

Heat metal and IT...

Hammond Heat Treatment was founded 15 years ago at Darlaston, West Midlands. The company provides a broad range of specialist heat treatment services for metalworking and other manufacturing industries. At 80,000 sq.ft. this is the largest single site for heat treatment. The technology in use covers many generations of processes, from those that can be understood from a basic knowledge of Physics to the latest in Computer-controlled Mesh Belt Furnaces.

“Our customers demand demonstrable quality and process traceability”
Managing Director
John Houseman

The basic service of Hammond's to their customers is to provide repeatable, documented, quality-driven processes that in their various ways manipulate the properties of the base metal. These include core strength and hardness, surface hardness, wear resistance and fatigue resistance. The basic physical processes used are normalising, hardening, tempering, case hardening, nitrocarb, and induction hardening. This service has in many cases replaced in-house heat treatment at Hammond's customers. The main justification for using external specialist services being consistent, documented quality control, and zero-defect product.

of many kinds from simple machine screws to self drilling screws for roof fixing, internal strengthening components for saddles, geared shafts and many others, all supported by accurate process control and quality assurance. If the heat treatment of these vital components is not done correctly, then many finished products would quickly wear out, break or simply never work. Heat treatment is no longer a hit and miss or solely “experience driven”, the tool provided by InTouch has now made the processes understood, controllable and repeatable. There are several basic requirements of the processes available at Hammond's, these can be summarised as Hard Surface, a Strong Core without it becoming brittle, Straightness i.e. no geometric distortion, no Scale i.e. surface contamination, and a clean surface finish without any damage through handling or in-process manipulation.

This multiplicity of requirements is made possible through data acquisition and associated visualisation by the integrated InTouch systems. What may be termed “process transparency” has allowed Hammond to generate long-term process experience of heat treatment for many varied products and applications.

The resulting repeatable quality and ability to commit to production lead times fully justifies using an external resource for heat treatment services.

Two Mesh Belt Furnaces are employed at the site, these are large linked mesh conveyors running through multiple steps of heating and quenching, each process control variable being under automatic control. The complete machines are fitted with programmable logic controllers, discrete loop controllers, and are supervised by SolutionsPT-supplied



Heat treatment

The range of products that are heat-treated by Hammond, using a variety of processes and machines, includes steering racks, camshafts, track-laying vehicle drive wheels, fasteners



New InTouch controlled furnace

[opposite>] InTouch furnace control display

untreated components



Wonderware InTouch SCADA (System Control and Data Acquisition). The InTouch is deployed right on the machines with connection to the controllers and upstream to a bespoke database that handles all the quality data that is collected in process. In turn this data is available to customers for every batch to confirm the quality and processes of the treatment. Managing Director John Houseman says “our customers demand demonstrable quality and process traceability”

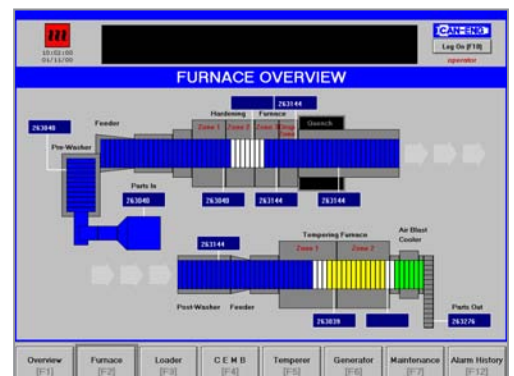
The Mesh belt furnaces are involved in a continuous process in which raw material (whose characteristic and variance data has already been supplied by the customer, or determined by Hammond’s internal laboratories) is first washed, then hardened, quenched, tempered and then cooled. Although belt speeds are relatively slow at 15-20 metres per hour, process control in the furnaces is demanding. With temperatures in the area of 1000°C, which is critical to the correct treatment of the parts, process know-how and the variability of raw material quality has to be fully understood. Simply getting the raw material to these temperatures

requires significant process control as this is done in stages. The company depends on the continuous data obtained by InTouch and SolutionsPT-provided Maxiflex I.O. of key controlled variables throughout the process.

In addition to quality advantages the InTouch investment has improved process in-sight, allowing minimal “product contamination” (waste) whilst batch changes are taking place.

