The international magazine for the tube & pipe industries

TUBE & PIPE Technology

管道技術

JANUARY 2014

VOL 27 NO 1 US$33

Multi-Cut Tube Cut-off Machine

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(Tube Ø 244 x 13,5 mm, P110)

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- DPI / CHINA / 2007 / 8”-24”Ø
- HALL LM / S.AFRICA / 2008 / 8”-24”Ø
- GIPI / OMAN / 2010 / 8”-24”Ø
- BSL / INDIA / 2011 / 8”-25”Ø

CAGE FORMING SECTION / PIPE MILL 8”-24”Ø

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www.milltechco.com

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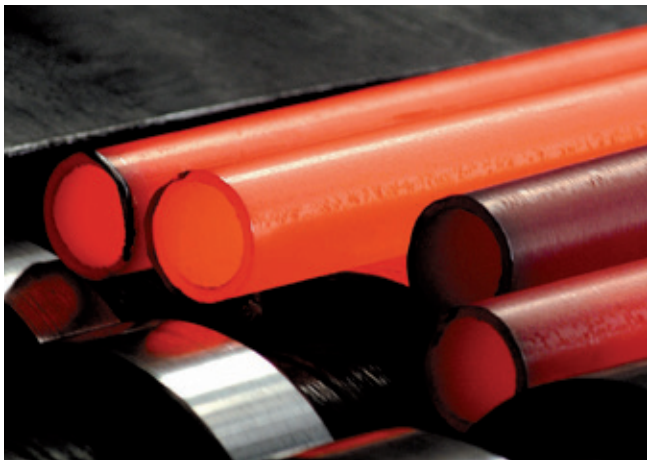
Cleveland, USA

Editorial Index

KOCKS Stretch Reducing Block (SRB)
Capital well invested

- established proven technology
- sturdy modular design
- minimized number of stands due to
  - quick roll change
  - efficient roll machining
- optimum yield and high mill utilization



KOCKS Stretch Reducing Block (SRB)
the synonym for a reliable and consistent production
of premium quality tubes with perfect inner and outer surface

KOCKS Stretch Reducing Block (SRB)
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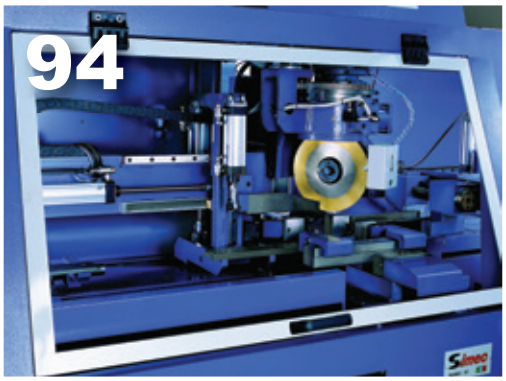
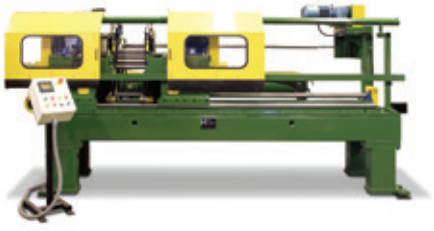




January/February 2014
Vol 27 No 1

The January Issue

Rory McBride – Editor

Welcome to the latest issue of Tube & Pipe Technology. This issue we have a great feature on cutting, sawing and saw blades, a first look at the Tube Düsseldorf 2014 show and an in-depth article looking at reducing cost during heat treatment using protective coatings. Enjoy the magazine.

By now I am sure most readers have their stands booked for 2014's spectacular Tube Düsseldorf exhibition and are busy finalising travel preparations. After going to all of that effort my advice would be to make sure that you make the most of your investment at the show by backing it up with coverage in the magazine. It makes sense to let people know what new products you will be exhibiting and, just as importantly, where your stand will be located. This is a huge show and people often do not have time to see every hall, never mind every exhibitor, so getting your name seen is vital.

Many purchasers that I speak to tell me they plan who they will visit before they actually arrive at the show. So, by featuring in the pages of TPT (which is an official media partner of organisers Messe Düsseldorf) you can maximise your exposure at the show and attract the attention of our readers.

Send your editorial for the March Düsseldorf issue by the deadline of 8 January. You can contact me at rory@intras.co.uk. Happy New Year to all of our readers and your families.

On the cover . . .

LINSINGER Tube cut-off machine, Type Multi-Cut MC 4 developed and manufactured by LINSINGER Austria. LINSINGER's four saw blade technology is the most productive low-cost solution available for tube cut-off. Ideal for round, square and rectangular tube cut-off at high speed.

LINSINGER Multi-cut is for inline-operation in ERW lines as a flying tube-cut off aggregate requiring highest possible availability. It utilises four cutters working simultaneously around the pipe for a surprisingly fast cut. If one of the four has an early lifetime end, it goes into a park position. The remaining three tool heads cut tubes continuing until the scheduled tool change. Thereafter there is a decrease of the tube line speed or an increase of the cutting speed.

LINSINGER machines are engineered and manufactured in Austria. LINSINGER offers an extended product range for the tube and pipe industry. It covers mainly circular sawing machines for cutting of steel billets and tube layers, milling machines for edge preparation for wind tower construction and shipbuilding and pipe bevelling machines for bevelling of tube ends.

Surge in demand for steel pipes and tubes benefits manufacturers

Large diameter steel pipe in production

THERE has been a significant upswing in the demand for industrial furnaces required for the manufacture of steel pipes and tubes, which are utilised in a wide variety of applications. The bulk of the growth has been in OCTG welded and seamless pipe used primarily in casing applications, as well as automotive and mechanical tubing.

The OCTG growth in North America can be attributed to the shale gas and oil developments, combined with the US victories in trade cases against Chinese supplied OCTG pipe in 2010. The result has been the recapitalisation of existing tube production plants, as well as massive investments in Texas, North Eastern USA and Canada. One of the most important API requirements is an upgrading of the mechanical properties from standard J55 to N80, L80, P110 and Q125. To achieve this, steel producers and end finishing companies are investing heavily in automated high volume continuous heat treatment systems. At this time there are at least ten major new facilities either under construction or capital plans for investment in the geographic territories mentioned above, with Texas winning the lion's share of the new investment. While induction heat treating is a viable option for certain locations at lower production rates, the preferred technology has been direct gas fired walking beam furnaces combined with water spray quenching on the OD and ID of the pipe.

Production rates up to 100 tons/hour are envisioned covering the size range 2.875" to 13.75" and wall thicknesses up to 2". The majority of new installations have favoured the industrial furnace route for both the austenitising (AF) and tempering (TF) portions of the quench and temper cycle.

There has been a surge in demand for steel pipe

Precision mechanical tubing, used in everything from hydraulic cylinder to bearing production, has seen increased activity.

In applications involving annealed (softened) steel tubes, there has also been strong demand for high volume continuous bright annealing furnaces. Recent installed capacities have been undertaken for systems up to 30tph, operating under a variety of atmospheres including hydrogen, nitrogen, and manufactured gases from the controlled combustion of natural gas to result in atmospheres containing strongly reducing components of carbon monoxide and hydrogen.

A number of these tubes are produced to exacting tolerances for diameter and wall thickness, and are subjected to significant cold drawn stresses during their production. As a result, the need to anneal the tubes prior to subsequent redraws, or prior to shipment, is an important step in the process. To protect the surfaces from oxidation, reducing combustible atmospheres are necessary to ensure the surface finish.

Lastly there are new installations underway for the production of large diameter (12"–24") heavy walled tubes (1.625") utilised in the transportation of industrial gases. This very specialised market segment of high value goods measures production rates in pieces per day as opposed to tons per hour. In the US, there are only two domestic manufacturers of such highly specialised products that utilise seamless tubes, end spinning and finally quench and temper heat treatment to achieve the tight metallurgical and mechanical properties. Quenching systems for such applications are done in immersion baths that range in volumes from 50,000 to 100,000 gallons of special polymer solutions.

The importance of industrial furnace technology to the success of the oil, gas, automotive and machine building industries is of immense value, and manufacturers such as Can-Eng Furnaces International have reaped the benefits from the increased North American and global demand.

Can-Eng Furnaces International Ltd
– Canada
Fax: +1 905 356 1817
Email: furnaces@can-eng.com
Website: www.can-eng.com

The transfluid Innovation Days 2013

THE 8th Innovation Days showed again how valuable and important the open exchange of ideas is in the tube machining industry. Under the motto “Single piece or small batch – the solution for your tube production needs”, numerous experts from Germany, the Benelux countries, Austria and Switzerland came together in Schmallenberg (Germany) to discuss current trends and the outlook for the future. The impetus was delivered by various presentations, which allowed the audience of experts to obtain information on the latest developments in the world of tube machining.

In its contribution on the topic of “Connection systems”, company Parker presented to the meeting the innovations and proven technologies in the areas of hydraulic screw fittings, cutting ring connections and flanged screw fittings. EO2 Form F3, a special forming process for forming a screw connection contour right onto the end of the tube, was examined in detail.

Measuring tube geometries for reproducing components, for quality assurance purposes or for mobile recording of tube systems was the title of the presentation by Hexagon Romer, which looked at “tube measurement systems in practical use”.

In the transfluid presentations, the focus was on application-specific machine technologies, software systems for tube machining and various forming processes. A tour of operations also allowed the expert audience to gain a comprehensive general impression of transfluid working practices and specifically of its intelligent software solutions.

“This open exchange of ideas allowed us to open up many new perspectives,” said Gerd Nöker, transfluid’s managing director of sales and marketing.

transfluid Maschinenbau GmbH – Germany
Website:
www.tube-processing-machines.com

Diary of Tube Events

2014

11-15 March
METAV *(Düsseldorf, Germany)*
International Exhibition
www.metav.com

7-11 April
Tube Düsseldorf *(Germany)*
International Exhibition
www.tube.de

14-17 May
Lamiera *(Bologna, Italy)*
International Exhibition
www.lamiera.net

3-6 June
Tube Russia *(Moscow, Russia)*
International Exhibition
www.metallurgy-tube-russia.com

24-27 September
Tube China 2014 *(Shanghai, China)*
International Exhibition
www.tubechina.net

21-25 October
EuroBlech *(Hanover, Germany)*
International Exhibition
www.euroblech.com

28-30 October
Tube India 2014 *(Mumbai, India)*
International Exhibition
www.tubeindia.com

10-12 November
Fabtech *(Atlanta, USA)*
International Exhibition
www.fabtechexpo.com

2-4 December
Valveworld *(Düsseldorf, Germany)*
International Exhibition
www.valveworldexpo.com

11-13 December
Indometal Tube *(Jakarta, Indonesia)*
International Exhibition
www.indometal.net

Butt-welding fittings approval

ERNE Fittings Middle East (EFME) has achieved ExxonMobil approval for butt-welding fittings up to 12". EFME, part of the Erne Group, is the sole producer of butt-weld fittings such as elbows and reducers in the Kingdom of Saudi Arabia. ExxonMobil is the world's largest publicly traded international oil and gas company, as well as the world's largest refiner and marketer of petroleum products.

Since 1998, the parent company Erne Fittings GmbH has been listed on the Exxon Approved Manufacturers List. By achieving this approval Erne Fittings Middle East underlines that it understands the respective requirements of the industry and is able to produce according to one of the most demanding standards in the oil and gas industry.

Manfred Havrilla, head of sales and marketing at EFME, commented, "The world's most modern production site with the latest technologies assures first class quality based on European standards, produced in Jubail. Approvals like Saudi Aramco, Qatar Petroleum or Saudi Electricity Company certify this. We are happy to add another important accreditation to our list. We will take this as further motivation to exceed expectations in regard of meeting standards and adhering to specifications."

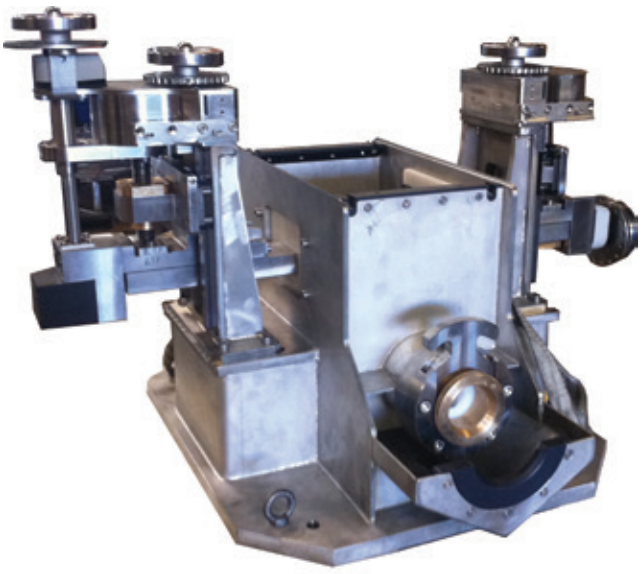
With technological expertise in moulding, heat treatment and weld-end preparation, Erne Fittings produces elbows, tees and reducers for use in the construction of power stations, refineries, and oil and gas plants, and in many other demanding applications.

Erne Fittings Middle East Co Ltd – Saudi Arabia
Fax: +966 3 340 8197
Email: sales@ernefittings.com
Website: www.ernefittings.com

New contract for specific ultrasonic tube control

PROVEA, a French company that specialises in designing and manufacturing machines for tube producers, has received an order for a new ultrasonic testing bench.

This new bench will be designed for a wide range of stainless steel specific alloy tubes (from 12 to 50.8mm OD; 0.4 to 3mm WT; 1 to 6m length). The main technical feature of this bench will be linked with aeronautic and nuclear quality standards (NADCAP for example). These severe standards imply new developments in terms of quality control (tube tracking and sorting, specific software, tube mechanical guidance and speed measurement). Provea will be in charge of the global project. Mechanical design, manufacturing and assembly (all mechanical aspects in general) will be done internally. One of Provea's partners, Socomate International, will develop the acoustic and electronic solutions.



Ultrasonic tube control

The machine will use the Roto-translation technology (helical movement of the tubes) to cover the entire tube surface. Tubes will be fully immersed in the ultrasonic tank, and guided by three different mechanical units (entry, middle and exit of the tank). Accuracy of tube positioning compared to sensor orientation is one of the key points in this kind of application, especially for the smaller diameter/smaller wall thickness. The helical movement will be ensured by successive orientated pinch rolls, before and after the tank.

The customer technical specifications require a reference defect size of: 0.05mm depth x 1.5mm length x 0.05 width. The challenge will also be to detect defects up to 0.035mm depth (for critical type of production). Provea said the numerous trials organised before the contract turned out to be very positive in terms of SNR results. The ultrasonic bench will control the defects as well as the tube's dimensions (wall thickness and tube length).

Thanks to these technological improvements Provea's new bench will provide high quality controls for this very specific demand: quick settings for a new production campaign, on demand software, defect positioning marking and online customer marking (pilgrim steps systems on the sorting tables for a future complementary process), fully integrated water management system and calibration procedure to be integrated. As always in the NDT field, technical developments are necessary in order to meet the customer's needs. This new UT bench will entirely be mounted and fully tested by Provea by the end of Spring 2014.

Provea – France
Email:
contact@provea-machine-tube.com
Website:
www.provea-machine-tube.com

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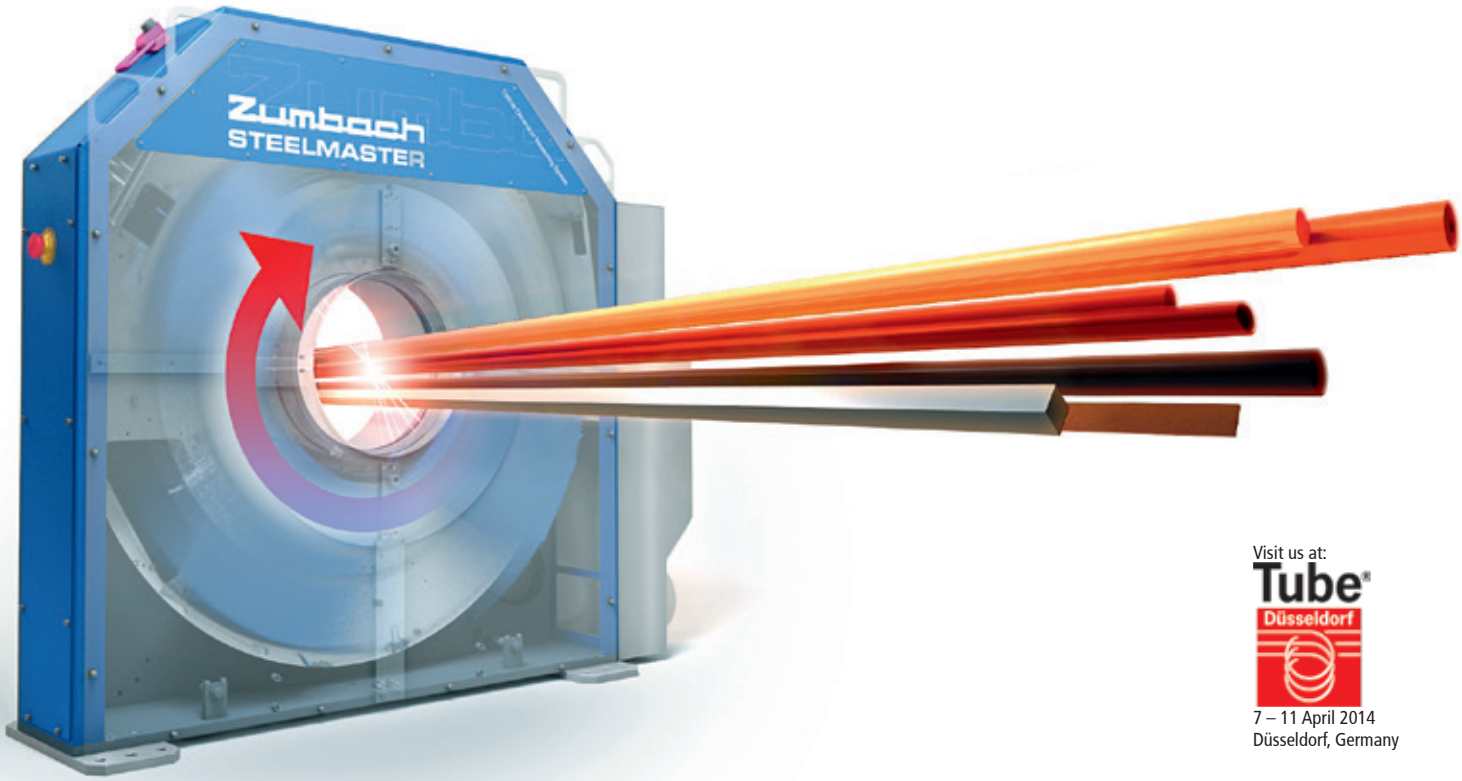
Revolutionary Rotational Measurement

Revolutionary laser rotation technology results in highly accurate measurement of dimensions down to 1/10th second cycle. STEELMASTER SMR systems from ZUMBACH: The solution for all lines including high speed with 2- and 3-roll block technology, also for short product lengths.



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Tube
Düsseldorf
7 – 11 April 2014
Düsseldorf, Germany

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Video

Finally the trouble-free answer to the industry demands for rolled steel.
As quality requirements become ever stricter and raw material prices continue to rise, reducing waste is increasingly the key factor for economic viability.

- STEELMASTER SMR measures a complete profile within 1/10 second. The system, with up to 3 synchronous rotating measuring heads can acquire up to 6000 measurements/second due to our innovative laser rotational measurement technology.
- Unique, fully contact-free transmission of both energy and signals by means of induction and encapsulated W-LAN grants virtually zero maintenance and wear-free operation.
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sales@zumbach.ch I www.zumbach.com

Bulgarian tube maker HUS chooses EFD Induction Weldacs

Mr Milenkov signing the EFD order

HUS, the Bulgaria-based steel and tube maker, has ordered four complete Weldac induction welding systems from EFD Induction. The systems will be installed in HUS's new manufacturing facility in the city of Lom in northern Bulgaria, which has a planned monthly output of 12,000 metric tons.

"After carefully examining various suppliers we were finally convinced by the proven ability of the Weldac to reduce operating costs while delivering outstanding throughput," said HUS export director Dimitar Milenkov. "Also, the fact that EFD Induction is present throughout Europe, including having a major factory in Romania, means we have considerable after-sales support on our doorstep."

The four Weldac systems ordered by HUS range in power from 125 to 450kW. Each welder features impeders from Electronic Heating Equipment (EHE), the US impeder specialist acquired by EFD Induction in 2012. "The inclusion of the EHE impeders is important," said Matthias Gruber, managing director of EFD Induction Austria, who was one of the team that secured the order. "It shows how we can supply complete induction welding solutions that are customised to specific customer needs."

HUS's new factory in Lom, together with the four new Weldac welders, makes the company one of Bulgaria's largest tube and pipe companies. "We already export, particularly to customers in the Balkans and Eastern Europe," said Mr Milenkov. "However, we aim to export much more to other markets, especially after our acquisition of Kloeckner Bulgaria earlier this year. In fact, all the tube and pipe welded by the new EFD Induction Weldacs will be sold to customers in Central and Western Europe."

Two of the four Weldacs have already been shipped to HUS. "The schedule is for the remaining two to be completed at an EFD Induction production facility in Norway and shipped to us by the end of October," said Mr Milenkov. "So we're very busy preparing our factory and setting up the lines. I mean, the arrival of one brand new Weldac is an event, but four in the space of a few weeks is certainly a major turning point, not just for HUS, but for the entire Bulgarian tube and pipe industry."

EFD Induction has to date installed thousands of heating solutions for a wide range of industrial applications – bringing the benefits of induction technology to many of the world's leading manufacturing and service companies.

EFD Induction has manufacturing plants, workshops and service centres in the Americas, Europe and Asia. Corporate headquarters are in Skien, Norway.

EFD Induction as – Norway
Website: www.efd-induction.com

Benteler enters North American seamless tube market

IN the course of implementing its growth strategy, Germany company Benteler Stahl/Rohr (BSR) has concluded a contract with Danieli & C, Italy, for a new turnkey 4½" seamless tube mill.

The mill will be built in Shreveport, in the north-western part of Louisiana, USA, and will be one of the largest production plants in the history of this region. The mill is designed for an annual capacity of 320,000t and will produce high-quality seamless tubes with excellent tolerances and material properties according to API and ASTM standards.

Within the framework of its cooperation with Danieli Centro Tube, Friedrich Kocks GmbH & Co KG will supply an EXB 315/3 extracting block and an SRB 315/30 stretch reducing block as essential components of the hot rolling mill. BSR opted for rolling blocks with a modular design, which are equipped with both non-adjustable and adjustable roll stands. The stands are operated with individually driven rolls, which are interchangeable so they can be used in the EXB as well as in the SRB on every stand position.

The specification of this design, including pass remote control for the adjustable stands, and quick-changing systems for stands and rolls, minimises the number of changing stands required for optimum production. The automation system enables the visualisation of the measured data of the rolling mill, while allowing the operator to control the operation, minimising heavy ends and wall thickness variation.

Production of the mill is scheduled for the second half of 2015.

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Website: www.kocks.de

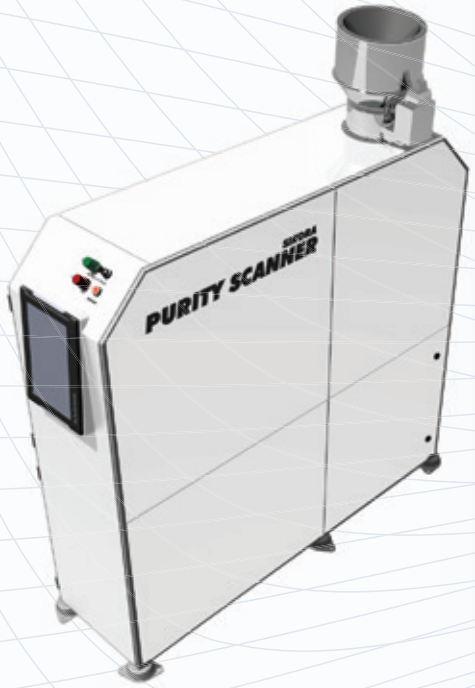
Danieli & C – Italy
Fax: +39 0432 1958289
Email: info@danieli.it
Website: www.danieli.com

Benteler Stahl/Rohr – Germany
Website: www.benteler.com

www.sikora.net/purityscanner

»Absolute purity makes the difference.«

Dr. Christian Frank
Executive Board SIKORA AG



The SIKORA PURITY SCANNER is a system for the online inspection of plastic pellets as they are used in raw materials, masterbatches and compounds for all kind of production processes.

Contaminated pellets are reliably detected and separated by compressed air, assuring that they initially do not get into the production process. The pellet inspection allows the detection of metallic and organic contaminations inside the pellet as well as on the pellet surface, using a superior combination of x-ray technology and an optical system.

PURITY SCANNER

- Dual inspection: X-ray and optical
- Detection of contaminations from 50 µm on the pellet surface and inside the pellet
- Flow rate: 500 kg/h, 1000 kg/h, 2000 kg/h
- Hermetically sealed system
- Suitable for all kinds of transparent and colored pellets
- Automatic sorting
- Easy to integrate in existing feeding systems

SIKORA
Technology To Perfection

Victor realigns Tweco brand

VICTOR Technologies has announced that it is positioning Tweco as its single brand for speciality welding products and arc accessories. Starting with the Tweco Fabricator 3-in-1 welding machines, and continuing throughout the entire Thermal Arc product line, all welding products will transition to the Tweco brand.

"From the classic Tweco MIG gun to the latest multi-process welding machine, Tweco products are designed to enhance the skill and reputation of every welder," said Martin Quinn, CEO of Victor Technologies.

In 2012 the Tweco logo design was refreshed to welcome a new generation of welders to the brand. The new brand mark and trade dress have already been introduced with Tweco MIG guns and arc accessories. Welding power supplies will now be added, with all current Thermal Arc units transitioning to a sleek black design and prominent Tweco branding.

The company also changed its name to Victor Technologies, aligning all of its cutting and gas control products under the Victor brand. "Tweco shares a history and a set of values based on authenticity, innovation and a deep connection with the end user," said Mr Quinn. "This realignment leverages our two strongest and most respected brands in the market, Victor and Tweco."

Victor Technologies provides solutions for cutting, gas control and welding equipment under brand names that include Victor, Victor Thermal Dynamics, Victor Arcair, Victor TurboTorch, Tweco, Thermal Arc, Stoody, Firepower and Cigweld.

Victor Technologies – USA
Website: www.victortechnologies.com

Benteler awards a contract for a quench and temper system

BENTELER Steel/Tube from Salzburg (Austria) has ordered a TemperLine™ system from SMS Elotherm for its planned seamless tube plant in Louisiana, USA.

With this new plant Benteler strengthens its presence in one of the most important growth markets for worldwide oil and gas exploration.

The Quench & Temper system consists of the induction austenitising and equalising units, the quenching system and the related transport rollers and cooling beds.

SMS Elotherm provides its in-house built converter technology (IGBT) for generating the operating frequency and electric power. This allows for a throughput of 15 t/hr for a range of tubes with diameters 40mm to 140mm and various wall thicknesses.

Core of the supplied TemperLine™ are the flexible multizone converters with a total of about 10MW power out of the Elomat® series. With three converters only, eight zones of the austenitising and tempering line can be individually controlled for achieving optimum process results.

"This system configuration enables Benteler to produce metallurgical and geometric qualities, better than the demands of the applicable API specification," said Dr Guido Opezzo from SMS Elotherm.

Furthermore, Benteler can avoid the investment in sizing and calibration presses, since the straightness and ovality of the tubes after being heat treated on the TemperLine™ does not require additional geometrical corrections.

The systems will be commissioned in the second half of 2015.

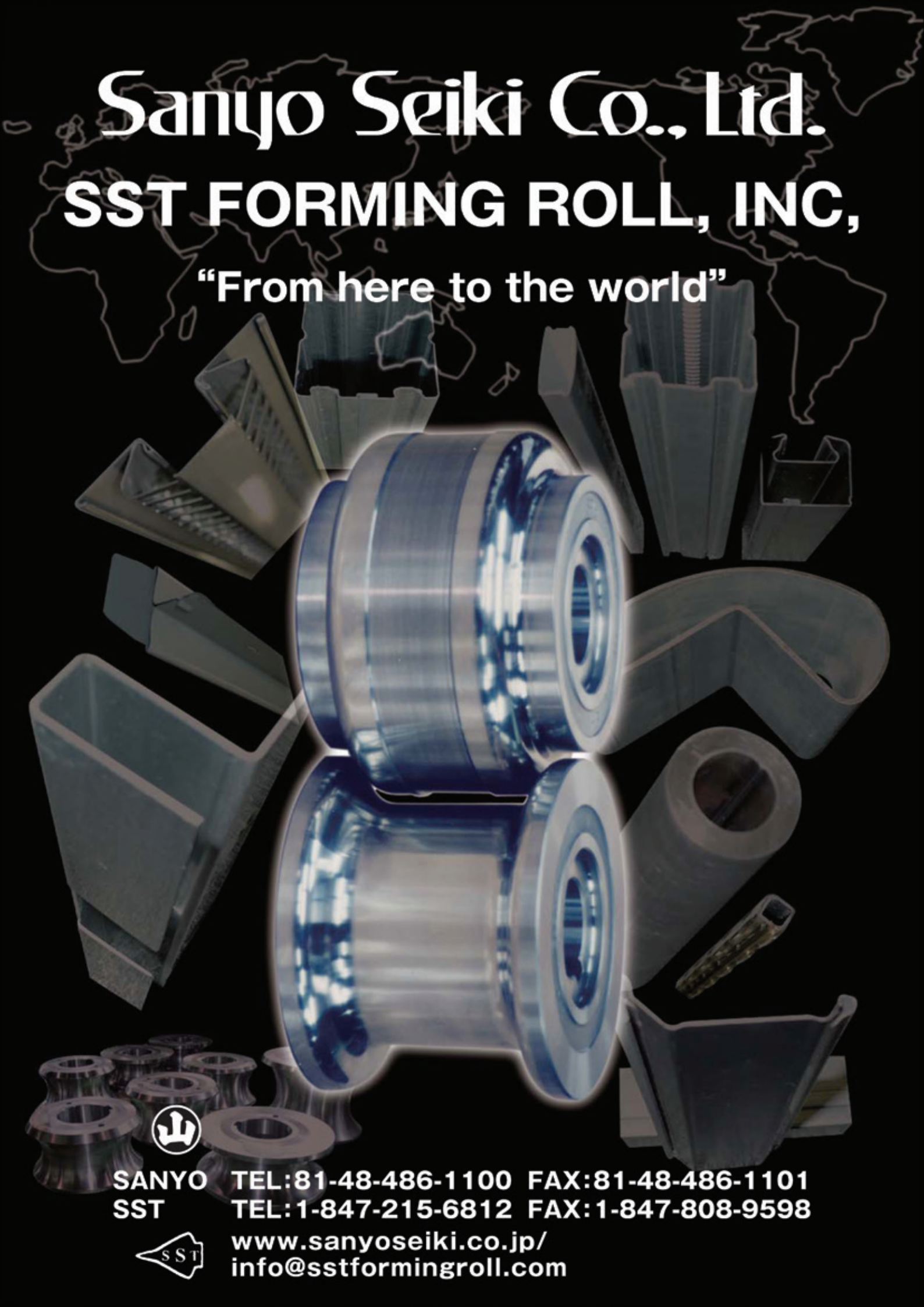
SMS Elotherm GmbH – Germany
Email: a.zentner@sms-elotherm.com
Website: www.sms-elotherm.com

Benteler has ordered a new TemperLine system

Sanyo Seiki Co., Ltd.

