



# OTTO JUNKER

Volume 10/June 2006

News

## We understand Metals

INDUGA joins OTTO JUNKER Group  
as new member



Ideal supplement to the company's  
product portfolio for the non-ferrous  
metals industry.

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## Tube Trade Fair in Düsseldorf – April 24-28, 2006

Our extensive range of innovative processes and technologies for the production of tubes/pipes, wire and fittings was showcased successfully to an expert international audience at this leading industrial trade fair.

Summing up the results of five days in Düsseldorf, a pleased Dr. Gunther Voswinckel, Chairman of the Board of OTTO JUNKER GmbH, Simmerath, said: "The high calibre of Wire and Tube is the basis for many good contacts made in Düsseldorf; this is where the international industry comes together and hardly anyone can afford not to be in Düsseldorf." "For

us, this year's Tube trade fair brought many interesting talks with numerous manufacturers who shared valuable suggestions for improvements and new developments with us", he added.



## RWTH Institute is an important research partner

Our successful co-operation with the Institute of Industrial Furnace Engineering headed by Prof. Pfeifer deserves to be particularly emphasized here. Providers of market-focused equipment technology for thermal treatment processes are currently faced with demands for

- innovative technologies related to the use of new materials and process approaches, combined with the development of new fields of application;
- narrower quality tolerances, plus higher levels of process reliability and repeatability of technological parameters;
- further cuts in energy consumption and environmental loads, in conjunction with increased automation levels based on intelligent process control systems and remote diagnostics.

Against this backdrop, the research collaboration with high-profile academic establishments such as the Institute of Industrial Furnace Engineering is an important and, indeed, indispensable aid for meeting the above requirements with the appropriate time-to-market speed. Our successful cooperation is exemplified by past achievements and successful projects in the following areas:

- optimised atmosphere flow management in thermal treatment equipment

for automotive suspension parts made of aluminium;

- new jet array for heating aluminium strip coils;
- essential improvement in design of flotation-type strip annealing furnaces. Numeric models and thermal process simulations were validated at the Institute by appropriate measurements and test runs under near-field conditions. This was then followed by a joint analysis of results and a discussion of implementation options at the equipment design level. Measurements on real-life industrial furnaces were carried out in individual cases and showed a good coincidence between computed and measured performance characteristics. The findings gave us the confidence to anticipate tangible benefits from each of these improvement steps.

Our expectations were impressively confirmed in the progressive completion of customer orders. Our successful cooperation is continuing and currently focused on the following subjects:

- Use of an innovative swirl nozzle system for batch furnaces
- New heating concept for gas-fired billet heaters
- Improved heating system for foil annealing chamber furnaces

## Selective investment strengthens OTTO JUNKER sites

### ... at the Lammersdorf headquarters plant

Generally, our investment efforts in recent years have been focused on the continued cost-efficient expansion of in-house manufacturing capabilities at Lammersdorf while aiming to improve our labour conditions and environmental performance at the same time. One example of the progressive upgrading and expansion of our Lammersdorf furnace manufacturing shops is the coilmaking operation.

With the operative launch in February this year of the project entitled "Modernization and Expansion of the Coilmaking Section", another key project aimed at securing the future of the Lammersdorf site was brought to a successful conclusion.

The existing coilmaking shop was expanded through the addition of a modern annex building. On 250 m<sup>2</sup> of floorspace, a new furnace for burning off coil insulation was installed and an area was set aside specifically for the production of insulation parts.

In the context of this investment, great importance was attached to the improvement of working conditions and to the use of technology allowing us to surpass current emission standards (TA-Luft).

As a result of the upgrade, much more space is now available for making the coil insulation parts, and the exhaust equipment ensures a "clean air" work environment. Our hiring of 7 new employees especially for this operation testifies amply to the viability of OTTO JUNKER's services strategy.

Our customers, too, will benefit from this investment. Repair times are reduced, and the new burn-off furnace removes the coil insulation without considerably affecting the coil copper sections.



The new production building in Boskovice measures over 80 m in length.

### ... and at our Boskovice facility (Czechia)

The manufacturing facilities of OTTO JUNKER Industrial Equipment at Boskovice near Brno are geared for the production of sub-assemblies and machinery for industrial furnace installations. Technical preparations are handled by the company's engineering design offices.