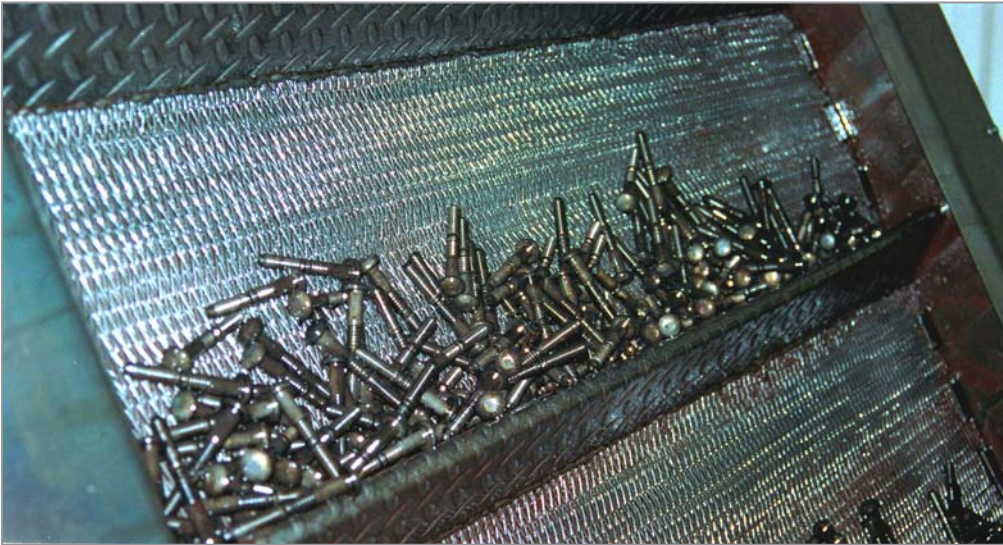
The first mesh belt furnace was manufactured in Canada by Can-Eng and handles 100 tonnes per week, this gave Hammond a significant competitive advantage. On the basis of this success a second furnace was manufactured locally by Seco-Warwick, with InTouch specified. This handles a similar weekly capacity.

To keep close control of quality and to develop

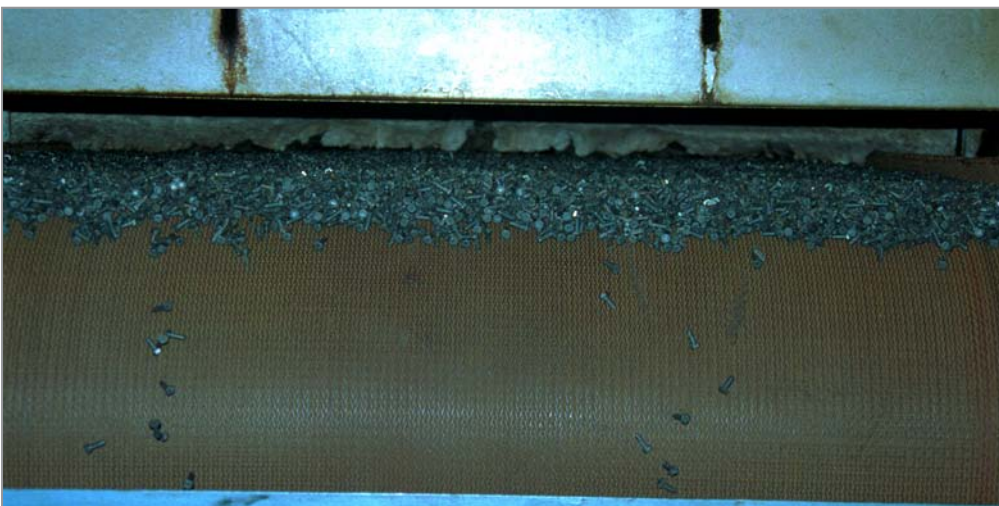


process techniques, Hammond has eight metallurgists on the staff. Sections of finished product are etched to visibly show the effect of the treatment and thereby to confirm that the process characteristics have been calculated correctly for that batch of product. The connection to the process for real-time quality assurance and production scheduling has given Hammond’s the confidence to have on-going

development of its facilities, using InTouch and other Wonderware FactorySuite 2000 products. It is planned to develop the experienced gained on the mesh belt furnaces to other processes, this may well be accelerated by the introduction of the Climate Change Levy in April 2001. It’s a hot place to put the IT, but the combination of Heat, Metal and IT has made Hammond Heat Treatment a foremost supplier in the United Kingdom.



part way through treatment



treated components

Wonderware UK wishes to thank the following company for its valued contribution to this success story...

**Hammond Heat Treatment
(now trading as Midland Surface Engineering Limited)**

www.midlandsurface.co.uk



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