SST FORMING ROLL, INC,

"From here to the world"



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www.sanyoseiki.co.jp/
info@sstformingroll.com

Slitting, punching, straightening and finishing lines

FASPAR SpA is a machine builder from the Milan area of Italy that began production in 1966. It previously produced presses but since 1977 has produced complete sheet metal working lines. With a 4,000m^2 production area, FASPAR is now a well-known company for its main products: slitting lines; levelling and straightening and cut-to-length lines (with rotary, flying and mechanical shear); surface finishing lines; feeding and pressing/punching lines; tension/stretch levelling lines; roll forming lines and sandwich panel lines.

The FASPAR slitting machine

Processed material can be mild/carbon steel, galvanised steel, pre-painted steel stainless steel, aluminium, titanium and copper.

Its customised products serve steel service centres, automotive industry, white goods industry, and construction industry. FASPAR is the supplier of important international groups, such as ThyssenKrupp Group, Sassoli Group, Sandvik, Metecno Group, Ugine & Alz (Arcelor Group), Acesita, and many other important service centres worldwide. Over 300 FASPAR machines are used in Italy, Europe, Russia, Asia, North and South Americas and Africa by a wide range of customers.

FASPAR is an UNI EN ISO 9001/2000 certified company. It is now making a new step in its internationalisation, participating in the most important exhibitions worldwide and expanding its contacts and collaboration. FASPAR will be present at the Tube Düsseldorf exhibition (stand 5D19).

FASPAR SpA – Italy
Email: faspar@faspar.it
Website: www.faspar.it

Offering equipment and services to Europe

TRI Tool Inc, a supplier of precision machine tools and welding equipment, and TechnoPipe GmbH, a service provider and industrial equipment distributor, have joined forces to provide an extensive range of equipment and service solutions in Europe.

"We are so pleased to be doing business with TechnoPipe," stated Todd Fox, vice president of international sales at Tri Tool Inc. "Their reputation for excellent service and long history of expertise with portable machine tools is a perfect fit for Tri Tool."

Tri Tool Inc is a US manufacturer of portable machine tools, multi-process welding equipment, pipeline equipment and high purity pipe end prep tools. TechnoPipe GmbH is located near Frankfurt, Germany, and has served European industry for over 30 years, providing machine tool sales, rental and servicing, as well as hot tapping and pigging sales and services.

Patrick Fuss, managing director of TechnoPipe, commented, "We are excited to launch our relationship with Tri Tool at the Essen Cutting and Welding show. Tri Tool's portable machine tools are reliable, high performance and long lasting, and we are proud to represent them in Europe."

Tri Tool Inc manufactures precision portable equipment for pipe bevelling, flange facing and in-line cutting, multi-process welding equipment, high performance pipeline machinery, and a wide range of internal line-up clamps. The company also provides custom machinery design and manufacturing, on-site machining and code welding services, and Tri Tool equipment rental.

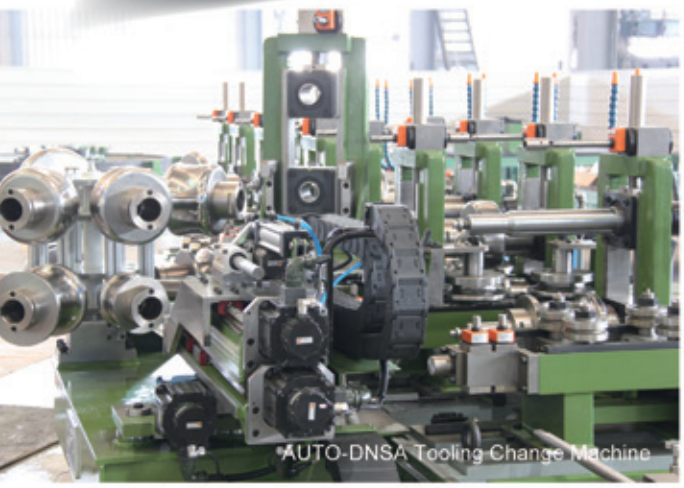
TechnoPipe GmbH is a service provider and industrial equipment distributor for on-site machining needs in multiple industries, in particular the power, refining and chemical industries. TechnoPipe also provides online pipelines services through sister company IPSCO GmbH.

Tri Tool Inc – USA
Fax: +1 916 288 6160
Email: international@tritool.com
Website: www.tritool.com

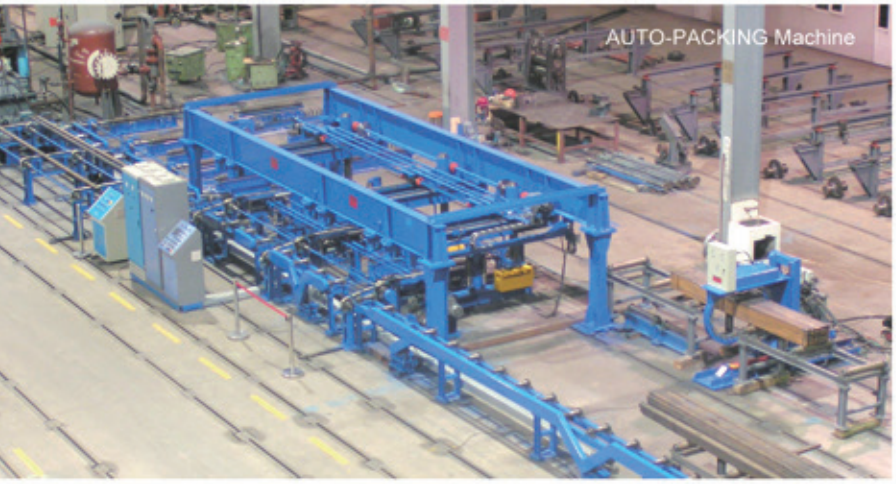
TechnoPipe GmbH – Germany
Website: www.technopipe.de

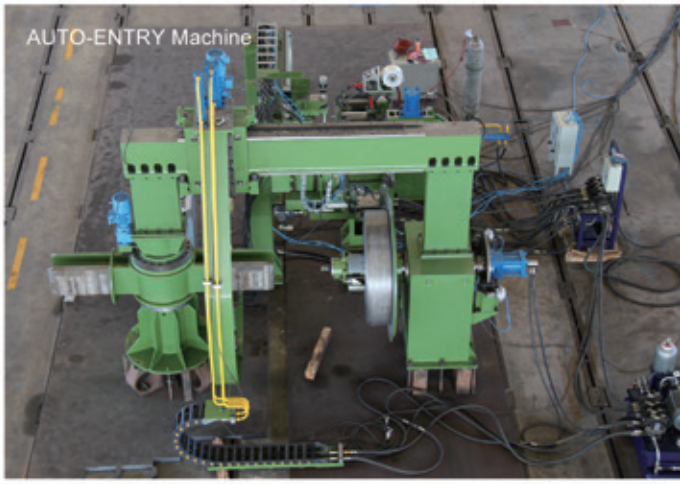
FD Machinery CO.,Ltd

www.fdmachinery.com


AUTO-DNSA Tooling Change Machine


AUTO-CFS Line


AUTO-PACKING Machine


AUTO-ENTRY Machine

DEAR CUSTOMER

You certainly hope to have a tube mill which has high production rate and less operators, if you are a leader of a tube company. You hope to only push one button to finish your job, if you are a tube mill operator. FD's brand new AUTO DNSA-X2 technology can help your dream comes true. The horizontal rolls can be automatically changed and adjusted. Other rolls also can be automatically adjusted. No more position indicators. No need to bother with the adjustment data.

RELIABLITY

AUTO DNSA-X2 technology not only can be employed to new mills, but also can be used for old mill upgrade. You can choose either automatic change horizontal rolls, auto adjustment or automatic change all the rolls to upgrade your mills. Someone may say the automatic changeover may cause your mill shutdown often. FD can guarantee you that Auto DNSA-X2 technology will never shutdown your mill.

ADVANTAGE

AUTO DNSA-X2 technology shorten the changeover time to less than 1 hour. A new operator only need two hours training before the actual work and the yield will not drop. You can imagine what a great advantage that AUTO DNSA-X2 technology brings to you. The upgrade cost are small compare to the benefits it brings to you. The cost approximate equal to two operators' 1 year salary.

NEW BRANCH

In order to spread this technology, FD plans to open a branch company in Europe and US. We are recruiting district managers. Interest persons please contact Owen Gao,

email: cgb@fdmachinery.com.

Phone: 0086-13998635783

Tube Düsseldorf

Booth No.6C42

Add: Jinma Street, Tiexi Development District, Pulandian,Dalian P.R. China 116200
Tel: (86)-411-83192715 Fax: (86)-411-83192716 Email: fd@fdmachinery.com Web: www.fdmachinery.com

Burr Oak presents at Siemens Automation Summit

ERIC Lund and Adam Broadwater from Burr Oak Tool Inc presented a case study at the 2013 Automation Summit in New Orleans.

The presentation covered Burr Oak's use of Siemens technology, specifically its S7-1500 series PLCs and TIA Portal engineering software. Mr Lund and Mr Broadwater described how the technology was implemented and the benefits that it provided to Burr Oak to help build new equipment faster, better and more economically.

The Automation Summit is held by Siemens as a way for its customers to learn from other companies, network, receive training, and provide input to Siemens.

For over 65 years Burr Oak Tool Inc has designed customised production machinery for the heat transfer and tube processing industries.

Oak machines are installed and successfully operating in over 70 countries. The company aims to offer quality machines, service and parts to customers worldwide.

Burr Oak Tool Inc – USA
Website: www.burroak.com

Reece Group completes third acquisition in 18 months

AS part of its continuing strategy to create a diverse engineering business, the Reece Group has acquired a 100 per cent stake in Pipe Coil Technology Ltd.

The Reece Group is the holding company for a number of innovative North East engineering businesses including Pearson Engineering in Walker, Responsive Engineering in Gateshead and Velocity UK in Sunderland. These businesses operate in the defence, subsea, construction and oil and gas markets. Following the acquisition the group turnover will be £100m and the business will have more than 500 local employees.

Pipe Coil Technology, based in the North East of England, is one of the world's leading specialists in the design and manufacture of complete coiling, packaging and handling equipment for a wide variety of flexible piping products. The business has a forecast turnover of over £6m and has more than 40 employees.

John Reece, Reece Group chairman, said: "This is another strategic acquisition for the Reece Group. It comes on the back of our acquisition of Velocity UK and Responsive Engineering last year and our recent purchase of the BAE Systems property on Scotswood Road. Pipe Coil Technology adds a third product company to our business, enabling us to explore another new market. The business has shown it can deliver world-class engineering solutions and we are looking forward to working with the management team to grow the business."

Gordon Fiddes (left) of Pipe Coil Technology with John Reece and Phil Kite of Reece Group

Phil Kite, Reece Group CEO responsible for acquisitions, added: "Our goal is to create a more broadly based engineering business which is less dependent on defence with strength in the oil and gas, construction and subsea markets.

"The acquisition of Velocity UK, Responsive Engineering and Pipe Coil Technology in the last 18 months highlights the progress made in delivering on our strategic plan. The acquisition of Pipe Coil Technology gives us another product business and we are excited by the opportunity this will create."

Pipe Coil Technology managing director Gordon Fiddes, who will remain with the business, said: "It was the ambition of Reece Group that made them attractive as a buyer for the company. From the start of negotiations it was clear they wanted to invest in the business for all the right reasons. We are looking forward to working with the Reece Group and taking the business forward, in particular in the export market, where Reece Group has had considerable experience and success."

The Reece Group – UK
Website: www.reecegroup.co.uk

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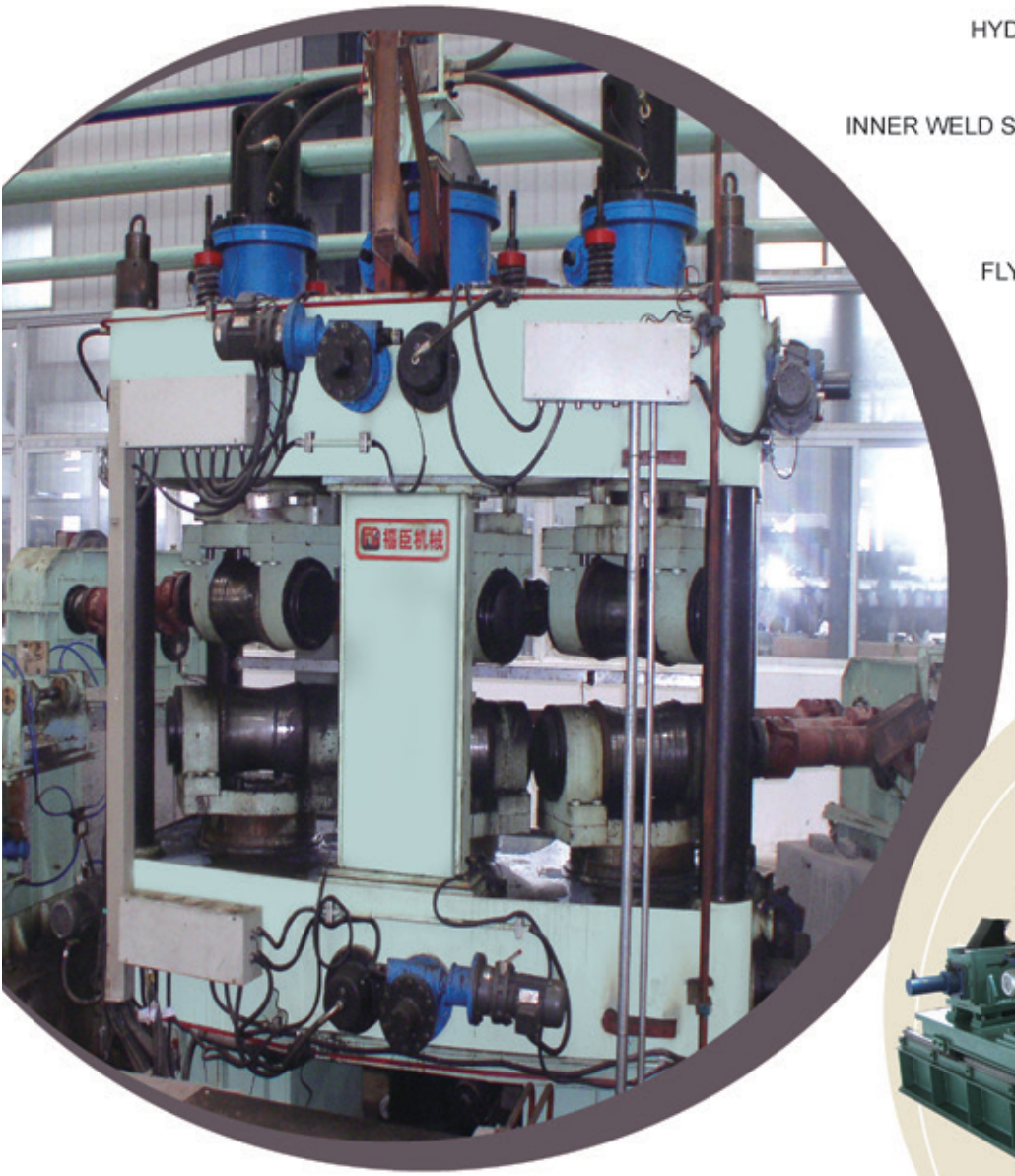
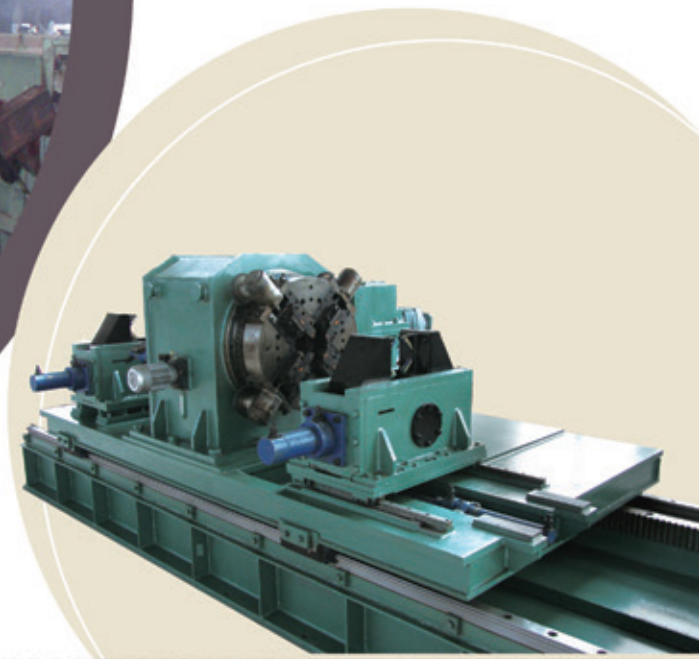
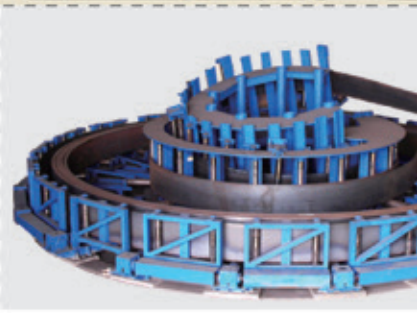
- PIPE CUTTING MACHINE
- FLYING SAW WITH ROTATING CUTTER
- THREADING MACHINE
- STRIP ACCUMLATOR
- . . . . . .







FORTUNE

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TEL : 008622-22928211 FAX : 008622-29332199 HP : 13902159364

HTTP : //www.tjfuchen.com E-mail : tjfc@eyou.com

Tube bending and fabrication

SHARPE Products, which specialises in tube bending and fabrication, offers custom CNC pipe/tube bending and rolling, tube laser cutting and tube fabrication services for many industries and OEMs including the automotive, medical, furniture, retail and handrailing sectors.

Utilising state-of-the-art CNC tube bending machinery and tube inspection technology Sharpe's bending team is equipped to handle pipe and tube up to 6" OD with experience bending steel, stainless steel, aluminium, copper, and other materials. With the use of all-electric tube benders, quality bent products are produced and delivered to customers in a cost effective and time efficient manner.

Sharpe's fibre optic tube laser has unique cutting capabilities and increased production speed versus traditional CO_2 tube lasers. This 3,000 watt fibre optic tube laser can cut highly reflective materials which include copper, brass, bronze, galvanised pipe, and aluminium along with the traditional steel and stainless steel. Capacity for the tube laser is up to 6" OD.

End-forming capabilities have recently been expanded at Sharpe's facility with the addition of a Proto-1 Ram-70 end-forming machine allowing for a wide variety of end-forming options. This six head end-former can handle tube sizes from ½" OD up to 7" OD for a variety of pipe and tube shapes. In addition to making end-forms such as beading, expanding and reducing, this CNC machine allows for multiple end-forms on one piece of tube by being hit up to six times. This allows for complicated parts to be made in an efficient and cost effective manner.

The following value-added custom tube fabrication services are also available to help complete your project: high-speed cutting, end-forming: reducing, expanding, flaring, swaging, beading and threading. Fabrication: welding, notching, punching, coping and drilling. Finishing: anodising, polishing and powder coating.

Quality inspection processes are in place for every type of quality level needed from 100 per cent fixturing on the BluCo to detailed reporting from the Tube Inspect S and 3D laser scanner. This gives Sharpe customers confidence of a smooth product development process.

Specifically designed for the tube bending industry, the Tube Inspect S inspects bent parts in seconds and sends needed corrections directly to the bending machine if required. This results in shortened set-up times and more accurate set-up of parts.

For customers that have a continuous need for their products, Sharpe Products offers inventory management programs such as Kanban, and stock and release programs. These programs provide customers with shortened lead times for lean operations. Jobs from prototype to large volume production are welcome.

Sharpe Products – USA
Email: estimating@sharpeproducts.com
Website: www.sharpeproducts.com

A new European distribution centre for PIPE

AFTER the huge success of its 2013 Exhibition Campaign, including Steelfab and Tube Arabia in the Middle East and the Schweissen & Schneiden Exhibition in Germany in September, PIPE Ltd will once again be showcasing its extensive pipeworking product portfolio at the upcoming Tube Fair in Düsseldorf from 7 to 11 April 2014.

Regular exhibitors at Tube for nearly ten years, this will be PIPE's fourth Tube fair. "Since our first presence at the Tube Fair, the fair has gone from strength to strength, increasing footfall year on year, while maintaining the relevance and quality of visitors, making it an excellent platform for launching new products into the pipe and tube market," said managing director Tony Tagliaferro of the show.

"Some of our best customers have developed from initial contact at the Tube fair, and have grown to become some of the most valued and long-term relationships. The Tube show, among others, really is an essential platform for us."

PIPE will be unveiling a number of new pipe and tube-related machining products and ancillary tools including: new self centring O/D mounted split frame pipe cutting and bevelling machines, together with the latest incarnations of its popular mid-size dedicated pipe bevelling machines, the Supermaxi series.

Since the last Tube Fair in 2012, PIPE has gone from strength to strength, both in the domestic and European markets, as well as further afield. This is partly due to its new international sales strategy and the success that has come from its presence at Tube, and other international trade shows.

By the time the Tube 2014 fair arrives, PIPE will also have fully established its new central European distribution hub. With the directive to facilitate existing and new customers and distributors with its complete portfolio of pipe working tools and equipment – "this is a natural step in progression for PIPE," said international account manager Justin Gammond.

"With the dramatic increase in international business for us over recent years it has now become necessary for us to set up a base on mainland Europe to allow us to offer even faster delivery times at lower costs and to meet the demands of our customers. It will also further grow our presence within the European market.

"These are exciting times at PIPE, and we look forward to meeting many existing and, I am sure, plenty of new potential customers at the Tube show."

Visit PIPE at the Tube Fair in Düsseldorf from 7 to 11 April at stand H41 in Hall 6.

PIPE – UK
Email: sales@pipe-ltd.com
Website: www.pipe-ltd.com

Continued expansion plans

PIPE measurement specialist Optical Metrology Services (OMS) had a successful 2013. In the last three months the company completed 26 separate pipe measurement projects for customers, achieving record sales revenues in this period.

In addition, OMS is continuing to expand in the UK and USA. Hugh Davies, director of client solutions at OMS, commented, "This last quarter has seen OMS operating at record levels and there doesn't seem to be any signs of it slowing down. We are busier than ever and are currently working on five pipe measurement projects around the world.

"Investing in people and equipment is also at an all-time high. We've recruited six new staff in the UK since the beginning of 2013 and two additional staff in our Houston office in the USA. In the UK, we will shortly be expanding our existing office and production space to cope with this growth."

OMS has grown company sales revenues by at least 100 per cent per year since 2006, with around 90 per cent of annual turnover from overseas customers. The company specialises in providing measurement services and precision measurement systems to the oil and gas industry worldwide. A key focus for the company is in the dimensional measurement of oil and gas pipes or other similar structures where dimensions are critical.

OMS pipe measurements

In the last 12 months OMS has successfully completed pipe measurement, fit-up or internal weld inspection surveys for a number of high profile customers and projects, including Subsea 7 (StatOil and Clare Ridge), Chevron (Gorgon), Saipem (Jack & St Malo; Casterone pipe laying vessel), Serimax (Chess; Shell Gannet), McDermott (Gorgon), Bredero Shaw (Wheatstone), Hyundai Heavy Industries (Barzan), Oceaneering (Llano) and Socotherm (West Boreas).

Mr Davies continued, "In order for the UK economy to climb out of recession, UK businesses need to be extraordinarily good at growth. The ones who will make a difference are not those that grow at 5 per cent per year, but those that grow at rates nearer 100 per cent per year. OMS is a shining example of a successful, UK-based, high growth SME that is exporting its services to every corner of the globe. For these reasons, we are also attracting high calibre people to come and work with us, who are keen to learn and to be trained and to take on further responsibilities."

Optical Metrology Services Ltd – UK
Fax: +44 8700 940014
Email: sales@omsmeasure.com
Website: www.omsmeasure.com

Contract signed for large-diameter two roller cold pilger mill

JIULI Group, one of the leading companies for stainless tube manufacturing in Zhejiang Province, China, has placed an order with National Heavy Machinery Research Institute, which was founded in 1956 and is one of the largest comprehensive research and development enterprises in steel, aluminium and non-ferrous metals.

Jiuli Group has placed a new order to supply one set of two roller LG-530 cold pilger mills with a horizontal force dynamic balance for the crankshaft, feeding and turning system and servo synchronisation system.

This cold pilger mill will be used for producing power station boiler tubes, oil drilling pipes and various other applications. The customer decided to favour the cold pilger mill due to the high quality of the tubes and experience of the company. This is the 40th set of cold pilger mills that the company has supplied to Jiuli Group. Over the past 57 years China National Heavy Machinery Research Institute Co has supplied more than 200 sets of cold pilger mills, which it has also exported to the USA and to Indian seamless tube plants. Among them, there have been 40 for high-speed cold pilger mills.

China National Heavy Machinery Research Institute Co – China
Email: yangbo@sino-heavymach.com
Website: www.sino-heavymach.com

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Technical innovations in masterbatch and additives

COLLOIDS Ltd, UK, has been producing masterbatches and concentrates for the thermoplastics industry since 1967. The company offers custom-designed solutions alongside a comprehensive range of standard products.

The company has announced a number of technical innovations in masterbatch and additives. The Pace® series includes masterbatches based on solvent black (nigrosine) and/or carbon black, as well as formulations offering improvements in frictional properties or heat stabilisation.

The E-Tec® range features anti-static, dissipative and conductive compounds for applications where varying degrees of permanent electrical conductivity are required.

An enhanced range of special effects for film augments the company's seasonal colour palettes, ensuring customers' products stand out.

Lead-free film, with a doubling of the grades available, covers the extremes of opacity and both light and colour fastness, all approved for EU food contact applications.

The all-new Sustain line is bio-based for environmental sustainability (typically corn starch or cane sugar) and available in either universal or polymer-specific masterbatches (polyamide, polyethylene and polyesters including PLA).

The Sustain range is fully recyclable and will not impact on quality if mixed with fossil derived polymers of the same type, unlike biodegradable polymers.

Backed by ISO/TS 16949:2009 accreditation, Colloids continually strives to improve performance in both service and products, supported by a skilled R&D team and extensively equipped laboratory facilities. The company is also accredited to the ISO 14001 Environmental Management System standard, and committed to developing technologies in areas such as bioplastics, polymer recycling, energy recovery and responsible disposal.

Colloids Ltd – UK
Fax: +44 151 545 4741
Email: sales@colloids.co.uk
Website: www.colloids.co.uk

Burr Oak Tool breaks ground for assembly facility

BURR Oak Tool Inc held a ground breaking ceremony for its new assembly facility in Sturgis, Michigan, USA, in October.

The multi-million dollar investment is expected to create approximately 50 new jobs immediately, and many additional employment opportunities over the next two to five years.

The new facility will be located at Dresser Industrial Park in Sturgis, with expected completion in March. The expansion is required to meet the growing worldwide demand for Oak-designed machines, especially the new FP-1400 and FP-1000 fin lines and the Triumph hairpin bender.

For almost 70 years Burr Oak Tool has designed customised production machinery for the heat transfer and tube processing industries.

Oak machines are used in over 70 countries.

Burr Oak Tool Inc – USA
Fax: +1 269 651 4324
Website: www.burroak.com

Burr Oak Tool's ground breaking ceremony

Roll Magic

75 delivery results of FFX Mill

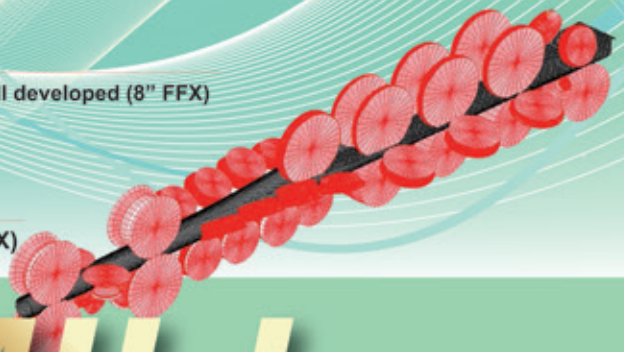
2009
Complete API mill plant
(25" FFX)

2003
Largest mill revamped (24" FFX)

2002
First large size mill developed (16" FFX)

2001
Heavy gauge mill developed (8" FFX)

1998
First FFX developed (2" FFX)



FFX MILL

High Performance Tube Forming Mill

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http://www.nakata-mfg.com

Herber and Soco in collaboration

HERBER Engineering AB of Varnamo, Sweden, and Soco Machinery Company Ltd of Taichung City, Taiwan, have announced a newly formed collaboration in various European and Asian markets.

The partnership will help to broaden Herber's product portfolio via a unique partnership with the specialist in tube forming and cutting machines, and will further expand the range of Soco's tube fabrication machinery.

Herber currently manufactures its own line of high-end CNC tube and pipe bending machines, which will be complemented by Soco's range of tube bending, forming and laser cutting machines for most countries in Europe.

Herber will be directly responsible for service, as well as spare parts and production of bend tools for Soco products in select European countries, and will assume full responsibility for Soco's European customers in these countries. Soco will promote Herber's range of CNC tube and pipe bending machines to new and existing customers in Asia.

Herber Engineering AB – Sweden
Fax: +46 370 156 25
Email: info@herber.se
Website: www.herber.se

Soco Machinery Co, Ltd – Taiwan
Fax: +886 4 23592386
Email: sales@soco.com.tw
Website: www.soco.com.tw

OMS appoints chief technology officer


Peter Day

OPTICAL Metrology Services (OMS) has appointed Peter Day as the company's chief technology officer (CTO). Based at OMS's UK office in Bishop's Stortford, Mr Day will lead the tools division, and will sit on the OMS board of directors.

