

# Deltatherm

**Solid Fuel Fired Thermal Oil Heaters**

A 3D CAD-style rendering of industrial machinery, including a large vertical cylindrical tank with a walkway, various pipes, and smaller units on a grid floor.

**EXPERIENCE  
IN BURNING MORE THAN  
100 FUELS**



COAL

DE-OILED  
CAKE

HUSK

PALM KERNEL  
SHELLS

BAGASSE

SAW  
DUST

COCONUT  
SHELLS

## Concept to Completion

Increasingly companies worldwide are in agreement that being energy efficient and eco-friendly makes good business sense. At Thermax we help companies achieve both aims, energy optimisation & a green outlook- the best of both worlds.

For the past two decades Thermax has been developing combustion technologies for boilers and heaters suitable for agro-wastes/biomass fuels. Thermax has experience of using over 100 biomass fuels, in various capacity boilers & heaters and has commissioned more than 20,000 boilers & heaters in various capacities. Today with the experience of burning such a vast variety of fuels, we proudly say-

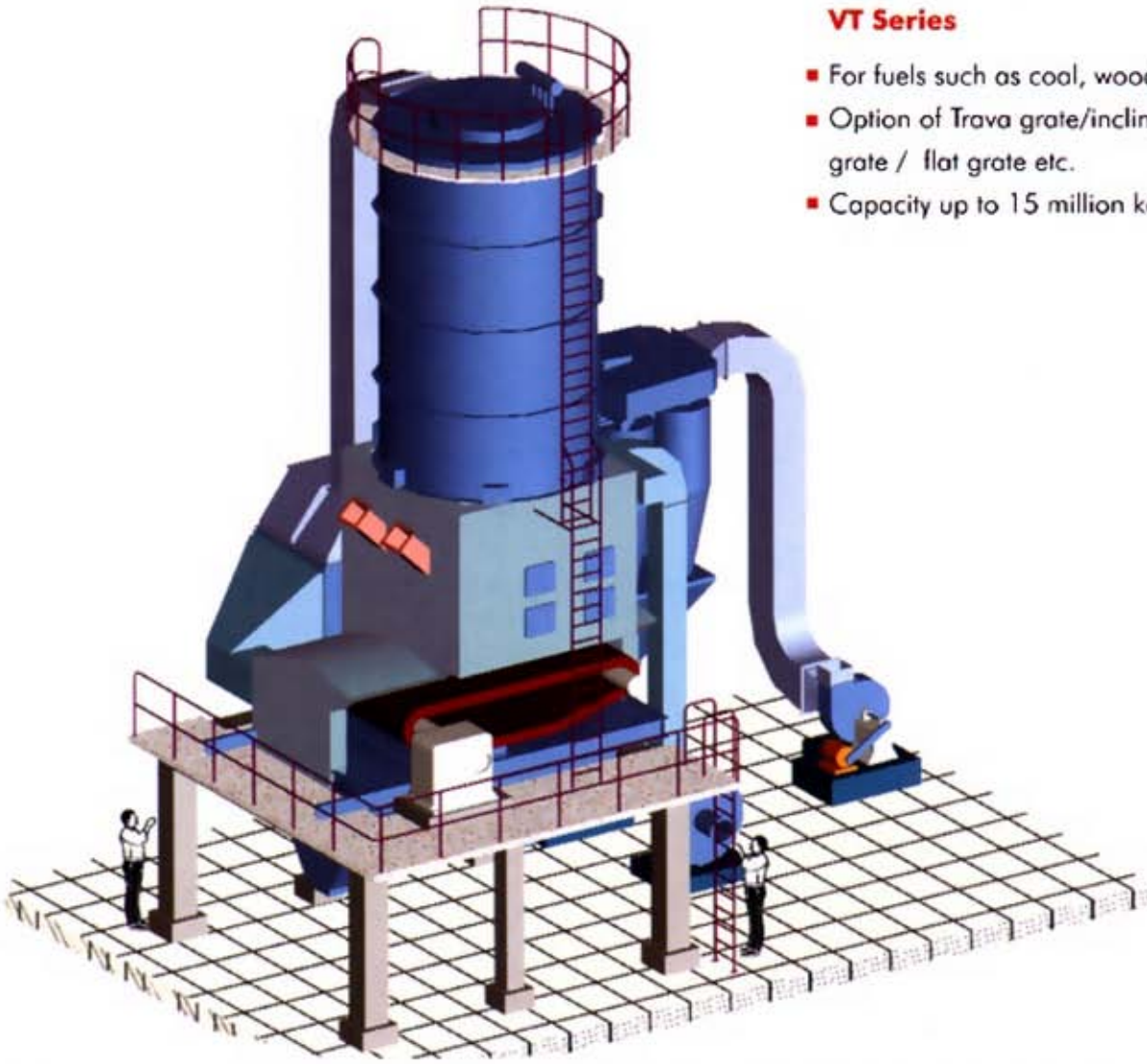
YOU NAME IT, WE BURN IT.

