

Bagasse & Biomass Fired Boilers



Thermax Babcock & Energy Solutions

Sustainable Solutions in Energy & Environment

Thermax is an engineering company that helps business enterprises perform competitively and sustainably in global markets. In over 75 countries, clients make use of Thermax’s products and solutions for energy efficient and eco-friendly operations: heating equipment and power plants that use a wide variety of fuels including solar energy; absorption chillers that use heat in place of electricity; waste heat recovery units; water & waste water management, air pollution control systems; performance improving chemicals.

The company provides its customers value added services – audits of energy and water, system modifications for optimal use of resources, annual maintenance contracts, energy rentals and O&M of power and water installations.

Thermax operations are supported by innovative R&D and partnerships with global technology majors. It has an international sales & service network spread over 24 countries and state-of-the-art facilities (in India, Denmark and China) that manufacture to international standards.

Thermax Babcock & Energy Solutions (TBWES))

TBWES's Boiler & Heater provides equipment and complete solutions for generating steam for process and power needs through combustion of various solid, liquid and gaseous fuels, as well as through heat recovery from turbine/engine exhaust and (waste) heat recovery from industrial processes. TBWES also offers heaters for various applications in the Chemical, Petrochemical and Refinery

segments. Its services arm offers renovation and modernization solutions for old boilers and heaters.

The major industry segments served in India and across the world are Steel, Refinery, Petrochemical, Power, Cement, Sugar, Distillery, Fertilizer, Paper, Chemical, Non Ferrous Metal and Textile.

300+
Bagasse &
Biomass
Fired Boilers

2400+
Boilers &
Heaters
across 75
countries



Groundnut Shell



Rice Straw



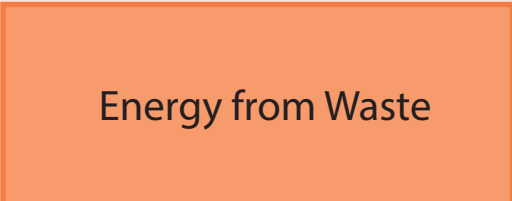
Corn Cobs



Palm Kernel Shell



King Grass



Energy from Waste



Wood Chips



Cotton Stalk



Sugarcane-Leaves



Rice Husk



Red Gram Stem



1 unit of 140 TPH, 82 kg/cm²(g), 520°C bagasse, coal, king grass fired travelling grate boiler

Bagasse & Biomass Fired Boilers

TBWES has always been responsive to the energy needs of industry and to the ever-changing economic and environmental factors governing those needs. Current trends and future outlook highlight the need for utilising the vast untapped energy potential of agrowastes and biomass.

The biomass boiler is the equipment required to improve profitability through maximum utilisation of solid agrowastes generated in your plant or available in nearby areas. Over 300 plants in India and abroad meet their process steam and electric power requirements through biomass fired boilers supplied by TBWES

Flexible design - a variety of options

- Capacity upto 300 TPH, Pressure upto 160 kg/cm²(g) and temperature upto 560°C
- Travelling Grate, Dumping Grate, Pinhole Grate, Pusher Grate or Hopper Bottom (fluid bed)
- Membrane wall / tube and tile construction
- Indoor and outdoor installation
- Auto controls or remote - manual control option
- **Multifuel firing capability** - Includes bagasse, husk, straw, coffee grounds, cane tops, coconut shells, lignite, coal, pith, wood chips, oil, gas etc.

Higher overall efficiency

- Optimum design & selection of auxiliary equipment to ensure the highest operational efficiency and availability of the plant
- High efficiency steam separators ensure steam purity
- Variable speed fuel feeder allows fine control of feed
- Modulating cyclomotor to ensure even distribution of fuel

Membrane panel furnace design

- Machine welded membrane wall furnace forms a gas tight enclosure preventing ingress of unwanted excess air
- Requires no refractory in furnace walls and eliminates associated maintenance
- Results in quicker boiler commissioning due to reduced site welding, simplified handling / erection

Tall furnace for complete combustion

- Tall furnace increases residence time of flue gases, allowing fuel to burn completely before the gases enter the superheater zone
- High pressure, deep penetration secondary air jets are strategically located at multiple levels on furnace walls, ensuring proper turbulence and good mixing of volatiles with air and complete combustion