Mr Day's responsibilities include all technical aspects of OMS tools, including managing the delivery of measurement and inspection tools used by OMS operators. He will also manage the team responsible for delivering analysis and statistical reports to customers and for evaluating existing and new technologies. He brings a wealth of experience in technical and business management, including a successful track record in business re-engineering and continuous improvement at several blue chip companies. He also has a strong technical background, with previous roles as a design engineer, draughtsman, mechanical engineer and materials/manufacturing engineer.

Commenting on his appointment, Mr Day said, "I am very excited to be joining the OMS team. These guys have a passion for innovation and customer service that I admire greatly. I am looking forward to focussing their energy on new and existing product developments – so watch this space."

OMS is a specialist measurement technology company that provides measurement services and precision measurement systems to the oil and gas industry. A key focus for the company is in the dimensional measurement of oil and gas pipes or other similar structures such as aero engines, process industry tubes or manufactured cylindrical objects, where dimensions are critical.

Optical Metrology Services Ltd – UK
Fax: +44 8700 940014
Email: sales@omsmeasure.com
Website: www.omsmeasure.com

Board of management downsized

AS part of its future-orientated Growing Together 2.0 programme, the Schuler Group is streamlining its top management level and merging individual companies. The board of management is to be downsized from five to four members and the number of second-tier managers in Germany is to be reduced significantly.

In explaining the planned changes, Schuler AG's CEO, Stefan Klebert, stated: "The new organisational structure will help us become more efficient. Schuler has been performing strongly over the past few years and our Growing Together 2.0 programme is aimed at maintaining this success in future."

Since 2010 the company has doubled sales revenue and quadrupled its operating result. According to the latest figures Schuler is on course to reach the growth targets it set itself for fiscal year 2013/14 (sales of around €1.2bn and an EBITDA margin of about 10 per cent) already in the 2012/13 fiscal year.

In the course of the planned structural changes, Dr Markus Ernst stepped down from Schuler AG's board of management on 30 September, 2013. He had been a member of the board since 2007 and was responsible for five technology fields in the group's non-automotive business. His responsibilities will be assumed by CEO Stefan Klebert.

"The supervisory board would like to thank Dr Markus Ernst for his tremendous dedication and contribution to the Schuler Group's success over the past years," stated Dr Wolfgang Leitner, chairman of Schuler AG's supervisory board.

As of 1 October, 2013, the board of management of Schuler AG will consist of Stefan Klebert (CEO – chief executive officer), Joachim Beyer (CTO – chief technology officer), Norbert Broger (CFO – chief financial officer and labour director), and Peter Jost (COO – chief operating officer).

The board of management and supervisory board are currently examining possibilities to streamline the complex group structure, especially in Germany, which has resulted from a number of company acquisitions over the years.

"The new corporate structure is aimed at facilitating fast decision processes and clear responsibilities, while at the same time ensuring the group offers its customers a unified product range," said Stefan Klebert.

"The resulting firm foundation will enable us to successfully overcome any future challenges."

Schuler – Germany
Website: www.schulergroup.com

Royalton awarded 20th entry line for coil build-up

ROYALTON Industries, a provider of tube and pipe entry systems, recently secured orders from major customers for several additional entry lines for the purpose of coil build-up. This brings the total number of entry lines supplied for coil build-up applications to 20. These types of coil build-up lines are generally designed to build up coil lengths of approximately 20,000 to 25,000ft, which is then fed into a tube mill which produces a 20,000 to 25,000ft long continuous tube.

At the exit end of the tube mill is a very large spool where the tubing is coiled up. The spools are loaded onto rigs that transport the spools out to oil and gas fields and used for down hole work such as drilling, perforating, matrix and fracture stimulation, wellbore cleanout, logging, nitrogen kickoff, sand control, cementing, well circulation, and mechanical isolation.

Royalton said it was chosen over the others because of its knowledge of what it takes to design and build a coil feeding equipment that works from day one with no start up delays. Royalton can supply the complete equipment requirement up to and including the large rewind spool, commonly called the 'big wheel'. This includes the uncoiler, automatic coil retainer, double hold down peeler, alligator flattener, crop shear, coil end joiner, planisher, tab punch, strip annealer, temperature sensor, X-ray unit, pinch rolls, electrics and hydraulics. Royalton has also supplied this type of equipment with the option of completely wired and piped, grid mounted, for trouble-free quick installation. Strip specifications on these lines generally are 3" to 16" wide strip, 0.08" to 0.337" strip wall thickness, HSLA grade material with 110,000 to 130,000 PSI ultimate yield strength, 82" OD coil diameter and 23,000lb maximum coil weight.

Royalton Industries – USA
Email:
lsteinmeyer@royaltonindustries.com
Website: www.royaltonindustries.com

Successful trade show for PIPE

THE Schweissen & Schneiden Exhibition in Essen, Germany, is the largest welding and cutting show in the world. PIPE has been a regular exhibitor for more than ten years and has found the show to be one of the best 'lead generators' and networking events in the calendar. This year PIPE exhibited its entire product range over an impressive 100m² open-plan design stand with live demonstrations being performed throughout the week.

PIPE's exhibition organiser, Justin Gammond, said: "This year has been one of the hardest shows to prepare for as previously we have never had anything quite this size or so bespoke. It took a lot of time and effort to get the stand the way we had it in our minds, but we were very pleased with the way everything turned out."

"We had great opportunities to meet with existing customers and distributors and have also had some very interesting enquiries that we hope will lead us into strong representation in some new countries as well as new markets, and it's only day two."

PIPE's new range of hot cutting equipment, the E-Z Cut Series, a comprehensive range of machines for the flame and plasma cutting of pipe and platework, proved to be popular with visitors. New machines in the range include the new 3D rail magnetic track cutting machine, the E-Z Cut manual and automatic pipe cut and bevel machine, and the Magnetic E-Z Cut pipe cutter. These machines drew great interest at the show due to their versatility and low cost, enabling operators to perform a variety of functions and operations on a multitude of pipe diameters.

Also drawing a lot attention at the show in Essen was the new Supermaxi series of pipe end bevelling machines.

PIPE – UK
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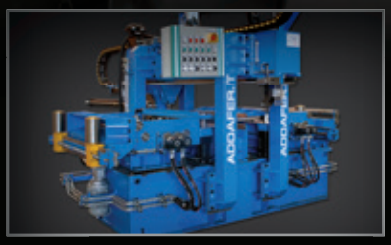
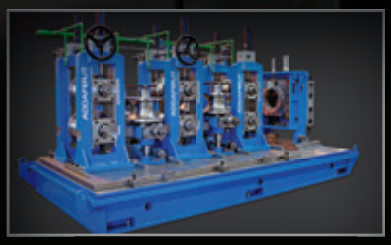
Website: www.pipe-ltd.com

ADDA FER MECCANICA

TUBE INDUSTRY SOLUTIONS

TUBE MILLS





ERW TUBE MILL ***TM10*** A.P.I.
273 x 8 mm.
50 m/min.

Tube Düsseldorf

Adda Fer @ Tube 2014
7-11 April 2014
Hall 06 - Stand 6D 02

ITALY | Via Giulio Natta, 9 | 24030 Mapello (BG)
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www.addafer.it | info@addafer.it

Ultrasonic and eddy current inspection for tubes

WITH over 85 years of experience in designing and manufacturing non-destructive test instruments and systems for the metals industry, Magnetic Analysis Corp (MAC) will be featuring its newest ultrasonic, eddy current, and flux leakage inspection systems for tube manufacturers.

Building on the success of MAC's Echomac® rotary ultrasonic testers, the company will be featuring a new spinning tube ultrasonic test system at Tube 2014. The system features an APC (automatic pitch control) transducer carrier that contains the water couplant and follows and adjusts to the pitch of the tube as it rotates through the tester. This allows testing of a large range of pipe sizes, including large diameters, with minimal transducer adjustments, if any, during size changeovers.

Because the transducers are under the pipe, no tight fitting glands or shoes are needed, resulting in lower water circulation requirements, fewer wear components and virtually no changes required to the basic water tank on size changeover. The spinning tube transducer system can also be installed as a retrofit or upgrade to existing installations.

MAC will also be exhibiting the latest MultiMac® eddy current testers and rotaries to detect surface, subsurface, ID and OD defects in tube and pipe, and the Xiris laser-based weld inspection system.

Information will also be available on test systems using a combination of more than one type of test technology – a requirement to meet many of today's stringent test standards such as API and ASTM.

Echomac ultrasonic testers combined with either MultiMac eddy current or MAC's Rotoflux® flux leakage technology can meet these standards.

Both the ultrasonic and flux leakage systems are capable of testing to 5 per cent defect levels on the OD and ID of tubular products. Because MAC offers all of these technologies, the systems can be fully integrated, providing operators with a consistent look and feel as well as enabling combined defect reporting.

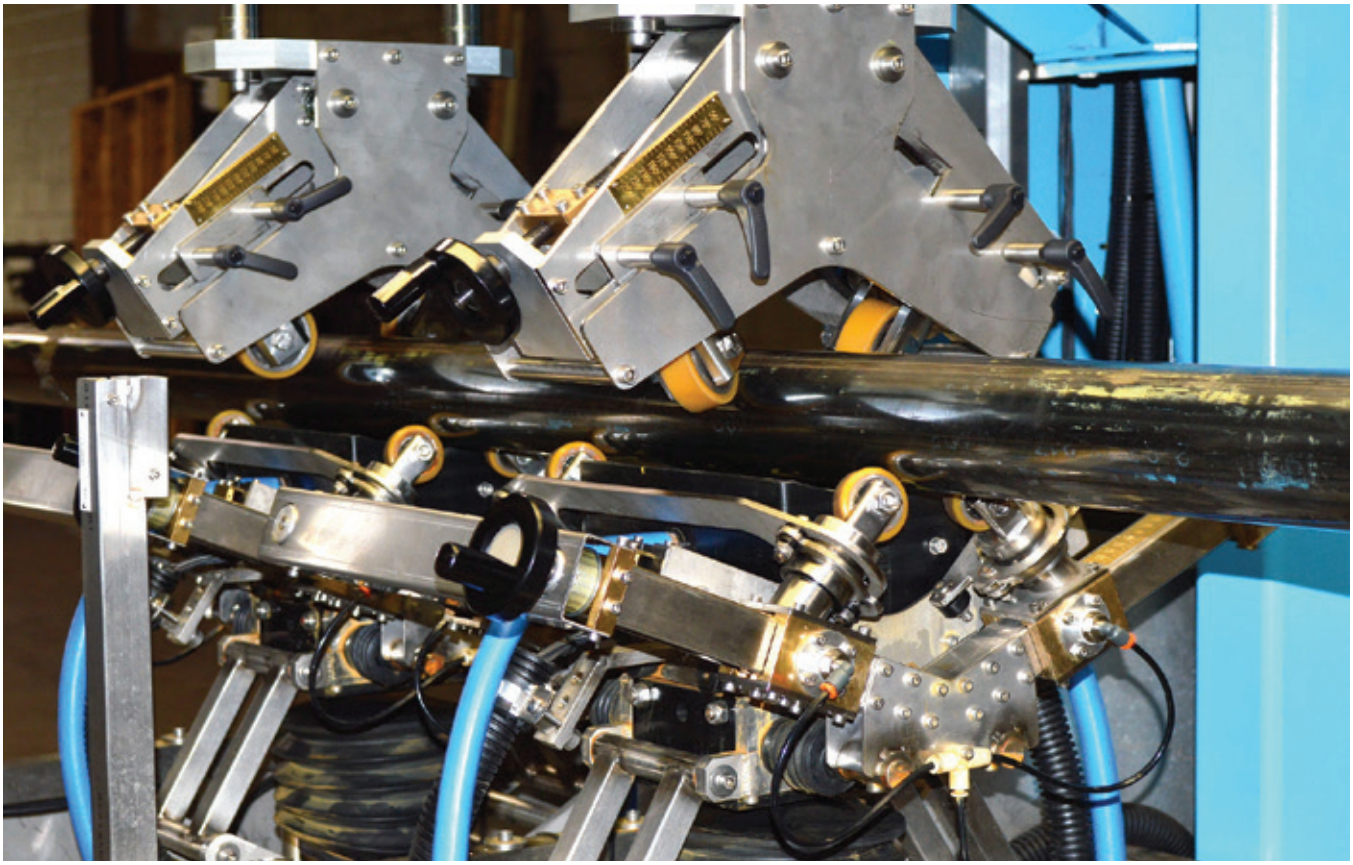
The testers can easily be combined into complete, automated test systems including triple pinch benches to maintain accurate positioning, standard and custom conveyors, markers, sorters, demagnetisers, water circulation systems for ultrasonic test applications, and sophisticated controls, all designed by MAC.

Typical system applications include testing welded and stainless tube, automotive tube, OCTG, and heat exchanger and Duplex tube.

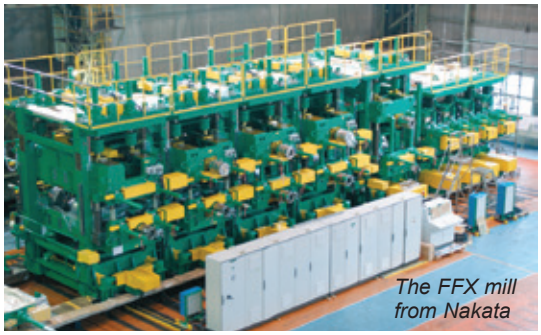
MAC's knowledgeable field staff will provide information in multiple languages on all of the company's products. See Magnetic Analysis at stand 6G40 in Hall 6.

Magnetic Analysis Corp – USA
Fax: +1 914 703 3790
Email: info@mac-ndt.com
Website: www.mac-ndt.com

Two Echomac spinning tube type ultrasonic inspection units with automatic pitch control for testing tube and pipe



Roll-common-use pipe mill under NC control


The FFX mill from Nakata

NAKATA, founded in 1908, has been engaged in designing and manufacturing tube and pipe mills for over half a century and has built more than 500 machines worldwide. It also works on the engineering business of tube and pipe, making lines with a combination of its finishing equipment.

The products manufactured by its mill are widely used in the oil and gas industry, machinery industry, infrastructure and for automobile uses.

Oversea markets are mainly the US, Europe, China and Russia, accounting for about 80 per cent of total sales.

It has always been devoted to developing more innovative technology for the tube and pipe industry and maintaining close corporation with many famous universities such as Tokyo and Osaka in the theoretical research of roll forming technology.

In 1998, based on its original 3D FEM simulation, the company succeeded in developing a new generation flexible forming technology, "FFX Mill", which realised the complete roll-common-use with precise NC control and can produce the pipes with different diameters, thickness and materials without any roll change in the breakdown pass.

In recognition of its achievements, in 2010 the company was awarded the Okochi Memorial Grand Prize for Production, the highest honour available from the Japanese manufacturing industry.

The company has so far delivered 75 FFX mills worldwide and they have been warmly received by customers. The FFX mill is capable of producing 2" to 25" high performance and high grade pipes with 25mm maximum thickness.

Nakata MFG – Japan
Email: sales@nakata-mfg.co.jp
Website: www.nakata-mfg.com

Welding technology expert presents automation solutions in Hanover

DURING its appearance at the international specialist trade fair EUROBLECH, German welding technology expert EWM focused on its innovative MIG/MAG orbital and submerged arc welding products and the expansion of current product lines. The company presented complete solutions with the aim of emphasising its technological and economic advantages.

In comparison with manual TIG welding, for example, the pipeTruck automatic orbital pipe welding system offers a five- to 15-fold increase in the deposition rate, as well as guaranteeing full X-ray quality. This, together with alpha Q and the innovative pipeSolution MIG/MAG welding process, means EWM is able to offer machines that are especially suitable for use in the field, at the pipeline and in the workshop. EWM is also set to grab the attention of the specialist audience with its expansion of the Picomig, Phoenix and Taurus model ranges.

EWM exhibited its welding technology at the show

The new portable machines in the Picomig 305 Puls series are incredibly powerful and very versatile multi-process inverter power sources in sturdy plastic casings.

The power sources master standard arc and pulsed MIG/MAG welding processes, as well as TIG welding (lift arc) and joining with the MMA process.

Thanks to its dynamic inverter technology, the portable, gas-cooled Phoenix 405 and 505 puls and the Taurus 405 and 505 MIG/MAG power sources are suitable for welding tasks in the workshop, on the construction site and during assembly, and in particular at the shipyard and in vehicle construction.

In addition to standard welding processes the Phoenix 405 and 505 are also capable of the forceArc and rootArc joining processes developed by EWM.

EWM Hightec Welding Automation offers complete automation solutions. These complete, turnkey systems are geared towards customer-specific needs and include the appropriate robots in addition to the welding system.

Visitors to the EWM exhibition stand also noticed the EWM virtual welding trainer. Thereby, the company is taking a completely new approach towards training welders at both basic and advanced levels.

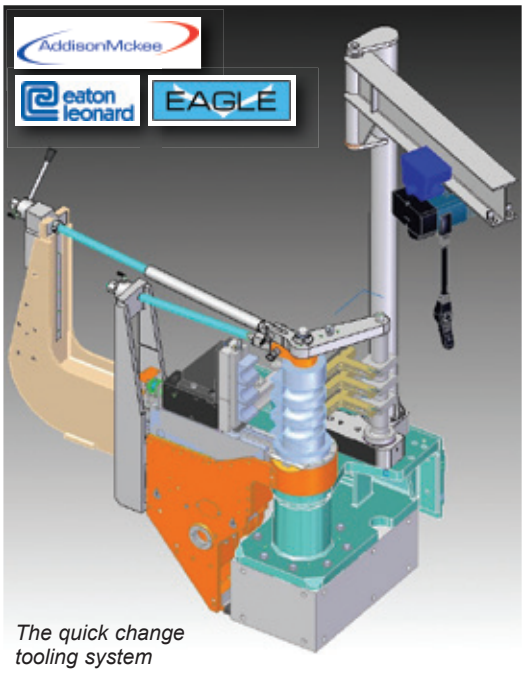
EWM Hightec Welding GmbH – Germany
Email: info@ewm-group.com
Website: www.ewm-group.com

Innovative quick change tooling system from AddisonMckee

TUBE bending and endforming technology specialist, AddisonMckee has designed an innovative new quick-change tool system that drastically reduces the man power and time required for tooling changeover on tube bending machines. With the AddisonMckee quick-change tool system, "part to part" tool changes with either single or multi-stack tooling can be accomplished by one person in less than ten minutes.

AddisonMckee has developed and proven this technology through concept alterations to key aspects of the tube bending machine and tooling.

This system holds the bend die and wiper posts together as a set by a lifting plate which negates the need for wiper or bracket adjustments during tooling change-overs. Additionally, because the bend die and wiper posts are retained as a pair the wiper inserts are much less susceptible to accidental damage. The lift plate includes a single hook for removing the bend die and wiper post together via a small crane mounted to the tube bending machine. An automatic clamp unit quickly locks the bend die and wiper posts to the machine without any additional tools or fasteners.



The quick change tooling system

The new AddisonMckee tie-bar system incorporates a cam-action release which ensures minimum operator setup time between tool changes. A quick release tie-bar pin provides for effective tie-bar retraction, without the need to remove the tie-bar from the machine, and allowing for the tie-bar to slide away for quick access to the tool set. Other features of the quick-change tool system includes a quick release clamp and follower that are also removed and replaced from the machine using a lifting hook, or by hand as preferred for fastest change-over times. The tube collet change-overs are also quick and need no fasteners or tools. Additionally, wheeled trolley carts are included with this system for storing and protecting the bend tool sets not currently in use on the tube bending machine.

Presently the quick change tool system is available on new or existing AddisonMckee DB75 ESRB or eB80 ESRB tube bending machines and tool sets.

Release the full production potential of your tube bending machine and tooling today with AddisonMckee's new quick-change tool system.

Tube bending and endforming technology specialists AddisonMckee and Eaton Leonard have recently merged under the common ownership of AddisonMckee Holding LLC (ADMC). As part of this transaction, Jaubert Investment LLC has acquired an interest in ADMC.

AddisonMckee – UK
Email: smoore@addisonmckee.com
Website: www.addisonmckee.com

Efficent and defect free TIG

ENGINEERING companies, contractors, pipe manufacturers all agree that the GMAW process and its variants (CMT, STT and cold arc) have almost reached their limits in terms of productivity and quality.

Most players in the field of offshore oil and gas exploration agree that within the next three to four years, the unavoidable combined request for mechanical resistance/fatigue and corrosion resistance will lead to zero defects (zero lack of fusion and zero porosity).

Concerning the TIG process "zero defects" is normal, but up to now, the issues of productivity and efficiency have been more difficult.

Polysoude is constantly working on improved technology solutions and launched its latest development in 2013, the 'TIGer bicathode technology'. This involves the juxtaposition of two TIG arcs and thus allows for considerable improvement and efficiency of the process.

The optimisation of the layer thickness leads to significant savings, while the optimised welding speeds go approximately three times faster than the conventional TIG hot wire technology.

In all cases and whatever the pass thickness chosen, complete control over dilution is provided with a rate of 1.5 to 2 per cent after the second layer deposited.

After the world premiere at the Schweißen & Schneiden fair in Essen, Germany, which attracted great interest, the TIGer equipment will be exhibited again at the upcoming Tube fair in Düsseldorf, Germany. Live demonstrations and cladding tests on samples from potentially interested companies will be organised by Polysoude.

Polysoude – France
Fax: +33 240 681 188
Email: info@polysoude.com
Website: www.polysoude.com

Eddy current and ultrasonic rotating heads for flaws detection

CONTROLE Mesure Systèmes, which has now operated for more than 25 years, designs, develops and manufactures a complete NDT range of products in eddy current and ultrasonic testing methods, which comprise high performance instruments and systems, probes and transducers, accessories, and complete turnkey machines with associated mechanics.

The main equipment manufactured by CMS is: eddy current rotating heads RotoETscan for tubes and bars diameter range 1 to 220mm for surface, subsurface and punctual flaws detection; and ultrasonic rotating head RotoUTscan for tube inspection, either welded or not, in stainless steel, titanium or zirconium.

It is also available in carbon steel (diameter range 6 to 250mm) for longitudinal and transversal defect detection, thickness measurement and ovalisation.

Ultrasonic and eddy current rotating heads (RotoUTscan and RotoETscan) can be combined with other CMS equipment (magnetising units, rotating systems and support coils).

They can be installed together in a strong control bench including centring devices.

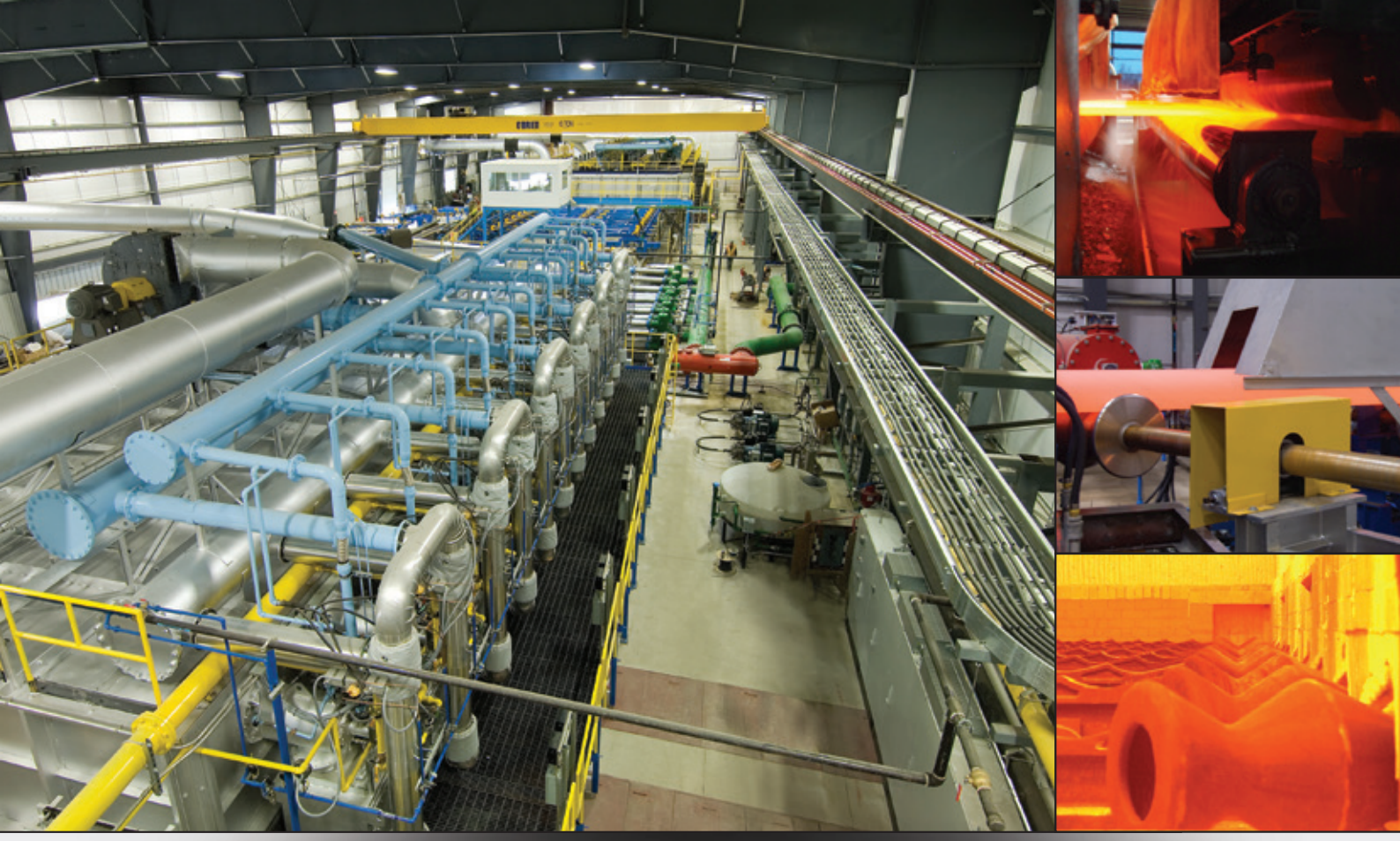
Supervision software called Probus (which collects information provided by NDT equipment) allows customers to display combined signals (UT/ET) and create inspection reports that can be used as control evidence for quality services and customers. Data stored can be recalled and helps to analyse and recommend treatment.

All the systems meet quality standards such as API, ASTM and DIN and could be used online and offline.

Through its products and its remote assistance, Contrôle Mesure Systèmes provides quality and productivity solutions for industrial applications internationally.

Contact the company at Tube Düsseldorf stand number 6H39, Hall 06.

Contrôle Mesure Systèmes – France
Email:
contactcms@cmseddyscan.com
Website: www.cmseddyscan.com



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Tube® Düsseldorf

To learn more about Can-Eng Furnaces' engineering, design and manufacturing capabilities visit www.can-eng.com, e-mail Mike Klauck at mklauck@can-eng.com or visit Can-Eng at Tube 2014, stand 7AD13

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Tube bending tooling

BEND Tooling Inc of Michigan, USA, has supplied companies around the world with tube-bending tooling since 1986. It produces die sets, mandrels, and wipers for rotary-draw tube-bending machines for most makes and models.

Bend Tooling is distinguished by precision machining every feature of its tooling. This eliminates hand-working and improves quality, shortens lead times, and reduces costs.

Bend Tooling is also distinctive as the developer of the modern inserted mandrel and wiper. Its inserted designs are favoured by production tube-bending operations in the automotive, sports vehicle, HVAC and hydroforming industries.

They are also widely used by speciality tube-bending companies because of their consistency in specification, which facilitates frequent changes in set-up. All tube-bending companies benefit from the lower per-bend cost, the consistent reliability, and the easier stocking and JIT shipping of Bend Tooling's inserted mandrel and wiper in place of traditional solid-body ones.

Bend Tooling also manufactures high-quality solid-body mandrels and wipers for those tube-bending jobs that need them. This primarily includes bending under extreme high pressures and bending non-round tube.

Bend Tooling Inc – USA
Email: sparrow@bendtooling.com
Website: www.bendtooling.com

Straight and pre-stressed tubes

THE tube and pipe industries utilise straighteners, both in-line and off-line, with regard to the main manufacturing process. Straightening products involves 'stressing' the tube in a particular plane (or planes) to counteract forming, internal material or welding heat stresses, all of which can be removed or balanced by using straighteners.

Many types of straightener are used in the manufacturing environment, including multi-roll or multi-plane, turkshead and cross-roll. Cross-roll straighteners tend to be used as an off-line processing action, as the tube or pipe is typically cut to a finite length, rolling radially as it is processed.

Turkshead straighteners are used in-line in tube and pipe mills, and use either two- or four-roll designs to encompass the tube and impart a force (or stress) in up to two axes of direction. Multi-roll or multi-plane straighteners tend to be used to counteract forces within a tube or pipe that are variable and multi-directional as the product moves through the straightener.

Turkshead straighteners involve an operator to adjust the unit to counteract the internal stresses, but as these stresses change, the turkshead must also be changed. This is not entirely true with a multi-roll or multi-plane straightener, which is more robust to small changes as it stresses the tube multiple times to achieve straightness. More rolls can be added to achieve a state that almost does not require an operator for all but the most stubborn material characteristics.

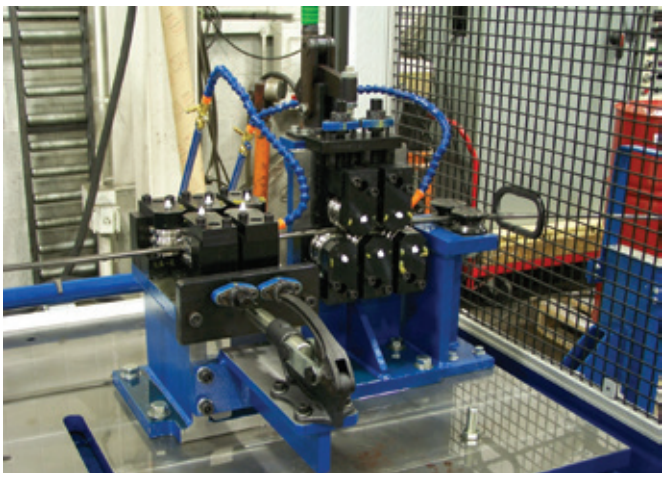
Straighteners can be used before special forming units or after them, depending on the specific manufacturing method.

These units have been recently used in applications where manufacturers want to "raise the level of work hardening" within their product without adding heat treatment processes or speciality materials.

