

Major order for Gräbener Maschinentechnik

Global Pipe ordered seven machines for a new pipe mill in Saudi Arabia



Ahmed Al Khonaini, Managing Director of Global Pipe and the two Managing Directors of Gräbener Maschinentechnik, Dr. Theodor Gräbener and Dieter Kapp (from left to right) signed the contracts for the delivery of six machines for the pipe production. An additional 4-roll bending machine has been ordered by Global Pipe just recently.

In May, Gräbener Maschinentechnik GmbH & Co. KG secured the major order to deliver six machines with a total value of more than 20 million Euro to the company Global Pipe in Jubail,

Saudi Arabia. Just recently, the company has decided to extend the order volume and ordered an additional modern 4-roll bending machine for the new pipe mill.

The initial order, which received considerable national and international media coverage, comprises the manufacturing of one 5,200 ton bending press, one post-bending press,

one continuous root taking machine, one end beveling machine as well as one long and one circumferential seam milling machine. Global Pipe, a Joint Venture of Saudi Arabian investors, Saudi Steel Pipe Company and Erndtebrücker Eisenwerk GmbH & Co. KG (EEW) intends to utilize these machines in the completely new pipe mill – one of the most modern pipe mills worldwide. The new pipe mill will produce LSAW pipes with diameters of 16" to 62" and wall thicknesses of 8 to 51 mm for the oil and gas sector, but also for on- and offshore industries. The production capacity shall be 200,000 tons per year for the supply of the local market.

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Electrical engineering is booming

Kleinknecht subsidiaries in Lohfelden and Ilmenau unaffected by the crisis

The worldwide economic crisis seized and still seizes many German companies. H. Kleinknecht GmbH & Co. KG is one of the few companies which remained almost unaffected by the recession and did not need to resort to stabilizing measures like short-time work. Surprising, since the automotive industry, which has been hit especially hard by the crisis, makes up a substantial part of Kleinknecht's business, especially for the teams in Lohfelden near Kassel, and Ilmenau. "The last three contracts alone

are worth 6.5 million Euro," reveals Harald Tiede, Managing Director. Contract 1: WINGAS GmbH & Co. KG entrusted the specialists of electrical engineering with the installation of the electric system for a gas compressor station south of Berlin. This is a project which is closely linked to the Baltic Sea pipeline of Nord Stream AG.

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VW China ordered nine gear test benches DQ 200.



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The RingSaw is a genuine whirlwind

"The RingSaw has come like a real bombshell." It seems as if Andreas Zimball, Sales Director at Reika, has been taken by surprise by the tremendous demand for the new whirling machine for tubes and bars. "Not really," he says with a smile. "From day one, the product has been far too convincing for that." **continued on page 4**

Graebener group acquires Schuler real estate

On September 30, the managing directors of the Graebener Group signed the contract with Schuler Hydroforming for the acquisition of the real estate in Wilnsdorf-Wilden as well as for the purchase of one 10,000 ton and one 2,500 ton hydroforming press. The plans of the Graebener Group with this investment will be reported in the next edition of "update".

Editorial

Dear customers,

2010 started as year of the crisis and the acute decrease of the incoming orders in 2009 was expected to lead to an employment problem. In particular the machine and apparatus construction was expected to reach rock bottom mid 2010. But the economic recovery with increasing incoming orders happened sooner than expected.

Since March of 2010, we too have been experiencing this increase of incoming orders. The demand for our principal field of business, the production of large SAW pipes, remained undiminished in the market and we were able to secure a major order of the newly founded Saudi Arabian company Global Pipe.

The automotive industry and its suppliers have stabilized again as well and have almost reached the same employment level as before the crisis. For the Graebener Group, this stabilization has led to new orders for presses and gear test benches.

Over the last months, we have put much effort in the further development of our technology. Since the beginning of this year, we have applied for seven new patents. Two patents have been granted so far for an innovative plate crimping press and the cooling of a fuel cell.

Our goal is to keep in close contact with our customers. Therefore we have increased our presence at exhibitions. In 2010 we were able to conduct in-depth discussions with customers during the TUBE in Düsseldorf, the Hanover Fair, the exhibition Oil & Gas in Rio de Janeiro, the TUBE in Shanghai and the exhibition F-Cell in Stuttgart. In October our company will be exhibiting at the EuroBLECH in Hanover.

We are also noticing that the sector of fuel cell technology is getting more and more attention again – especially in the aircraft and automotive industry. We are confident that electric cars of the future will not need to be charged at sockets but rather will generate their own energy with the aid of fuel cells. Only the fuel cell for the range extension of electric cars to 500 to 600 km will be the breakthrough of this innovative drive technology using sustainable energy.

We would like to thank all our customers who have given us the opportunity for in-depth discussions in 2010. Your requirements are a welcome challenge for us and your communication of these challenges enables us to evolve our technological level and supply innovations based on cooperation and partnership.

Thank you for trusting in us.

Yours sincerely,

Dr. Theodor Gräbener



Kleinknecht secured orders of strategic significance

Control development for two large strip lines

Furnishing two strip lines with electric controls and drive systems was comprehensive and just the cup of tea for H. Kleinknecht & Co. GmbH.

The task was to equip a lithographic line of an Asian aluminum manufacturer with the complete electric control, or rather the complete coil handling with its high degree of automation. Before it was possible to carry out the start-up, 15,000 hours had to be spent on

15,000 hours of engineering and manufacturing works

the engineering and manufacturing works. During this time, up to six Kleinknecht employees were responsible exclusively for the software and drive technology on site. The order volume was correspondingly large. Christoph Hauck, Managing Director of Kleinknecht, confirms the volume to be well into a seven-figure sum.

Because the company had furnished another lithographic line with the entire automation technology a

short time prior to securing this order, the experience gained from this line could be incorporated into the new order. Hauck: "The result was that we were once again able to reduce the times spent and to extend the task fields."

Kleinknecht has expanded its customer base with yet another order: Furnishing a slitting shear with the electric control

for the cutting of coils into smaller strips. Christoph Hauck considers this order to be "a milestone of strategic significance", since the contract was awarded by no other than the ThyssenKrupp Group. In contrast to the lithographic line, which is entering the start-up phase these days, the slitting shear has already been successfully put into operation.



Kleinknecht equipped a slitting shear similar to the one pictured above with a new electric control.

Retrofit of dust extraction system within six days

H. Kleinknecht & Co. GmbH has recently secured an order from an internationally renowned roll manufacturer to retrofit a very comprehensive dust extraction system used for the exhaust

air treatment of an arc furnace. This order for a purely electrical retrofit was placed with Kleinknecht due to a supplier's decision to phase out the PLC components. Within only six days the system with approx. 1,500

I/O points was retrofitted to the new technology without having to carry out a new I/O check. In this case, an intelligent adaptor solution for the new I/O cards was the key to success.



The incredible dimensions of the panels which are joined by the Gräbener TWP® system (blue and yellow in the background of the picture,) become evident when comparing the size of the machine to the size of the person (on the left of the picture).

Building the TWP® system has been yet another milestone in the short history of Gräbener Maschinentechnik. After all, the new TWP® system is the world's largest of its kind. The technological challenge was the design and the manufacturing of the two laser traverses in longitudinal direction. In contrast to the one-piece cross traverses, the laser traverses consist of three parts and span the entire system. Therefore, the welding carriage can move along the traverses in order to join the long plate strips. Each longitudinal traverse has a length of 43.5 m and weighs 73 tons. Despite these dimensions, and even when the welding carriage is moving along the traverses, they only show a deflection of max. 0.75 mm. This guarantees most accurate welding results. Most accurate welding results, which are necessary for a modern shipyard in the face of the fierce competition in the shipbuilding sector.