For other services – and specifically for the production and assembly of larger subassemblies and installations – the company had been using a factory site located some 80 km away. Given the OTTO JUNKER Group's continuous uptrend in order volumes, this dual-site manufacturing arrangement called for an urgent expansion and concentration of production resources. Following some in-depth planning and extensive pre-investment analyses, a high-powered capital spending program was adopted for the Boskovice site.

The plans called for the erection of a new production building measuring more than 80 m in length and designed to connect directly to existing structures and facilities. Social rooms and offices were likewise envisaged. The project was scheduled to more than double the company's production floorspace, increasing its total manufacturing surface area to over 7,000 sq.m. Foundation work started in the autumn of 2005, and the building shell was completed this spring despite the long winter. By May 2006, the new building was fully equipped and ready to start production.

Today this investment project stands as a full success, having resulted in major time and cost savings, increased production capacity, and improved working conditions.

## Successful implementation of a challenging pouring furnace project

Following the previous successful installation of an OTTO JUNKER medium-frequency coreless melting furnace plant, the AFC foundry based in Redon/France came back to us with an order for a new heated pouring furnace.

Designed for a total capacity of 8 tonnes and a useful capacity of 6 tonnes, this automatic pouring furnace was intended to replace an existing older installation. It therefore had to be integrated with existing infrastructure and foundry control equipment, specifically with the existing SERT automatic mould filling and sprue cup level control system.



The bottom inductor is flanged into place.

The pouring furnace serves a DISAMATIC moulding line with an average output of 280 moulds per hour (with cores) and 360 moulds per hour (without cores), respectively. The line produces spheroidal graphite iron (SGI) castings for the automotive industry. With pouring weights between 10 and 30 kg, the pouring cycle must be completed within 6 to 10 seconds. For accurate approach to the pouring position the system is equipped with an automatic positioning system and directly linked to the mould conveyor.

The pouring furnace was purpose-designed for its task of holding and pouring treated SGI. It is heated by a bottom-mounted inductor with a 300 kW power rating; the diameters of the filling and pouring siphons were enlarged from the standard size. As a result, the filling siphon allows the unit to be charged with up to 2,000 kg of fresh iron in about 60 seconds' time.

The system was shipped in mid-December 2005, just four months from the order date, and its turnkey erection was commenced right away. Thanks to the high commitment of the erection crews and the outstanding support provided by AFC's experts, the installation was completed before the end of the year. Production was launched in early 2006.

By now the new pouring furnace has successfully passed the rigorous acid test of several months' continuous foundry service.

*Herbert Johnen (Tel. +49 2473 601 250)*

## NEWS

### Extension of the melting shop at Schmiedeberger Gießerei GmbH by OTTO JUNKER

Schmiedeberger Gießerei GmbH, a company of DIHAG Deutsche Giesserei- und Industrie-Holding AG placed an order with OTTO JUNKER GmbH, Simmerath, for the extension of their melting shop. The crucible induction furnaces with a capacity of 5 t and a power of 4 MW each which are already in operation there will be extended by another induction furnace line.

A 3 MW IGBT converter will be used: The converter plant based on the transistor technology has an inherent overload protection

of the electronic components and is easy to maintain due to the low requirements to the cooling water quality.

### Further OTTO JUNKER furnaces for Edelstahlwerke Schmees GmbH, Pirna

Edelstahlwerke Schmees GmbH placed an order with OTTO JUNKER GmbH, Simmerath, for the extension of their Pirna melting shop. Another induction furnace with a capacity of 5,000 kg will be added to the OTTO JUNKER crucible furnaces already in operation there.

A 3 MW IGBT converter will be used: The converter plant based on the transistor technology has an inherent overload protection

## Installation of a complex melting furnace plant at Lezno (Poland) is under way

For the renowned Polish pump factory and foundry at Lezno we are planning and building a complete 'single-source' solution package that involves civil engineering services in addition to equipment supplies for an advanced, powerful melting facility.

The heart of this installation is a DUOMELT system comprising two 12-tonne coreless melting furnaces plus their joint frequency converter system with a rated output of 8000 kW at a frequency of 250 Hz.

