



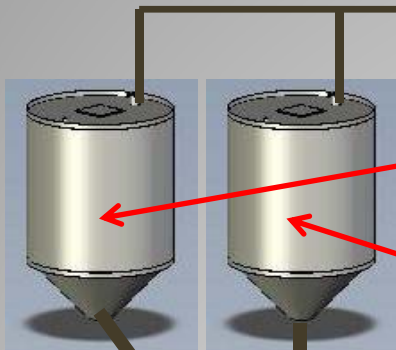
**F**OUNDRY  
**M**ACHINERY AND  
**S**PARES LIMITED

# Thermal Sand Reclamation

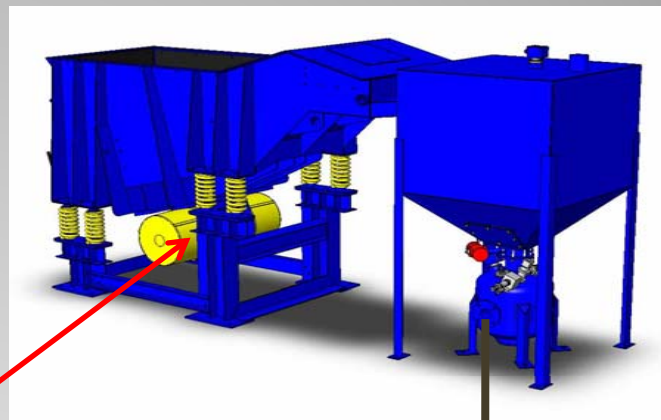


- 1 - Reclaimed Sand Silo (existing?)
- 2 - Sand screw conveyor (optional)
- 3 - Mixer for additive (for Alkaline Phenolic only)
- 4 - Screw feeder and vibratory screen
- 5 - HPG Gas fired thermal furnace
- 6 - HPG Cooler classifier and fan set
- 7 - Pulsor Pneumatic conveyor to convey thermally reclaimed sand
- 7a - Conveying pipe work for thermally reclaimed sand
- 8 - Evaporate water cooling tower for HPG cooler classifier
- 8a - Water pipe work from cooling tower to cooler classifier
- 9 - Dust extraction plant with auto cleaning controls
- 9a - Interconnecting ductwork (stainless steel at high temperature points)
- 10 - Additive tank (for Alkaline Phenolic only)
- 11 - Thermally reclaimed sand silo for bulk storage (optional)
- 11a-Sand feed pipe to second pneumatic conveyor if item 11 is installed

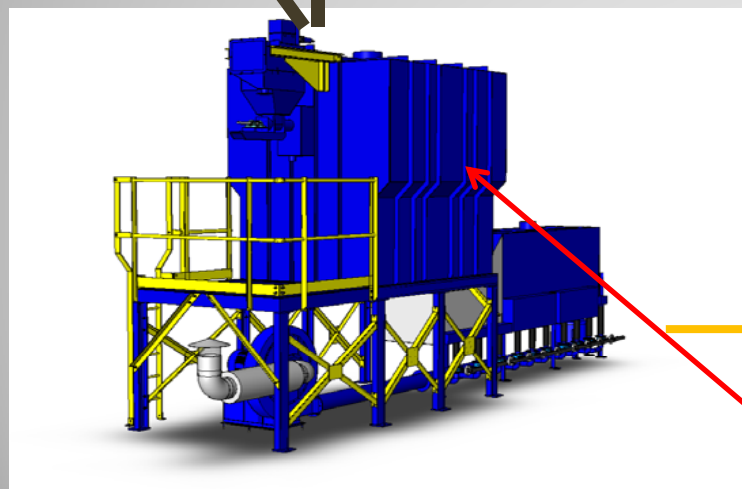
Pneumatic conveying pipe work from pneumatic conveyor



Existing silo's sited Above HPG Thermal plant to Accept mechanically Reclaimed sand from mechanical reclamation