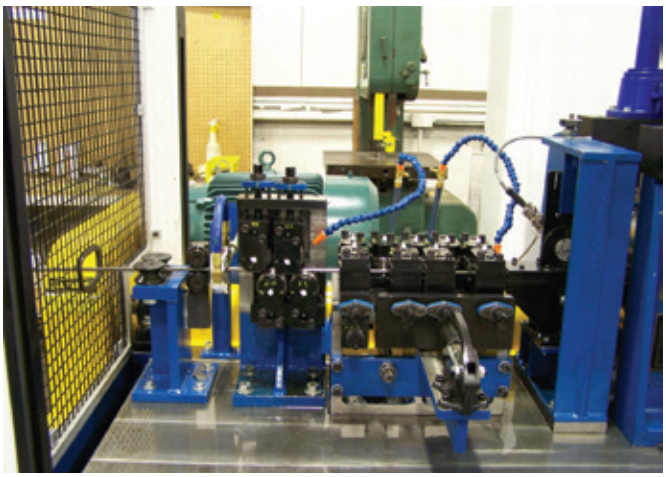
Since these straightening devices work by imparting stresses to counteract already-present stresses, they are a viable choice to add percentage points to the work hardness of a product without imposing other damage, such as ovality changes. Too much straightening can damage the OD characteristics of a tube or pipe, so there are side effects that must be monitored in order to achieve the highest level of quality within a process.

Formtek, Inc – USA
Fax: +1 216 292 2898
Website: www.formtekgroup.com

Multi-roll straightener or stressing unit (prior to wire forming)



Multi-roll straightener or stressing unit (post wire forming)



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LIMAB's well proven measurement system for seamless and welded tubes. We measure full cross section shape with no blind spots. Our system provides real time profile measurement which results in a faster mill set up.

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Tube® Düsseldorf

Welcome to visit us at:
Tube 2014, 7-11 April, Stand 7aB14
Düsseldorf, Germany

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Compact press tool

RIDGID'S pressing solutions enable contractors to make reliable, water-tight connections to copper, stainless steel, multilayer and PEX tubing in as little as four seconds. The RP 340 is the company's latest press tool innovation.

The Ridgid RP 340 press tool is 30 per cent smaller and 17 per cent lighter than its predecessor, while offering a 25 per cent longer service life. For maximum flexibility, an interchangeable power source allows the RP 340 to be operated as a corded and battery-powered tool.

The compact RP 340 is 33cm long and weighs just 3.76kg, and supports connections up to 108mm. The detachable corded power adapter can be replaced with new advanced lithium batteries (2.0A or 4.0A), allowing contractors to carry out more work per charge. The RP 340 is compatible with standard series pressing jaws from Ridgid and other manufacturers. It only requires recalibration after up to 42,000 cycles. Microprocessor-controlled cycles ensure a reliable press and watertight connection.

Other features of the RP 340 include an LED status indicator and warning light; white LED work light to illuminate workspaces; nylon straps for attaching a security harness; on/off button for disabling the tool; and an extreme-temperature sensor to prevent the tool from operating outside acceptable limits (-10°C to 50°C / 14°F to 122°F).

Enver Celik, product manager at Ridgid, commented, "Ask any contractor and they'll tell you bulky tools can really slow them down. But give them a smaller tool and they can move swiftly from job to job. That's what the RP 340 is all about. It's smaller, lighter, and runs off corded or battery – exactly what contractors need to get the job done quicker."

As part of the launch of the RP 340, Ridgid has created a dedicated webpage (www.ridgid.eu/340), which explains in more detail the benefits and applications of the tool.

Ridgid markets its tools and equipment in more than 140 countries. The company's range of more than 300 types of tool serves the rental, plumbing, HVAC/R, utility, industrial, electrical, petroleum, institutional, commercial and hardware markets.

Ridgid – Belgium
Website: www.ridgid.eu

Easy handling in the pipeline with Combilift

COMBILIFT manufactures a wide range of customised handling solutions with capacities ranging from 1.5 to over 30 tons, which are designed for the safe and space-saving handling and storage of the large and bulky loads typically handled in the tube and pipe sector. The four exhibits on stand 6G 23 at Tube Düsseldorf are just a small selection of the products on offer from Combilift which it exports to over 75 countries.

Two models from Combilift's original core C Series will be on show – a 4t C4000 and a larger heavier duty 8t C8000.

These robust trucks have for years been the forklift of choice for companies dealing with long tube product: their ability to work inside and out and on uneven terrain in all weathers makes them robust and reliable workhorses for universal applications in the yard and warehouse. 4-way capability enables space-saving sideways travel with loads resting on the platform for greater stability and safer manoeuvring in confined spaces.

Safe, space-saving handling and storage from Combilift

Two smaller Combilifts complete the lineup: the award winning compact counterbalance design 4-way Combi-CB was designed for operations that need to handle a mix of palletised and long loads and is now available with a load capacities of up to 4t.

Combilift's new Combi-WR4 Walkie Reach, which makes its Tube premiere in 2014, is a very compact and manoeuvrable multidirectional reach stacker and the company's first pedestrian truck. It can handle both long loads and pallets in very narrow aisles and is the only truck of its kind able to work in aisle widths of 2m pallet to pallet. A further major advantage from a safety point of view is that the operator can remain at the side of the unit rather than between the rear and the racking when placing and picking in the aisles.

Combilift Ltd – Ireland
Email: info@combilift.com
Website: www.combilift.com

Bringing the Best Together

World-leading tube bending and endforming technology specialists, AddisonMckee and Eaton Leonard, are excited to announce we have merged!

Together, our combined companies provide an exciting opportunity to offer our customers the best of both companies – a complete range of products and expert services adapted to their specific needs, a worldwide presence and a team focused on innovative solutions.

eaton leonard®

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EAGLE

Tube® Düsseldorf 5/B10 & 5/F10

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shanghai.office@eatonleonard.com

www.addisonmckee.com • www.eatonleonard.com

Anti-rust systems for tubes and profiles

DIETRONIC Srl has worked in the the area of tube protection for more than ten years and the ever-evolving technology of lubricants used in metal forming has led the company to develop a variety of solutions for the many needs of of its customers.

It offers spray systems for the application of protective rust oil and cleaners with drying systems for different diameter and square measures.

The protection of the finished product guarantees a long life against oxidation even in the case of transport with large changes in temperature and outdoor storage.

The application of these protective lubricants requires management and control of the uniformity of application over the whole surface.

For this reason Dietronic developed a system called LCP Anti-rust, which is a spraying machine capable of applying a protective film of lubricant measured in g/m^2 maintaining the production speed of the tube.

Its systems are composed of a spraybox with relative number of nozzles – depending on the diameter of the tube or profile – and flow control sensors for each nozzle, suction system and fluid recovering for overmist, air knife system for keeping fluids in the spraybox, blowing for drying, up and down system for centring production line and last but not least lubrication system for the cutting blade.

All functions are managed automatically. The tank is equipped with visual level control, heating system for the anti-rust medium and a filter of 150 micron.

More than 200 applications and a technical and commercial presence in several countries around the world make Dietronic an excellent partner for finding a solution for cleaning, protecting and drying pipes.

Tube protection from Dietronic

Dietronic Srl – Italy
Websites: www.dietronic.eu
www.tubeface.com

16" x 16mm Easy tool Change Tube Mills

OTO joins fives

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info@otocompany.com | www.otocompany.com | www.fivesgroup.com

DANOBAT launches DS 3A horizontal cutting band saw machine

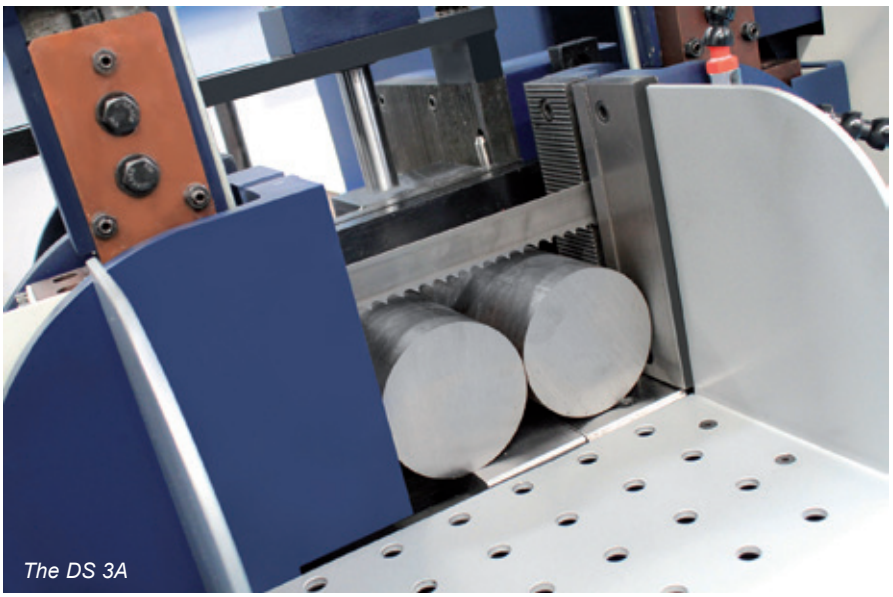
DANOBAT, a company that has developed innovative machines for more than 55 years, has launched the new DS 3A horizontal cutting band saw machine, which is characterised by its quality and modern design.

The DS is a versatile machine that allows users to cut different geometries, within solid components and tubes of different materials with high accuracy.

The main components of this model are manufactured with high quality materials that provide to the machine the necessary rigidity to achieve a clean and accurate cutting.

Blade guiding is done by a combination of bearings and hard metal plates fitted on plate holders, allowing any realignment of the blade position.

Both columns – the main round column and the secondary prismatic column – are designed to absorb the deformation produced by blade tensioning.



The DS 3A

The DS has a feeding system that automatically sets the component in the cutting position already defined by the operator. In order to improve the process, the chariot moves only when the length of the component requires it to do so.

The material is clamped on both sides of the blade, the fixed arm is attached to the head achieving more rigidity, and the movable arm moves by means of a linear guide and is automatically adjusted to the width of the material together with the vice.

Thanks to this automatic system it is possible to reduce the distance between guides and increase the speed and the quality of the cut.

All these improvements that have been made in the design of the machine have increased the blade life even in hard conditions. (For example: testing the machine cutting carbon steel with aggressive times achieves 18-20m^2).

This model is equipped with a control panel and software specifically developed by ©DANOBAT, which allows the programming of different cutting lengths of component from the same bar without making any change.

DANOBATGROUP – Spain
Website: www.danobatgroup.com

Steel tube finishing machine

SIERRA Machinery Inc, a manufacturer of fast skiving and roller burnishing machines and patented tooling, has unveiled the new-generation SIERRA USA® Machines and patented tooling. The new SIERRA USA® offers high level finishing of steel tubes for the hydraulic cylinder industry and other applications where fine-finishing of the internal diameter of a tube are required.

Skiving is the preference over honing by manufacturers world-wide such as Caterpillar, Komatsu, Wipro India and JC Bamford Excavators Ltd.

The SIERRA USA® is quality built with technology, features and tooling not found in competitor's products. The SIERRA USA® offers greater speed, increased cost efficiency, and high quality machining solutions to serve the cylinder manufacturing industry.

A skived and burnished surface provides longer seal life and has a 50 per cent higher TP rating than that of a honed surface.

The speed and efficiency of the SIERRA USA® can handle 88.9mm bore tube 762mm long finished in 30 seconds including loading and unloading – 122 tubes per hour, achieving H8 and Ra 0.1-Ra 0.4. Skiving and burnishing is 80 to 100 times faster than honing.

Sierra Machinery Inc – USA
Email: sierram@sierramachinery.com
Website: www.sierramachinery.com

INDUCTION SOLUTIONS. HARD TO BEAT!

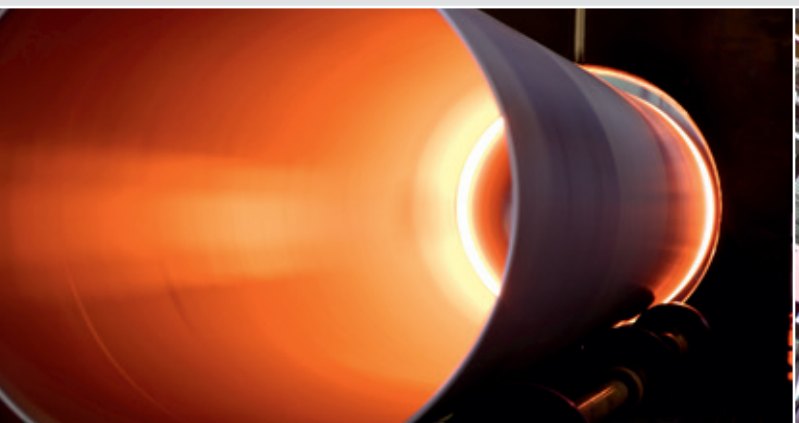
For more than 75 years SMS Elotherm delivers complete inductions systems for multiple applications to manufacturers of tubular products worldwide. Whether HF seam welding and annealing, tube heating for processes such as coating, bending and sizing, or fully integrated Quench & Temper lines for any type of long product – SMS Elotherm always stands for robust machinery with reproducible quality results as well as a vivid partnership with their customers and customized services.

- Tube Welding
- Seam, Black and Bright Annealing
- Tube Heating for Coating
- Tube Heating for Bending operations
- Integrated Quench & Temper systems (Heat Treatment)
- Tube end Heating

MEETING your **EXPECTATIONS**

ELOTHERM
SMS group

www.sms-elotherm.com



Conveyor idler manufacturing re-engineered

IN today's mining industry, the product isn't moving unless the conveyor rollers are turning. Conveyor manufacturers rely on machine tools to manufacture idlers (roller bodies) rapidly and within tolerance. Reducing overall run-out increases the field life of this component. Bardons & Oliver, a machine tool manufacturer from Solon, Ohio, USA, produces RH-series tube cutoff machines for that very purpose.

Vern Fabry, product manager for the rotating head (RH) line of machines, has placed machines in plants producing conveyor parts in the USA, South America and Australia. He says: "In today's market, producing a quality roller efficiently is the goal of every conveyor manufacturer. Our rotating head cutoff machines provide the means to achieving that goal."

Bardons & Oliver installed its first conveyor idler manufacturing system in January 2010. This PLC-controlled, servo-based machine produced immediate results: increased quality, reduced setup times, and eliminated sub-processes such as sawing and subsequent transfer of the material to the next operation.

When you use a Bardons & Oliver RH series tube cutoff machine to create your conveyor components, you're not just using a machine, you're utilising a system. From the loading table, which provides staging room for additional raw materials and adjusts size instantly, to the table where finished product is stored (with the option of robotic assistance for moving parts), you have the entire manufacturing solution on your factory floor. With the RH-series cutoff, it's raw material in and finished parts out, one machine, one operation.

Not every application starts from perfectly round or straight raw materials. Traditional cut-off machines, which have stationary tooling and materials that rotate, have a hard time dealing with unusually shaped raw materials. This can limit their uses.

Bardons & Oliver's rotating head machines hold the material stationary and rotate the tools. The RH-900 can accommodate hot rolled or irregular tubes more efficiently than traditional lathes.

Part of the advantage Bardons & Oliver's RH machines provide is the ability to produce the parts you need as you need them. There's no need to maintain an expensive inventory of finished parts. With a part program capable of storing as many as 200 part numbers, you have your product line available on short order – in a matter of hours, instead of weeks or days.

Whether your need is for single part production, parts cut in sequence for a kit, or an on-demand combination of parts, the RH-900 machine can handle that. Further, it reduces waste by allowing your operator to create a sequence of long parts, with the remnants then turned into short parts rather than going into a recycle bin.

Bardons & Oliver – USA
Website: www.bardonsoliver.com

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Fast phased array system

FAAST II is a UT phased array system designed for high-speed testing applications and production lines and able to replace more than ten conventional phased array systems working in parallel.

FAAST II patented linear pulsing generator allows multi-beams transmission in one single shot throughout 1D linear multi-element probe.

As an example, the first industrial application being built by Socomate and using this method is an ultrasonic rail testing car providing in-track inspection at a speed of 100km/h with only one 1D multi-element probe.

The most important industrial applications are tube and pipe testing in high-speed production lines from which FAAST II is able to detect and process in real-time all orientated reflectors in one shot with 2D matrix array probes.

The FAAST II system is compatible with any type of standard multi-element probes as well as with active probes embedding Socomate International Electronics with pulser, preamp and multiplexer.

Socomate International – France
Email: philippe.coperet@socomate.fr
Website: www.socomate.com

Tube scarfing equipment

TSE GmbH Tube Scarfing Equipment, located in Germany, is an international operating company offering solutions for tube inside and outside weld bead scarfing (de-burring) of longitudinally welded steel tubes, strip conditioning, bead chopper applications, welding equipment, sawing technology, slitting knives, filtering technology, and turning/milling/drilling processes.

The company's product range includes tube inside weld bead scarfing tools/systems, carbide cutting rings for tube inside weld bead scarfing, carbide inserts and holders for tube outside weld bead scarfing, bead choppers, strip shaving units, welding impeders, ferrite cores, epoxy fibreglass tubes, silicone fibreglass tubes, mica silicon tubes, induction coils, flexible PTFE tubes, HSS/HSSE/TCT saw blades, slitting knives, filter systems, filter fabrics, carbide inserts and holders for turning/milling/drilling.

The company works with a network of representatives worldwide to offer the best service. See TSE at Tube Düsseldorf at Stand 6A13.

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HORMESA is a foundries solutions manufacturer, offering turnkey projects including engineering and knowledge sharing. Since the company was founded in 1987, it has specialised in equipment, materials and custom-made solutions for melting and casting ferrous and non-ferrous metals.

The main scope of supply includes melting furnaces for ferrous and non-ferrous metal (gas, resistance, induction); holding furnaces for non-ferrous metal (gas, resistance, induction); continuous casting plant (horizontal and vertical) for copper alloys (tube, strip, bar); semi-continuous casting for aluminium billet; continuous casting plant for steel billet and wire; continuous casting plant for precious metal (gold, silver); battery and lead recycling plants; and refinery plant for non-ferrous metal (aluminium, copper).

By offering all technologies, Hormesa is able to provide advice on the most suitable and profitable solution for each case. A customer-orientated approach and continuous technological development enables the company to provide custom-build solutions.

Hormesa-Conticast Group – Spain
Email: hormesa@hormesa.com
Website: www.hormesa.com

I-Purge modular bladder system Introduced

AQUASOL Corporation, inventor of the internationally recognised and patented pre-formed water soluble EZ Purge® Dams, has announced the launch of an alternate purging device, the patent-pending I-Purge™ modular inflatable bladder systems. I-Purge modular systems permit the operator to combine various components to create a customised solution.

Creating a near-perfect weld is the result of selection of the best purging equipment combined with using a skilled welder well versed in proper technique. Aquasol's I-Purge modular system provides an air-tight seal enabling achievement of an oxidation-free weld and even penetration beads on all pipe joints.

Pipework involves the inert gas welding process of arc welding. A molten weld pool is shielded from atmospheric contamination by flooding the area with an inert gas such as argon or noble gas mix (argon and helium). The inert gas is pumped into the dammed area. Since argon has a greater density, it will naturally displace the oxygen.

The pre-purge displaces oxygen inside a pipe with an inert gas. The inert gas continues to purge during welding to maintain an oxygen-free environment. Failure to eliminate oxygen can result in porosity, corrosion and premature failure of the joint due to cracking. To ascertain a quality weld, complete evacuation of oxygen is necessary.

The I-Purge modular system is comprised of two spark-resistant inflatable bladders connected by a high heat resistant bridge harness. Unlike other models with permanent fittings, Aquasol's model allows for the creation of a pipe reducer by simply connecting two bladders of different yet similar diameters.

Equipped with quick connect fittings, components easily snap on and off in seconds. Operators can select from variety of standard harness lengths and customise length based on particular need. This enables the placement of the bladders outside the HAZ (heat affected zone).

The extremely flexible harnesses enable navigation through 90° elbows and tees. The central point of the high heat bridge harness is marked with a luminescent indicator to easily align the centre of the unit with the root gap.

A tri-flow hose maximises efficiency, enabling bladder inflation and quick flooding of the purge area with noble gas. An innovative tubing system provides separate connections for inflation of bladders and introduction of inert gas to the weld zone to expedite the purging process. The inflated bladders create an airtight seal against the pipe walls and a superior barrier. Another connection enables monitoring of exhaust gases so that assurance of an oxygen free environment is ascertained. Equipped with a patent-pending diffuser, gas is evenly distributed throughout the purge area and turbulence is greatly reduced.

Once the weld is complete; the bladders can be deflated, extracted, cleaned and stored in a convenient and provided carrying bag.

Another feature that showcases the system's flexibility is the ability to modify the I-Purge with the Isolator™ Adaptor Kit into a one sided plug. An Isolator can be used to close off the end of a pipe for servicing, cleaning, inspection or sealing.

The I-Purge modular system can be used multiple times due to its durable construction and high quality components. Aquasol Corporation has simplified the purging process with a unique, patent pending product. Bladders are available in sizes from 2" to 48" diameter pipe and may be purchased either individually or as a complete unit, a distinct advantage should a bladder be lost or blown.

The I-Purge system

Acquasol Corporation – USA
Website: www.aquasolcorporation.com

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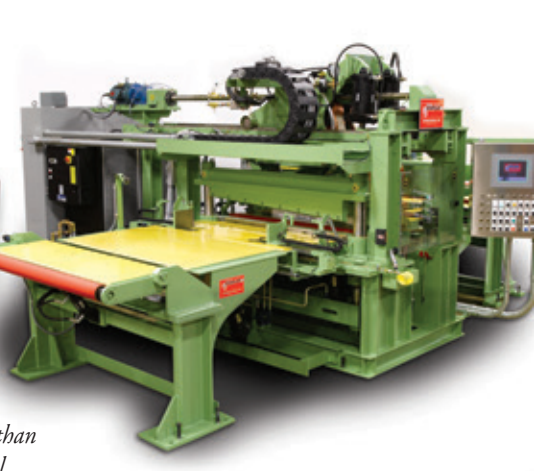

NB Overlap Resistance Zipwelders™ produce fast, high strength welds.

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The TIGer hot wire welding technology

By Jean-Pierre Barthoux – technical director and European welding engineer

THE TIGer technology first resulted from a Polysoude technological development, a variant of the hot wire TIG welding principle.

A significant amount of investigation enabled the company to define the combination of optimum operating conditions and torch design required to obtain the best levels of performance.

The basic principle involves the juxtaposition of two TIG arcs, organised and controlled so as to combine into a single arc with the calorific value of the combination of both powers, but with characteristics which are unusual for such intensities. Indeed, depending on the position of the two electrodes, it is possible to considerably reduce fusion of the base metal to arrive at dilution rates, which predestine the TIGer for use in surfacing applications.


TIGer welding technology

The addition of the wire preheated using the Joule effect via the control of a third current source enables the special profile of the weld pool to be used and to considerably improve the efficiency of the procedure. The control of the deposition rate remains, as for all the variants of the TIG technology, independent of the setting of the arc parameters and the quality of the deposition is similar to that which can be obtained with conventional TIG.

It is remarkable to observe that the level of compactness is of the same order as that expected for the welding of high-strength assemblies, which also enables preliminary buttering carried out before heterogeneous welding operations to be envisaged without restriction along with surfacing applications.

Depending on requirements, it is possible to optimise the thickness of the layers to within a range of normally between 1.5 and 3.5mm. This flexibility enables the quantity of weld metal to be adjusted to strict requirements and allows significant savings to be made taking into account the costs of filler products (generally the noble alloys). The optimised welding speeds are of the order of 70 to 90cm/min with deposition rates of between 2.5 and 6kg/h – about three times more than with the TIG hot wire technology.

In all cases and whatever the pass thickness chosen, complete control over dilution is provided with a rate of the order of 12 per cent on the first layer and of the order of 1.5 to 2 per cent from the second layer deposited.

In the case of surfacing with nickel-based grades, this level of performance enables the difficulties associated with requirements relating to limitations of 5 per cent ferrite in the deposits to be easily surmounted.

Old generation hot wire TIG surfacing machines can be converted to integrate the TIGer technology providing a ten-fold increase in the productivity of existing installations cheaply. Once the investment has been made, a machine fitted with the TIGer technology will prove to be profitable and economical allowing a 20 to 50 per cent drop in operating costs per kilogram of weld metal.

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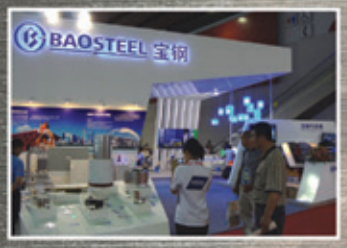

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Email: meiwen@julang.com.cn

Specialised bending equipment for pipe forming

LVD-HD's PPF Series multi-cylinder bending machines are designed for forming large pipes up to 1,524mm diameter and are available in capacities up to 10,000 tons, 14.1m configurations. They are suited to address the pipe manufacturing needs of the oil and gas industries.

These heavy-duty, specialised forming presses feature front and back feeding and support systems, roller conveyor, side discharge system, and LVD's exclusive Touch B control.

This multiple cylinder machine is driven by an electro-hydraulic servo synchronous system, providing precise control of the ram and adjustment of the Y-axis to compensate for material variations. Positioning accuracy is 0.05mm with repetitive accuracy of 0.03mm.

PPF bending machines may be equipped with automatic feeding, charging and discharging systems for increased efficiency.

LVD's custom PPEB-H press brakes suit pipe forming and specialised section/profile forming applications with the ability to handle workpieces up to 14m long (28m long on tandem machines).

PPEB-H Series machines are available in capacities from 400 tons up to 3,000 tons in stand alone configurations, as well as tandem designs up to 6,000 tons comprised of two press brakes, servo-controlled with state-of-the-art hydraulics and electronics.

PPEB-H press brakes are provided as a turnkey system including press brake, and CNC feeding – evacuation automation and CNC forming tools.

Bending machine from LVD

Key features include Touch B CNC control, an icon-driven touch screen system that works in conjunction with an on board Windows® operating platform and LVD's CADMAN-B® programming software to simplify and shorten programming and production time.

LVD's Impuls Series of flying optics laser cutting systems features a large table capacity to handle sheet sizes up to 3.10 x 12.5m.

Uniquely designed for heavy plate cutting and profiling, these high performance laser cutting machines process mild steel up to 25mm; stainless steel up to 15mm.

Forming large diameter pipes

A constant beam length system achieves consistently accurate cutting results throughout the complete work envelope.

Optional features include NC Focus control, process control, automatic shut down, and CADMAN® offline programming software. Impuls is offered with a laser source of 4 or 6kW.

Impuls also features a unique patented technology, ALC (adaptive laser cutting).

ALC optimises laser cutting in thicker mild steel materials by using dynamic feedback to monitor and regulate laser power, speed and assist gas pressure in real time during the cutting process.

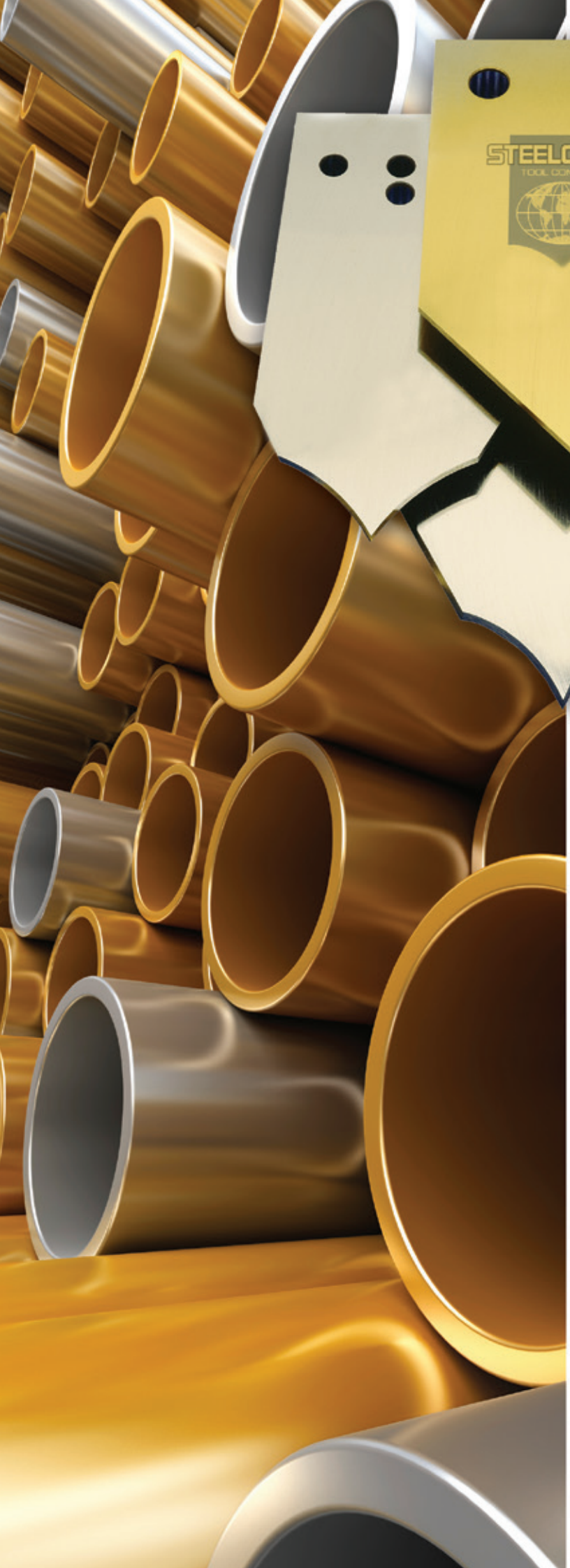
ALC can increase productivity up to 10 per cent, maximises part quality and eliminates scrap or rework.

The LVD Group is a manufacturer of a comprehensive range of sheet metalworking machine tools and software solutions, including laser cutting systems, punch presses, press brakes, guillotine shears and mid-level automation systems, integrated and supported by its CADMAN® PC-based Windows® compatible software.

LVD-HD is the joint venture company of LVD Company nv and Hubei Tri-Ring Metalforming Equipment Co Ltd (HD).

The company produces sheet metalworking equipment, including large customised press brakes, standard format press brakes and shears.

LVD Company – Belgium
Email: marketing@lvd.be
Website: www.lvdgroup.com



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Magnetic metalworking angles and lifting devices

LINCOLN Electric now offers a line of rugged, magnetic angle fixturing devices and hand lifters in its Radius™ tool welding gear product group. The magnetic fixturing tools can be used to position steel for tack welding or other pre- or post-weld operations. They are also suitable for cutting and grinding applications.

Lincoln Electric magnetic fixturing tools can be used to position steel for tacking or lifting sheet steel at the work table

The magnetic fixtures are available in three different models intended for various material thickness or applications.

All are easy to operate: a half-turn of the knob can toggle the magnet on and off for part removal and cleaning.

The fixtures are compact and lightweight, making them suitable for tight spaces.

In addition to magnetic fixtures, Lincoln Electric offers a manual hand lifter designed for small steel part lifting and sheet dragging.

The manual hand lifter does not require batteries or electricity for use. A simple half-turn of the knob switches the powerful hand lifter magnet on and off as required.