To facilitate de-slagging, the furnaces are equipped with a back-tilting mechanism providing stepless back-tilting at angles up to 20 deg. A set of OTTO JUNKER exhaust hoods ensures that the emissions released during operation of the furnaces will be reliably extracted. A modern dust collection system completes the scope of our supply.

The 24-pulse design of the converter system ensures very low system perturbation with high electrical efficiency. Our supply also includes switchgear ventilation equipment.

A Junker Furnace Control System (JOKS) allows the furnace to operate automatically and monitors all equipment functions. It is linked to the existing spectrometer system. In this way the JOKS can calculate all additives based on a chemical analysis of the melt as determined by the spectrometer.

The advanced charge make-up system consists of an automatic crane, the additive storage bins with their discharge conveyors, and two charging chutes. The entire charge make-up process is handled by the JOKS-GATT software suite, which also manages the exchange of data with the charge make-up crane.

It should be noted here that the new charge make-up system also takes care of charge material supply to the two existing coreless-type induction furnaces. Similarly, the JOKS software for the new installation provides the analysis correction and charge make-up computing capability for the existing furnaces.

Our contract even includes the civil construction work for the furnace foundations, the emergency tapping pit, the furnace platform, and the switchgear rooms.

The system is currently being installed and the first items of equipment are being commissioned at the time of writing. We are sure that we will meet Lezno's exacting demands on planning and overall coordination to their full satisfaction, and that the new melting plant will operate reliably and efficiently.

*Rudolf Schwarz (Tel. +49 2473 601 261)*



The 12-tonne furnace under shop assembly.

of the electronic components. The scope of supply also includes the melting processor "JOKS" based on Windows XP as well as an air/water re cooler according to the "glycol-free" principle developed by OTTO JUNKER.

### More heated and unheated pouring equipment goes to La Fonte Ardennaise in France

The French foundry La Fonte Ardennaise has entrusted OTTO JUNKER GmbH, Simmerath, with the order for a stopper-controlled pressurized pouring furnace for cast iron as well as for an unheated stopper-controlled pouring unit for spheroidal graphite iron (SGI) that will be equipped with a Junker laser control system. The furnaces are intended for installation on an

indexing flaskless moulding line. Both furnaces can be hydraulically moved in two directions. The pouring units are filled out of transport ladles with the aid of a forklift truck.

OTTO JUNKER pouring equipment has been successfully in use for years at this French foundry.



## Heat treatment of aluminium plates for the quenching lines ensure unsurpassed quality

Horizontal heat-treatment lines for aluminium plates are an important enabling technology in the manufacture of high-grade structural aircraft components made of aluminium. For OTTO JUNKER, extensive product development and the resulting customer benefits have been rewarded by order bookings for four horizontal plate annealing systems from European, U.S. and Chinese customers within just 10 months. Three of these

lines will be delivered with indirectly gas-fired furnaces, one furnace will be equipped with direct electrical heating.

Hot-rolled plates of age-hardenable aluminium alloys are heat-treated to maximize strength while ensuring an adequate yield behaviour and good corrosion resistance. Depending on the envisaged application, plate dimensions may range from 2 to 406 mm in thickness, 0.8 to 3.4 m in width, and 2 to 36 m in length.

The maximum weight of each plate is limited by the rolled slab, varying theoretically between 10 and 19 tonnes, depending on the manufacturer.

A furnace load may consist of one single plate or of an envelope of plates. In case of an envelope there may be several plates arranged side by side and/or one behind the other. The loads are made-up on the feeding roller table, normally

with the aid of a crane with suction cup lifting equipment.

Solution annealing furnaces are either indirectly gas-fired or directly electrically heated, depending on the available energy source. Heat is transferred to the load by high convection. Jet impingement systems are used to apply the atmosphere at high velocity to the plate top and bottom surfaces through an array of nozzles. This ensures rapid and uniform heating. The plates are conveyed through the furnace on stainless steel brush rollers to minimise mechanical contact. During heat-up and holding, the plates oscillate in the furnace at slow speed, i.e. the furnace operates in discontinuous mode. The use of natural gas as an energy carrier for heating industrial furnaces is now very widespread. Reliable and cost-efficient combustion systems are available from several manufacturers.