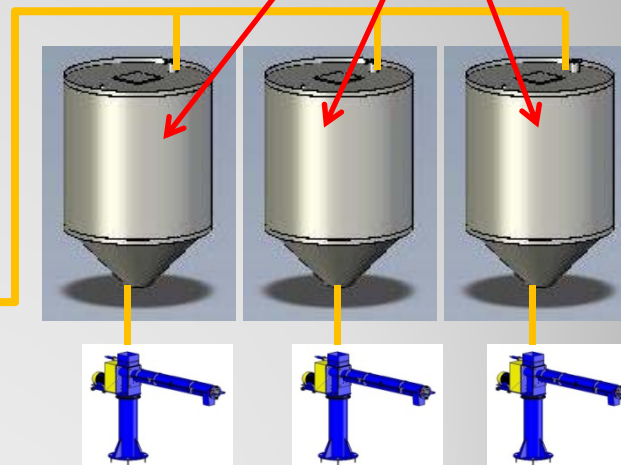


Mechanical reclamation plant



New proposed HPG thermal plant

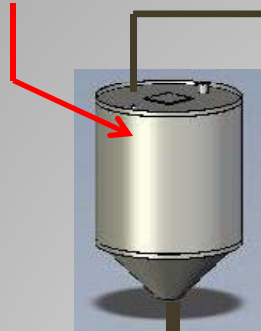
Existing sand silo's



New thermally reclaimed sand pipe work

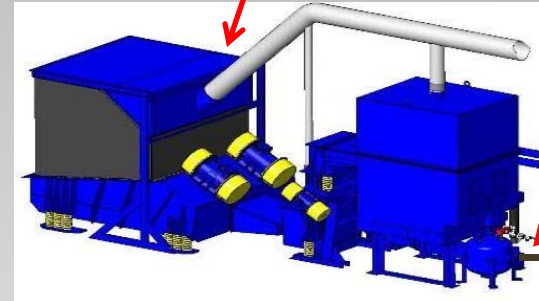
# Typical layout - 1

Existing silo sited above HPG  
Thermal plant to accept mechanically  
reclaimed sand from  
mechanical reclamation



Reclaimed Sand  
Pipe Work

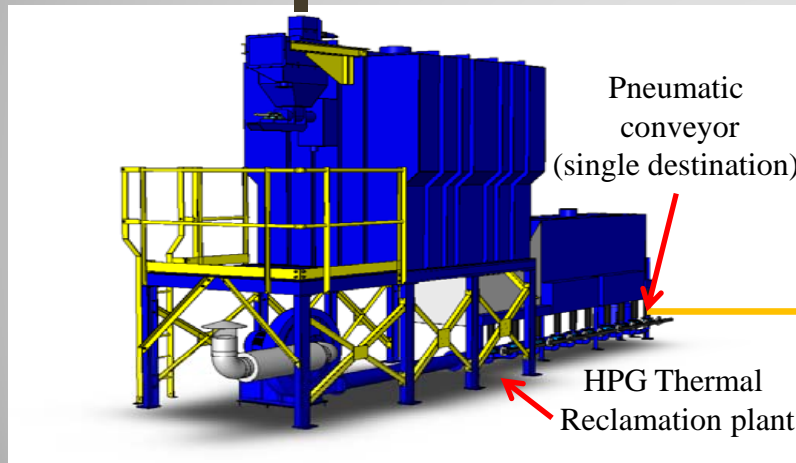
Mechanical  
Reclamation plant



Pneumatic conveyor  
(twin destination)

Thermally Reclaimed sand  
Pipe Work

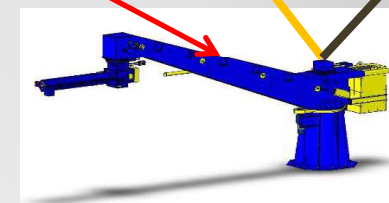
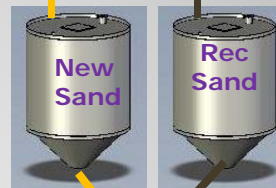
Diverter Valves



Pneumatic  
conveyor  
(single destination)

HPG Thermal  
Reclamation plant

Articulated  
Sand Mixer



# Typical layout - 2

# Standard sizes

<b>MODEL</b>	<b>OVERALL HEIGHT (mm)</b>	<b>OVERALL LENGTH (mm)</b>	<b>OVERALL WIDTH (mm)</b>	<b>POWER REQUIREMENT KW</b>	<b>GAS REQUIREMENT M3/HOUR</b>
<b>HPG 250</b>	3900	4650	1700	21	10
<b>HPG 500</b>	3900	5650	1900	31	20
<b>HPG 1000</b>	3900	7850	1900	41	40
<b>HPG 2000</b>	3900	9250	1900	51	80

