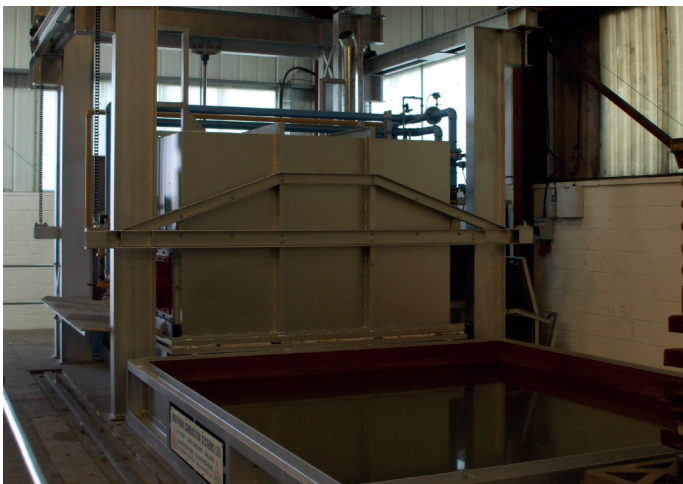


Heat Treatment Facility



Furniss & White (Foundries) Ltd



Heat Treatment Facility for Furniss & White

Northern Combustion Systems supplied a new heat treatment plant for a local customer, Furniss & White (Foundries) Ltd. The package consisted of one gas fired furnace, a transfer charging machine, water quench tank and all appropriate ancillary equipment for the complete heat treatment of castings fully designed, built, installed, commissioned and includes operator training with a service package.

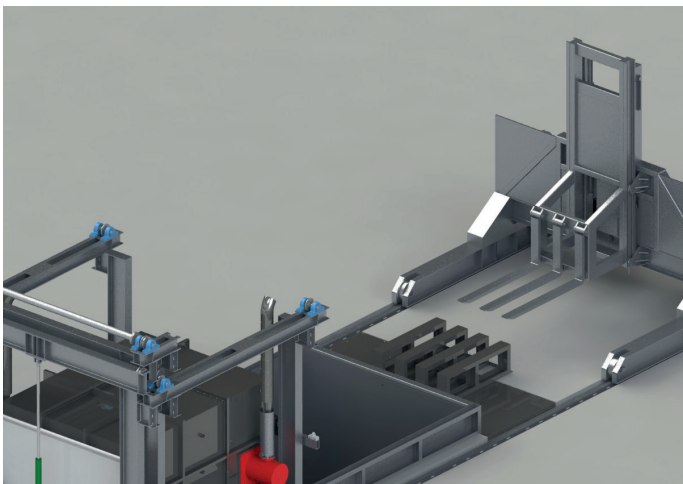
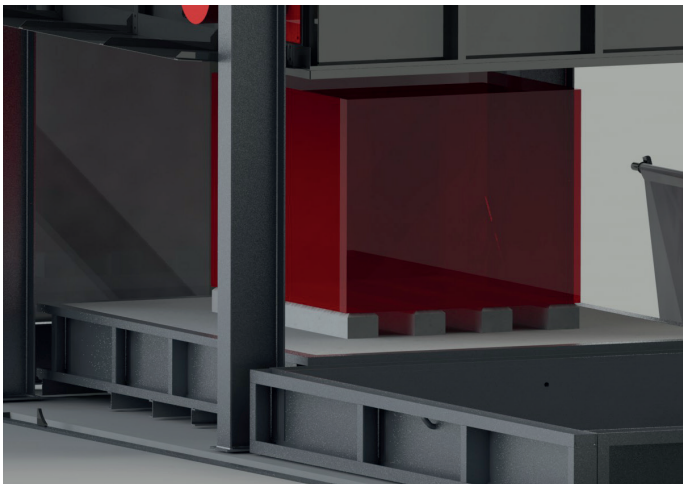
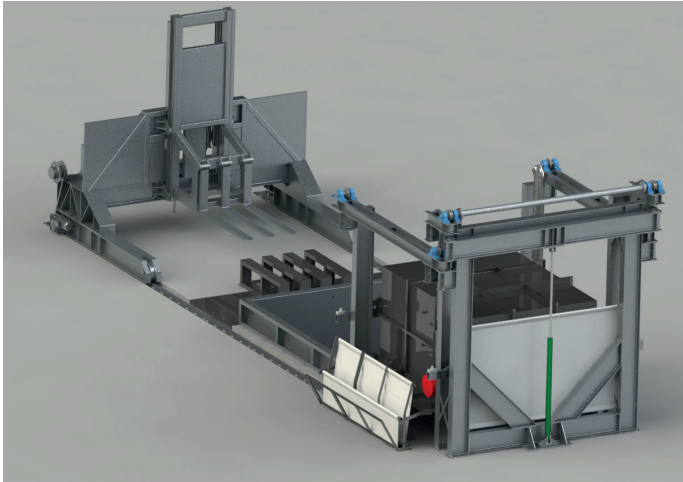
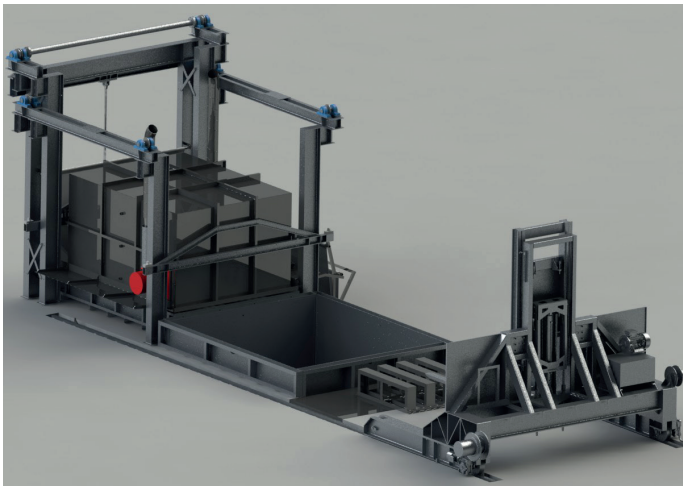
Normalising (Gas) Furnace

