Core Furnace Systems and LOI Combine Operations

Core Furnace Systems (CORE), Pittsburgh, Pa., a multibusiness unit company of the Tenova Group, and LOI Inc., Coraopolis, Pa., the U.S. unit of Tenova LOI Italimpianti, combined their business operations on March 31, 2009. LOI Inc. will be merged into and become another business unit of CORE, along with CORE’s existing Metal Making and Furnace business units. CORE designs and supplies reheat, heat treating, specialty and carbon processing furnaces as well as melt shop equipment, technical services and automation systems in North America. LOI Inc. makes industrial furnaces for the steel, aluminum, and automobile industries for the North American market. Tenova, Milan, Italy, designs and supplies advanced technologies, products and services for the metals and mining industries. Tenova operates close to its customers through a network of 31 companies based on the 5 continents.

www.corefurnace.com, or www.tenovagroup.com

PLANSEE Manufactures Large HIP Cylinder

PLANSEE Metall GmbH, Reutte, Austria, manufactured a cylinder for the world’s largest hot isostatic press (HIP) for its customer Avure Technologies AB, Sweden. The cylinder is made of a doped molybdenum material, which enables the furnace to operate at temperatures to 1350°C and a pressure of 1,180 bar. The HIP press is due to start operation in Japan by 2010. The cylinder is about 5 m long and measures more than 2.2 m in diameter. Manufacturing the cylinder required the use of the company’s full range of refractory metals processing technologies including laser and water-jet cutting, tooling, hot working such as spinning, bending, and rolling, as well as joining using doped molybdenum rivets and flame spraying.


Proton Energy Develops High-Pressure Hydrogen Technology

Proton Energy Systems, Wallingford, Conn., announced a major technological milestone involving its advanced high pressure, proton exchange membrane (PEM) electrolysis technology, demonstrating more than 18,000 h of hydrogen generation at 2,400 psi, without any external mechanical compression. The ability to produce hydrogen at elevated pressure will help reduce the hydrogen storage footprint in applications where space is a premium. Additionally, producing high pressure hydrogen without generating high pressure oxygen provides a safer, more cost effective on-site hydrogen solution. The elimination of a mechanical compressor in the system makes it possible to reduce the overall capital cost and operating cost of the installation. The 2,400 psi milestone was achieved while at the same time increasing hydrogen production by a factor of four from previous high pressure hydrogen generation systems.


POSOCO Will Use Linde Rebox DFI System

Linde Gases, a division of The Linde Group, Munich, Germany, will install its Rebox direct flame impingement (DFI) to one of POSCO’s continuous annealing lines at its large integrated steel mill in Pohang, South Korea. The main benefits of DFI technology include higher heat transfer rates for increased capacity and reduced fuel consumption and the capability to influence surface properties.


Siemens Installs Automation Equipment at Chinese Steel Plant

Siemens VAI Metals Technologies, Willstaett, Germany, will equip an annealing line and two hot galvanizing lines of Chinese steel producer Shougang Jingtang Iron and Steel Co. with drive technology, electrical equipment, and automation systems. Production is scheduled to start at the end of 2010.


One-Shot Brazing with CuproBraze

International Copper Association, New York, N.Y., reports that a manufacturing capability called one-shot brazing has been achieved through the cooperation of members of the CuproBraze Alliance. One-shot brazing joins all components of a CuproBraze mobile heat exchanger during one pass through the brazing furnace, including fins to tubes, tubes to headers, and headers to the tank. Manufacturers save time and expense with one-shot brazing. Although the process requires considerable skill and teams highly dedicated to quality, training time is much shorter for one-shot brazing than for the alternative of welding, which requires highly trained welders. One member of the alliance, SJO, a division of FinnRadiator, Suolahti, Finland, is using the method to produce an estimated 4,000 pieces per year for Valtra tractors.

Nitrex Metal Upgrades European Facility

Nitrex Metal, St. Laurent, Quebec, Canada, completed an upgrade on an expanded heat treating facility for European gas turbine manufacturer Turbomeca of Safran Group. The expansion project has added a Nitrex NX-811 nitriding system using Nitreg-S technology to the newly constructed heat treat shop in Bordes, France in the first quarter of 2009. The system will be used for nitriding stainless steel auxiliary gears and drive shaft assemblies. Turbomeca is a leading manufacturer of low- to medium-power gas turbine for helicopters. www.nitrex.com.

Trumpf Receives Innovation Award from Daimler

Daimler AG honored Trumpf GmbH, Ditzingen, Germany, with its Key Supplier Award in the Innovation category in March, acknowledging Trumpf’s contribution to the development of the RobScan robot-driven laser welding system. RobScan consists of programmable focusing optics and scanner optics for laser welding integrated into a robotic arm. Mirrors position the laser beam extremely fast on each area in the processing field.