"These devices make it easy to align and hold small parts and sheet metal in place for tack welding," commented Jamy Bulan, Lincoln Electric product manager, commercial products. "Using the manual hand lifter can reduce contact with hot or sharp-edged steel. These tools represent just one new way we are working to protect the welding operator in the workplace."

Lincoln Electric designs, develops and manufactures arc welding products, robotic arc welding systems, and plasma and oxyfuel cutting equipment. Headquartered in Cleveland, Ohio, USA, the company has 45 manufacturing locations, including operations and joint ventures in 19 countries, and a worldwide network of distributors and sales offices covering more than 160 countries.

Lincoln Electric – USA
Fax: +1 216 383 2699
Website: www.lincolnelectric.com

Milacron showcases extrusion technology

MILACRON Extrusion Systems showcased the TP75 and the PAK250 with the Multi Pass Tank at the 2013 K Show in Germany.

The TP75, a counter-rotating intermeshing twin screw extruder, is well suited for profile, pipe and WPC production. The TP75 comes standard with an energy efficient AC motor and drive, and active screw oil cooling for precise process control.

Available options include an environmentally friendly dry vacuum pump, tungsten screws, and matching barrel for reduced long term maintenance cost.

The TP75 uses Milacron's MOSAIC® control system to provide advanced machine control. When combined with one or more twin or single screw models, the MOSAIC control system is capable of handling the control of extruders while supporting other equipment downstream within the system.

These features make the TP75 well suited for the production of co-extruded profiles, which utilise recycled and virgin materials.

Milacron uses the TP twin parallel models in conjunction with its TC twin conical models to provide solutions for the co-extrusion profile market.

Features include automated articulation of auxiliary machines to make the adjustments to different products easier, while utilising its MOSAIC® as a single point of control.

For example, the technology in the co-extrusion system allows the combined machines to create product that features a pure outer layer and a recycled inner core at a rate of 1,360kg/hr while reducing waste.

The PAK250, which was also showcased at the K Show, is an extruder specific to the medical market. The most common product produced by this machine is flexible PVC for non-phthalate plasticisers.

Features include: control by MOSAIC; available with custom screw design; easy to clean; and easy to maintain stainless steel covers and hopper.

At the K Show, the PAK250 was featured with the Multi Pass Tank (model HTMP-18-4) from partner Conair. The tank is used to produce flexible PVC medical tubing at a high rate of speed with a reduced footprint. The benefit of the Multi Pass Tank is the ability to reduce the stretch of the tubing during the extrusion process.

Other key features include: 40cm servo driven first pass wheel; vacuum chamber with closed loop vacuum system; ultra-violet water treatment system; and stainless steel tank for easy maintenance and cleaning.

Milacron Extrusion Systems – USA
Website: www.milacron.com

Roll forming of thin wall tubes

SEVERAL vital processes are possible with the economic roll forming process “rollotronic” by Max Simmel Produktions GmbH.

Parts for optical sensors or automotive precision systems as filter components or fuel injection parts are creating using roll forming operations on a subcontracting basis from Max Simmel Produktions GmbH in Karlsbad near Karlsruhe, Germany. Priority is set on parts production – however machines new, second hand or from exhibitions are also available.

Simmel Produktions GmbH – Germany
Email: info@max-simmel.de
Website: www.max-simmel.de

Tubular parts with grooves, threads, knurls or cutting/facing

Sica goes green

ITALIAN pipe machinery producer Sica wants to contribute to saving energy, raw materials and keeping the environment clean and safe.

This is why all its latest research and development efforts are aimed at ‘going green’ and bringing pipe producers savings.

Practical examples include swarfless cut and chamfer technology for PVC pipe that saves raw materials, eliminates recycling, reduces maintenance costs, and assures a clean and noiseless environment; and belling machines with short-wave ovens that are active only during the heating phase and for the time needed to reach the final set temperature of the material, for reducing energy consumption and avoiding scrap material.

Sica aims to bring its 51 years of history and know-how to the service of pipe producers, adding new technologies that will help them save money and at the same time will protect the environment.

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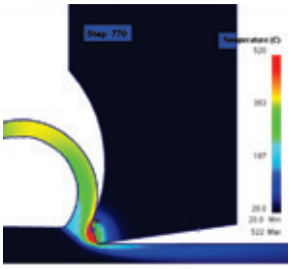

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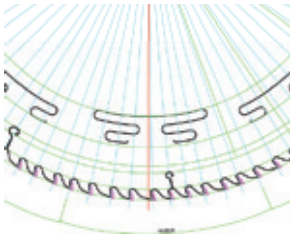

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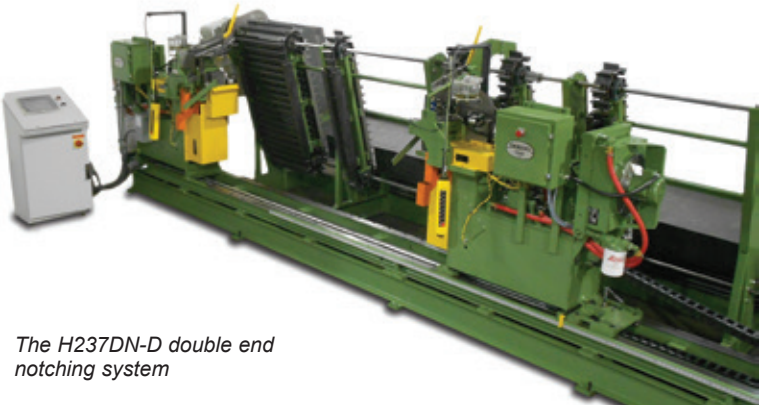
Hydraulic double end notching systems

INNOVO Corporation has unveiled its Generation II line of H237DN-D hydraulic double end notching systems for high volume notching applications producing 90 joints on both ends of tubing or pipe in a single cycle, as used in the manufacturing of livestock containment panels, feeders and many other applications. The H237DN-D unit has a capacity of 2" Sch #40 pipe (2-3/8" OD x 0.154" wall).

Units are adjustable to accept tubes ranging from 12" long to the maximum range of the selected unit. Standard models are available for 4ft, 12ft, 16ft, 20ft and longer tube lengths.



The H237DN-D double end notching system

The new Generation II line features simplified transfer mechanism of tubing from loader to notch heads and reduced cycle times offering maximum production rates of approximately 1,200 tubes per hour in a single tool unit to approximately 2,400 tubes per hour in a double tool unit.

INNOVO offers options of manual load units, units with a bundle loader and units that can be integrated with a tube mill to minimise handling, reduce floor space and improve operational efficiency.

INNOVO Corporation manufactures standard and custom engineered tooling and equipment for tube and pipe fabrication applications.

INNOVO Corporation – USA
Email: info@innovo.us
Website: www.innovo.us

Automatic die centring

AMERICAN Kuhne is using die centring technology that was originally developed by its partner company Graham Engineering for use on a Parisan sidewall adjustment, for die centring technology for medical tubing applications.

The new development includes an AK fixed centre die head that is used to eliminate manual die centring and instead the die pin centre location relative to the die bushing is precisely adjusted by touchscreen control of four die-pin heaters. These heaters are located in the rear mandrel of the die head where they can be heated in an uneven pattern to "flex" the die pin to control its position. American Kuhne has developed the technology further and incorporated closed-loop control of tubing wall thickness concentricity by integrating its control system with an online OD and wall thickness gauge controller. This technology was showcased in a live demonstration with a Zumbach OD and wall system at the MD&M East medical trade show in Philadelphia.

For the test, LaserLinc incorporated its Triton™ triple-axis micrometer, UltraGauge+™ ultrasonic wall thickness measurement system and Total Vu software with OPC (object linking and embedding for process control). Using OPC, the wall thickness data collected by Total Vu was shared with American Kuhne's PLC where the closed-loop control is performed.

During the test, the concentricity was intentionally taken out of specification several times. Each time the control system recovered to 90 per cent concentricity within a minute, and after just five minutes the concentricity was stable at 98 per cent. Tom Shoup, New England regional sales manager at LaserLinc, said: "I've been around extrusion over 38 years and 90 per cent concentricity seemed to be the acceptable goal for tight tolerance medical tubing. American Kuhne has completely shattered those rules. I honestly would not have believed it had I not been there to see it."

Tyler Ware, American Kuhne process engineer, added: "The LaserLinc system proved to have very robust and fast communications, which allowed our system to quickly and accurately make automatic adjustments to concentricity."

American Kuhne Inc is a supplier of standard and customised single screw extruders, feed screws, and complete extrusion systems for medical tubing, pipe and profile. LaserLinc is a manufacturer of non-contact laser and ultrasonic systems for OD, ID, wall thickness, eccentricity and concentricity across many industries including wire, cable, medical and other tubing, hose, pipe and fibre.

American Kuhne – USA
Email: sales@americankuhne.com
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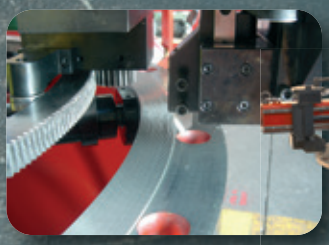

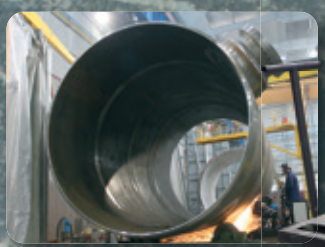

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Annealing stainless steel pipe

IN-LINE bright annealing equipment is mainly used to in-line anneal AISI 300 and AISI 400 stainless steel pipe. The annealing process is completed under a controlled atmosphere (pure hydrogen) in order to assure the brightness of the surface and to regain the natural hardness of the material before forming and welding. Tube straightening is not required after the process.

The in-line bright annealing systems developed and produced by EMMEDI resemble a tunnel through which the stainless steel tube passes at the out-feed of the profiling machine. The tunnel is filled with reducing gas for cleaning and inhibiting oxidations of the tube surface. Induction heating reduces start-up times to a minimum and permits a much higher power density than conventional furnaces with a consequent reduction in the length of the heating. Since dwell time inside the inductor is restricted, treatment temperature must be increased to almost 1,200°C.

A special cooling section located immediately after the heating inductor reduces the tube temperature to the values required for the annealing cycle. This system uses non-recycled pure hydrogen gas at a low flow rate for a perfect cleaning of tube surface in excellent safety condition. The outgoing hydrogen is burned to prevent gas dispersion in the environment. The heating section includes the heating inductor and the generator. In this section the tube can be heated up to 1,200°C.

The heating inductor is a multi-turn coil, made of copper tube, internally cooled with demineralised water. The tube enters the heating inductor through a special adjustable seal, which prevents gas leaks at various tube sizes. As in the heating inductor, the entire cooling operation is carried out in a reducing gas controlled atmosphere.

At the end of the cooling tunnel, the tube temperature drops below 150°C so the tube can be exposed to the external atmosphere. Two main gases are used to fill the controlled atmosphere treatment area: nitrogen to purge and hydrogen to clean the product. Nitrogen evacuates the air and other gases from the heat treatment area, but is unable to exert the same strong reducing effect on the material as hydrogen. Nitrogen is used therefore simply to fill the area in order to eliminate the oxygen before introducing the hydrogen. Both the heating inductor and the cooling section are assembled on a specific support frame, able to traverse on rails, perpendicularly to the production line, in order to clear the mill area when heat treatment is not required.

The closed loop demineralised water cooling system is mounted on an independent structure. The unit includes the stainless steel collection tank, the stainless steel pump and the heat exchanger, also made of stainless steel. It cools the demineralised water of the closed loop with plant industrial water. The temperature of the treated tube is measured at the outlet of the heating inductor by means of an IR pyrometer.

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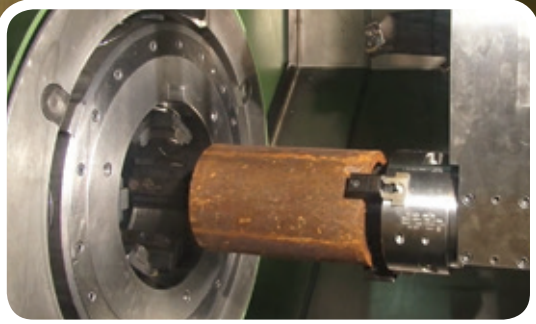

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The gradual unwinding of coils

THE UNC Uncoiler from Guild is a machine that is used to hold the coils to allow the gradual unwinding of the coils during press operations. Uncoilers are available in a number of variations, but the most frequently used samples are the single- and double-ended arm units. The machines are designed for use in different types of processing lines including roll form lines to high speed tube and pipe mills. The uncoilers that are used in steel making are available in the sizes of 15,000lb single and 25,000lb double. However, there are a variety of uncoilers available in sizes ranging from 3,000lb to 40,000lb.

Uncoilers are available with a variety of customised features, however, the standard features available with uncoilers are 12" traversing base, outboard coil retainers, speed funnels, shearwelders and accumulators, hold down arms and snubbers, feed-up and rewinders, powered hydraulic rotation system, hydraulic expansion, manual/ hydraulic expansion of mandrel, wedge/ link type expansion, AC variable speed drives, hydraulic threading drives, quick release narrow coil keepers, loop controls alloy steel main shaft, 4-segment drum, coil joining – tube mill entry systems, 0.5" thick steel back plate, large air brakes, hydraulic cylinders for drum expansion, and two slots per back plate for "C" hook loading. Complete entry systems from Guild International are also available and can be customised to accommodate any application. Commonly included in entry systems are double arm uncoiler, outboard coil retainer, speed funnel, shearwelder and accumulator.

The SL Superloop™ Accumulator is suitable for small and medium size mills. The patented overspeed feature produces large amounts of usable storage. Flexible entry and exit points allow for installation in new or existing lines. This accumulator can handle material from about 0.03" thick up to 0.312" thick and line speeds from approximately 50 FPM up to 900FPM.

Guild International – USA
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New casting material for low-temperature applications

PARTICULAR demands are placed on steels that are used in the low temperature range – they have to withstand temperatures down to -196°C. To date, austenitic steels have been used.

However, because of their low yield strength, these are subject to the risk of early deformation and must therefore be cast with very thick walls.

This was the starting point for the development of the new low-temperature material Dux Cryo®, which displays higher strength values with good toughness. The casting can be constructed with thinner walls, which saves not only weight but also costs.

Dr Petra Becker, head of research and development at Schmolz + Bickenbach Guss

Instead of austenitic steel, Schmolz + Bickenbach Guss has started using martensitic steels for jobs in the low-temperature range; this is the result of an extensive research project funded by the German federal ministry of economics and technology. These materials are excellent for tempering and therefore also display significantly higher yield strength (Rp0.2³ 490N/ mm²) than the alternative of austenitic steels – a property that is particularly advantageous in such extreme temperatures.

However, particular demands are placed not only on the strength but also on the toughness (KV (-196°C)³ 40J). The prerequisite for high strength at low temperatures is primarily a low content of selected trace elements. Otherwise, the segregations caused result in embrittling of the casting. "For us, the challenge lay in achieving reliable manufacture of the castings with a focus on optimised structure and therefore adequate strength – without cracks appearing in the casting volume," explained Dr Petra Becker, head of research and development at Schmolz + Bickenbach Guss.

The starting point for the research project was the low-temperature material X8Ni9, which is used as a standard sheet and forging material for applications down to -196°C. However, due to the high cracking sensitivity of the coarse-grained primary structure, no casting alternative to the material previously existed. The aim was to present the material as a casting modification by combining findings from analytics, metallurgy and heat treatment.

In addition to extensive materials testing and comprehensive literature research, this also involved cooperation with external experts. The latest technologies were used, including a casting technology simulation, thermodynamic calculations of the material and heat treatment, and the latest methods of analysis for the investigation results.

Schmolz + Bickenbach Guss – Germany
Website:
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Steam generator tubing

MANY of the world's nuclear power generation reactors use pressurised water reactor (PWR) designs. The nuclear reaction generates tremendous heat and by way of a heat exchange system produces steam, which drives turbine electricity generators.

The heat exchangers consist of primary coolant loops comprised of thousands of steam generator tubes directly circulating water from the reactor under high pressure and high temperature. These tubes are commonly referred to as "U tubes". These heat exchange tubes are usually about 18mm in diameter and the most commonly used tube material is Alloy 690. Steam heater tube deterioration is a major problem in the operation of PWR installations and all processes in the production of U tubes must be very carefully controlled.

Specifically, cold working of Alloy 690 must be carried out in a very controlled manner to ensure that the tubes are free from defects, which would result in stress corrosion cracking of the tube walls in service. All such tubes go through a straightening process before being formed into U tubes and therefore they must be straightened, ensuring that they are subjected to minimum excess strain during this cold working process.

Turner has developed straightening machinery control systems to enable precision straightening without creating unacceptable stresses in Alloy 690 tubing.

U Tubes are usually very long (up to 40m). To straighten these long tubes it is necessary to do the straightening at a reasonable speed to keep up with high volume production needs. During straightening, the tube will revolve at high speed. If the machine rolls were to grip the end of the tube and immediately start to revolve the tube, unacceptable torsional stresses would be induced along the tube. With the Turner-developed combination of systems, the stationary tube is carefully gripped by a "cross roll feeder unit" (pair of non-marking driven hyperbolic rolls). This unit grips the tube and starts it revolving slowly while feeding the end of the tube into the first pair of rolls in the straightening machine. The machine is equipped with a feature that allows the roll to move below the pass-line of the machine. This creates a gap between the first pair of machine rolls allowing the tube to move into the machine without contact with the rolls.

When the tube leading end arrives between the first pair of rolls, the bottom roll lifts up into position. With the tube now in the first pair of rolls a specially controlled drive motor control system enters a highly developed control sequence, which carefully feeds and accelerates the machine up to its full production speed. The rpm of the tube is therefore accelerated following a Turner proprietary speed algorithm.

Turner – USA
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A laser processing head with rotating optics

IN order to be able to weld cylindrical and other rotation-symmetric parts without complex and inefficient multi-axis systems, a laser processing head with rotating optics is almost indispensable, according to Rofin-Lasag AG, Switzerland. With this rotating head, processing is carried out quickly and efficiently directly on the tray of the transfer line or of the rotary indexing table.

An example of the challenges faced is the fusing of two concentrically arranged components, and to realise this, if possible, within the scope of mass production.

With the rotating optics LLDROP, Rofin-Lasag designed a beam control system that is custom-made for this type of application. The rotating processing head is suitable for spot, seam and segment welding of circular weld seams.

The components are fixed, for example on the tray of a transfer line, and guided to the processing station, where they are welded with a freely programmable rotation speed. Because the installation of a rotating axis in the CNC machine or automation plant can be omitted, production is made more efficient.

Further possibilities of transporting the components are indexing tables or a monorail and tablet.

Besides the advantage of efficiency with respect to the component transport, LLDROP also covers different application areas due to its modular structure. It offers the possibility to weld different diameters under various angles; currently 45°, 30° and 15° as well as the diameter ranges 0-27mm, 25-47mm and 45-67mm are available. In order to achieve an excellent welding result, the inert gas nozzle is entrained.

LLDROP has been optimised for the laser platforms SLS and FLS (solid-state laser), as well as the fibre laser platform LFS.

The solid-state lasers offer output values of up to 800W and a maximum pulse energy of up to 200J. The fibre laser offers output values of up to 150W and maximum pulse energy of up to 15J with maximum efficiency and no need for maintenance.

LLDROP will be presented at several forthcoming trade fairs.

Rofin-Lasag offers high quality, reliable products and is a market specialist for aviation and space travel, automotives, electronics, medical technology, tooling, industrial and watch industries.

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Debut of Shop-Calc software

2020 SOFTWARE Solutions, a worldwide provider of tube bending software, has rolled out a new product line called Shop-Calc software. Shop-Calc is a series of calculators designed to take the guesswork out of specific manufacturing processes. There are four different versions of Shop-Calc software and the machines they work with are: Shop-Calc Vertical Press – Used with a vertical press brake, this calculator will find the depth location needed to achieve the desired angle; Shop-Calc Horizontal Press – Used with a horizontal press brake, this calculator will find the ram location needed to achieve the desired angle; Shop-Calc Plate Rolls – Used with 3 or 4 roll plate machines, this calculator will find the roll locations for the desired radius; and Shop-Calc Profile Bending – Used with angle roll machines, this calculator will find the roll locations for the desired radius.

"In many cases customers are looking for a product to do one specific function," said Cris Merry, president and manager of software development. "They do not want it cluttered with bells and whistles they will most likely never use. Shop-Calc is designed to take the mystery out of the machine setup." He also went on to say about the target audience: "Shop-Calc products are designed for the working man, real world solutions for real world problems."

Each calculator combines geometric maths calculations with the calibrated log data to provide accurate machine settings. Shop-Calc will provide the roll or die locational value to the scale and range for your machine. Sheet and plate calculators account for material thickness and length down the die or roll. There are quick adjustments for mill run variances of material, and spring back is also accommodated for. There is also a graphical display to show the comparison of historical data.

2020 Software Solutions – USA
Website: www.shop-calc.com

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It has products for companies that specialise in gear grinding and/or milling:

MILPRO® 740ACF is a clear, yellow metalworking oil designed for use in horizontal broaching of high temperature alloy aircraft engine parts. This chlorine free oil offers excellent water rejection, oxidative stability, rust protection, and cooling capability for a straight oil.

MILPRO® 500 is a metalworking oil blended from naphthenic base stocks and is recommended for a wide range of light- to medium-duty applications such as general-purpose thread grinding, tapping, gear hobbing, gear shaving, milling and turning. It offers a balanced blend of sulphur, chlorine and fat that produces better finishes and longer tool life than most competitive oils. MILPRO 500 is low misting in most applications.

MILPRO® 840CF is a general-purpose oil recommended for machining and grinding operations. Recommended for gun drilling, tapping, broaching and grinding, MILPRO 840CF contains a lubrication package comprised of both a physical lubrication component and extreme pressure additives. It contains stable lubricity additives with very low depletion rates and high temperature stability. This light viscosity fluid offers cooling.

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CIMPERIAL® 20-8SX is a premium soluble oil developed for use on carbon steels, high speed steel, cast steels, alloy steels, tool steel, stainless steel, titanium, cast iron, and most aluminium alloys. It is designed for heavy-duty operations and contains a unique blend of sulphurized and chlorinated extreme pressure (EP) lubricant additives to perform a wide variety of machining and grinding applications, including creep feed grinding. This low foaming product also offers very good biological protection, thus providing extended sump life.

While providing higher productivity and improved cleanliness compared to straight oils, it also avoids the housekeeping problems and fire hazards of straight oils.

CIMCOOL – USA
Website: www.cimcool.com

Portable hand-held marking system

THE portable and powerful FlyMarker Pro for durable markings was launched by Markator in 2013. The third generation of the hand-held marking system is based on many years of experience in the market of mobile marking systems. It convinces among other things with a high marking speed. Due to the low weight and the small construction the marking device is even more handy and compact than the previous models.

Equipped with a strong magnet and a powerful battery, the mobile "power package" is well-prepared for almost any marking tasks. The portable dot peen marking device is used to create durable and forgery-proof markings on the device. It weighs only slightly over 4kg including battery and is very easy to handle.

The control unit is installed in the break-proof housing and is protected against external influences.

No annoying cables endanger the work. The marking files can be programmed via the clearly structured and self-explanatory software of the integrated control unit. For this no programming skills are necessary.

Markator – Germany
Email: uschi.gassmann@markator.de
Website: www.markator.de

Weld seam detection on precision steel tubes

Roland Electronic's SND40 weld seam detector

THE position of a weld seam has a crucial influence on the quality of the final product when bending or hydraulic forming a tube.

An unfavourable seam position causes deviations in geometry, has influence on the firmness and in the life span of the produced component or precipitates by cracking during the manufacturing process.

In order to prevent such disadvantages, different solutions for the localisation of the weld seam were established. Common optical procedures, such as colour marking of the longitudinal welds, in order to detect their position are widespread. Camera-based systems that detect the visible welding seam are also in use.

However, colour marking is not always possible, or the welding seam may not be visible. This problem arises when an application requires a treatment of the tube after welding, for example in the production of precision steel tubes. The cold drawing of the tubes changes the original surface and impedes the use of colour. If the tube is additionally annealed, the welding seam may become invisible in its external appearance.

Roland Electronic offers alternative techniques, well known from the non-destructive testing of materials with eddy current, magnetic induction and the magnetic leakage flux method. These techniques have the advantage of dry functioning, without significant radiation exposure.

Crystalline modifications of the structure within the weld seam can be used for detection. In the process of welding ferromagnetic steel, martensitic crystals are formed within the range of the heat effect zone. Since martensitic crystals hardly occur in the unwelded structure, the welding seam is detected by the crystal structure modification. The SND40 weld seam detector supports these alternative techniques and offers high process reliability in practical usage.

Roland Electronic claims that tubes with scraped weld seam and calibrated diameter will reach in the first detection run ratios of 99.9 per cent, and that the error rates in detection with an SND40 system are between 0 and 100ppm.

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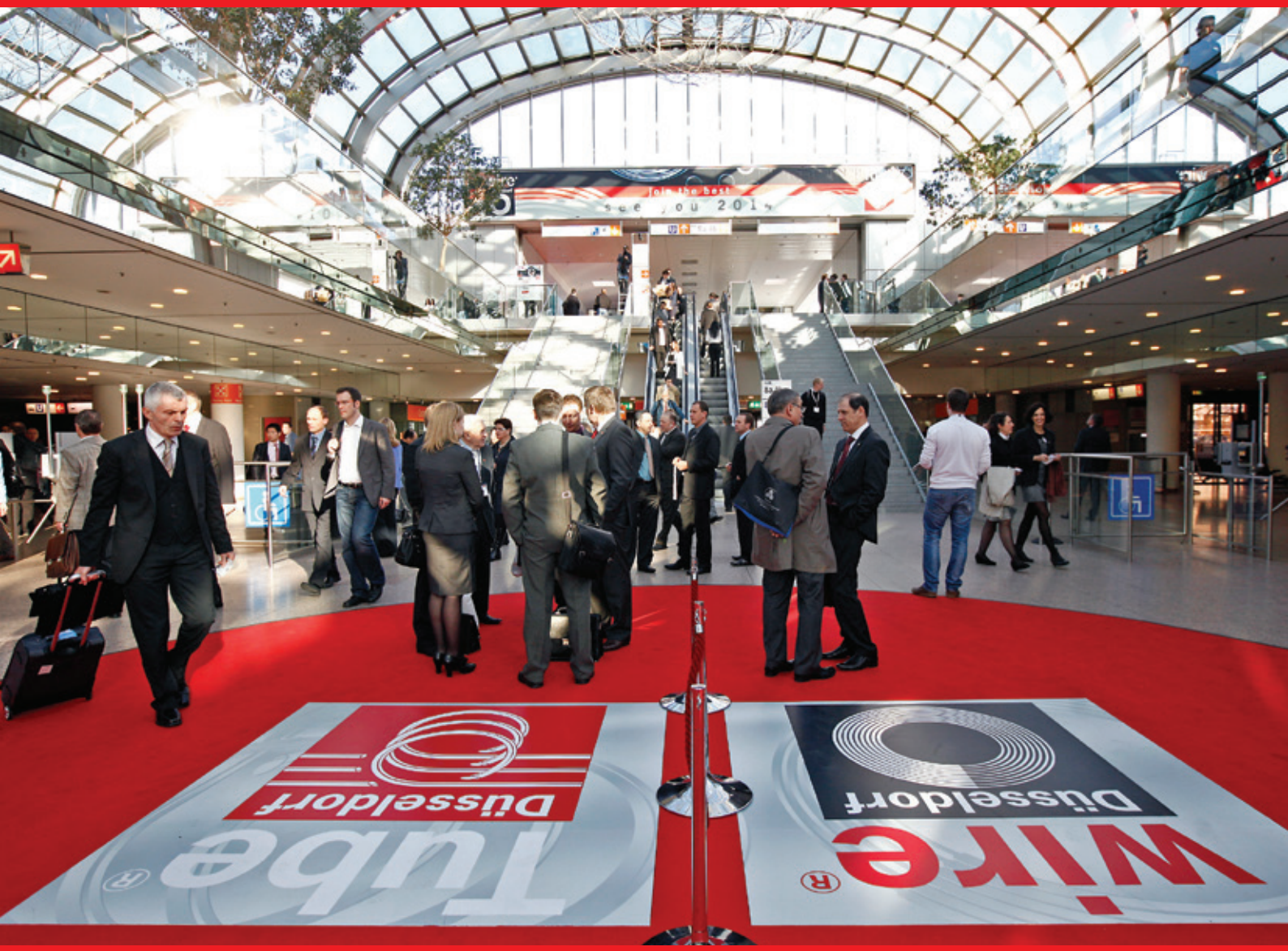

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To thousands of producers, designers, engineers, suppliers and customers in dozens of countries Düsseldorf means one thing: the biennial International Tube and Pipe Trade Fair, the world's biggest and best showcase for the tube and pipe industry and those serving it.

Düsseldorf is an appropriate choice for Tube 2014. In its development and maturation since 1988, Tube mirrors its host city on the Rhine, whose singular blend of ancient and modern reflects a will to preserve the best of the old while embracing the promise of the new. Tube and pipe manufacturers, committed to realising maximum productivity from existing equipment while actively weighing the benefits of upgrading, are well acquainted with this double perspective.

The most renowned names in the industry worldwide are there in force. But some names will be encountered for the first time both here on the page and later in the exhibition hall. The organiser's experience suggests that by the time the next edition of Tube is in preparation many of these companies will have joined the A-list. Those heading for Düsseldorf for Tube 2014 will meet new and old friends as well as strengthen their command of current industry practice and explore tomorrow's methods today.

www.tube.de

Energy

Familiarity with North Sea and Baltic Sea conditions informs an innovative project for embedding wind turbines in Lake Erie

"This is all about having a foundation that will work in these icing conditions and that therefore will work anywhere in the Great Lakes." ("Lake Erie Wind Turbines Viable, Say Engineering Firms with North Sea Experience," 23 September)

David Karpinski, vice-president of operations for Lake Erie Energy Development Co – or LEEDCo, LLC – was outlining for the Cleveland *Plain Dealer* the preliminary results of a six-month feasibility study by European and American engineering firms that have partnered with LEEDCo. The non-profit corporation was formed to test the concept that turbines can survive in the five ice-choked Great Lakes; but also to determine whether or not they can be built inexpensively enough to compete with land-based power plants.

Together with Mr Karpinski and LEEDCo president Lorry Wagner, five engineers from European-based firms with decades of offshore experience building wind turbines and oil drilling platforms described to *Plain Dealer* business reporter John Funk a solution that they believe satisfies both criteria. The six turbines in the pilot wind farm planned for Lake Erie would not need steel and concrete foundations drilled into the bedrock under the lakebed. Instead, each turbine would sit atop a single but very large-diameter pole, or tower, much like those used for land-based wind turbines.