When it comes to solution-annealing furnaces for aluminium plates, a key challenge for the industrial furnace manufacturer lies in optimizing the atmosphere flow regime and gas heating conditions for the requisite very narrow temperature tolerances in the furnace chamber. Applicable standards for annealing aluminium plate for the aircraft manufacturing industry merely specify tolerances of  $\pm 3$  K. Plant operators, on the other hand,



ALPROM heat treatment line.

## NEWS

### Aluminium foil recycling in a coreless induction furnace

At Comital in Valpiano/Italy, a 5.5-tonne medium-frequency coreless induction furnace built by OTTO JUNKER is used successfully for melting down aluminium foil. The furnace system has a 1,500 kW power rating and operates at a frequency of 70 Hz. Bales of pure aluminium foil, containing up to 2 % rolling oil residue in some cases, are charged into the

furnace intermittently using a belt conveyor. The unit is started with a liquid heel of about 50 %. The bales are embedded in the molten metal of the heel and melt down smoothly. The bath is kept covered with bales at all times; the meniscus is not visible until close to the end of the heat.

The vapours produced by the combustion of rolling oil are fully captured and extracted by the hood extending over the furnace.



## aviation industry – advanced annealing and

often require tolerances of  $\pm 2$  K or even  $\pm 1.5$  K within the typical 400 - 600 °C temperature range for reasons of process reliability. Close temperature tolerances in the furnace atmosphere ensure that temperature tolerances within the plates will likewise remain within narrow limits, so that high solution annealing temperatures providing the appropriate metallurgical benefits can be achieved without any risk of local overheating.

To avoid an exposure of the load to off-gas impact and possibly resulting surface reactions, indirect heating with radiant tubes is preferred. The radiant tubes employed are of the "double-P" design and are manufactured in-house by Otto Junker. Given the high process temperatures, it makes sense to use burners with a built-in recuperator since this will provide higher thermal efficiencies of close to 80 % and hence, a reduced gas consumption. Each burner with its radiant tube, forming one unit, is assigned its own temperature control zone.

The quality of temperature distribution in the furnace chamber is directly related to the quality of atmosphere flow control. The multi-dimensional flow field can be modelled with adequate precision using appropriate software. These simulations can be used to derive improvements which can then be validated through further computer modelling and, ultimately,

measurements on true-to-scale flow models. This is done in close cooperation with the Technical University of Aachen's Institute of Industrial Furnace Engineering. An example of such a flow simulation is shown in the following illustration.

Upon completion of the holding cycle the plates are passed very quickly through the main quench section on rollers.

The high quench rates required for metallurgical reasons are achieved by spraying water from a nozzle system uniformly onto the plate surfaces. The quench operating point can be flexibly adapted to the plate thickness and alloy type and is separately adjustable for the top and bottom side of the plate. Apart from providing the specified quench rates, this design makes it possible to keep residual stresses and hence, plate distortion, within the approved tolerance limits. The low residual stress levels achieved in the plate provide many benefits in subsequent machining operations.

The load then passes an after-cooling zone which is likewise equipped with water nozzles. Here the plate temperature is reduced to match the requirements of downstream processes. This after-cooling section is attached directly to the quench. Thin plates pass continuously through the after-cooling section at low speed, whereas heavy-gauge plates are oscillated during the after-cooling cycle.

Upon completion of the cooling process the load passes through the blow-off and drying section, again travelling on rollers. In this section, surface water and moisture are removed from the plate surface by powerful jets of air.

The solution-annealed and quenched plates are then lifted off the unloading roller table and fed to the respective stretching and ageing stations.

The line is operated and controlled by a PC-based process visualization system combined with a PLC and local operator terminals. Variable frequency drives and sensors are connected to the PLC via bus systems wherever possible. All relevant process data can be stored in a data base and can be retrieved for production or documentation purposes or for analysis. A modem is fitted to facilitate remote diagnostics as part of the after-sales service.

The picture shows a heat-treatment line delivered to ALPROM in Slatina/Romania that is currently awaiting the successful completion of on-site commissioning procedures. Throughout the acceptance tests, exacting aircraft industry quality demands as set forth in AMS 2750 D, AMS 2772C and AMS-H-6088 standard specifications will be met reliably.

*Harald Lehmann  
(Tel. +49 2473 601 322)*

An energy input of only 520 kWh/tonne is needed to melt down the bales and heat the melt to the specified temperature of 750 °C.