The world's largest fabrication system

Gräbener Maschinentechnik builds centerpiece of the new pre-fabrication for the Meyer shipyard

The dimensions of the system are quite impressive: it weighs approximately 1,400 tons and covers a surface of approximately 2,300 m².

The purpose: fabrication of ship deck sections with a size of 30 by 25 m, that is 750 m² at the Meyer shipyard. Manufacturer of this gigantic machine is the company Gräbener Maschinentechnik GmbH & Co. KG.

It was not by accident that the renowned Meyer shipyard in Papenburg reverted to Gräbener when looking for a manufacturer for the new pre-fabrication. Ten years ago, Gräbener built a similar TWP® system for the shipyard. A system for the fabrication of ship deck sections – however, only up to a size of 400 m² (20 by 20 m). TWP® is the abbreviation for "Tailor Welded Plates".

Custom- or better tailor-made being the key word. Individual plates of various thicknesses and materials are joined to a large panel, which eventually makes up the exactly tailored floor or wall of a ship deck. Or rather, a small part of a ship deck, since

at the Meyer shipyard, ships are built from a few dozen partial decks. This type of shipbuilding is called "Lego principle".

The Gräbener TWP® system is the centerpiece of the pre-fabrication. Here, the individual incoming plates have the relatively modest dimension of 3.3 by 12 meters. As a first step, their edges are milled. Afterwards, the plates are joined to large sections using the laser-hybrid welding process. The machine's most ingenious feature is the simultaneous milling of two plates. This process ensures identical and thus optimum welding edges, a main prerequisite for perfect welding results.

The first plate is transported through the cross milling machine

to the outfeed side where it is positioned and clamped with the aid of 3D camera systems. A second plate is similarly positioned and clamped on the infeed side so that the milling head can process both plates. Right after that, the two plates, which are still clamped, are moved together and joined using



Milling the clamped plate edges provides an optimum preparation for the welding process

the laser-hybrid welding process – highly accurate, without errors and, of course, fully automated. A time- and money-saving method, given the fact that, without the disk laser, the panels would also need to be welded from the other side, which – in view of the panel size – would mean an enormous effort.

After the individual plates have been joined to a longer strip, the longitudinal plate edge mil-

ling machine is applied similarly to the cross milling machine in order to join these individual plate strips with a length of up to 30 meters to deck sections with a size of up to 750 m² and a weight of up to 90 tons.

Broadened pre-fabrication

When the Meyer shipyard decided to build another production line in April 2008, this line was meant to fabricate ship deck sections with a width of 20 m. However, in summer of 2008, the width of 20 m was increased to 30 m and the maximum deck section size of 400 m² was increased to 750 m². One reason for this enlargement is the broadening of the Panama Canal, which allows the passage of larger ships. The shipyard located in the Emsland region of Germany has been building ships of the "Post-Panamax-Series" since 2008 anyway. By

fabricating larger panels, the number of partitions and thus material, weight, fuel consumption etc. is decreased. Similar to the automotive industry, the subsequent operating costs are minimized. This is made possible by the technology of "Tailor Welded Plates" (TWP®), that is the joining of plate panels made of various materials and thicknesses depending on the requirements – for example requirements due to the statics of the ship's hull. Top priority: The panels are to be as thin as possible and only as thick as necessary.

The RingSaw is a genuine whirlwind

The new Reika machine generation reduces tool costs by up to 80 percent

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He was not the only one convinced, but several (potential) customers as well. Already at the exhibition TUBE in April of this year, the fully operational RingSaw was in continuous use and constantly surrounded by a crowd of interested visitors. They marveled at the concept of the cutting ring whirling around the work piece. This new concept – in comparison with conventional carbide saws – leads to a reduction of tool costs by 50 to 80 percent while at the same time increasing the performance by 30 to 60 percent. Meanwhile, the first user reports have arrived confirming these amazing figures – even exceeding them. “We are talking about six-figure amounts that can be saved each year”, Zimball explains. “This means that the investment for our RingSaw pays off after just three or four years.”

A very powerful sales pitch such a short time after the worldwide economic crisis, a time where all costs are being scrutinized very closely. Yet another argument: “No customer will be used as guinea

pig”, Zimball emphasizes. While it was true that the RingSaw was a completely new machine line for the cutting of tubes, profiles and bars, the machine also was a result of vast experiences gained from the well established lines of a similar concept. Therefore, the machine was “far from being a prototype, but rather the pioneering enhancement of a well proven concept”.

A well proven concept originating from one of Reika’s German competitors, the company Procon. In 2009, Reika acquired the Procon lines. Based on the already existing Procon whirling machines and making use of the vast engineering capacities within the Graebener Group, Reika then developed the RingSaw.

By now, the first customer reports on the RingSaw have arrived: a renowned German manufacturer of rolling bearing rings was able to reduce the tool costs by up to 80 per-

cent while at the same time increasing the performance by 30 to 60 percent when using the RingSaw instead of a conventional carbide saw for the following work piece characteristics: material grade 100Cr6, pre-hardened, a tube diameter of 73 mm and a wall thickness of 12,6 mm. Zimball: “This result exceeded all expectations

of the manufacturer.” After conducting a comprehensive series of tests, a leading manufacturer of rolling bearing steel from Scandinavia confirmed the above mentioned results. According to Zimball, this company used enhanced tools and various tool technologies for these tests. Something that was easily done, since the

RingSaw is equipped with an optional automatic tool changing device in order to reduce manual handling and to increase availability. “It is a proven fact that the quality of the rolling bearing rings produced on the RingSaw is far superior”, Zimball summarizes the test results. Further tests with cutting tools of various designs

brought equally impressive results: “In terms of absence of burr, surface quality, rectangularity etc., RingSaw machines are unparalleled.”



The main advantages of the RingSaw are the reduction of costs and the much faster cutting process.

Gräbener Maschinenteknik will be exhibiting at the EuroBLECH

New trends and innovations at booth G14 in hall 11

“Time for innovation!” This is the slogan of this year’s EuroBLECH in Hanover from Tuesday, October 26 to Saturday, October 30, 2010. Gräbener Maschinenteknik GmbH & Co. KG will seize this opportunity to exhibit their innovations and latest developments at booth G14 in hall 11 during the largest exhibition for plate processing worldwide. There is no lack of innovations at Gräbener Maschinenteknik, a fact which is easily proven by



The World’s No.1

looking at the vast and unparalleled product range of the company: Plate processing technologies for various industrial sectors – from huge ship deck sections to very small separator plates with only a few square centimeters – will be presented at the Gräbener booth of this year’s EuroBLECH in Hanover.

In addition to this, a genuine premiere will be waiting for the visitors. As can be seen on page 8 of this “update” edition, the companies Gräbener Maschinenteknik, Fontijne Grotnes and Weldec have formed a Joint Venture for the development and construction of complete pipe mills – starting with the plate edge milling machine and the forming of pipes, continuing with the welding processes and finishing with the expander.

Electrical engineering is booming



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“In order for the gas to reach the customers over a distance of several thousand kilometers, it has to be compressed within the pipeline at intervals of 200 kilometers,” explains Harald Tiede. Kleinknecht was awarded the contract because the Hessian company, due to the vast know-how gained during many years of planning and constructing gas compressor stations, is an expert for an optimum gas flow.

Kleinknecht Lohfelden, which, by the way, is a subsidiary of

Latest project: gear test benches for Audi R8 and Lamborghini

the Siegen based H. Kleinknecht & Co. GmbH, has gained equally impressive know-how in the field of the construction of test benches for twin clutch gearboxes. According to Harald Tiede, more than 50 of these highly specialized test benches have been built, including the nine new test benches carrying the

product name DQ 200 (transverse twin clutch gearboxes up to a torque of 200 Nm). The company builds these test benches (Contract 2) for VW in China. “There is also an option for nine additional test benches, which is valid until March”, adds Harald Tiede.