Notes:

- 1) Gas consumption will depend on the L.O.I (loss of ignition) of feed sand.  
A typical consumption at 3.7% L.O.I has been recorded at 15.8m<sup>3</sup>/tonne of feed sand
- 2) Electricity consumption will vary with the size of plant between 25 and 60 Kwh/tonne of feed sand  
A recorded value for the HPG 500 unit was 48 Kwh/tonne.
- 3) Gas details are based on natural gas (Propane systems are available)

# General

The range of gas fired thermal sand reclamation units are designed to provide the foundry man with a compact system to operate at maximum economy. The heat recuperation system and the PLC control provide a reliable and cost effective operation that will process most types of chemically bonded sand

<b>MODEL</b>	<b>THROUGHPUT RANGE (Kgs/Hour)</b>
HPG 250	250 - 350
HPG 500	500 - 750
HPG 1000	1000 – 1250
HPG 2000	2000 - 2400

# Control System

- Electrical/pneumatic control panel with Mitsubishi PLC (or equivalent).
- Full logic control for automatic operation in either continuous unsupervised 24 hour running or batch process and providing all the appropriate interlocks and alarms.

Display on a mimic panel will show:-

- A. State of plant operation
- B. Operating temperature of thermal fluid bed, air exhaust, outlet sand and cooling water
- C. Hours operating on a total basis and on each of the pre-calibrated flow rates operated by a unique modulating system
- D. Quantity of sand processed

Separate mimic panel for the gas burner system to indicate its state of operation

# Gas Burner System

- Fully accessible for inspection during operation and maintenance
- Gas/air nozzle burners of simple design are controlled by the monitoring thermocouples which allow full use of the latent energy content of the feed sand.
- The residence time within the fluid bed at a pre-set temperature of normally 700-750 degrees C produces a clean sand with L.O.I of less than 0.1%

# Dust Collection System

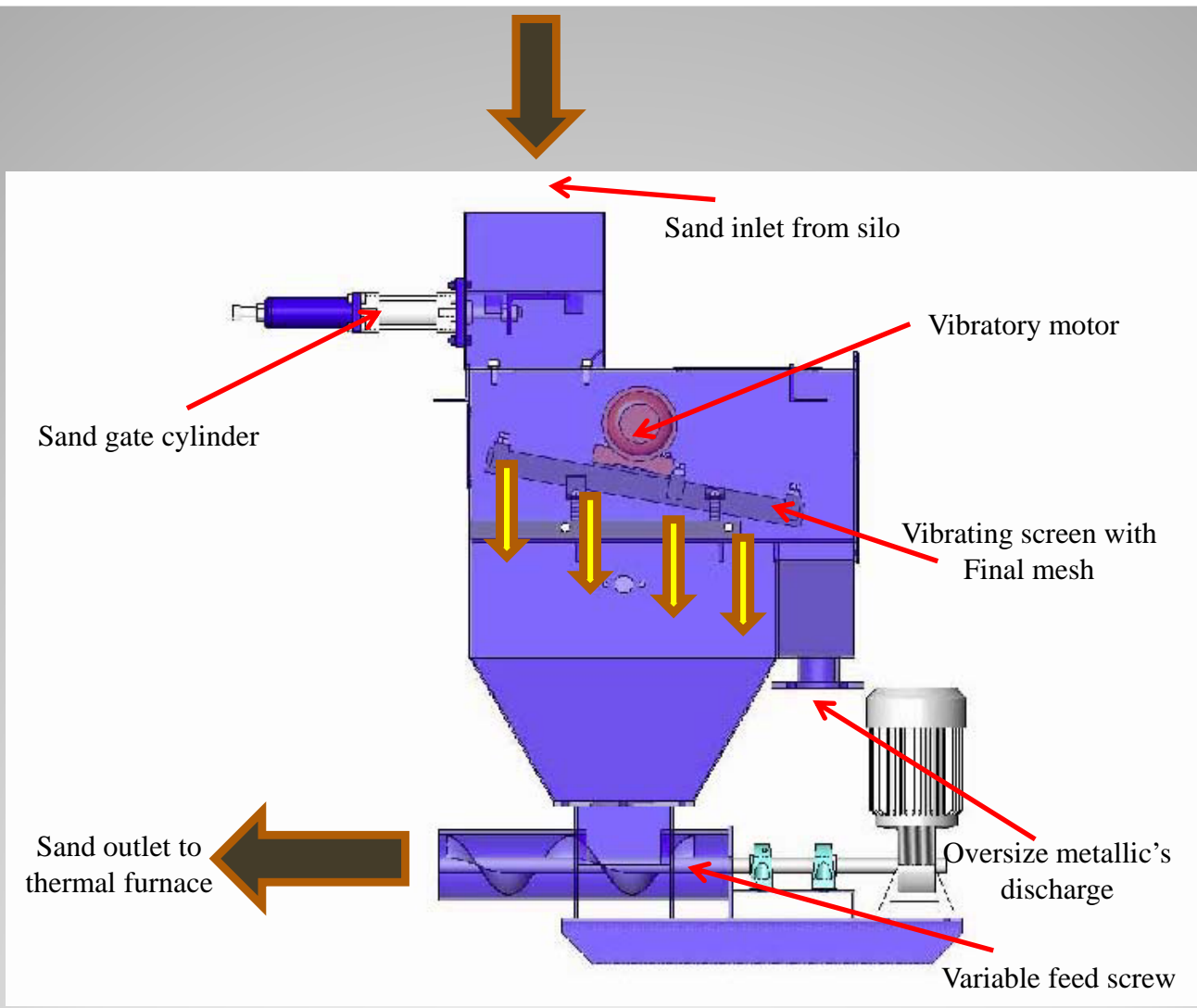
- All the exhaust air from the plant with an additional intake of cooling air is passed through a high efficiency cartridge filter (with reverse jet cleaning)
- A constant monitor of the pressure drop across the filtration media is provided to indicate the condition (optional)
- The exhaust stack is provided with monitoring points for the discharged air
- The retained dust is discharged in to heavy duty easily disposable plastic sacks which are mounted beneath the collecting hopper(s)