The refractory lining consists of a corundum-based dry ramming compound. Since no dross accretion occurs, the laborious process of cleaning the crucible walls is eliminated. Thanks to the overall low dross formation rate it is not even necessary to skim the bath surface.

These features, combined with more than six months crucible lifetime at a throughput of 5,000 tonnes, testify to the high

suitability of this coreless induction furnace for melting down baled foil.

### **SUAL GROUP Company awards contract for a heat treatment line to OTTO JUNKER**

The Russian company KAMENSK URALSKI METALLURGICAL WORKS, a member of the SUAL GROUP, has placed an order for a heat treatment line for aluminium strip coils and aluminium sheet stacks with OTTO JUNKER. The system comprises two batch furnaces with

protective atmosphere re cooler, one charging machine, two loading stations and a protective atmosphere generator.

The strip coils and sheet stacks, varying widely in configuration and size, are heat-treated by the high-convection method in a protective gas or air atmosphere. High-pressure recirculating fans and nozzles designed specifically for this application direct the atmosphere onto the product at high velocities by the jet impingement process. The resulting high-convection heat transfer minimises the coil heat-up and soaking times.

# OTTO JUNKER extrusion in action

## Upgrade of an extrusion line at Alcoa Drunen (The Netherlands)

OTTO JUNKER EXTRUSION stands for sophisticated, comprehensive planning and execution capabilities when it comes to the "single stop" supply of integral equipment systems for the production of aluminium sections.

A demanding solution for a revamped billet preparation system based on newly developed equipment has been devised and successfully implemented in joint enterprise by the planning and design teams of the OTTO JUNKER Group i. e., ELHAUS, OTTO JUNKER U.K., and OTTO JUNKER Lammersdorf.

The project specification submitted by Alcoa Drunen had called for a substantially more flexible and cost-efficient billet preparation capability while stipulating the continued use of an existing OTTO JUNKER multi-billet induction heater and of the existing extrusion press. The overall package comprised all equipment needed to store, join and cut to length 8" dia. aluminium logs.

The detailed project work had to address all issues relating to the new system's layout and integration into the existing infrastructure and plant control functions. A meticulous definition of inter-

faces was part of this effort. Since the upgrade called for the use of newly developed equipment such as an innovative log welder, a test series with billets processed by the new technology was part of our scope.

The upgrade specifically comprises the following equipment

- horizontal log magazine
- log feeder
- log welder
- log saw
- billet cross conveyor

in addition to the plant control system with the appropriate software.

Apart from the log welding machine mentioned earlier, the project involved the use of another new development, viz., an innovative cut-to-length saw designed entirely from scratch.

The innovative feature of this saw lies in the fact that it relies on two saw blades instead of one, thereby reducing the kerf width. Thus, the material loss associated with the cut-to-length operation can be reduced to 60 %, with substantial savings being achieved as a result. The purpose of the log welder is to join logs so as to eliminate the tiresome management and/or optimization of odd ends in the future. For the welding process, two rotating heads similar to milling cutters are manoeuvred into the gap between two logs to melt the aluminium material. The milling heads are then swivelled through 45 ° to heat the metal at two more points. As a result, a strong joint is produced without any use of welding filler metal.

The first such log welder/cold saw combination has been employed successfully at Alcoa Navarra, Spain.

Installation of the new equipment commenced in December 2005. Following completion of the installation and fine-tuning phase, the system has successfully passed its performance tests.

*Bernd Gier (+ 49 2473 601 402)*



The new saw in operation.

## NEWS

Compared with the conventional (mass flow based) atmosphere recirculation technology, this system achieves higher throughputs while reducing power consumption rates in terms of both the heating medium and protective gas input.

### **OTTO JUNKER single-billet induction heaters based on transistorized converter technology conquer the market**

For reheating extrusion billets, single-billet induction heaters based on transistorized (IGBT) converter technology are rapidly gaining market share because of their numerous user benefits.

Several orders recently received from Korea and Germany call for the supply and installation of single-billet heaters with four separately controlled coil sections. Our advanced converter technology does not merely provide an infinitely variable power control of the individual coil sections but also allows the full power input to be focused on the active coils after individual coil sections have been shut off, e.g., for heating a short billet.