"This is the most common foundation used in the business today," said Dan Woodman, of British-based Offshore Design Engineering, a company with extensive experience building offshore structures, including platforms in the North Sea. Favouring the single-pole approach, he said, is the fairly lightweight (70-ton) turbines that LEEDCo plans to use, and the relative shallowness (60ft in depth) of the water at the site of the projected wind farm.

The "monopole", made of rolled and welded plate steel, would be driven into the 80ft of sand, clay and glacial material under the lake before coming to rest on the shale bedrock. Each tower would be equipped with an "anti-ice cone" that would protect it from crushing ice floes that critics have warned would destroy any freshwater wind turbines. The inverted steel cone, filled with concrete and attached to the towers some feet below the surface of the water, would protect them from "keel ice" (broken and refrozen chunks of ice) pushing up against the structures from below.

The weather conditions around Lake Erie present their own unique challenges

The tower, or pole, would weigh about 600 tons, said Stanley White, a Connecticut-based engineer working with Ocean and Coastal Consultants, also of Connecticut but now owned by Denmark-based international engineering company COWI A/S.

Intended for hard service

Finnish engineer Esa Eranti, an acknowledged ice expert in the offshore area, told Mr Funk that oil companies pioneered the cones 30 years ago to protect drilling rigs. The method has since been employed to protect wind turbine towers inshore in Finland, where temperatures can plunge well below zero and where snow and ice cover much of the land from December to April.

"The Gulf of Finland, part of the Baltic Sea, is very similar to the Great Lakes region," Mr Eranti said. "The conditions – waves, wind and ice – are very similar."

The solution was one of four developed by the team members, who designed the towers to withstand up to twice the forces of a 50-year storm. The final decision was taken on the basis of cost, installation time, and whether the expertise, manufacturing and shipping on offer in the region could get the job done, said Dr Wagner.

The towers would be fabricated in 2016, a job that three Ohio companies are capable of doing, said Mr Karpinksi. Representatives from the three companies, recommended by the manufacturing supply-chain group Great Lakes Wind Network, have already met with LEEDCo. Installation in the lake is planned for the spring of 2017.

On an environmental note, the team assembled by LEEDCo observed that turbine towers often re-establish thriving fishing grounds. Mr Funk was told that, with a tweak of the electrical gear, the six turbines planned for Lake Erie could help push oxygen into "dead zones" in the water, created by algae blooms consuming dissolved oxygen.

To judge from reader reaction to the *Plain Dealer* coverage of the Lake Erie project, contrarian views on wind power generation show no sign of abating. Among the more temperate responses is this, much abbreviated, from a local resident:

"Please Google *europe wind farms failing* and read what is going on in Europe with wind energy: increasing problems with wind turbine failures, unsustainable government subsidies, high maintenance costs, negative environmental impacts, increasing citizen disenchantment with wind power whether on land or water, and its continued broken and unfulfilled promises . . . Many of the same issues that wind farms create on the land do not disappear when located in the water."

With its 50 nuclear reactors still idled, energy-deprived Japan sees potential in deepwater 'floating windmills'

"When this 350-foot-tall windmill is switched on [in November], it will generate enough electricity to power 1,700 homes. Unremarkable, perhaps, but consider the goal of this offshore project: to generate over 1 gigawatt of electricity from 140 wind turbines by 2020. That is equivalent to the power generated by a nuclear reactor."

Datelined "Off the Coast of Fukishima", an article by Hiroko Tabuchi in the *International Herald Tribune* referred to a giant floating wind turbine 12 miles out to sea from the site of multiple nuclear meltdowns in March 2011. In Ms Tabuchi's view, the turbine project signals the start of the country's "most ambitious bet yet on clean energy." ("To Expand Offshore Power, Japan Builds Floating Windmills," 24 October)

She cited several factors favouring the hope of the backers that offshore windmills could be a breakthrough for an energy-poor nation. They would take advantage of Japan's coastline, which is longer than that of the US. With an exclusive economic zone – an area up to 200 miles from its shores where Japan has first claim on any resources – that ranks it among the world's top ten largest maritime countries, Japan has millions of square miles to give over to windmills.

Ms Tabuchi noted that the project is also a bid to seize the initiative in an industry expected to double over the next five years to a global capacity of 536 gigawatts, according to the industry trade group Global Wind Energy Council. Currently, wind turbine manufacture is dominated by European and Chinese firms.

The Japanese government is paying the $226mn cost of building the first three wind turbines off Fukushima, part of Prime Minister Shinzo Abe's push to make renewable energy a pillar of his economic growth programme. After that, wrote Ms Tabuchi, a consortium of 11 companies – including Hitachi, Mitsubishi Heavy Industries, Shimizu and Marubeni – plan to commercialise the project.

"It's Japan's biggest hope," Hideo Imamura, a spokesman for Shimizu, told the *Tribune* during a recent trip to the turbine ahead of its test run. "It's an all-Japan effort, almost 100 per cent Japan-made."

What sets the project apart from other offshore wind farms around the world, consortium officials say, is that its turbines, and even the substation and electrical transformer equipment, float on giant platforms. If the technology proves workable, it would multiply the potential locations for offshore wind farms – customarily fixed into the seabed and limited to shallow waters. (See "Wind turbines in Lake Erie", above.)

As noted by Ms Tabuchi, ideal sites for offshore wind farming are scarce in Japan, which lies along a continental shelf that quickly drops off to depths that make it unfeasible to drive

structures into the seabed. But, she wrote, "Floating wind farms could change the picture in a big way."

That would be very welcome to Japanese consumers. Their 50 nuclear reactors remain down, awaiting inspections and depriving the country of a power source that had provided close to 30 per cent of its electricity.

Steel

With consumption on the rise, Eurofer's top market analyst sees better days just ahead for Europe's steel producers

Speaking at the Eurometal Steel Net forum in Copenhagen in October, the director of market analysis and economic studies at the European steel producers' association Eurofer said that apparent European steel consumption would rise by around 3 per cent in 2014 after dropping 2-2.5 per cent last year. Jeroen Vermeij construed his use of *apparent*: despite a continuing drag on real consumption, there will be less negative steel intensity this year.

Sharing his expectations for the European steel industry in the year ahead, Mr Vermeij said that the market will be buoyed by a general strengthening in macroeconomic activity, with growth in GDP (gross domestic product) of around 1.3 per cent. Steel-using sectors of the European Union will grow by a combined 2 per cent after a fall of 3 per cent in 2013, with stocks low throughout supply chains and inventories recovering. Internal demand will pick up, driven by investment in machinery and equipment and aided by a loosening-up of credit.

Reporting for *Platts* (24 October), Colin Richardson noted Mr Vermeij's estimate of the construction sector (residential, including repair and maintenance) as displaying the strongest prospects at that point, but overall no real rise in major steel-using construction was seen. Persistent issues include a scarcity of large projects, financial sector deleveraging, and unsold property stocks.

Mr Vermeij's forecast includes a European automotive sector growing around 2 per cent this year after a contraction in output and sales in 2013. The better investment climate, easier financing, and pent-up demand will mean production rising 3.5 per cent and vehicle exports gaining upward momentum, he said.

Reviewing last year in steel, Mr Vermeij said that demand in the second half of 2013 had trended higher after a weak six months, with import pressure easing and end-use activity showing "relative improvement" (although from a low level) after stabilising in July-August – more so for flats than longs.

Taking in the vista beyond Europe, Eurofer's top market analyst said he expected this economic strengthening to be supported by an upturn in the largest developed economies. Among the upbeat indicators he cited were the growth of manufacturing in the US and strong industrial activity in Japan. As for the BRIC economies, they will experience a "mild improvement" in 2014, after disappointing last year, Mr Vermeij said.

Also on 24 October, the German automaker Daimler lent support to Mr Vermeij's optimism on the automotive sector. The maker of Mercedes cars posted a third-quarter 2013 net profit of $2.6bn, up 53 per cent from a year earlier. In its announcement of the results, Daimler said that car demand had "stabilised at a low level in Western Europe, and a gradual improvement of the market situation [was] to be anticipated in the rest of the year."

Automotive

China edges up on the last prerequisite for high-volume auto exports: parts designed and certified to Western standards

According to senior executives at some of the largest auto parts companies in the West, Chinese automakers are starting to ask them to supply parts that meet American and European regulatory standards.

Writing from Wuhan, China, in the *New York Times*, Keith Bradsher commented that the requests are "the clearest sign yet that, after more than a decade of preparation, Chinese manufacturers are starting to feel the confidence to begin high-volume auto exports to the West."

In another sign of this perceived shift in policy, a senior Chinese Commerce Ministry official said at the Global Automotive Forum – held in Wuhan in October – that Chinese automakers should prepare for the lowering of steep tariffs on imported cars. Those producers "may have a very huge impact from this reduction of tariffs," said Chen Lin, the Commerce Ministry official who oversees international automotive investment policy.

That change had never been acknowledged outright by a Chinese official, wrote Mr Bradsher, who is the *Times*'s Hong Kong bureau chief. ("China Hints at Effort to Export Cars to West," 17 October)

Mr Chen also said that Chinese automakers should be ready for China to reduce its requirement that foreign automakers set up assembly plants in China only through 50-50 joint ventures with local partners, instead of as wholly foreign-owned factories.

Mr Bradsher parsed the likely results of the lower tariffs. They would make it much easier for multinational corporations to import cars into China, while the removal of the joint-venture requirement would allow multinationals to streamline the management of their Chinese operations. (Their Chinese joint-venture partners have insisted on assigning managers and engineers to these projects to gain familiarity with Western technology and management.)

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Although Mr Chen did not say so explicitly, reducing China's trade barriers now would make it harder for Western countries to impose reciprocal restrictions later on Chinese car exports. But, as noted by the *Times*, Mr Chen acknowledged this point indirectly when he noted that, unlike China, most countries do not require joint ventures with local partners to own any assembly plants built in their markets.

"We are seeing this imbalance of policy," he said in a panel discussion at the annual conference of auto-industry chief executives from all over the world.

EMPHASIS ON MIDSIZE, SUVS

Jeffrey J Owens, chief technology officer and executive vice-president of Delphi, the largest auto parts company in the US, said in a separate interview that Chinese automakers were starting to order parts for delivery three years from now that meet American and European regulatory standards. The orders tend to be for parts for midsize cars and sport utility vehicles, Mr Owens said.

This suggests that Chinese automakers plan to go after the most profitable parts of Western markets, instead of starting in the overcrowded markets for compact and subcompact cars. Mr Owens said auto parts designed to Western regulatory standards would also meet Chinese standards but would tend to be more expensive.

Parts meeting international standards can be made in China. Delphi has opened three factories in China this year and is building six more.

Jay K Kunkel, the president for Asia and the Pacific at Lear, another large American auto parts supplier, said his company was also starting to see more Chinese orders for parts that meet Western regulatory standards.

Recent public statements suggest that newer automakers in China and those with mostly private sector owners, like Geely and Great Wall, are the most interested in exporting to Western markets. Older, state-controlled manufacturers have been less enthusiastic, according to Mr Bradsher.

Wang Xia, chairman of the automotive committee of the China Council for the Promotion of International Trade, a government-controlled group, said in a brief interview with the *Times* at Wuhan that he expected Chinese carmakers to enter the US market within five years.

Oil and gas

In 'a major symbolic shift', China pulls ahead of the US as the world's largest oil importer

The US recently overtook Russia to become the world's largest oil and gas producer. The US Energy Information Administration (EIA) also marked another notable energy-market shift: "China passed the US in September as the world's biggest net oil importer, driven by faster economic growth and strong auto sales."

Chinese oil consumption outstripped production by 6.3 million barrels per day, which indicates a necessity to import that much to fill the gap. The EIA said the comparable margin in the US was 6.1 million bbl/day over production. China's imports are expected to rise to 9.2 million bbl/day by 2020.

Joshua Keating, a writer on international affairs for the daily webzine *Slate*, pointed out "a couple of caveats on this story" (11 October). For one, while US imports are offset by its exports, the country does import more oil overall than China. The US also still dwarfs China – with three times the population – in per capita consumption of oil.

In September, Americans used 18.6 million bbl/day of oil and other liquid fossil fuels, while China used 10.9 million, according to the EIA's "Short-Term Energy Outlook." US production was 12.5 million bbl/day, while that of China was 4.6 million.

All the same, wrote Mr Keating, the reversal of positions is "a major symbolic shift" and one likely to have major geopolitical as well as environmental implications. In his view, the Middle East is likely to claim more of China's attention.

The need for secure oil exports has been an important factor in US foreign policy, particularly in that region. But, today, Saudi Arabia exports nearly as much oil to China as to the US – and China will soon be importing more oil from the Persian Gulf than the US did at its 2001 peak.

"Compared to the US, China's diplomatic and military footprint in the Middle East is still modest," wrote Mr Keating. "But it may soon feel the need to make its presence a bit more felt."

As shale gas exploitation in the US alters the world's energy trade flows, Russia works at cementing stronger ties with China

"Moscow is increasingly looking to Asia for customers and funding to help develop its vast energy reserves, with demand in oil-and-gas-deficient China and parts of Asia soaring while it shrinks in other industrialised countries."

From Moscow, Lukas I Alpert of the *Wall Street Journal* was reporting on an important instance of Russia-China linkage: the agreements announced in the autumn by two of Russia's top energy producers to deliver oil and gas to China. ("Russia and China Agree on Oil and Gas-Supply Deals", 22 October)

Rosneft, the world's largest listed crude oil producer, is to supply Sinopec Group – China's largest oil refiner – with 10mn metric tons of oil a year for ten years. Rosneft's president, Igor Sechin, outlined the deal following a meeting of top energy and political officials in Beijing. According to Russian news agencies, Russia's prime minister, Dmitry Medvedev, later told reporters that the Rosneft-Sinopec contract is valued at around $85bn.

And Russia's largest independent natural gas producer, OAO Novatek, said it had agreed to deliver 3 million tons a year of liquefied natural gas from its Yamal LNG project to China National Petroleum Corp over a period of 15 years.

Novatek said the price would be indexed to the Japanese Crude Cocktail, defined by the *Journal* as a "commonly used reference price index for long-term LNG contracts in Japan".

Providing context, Mr Alpert noted that the growth in Russia-China ties comes at a time when huge hydrocarbon reserves are being freed from shale-rock formations in North America, effectively re-rechannelling global energy trade flows. Coal and gas normally sold to the US is being displaced to Europe, in turn undermining demand for Russian gas.

The *Journal* reported further that Mr Medvedev, after meeting his Chinese counterpart Premier Li Keqiang, said he hoped a natural gas delivery contract between Russian state gas producer OAO Gazprom and China would be signed soon.

Additionally, Russia's En+ Group – the mining, metals and energy conglomerate – said it had signed a strategic cooperation agreement with Chinese power and coal producer China Huaneng Group to jointly develop power projects in Russia.

Eurozone redux

Fifteen of the 17 European Union member states using the euro mark their first period of growth since early 2011

"The expansion is reassuringly broad-based across the region, reflecting signs of economic recoveries becoming more entrenched in the periphery as well as ongoing expansion in Germany and stabilisation in France."

Chris Williamson, chief economist for Markit Economics, was summarising the results of a closely watched corporate survey released by the London-based international data and analysis firm on 24 October.

While the growth trend is a modest one, it strongly suggests that the economy of Europe, where 330 million citizens of the European Union use the euro, has entered a period of steady growth.

The composite purchasing managers' index compiled by Markit Economics came in at 51.5 in October, above the 50.0 mark that signals expansion. While that is a slight deceleration from September's 52.2 showing, it was the fourth consecutive month in positive territory.

Writing from Paris, David Jolly of the *New York Times* said that the report was the latest to reinforce the message that "after lurching from the Lehman Brothers crisis five years ago to its own sovereign debt problems," Europe appears to be getting quit of its problems. The eurozone officially exited recession in the second quarter, with a small upturn.

On the same day that the Markit Economics report was published, the Spanish government said that Spain had pulled out of a two-year recession, with a modest third-quarter expansion. While joblessness in Spain remains at depression levels, and that of the overall euro zone is elevated at 12 per cent, both appear to have reached a plateau.

Mr Jolly observed that "no one is predicting a near-term economic breakout" – and the survey of purchasing managers revealed that growth appeared to be slowing slightly in Germany and registering only a negligible expansion in France.

But, he wrote, the other 15 members of the euro currency area "reported modest growth of activity for the third month running, representing the first period of growth for these countries since early 2011."

Ben May, an economist with Capital Economics in London, told the *Times* that, in spite of the small monthly decline in the Markit Economics index from September's level, it was still far higher in October than in January. He noted also that manufacturing in Europe actually improved, in contrast to a slightly weaker showing in the services sector.

"On past form, the index is now consistent with quarterly growth in eurozone GDP of about 0.2 per cent," for an annualised rate of about 0.8 per cent, Mr May wrote.

While that is weaker than the second-quarter expansion of about 1.1 per cent annualised, it is, he pointed out, "positive nonetheless."

Dorothy Fabian,
Features Editor (USA)

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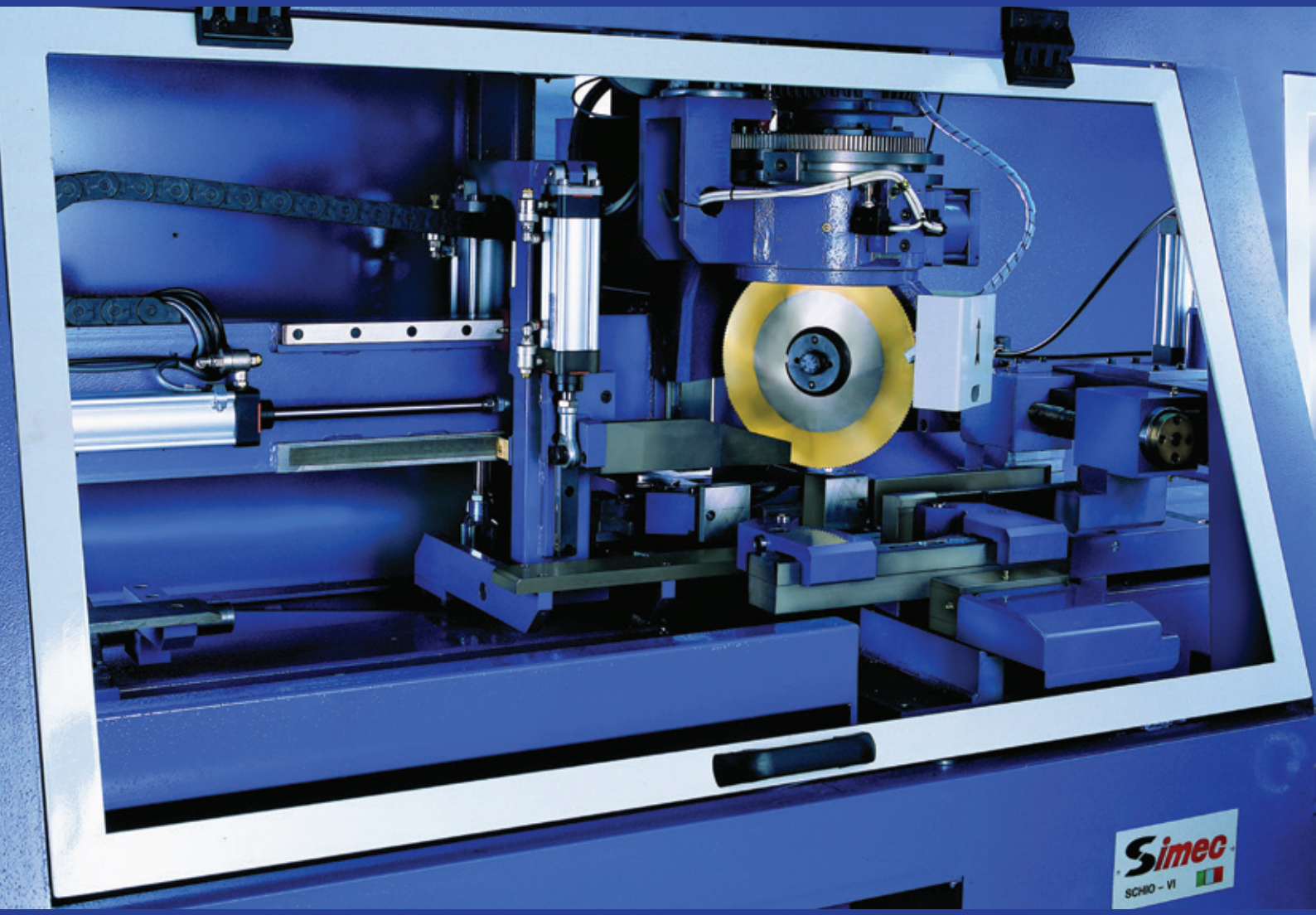


Photo: Simec Srl, Italy

The cutting of tubulars is a straightforward operation which happens to have an extraordinary requirement for precision; and modern tube and pipe cutters ensure that precision to an extraordinary degree.

Suppliers of state-of-the-art cutting machinery offer a wide array of fully automated equipment entirely in the service of making clean, accurate cuts – every time. Featuring integrated logistics, the units will handle round, elliptical or conical tubing. They will accommodate a variety of materials in a broad range of diameters. They will operate without interruption at high speeds, producing negligible trim waste.

In the matter of cutting a tube, a miss is as good as a mile. The small-town plumber at a basement workbench knows that. The big customer in the building trades knows it, too. The supplier of cutting equipment to the tube and pipe industry never forgets it for a minute.

Specialist tube machines

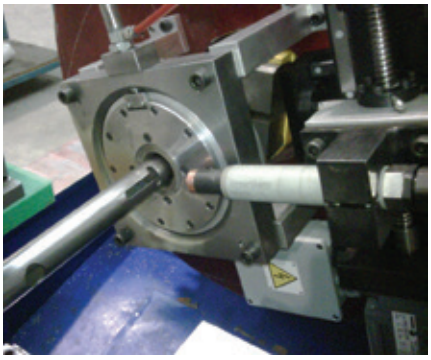
SMS Engineering is an Italian engineering and manufacturing company that specialises in tube machinery. Its machines perform finishing operations on metallic tubes by making use of simple hydraulic units, similar to small presses, which are linked to a hydraulic power pack and duly positioned on a steel surface (being a rig or a plate) and can punch, flatten, swage (reduction of the tube ends) and cut the tube.

The tube and all its machining cover a wide range of uses and can be found in baby articles production (perambulators, push chairs, school desks), home appliances (clothing driers, domestic ladders, heaters, radiators), building production (scaffolding), automotive production (car safety bars, seat adjusting levers, head rests), leisure time (swings, deckchairs, camper accessories, tents), garden items (grass cutters, wheelbarrows), and furniture (chairs, shelves and office furniture).

The machine working is provided through the manual feeding of the tube, which is closed by the gripper, and then by pressing the start cycle. The machine makes all the operations and the finished tube comes back to the starting point where it is unloaded. Using this machine you can work bars of length 3m with the possibility of cutting the tube.

Options available include ordering the machine with automatic loading/unloading and with the possibility of working commercial bar length of up to 6m. The machine can work up to ø120mm round tubes and square/rectangular tubes maximum 80x80mm, with or without deformation in steel, stainless steel and aluminium.

The machine is accurate as a laser machine but it requires lower investment. The best advantage of the plasma machine as regard to the traditional punching machine is that you can program it and avoid in this way the exchange operation of the toolings and corresponding costs for each different mould: different shapes of holes and hole-slots can be performed on the same tube.



The plasma cutting machine is also very easy to use. In order to program it, you must be acquainted with the CAD-CAM systems and just a short period of training is enough to become confident. The machine is suitable for manufacturers of shelving, radiators, stairs, bed nets, ladders, parts for cars, furniture and similar tube products for different sectors.

SMS Engineering – Italy
Email: commerciale@sms-italy.it
Website: www.sms-italy.it

Efficient in-line cutting

KINKELDER has developed a smooth cutting TubeMaster® saw blade for orbital cut off applications. Its special tooth-geometry cuts a large range of thin- to thick-wall tubes.

"Key features of this TubeMaster saw blade are a special carbide grade and a high-tech PVD-coating," said Kinkelder application engineer Leo Molenaar. "This, combined with a special cutting geometry, does not require much force for chip removal, assuring a milled-like finish of the cut surface. This special geometry also reduces vibration when cutting thin wall (<4mm) tubing, thereby achieving an excellent blade life."

The saw blade concept allows the use of one set of blades with medium tooth pitch to cut tubes with wall thickness from 3 to 9mm, and on some machines even up to 12mm. For wall thickness from 9 to 30mm, a coarse pitch is defined.

TubeMaster saw blades are available in diameters from 300 to 420mm for all types of orbital cutting machines.

Tubes for oil and gas, as well as structural pipes and hollow sections, form a primary market for TubeMaster saw blades. Even high hardness materials such as X80 can be cut efficiently thanks to the type of carbide used.

The PVD coating protects the tips against the high temperatures developed during the cutting process.

In the case of ID scarfing in the tube making process, the internal weld bead, often around 6mm thick solid steel, remains inside the tube. During cut-off this inside wire is caught by the saw, causing a huge peak load, usually on one saw tooth. This can lead to tooth breakage of the saw blade.

Kinkelder started developing a new saw in 2010, which resulted in the ScarfMaster® – a carbide-tipped saw blade featuring a very specific tooth geometry, with the tips themselves being made of a highly shock resistant type of carbide. The teeth are supported by a saw body with extra strong shoulders, which give the combination tooth/body very high stability and fracture resistance.

"Not only is the blade life of the new ScarfMaster considerably longer, it can also cut 50 per cent faster," emphasised Mr Molenaar. "Due to this, line speed can be significantly increased. Also, the line does not have to be shut down as often to change the saw blades, which means better uptime."

A Kinkelder saw blade

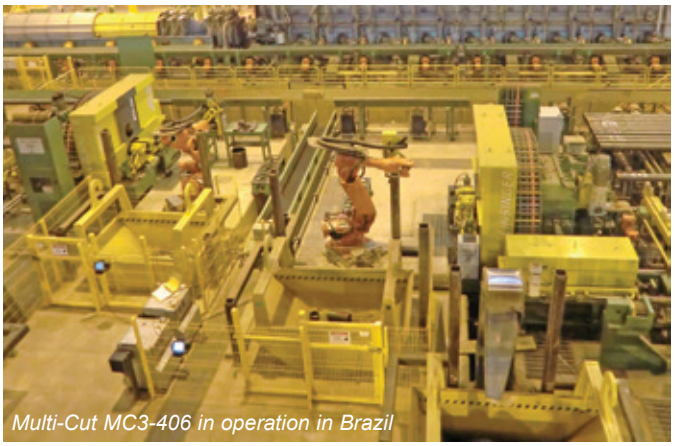
Kinkelder BV – Netherlands
Fax: +31 316 58 22 17
Email: info@kinkelder.nl
Website: www.kinkelder.com

Multi-cut tube cut-off machine

THE stationary tube cut-off machines multi cut (MC3) is a new machine from Linsinger that revolutionises tube cutting with diameters between 150 and 660mm. Instead of one large saw blade, it has three smaller circular saws attached to a radial rotating disc and gives a clean ready-to-sell cut.

Much shorter cycle times result from the simultaneous intervention of all three saws in the tube and subsequent rotation by 120°; the actual cutting time for a P110 steel tube in the size 244 x 13.5mm is therefore only eight seconds. Another decisive advantage: if one of the saws fails, the machine can continue processing with slightly less power but without interruption up until scheduled replacement of the saw blades. This avoids expensive production stoppages.

According to Linsinger, the efficiency of the MC3 is unrivalled due to several reasons: in contrast to the large and therefore expensive blades in conventional steel circular saws, much smaller and correspondingly less expensive disposable saw blades can be used in the Multi Cut machine. Together with the construction-related higher life time of smaller saw blades, this is a massive reduction in tool costs, which are often higher than the cost of the actual machine for circular saws that may be used for more than 20 years. Beyond that the thin cutting width saves a lot of material.



Multi-Cut MC3-406 in operation in Brazil

Last but not least, the MC3 impresses with the fully automatic tool change performed by a robot as soon as a certain number of cuts has been achieved. It changes all three saw blades in just 90 seconds – this would be a pit stop in record time in Formula One.

In relation to a twenty-year life cycle of the machine, the time savings achieved corresponds with more than half a year in three shift operation.

"The MC3 is not only the measure with all things in precision but also in the efficiency of the machine. The extra cost in comparison to conventional saws amortises within two to three years."

This is how the Linsinger company manager Hans Knoll summarises the number of advantages, which also convinced several customers. And not only them: "The benefits of our multi-cut system have also already been recognised in China. We are expecting a run on this new machine type from the local industry," explains sales manager Johann Wolfschwenger.

For further information visit Linsinger at Tube Düsseldorf Hall 6, Stand 6K20.

Linsinger – Austria
Email: maschinenbau@linsinger.com
Website: www.linsinger.com

Yoder upgrades WH-350 tube mill

YODER Manufacturing of Cleveland, Ohio, a member of the Formtek Group, has been contracted to refurbish and upgrade an existing WH-350 tube mill to produce structural shapes (HSS).

Formtek is a group of long-established companies, each with a well-known name and a history of providing innovative, reliable equipment to the metal forming and metal processing industries. As a single source provider, Formtek supplies all of its customers needs.

Formtek – USA
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High strength circular saw blades

NEW-FORM Tools offers specialist blades and cutting systems for high tensile and high strength materials. For over 30 years it has been manufacturing metal cutting solutions for the tube and pipe, roll form and coil processing industries.

New-Form Tools titanium coated shear blades, jaws and roll-forming tools are impact and wear resistant. With durable tooling that resists chipping and cracking, New-Form Tools is a good source for cutting solutions.

The company offers its range of cutting blades across North and South America for durable, high-speed steel and specialist high-speed steel circular saw blades.

Jim Jantzi, president of New-Form Tools, said: "We knew expanding our product line was the right decision. There is such a high demand in North and South America for high quality, long-lasting, circular saw blades and we knew this was a decision that our existing customers could also utilise for their operations. We're more than thrilled to say that we now serve the whole tube cutting market."

From the manufacturing process to regrinding and custom design, New-Form Tools said it is proud to supply operations across the world with its cost effective, high quality circular saw blades.