Air Products Starts Third Air Separation Facility in China

Air Products, Lehigh Valley, Pa., recently brought on-stream its third air separation facility (ASU) in Tangshan, Hebei Province, Northern China to supply oxygen, nitrogen and liquid argon to Tangshan Guofeng Steel Co. Ltd. and its other local customers. Air Products was awarded three long-term industrial gas supply contracts to support the business growth plans of Guofeng Steel. www.airproducts.com.

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Edwards Vacuum Launches GXS Industrial Dry Screw Pump

Edwards Vacuum has launched its GXS Industrial Dry Screw Pump, which combines the latest in vacuum technology with the efficiency of a dry screw pump. The GXS pump is designed for use in a wide range of applications, from food processing to pharmaceuticals. It features a compact design and is easy to install and operate. The GXS pump is available in a variety of sizes to meet the needs of different applications. For more information, visit www.edwardsvacuum.com.

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For more information email us: vacuum@edwardsvacuum.com

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Both figures, the bright, clean part on the left is vacuum carburized and gas quenched and the dark part is atmosphere carburized and oil quenched. In the article “No Hydrogen Embrittlement with Low Pressure Gas Carburizing” (Mar./April 2009 HTP), Fig. 2 indicates that both parts in the figure were vacuum furnace carburized and gas quenched, and Fig. 3 indicates that both parts are atmosphere furnace carburized and oil quenched. In both figures, the bright, clean part on the left is vacuum carburized and gas quenched and the dark part is atmosphere carburized and oil quenched. The text on page 31 should also reflect that. We apologize for any inconvenience this may have caused.
Seco Warwick Allied Pvt. Ltd., Mumbai, India, recently commissioned 100% hydrogen atmosphere bell annealing furnaces at two steel plants in India. A four-base hydrogen atmosphere annealing installation with a capacity of 54,400 metric tons/year was installed at Uttam Strips Pvt. Ltd., Bhiwadi, Rajasthan, India (headquarters in New Delhi). Uttam supplies the annealed material to manufacturers of automotive components, domestic appliances (e.g., washing machines), and for its in-house tube mill. The charge material is cold-rolled strip coils of grade DQ/DDQ having an outer diameter of 2,000 mm and width of 1,250 mm (~79 and 49 in.). Each annealing base is designed for a maximum load of 108 metric tons and reference charge load of 96.4 metric tons. The designed overall stack height is 5,300 mm (~207 in.) for four coils per batch, which are stacked using intermediate convectors between the coils.

The scope of supply for the installation included two gas-fired heating hoods based on LPG fuel, four annealing bases each with base valve stands, four corrugated inner covers, two mist cooling hoods, a main common pressure-reducing station for the utilities, and a complete PLC-based control and monitoring system.

SW Allied also recently commissioned a ten hydrogen atmosphere annealing base installation with a capacity of 148,500 metric tons/year for Shree Precoated Steels Ltd. (SPSL), Pune, India. The company plant, located at Sanawadi, which is about 165 km from Mumbai, specializes in the production and supply of high-quality coated flat steel products, marketed under the brand names Metacolor, Metagalva, and Metacor. The charge material is cold rolled strip coils of grade CQ having an outer diameter of 2,000 mm and width of 1,300 mm (~79 and 51 in.) Each annealing base is designed for a maximum load of 98 metric tons and reference charge load of 78 metric tons. The designed overall stack height is 4,550 mm (179 in.) for four coils per batch, which are stacked using intermediate convectors between the coils. The scope of supply for the installation included five gas-fired heating hoods based on LPG fuel, ten annealing bases each with base valve stand, ten corrugated inner covers, five mist cooling hoods, a main pressure reducing station for the utilities, and a complete PLC-based control and monitoring system.

The control system consists of PLCs for control and safety, with a PC operator station for supervision. The control system allows for control and monitoring, as well as all required safety features for the equipment. The main analog values and status of each base comprising the anneal plot and report details are displayed on PC screens. Archiving of the data and preparation of annealing cycles are also accomplished by the control system. The main PC station also shows the various alarm history, log book provision for events for a particular annealing cycle, malfunction and reporting for the time intervals requested for the corrective action, and operating hours of the equipment for the maintenance/calibration requirement. The deployment of the equipment is also displayed both in the tabular/bar chart manner to obtain the actual time of the end of that heating/cooling sequence to pre-plan the activity.

Logging of the various process activities, utility consumption plots for hydrogen and nitrogen, anneal plot with the zoom feature, and the annealing protocol for each charge are available. The control and monitoring system has the following components:

- Main PLC
- Base PLC for each base
- Touch screen OIU common for all the bases
- SCADA PC
- Engineering PC

PLCs, PCs, and OIUs are linked by Profibus network. www.alliedfurnaces.com, or www.secowarwick.com.
Seco/Warwick Delivers Brazing and Annealing Furnaces

A New England manufacturer purchased a 2-bar vacuum brazing furnace from Seco/Warwick Corp., Meadville, Pa., to enhance its vacuum brazing capabilities for specialized products used in fabricating machinery. Vacuum brazing is usually a high temperature (typically 1700 to 2250°F, or 930 to 1230°C), fluxless process using nickel-base, pure copper, and less frequently, precious brazing filler metal. The VP is a cold wall, front-loading vacuum furnace incorporating pressure gas quenching. The furnace requires minimum floor space with an internal re-circulation blower and heat exchanger.