Thermax is uniquely positioned to understand customer heating requirements with its vast process heating knowledge, design & develop specific total heating solutions under a single window, manage projects from concept to commissioning and extend beyond to offer various services which includes Operation & Maintenance Services, Fuel supply, Revamp & Retrofits etc.

# Biomass / Solid Fuel Fired Thermal Oil Heater

## VT Series

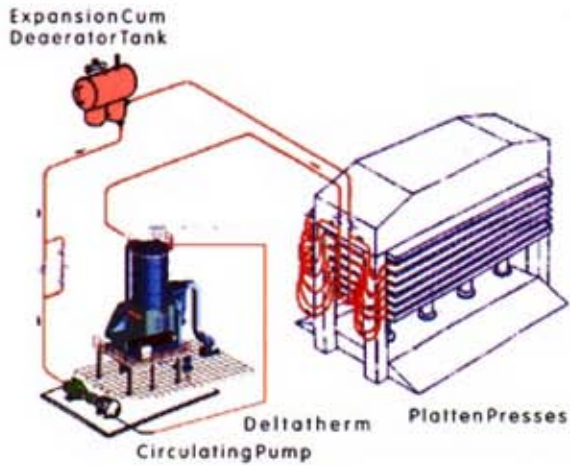
- For fuels such as coal, wood, sawdust, bagasse, etc.
- Option of Trava grate/inclined water cooled grate / flat grate etc.
- Capacity up to 15 million kcal/hr



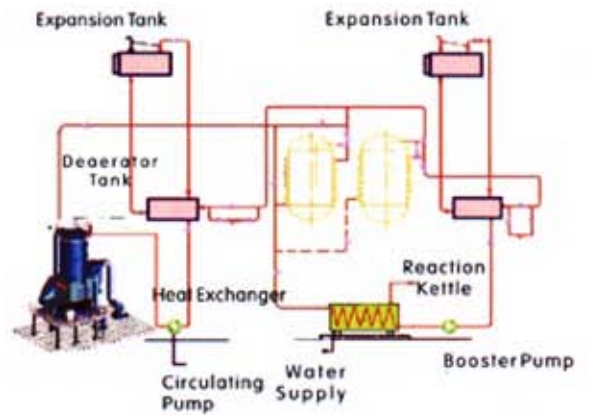
## Annual Savings with Solid Fuel Deltatherm

| Operating cost comparison for Furnace Oil Fired Heater v/s Wood Fired Heater |             | Sample Calculation            |                                     |
|--|-------------|-------------------------------|-------------------------------------|
|  |             | Wood Fired Thermal Oil Heater | Oil fired Thermal Oil Heater/boiler |
| Parameter  |             | Option I                      | Option II                           |
| Fuel   |             | WOOD                          | OIL                                 |
| Fuel calorific value   | kcal/kg     | 3500                          | 9650                                |
| Capacity of Thermal Oil heater   | kcal/hr     | 1,000,000                     | 1,000,000                           |
| Efficiency of Heater   | %           | 70%                           | 88%                                 |
| Fuel Consumptions  | kg/hr       | 408                           | 118                                 |
| Storage and handling losses for fuel   | %           | 15%                           | 1%                                  |
| Nos. of operators for handling the fuel & Heater operation                   |             | 2                             | Nil                                 |
| Average fuel cost  | US\$/MT     | 40                            | 400                                 |
| Electricity cost   | US\$/kW     | 0.1                           | 0.1                                 |
| Manpower cost  | US\$/Day    | 10                            |                                     |
| Fuel cost /hr  | US\$/hr     | 16.33                         | 47                                  |
| Additional electricity incase of wood fired heater                           | US\$/hr     | 3                             | Nil                                 |
| Manpower cost  | US\$/hr     | 2                             | Nil                                 |
| Total hourly operating cost  | US\$        | 22                            | 47                                  |
| Annual operating cost (7200 Hrs running time)                                | US\$        | 157151                        | 339143                              |
| Other expenses like handling and maintenance etc per year                    | US\$        | 10000                         | 1500                                |
| Total yearly expenses  | US\$        | 167151                        | 340643                              |
| <b>Savings per year with wood firing</b>                                     | <b>US\$</b> | <b>173492</b>                 |                                     |