New-Form Tools – Canada
Email: tjantzi@newformtools.com
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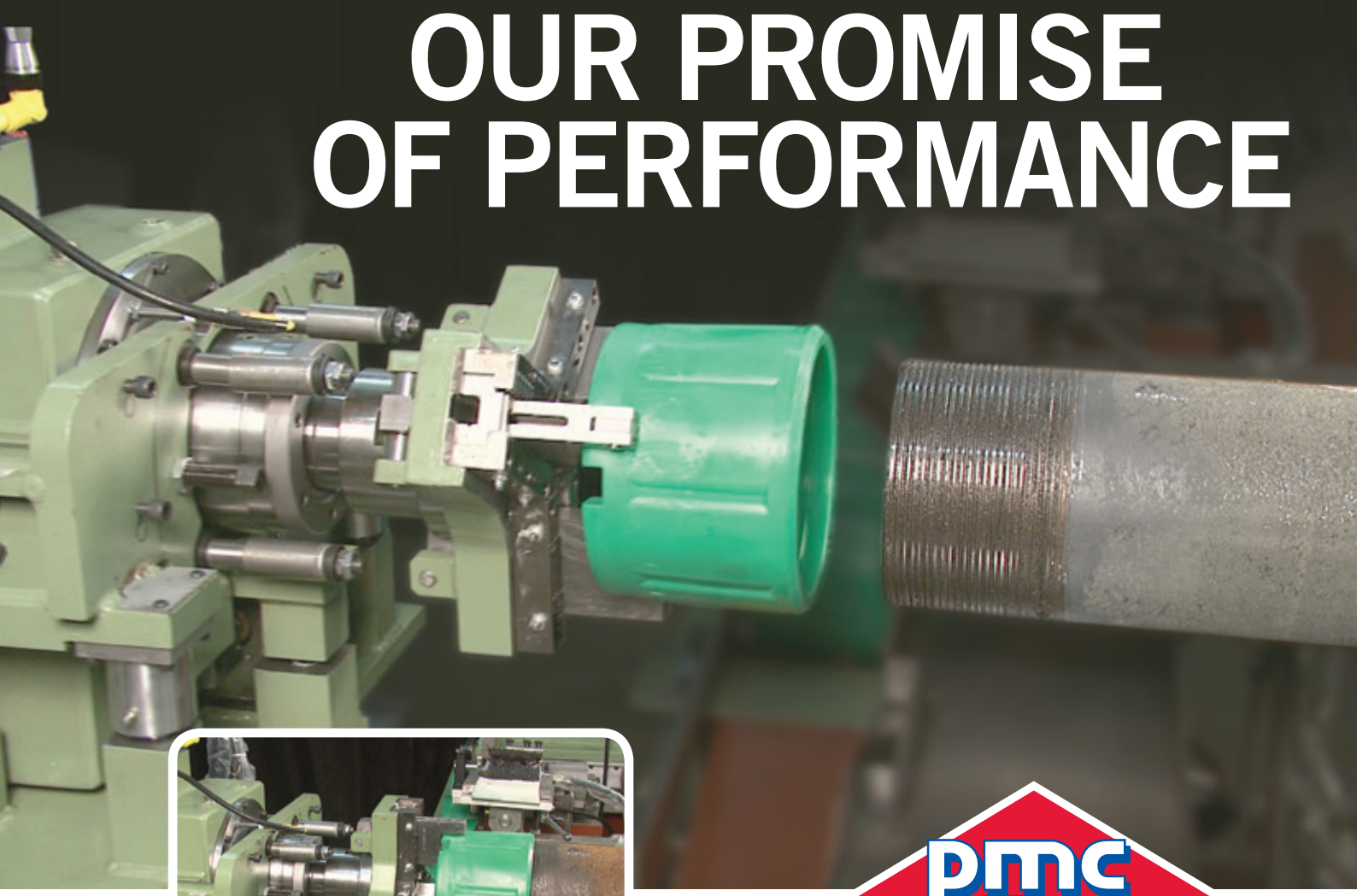

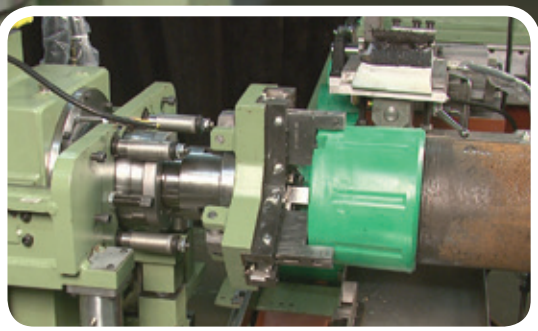

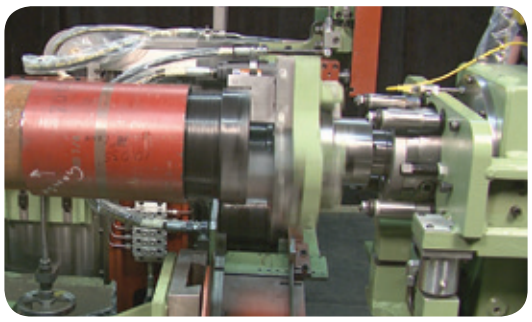

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XR series cutting nozzles improve performance

The XR Series nozzles

ESAB Cutting Systems, a leading manufacturer of thermal cutting systems, offers the XR Series of high-speed cutting nozzles for its popular M3 Plasma System. The innovative design of XR Series nozzles improves cutting speed and extends the dross-free cutting range, providing better cut quality on a wider range of materials resulting in lower overall operating costs.

An advanced nozzle design allows XR Series nozzles to cut faster through a wider range of materials. The 260 Amp XR nozzle can cut as much as 45 per cent faster than previous PT-36 nozzles, while the 360 Amp XR nozzle achieves speeds up to 80 per cent faster than formerly possible. The improved speed combined with enhanced cut quality and dross performance result in significant increases in productivity and reduced operating costs.

The wide cutting range also means fewer consumable changes, so machine operators spend more time cutting and less time changing nozzles. Throughout each nozzle's cutting range, the cut quality and dross performance are improved, reducing secondary operations and clean-up work.

The XR Series nozzles feature an extended water cooling surface, so that more of the nozzle is in contact with cooling water, closer to the nozzle tip. When compared with older PT-36 torch nozzles, XR nozzles feature more than double the water cooled surface area. This results in the nozzle running cooler, providing longer consumable life.

The improved nozzle cooling also helps extend nozzle life when piercing thicker material. XR nozzles can cut up to 80 per cent thicker material with the same current. Lower current usage may also provide costs savings.

In addition, superior piercing performance allows thicker plate to be cut more reliably. A nickel plated shield retainer and two new nickel plated shields help shed pierce spatter and resist front-end damage when piercing thicker plate. These shields are thicker and heavier and are designed to last longer under the most challenging conditions. The XR Series nozzles are used with ESAB's M3 Plasma system for cutting and marking on mild steel plate up to 75mm thick, depending on the amperage.

The XR Series nozzles are designed to be used exclusively with ESAB's TL oxygen electrode. This electrode delivers more consistent cutting angles by reducing turbulence in the plasma stream. Electrode cooling efficiency has also been optimised, so one new oxygen plasma electrode is used throughout the entire range of XR nozzles, as well as many other oxygen plasma setups.

For more than 75 years, ESAB Cutting Systems has been offering turnkey solutions to customers around the world. ESAB offers cutting solutions with mechanised plasma, CNC systems, software, and gantry cutting tables in a variety of sizes. Unlike other cutting systems manufacturers who assemble components from a variety of vendors, ESAB works with customers to design the ideal system.

ESAB – USA
Website: www.esab-cutting.net

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13.113 Visual Comunicazione - Venezia

Multi-functional tooling system

GUEHRING offers over-turning, internal and external chamfering of tubes and bars in a single operation.

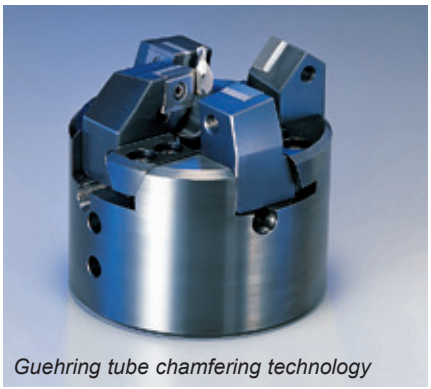
The flexibility of its modular tooling solution maintains the transformation of the standard tool GE 100 into a “special tool” for the most varying of machining tasks and this ex-stock.

The standardised modular system succeeds through its adaptability to different diameters, materials and demands on precision. Thanks to its flexibility, machining diameters from 5 to 240mm are possible with GE 100. The tool head can be universally applied: it allows adaption to all known machine holders, including all quick-change systems. By exchanging the holder or clamping sleeve it is possible to machine different workpieces with one basic holder, ie tool head. The bore in the tool head serves as clamping sleeve holder for centre drills, step drills, form drills or boring bars. The adjustment of the radially and axially moveable holders is simply carried out via a threaded pin.

The standard DIN/ISO insert programme for the holders is specifically adapted to the GE 100 user requirements. The indexable inserts are high-precision ground, enabling optimal component accuracy, repeat accuracy, low cutting forces and therefore high process reliability.

Ground chip breaking grooves produce short chips that are absolutely essential for accurate machining with multiple inserts. The insert programme includes various carbide qualities as well as diverse coatings enabling optimal tool life, cutting rates and low unit costs.

Various machining tasks such as facing, external and internal chamfering, spot facing and centring or over-turning can be combined. Alongside the application on end machining systems GE 100 also achieves efficient machining strategies on machining centres or rotary indexing machines.



Guehring tube chamfering technology

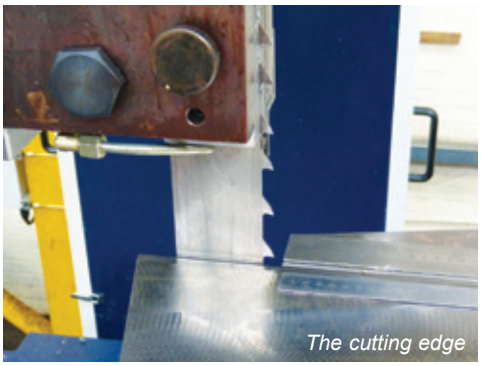
Guehring – Germany
Website: www.guehring.de

Vertical bandsaw for valve manufacturer

BEL Valves, based in Newcastle, UK, is a designer and manufacturer of critical oil and gas valves for both surface and subsea applications, serving evolving markets that demand the highest quality and reliability. The company has around 50,000 valves installed worldwide, some of which operate in the most inhospitable environments on the planet, often in ultra-deep waters of up to 10,000ft, under high pressures and extremes of temperature.

With valve sizes ranging up to 48" in diameter and tolerances typically less than one micron, precision machining is of the utmost importance. When BEL Valves needed to upgrade the cutting operation during the production of 24" diameter split gate 4A topside through-conduit valves, it turned to Prosaw to provide the solution.

Although the existing process utilised a vertical bandsaw, it was very wasteful of material, typically deviating from its true path by up to ½" on either side of the blade, requiring a considerable amount of post-cutting additional machining in order to form a true surface.



The cutting edge

A Danobat bandsaw with the workpiece in place

Prosaw specified a Danobat VL vertical bandsaw, which has reduced the cutting time for the product from 18 hours to just six hours. The more accurate cutting path has reduced waste material, and the company reports that this amounts to cost savings in the region of £1,500 for each valve.

Further cost savings have been achieved by the use of a new type of carbide saw blade that has a life of more than 50 times that of the previous machine.

Danobat – Spain
Website: www.danobatgroup.com

Prosaw – UK
Fax: +44 1536 410080
Email: sales@prosaw.co.uk
Website: www.prosaw.co.uk

BEL Valves – UK
Fax: +44 191 276 3244
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Tru-Cut Saw nanocomposite coated saw blades

TRU-CUT Saw has developed a new nanocomposite PVD coating that dramatically increases blade life in circular ferrous and non-ferrous sawing applications.

The new coating, called ViTA-Nano, was developed by Tru-Cut's ICO surface coatings division. The coating is a proprietary combination of titanium, aluminium, aluminium-titanium, chrome and silicon. Unlike multi-layer coatings in which each material is deposited consecutively, with ViTA-Nano, all cathodes in the PVD chamber are turned on at once – resulting in a more cohesive, harder coating. Saw blades coated with this material will run a minimum of 30 to 50 per cent faster with less scrap and increased production rates compared to AlTiN coatings.

TRU-CUT nanocomposite PVD coating

Richard Otter, VP sales for Tru-Cut Saw and ICO surface coatings, said: "ViTA-Nano blades are ideal for flying saw machines, re-cut machines and high production sawing machines. Users will see immediate cost benefits in longer blade life when sawing with the ViTA-Nano coating."

ViTA-Nano blades are claimed to be much better than AlTiN for sawing hardened steels, cast iron, aluminium and super alloys. The blades withstand 33 per cent greater temperatures and last longer because blade edges are protected from steel build-up (which reduces tool life) for a longer period of time. Tru-Cut recommends dry cutting with ViTA-Nano blades to further reduce coolant costs.

Tru-Cut Saw manufactures saw blades for all types of cutting applications from simple hand cut-off machines to high production flying cut-off machines. Blades are designed for all sawing applications in ferrous and non-ferrous materials.

Sizes range from 200mm to over 3m. Tru-Cut is the only US saw manufacturer with its own in-house PVD coating chambers.

The company also sells the Tru-Cut 16" (400mm) dry cut metal saw designed for cutting tubular, solid, angled and other shapes.

Tru-Cut Saw's ICO surface coatings division offers PVD coating and re-coating services for all types of new and used saw blades, tools and wear parts. Equipped with two state-of-the-art coating chambers and carousels, Tru-Cut and ICO offers both standard and special surface treatments.

Standard coatings are: CrN, TiN, TiCN, AlTiN-ML, AlTiN-XL, AlTiCrN and TiAlCN Phoenix™. Special and tool-specific coatings can be individually tailored to specific customer requirements. Coating chambers can handle part sizes up to 1,250mm OD x 700mm.

Tru-Cut Saw Inc – USA
Websites: www.trucutsaw.com
www.icosurfacecoatings.com

Shearing, cutting and sawing

HAVEN Manufacturing will be showing at Tube Düsseldorf a variety of products designed for shearing, cutting, sawing, chamfering, trimming, parting, and de-burring tube and bar finished parts, as well as systems designed to aid manufacturers in handling, inspecting and processing those parts.

Although the company's product line is too broad to demonstrate all of its material handling and processing expertise in a single trade show, the company hopes to give potential customers an indication of its expertise.

Dave Erickson, president of Haven, said: "We remain committed to our traditional markets, but our partnership with Soco Machinery, coupled with our expertise in designing and manufacturing systems for material handling, appeals to manufacturers beyond our traditional market segments.

"Haven's ability to adapt to a variety of industries and applications combined with our company's capability to design and build special one-of-a-kind machines, gives Haven the ability to help manufacturers that might not be familiar with our products."

Haven Manufacturing Corp – USA
Email: info@havencut.com
Website: www.havencut.com


Machinery from Haven

High-speed steel and plastic pipe cutting machines

EXACT Tools has developed a new method to cut pipes, and has launched a new range of steel and plastic pipe cutting systems and cutting accessories.

The award-winning PipeCut range of pipe cutting systems provide a fast, easy, safe and precise way to cut and bevel pipes and tubes on site, producing a straight, ready-to-install finished surface in a multitude of diameters and materials, and eliminating many of the problems associated with pipe cutting.

Exact PipeCut 280E system in operation

Available models range from the PipeCut 170 and 170E systems for cutting 15 to 170mm diameter steel and plastic pipe, to the PipeCut P400 for cutting and bevelling, in one process, plastic pipe from 100 to 400mm in diameter with a wall thickness up to 25mm.

Each model can be supplied with a choice of three different blades: TCT (tungsten carbide tip) blades for general use in cutting steels, copper, aluminium, plastic and multi-layer materials; cermet with ceramic tips for heavy-duty applications such as cutting stainless steel and acid proof steel; and diamond discs for cutting cast iron pipes.

Exact pipe cutting systems are suitable for cutting a wide range of tubes and pipes, including spiral duct tube ranging from 75 to 1,000mm in diameter, with wall thicknesses ranging from 1.5 to 6mm.

The systems are aimed at professional industrial pipe installers employed in power generation, refinery and chemical plant, hospital and other construction sites, house building and renovation, shipbuilding, wood pulp, fresh and waste water systems, heating and cooling systems, gas installations, maintenance and repair work. They are easy to use on steel, cast iron, stainless steel, aluminium, copper and most types of plastic.

The cutter firmly grips the pipe to be cut, with the blade being automatically positioned to cut correctly; the entire weight of the cutter rests on the pipe. When started, the blade chips the pipe surface rather than grinding it, producing a burr-free cut surface that is ready for installation. The operation is dust-free, and does not produce any sparks.

Each system is supplied with its own pipe holders (except the V1000 model, for which they are an optional extra), pipe saw, Allen keys, CD user manual and carry case.

Other features include the ability to cut pipe at floor level, increased productivity through fast cutting speeds, and improved working environment and user safety, including fire safety. Pipes can be cut wherever electric power is available: workbenches and large manipulators are not required.

Exact Tools Oy – Finland
Fax: +358 9 43667550
Email: exact@exacttools.com
Website: www.exacttools.com

Dimple-free tube cut-off systems

IN the past, “dimple-free” tube cut-off systems were made for typical higher speed tube lines, and because they had to produce at these high speeds, they came with a high price tag.

The tubing industry needed a cost-effective alternative for a dimple-free cut-off system on slower, lower production tube mills. This is the niche that the Hill Engineering “Duo-Cut” system was engineered for.

By combining Hill Engineering’s Flying Duo-Cut integrated die/press units with its high-speed hydraulics expertise, it is able to produce clean, dimple-free cuts on tubing up to 3" diameter. In order to obtain optimum speeds at reasonable prices for different sized tubing mills, the company offers three sizes of systems – ¾" maximum diameter, 1½" maximum diameter and 3" maximum diameter for up to 0.125" thick steel. Because of the compact nature of the units, they are more economically priced with faster ROI on slower lines for lower production requirements.

The basic mechanical unit is also designed to be quick-change when going from one tube diameter or thickness to another. This again lends itself to lower production requirements where quick change is more important, due to shorter runs from one order to the next.

Because of the nature of this system design, the company also offers a small diameter pneumatic Duo-Cut system which is the essentially the same as the ¾" diameter system, except operates with air cylinders instead of hydraulic cylinders.

These systems are used for such applications as brake line tube mills with approximately 0.156" dia – 0.312" dia tubing being produced. This allows an increase in the speed of these systems to match small diameter tube lines and at the same time reduce the costs even further.

For both hydraulic and pneumatic systems, the measuring is done by a “closed loop” servo accelerated system, for the most consistent and best accuracy results.

Hill Engineering/Formtek Inc – USA
Website: www.formtekgroup.com

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Messe Düsseldorf

Strand extensioner slitting line

HERR-Voss Stamco is manufacturing a new Strand Extensioner® slitting line for Cascadia Metals Ltd.

The backbone of the new slitting line will be the Herr-Voss Stamco Strand Extensioner, which provides evenly rewound coils, with levelling and burr reduction to the slit material, allowing the user to create higher quality slit mults.

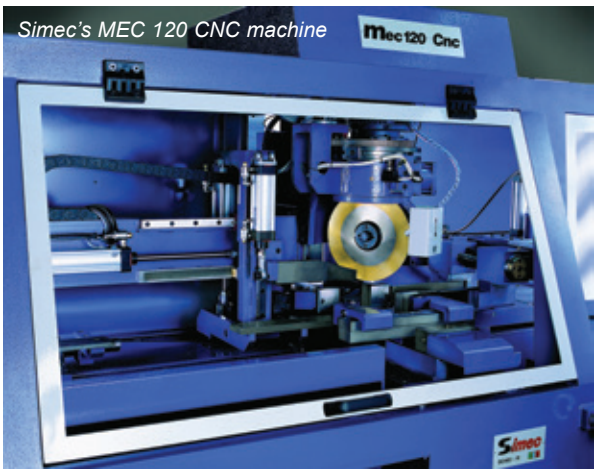
The line will process material with a thickness range of 0.012" to 0.25" with an incoming coil capacity of 50,000lb x 72" wide. The slitting line also includes Herr-Voss Stamco's quick-change injector slitter head system, which allows operators to efficiently change slitter heads out of the line. This line will be installed in Cascadia's facility in Brandon, Manitoba, Canada.

Herr-Voss Stamco supplies coil processing solutions, including tension levelling, slitting, cut-to-length, multi-blanking, precision roller levelling, and enhanced levelling technology (ELT™).

Herr-Voss Stamco – USA
Fax: +1 724 538 3056
Email: sales@herr-voss.com
Website: www.herr-voss.com

Fully automatic CNC cutting

SIMEC's fully automatic MEC 120 CNC machine is designed to use circular saw blades of the DMO5 type and their derivatives.



Simec's MEC 120 CNC machine

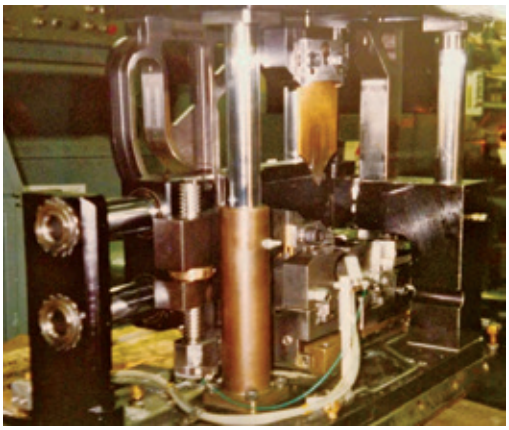
The machine can cut to any pre-programmed angle of ±60° and has the ability to cut intersecting angles on the end of a wide selection of material types. With the choice of three loaders, the machine is suited to load and feed both symmetrical and asymmetrical profiles.

The CNC control uses a sophisticated program that is able to process all of the data and then select and optimise this to give the greatest efficiency with the minimum of waste. Particular attention has been paid to reducing the scrap end of the material, which can be as little as 20mm.

The material in-feeding is servo-controlled, as is the head rotation. The tolerances of the cut pieces are maintained to a high accuracy, making it suitable for robotic welding systems. The saw can be linked to a de-burring machine or multi-discharge feature; the standard version has three-position discharge.

Simec Srl – Italy
Fax: +39 0445 575910
Email: simec@simecsrl.it
Website: www.simecsrl.it

Reduce down time while cutting on your tube mill



RANDOLPH Tool vertical and horizontal tube cut-off blades as well as jaws/dies are manufactured with the best tooling processes by craftsmen with a good eye for perfection and a reputation for exceeding expectations to guarantee that the blades are extremely flat and smooth.

The blades, being flatter and smoother, cause less friction during the cutting process, which in turn makes the tooling last longer. The longer tooling lasts, the less down time there is on the mill, which means more production time is possible. The blades lasting longer will also mean that customers spend less on total tooling budget at the end of the fiscal year.

Buyers have the option of helping blades last even longer by adding coatings. Randolph offers many different coatings to suit different cutting materials.

Randolph Tool Co – USA
Email: info@randolphtool.com
Website: www.randolphtool.com

Cutting and welding products

BOEING has selected ESAB welding and cutting products as a partner in the manufacturing of fuel tank structures for NASA's new heavy-lift rocket, the Space Launch System (SLS).

The SLS will be the largest American rocket ever built and will measure 200ft taller than the entire space shuttle rocket assembly. The SLS will measure 384ft in total length, with a weight of 6.5 million pounds. The construction of an assembly of this magnitude requires entirely new ways to fabricate, assemble and weld the main fuel tank structures.

Engineers and experts from ESAB have worked with Boeing and NASA for more than a year to develop the new Vertical Assembly Center (VAC), which is a giant orbital welding system that is capable of supporting the huge rocket fuel tank while circumferentially welding its sections together with the friction stir process. ESAB's construction of the VAC will be the largest welding machine of its type in history, and is the most precise part of the assembly.

The VAC is being designed, engineered and built at the ESAB facility in Laxa, Sweden, and is supported by ESAB's North American automation division. The vertical tower assembly is being built in the USA using US steel and component materials.

ESAB's level of friction stir technology expertise and strong operational and project management procedures were key factors in this selection.

Boeing worked with ESAB to employ friction stir welding technology on the Delta II and Delta IV rocket programmes in the late 1990s and early 2000s. Friction stir welding uses a spinning tool with a great deal of pressure and torque to mix metals together without melting them. This allows users to fuse together hi-tech alloys that are difficult or impossible to join with conventional welding techniques.

Friction stir welding has the potential to change the way many common structures are built, from passenger trains and airplanes to trucks, cars and electronics. The low heat input and high strength of automated friction stir welds provide opportunities for manufacturers to redesign their structures for lighter weight, lower cost and higher performance.

The SLS project is widely viewed as America's next-generation space programme, with the goal of producing a rocket to transport people beyond Earth's orbit. Slated for launch in 2017, this expandable rocket has tremendous capabilities for transporting payload during deep space explorations.

"We are honoured to be part of this historical project with the Boeing Space Launch System (SLS) team and NASA," said Ken Konopa, vice-president of marketing for ESAB. "ESAB is known as a developer of advanced welding technologies, and we are prepared to deliver those results as part of this next-generation space programme."

ESAB – USA
Website: www.esabna.com

Heavy wall thickness tube mill and cutting

DANIELI W+K has delivered a new mill for the production of high tensile strength material precision tubes with ranges from 2½" to 7" and a maximum wall thickness of ½" to a customer in India.

The challenge for Danieli W+K was designing a customised special tube mill for company Tube Products of India, located in Chennai, since this line will mainly produce precision tubes for hydraulic cylinders used for earth moving and construction machinery and hollow sections for steel construction.

The complete line consists of fully automatic strip preparation, a forming, welding and sizing section and a newly developed flying saw – the multi-cut. The finishing line also provided by Danieli W+K consists of a run-out section, sample tube-cutting device and an integrated flush-out station to flush out the inside scarf. A chopper to cut the inside scarf and a blow-out station is incorporated into the flushing station. The system is also equipped with an automatic bundle station and a magnetic portal packaging device for bundling hexagonal and rectangular bundles for round tubes and hollow sections. Production is scheduled to commence in March 2014.

Danieli W+K – Italy
Website: www.danieli.com

这一栏目专为我们的中文读者介绍国际管道行业的最新技术和行业新闻的综合信息。

e2v提供世界领先的栅极管

60多年来，e2v公司一直为客户提供性能卓越、使用寿命长的栅极管。该公司是世界上最大的高质量、获奖产品制造商，产品包括一系列用来满足要求严格的工业市场如管道焊接的栅极功率管。

EEV品牌的振荡管以其高质量建造标准和可靠性得到认可，被业内几乎所有的原始设备制造商们选作初始设备。输出功率从25千瓦到530千瓦，我们生产的许多EEV三极管和四极管直接等价于其他制造商的装置，或者可以在我们的指导下以相对低的成本取代他们。

e2v最近大量投资先进的制造技术和设备。所有设备都经受大量高压调节以及全功能射频/直流测试程序。

公司致力于与客户合作，为他们提供他们正想要的东西。我们还提供高水平的技术支持，以及有现成的专家帮助你们选择和使用你们的产品。

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从拥有有技术、有学识员工的稳定制造商那里购买产品，你能得到内心的平静。我们的产品有无与伦比的服务支持，为你提供高水平技术支持，而且所有管道都有两年质保。

e2v – 英国
网址: www.e2v.com/tubes

切割、精整和搬运设备在沙特阿拉伯完成安装

ADDA Fer Meccanica最近为沙特阿拉伯著名的管道生产商安装了一套重要的设备，用于管道切割、精整以及搬运。

该项目是去年年底进行的，将用来完善工厂已有功能，AddaFer帮助设计、构造和安装了用于切割219毫米（8″）管道的双刀飞切锯、一台铣头机、液压试验机以及搬运设备。

多年累积的技术以及20年的经验使得AddaFer的技术员能够按照客户的精确规格设计解决方案。

通过这些安装启用，亚洲制造商将增加生产率，同时提高管道质量。

为实现绝对清洁且无变形和毛刺的几乎完美的在线切割，这台铣切机进行了深度优化。该装置的所有功能都有微处理器管理，这样就可以控制机器实现高度可靠性，确保非常精确的切割长度，在切割性能参数得以优化的基础之上，不影响有效生产速度。

在最大操作速度下确保杆长公差达到±1.5毫米，而且还能实现明显更高的精度。这些切割是全自动的：一旦编好程，无需操作员一直在控制台就能操作；这些装置装运前就已在工厂完成预测试。

带切屑输送机的铣切机

基座：由标准焊接板材重型结构组成，其中，线性滑动导向架安装在上刀口，用来支撑切割小车，有一个侧面齿条暂时收纳处，可以移动同一个小车。

减震器和小车闭塞系统安装在基座终端，紧急情况下避免损害齿条和齿轮系统。

小车：由规范化焊接钢结构组成，上面所有工作台一直用来支撑以及暂时收纳切割头滑动装置，按尺寸做的夹紧钳和控制组用于跟踪。

切割头有两个，从管子中心沿纵向和横向轴按相反的方式运行。他们由减速齿轮组成，齿轮间隙为“0”，用来使安装锯片的芯轴旋转。

钳紧装置紧靠锯片的两个大尺寸门架里，给系统提供最大坚固性。他们由1个液压缸提供动力。跟踪组由齿条和齿轮控制以及垂直轴制造。

机动化：该单元配备了由最新一代数字逆变器控制的7台无刷电机。

运行：在上面的方案中，显示刀片的运动；专用软件（圆形——方形——矩形）满足管道外形得到遵循；这样，切割时间的减少以及相同管道的超高等级的表面精加工得以证明；在进口和出口端的双钳组在切割时安排管道封闭，避免危险的振动。

Adda Fer Meccanica Srl – 意大利
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管道设备改造、改装动力以及升级

全球二手管道和滚压成形机器供应商UNIVERSAL Tube & Rollform公司认识到在当今不确定的经济环境中，各公司正在尽可能地节省开支、提高产量以及充分利用现有的设备。但继续使用不再符合现今对效率、安全以及质量控制高标准的机器会造成不必要的风险。

针对这种情况，Universal Tube & Rollform公司可在美国俄亥俄州对你现有的机器按最严格的规范进行改造、改装动力以及升级更新。

与Universal Controls Group （UCG）合作，我们还能更进一步，为您带来你所需要的选项，如新的控制装置、驱动系统、模具加速器、长度控制以及其他配件来翻新你现有的机械。

Universal的改造、改装动力以及升级方案可带来很多好处，包括：显著的成本节约；准确和可靠的生产；提高了安全；改造文件记录；操作方便；提供安装服务和培训服务。

Universal还提供最大的选场之一，拥有比世界上任何地方都多的二手轧管机和滚压成形机。我们很多库存线已完成升级，并准备投入生产。我们供应轧管机、滚压成形机、高频焊机、矫直机、切割机以及其他。客户可以直接从我们这采购机器，因为，当很多公司在裁员时我们一次可以提供这么多自产选项，很多客户考虑到我们提供的优势。