And that is not all. Kleinknecht has also secured a completely new project. In future, the sports cars of the VW Group – Audi R8 and cars of the brand Lamborghini – are also to benefit from the gently shifting semi-automatic gearbox. Therefore, the company of the Graebener Group – after already having fostered the development – now has been entrusted with building a test bench for these sports cars as well. The maximum torque to be tested is 800 Nm!

Even though Kleinknecht Lohfelden, together with the Ilmenau team, is currently “working at a capacity of 110 to 120 percent”, Harald Tiede is expecting many more orders, both from existing and from new customers. “For

one thing, I believe that our customers are satisfied with our work. For another, former big players in the sector of electrical engineering, such as Cegelec, Moeller or Siemens, are withdrawing from the market. This opens up new possibilities for us.” Flip side of the coin: Kleinknecht too is affected by the shortage of skilled workers.

Nevertheless, Harald Tiede is certain that the sales target can be achieved. Considering that the sales target is between 12 and 14 million Euro, the subsidiaries in Lohfelden

and Ilmenau have already generated half of this revenue for the year 2011.

Kleinknecht received the order for the installation of the electric system for a gas compressor station from Wingas.

Keyword: Compressor station

On the long way to the customer, the gas pressure decreases constantly, especially because of the molecular friction within the gas flow and at the pipeline walls. Inside the compressor station the pressure is increased again. In concrete terms: the gas is compressed in the compressor station, the gas flow volume is reduced and more natural gas can pass through the pipeline.

Gräbener staff competes in company run

Mainly fun, but also team spirit and promoting health, these were the main motivations for roughly one third of the Gräbener Maschinen-technik staff to once again compete in the “Siegerländer company run.” Months prior to this event, the first runners and walkers started to meet regularly in order to increase their fitness. With much success: Following the

slogan on their jerseys – “We can and we do” – they mastered the course of 5.5 kilometers well, with respectable finishing times, by no means ranking behind those of the other 7,400 runners. The Gräbener athletes

proved to be a great team – in sports as well as at work.





The 3-roll bending machine is a multi-talent – for the bending of pipes and shells, vessels, apparatuses and even cones.

Genuine multi-talents

Gräbener's 3-roll bending machines form plates to pipes and cones without changing rolls

Multi-talents are sought after, because they are versatile and because they can be applied universally. The 3-roll bending machine made by Gräbener Maschinentechnik is such an all-round talent. A smooth and fast production of pipes and half-shells, pressure vessel shells and cones is possible – with-out having to change rolls.

This is ensured by the fully flexible adjustment of the two bottom rolls and the top roll. The bottom rolls can be adjusted individually via a hydraulic system (center distance between 950 and 1,500 mm), the top roll can be vertically adjusted by up to 320 mm. Moreover, all three rolls can be set to an inclined position so as to bend conically shaped work pieces.

The 3-roll bending machine of Gräbener origin has no rival in terms of flexibility. This was witnessed by the management of an important pipe manufacturer during a visit to another Gräbener client, the company Mudersbach GmbH & Co. KG in Friedewald. Gräbener designed such a multi-talent, which

is able to bend plates to pipes, half-shells, pressure vessels, and cones, especially suited for the needs and requirements of the company Mudersbach (see "update" 1-2010).

The task was to bend an 80 mm thick plate to a cone with a radius of 2,592 to 2,698 mm. The decision-makers were caught by

surprise when they saw that, after smartly having pre-bent the plate edges, the 3-roll bending machine of compact design shaped the plate into a cone in record time. They were especially impressed by the short straight end of the plate formed.

The reason: On this Gräbener machine, the bottom roll can

approach the top roll to within a distance of 100 mm. This is enabled on the one hand by the flexible adjustment of the rolls, and on the other hand by the fact that the conical bending device, which controls the bending of cones, can be slewed away completely. The operator receives ex-

act information on the relevant position, as well as on the individual contact pressure of the rolls. All data are displayed on instruments integrated in the control panel.

The visitors were even more surprised when they were told that the bending capacity (plate thickness) of this machine for plates of material grade S355, over the entire roll length of 3,100 mm, was 120 mm. One of the visitors stated: "The 3-roll bending machine is a genuine multi-talent." And that, precisely, is the reason why Bernd Mudersbach, Managing Director of Mudersbach GmbH & Co. KG, had Gräbener build the new centerpiece of his production. He reports that, six months after the start-up, this machine has been running smoothly and reliably – "like Swiss clockwork".

Another robust and no less precise multi-talent within the Gräbener machine range is the 4-roll bending machine, which can be equipped with a

supporting yoke. This machine type performs to the highest quality requirements and reduces the calibration efforts to a minimum. With a supporting yoke, it is possible to install a top roll of smaller diameter,

which allows the production of smaller pipe diameters. In addition to this, a discussion on the top roll camber requirement, which would predetermine a certain pipe production range, is avoided.

With the Gräbener concept, the plate thickness range from small up to the maximum possible sizes can be realized without any restrictions, owing to the fact that the supporting yoke can be hydraulically adjusted to the individually required bending force. The meeting plate edges are parallel. Convex respectively concavely shaped pipes become a thing of the past. This ensures an optimum precondition for welding, as is reported by international and renowned customers.

"Like Swiss clockwork."



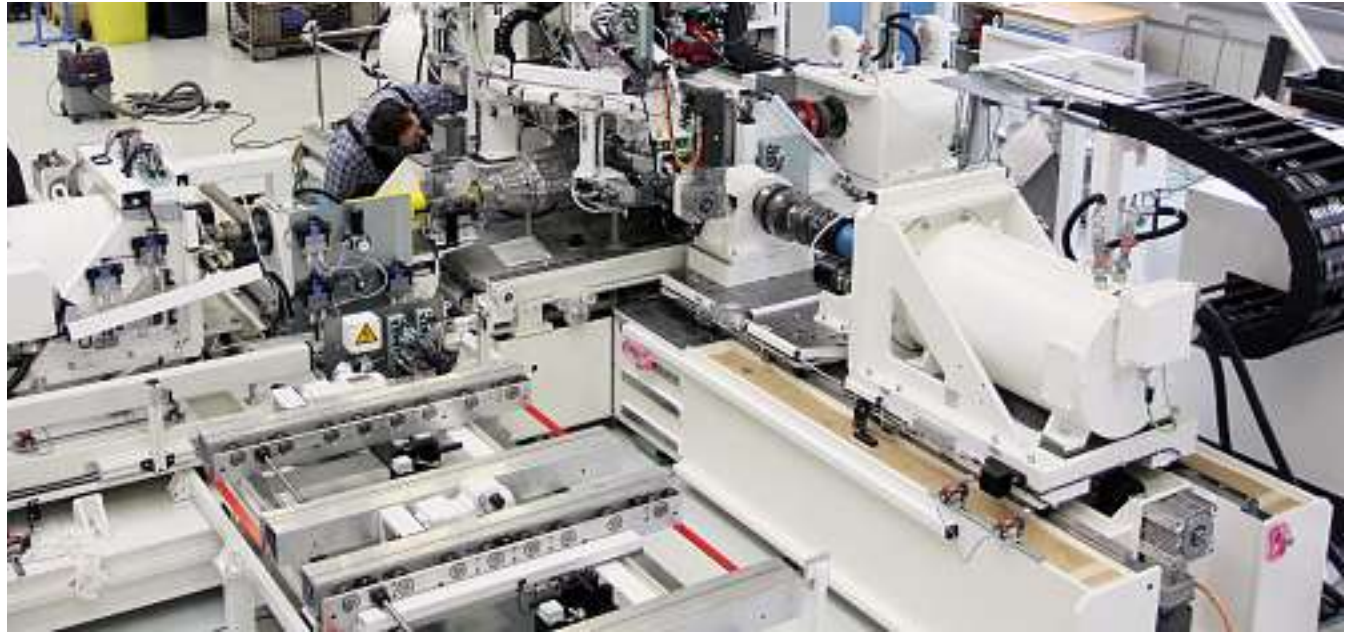
The size of the plates formed by this relatively compact machine is impressive.