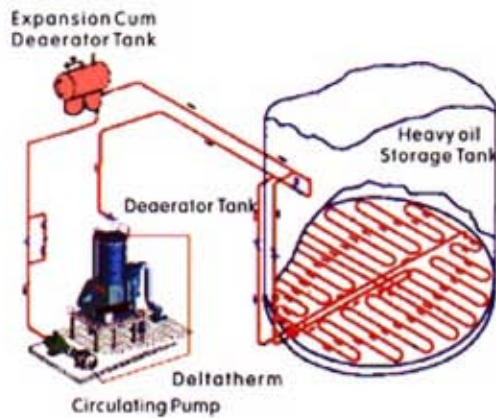
# Applications



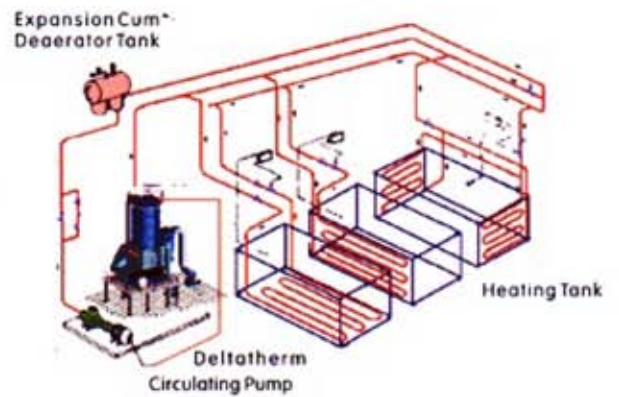
**HEATING OF PLATTEN PRESSES**  
Industry - Rubber Plywood



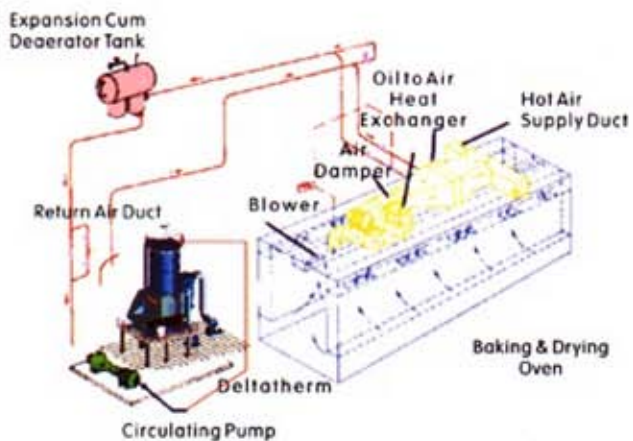
**HEATING & COOLING OF REACTION KETTLES**  
Industry - Chemical



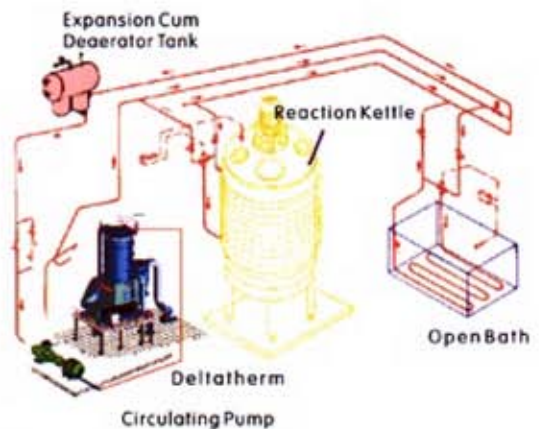
**HEATING OF STORAGE TANK**  
Industry - Edible Oil/Crude Oil