总的来说，我们的任务是使每一位到来的客户满意，因此请联系并访问我们。请你们亲自来看看为什么我们不是你们普通的二手机器销售商。我们欢迎有兴趣的发送邮箱地址给我们，接收每周的库存更新以及特价商品。

Universal Tube & Rollform – 美国
网址: www.utubeonline.com

配件制造

意大利RITMO SpA公司有着30多年的热塑塑料管道焊接设备和工具制造商。公司提供一整套车间配件制造机器，如弯头、Y形管件、四通、三通，以及生产Ø 40到1600毫米高密度聚乙烯-聚丙烯管件的Alfa Line生产线。

Alfa 1000是一台数控车间焊接机，用来制造Ø 400到1,000毫米弯头、Y形管件、三通以及Ø 400到800毫米的四通。弯头夹具移动、开/关和封闭都是电动液压操作的。

Alfa 1000是一台易于使用的精密机器。它配备了带两个液压控制小车的机体；一个带数控系统的控制面板，可以简单、直观以及可重复的完成整个焊接循环，将操作员的介入降到最低。

Ritmo的Alfa 1000

内置存储器使机器可储存4000个焊接循环，包括设置直径和SDR。焊接数据可以通过USB插口和数据管理软件传输到电脑上。其他功能还包括一个在球面轴承导向架上液压运动（进/出）的聚四氟乙烯涂层加热板；一个通过电力发动机操作、有8个钢刀片、在球面轴承导向架上液压运动（进/出）的铣刀；以及焊接超厚管道和/或需要使用高压时安装在夹爪上的一个上气缸。

Ritmo SpA – 意大利
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电子邮件: info@ritmo.it
网址: www.ritmo.it

快速切换的轧管机

T&H Lemont为目前在使用其他T&H Lemont轧管机的客户运送和试运行了一台WU35M-11快速切割高频轧管机。

该轧机用于成形和焊接外径6″x 0.312″壁厚的标准碳钢和合金钢管道、以及外径6.5″ OD x 0.125″壁厚的碳钢和合金钢管道，材料屈服强度达到150,000磅/平方英寸。对于这种快速轧机，设计了第二组底板用于运行更厚壁管道。轧机设计的灵活性使客户能服务更多的市场，从标准管道到高屈服强度管材。

T&H Lemont设计和建造的轧机有两大特性，一个是减少切换时间，一个是提高生产率。第一个特性是用第三机架快速切换系统设计和制造轧机实现的。该系统组对和连接轧机线通用驱动轴与轧机机架驱动轴，同时在切换管道尺寸时快速释放。每个第三机架安装在内侧轧辊机架后面的轧机基座上，由基座支撑着。快速切换第三机架配有万能驱动螺杆，由内部有圆锥滚子轴承的滑动块支撑着。每个套管由弹簧支撑的传动销组装，并与轧机侧面万向接头螺栓式法兰连接。有传动销插口安装在每个上辊和下辊机架轧辊轴内部双头螺栓上。

在轧机运行模式，每个轧机段底板由快速更换机械和液压缸系统稳稳锁住并固定在位置上。液压压力根据后面的调整块维持底板位置，并由四个锁紧棒和杆子锁住。在切换时，液压缸推动底板向前，与限位装置保持几英寸距离，使第三机架紧固套松开。一旦紧固套脱离，桥式吊车会绑到底板上并垂直吊起底板，将其从轧机上移除。

新的底板被定位并放置在轧机基座锁紧杆上。然后对用液压缸对着轧机基座限位装置推回底板，并锁在运行位置。同时，底板被拉回，紧固套弹簧支撑制动销压低。一旦底板被液压固定，轧机驱动慢下来，所有弹簧制动销与内部传动销插口对准，扣响到位。在最后的装配检查后，轧机准备运行。

汽缸和限位装置将被用来定位第三机架上、下辊轴位置，与内侧机架相配。这样，底板装配可以离线进行。

为该轧机设计的第二个特性是自动设置系统，用于轧辊精确的自动调整。该系统用于将装配时间降到最短。利用编码器和驱动技术，新装配轧辊调整所需时间减短，而且在操作员站就可完成，不需要使用手工具。

利用交流向量驱动器、一个可编程控制器、绝对位置编码器以及彩色触摸屏界面，能够对轧机编程使轧辊自动回到预定位置。

除了完整的生产系统，T&H Lemont还为管道和滚压成形行业提供各种组件和服务。服务包括管道轧辊设计、轧机对准和操作咨询。提供的组件包括切断机、输入设备、储材器、接缝方位机架、焊接箱、边缘处理机、焊珠清理系统、矫直系统、单点调整系统、去皱机、轧辊、刀片、夹爪以及轴。

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五十年的经验

STAROFIT是欧洲钢、合金钢和不锈钢对焊配件主要供应商。

国际化一直都是Starofit的焦点之一。公司一直积极加强国际地位以及客户群。为了更好的支撑日益增长的量以及满足不断提高的国际要求，Starofit重组了出口部门，组建了新的管件专家团队专门为国际客户服务。有了这个提供更多灵活性的团队，公司能够快速向国外客户交货。

Starofit长期拥有6,500吨配件库存

Starofit最近第二次参加了在圣保罗国际管道技术展览会，而且正在忙着准备即将到来的2013马斯特里赫特不锈钢世界研讨会暨博览会以及2014年的杜塞尔多夫管材展。

公司现在有库存 ½″ 到 8″ 的WP 304 h材质无缝弯头和配件，也提高了满足双相不锈钢需求的能力。库存的1.4462材质的配件和弯头是VdTÜV 418的3.2 TÜV认证产品。

Starofit有6500吨的永久配件库存，能对客户需求做出及时响应。库存范围包括ASME和EN/DIN的标准产品到极端壁厚和尺寸的高度专用弯头和配件。有严格的供应商选择流程，只接受获得ISO、PED以及TÜV批准的制造商的产品。公司还根据需要生产复杂需求的定制弯头和配件，以及提供耐极端环境（如温度、压力和介质）的产品。

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感应加热应用扩展

Ajax Tocco Magnethermic的新进展扩大了感应加热设备的能力，设备的外形尺寸减小，冷却要求降低。

能抵抗较高温度和电流的半导体、快速响应的数字信号处理器(DSP)、功率切换和控制技术使得工艺工程师开发了先前认为不可行的的焊接工艺。便携式感应加热电源系统几乎很少或不需要水冷却。Ajax Tocco的1.5 千瓦到35 千瓦的系统运行及100千瓦、500千瓦和MW额定系统。

涂层管道制造商可以以小到1.5千瓦的功率安装熔结环氧防腐层小块修补磨损和气孔。使用100%气冷的Autotron不到1分钟就可以将小到1平方英寸的区域加热到400°F。摩擦搅拌焊（FSW）：紧凑型低功率感应加热提高钢工具寿命和进给速度。感应适用于关键工艺应用经济的钢材连接。

10千瓦TOCCOtron AC横贯在摩擦搅拌焊绕包机前。沿接缝线的钢材预热到约2000°F。摩擦搅拌焊绕包机将软钢绕到一起，实现100%母材焊缝。

埋弧焊（SAW）：和搅拌摩擦焊一样，感应加热配合焊接设备使用。5千瓦功率就可以预热管道和容器。焊接½″钢板，速度可达到24″每分钟。

焊后处理：电阻焊退火，感应焊缝和连续线圈钢管偏压焊缝常常需要超过500千瓦的功率。

而35kw TOCCOtron AC气冷感应系统利用较小的空间可靠的用于恶劣的金属加工环境。

感应加热增加了玻璃纤维增强聚酯的固化速度。

钢芯棒用作复合钢管外径上感应加热线圈接收器。电磁场对复合材料来说是看不见的，同时芯棒加热到约300°F。这样可以产生一个坚固、轻质的滑腔管道。

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表面裂纹检测

Karl Deutsch多功能紫外线LED大面积照射灯最适合静止物体检测。它包括通过紫外光对渗透检测和磁粉检测荧光测试媒介进行可视化，以及使用白光对非荧光媒既红白渗透进行可视化。按动按钮就可以从紫外线换到白光。

LED的20紫外线高功率提供非常高的耐力。UV-A-辐射仅限于365nm的波长，因而排除UV-B-和UV-C-辐射带来的伤害，即使是缺陷的保护眼镜。因使用LED技术，因此不需要紫外线过滤眼镜。操作热量通过铝制外壳上的阳极氧化黑色冷却体散掉。因未使用排风扇，因而未产生环境噪声。灯内有过热保护。

根据所需的光的强度和照明模式，可以将几盏灯串联起来，通过任何一盏开关。相关的电源装置可为两盏灯提供电源。也可以选择为六盏灯供电的电源装置。

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伺服定位停站系统

Manchester Tool & Die Inc公司的新型伺服定位停站系统旨在帮助设置人员快速调整管道通过机器的HMI(人机界面)。该系统将提供一致的调整，从而加快启动时间。该伺服定位系统适用于配备人机界面的新型M71机器。

Manchester Tool & Die提供用于各种应用的管端成形设备和工具，加工范围为3/16″到3″外径。可制造特殊用途的机器和部件。Manchester Tool & Die还提供钢材制作和生产加工服务。

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动态切割

BEHRINGER将在2013汉诺威机床展上第一次向热切的公众展示新的HBE动态系列。它被誉为是满足更高效、更经济和更精确锯切机不断增长的市场需求的解决方案。“性能增强、能耗降低、占地面积更小、职业安全提高，以及操作简单性只是开发团队对新机器努力实现的一部分，”首席执行官Christian Behringer表示。新的HBE动态系列有四种型号261、321、411和511以及相应的切割范围，将覆盖钢材贸易、机械工程、工具制造以及高端金属加工车间各种应用范围。

有了400多次锯切200毫米直径42CrMo4材质的突出刀具寿命，比如，新的HBE261A动态机能完成超过标准的切割，而且可以很容易的满足这一范围最严格的要求。在这些成就中起到重要作用的是经过考验的Behringer的一些特性，如进一步改进切割压力控制，持续帮助工具过载。由阻尼振动灰口铸铁做成的稳定的锯机框架以及传动皮带轮的双面轴承使噪声最小化并优化了切割精度。测试表面刀具寿命增加30%，切割表面质量明显提高。传动皮带轮的倾斜位置也有助于保护带锯锯片，从而减少弯曲应力。

生产时使用最少的资源以及高效、可持续的能源利用是反复提到的主题，在新产品也持续保持。能源价格的上升意味着许多公司不得不重新考虑他们现有的工艺并开发创新型技术解决方案，以较低的能源输入实现较高的产出。“我们正用新的HBE动态系列证明能效和高性能液压不再是自相矛盾的，”Christian Behringer解释道。使用来自知名制造商的一流的频率控制驱动系统以及面向应用的齿轮速度，简单的千瓦电机输出规格不再是高切割量的保证。在HBE 261A动态系列中，比如，2.6千瓦的驱动就可以实现高产出以及低能源要求——从而实现高效生产。

新的全封闭式机壳不仅确保符合最新的CE准则，还满足了客户对方便、职业安全与环境保护方面日益增长的需求。这些好处不言自明：保持干净的工作环境、噪音最小化以及大的观察窗提供了良好的机器观察视线。易于维护的理念使锯片更换简单，维护以及清洁通道方便。

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Siempelkamp用环形轧机扩大了产品范围

由Siempelkamp设计和制造的第一台环形轧机在克雷菲尔德工厂第一次启动时通过了重要的测试。7月，Siempelkamp使用轧机生产了第一个钢环，不久将被运往俄罗斯Metallurgical Plant Electrostal。

该环形轧机最大径向和轴向压制力分别为6,300千牛，能精确轧制外径2500毫米、高度600毫米的环形材。

Siempelkamp不仅在克雷菲尔德工厂完整制造环轧机，还在这里完成了组装和启动以及对热轧工艺进行大量测试。在克雷菲尔德的启动不仅证明设备能满足而且在某些方面还超越了客户的规格需求。环形轧机预计今年年底将在俄罗斯完成安装，2014年开始运行。

第一台这种类型的Siempelkamp设备制造了钢环以及其他材质的环形材料，如镍基、钛和铝合金。这些由机器坚固的轻量级特殊材料制造的矩形或异形截面环形材主要用于航空航天工业机械和热压部件。该环形轧机再次证明了Siempelkamp作为系统供应商和完整解决方案提供者在设计和建造金属成形各个阶段用压力机的能力。

这台环形轧机是Siempelkamp提供给俄罗斯客户JSC Metallurgical Plant Electrostal的第二台设备：公司还使用了一台Siempelkamp生产的20000吨闭式挤锻机，除了其他产品外，这还可以为环形轧机提供原料。JSC Metallurgical Plant Electrostal用自己的设备完成整个高合金钢环的生产，从而为生产增加了价值。

利用各种设计细节，Siempelkamp实现了极高的环轧精度。比如，轧制过程中通过激光测量系统对环材直径进行精确测量。还有Siempelkamp专门为环轧开发的SicoRoll控制装置确保了高的加工精度。SicoRoll程序包用来支持客户过程计划。利用考虑到机器界限值的预先模拟确定所有相关的轧制参数。改程序利用数据库存储工具和材料数据。此外，它包含常见轧制曲线图和策略作为过程计划基础。该系统可以根据客户要求扩展。

计算的轧制参数传输到机器控制单元，确保最佳轧制过程以及保持轧制参数与过程同步。轧制过程可以完全记录下来并存档。和轧机一起的供应范围包括整套液压系统，、轧辊自动化以及SicoRoll控制单元——为闭式挤锻机提供坯料尺寸的核心。利用得到其它Siempelkamp机床验证的设计原理使该设备实现了长的操作寿命。大量的有限元计算保证了机械结构组件的高疲劳强度。经受高机械应力的锥形辊外壳设计成完整无焊缝的铸件的事实进一步证明了这点。同样，所有轴承的设计都考虑了长的操作寿命。设计过程中，Siempelkamp设计工程师非常重视使用许多标准组件，尤其是高应力组成部件，如齿轮。这对客户来说转化成了成本节约，因为维修和备件易于获得。

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由另一个Siempelkamp压力机生产的坯料制成的环

Cost reduction in heat treatment by using protective coatings

By SP Shenoy, M Tech (Met Engg), CEO, Steel Plant Specialities, India

This article introduces a practical technique pioneered by a metallurgist from the Indian Institute of Technology. It enables the prevention of oxidation and decarburisation during heat treatment using open air atmosphere. It has simplified and accelerated many metallurgical heat treatment operations, saving a fortune in capital investment, reducing costs and improving quality.

Introduction

Heat treatment is an important operation in the manufacturing process of engineering components, machine parts and tools. Oxidation and decarburisation of steel take place when steel is heated in an electric furnace or oil fired furnace, in the presence of air or products of combustion.

Oxidation leads to numerous problems like scale pit marks, loss of dimensions, bad quality surface finish of metal, rejections, quench cracking and increased expensive operations like shot blasting, machining and acid pickling.

Protection against scaling and decarburisation is achieved by heating in molten salts, fluidised bed furnaces, protective gaseous media or vacuum. These measures demand heavy capital investment, highly skilled personnel and special safety precautions. Many companies cannot afford them, and yet they are under mounting pressure to prevent oxidation and decarburisation.

This article introduces a practical technique pioneered by an experienced metallurgist from the Indian Institute of Technology (IIT). The technique enables any kind of steel to be heated without basic problems of oxidation and decarburisation. The discussed technique, established in a number of hot forging units, heat treatment shops and hot rolling mills, can be adopted by both small and large scale units.

Understanding oxidation and decarburisation

When steel is heated in an open furnace in the presence of air or products of combustion, two surface phenomena take place: 1, oxidation and 2, decarburisation.

Oxidation

Oxidation of steel is caused by oxygen, carbon dioxide and/or water vapour. The general reactions are given below:

$$O_2 + 2\,Fe \rightleftharpoons 2\,FeO$$

$$O_2 + 4\,FeO \rightleftharpoons 2\,Fe_2O_3$$

$$CO_2 + Fe \rightleftharpoons CO + FeO$$

$$CO_2 + 3\,FeO \rightleftharpoons Fe_3O_4 + CO$$

Oxidation of steel may range from a tight, adherent straw-coloured film that forms at a temperature of about 180°C to a loose, blue-black oxide scale that forms at temperatures above about 450°C with resultant loss of metal.

Decarburisation

Decarburisation or depletion of surface carbon content takes place when steel is heated to temperatures above 650°C. It progresses as a function of time, temperature and furnace atmosphere.

Typical reactions involved are :

$$O_2 + C \rightleftharpoons CO_2$$

$$O_2 + Fe_3C \rightleftharpoons 3\,Fe + CO_2$$

$$CO_2 + C \rightleftharpoons 2\,CO$$

$$CO_2 + Fe_3C \rightleftharpoons 2\,CO + 3\,Fe$$

$$H_2O + Fe_3C \rightleftharpoons CO + H_2 + 3\,Fe$$

The equilibrium relationship depends on the ratio of carbon dioxide to carbon monoxide. It is neutral to a given carbon content at a given temperature.

Harmful effects of oxidation and decarburisation

Oxidation leads to loss of dimensions and material as extra material allowance needs to be kept for scaling. Often,

surface quality is deteriorated due to pitting. Metallurgical transformation during austenitising and subsequent quenching may be non-uniform. Surface hardness and strength are also lowered due to layer of scaling. Fatigue strength of heat treated product is reduced. This is especially true in case of automobile leaf springs.

Preventing oxidation and decarburisation

Prevention of oxidation and decarburisation is not only better than cure, it is profitable too. There are several ways to address problems caused by the two harmful reactions. Decarburised surface removal by machining operations after heat treatment, copper plating of thickness upto 0.025mm prior to heat treatment or change of heating media to molten salt bath are some ideas. A number of protective atmospheres may be introduced like liquid hydrocarbon, dissociated ammonia, exothermic gas, nitrogen and endothermic gas. Fluidised bed furnaces and vacuum furnaces have also proven to reduce scaling.

Switching over to grades which do not require heat treatment is possible in rare cases. However, most of the mentioned solutions pose a number of problems or practical difficulties. Availability of capital and human resource for using high-end furnaces is a major issue. Many small heat treatment shops cannot afford these solutions. Yet they are under mounting pressure to prevent oxidation and decarburisation. Use of protective anti-scale coating has proven to be a logical solution to the problem of scaling and decarburisation.

Insights into use of protective coating and its characteristics

Use of protective coating has been found beneficial and cost-effective. An anti-scale coating is applied on components or billets to be heated before charging them into the furnace. This anti-scale coating acts as a barrier between oxygen and metal.

Care is taken to apply a uniform, impervious layer of coating on the component to be heated. Coating ensures prevention of scaling and decarburisation. For exceptionally long heat treatment cycles of 10 to 15 hours, the extent of scaling and decarburisation mechanism is substantially reduced.

Table 1: *Efficacy of protective coating*

Type of furnace used	: Box type, electric
Test coupon dimensions	: 300mm x 100mm x 10mm
Grade of steel	: AISI – 1010
Heat treatment cycle	: 1000°C / 4 hrs / air cool
% scale loss when not coated	: 5.52
% scale loss when coated	: 0.70

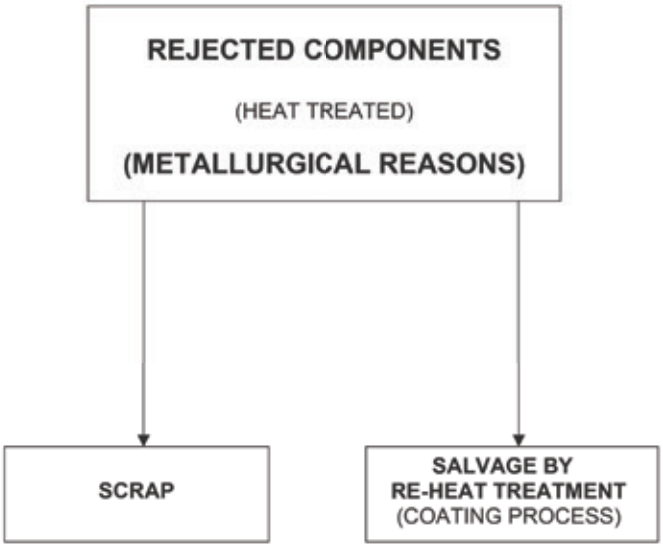


Figure 1: *Ability to salvage the rejected components*

Anti-scale coating also reduces decarburisation on billets and ingots during hot forging and hot rolling operations. Heat transfer from heating media to metal is not affected due to anti-scale coating.

No reaction with steel surface, no release of toxic fumes during use or heat treatment or storage, non-hazardous and economical implementation are other required characteristics of the coating. Coated tools and components must be able to be heat treated in air using a box type or bogie hearth; electric, gas or oil fired furnace.

Benefits of anti-scale coating: industrial case studies and success stories

Table 1 shows the efficacy of the coating in an electric furnace. Coating eliminates need of salt bath or controlled atmosphere equipment in many cases. Considerable savings in capital investment and operating costs are enabled by use of anti-scale coating. Due to prevention of decarburisation, uniform surface hardness is achieved. Rejected components can be salvaged (figure 1). Large savings are possible when plates of expensive alloy steel can be re-heat treated by using the anti-scale coating.

Figure 2 explains the benefits of using coating during hot forming and solution annealing of stainless steel pipe fittings. Due to prevention of oxidation even in an ordinary oil fired furnace, pickling time could be reduced by 75 per cent. Buffing can be eliminated or minimised in many cases. In the manufacturing process of shearing blades of expensive high carbon, high chromium grade steel, grinding allowance is substantially reduced when protective coating is used during heat treatment. Some other distinct case studies are listed below.

1. Prevention of quench cracks

Forgings like knuckle joints and crank shafts when heat treated in furnaces of oxidising atmosphere are susceptible

to quench cracking. Quench cracks appear when stresses generated during quenching are higher than tensile strength of thin sections of forgings and due to differential quench severity at different areas. Chrome-moly grades of steel are most susceptible to quench cracks, which usually occur in the gear-end portion of the crankshaft. By coating the gear-end with an anti-scale coating, the cracking is prevented. (Image 1). By coating the gear-end with anti-scale coating, cracking could be effectively prevented. Reputed forgers of largest crank shafts in India use this technique. (Endorsement 1).

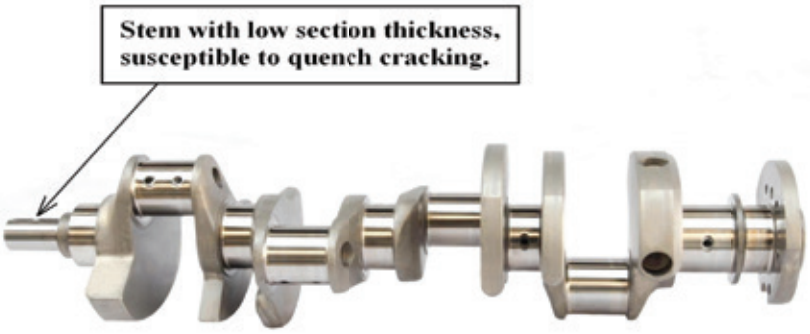
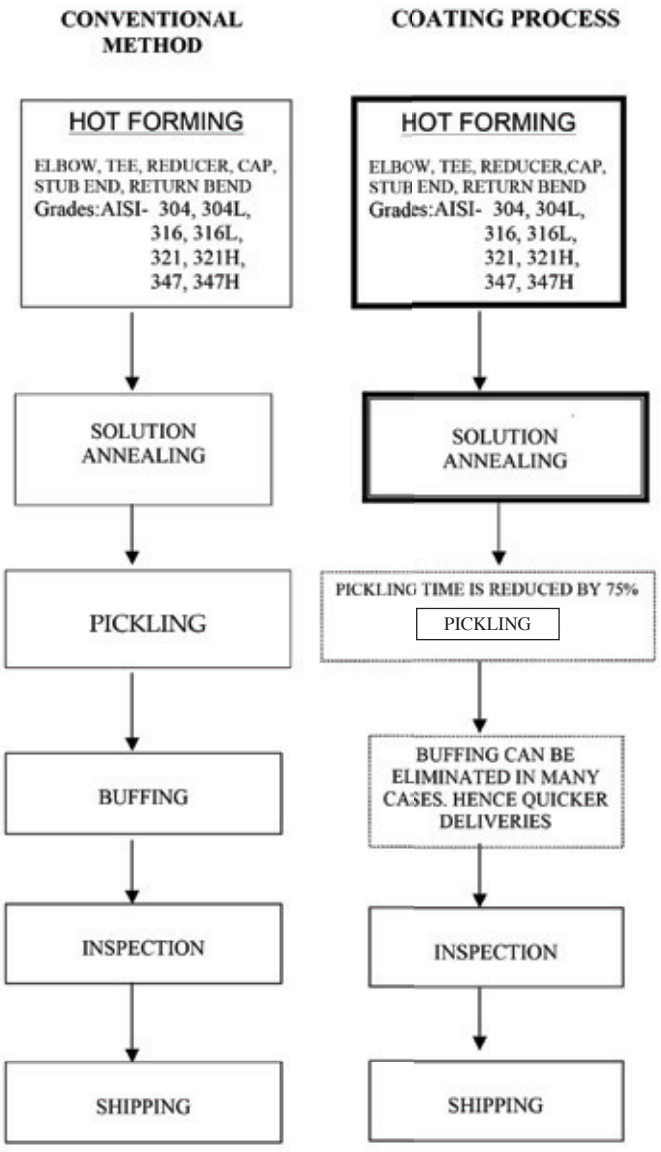


Image 1*: Crank shaft gear-end section prone to quench cracking*

2. Reduction in shot blasting time after heat treatment

Operations like shot blasting, grinding, acid pickling etc. do not add value, but are expensive and time consuming procedures. These operations are necessary to remove adherent scaling from components and to enhance aesthetic appeal of forgings. Time required for these operations can be substantially reduced if a coating is applied on components before heat treatment (Endorsement 1). Aesthetic appeal of components is automatically enhanced without much effort as scaling is either prevented or reduced by using anti-scale coating.

Figure 2*: Benefits of using coating in processing of stainless steel pipe fittings*



3. Salvaging fully machined components by protecting during re-heat treatment

Often, fully machined forgings need to be re-heat treated for metallurgical reasons. However, there is no material allowance left for further scaling to take place and for subsequent machining or shot blasting. In such cases, even a small amount of scaling can render components to be scrapped. Use of anti-scale compound ensures prevention of scaling during re-heat treatment. Hence, huge losses can be prevented by salvaging fully machined components. Aesthetic appeal of components is retained (Image 2). The coating itself can be removed after heat treatment by cleaning the forging with diesel, emery paper brushing or light wire brushing (Endorsement 2).

Image 2*: Fully machined spindle re-heat treated by applying anti-scale compound. Zero scaling observed. Aesthetic appeal is intact*

4. Heat treatment of pressure vessels

Valve areas of pressure vessels are critical and need to be protected from scaling during thermal cleaning and heat treatment. This is achieved by use of anti-scale coating being applied only on areas where scaling needs to be prevented (Image 3).

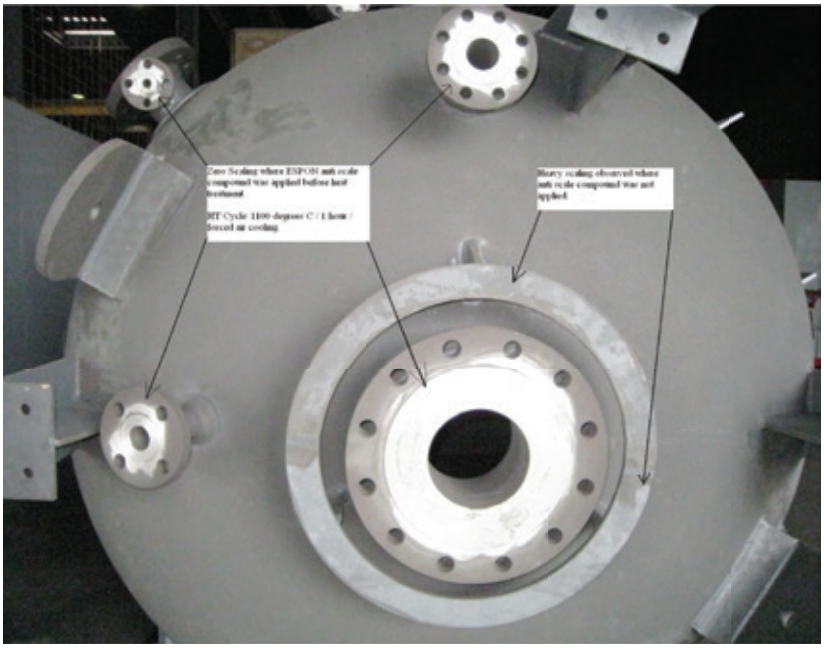


Image 3: *Protection of critical valve areas during heat treatment of pressure vessel. Coating was applied on critical areas that have turned white after heat treatment, with zero scaling*

5. Salvaging of rejected forgings

Re-heating or re-working of forgings is required due to underfill, improper metal formation and similar reasons. However, with stringent dimensional tolerances, there is a risk of components getting scrapped due to excessive scaling (Image 4). Anti-scale coating, when applied on forgings before re-heating for re-working, ensures minimal or no scaling, thereby eliminating risk of scrapping components during re-working (Image 5).

6. Reducing decarburisation during hot forging and hot rolling

During hot rolling of special grades of steel where decarburisation needs to be kept in check, unforeseen conditions like mill breakdown and unplanned downtime may arise. Even when the plant is closed for weekly holiday, the furnace is shut off abruptly, leaving billets inside the furnace. In these cases, billets or ingots are left in furnace and are subjected to prolonged heating leading to decarburisation. In both cases, applying an anti-scale coating ensures that billets are protected from decarburisation. (Endorsements 3 & 4)

Image 4: *Pit marks formed due to scaling during re-heating for re-working*

Image 5: *Coated with ESPON anti-scale compound before re-heating. No scale pit marks*

Summary

1. Use of protective coating has established itself as an effective technique of preventing oxidation and decarburisation during heat treatment, hot forging and hot rolling.
2. It has unleashed a number of additional benefits like ability to salvage by re-heat treatment, elimination of post-heat treatment operations like grinding, shot blasting, acid pickling, etc.
3. The coating process has simplified and accelerated many metallurgical heat treatment operations, saving a fortune in capital investment, reducing costs and improving quality.

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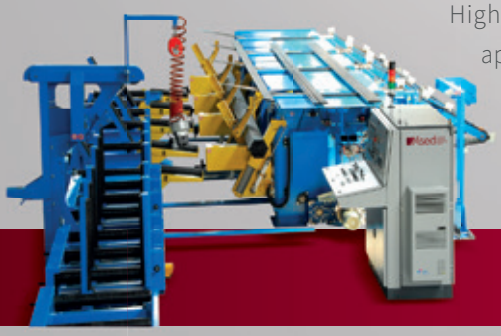

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