1 unit of 170 TPH, 31 Kg/cm²(g), 480°C, bagasse fired travelling grate boiler

Technical Features

- Travelling Grate front and rear air seals automatically keep excess air to a minimum within the furnace. These front and rear seals are ruggedly constructed for long service and are automatically self-adjusting to maintain continuous close sealing contact.
- The curvature design of the grates keeps the grates closed without the aid of auxiliary weights, when making the turn around the sprockets. No gaps appear between the grates, thereby directing all foreign materials into the ash pit and not into the drive shaft mechanism.
- Design is such that any grate section can be replaced without taking the stoker out of service. Simply remove a single bolt, nut & washer and slide the grate off the carrier bar.
- To reduce maintenance costs, grate surface is made in short sections (230 mm to 300 mm long) of best quality, heavy duty, heat-resisting cast iron alloy with uniformly spaced, tapered, self-cleaning air-metering openings, and with close fitting overlapping edges to prevent air leakage at the joints.
- Planetary gear drive with VFD Benefits:
 - Higher transmission efficiency
 - Compact arrangement
 - Design for heavy duty loads
 - Finer speed control through VFD
 - 10:1 turndown
 - Troublefree operation
- The hydraulic grate drive can also be provided as an option in place of Planetary gear drive with VFD.





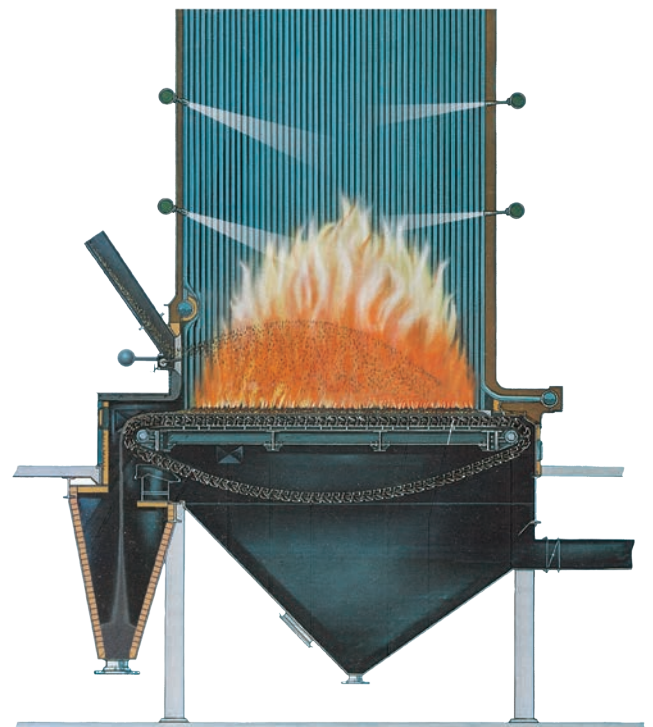
1 unit of 170 TPH, 108 kg/cm²(g), 540°C bagasse and biomass fired travelling grate boiler

Travelling Grate Boilers

Salient Features

Travelling Grate ensures uninterrupted combustion

- Continuous ash discharge system avoids dependence on operator's judgement
- Grate speed can be varied continuously in range 0-12 m/hr.(0-45ft / hr)
- Overlapping grate design prevents air leakages
- Maintenance of grate can be carried out without shutting down the boiler
- An overfire air system provides turbulence and thorough mixing of the volatile gases, thus assuring complete combustion
- All other advantages of suspension burning are ensured
- Dumping Grate can be offered in place of travelling grate on request



