



**B.S. ENGINEERING MACHINERY PVT. LTD.**



**Thermic Fluid Heater**

# Thermic Fluid Heater

## Model Details: BS Max Therm Thermic Fluid Heater Five Pass (MXT Series)

New MXT series with 5 Pass Thermic fluid heater is designed to cater to the heat requirement of the Process Industries where consistent temperature with Fuel Efficiency is utmost requirement.

Suitability for multiple operation accessibility to the heat surface area and simple provision for ash removal makes MXT an ideal and attractive choice to the industries such as Textiles, Edible Oil Plants, Laminates, Plywood, Foods etc.

The MXT TF System is a forced circulation, Semi Automatic Thermic Fluid Heater. The thermic fluid is circulated in a closed loop through heater and user equipment where the heat is dissipated through process. The same thermic fluid is re-circulated through heater for reheating. The separate expansion and de-aerator tanks ensure a pressure less and vapour free system.

The Thermic fluid heater gives high temperature upto 300°C using thermic fluids at near atmospheric pressure as compared to steam heating which requires 85 kg/cm<sup>2</sup> pressure. Thus expensive high pressure pipelines and fittings and condensate return system is eliminated.

### Radiant Heater Exchanger (3RE)

2 sets of helical tube coil & roof coil manufactured from Boiler tubes of adequate thickness ensuring longer life of heater.

Heavy duty M.S. Shell with adequate insulation & cladding which keeps the heat loss at minimum.

Connecting Duct : between two heat exchanger is provided with expansion bellow & do not require any refractories due to lower flue gas temperature.

### Convective Heater Exchanger (2CE)

2 sets of multistat helical tube coils ensure two passes of flue gas, heavy duty MS shell with adequate insulation & cladding keeps heat losses to minimum.

Dust Collector provided at bottom which can be easily opened on hinge for heater cleaning.

### The External Furnace

- MXT - BSTFH - (SFB) introduce larger combustion chamber volume and larger grate area for maximum combustion efficiency & fuel flexibility.
- Combination of FD Fan, High Pressure ID Fan with High Capacity APH ensures complete combustion of low grade fuels through specialized Fire Bar Furnace Bed.
- Furnace with heavy duty steel structure & casing lined with high quality fire & insulation bricks and Baffle Wall ensure longer Furnace and Radiant Coil life.

## Salient Features THE HEAT EXCHANGER

- Unique 5 Pass Thermic fluid heater comprises of 2 sets of heat exchanger (3 Pass + 2 Pass)
- Larger heat transfer surface,adequate flue gas pass & velocity gives increased heat transfer efficiency.
- Higher thermic fluid flow rates through the heater coils improves the life of the coil and thermic fluid heater to a great extent.
- Semi Fluidised Bed Furnace with Baffle wall to protect coil from direct heat & increasing coil life.
- Multiple ash collecting device at secondary heat exchanger, APH, MDC to collect almost all fly ash which can be removed during operation with great ease & thus provides:
  - Consistent efficiency & output
  - No choking of flue gas passes and hence reduced down time for cleaning.
  - No back firing due to choked flue gas passes
- Digital electronic indicator cum controller for forward temperature for ID fan cut off.
- Digital electronic indicator cum controller for return temperature for ID fan cut off.
- Electronic slack temperature safety shuts off the unit in case of abnormally high temperature.
- Low level switch controller in expansion / deaerator tank shuts off the unit in case of low thermic fluid level in tank.
- Differential pressure switch shuts off unit in case of abnormal thermic fluid flow conditions.
- Pressure gauge for pump pressure measurement.
- Audio visual alarm for abnormal operation conditions.
- Diesel engine for thermic : fluid circulation for standby (optional).
- Suitable for Multi-fuel - Coal,Rice Husk,Wood Chips,Palm Shell, Bagasse,Lignite,Ground Nut Shell,Saw Dust,Pet Coke,Rice Straw, Coconut Shell,Coffee Husk,Oil & Gas.
- 5 Pass design results in low stack temperature of flue gas.

### Thermic Fluid Heater (3+2 = 5 Pass) Vertical

Capacity	Model No.
1000000 Kcal	BSTFH - (SFB) -1000
1200000 Kcal	BSTFH - (SFB) -1200
1500000 Kcal	BSTFH - (SFB) -1500
2000000 Kcal	BSTFH - (SFB) -2000
3000000 Kcal	BSTFH - (SFB) -3000

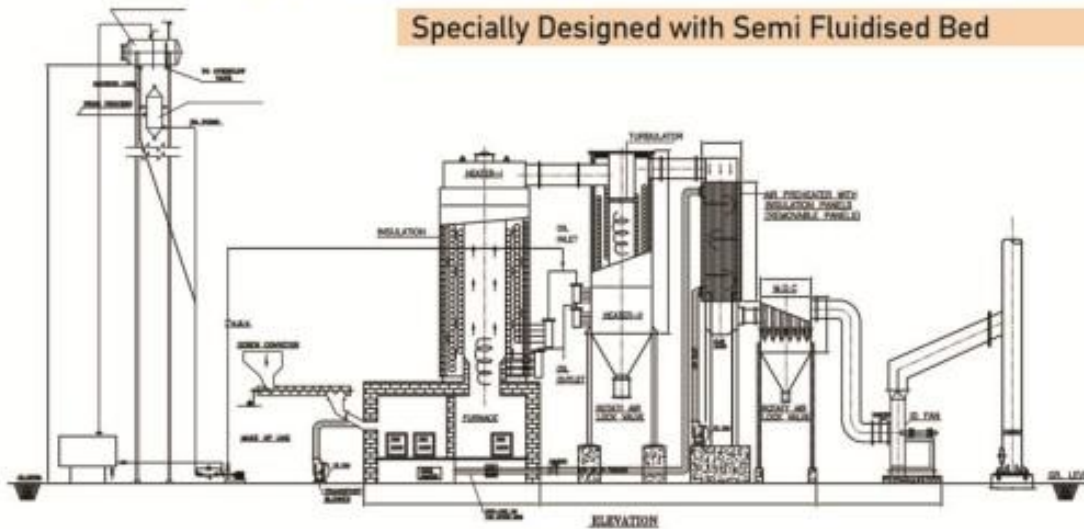
### Thermic Fluid Heater 3 Pass Horizontal / Vertical

