



Since 1915, Surface Combustion has focused on applying our vast technical and practical experience thereby providing customers equipment solutions that are rugged and provide extended production. Additionally, Surface remains highly dedicated to the pursuit of new technology through extensive research efforts and maintaining our industry leading service and support capability.

Rotary Hearth Furnaces

Surface Combustion is currently working on two (2) new rotary hearth furnace projects. The furnaces being provided utilize a high degree of automation to allow for very fast cycle times. In one furnace, small parts are charged and discharged from the furnace every fifteen seconds by a fully automated robot. In the second furnace, 500 pound loads of castings are charged into the furnace every two minutes by an automated loading system.

The units provided are completely shop assembled to allow high levels of shop testing in order to provide the customer faster, more cost effective equipment installations.

Surface provides a diverse line of rotary hearth furnaces servicing many industries. Popular processes for rotary hearth furnace designs include carburizing, normalizing, reheating prior to press or plug quenching, reheating prior to forging and annealing.

Rotary hearth furnace designs have been provided in both the ferrous and non-ferrous metals industries processing aluminum, copper, carbon and stainless steels. Products range from small automotive parts to large billets or rod coils weighing several tons.

Surface offers rotary hearth furnaces from standard diameters as small as 6 feet in diameter to custom sizes as large as 80 feet in diameter.

The rotary hearth furnace systems can be provided as stand alone furnace

systems or can be provided as fully automated heat treat lines incorporating controls, robotics, dunk or press style quenches, washers, temper furnaces and fully automated tray and part handling systems.



Rotary Hearth Furnace

Gas Nitriding System

Surface Combustion has recently provided three (3) fully automated gas nitriding furnace systems. The systems utilize the latest state-of-the-art atmosphere controls including both hydrogen and oxygen sensors for monitoring of the furnace atmosphere. The atmosphere controls are being provided in concert with Stange Elektronik of Germany.

Surface is providing integration of this atmosphere control system into both batch and continuous furnace designs. Batch furnace designs available include, pit, cover and base and single or multi-chamber horizontal concepts. Furnace sizes are available from small laboratory sized equipment to systems with greater than 1,000 cubic feet of effective working volume.

The furnace systems provided include all required auxiliary equipment including gas control panels, gas generators, furnaces, fast cool packages and after gas treatment systems including incinerators.

The new furnace systems are being designed to run multiple processes utilizing the same controls system. Processes to be run include classical gas nitriding, ferritic nitrocarburizing, oxy-nitriding, nitriding of stainless steels and both pre and post oxidation

processes. The systems provided are fully flexible since they can be used with bottled or generated gas of multiple varieties.

The new controls package provides fully automated recipe based control of the processes being performed. The recipe based system allows development of multi-step recipes, including all of the individual process parameters. Software packages are provided with the equipment to provide both on line and offline calculation of nitriding and nitrocarburizing potentials. This provides plant engineers a productive tool for the nitriding process being performed.

The nitriding systems provided meet the requirements of AMS 2750 and AMS 2750/10 for automated nitriding control.



Gas Nitriding System
Courtesy of Advanced Heat Treat,
Monroe, MI

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