Major order for Gräbener

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Ahmed Al Khonaini, General Manager of Global Pipe, explained that his company "opted for Gräbener as supplier of the most important and technically sophisticated machines, especially as the new pipe mill is to be one of the utmost modern and efficient pipe mills worldwide." According to Mr. Al Khonaini, Gräbener Maschinentechnik knows best what is needed for a successful pipe mill; this being due to Gräbener's experience as pipe manufacturer, as well as their continuous development and improvement of the manufactured machine range.

That is also one of the reasons that Global Pipe will most likely be able to keep to their tight and ambitious schedule: The production is scheduled to start in 2012 already. The Gräbener machines, however, will be assembled on site as early as September 2011.



Kleinknecht is renowned for their end-of-line gear test benches (picture of a DL 501). Now they are working on a test bench for electric motors.

E-traction - a big issue

Kleinknecht Lohfelden is working on a test bench for electric motors

If you ask the automotive industry for manufacturers of end-of-line gear test benches, it will not be long until you hear the name Kleinknecht. Therefore, it is not surprising that the topic of test bench technology for combustion engines is being discussed with customers of this industrial sector worldwide. The automobile manufacturers have, however, already geared up for the

time following the combustion engines. As a result, H. Kleinknecht GmbH & Co. KG in Lohfelden also tackles the issue "E-traction", of course in connection with the test bench technology.

"We are currently getting familiar with the topic," reports Harald Tiede, Managing Director of Kleinknecht Lohfelden. In this respect, the Hessian company has a decisive advantage over other machine building companies: "In the near future, the portion of

mechanical engineering will be getting smaller and smaller. Even though mechanical parts are still very important and present, Kleinknecht Lohfelden can make use of their vast know-how in the field of electrical engineering, which has been a main line of business for them so far." Thus, Kleinknecht is just the right partner for solving problems such as: "How to test an electric motor and its drive technology? What exactly is tested at an electric

motor? What is the control response of the electric motor?" Even more so as the subsidiary of H. Kleinknecht & Co. GmbH can benefit considerably from the knowledge and experience of Kleinknecht's other subsidiary in Ilmenau, especially when it comes to the simulation of battery and motor. The key word being: Power Quality Monitoring. Harald Tiede: "With this in mind, the prospects of becoming established on the market are excellent."

GGT completes relocation and upgrade project for Timken Corporation

Graebener Group Technologies (GGT), sales and service point in North America for equipment of Gräbener Maschinentechnik and Reika with its headquarters in Napoleon, Ohio, recently completed a yearlong project for the Timken Corporation encompassing installation, mechanical refurbishment and complete control replacement on a Reika Model 243 finishing line. The line had operated for nearly 2 decades at Timken's Desford, England, facility. Upon the decision to decommission the Desford plant, Timken's central planning group elected to relocate

the Reika line to Timken's main plant in Canton, Ohio.

GGT was contracted to support decommissioning, reinstallation and refurbishment efforts. During the reinstallation phase, many of the critical systems were mechanically refurbished and/or upgraded to current standard. GGT also engineered, constructed and installed a completely new control system replacing the obsolete Siemens S5/Optronic platform. The new control, built on the Modicon platform, is completely integrated with Timken's plant wide Level II operating system. The system is fully commissioned

and is currently running 3-shift production operations.

GGT continues to work closely with Timken to identify and implement productivity and process flexibility enhancements.



GGT supported the decommissioning, reinstallation and refurbishment works.

Pipe Mills from a single supplier

The special machine builders Gräbener, Weldec and Fontijne Grotnes are pooling their skills and strengths

If three individualists can enhance and broadcast their outstanding skills further within a network, they should form a Joint Venture. This was the sentiment of the companies Gräbener Maschinenteknik GmbH & Co. KG, Weldec GmbH and Fontijne Grotnes B.V. Each one of these companies is a renowned expert in its individual branch. Together, they are able to furnish pipe mills with the entire machinery necessary. As a consequence, these three companies now have formed a Joint Venture in order to combine their individual strengths and skills when it comes to creating processes of special machines for the production of large LSAW pipes.

Gräbener Maschinenteknik can fall back on decades of experience in the production of large pipes. On the one hand, they have detailed and comprehensive technical knowledge derived from the time when the com-

bending machines. This well-founded and extensive knowledge is the basis for the know-how of Gräbener Maschinenteknik. It is also expanded further in cooperation with well known pipe manufacturers worldwide - day after day, for example by developing milling machines, bending machines, pipe forming and post-bending presses, continuous root tacking machines, impanding and straightening presses, hydrotesters or end beveling machines. Apart

from the individual machines for the pipe production, Gräbener Maschinenteknik also designs and engineers complete pipe mills. Using state-of-the-art CAD technology, all processing stations of a pipe mill are optimally aligned from the very beginning.

In contrast to Gräbener Maschinenteknik, the company Weldec GmbH (Erndtebrück, Germany) is a fledgling company.

Yet, as a member of the renowned EEW Group, Weldec has already gained a lot of experience in the machine building sector, especially with longitudinal and circumferential submerged-arc-welding systems. These systems have been developed specifically for the pipe, vessel and apparatus construction as well as for the wind energy industries. Weldec submerged-arc-welding systems can be used for both, internal and external welding of pipes in case of V and X seam preparations as well as

in case of narrow-gap-welding (U). In addition to this, Weldec manufactures submerged-arc plate welding machines as well as fully automatic ultrasonic and digital x-ray testing equipment. Since Weldec is a member of the EEW Group, the so-called soft factors, such as process know-how, theoretical instruction and on-the-job training, can be offered as well, if so desired.

The alliance is completed by a company well established in the market: Fontijne Grotnes (Vlaardingen, Netherlands). Over the

Gräbener supplies the machines for the pipe production, for example this pipe forming press

period of more than 40 years, the Dutch company, with its origin in 1909, has become an internationally renowned manufacturer for pipe end and full length pipe expanders for the pipe mill sector. The full length pipe expander is a crucial processing station in



From engineering to on-the-job training in one of EEW's workshops

pany Theodor Gräbener as Gräbener Großrohr was operating a pipe mill for LSAW pipes; on the other hand, there is vast know-how gained from a holding in a renowned manufacturer of plate



Weldec is the welding and NDT expert within the Joint Venture ...



... whereas Fontijne Grotnes supplies pipe expanders.

the production of LSAW pipes. Same as the other partners, Fontijne Grotnes is continuously enhancing its products with respect to new market requirements – increased capacity, increased wall thickness, increased material grades up to X120, stricter tolerances with regard to ovality and straightness being the key words.

The new pipe mill Joint Venture already is on solid ground. “When it comes to the manufacturing of machines for the production of large LSAW pipes, we are all well established companies;” the partners state in unison. “And we all know how a pipe mill can be run smoothly.” “What’s more, we have known each other for years;” says Jacob van Balen, Vice President of Fontijne Grotnes. “Therefore, we all know and appreciate the other partners’ skills.” For the Managing Director of Weldec, Jörg Heinrich, the Joint Venture was the only logic consequence: “These three companies make a great team. From now on, customers intending to build a pipe mill can purchase everything from one single supplier: from the initial engineering to the after sales service. If requested, it is even possible to conduct a theoretical instruction and practical training for the machine in question in one of our EEW workshops.”

The Quote

“The Gräbener plate edge milling machine is the best and most reliable machine we have ever operated at our company. The machine has been running without any trouble since its commissioning.”

This was the answer of a foreman at the Hudong Shipyards in Shanghai to the questions if there have been any problems with the plate edge milling machine which was put in operation at the beginning of 2007.