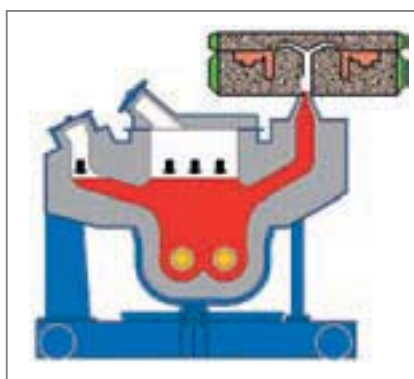
The heaters are designed to heat aluminium billets of 234 and 178 mm diameter and have a power rating of 740 and 700 kW, respectively.

## Innovative INDUGA low-pressure pouring furnace for sand mould casting stands the test of time

The world's first automatic low-pressure pouring system for sand casting of heavy metals on a high-performance moulding line is an impressive success, having been in uninterrupted operation since late 2004.

In process engineering terms, a low-pressure pouring system is characterized by the fact that the molten metal is forced into the open mould from below. Compared with gravity casting, the low-pressure method offers a number of important advantages:

- Reliable, simple and tight mould-to-nozzle docking action;
- Adaptable pressure build-up for active control of mould-filling characteristics;
- High dosing accuracy based on pressure and (where applicable) level control;
- Essentially laminar mould-filling flow;
- Clean melt supply without oxide inclusions.



To deliver molten metal to a high-performance moulding line, the furnace system must meet a number of requirements:

- Pouring operation to be synchronized with the operating cycles of the moulding line;
- Long-term stability of pouring process to be ensured;
- Topping-up with molten metal to be possible with the moulding line running;
- Different flasks to be detected automatically and supplied with molten metal individually.

Designed for 180 flasks per hour, the moulding line receives its molten metal supply from two low-pressure pouring furnaces.

The furnaces operate on an alternating schedule to avoid interruptions in pouring operation when topping-up with metal from the melting installation. For filling the mould, a robot takes a flask from the line and positions it on the furnace pouring nozzle, through which molten metal is then forced into the mould from below. Upon completion of the mould filling cycle the robot returns the flask to the moulding line. The entire operation takes only 20 seconds to complete.

The mould-filling process can be easily optimized since it is controllable via the filling pressure. A laser sensor ensures that drifts are compensated and the mould is filled precisely and reproducibly. The furnace is equipped with a channel inductor providing an accurate temperature regime while minimizing energy consumption.

Since the new system has been in continuous production service ever since its commissioning date, its high economic efficiency and process reliability have been amply demonstrated. Casting qualities have improved, and the percentage of returns has dropped dramatically.

The pouring furnace technology developed by INDUGA for low-pressure casting lines is used for thin-section steel castings. A pouring furnace with flange-mounted coreless inductor is employed in this application. The same type of furnace is also employed for a grey cast iron line currently being installed. Although the development of this process for steel and grey cast iron is still in its infancy, all forecasts point to its successful and promising future.

*Dr. Hans Bebbler (+ 49 221 957570)*

### NEWS

#### **OTTO JUNKER Group supplies a complete melting and pouring installation to Tongling Tongdu Brass Bar Co., Ltd. (China)**

For a 3-strand brass billet casting line, the OTTO JUNKER Group will supply both the melting furnaces and the custom-designed pouring furnace. Return chips will be melted down in a powerful 10-tonne medium-frequency coreless furnace with a 2,400 kW power rating. For lumpy charge material, two channel-type induction furnaces are to be provided. The channel-type furnaces have a useful capacity of 6 tonnes and a nominal power rating of 1,400 kW.

An ramified launder system transfers the molten metal from the respective melting unit to the pouring furnace.

The pouring furnace is a special INDUGA design to feed a horizontal-type continuous casting line supplied by SMS Meer. The furnace is pressurized such as to maintain a constant bath level and uniform pouring parameters. Further advantageous design features include the separate charging and pouring chambers and the capability for easy replacement of the continuous casting moulds flanged directly to the furnace.