The furnace to suite the customer was supplied as a lift off cover type furnace, designed for a load capacity of 5.3 tonnes including support tray, maximum load size (W)1500mm x (D)1500mm x (H)1100mm.

The temperature range of the furnace at 600°C to 1250°C was achieved with a temperature uniformity of 600°C to 800°C $\pm 8^\circ\text{C}$ and over 800°C to 1250°C at $\pm 14^\circ\text{C}$ to meet the specification requirements of NORSOK M650 Rev 4 2011.

The furnace is fired using two self-recuperating high velocity gas burners mounted at low level, in diagonally opposite corners of the furnace hood. This firing pattern is well proven and sets up a high velocity flow of combustion products which circulate around the furnace load, resulting in a high degree of temperature uniformity throughout the combustion chamber.

The system designed to meet with current European safety standards EN746-2 The furnace hood is hydraulically raised and lowered in seconds automated in time to ensure a safe fast quench of the load.



Water Quench

Positioned in front of the furnace for a rapid quench is a (W)3.4m x (L)3.8m x (D)3.95m quench tank holding 51,000 litre of water with high velocity agitation jets.

The volume of water calculated to prevent the water from exceeding 50°C when quenching a 5.3 Tonne load of castings and tray from 1250°C at 20°C.

The water is vigorously agitated from two sides and from below using multi-jet, high velocity agitation to break down the water vapour barrier and increase heat transfer between the casting and the quenchant. The agitated water pumped by two 30kW pumps 108ltr/sec, positioned in an underground service pit and controlled by variable speed drive controlling the quench jet intensity.

The system incorporates a circulation pump and sealed cooler capable of a cooling capacity of 370kW. Water at 50°C is capable to return to the quench at 15°C with an ambient temperature up to 32°C. The water is pumped through the plate exchanger where it is cooled then back to the quench tank.

Charging Machine

Loading and unloading of the furnaces is by a 5.5 Tonne capacity single sided, fully automated, 4-wheel drive charging machine.

The operator transfers the load to a dedicated high temperature alloy tray positioned on a loading table. The operator exiting the fenced off facility, activates new or pre-programmed heat treatment cycles.

The time for opening the door to total immersion of the load into the quench is critical and achieved in less than 30 seconds.

[Click here to view the Quench Facility in action!](#)