Kleinknecht ensures that the test benches, which tune the car engines to maximum power, work properly in adherence to the concept of low electric grid impact.

Know-how for the race tracks

Thanks to Kleinknecht Ilmenau, engine test benches do “neat” work

These days, racing cars on the circuits all around the world are once again trying to transfer their tremendous motor power onto the tarmac. In a small way, their success is also due to the services of the company Kleinknecht. The experts for electric energy systems at the Kleinknecht subsidiary in Ilmenau ensure that the engine test benches, which tune the F1 car engines to maximum power, work properly in adherence to the concept of low electric grid impact.

“We first started dealing with this particular issue in the year 2000;” says Dr. Helge Schäfer, Director of the Kleinknecht subsidiary in Ilmenau. “We” being Prof. Dr.-Ing. habil. Dietrich Stade of the Technical University Ilmenau and his team. At this time, a premium class engine builder was experiencing severe problems due to the interaction between the test benches and the power grid during engine test bench

runs. These problems went far beyond the company’s premises and more than raised a few eyebrows with the local energy supplier. Prof. Stade and his team, however, managed to solve these problems of electrical interaction between test benches and power grid. In doing so, they left an impressive mark.

And so it happened that in 2007, the engine tuner remembered the Ilmenau team. In the meantime, a renowned car manufacturer had taken over the engine builder and Kleinknecht had incorporated the energy experts into their own team. “By then, however, the problem had be-

“Dirty” current is counter-vailed by inverted “dirty” current.

come much more complex;” reports Dr. Helge Schäfer. The engine builder had merged several locations into one main production site and existing test benches had been supplemented with additional ones.

The Kleinknecht team with the six experts from Ilmenau was already involved while the plant expansion was still in the planning stages.

As technical consultant for the engine builder, Kleinknecht started to investigate the power grid. Main principle so far: The fewer test benches are running, the less high harmonic current with high grid impact, i.e. “dirty” current, is being generated. “It was clear, however, that interfering with the test sequences or limiting the number of test runs was out of the question;” explains Dr. Schäfer. “In the limited period of time available for testing prior to and during the racing season, the test benches are running non-stop.”

In order to get a handle on the grid impact issue and thus to “purify” the power grid, Kleinknecht and the engine builder came up with the idea to integrate an energy and power quality management system as well as a dynamic compensation system into the internal electric power grid. The-

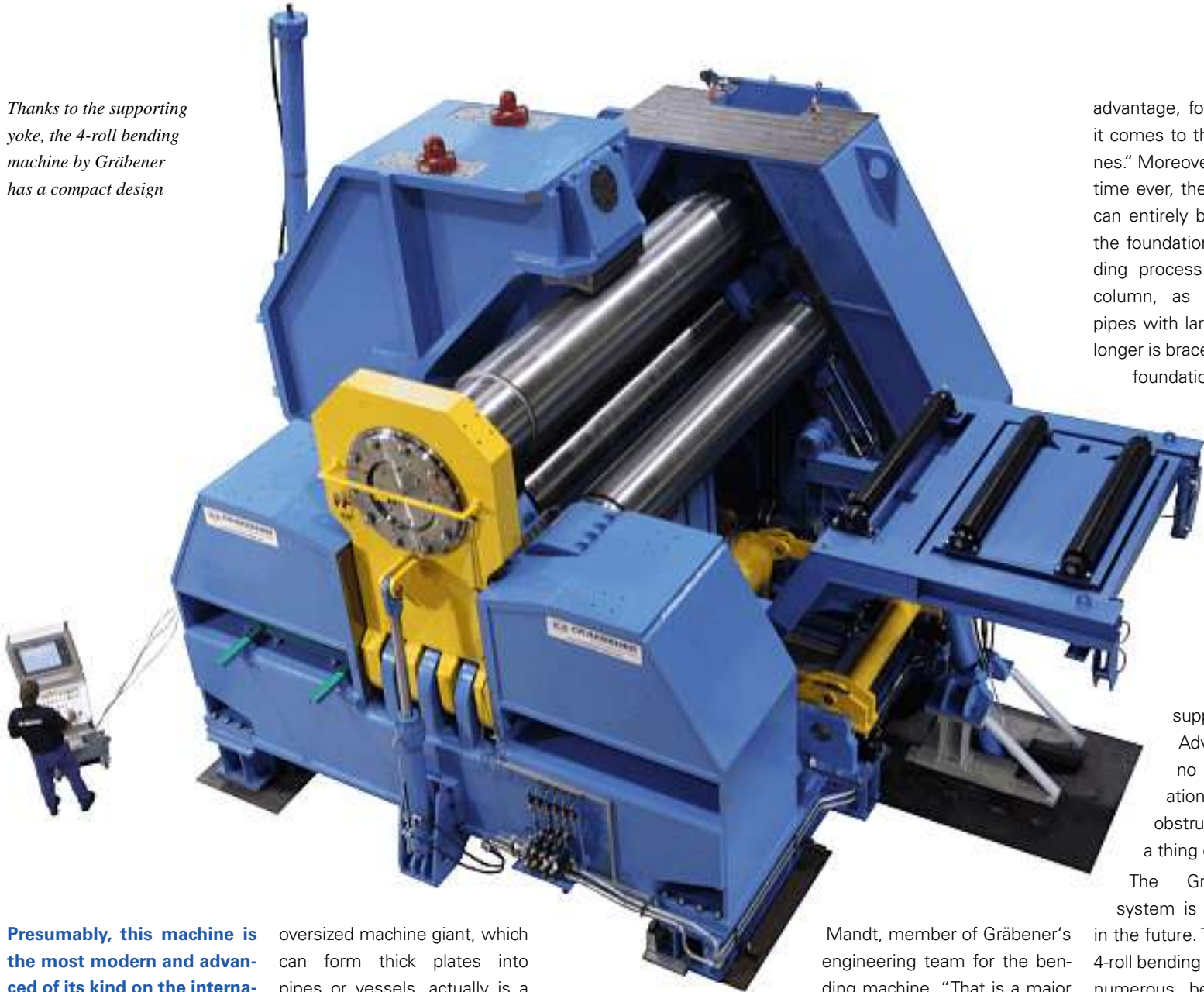
se systems sort of purify the “dirty” current generated during the test runs before feeding it back into the electric power grid. Dr. Schäfer explains: “Figuratively speaking, we are using and profiting from an effect well known to all of us, which is the following: If you toss two stones into a pool of water, the waves generated either amplify or annihilate each other. In the context of test bench operation, this means that ‘dirty’ current with high grid impact is counter-vailed by inverted ‘dirty’ current and thus only ‘purified’ current with low grid impact is fed back into the power grid.” Experts call this “grid impact limitation of converter-fed test benches.”

Since the beginning of Season 2009, the engine builder has been supplying engines to several teams. And by now, several test benches can be operated simultaneously at full power. The demands of all racing team customers can be satisfied, while at the same time accommodating the needs of the energy supplier - thanks to the engineering support provided by Kleinknecht in Ilmenau.

Gräbener delivers powerful plate bending machine to Austria

The 4-roll bending machine for Kremsmüller Industrieanlagenbau KG bends cylindrical and conical shells

Thanks to the supporting yoke, the 4-roll bending machine by Gräbener has a compact design



Presumably, this machine is the most modern and advanced of its kind on the international market. As a matter of fact, the 4-roll bending machine most recently delivered by Gräbener Maschinentechnik is "Austria's most modern plate bending machine".

This was the result of a research conducted by Wolfgang Leitner, Head of Production at Kremsmüller Industrieanlagenbau KG. Gräbener designed and built this machine for the company with its headquarters in Steinhaus bei Wels, Austria. What – at first glance and to non-experts – looks like an



Wolfgang Leitner:

oversized machine giant, which can form thick plates into pipes or vessels, actually is a high-tech product unparalleled among the other 4-roll bending machines on the international market.