**METAL PRE-TREATMENT HEATING SYSTEM**  
Industry - Automobile



**HEATING OF BAKING & DRYING OVEN**  
Industry - Food

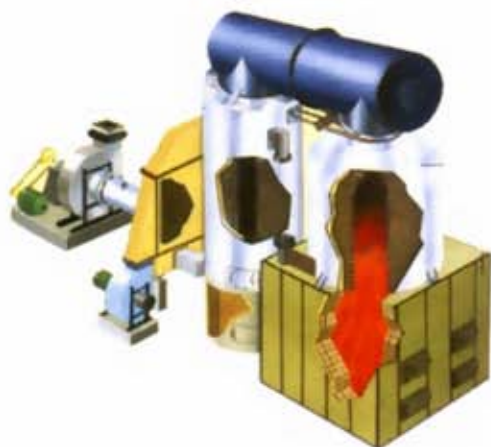


**MULTIPLE APPLICATIONS OF HEATING**  
Industry - Textile

## List of Solid Fuels experienced & used by Thermax

|                              |                           |                                |                                 |                             |
|------------------------------|---------------------------|--------------------------------|---------------------------------|-----------------------------|
| 1. Ajmoth Husk De Oiled Cake | 29. Coconut Shell         | 57. Kardi Husk                 | 85. Palm Kernal Doc             | 113. Soyabean Waste         |
| 2. Ayween Husk De Oiled Cake | 30. Coffee Husk           | 58. Katha Waste                | 86. Paper Sludge                | 114. Spent Compost          |
| 3. Almond Hulls              | 31. Coffee Shells         | 59. Kerosene                   | 87. Peat                        | 115. Spent Grain            |
| 4. Bagasse Pellets           | 32. Coffee Waste          | 60. Kutch Lignite              | 88. Pepper Waste                | 116. Spent Wash             |
| 5. Bagasse Pith              | 33. Corex Sludge          | 61. LDO                        | 89. Petcake                     | 117. Spent Wash (Dried)     |
| 6. Bagasse                   | 34. Corn Cob              | 62. Lignin-Turkes              | 90. Pineapple Leaf              | 118. Spent Wash Powder      |
| 7. Bamboo Dust               | 35. Cotton Seed Hull      | 63. Lignite-Thailand           | 91. Pineapple Peel              | 119. Spices Waste           |
| 8. Bark                      | 36. Cotton Stalk          | 64. Lint Waste                 | 92. Pineapple Pith              | 120. Subabhul               |
| 9. Barmar Lignite            | 37. Deoiled Spent Earth   | 65. LPG                        | 93. Pip Waste                   | 121. Sunflower Hull         |
| 10. Biomass Sludge           | 38. Distillery Waste      | 66. LSHS                       | 94. Red Gram Stalk              | 122. Sunflower Husk         |
| 11. Black Lignite            | 39. Dob De oil brane      | 67. Macadonian Innershells     | 95. Red Gram Stem               | 123. Switch Grass           |
| 12. Black Pepper Waste       | 40. ETP Sludge            | 68. Macadonian Outershells     | 96. Red Lignite                 | 124. Tamarind Fruit Husk    |
| 13. Board off cuts           | 41. Eucalyptus            | 69. Maize Sticks               | 97. Refined Deoiled spent earth | 125. Tapioca Skin           |
| 14. Cashew Shell             | 42. Fines of Fibre Board  | 70. MSW Loose                  | 98. Rice Husk                   | 126. Tapioca Stem           |
| 15. Cassava Fibre            | 43. FO (Heavy Oil)        | 71. MSW Fuel Pallet            | 99. Rice Straw                  | 127. Tobacco                |
| 16. Cassava Peel             | 44. Forest Residue        | 72. MSW Pellet W/O Binde       | 100. Rubber Seed Cornel         | 128. Tobacco Stem           |
| 17. Cassava Waste            | 45. Furniture Waste       | 73. MSW Pellet with CaO Binder | 101. Russian Peat               | 129. Turmeric Waste         |
| 18. Castor Doc               | 46. Ginger Waste          | 74. Mustard Husk               | 102. Sagoo Waste                | 130. Timber Chips           |
| 19. Castor Shell             | 47. Green Coal            | 75. Mustard Oil Cake           | 103. Sander Dust                | 131. Washery Rejects        |
| 20. Castor Stem              | 48. Ground Nut shell      | 76. Mustard Stalk              | 104. Saufseed doc               | 132. Washery Tailings       |
| 21. Charcoal                 | 49. Herbal Waste          | 77. Mustard Straw              | 105. Saw Dust                   | 133. Wheat Bran             |
| 22. Chicken Litter           | 50. HSD                   | 78. Natural Gas                | 106. Shea Nut Cake              | 134. Wheat Straw            |
| 23. Chilli Stalk             | 51. Hybrid Poplar         | 79. Neem seed Shells           | 107. Sheanut                    | 135. Wood-Rubber-Sri Lankan |
| 24. Chilli Waste             | 52. Jeera Husk Doc        | 80. Olive Pits                 | 108. Sieved Husk                | 136. Wood Shavings          |
| 25. Chipper Dust             | 53. Jiliaflora Wood Chips | 81. Orimulsion                 | 109. Sisal Agava Waste          | 137. Wood Waste             |
| 26. Coal Ash                 | 54. Julia Flora Stalk     | 82. Palm Empty Fruit Bunches   | 110. Solanum Berries Waste      | 138. Wood Logs              |
| 27. Coal                     | 55. Juli-Flora            | 83. Palm Fibre                 | 111. Soya Husk                  |                             |
| 28. Cocoa Shell              | 56. Jute Waste            | 84. Palm Kernal Shell          | 112. Soya Straw                 |                             |