# Recuperative System

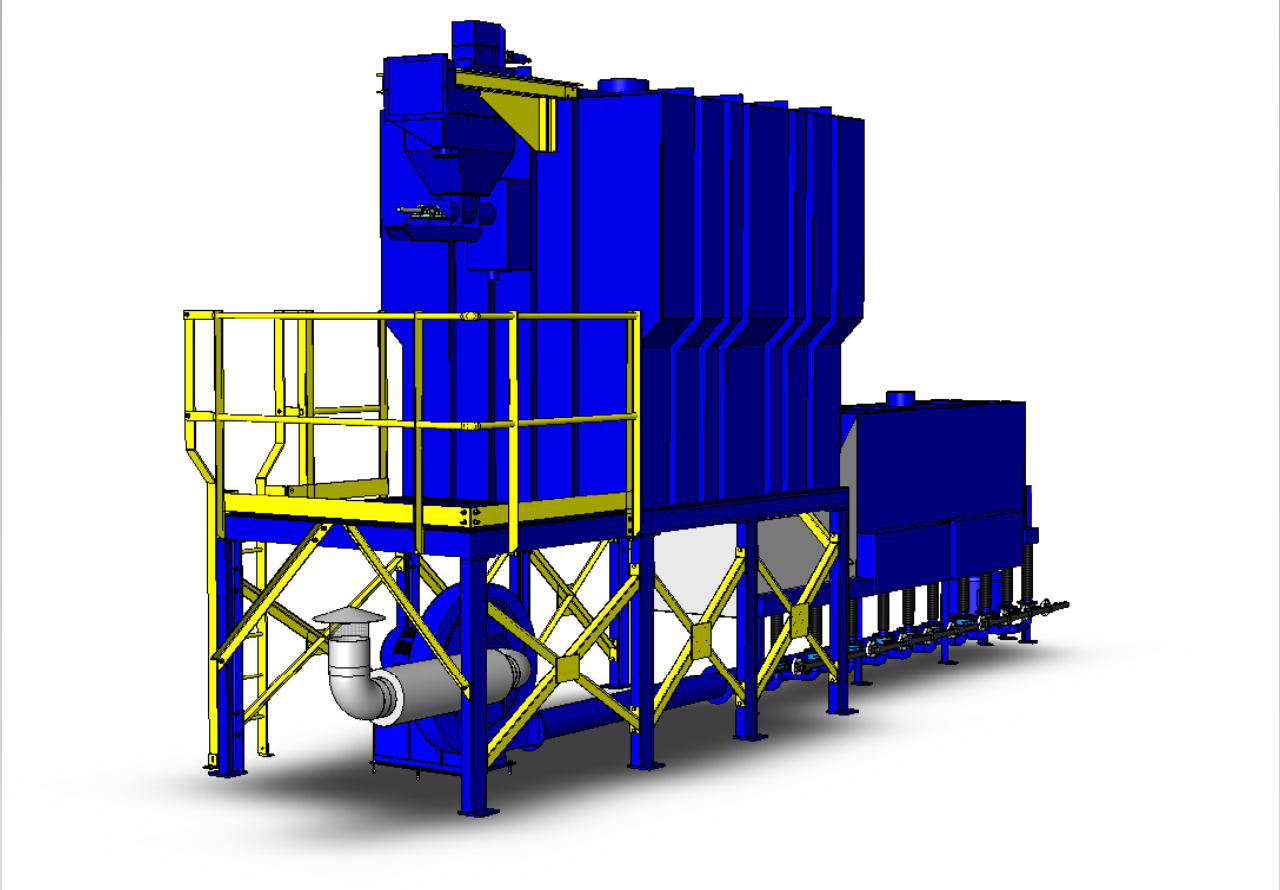
- To obtain the minimum heat losses, the insulated primary heat exchanger receives the sand from the fluid bed furnace and with a unique design, cools the sand and transfers the heat via the fluidising air back in to the furnace