One noteworthy component is the supporting yoke which can be adjusted in height. A special feature only to be found in the 4-roll bending machines built by Gräbener and which can even be retrofitted at 4-roll bending machines of other manufacturers. Due to the fact that the supporting yoke applies counter pressure to the roll, thus counteracting a possible deflection,

comparatively slim rolls can be used. Therefore, the machine's flexibility is increased considerably (please also see user report on page 13). "The supporting yoke can be equipped with a quick-change device which allows the dismantling in a very short period of time. Alternatively, the supporting yoke can be fully sunk below floor level so that the machine resembles a 'conventional' 4-roll bending machine without supporting yoke", explains Ulf

advantage, for example, when it comes to the bending of cones." Moreover, and for the first time ever, the supporting yoke can entirely be detached from the foundation during the bending process. The supporting column, as bending aid for pipes with large diameters, no longer is braced to the machine foundation, but is of self-

supporting design. Advantage: There is no strain on foundation and workshop; obstructing braces are a thing of the past.

The Gräbener control system is yet another step in the future. The control of the 4-roll bending machine provides numerous bending programs

Mandt, member of Gräbener's engineering team for the bending machine. "That is a major



The compact design of the machine is even more illustrated when most of the machine is embedded in the foundation.

which considerably simplify the bending process for pipes, vessels and cones: from in-feeding the plates up to opening the pivoting bearing. But that is not all: advanced or new programs can be saved and retrieved at any time.

The machine's compact dimensions are no less impressive, especially because the machine has a much more massive design than machines of competitors and weighs a hefty 410 tons. According to Ulf Mandt, "this makes the machine much more stable, rigid and robust." "Downtimes are to be prevented from the very beginning, if possible."

The excellent reputation of the Gräbener machines was the main reason for Krems-

"Gräbener simply builds superior machines."

müller Industrieanlagenbau KG to go with the 4-roll bending machine built in the Siegerland. Or, as Wolfgang Leitner, Head of Production says: "In comparison with competitors, Gräbener Maschinenteknik simply builds superior machines."

"From day one, everyone at Gräbener has been fair and honest," explains Leitner. "Each detail was backed up by facts." Moreover, Gräbener's engineering included CAD design and offered FEM simulations. A key factor for the company Kremsmüller intending to use the machine for the production of shells and conical components for precision apparatuses and vessels made of highly tempered and annealed steel. "From start to finish, the entire project has been handled following this policy." Wolfgang Leitner is pleased: "The communication between our companies was constant and open; no question was left unanswered, no problem unsolved. Therefore, Gräbener was put in charge of building Austria's most modern bending machine, and justifiably so."

Straightening machines on the road to success



Due to the consistent further development of high-tech straightening machines for the tube and pipe industry, Reika, by now, has delivered numerous straightening lines to several renowned pipe and tube mills worldwide.

Over the past years, quality requirements for tubes and pipes have been ever increasing, regardless of material or output capacity. By implementing various key features, such as high rigidity due to solid material blocks,

closed ring frame design, individual roll drives, CNC positioning of the axes and special roll geometry for a maximum surface contact and wear compensation, Reika's latest state-of-the-art straightening machine generation meets these requirements head on.

At the same time, the new machine design has eliminated all the weaknesses competitor machines are known to

have. The combination of Reika's know-how and the operational experience of the customers is the basis for an excellent result. Especially the elimination of un-

The "Return on Investment" is achieved within a very short space of time.



The latest Reika machine design meets the most stringent quality requirements.

straightened tube ends and the dramatically increased straightening accuracy provide the customer with a direct economic benefit, and Return on Investment is achieved within a very short period of time. The straightening accuracies of all straightening machines,

which have been delivered so far, have been much better than those stipulated in the customers' specifications and have

more than satisfied the customers' demands.

Additional highlights of these machines are the entirely enclosed design for the purpose of noise insulation and shielding against external influences, individual drives to minimize the roll wear, an optimum accessibility of the working area without obstructing columns for an easy maintenance and operation, a central, wear-free clamping of the roll carriers as well as a precise, zero backlash vertical and angular adjustment. Moreover, the adjusting and guiding components are shielded against scale, dirt and water in order to prevent corrosion and excessive wear. Complete line equipment, such as for example fully automated unscrambling systems, can be delivered as well.

Highlight of the machine is the entirely enclosed design.



Will fuel cell technology conquer the market?

An article by Dr. Peter Beckhaus,
Center for Fuel Cell Technology (ZBT) in Duisburg



Fuel cell technology as the rescuer for our future energy supply - a view which has been promoted for several years as the electrochemical process of the fuel cell allows high efficiency as well as low emissions. The greatest potential of this technology is seen in the decentralized energy supply and the electric mobility.

In the field of the decentralized energy supply, long hours of operation, the issue of life expectancy and the usage of hydrocarbon energy sources such as natural and liquefied gas are top priorities of the development. For the application in the transport sector, on the other hand, the main focus is on high dynamics, small sizes and,

above all, the development of the necessary hydrogen infrastructure. In general, however, a cost reduction is indispensable in order to successfully introduce this new technology onto the markets.

The German fuel cell industry responds to the above mentioned issues by intensive cooperation, either within a national network under support of the federally owned NOW GmbH (National Organization Hydrogen and Fuel Cell Technology), or within committees such as the VDMA consortium for fuel cells. Standardization is the key. Problems and questions are solved in the scope of joint projects. Here, the application-oriented research as service provider and partner of medium-sized companies is most important. Gräbener Maschinenteknik has also recognized this trend. The company is involved in these committees in an exemplary manner and supports the application-oriented research, not least by their new membership in the supporting society

of the ZBT (Center for Fuel Cell Technology) in Duisburg.

A main precondition for a cost reduction is the establishment of efficient and reliable production and testing processes for the individual components, the fuel cell stack and the complete systems. For example, metal separator plates, in contrast to the conventionally applied graphite solutions, offer excellent possibilities when it comes to size, weight and costs. The production process –

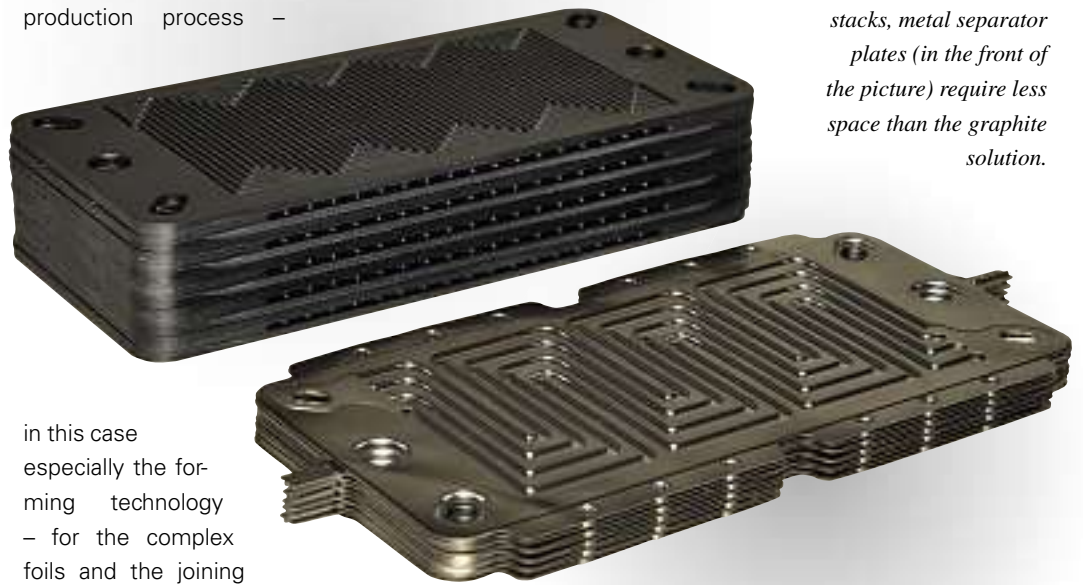
in this case especially the forming technology – for the complex foils and the joining technology of laser welding are well proven. The long-term

stability of the separator plates within the extremely complex operation environment of a fuel cell, however, remains a big challenge.