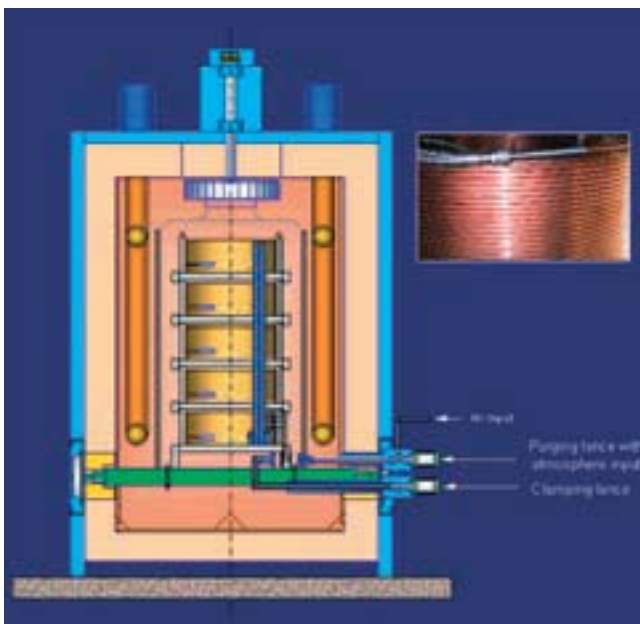
The furnace is equipped with a 250 kW channel inductor integrated between the chambers and has a useful holding capacity of 14 tonnes. Its maximum pouring rate is 12 tonnes/h. Delivery of these furnaces is scheduled for mid-2006.

## Elektrosan (Samsun/Turkey) has recently awarded the contract to supply a new bright annealing roller hearth furnace

As part of their expansion programme, Elektrosan approached Otto Junker with an enquiry for a bright annealing furnace for copper products. The furnace was to be capable of heat treating a variety of materials from level wound copper tube coils to straight length copper busbars up to 6 m long.

In order to accommodate the wide range of materials, OTTO JUNKER offered and secured the contract for an adapted version of their successful copper tube annealing roller hearth furnace which meets the requirements of Elektrosan.

The furnace comprises of an entry table, entry end vacuum chamber, entry vestibule, high convection furnace, high convec-



Schematic diagram of the CTP system.

tion cooling zone, exit end vacuum chamber, exit table together with all necessary electrical and process control equipment. The entire line is controlled automatically by a PLC and it will be possible to run the complete system, including loading and unloading with one operator.

In addition, the furnace will also be supplied with the OTTO JUNKER Copper Tube Purging System (CTP system). The purging system is used for the production of the so-called "super clean" tube used in the ACR industry.

Two level wound coils will be loaded onto a tray which in turn will be stacked up to three per stack. The coils are then attached to the distribution manifold of the CTP system. The stacks are then transported via the entry vacuum chamber through the furnace where the coils are not only annealed but are purged with clean inert gas. This process expels any vaporised lubricating oil which may be present in the bore of level wound ACR tubes resulting in cleanliness levels below the internationally specified values.

The furnace is due to be installed and commissioned towards the end of 2006.

This contract is the latest in a long line of furnaces which OTTO JUNKER has supplied to the copper tube industry and is a clear indication of the company's continued commitment to serve the industry.

*Monika Mertgens (Tel. +49 2473 601 508)*

## NEWS

### Complete continuous strip processing line for NINGBO JINTIAN COPPER (China)

NINGBO JINTIAN COPPER, a major Chinese manufacturing group, has entrusted OTTO JUNKER with an order for a complete recrystallization annealing and surface treatment line for copper and copper alloy-strip.

The strip of 0.1 to 1.2 mm in thickness and 300 to 440 mm in width will be automatically conveyed through the double-deck system at a speed of up to 50 m/min. A special welding machine reduces strip joining times and hence, the duration of the coil changing cycle.

Before the strip is heat-treated in the horizontal-type flotation furnace, it is cleaned in a degreasing section. Downstream of the annealing process the product undergoes pickling and passivation.

Decoiler and recoiler, accumulator towers and an advanced switchgear system serving the furnace and associated equipment round out the scope of our supply.

Design work is currently proceeding at full speed on this project. The line will be delivered in cooperation with OTTO JUNKER's subsidiary in China, the Shanghai-based OTTO JUNKER METALLURGICAL EQUIPMENT.

# PCGuss ERP system successfully introduced

## Tailor-made software solution handles key commercial and technical business processes for the foundry

Today's business management processes call for a continuous improvement of efficiency and quality levels, expansion of technology leadership and reduced turnaround times. The ability to map and control these important functionalities with the aid of process controlling tools is therefore a priority objective.