Capacity	Model No.
400000 Kcal	BSTFH - 1000
600000 Kcal	BSTFH - 1200
800000 Kcal	BSTFH - 1500
1000000 Kcal	BSTFH - 2000
1500000 Kcal	BSTFH - 3000

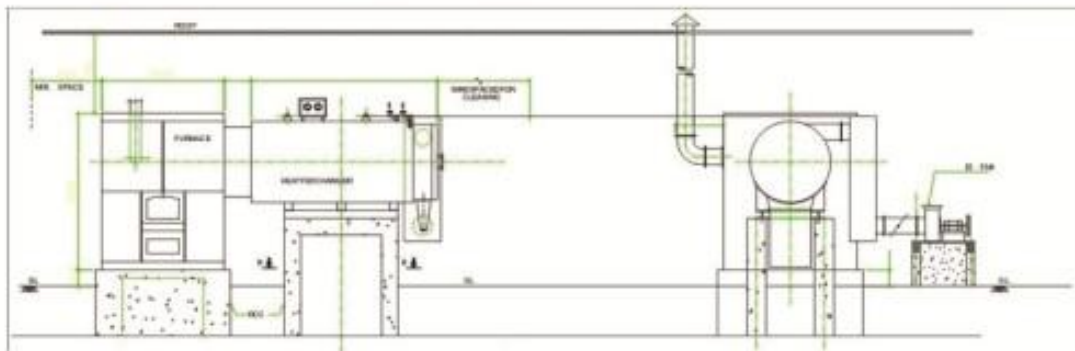


# Thermic Fluid Heater Vertical (3+2) = 5 Pass

Specially Designed with Semi Fluidised Bed



# Thermic Fluid Heater Horizontal / Vertical 3 Pass



Specialized Fire Bar For Semi-Fluidized Bed



Furnace Brick Work At Coil Bottom



Double Pump Circuit System



Panel Board

## TECHNICAL COMPARISON

BETWEEN 4 PASS DESIGN OF OTHERS & 5 PASS DESIGN OF ISOTEX MAKE FOR SOLID FUEL FIRED THERMIC FLUID HEATERS

3 Pass (THERMAX / Thermotech/ Alfa Entech / Others)	5 Pass (BS Engg Corporation)
Design and construction:-	Design and construction:-
<p>One radiant heater single coil which forms combustion chamber through which 1<sup>st</sup> pass of flue gas passes.</p> <p>1] The distance between fuel bed and coil is less, hence chances of flame impingement on coil which destroys thermic fluid &amp; reduce life of coil. Flue gas temperature entering connecting duct is almost 800°C -700°C and so the interconnecting duct is to be lined with refractory material.</p> <p>2] Large Coil diameter of Radiant Coil results in poor and uneven heat flux.</p> <p>3] Only 40% of the tube coil surface area is used in heat transfer to the Radiant Coil. The out side of the coil is not in contact with flue gases. (hence the heat transfer area given by manufacturers is not correct) actually only 40% is to be considered.</p> <p>4] No outer shell provided on the coil &amp; coil is directly insulated. Hence higher heat losses from tube coil surface.</p> <p>5] Connecting duct is having two 90 sharp bends at inlet &amp; outlet of hot gases which increases pressure drop.</p> <p>6] Convection coil manufactured from two helical coils &amp; outer shell, which form three passes of hot flue gases.</p> <p>7] Refractory lined chamber with ash door is required on which the Convective coil is mounted. Refractory brick work and structure to be manufactured at site. (normally not provided by manufacturers) for cleaning access can be made in to this chamber only when heater is shut down.</p>	<p>One radiant &amp; convection heater which is formed by set of 2 nos helical coils &amp; outer shell to form three passes of flue gases. (The dust collectors are provided after 2<sup>nd</sup> pass to automatically collect fly ash), which can be removed even when unit is under running condition.</p> <p>1] The hot flue at temperature approx. 350°C 370°C is transferred to 2<sup>nd</sup> coil. Short connecting duct is insulated from outside. No refractory required in duct.</p> <p>2] The distance between heater coil &amp; fuel bed is higher. Also special tangential secondary air is provided which create turbulence &amp; cyclonic effect of flue gases, and results in uniform, &amp; higher heat transfer rate.</p> <p>3] Both the sides of each tube coil are in contact with flue gases.</p> <p>4] Outer shell is provided on both radiant and convective coils.</p> <p>5] The connecting duct is shorter &amp; temperature is less than 370°C. No 90 sharp bends are provided hence less pressure drop for hot flue gases.</p> <p>6] Convection Coil is manufactured from two sets of helical coils through which two passes of flue gases are allowed to absorb convection heat &amp; to reduce stack temperature to below 230°C</p> <p>7] Rotary air lock valve may be provided at the bottom of convective coil which automatically removes ash without the shut down of heater operation. No refractory material used in heater II &amp; no work is required to be done at site.</p>



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