The fuel cell technology is on the right path. Today, first markets, such as for example in the sector of uninterruptable power supply (UPS) and the power supply of caravans, are already supplied successfully. Joint solutions for the techno-

logy, infrastructure and cost issues will be decisive for the future success. Such solutions, however, are very much depending on an open and fair cooperation – such as the one between Gräbener Maschinenteknik and ZBT.

As can be seen in the two separator plate stacks, metal separator plates (in the front of the picture) require less space than the graphite solution.



Gräbener is a project partner much sought-after



“The exhibition F-Cell was a great success.” This is the conclusion Achim Edelmann, Area Manager New Technologies at Gräbener Maschinenteknik has drawn after returning from the Stuttgart exhibition regarding the topic fuel cells.

After a slow start, there was a downright run on the exhibition in general and the booth of Gräbener Maschinenteknik in particular. “We have conducted productive and in-depth discussions with familiar and potential project partners,” explains Edelmann. During these discussions, products as well as solutions have been enquired. For Achim Edelmann, this is a clear sign that Gräbener Maschinenteknik has esta-



At the F-Cell, Gräbener Maschinenteknik was much sought after as problem solver.

blished its position as service provider but also as problem solver in the field of fuel cell technology. More than that: “Especially for difficult problems, we are much sought after as project partners.” Reason: In the course of the last years, Gräbener Maschinenteknik has become one of the worldwide leading developers and manufacturers in the sector of new technologies. Core business is the manufacturing of separator plates made of various metal materials for NT-PEM, HT-PEM, DMFC and SOFC fuel cells, microstructure plates and plates for high-performance heat exchangers.



Especially the long (photo) and the circ seam milling machines have become integral working stations of a wind tower production.

From plates to wind towers

Behind the scenes of an offshore wind tower production

Everyone is talking about sustainable energies. A change in energy politics should, no, must happen. The term "off-shore" is mentioned more and more frequently. Here, the main motive not only is to make use of the sufficiently available and free of charge wind, which is all but delivered to the doorstep, but also to become more independent of oil.

Whether wind parks off the European coasts will - as planned - be built galore, or not, it is worth taking a look into the production of offshore wind towers: With the aid of Gräbener machines, simple plates are turned into a wind tower of more than 100 meters, which can withstand the rigors of wind and water for decades.

A company, which has been producing wind towers for the offshore industry in the Rostock harbor for several years, is a subsidiary of Erndtebrücker Eisenwerk, EEW Special Pipe Constructions (SPC). The worldwide leading manufacturer of special large pipes has recognized the prospects for this industrial

sector at an early stage. By supplying EEW with the entire machinery for the production (with the exception of the welding equipment), Gräbener Maschinenteknik has made a key contribution to the company's success. Together, both companies approached this new industrial sector and mapped out the production facilities. When it came to optimally aligning the machines within the new pipe mill, Gräbener was able to make full use of the experiences gained as manufacturer of large pipes up until the end of the 90ies.

For the production, EEW SPC needs plates of various sizes and thicknesses, depending on the requirements and applications. What will it be? A wind tower or a pile for the foundation? The rolling mill products are already delivered in the sequence necessary for the later wind tower production.

Using a shop crane, plate after plate is loaded into a 4-side plate edge milling machine. Milling heads with different contours depending on the customer's requirement carry out a perfect

edge preparation for the later welding process.

After the milling process, the plates with a thickness of up to 120 mm are transported to the 4-roll bending machine, which forms them to pipes, or better, pipe segments with a diameter of up to 7 meters. Here, EEW SPC deliberately relies on the supporting yoke installed in the 4-roll bending machine of Gräbener. This special feature fascinates by its versatility and the reduction of change-over times for the exchange rolls. Moreover, there is no need for a pre-definition of the production program due to the restrictions of the roll camber. Using the Gräbener concept, EEW SPC is able to form plates without any limitation, from smaller thicknesses to thicknesses of up to 150 mm. Advantage for the wind tower manufacturer: The plate edges are always parallel; convex respectively concavely shaped pipe ends are a product of the past. This means that optimum pre-

conditions for the welding process are provided.

"Another important advantage of this machine", explains Michael Grebe, Head of Production at EEW SPC, "is that plate edges can be pre-bent without visible straight ends. This leads to a considerable reduction of calibration efforts while at the same time maintaining the required out-of-roundness tolerances."

The Gräbener roll concept fascinates by its versatility.

EEW SPC uses a second 4-roll bending machine made by Gräbener especially for the bending of cones.

After having formed the plate into a pipe, the weld seam is first tacked and longitudinally welded from the inside. Then, the long seam milling machine prepares the outer longitudinal seam of the pipe perfectly for the subsequent submerged arc welding process. A clean and fast preparation of the outer seam is crucial for the welding process. By using long as well as circ seam milling machines,

the costs per meter weld seam can sometimes be reduced by more than 50 %.

In case that the pipe segments are joined to a wind tower piece after piece, the process is similar. At first, the circular weld seam, which has been prepared by the milling machine, is submerged arc welded from the inside. Then, a circ seam milling machine prepares the outer seam for the welding sequence, which is also carried out using the submerged arc welding process.

At the end of the production arranged in a U shape, both, plates and almost finished wind towers lie side by side. The surprised observer glances back and forth between the first and the last production station. It's hard to be believe how fast pieces of rolled steel are turned into a wind tower of more than 100 meters (as reference, the Cologne Cathedral is 157 meters high). One thing, however, is certain: EEW SPC does not merely talk about sustainable energies. For them, this sector is already part of the daily business.

2006/42/EG as new field of business

The new machine guideline 2006/42/EG is still talked about everywhere. Naturally, this guideline is a big issue for H. Kleinknecht & Co. GmbH as well. Since the Siegen based company often acts as general contractor and has gained an excellent reputation in the sector of modernizations and retrofits, the Kleinknecht staff tackles the issue head on, as is explained by Managing Director Christoph Hauck. In fact, the employees have built up vast know-how regarding this topic - know-how that is non-existent at some end users.

As a result, customers want Kleinknecht to furnish their

machines with a CE sign. This requires the adaptation of hard- and software to the new guideline, which generally goes in line with a retrofit and modernization of the machines. In this respect, the new machine guideline has certainly opened a new field of business for Kleinknecht. Several customers in the machine tool industry have already made use of the comprehensive and time-saving service.



Enormous interest in Gräbener products

The overseas exhibitions in Rio de Janeiro and Shanghai brought numerous enquiries

"The 15th Rio Oil & Gas not only was the biggest but also the best of all exhibitions we ever held", João Carlos de Luca, President of the Brazilian Institute of Petroleum, Gas and Biofuels (IBP) rejoiced at the closing ceremony. More than 53,000 visitors from 51 countries came to the exhibition. That is 30% more than during the exhibition of 2008. No sign of the crisis.

A similarly positive conclusion was drawn by Gräbener Maschinentechnik

as exhibiting company on one of the biggest exhibitions for this sector in the Brazilian metropolis. "The interest in the machines of Gräbener Maschinentechnik for the production of large LSAW pipes was huge", reports Colin Macrae, Sales Manager at Gräbener. Enquiries for smaller machines such as circumferential seam milling machines but also for pipe forming presses were daily occurrences.