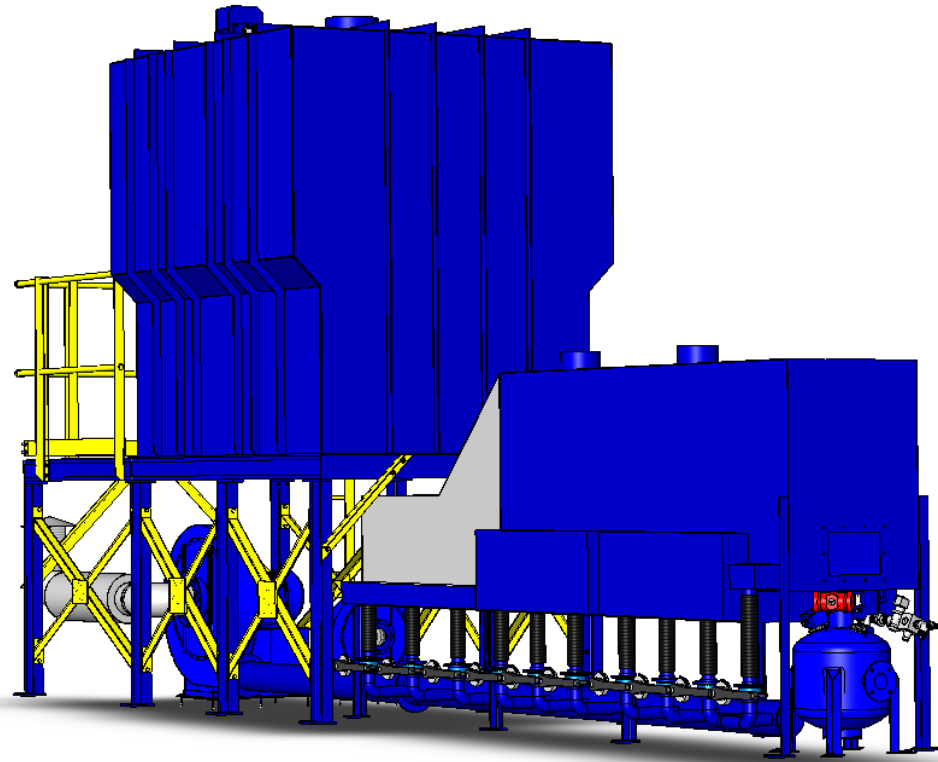
# Typical Installation





Screw inlet feeder







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United Kingdom  
WS3 2XQ  
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