Process controlling implies the acquisition, analysis and evaluation of business management and manufacturing data. Such information is indispensable for establishing the parameters needed to depict production workflows transparently from both a commercial and technical viewpoint while reliably detecting non-conformances at every process step. To be able to map all process steps and workflows comprehensively, it is necessary to plan and monitor operations with a high degree of detail – from sales to costing and production control through to operating data feedback and shipping. Conventional methods such as card-index filing, spreadsheet software, etc., have proven inadequate when it comes to ensuring an effective management of such complex, interrelated tasks. Indeed, these challenges can no longer be addressed in a target-oriented manner without an enterprise resource planning (ERP) system catering to the specific requirements of the foundry operator.

The demands to be placed on a foundry-specific ERP system are manifold. Apart from the above-described need to map processes and workflows, the system must be able to provide the following:

- determination of key business management and process engineering parameters;
- optimization of job turnaround;
- fast response to problem situations;
- continuous cost controlling;
- near-real-time result monitoring.

These capabilities are indispensable for ensuring the high degrees of delivery, costing and pricing reliability expected in the industry today, for the benefit of both customers and foundry operators. Without a planning and information system geared to perform these tasks, it is impossible to achieve the above targets.

The next step, therefore, was to select the most suitable system for our purpose and to find a suitable partner who would be familiar with the foundry-specific technology context while possessing the ability to implement system functions in a practically effective and consistently simple manner, compatible with day-to-day operating needs.

The PCGuss software suite marketed by BRAUN Software & Systeme GmbH meets all of the above specifications. It also pro-



vides a capability for developing specific software/program tools in cooperation with the foundry.

This ERP system essentially comprises the following tools:

1. Sales  
Quotations, orders, shipping, invoicing, complaint handling
2. Job control/scheduling  
Production planning, parts lists, capacity management, turnaround scheduling, load profiles, manufacturing status
3. Costing/pricing  
Costing estimation/pricing for quotations and orders, actual costing
4. Quality management  
Material standards, test/inspection plans, certificates
5. Operational data  
Weekly programs, feedback, master data
6. Materials management  
Enquiries, purchase orders, stocks, inventory management
7. Information management  
Key parameters, ratios/indices, statistics
8. Financial/fixed asset accounting  
Cost accounting, human resources management

Once the software was implemented, it turned out to be easy to integrate with our operational structures. Where specific adjustments were necessary, these took only a minimum of time and cost to complete. Individual program sections were customized in cooperation with the software supplier, and by now the system has evolved into an indispensable instrument in day-to-day foundry operations.

*Dr. Elmar Westhoff (Tel. +49 2473 601 400)*

# OTTO JUNKER acquires majority interest in INDUGA

## Ideal supplement to the company's product portfolio for the non-ferrous metals industry

As per January 1, 2006, OTTO JUNKER GmbH acquired a majority interest in INDUGA Industrieöfen und Gießerei-Anlagen GmbH & Co. KG.

This commitment marks a further step in the OTTO JUNKER Group's strategy of rounding out its product portfolio along the entire process chains of the aluminium and copper-based alloys, cast iron and steel industries.

As a foremost player in the planning and construction of special-purpose foundry equipment, INDUGA will supplement the OTTO JUNKER Group's competence and market presence in the non-ferrous

metals market in an ideal manner.

As a technology leader in induction furnace systems for melting and pouring copper and its alloys, INDUGA offers unsurpassed customer-focused process solutions based on technically mature products known for their high levels of functionality and quality workmanship. The company is a world leader in pouring furnaces for horizontal continuous casters and chip recycling applications and has developed new process engineering solutions for the production of oxygen-free copper. In addition, INDUGA possesses innovative products for iron casting and molten iron transport applica-

tions. In the aluminium sector, it has implemented a large number of customer-focused solutions relying on its proprietary induction-heated melting and pouring technology.

INDUGA will thus bring a valuable addition to the OTTO JUNKER Group's existing range of products. Its extensive expertise in the field of process management and control is bound to strengthen the OTTO JUNKER Group's position as a full-range system supplier and specifically, as a partner providing engineering services.

## OTTO JUNKER Group

*Global and Close to the Customer*



### IMPRINT

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