For Marco Butz, PR-Manager of the Graebener Group, the TUBE China in Shanghai was very successful as well. "Our entire product range was enquired, from machines for the pipe production to hydroforming presses. Especially the bending machines were in high demand." In view of these in-depth discussions and the new contacts with potential customers, exhibiting at the TUBE China was worth the effort.

Andreas Zimball, Sales Director at the Graebener Group member Reika could only confirm this conclusion. "There were many interesting discussions, especially concerning our new RingSaw."

Good work pays off

After the quick retrofit of a hot rolling mill Kleinknecht secures follow-up order

In the last edition of "update" H. Kleinknecht & Co. GmbH reported "successful retrofit acquisitions for machine tool controls." Meanwhile the first orders have almost been completely executed.

One of these orders was the retrofit of a hot rolling mill. Parts of the electrical control system were exchanged. The power supply was renewed. Among other things in the scope of this project, the main drives in TWIN design were set with a separate power supply of armature and field. Due to this separate power

supply, the existing armature reactance coil was made redundant. A double-stack transformer and thus a 12-pulse inverter were installed in order to reduce the grid impact, i.e. to generate low harmonic current.

A new visualization system offers additional advantages. From now on, information on faults can be displayed in great detail. As a result, downtime will be reduced and plant availability will be increased. At the same time, Kleinknecht prepared the hot rolling control console for the complete renewal of the control station

thus laying the foundations for an additional modernization and extension of the mechanical equipment.

The customer has already exercised this option since the entire project has been handled very smoothly. The very short shut-down time of only two weeks followed by the trouble-free rolling of reference products - all made of stainless steel, copper and aluminum alloys in small lot sizes - have certainly made a lasting impression.



A Waldrich roll grinding machine at the renowned Arcelor-Mittal Group is currently being retrofitted by Kleinknecht.

Cost reduction made easy

H. Kleinknecht & Co. GmbH is a trusted and sought-after partner for retrofits

It's not a secret that "retro" is the new trend. "The reason for this often are budgetary limits which are exceeded by new machines", explains Stefan Rößler, Project Manager "Retrofit

Machine Tools" at H. Kleinknecht & Co. GmbH. "Instead of buying new equipment, existing machines are simply retrofitted, i. e. overhauled and updated." The result of such a retrofit is a machine, which has been converted to the latest technical standard, thus operating much more cost efficient than before.

Foundations, machine beds etc. remain and can be used again. A retrofit increases the efficiency of the machine, its production volume and product quality while at the same time reducing emissions. Various machine types can be retrofitted: from controls and control stations to drives, measuring systems and mechanical components. Even a modular design approach in freely selectable stages is possible. "Easiest and simplest case: out with the old control, in with the new one", explains Stefan Rößler. "In this case the machine down-time is limited to just a few days." Even though a retrofit can be carried out in several stages, more often, the job is done in one go as complete overhauling. "The customers usually operate several roll grind-

ing machines in their workshops", reports Stefan Rößler. "So one machine can easily be set aside for the retrofitting works." This procedure has proven to be most beneficial, because a complete overhauling could take between two weeks and four months, depending on the retrofitting scope.

Especially the Kleinknecht control system "GPC" for roll grinding machines has a long track record worldwide and has gained an excellent reputation among existing and potential customers. Stefan Rößler: "High operator acceptance is our top priority. This reduces training times and makes the machine very user-friendly." In addition to this, Kleinknecht tries to utilize the existing accessories as much as possible. The replacement of motors, switchgears and machine cabling or measuring systems can be carried out in a similar way: out with the old components, in with the new ones.

20- or 30-year-old roll measuring systems are completely outdated. Today's measuring systems are much more comfortable, more efficient and

accurate down to the nearest micron, which you could only dream of in the past.

A good example is the Waldrich roll grinding machine, type WS III C 10 x 5000, which was built in 1985. Just recently Kleinknecht has been awarded the contract for the retrofit by the renowned Arcelor-Mittal Group. During the retrofit the machine will be equipped with a completely new CNC-controlled drive technology, a new control system, a measuring gauge and a crack detection system with a combined eddy current and ultrasonic roll inspection system. "The difficulty here is," explains Stefan Rößler, "that the roll grinding machine is to be retrofitted for a cold rolling mill, which means more demanding requirements compared to a hot rolling mill, i. e. higher precision is required."

Despite the comprehensive scope of works carried out, the general retrofitting rule is: retrofit costs should not exceed two thirds of the price for a new machine. "In this case it was 60 percent," reveals Stefan Rößler. "Very often, the costs are considerably lower."

Over the last few years, approx. 300 roll grinding machines with different control versions and made by various manufacturers such as Waldrich, Voith, Naxos, Herkules, Meuselwitz etc. have been equipped with the control system "GPC" by Kleinknecht. Moreover, Kleinknecht has supplied 60 controls for EDT machines (EDT = electrical discharge texturing).

The subsidiary H. Kleinknecht GmbH & Co. KG in Lohfelden near Kassel has also recognized this trend. "We have successfully retrofitted aluminum/magnesium die casting machines including the robot interface for the automotive industry," reports Managing Director Harald Tiede. The Kleinknecht subsidiary has managed to retrofit the old machines with so much upgraded technology that a completely new visualization interface including analyzing functions was implemented in addition to the modernization of PLC control and drive technology. Thus impressed and convinced the automotive customer has decided that this new technology will be set as the standard for all future retrofits.

Another decisive factor for the customers is the fact that they can rely on first class service and long term spare part supply for their roll grinding, EDT and die casting machines. The importance of this reliability is confirmed every day by the incoming enquiries and orders from around the world. Stefan Rößler: "Nowadays, the customers even ask us to locate second-hand machines for them – machines, which are then retrofitted by Kleinknecht."

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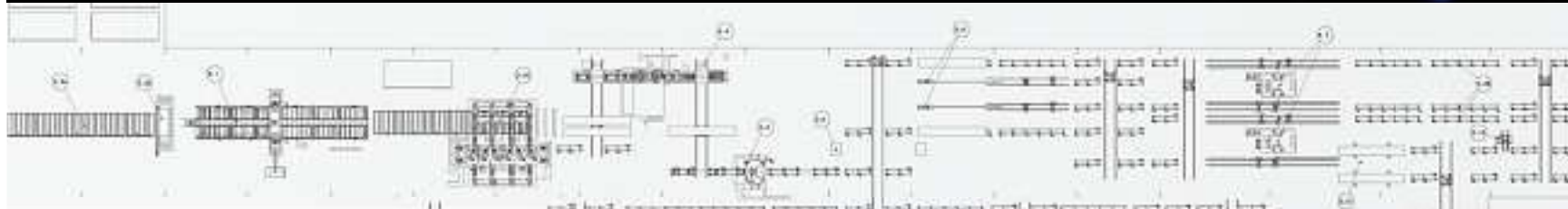
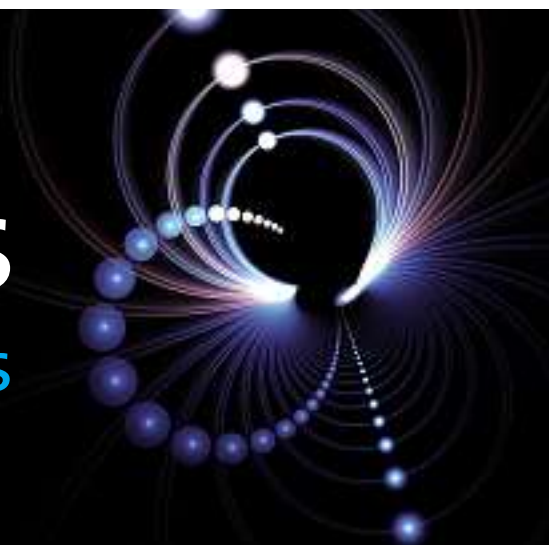
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