## Different Fuels - Different Combustion Systems



### Series VTA

- For high ash fuels like husk, coal, lignite etc.
- Capacity up to 4 million kcal/hr



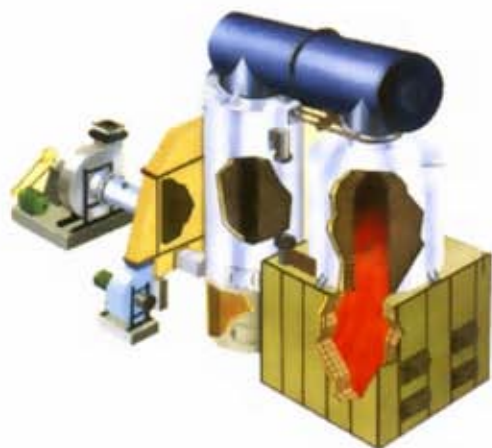
### Series VTAF

- Fluidised bed technology for fuels like husk, coal
- Capacity up to 4 million kcal/hr

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## Different Fuels - Different Combustion Systems



### Series VTA

- For high ash fuels like husk, coal, lignite etc.
- Capacity up to 4 million kcal/hr

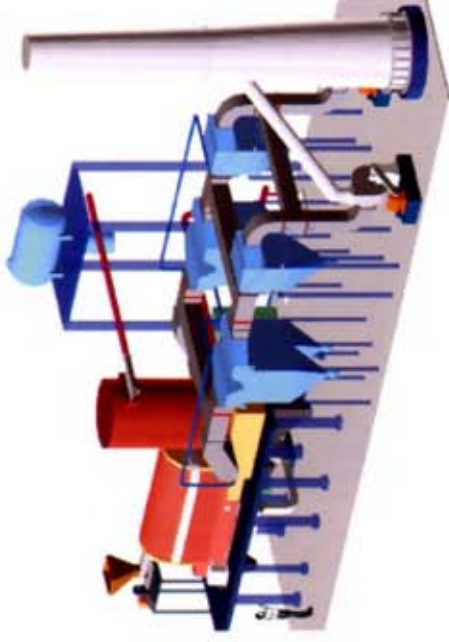


### Series VTAF

- Fluidised bed technology for fuels like husk, coal
- Capacity up to 4 million kcal/hr

**VTBH Series for Palm Fibre/Palm Kernel Shells/Indonesia Coal with the option of Trava Grate/Inclined Water Cooled Grate**

| Heater model                                       | VT-40     | VT-60     | VT-80     | VT-100    | VT-120    | VT-150     |
|--|-----------|-----------|-----------|-----------|-----------|------------|
| Heat output in the form of Thermic fluid at 280 °C | 3,200,000 | 4,800,000 | 6,500,000 | 8,000,000 | 9,600,000 | 11,000,000 |
| Heat output in the form of Hot water at 140 °C     | 800,000   | 1,200,000 | 1,500,000 | 2,000,000 | 2,400,000 | 4,000,000  |
| Thermal efficiency                                 | 70        | 70        | 70        | 70        | 70        | 70         |
| Thermic fluid flow across the Heater               | 225       | 315       | 460       | 480       | 640       | 660        |
| Coil Hold up                                       | 4500      | 6900      | 8900      | 10800     | 11800     | 18600      |
| Heater dimensions                                  |           |           |           |           |           |            |
| Dia  | 2800      | 3200      | 3700      | 3800      | 3900      | 4100       |
| Height   | 5500      | 5500      | 6300      | 6500      | 6800      | 7000       |
| Total connected load                               | 105       | 182       | 228       | 290       | 332       | 352        |



**VTBH Series**

- For palm kernel shells a combination of hot water generator & Thermic fluid heater.
- For rubber glove industry
- Customised upto 20 million kcal/hr

One of the largest size 15 million kcal/hr VTBH Delatatherm specially developed for Glove industry in Malaysia