Michigan Brazing LLC, Howell, Mich., (www.michiganbrazing.com) installed a controlled atmosphere brazing (CAB) furnace line from Seco/Warwick to expand production of aluminum radiators. Michigan Brazing’s furnace line consists of a dry-off oven, entrance chamber, three-zone electrically heated braze chamber, water-jacketed cooling chamber, exit chamber, and air-blast chamber. The furnace has an available belt width of 30 in. and an overall product pass height above the belt of 6 in. The complete line is 53 ft long and is designed for about 30 heat exchangers per hour.


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- Databases for Fe-, Al-, and Ni-based alloys

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Thermatool Commissions Precision Slot Quench System
Thermatool Corp., East Haven, Conn., commissioned a new precision slot quench system along with multiple induction preheaters for austenitizing and tempering operations. The high-performance modular slot quench and induction heating systems operate on an induction/gas quench and temper line at Timken Steel. The system is designed to process two size bands for pipe and bar from 4 to 9 in. The Quench Module is rafted and motorized thereby enabling the producer to change quench ring diameters automatically. Complete with variable flow pumps and a symmetrical high impingement quench spray, the precision quench equipment offers the customer opportunities for enhanced metallurgy and straightness. www.thermatool.com.

Solar Manufacturing Awarded Vacuum Furnace Orders
Solar Manufacturing, Souderton, Pa., received an order from a U.S. manufacturer for a top loading Model VTC-714 R&D furnace for process development of low pressure vacuum carburizing of new alloys for aircraft gearing. The carburizing process will be designed around U.S. Patent Application No. 11/235,739, filed September 26, 2005, using a mixture of hydrogen and acetylene as the carburizing gas. The furnace will help prove out LPVC to optimize the vacuum carburizing process with positive pressure gas quenching as opposed to atmospheric carburizing with oil quenching. The furnace will be shipped in the second quarter of 2009.

Solar Manufacturing also delivered, installed, and commissioned a new R&D vacuum heat treating furnace at a specialty metals industry customer for use in its metallurgical development laboratory. The furnace will be used for steel, low pressure vacuum carburizing, and magnetic metal developments, as well as alloy testing and process development. The horizontal, front loading model HFL-2624-10IQ has a work zone measuring 18 in. wide x 14 in. high x 24 in. deep and a workload capacity of 750 lb, with an operating temperature to 2400°F and temperature uniformity meeting AMS 2750D. It also features 10 bar fast gas quench. www.solarmfg.com.

CEC Installs Furnaces for Bosch Chassis
Bosch Chassis Systems, a division of The Bosch Group, contracted Consolidated Engineering Co. (CEC), Kennesaw, Ga., to supply four stress relief/ferritic annealing furnaces for its Dalian, China facility. The Dalian plant is expanding into processing cast iron components, and required heat treat capacity for stress relief and ferritic annealing. CEC proposed the use of several batch furnaces rather than one or two larger furnaces, because with 4 smaller units, production could be ramped up in stages and the production process could be more flexible, and smaller units allow for smaller batches of components to be heat treated as required, while still maintaining the best possible energy efficiency. Also, the stress relief cycle was at a lower temperature than the ferritic anneal, so the use of several different furnaces allowed for two different thermal cycles to occur simultaneously. CEC also provided a PC based SCADA system. www.cec-intl.com.

Abbott Furnace Ships Munitions Treatment Unit
Abbott Furnace Co., St. Marys, Pa., shipped the first of two munitions treatment units for a chemical demilitarization project in Pueblo, Colorado. The plant will destroy a stockpile of chemical weapons containing mustard agent. The munitions treatment unit will destroy any trace amounts of mustard agent that may remain on the munitions after they have been drained and the agent has been neutralized. The second unit, destined for the same project, is scheduled to ship before the end of 2009. Abbott was able to use its continuous belt furnace technology in this application. www.abbottfurnace.com.

AeroMat covers the topics driving materials technology for aerospace applications. The event attracts more than 750 delegates and over 70 exhibiting companies who discuss and display the latest advances in materials and processes for aerospace applications.

Some of the heat treating-related presentations include:
- Relating Microstructure and Machinability in Titanium Alloy Ti-5553
  James D. Cotten and Michael L. Watts, The Boeing Company
- Carpenter’s Experimental 290 Alloy: Paul Novotny, Carpenter Technology Corp.
- Low Temperature Carburization of Austenite Stainless Steels:
  Dr. Sunniva R. Collins, Swagelok Co.
- Novel Heat-Treatments for the Production of Refined Microstructures in Alpha/Beta Titanium Alloys:
  Peter C. Collins, Jonathan Osborn, and Hamish L. Fraser, Ohio State University

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