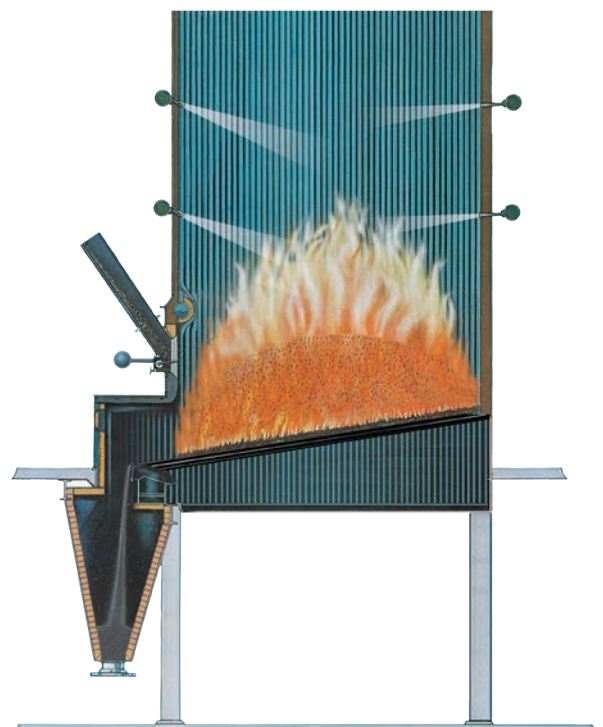


1 unit of 100 TPH, 45 Kg/cm²(g), 425°C bagasse fired pinhole grate boiler

Pinhole Grate Boilers

Salient Features

- Stationary inclined water cooled grate design with no moving parts for avoiding any mechanical failures and reducing maintenance in the furnace
- Steam nozzles for simplified on-line ash removal from the grate without drop in boiler pressure. Also agitation of fuel occurs which results in reduction in unburnt carbon loss
- An economical and viable option for high capacity boilers
- Combustor can accept air of temperature upto 250°C thus resulting in smooth combustion of fuel
- Inherently capable of burning high-moisture bagasse
- An overfire air system provides turbulence and thorough mixing of the volatile gases, thus assuring complete combustion
- Adequate number of feeders for uniform fuel distribution
- All other advantages of suspension burning are ensured



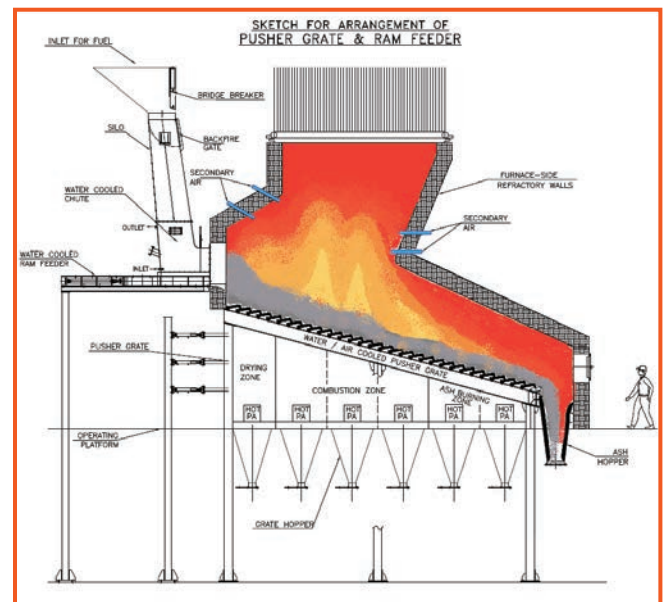


1 unit of 55 TPH, 66 kg/cm²(g), 485°C RDF and biomass fired pusher grate boiler

Pusher Grate Boilers

Salient Features

- Pusher grate is suitable for low quality fuels having high moisture content, low GCV, inconsistent fuel size with very large particle. This design is suitable for municipal solid waste, high moisture agricultural and industrial waste- palm fiber, empty fruit bunches, stalk fuel having high moisture content.
- Hydraulically operated water cooled ram feeder maintains continuous waste feeding.
- Refractory combustor sustains combustion of low calorie waste fuel.
- Furnace and convection zone design suitable for high fouling fuel.
- Water cooling for grate sections can be offered for specific fuels.
- Effective transportation and mixing of fuel as it burns on the grate.
- Air plenum is divided in multiple sections along length, enables independent control of air flow to each section as per combustion requirement.
- Larger grate width with modular construction
- Fully machined grate bars ensure proper clearances for thermal expansion, movement and air flow area.
- Special alloy castings for corrosion resistance and longer wear life.





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Thermax Business Portfolio

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- Solar
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