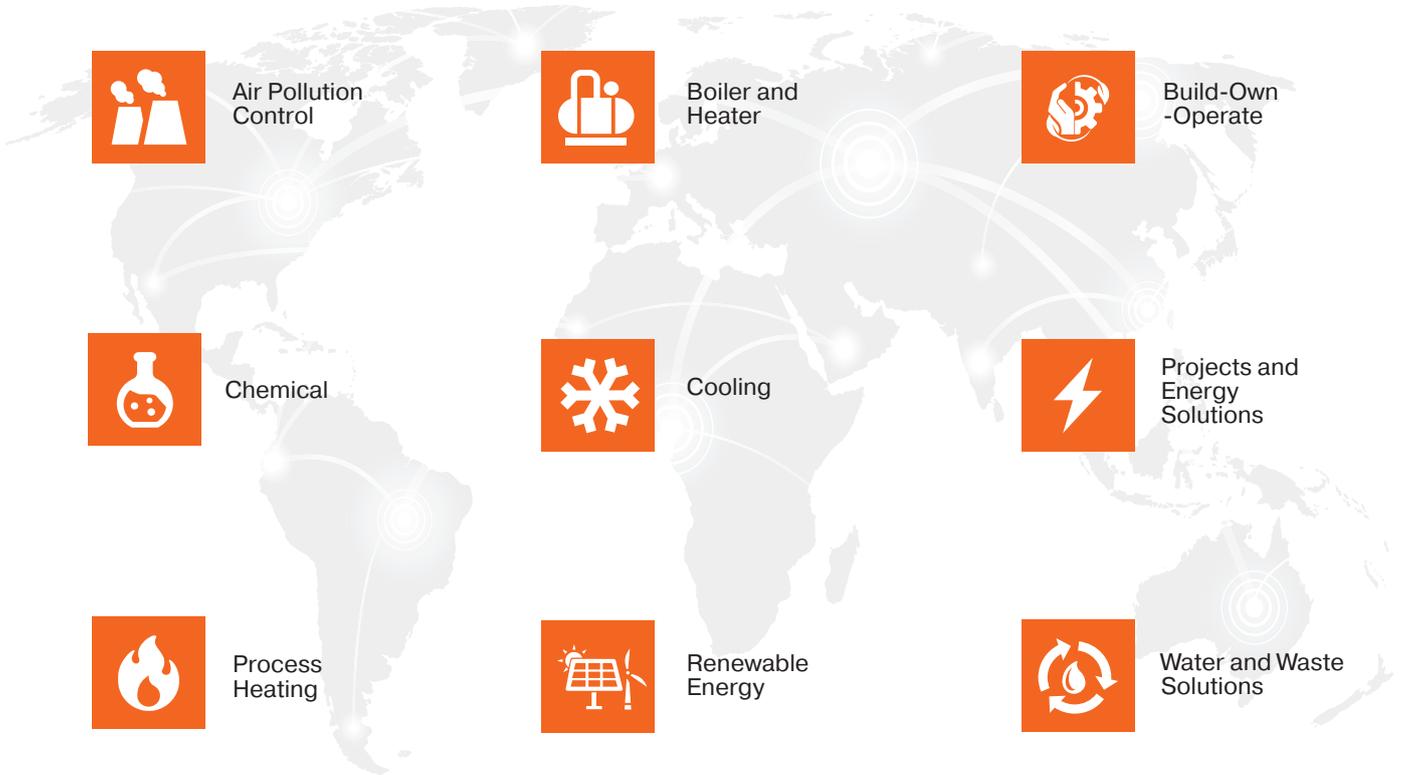
### Fuel and Efficiency

- Rice Husk 83% n
- Imported Coal 85% n
- Woodchips 84% n
- Pellets 84% n
- Petcoke 80% n

## Technical Specifications

Description	Unit	CB 15	CB 20	CB 30	CB 40	CB 50	CB 60
Boiler type		Horizontal Multitubular Shell Type Smoke Tube With Water Wall Furnace					
Max steam output ( F & A 100°C )	kg/hr	1500	2000	3000	4000	5000	6000
Out let steam condition							
Design Pressure (SVLOP )	kg/cm <sup>2</sup> (g)	10.54 / 17.50					
Temperature	°C	185 / 208					
Dryness		98%					
<b>Overall Size of the Boiler with HRU</b>							
<b>Stationary Grate / Bubbling Bed</b>							
Length (L)	m	5.20	5.20	5.65	6.10	6.40	6.40
Width (W)	m	3.52	3.70	4.10	4.31	4.60	4.80
Height (H)	m	4.43	4.56	4.70	4.85	5.12	5.25
Dry Weight - Boiler skid assembly	kg	8750	9790	11980	14100	17120	18975
<b>Electrical connected load with MDC</b>							
Stationary Grate	kW	12.5 / 13.0	15.5 / 16.0	18.0 / 20.5	23.5 / 26.0	28.0 / 31.5	33.0 / 37.0
Bubbling Bed	kW	19.0 / 20.0	23.0 / 23.5	27.0 / 29.5	37.0 / 39.5	41.5 / 45.0	48.5 / 52.0
<b>Electrical connected load with Cyclomax / Bag Filter</b>							
Stationary Grate	kW	14.0 / 15.0	18.5 / 19.5	25.5 / 28.0	31.0 / 33.5	39.5 / 43.0	41.0 / 45.0
Bubbling Bed	kW	21.0 / 21.5	26.0 / 27.0	34.5 / 37.0	44.5 / 47.0	53.0 / 56.5	56.5 / 60.0

Conserving Resources,  
Preserving the Future.



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