



FOR ALL YOUR THERMAL PROCESS REQUIREMENTS

CASE STUDY

Replacement of Mould Pre-Heating / Wax Burn Out Furnace Combustion System

Magma Combustion Engineering completed a project for a leading valves & fittings manufacturer in the UK which included the replacement of the existing rotary hearth furnace combustion and control system.

AIM

A rotary hearth furnace is used both to burn out residual wax in investment casting moulds, and to preheat them before molten metal is poured into them. It is operated as a batch furnace, i.e. a number of moulds are charged into the furnace within a short period of time. As a consequence, for a period after the moulds were placed on the hot hearth, flue gases from the furnace contained a significant amount of unburnt hydrocarbons; a hot gas filter was installed to prevent their emission to the atmosphere, but this was found to be ineffective. Investigation revealed that the mode of operation of the combustion control system was adding to the unburnt hydrocarbon problem, and that it also contained obsolete components whose failure would lead to the furnace becoming unavailable for production.

The aim of the upgrading project was twofold, namely to ensure that the furnace could be relied on for production and to maximise combustion of hydrocarbons within the furnace, eliminating visible emissions into the atmosphere outside the foundry.

SCOPE OF THE WORK

Firstly, the existing combustion system, including all defective and obsolete components was removed. The existing burner was then disassembled, inspected, cleaned, repaired and re-assembled, to ensure that it was serviceable. New pipe work systems for fuel gas and combustion air were then installed, which incorporating all necessary valves, regulators and pressure switches to comply with both control and safety requirements. A new flue gas system was also installed to vent combustion products outside the work space. In addition to the mechanical works, a new control panel was manufactured in our workshop. This incorporated a conventional 3-term temperature controller, an over-temperature controller and a PLC, to provide both analogue control and digital sequencing. Subsequent to manufacture, the new control panel was installed at site, and all field wiring connected to it. The new combustion and control system was then commissioned.

BENEFITS

Unlike during previous operation, all hydrocarbons are now burnt within the furnace, resulting in elimination of both visible emissions and odour, and ensuring compliance with local environmental quality requirements. Additionally, the furnace can be guaranteed to be available for production and energy use has been optimised.

CONTACT US

Want to know more about how Magma can help you?

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