**TECHNICAL SPECIFICATIONS OF SOLID FUEL FIRED DELTATHERM.**

| A. GENERAL SPECIFICATIONS                  |                    | VT-02   | VT-04   | VT-06   | VT-10     | VT-15     | VT-20     | VT-30     | VT-40     | VT-50     | VT-60     | VT-70     | VT-80     |
|--|--------------------|---|---------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1. Model                                   |                    | VT-02   | VT-04   | VT-06   | VT-10     | VT-15     | VT-20     | VT-30     | VT-40     | VT-50     | VT-60     | VT-70     | VT-80     |
| 2. Heat Output (MCR)                       | kcal/hr            | 200,000   | 400,000 | 600,000 | 1,000,000 | 1,500,000 | 2,000,000 | 3,000,000 | 4,000,000 | 5,000,000 | 6,000,000 | 7,000,000 | 8,000,000 |
| 3. Thermic Fluid flow rate (Q)             | m <sup>3</sup> /hr | 10  | 24      | 30      | 60        | 90        | 120       | 180       | 240       | 300       | 360       | 420       | 480       |
| 4. Head at outlet                          | MLC                | 20  | 20      | 20      | 20        | 20        | 20        | 20        | 20        | 20        | 20        | 20        | 20        |
| 5. Max. Thermic fluid temperature          | °C                 | 280   | 280     | 280     | 280       | 280       | 280       | 280       | 280       | 280       | 280       | 280       | 280       |
| 6. Temperature rise across heater (Del. T) | °C                 | 42  | 32      | 42      | 34        | 34        | 34        | 34        | 34        | 34        | 34        | 34        | 34        |
| <b>B. COMBUSTION SYSTEM</b>                |                    | Biomass / Solid fuel (Wood, Wood waste, Coal, Baggasse, DOC, coconut Shell, Husk, etc.) |         |         |           |           |           |           |           |           |           |           |           |
| 1. Fuel type                               |                    | 70 + 2%   |         |         |           |           |           |           |           |           |           |           |           |
| 2. Thermal efficiency on GCV               |                    |   |         |         |           |           |           |           |           |           |           |           |           |
| <b>D. OVERALL DIMENSIONS</b>               |                    |   |         |         |           |           |           |           |           |           |           |           |           |
| 1. Height                                  | m                  | 2.0   | 2.3     | 2.9     | 3         | 4.2       | 4.5       | 4.3       | 6.5       | 7.0       | 8.2       | 9.1       | 10.3      |
| 2. Length                                  | m                  | 1.0   | 1.2     | 1.4     | 2.3       | 2.6       | 2.8       | 3.2       | 3.8       | 4.0       | 4.8       | 5.4       | 6.2       |
| 3. Width                                   | m                  | 1.0   | 1.2     | 1.4     | 2.4       | 2.6       | 2.8       | 3.2       | 3.8       | 4.0       | 4.8       | 5.4       | 6.2       |
| 4. Dry weight of heater assembly           | kg                 | 3000  | 4000    | 5000    | 8500      | 12000     | 15000     | 17000     | 17500     | 19000     | 21000     | 24000     | 28000     |
| 5. Fluid hold up capacity of coil          | lit                | 350   | 600     | 850     | 1000      | 2200      | 2800      | 3300      | 5400      | 6000      | 7000      | 8500      | 9500      |

## Manufacturing Excellence

Thermax has a full fledged manufacturing setup with a built-up area of 67,000 sq. metres on a land area of 1,46,000 sq. metres. Its 14 plants are equipped with specialised machines for light, medium and heavy fabrication, assembly and testing in ferrous and non-ferrous metal. Thermax also has advanced Industrial Engineering and Welding expertise. Welding expertise covers projection, submerged arc, flangebutt and stud welding. It has an in-house welding school to train its welders.

## National & International Quality Standards

Thermax manufactures to National and International standards-ASME, GOST, DIN, EN IBR, BS. Customer inspection is carried out by Lloyds (UK), TUV (Germany), Bureau Veritas (France) and Societ'e Generale de Surveillance, Intertek Testing Services. ASME has credited Thermax manufacturing facility with 'S', 'U', 'H', 'R' and 'PP' stamps of quality.



**THERMAX**  
An ISO 9001 &  
ISO 14000 Company

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Mobile : 00-947 7769126  
Fax: 00-941-533217  
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- ◉ **Bangladesh**  
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email:debashish@global-bd.net

In view of our constant endeavour to improve the quality of our products, we reserve the right to alter or change specifications without prior notice.