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**TECHNOLOGY** 

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### **OF EXCELLENCE IN THE TUBE INDUSTRY**

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## CONTENTS

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#### Planes, trains and automobiles

Welcome to the latest issue of Tube & Pipe Technology magazine, which this month focuses on fittings, couplings and tubular joints and welding technology, equipment and consumables as well as all the very latest industry and technology news. I hope you enjoy the magazine.

It's always the biggest event on the calendar and this year was no exception for my first Tube 2010 in Düsseldorf, which received a very healthy turn out on the first four days and it was great to meet so many of you and to see such a vast array of innovative machines in operation and spread over such a huge space - as a few sore feet in the office will testify to. I look forward to meeting some familiar faces again at the next event in two years' time, which, hot off the press today, has been confirmed as being held on 26-30 March 2012. Sadly, most of our UK staff had to leave early on Friday morning due to the volcano. It's not since school that I have used an errupting vulcano as an excuse for anything, but for anyone who was expecting to see us on the Friday please accept our apologies, although I assure you it takes something fairly dramatic for us to desert our post. I hope our more than capable team of translators were able to help you with any gueries about the magazine but if not please feel free to contract me personally and I will endeavour to help.

The explosive events meant we had a long coach trip and ferry ride home rather than by air, but I know we were fortunate to get home on time

at all with some people still trapped abroad up to a week later or forced to take additional flights to alternative airports, which I am sure took its toll. I hope you stalwarts at the show that final day managed to make the most of it and that everyone managed to get home one way or another.



Rory McBride, editor, Tube & Pipe Technology

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US Copies only: Tube & Pipe Technology (ISSN No: 0953-2366) is published bi-monthly by INTRAS Ltd and distributed in the US by DSW, 75 Aberdeen Road, Emigsville, PA 17318-0437. Periodicals postage paid at Emigsville, PA. POSTMASTER: send address changes to *Tube & Pipe Technology*, PO Box 437, Emigsville PA 17318-0437.

Tube & Pipe Technology magazine is available on subscription, or via membership of the International Tube Association - See www.itatube.org for more membership benefits



#### FRONT COVER STORY

Meccanica Adda Fer was established in 1990 with a purpose to re-sell machinery that had been disposed of by the family company after extensive revisions and revamping operations.

TUBE & PAPE TECHNOLO

This proved to be a winning idea and the revised machines were soon successfully installed in several countries abroad.

With this extensive know how and its remarkable levels of customer loyalty Meccanica Adda Fer started to project and manufacture complete new plant systems after conducting technical feasibility studies: coil cutting lines, electro-welded pipe forming lines, pipe finishing plants, hydraulic test and pipe packing systems have been built and installed throughout the five continents of the world.

The production lines for electro-welded pipes using cold-forming processes are the company's core business. The machines are designed to require simple and basic adjustments and can be equipped with additional parts, automatic regulations and controls to automate the line further and to produce high quality pipes.



#### **F**EATURES

## 84 Production of fittings, couplings and tubular joints

Fittings, couplings and joints offer solutions to an extensive range of ordinary and specialised connecting applications and include reducers, unions, elbows, flanges and bulkheads among many other innovative products. As varied as the product line may be, these closely engineered pieces all have one thing in common: a precision fit, whether it is with gaskets, seals and rings or with the longer pieces.





#### Welding technology, equipment & consumables

Welding is crucial to a smooth manufacturing process. The welded joint can be seen as the essential link in a structure but as materials are formulated for greater strength, corrosion resistance, and other performance factors, welding can become more challenging. Whether it is performed under water or in other liquids it is important that no adverse effect are felt on the weldment.

#### TECHNICAL ARTICLE

105 Experimental and FEM investigation on influence of ring stiffeners on buckling behaviour of subsea pipelines under hydrostatic pressure H Showkati – Civil Eng. Department, Urmia University, Urmia, Iran

**R Shahandeh** – Civil Eng. Department, Sama organization (affiliated with Islamic Azad university), Khoy branch, Khoy, Iran



## **INDUSTRY NEWS**

# Harsco Infrastructure rises to power station challenge

ACCESS and scaffolding contractor Harsco Infrastructure has designed and installed two bespoke mobile access systems to allow contractors to carry out essential maintenance work on pipes at Peterborough Power Station.

Centrica, which operates the 360MW gas-fired power plant, has enlisted industrial painting specialist East Coast Industries to carry out the work which involves cleaning and re-painting the air cooled condenser (ACC) units. This has involved working on the ACC's enormous horizontal steam pipes with obscure angles that made the ACC units inaccessible by conventional means. Also with the pipes reaching a surface temperature of 65°C SGB had to make sure that the access system could withstand these high temperatures and still be functional.

East Coast Industries awarded Harsco Infrastructure with the contract to design, manufacture and install a mobile access system, which would afford a safe means of access to and from the working area. The system was also required to provide a safe means of evacuation in the event of emergency.

Harsco Infrastructure's design employs powered self-propelled work platforms suspended from a steel framework. The entire rig travels along the pipes on a series of wheels, which are specially angled to accommodate the cylindrical surface of the pipes. Users of the system gain access to the work platform via a cradle suspended



from an electric hoist attached to the frame.

Steve Latter, mechanical engineer at Peterborough Power Station, commented: "We knew that the maintenance work which had to be carried out was going to be a challenge due to the positioning and angles of the steam pipes. However, Harsco Infrastructure came up with a unique and effective method that overcame all of the access solutions."

One challenging task for Harsco Infrastructure was to find a way for the system to traverse the steel flanges, which project around the circumference of the pipe



sections. This was solved by providing a jacking system, which lifts the wheels clear of the flanges as they pass.

"Because of the location of the ACC units, a traditional access method was unfeasible and would have taken double the time," commented Bill Murdoch. "This required a completely different approach," he added.

"Harsco Infrastructure designed a mobile access system that was far superior to any of the other companies involved," said Harry and Ben Lee, owners of East Coast Industries. "The service that Harsco Infrastructure provided from concept to delivery was of a very high standard," they added.

The inaccessible location of the jobsite required the use of a high-capacity mobile telescopic crane to lift the two access rigs into position on top of the ACC pipes. East Coast Industries commenced work in early September 2009 and is due to complete the contract before Christmas.

Peterborough Power Station, which entered into operation in 1993, uses 'grey' water supplied by the local sewage works to generate steam for its turbines, thereby reducing the consumption of expensive potable water. The condenser is air-cooled rather than water-cooled to further reduce water consumption.

Harsco Infrastructure – USA Fax: +1 717 763 6424 Email: info@harsco.com Website: www.harsco.com

## EFD Induction lands major Indian order

THE global rebound in demand for industrial induction heating systems has resulted in several major new orders for EFD Induction's popular solid-state Weldac welders. Growth in demand has been particularly strong in Asia, with significant orders coming from tube and pipe makers in China and India.

"The tube and pipe industry is certainly back on its feet, at least in Asia," says Peter Runeborg, head of EFD Induction's tube and pipe division. "For instance, we've just received confirmation on a large order from Bhushan Steel Limited in India. The customer, which is India's third largest secondary steel producer, already had a Weldac on order. But to fit their expanded production plans, Bhushan wanted to rebuild the Weldac to a dual frequency system. The same customer has also just ordered an additional Weldac, as well as three of our seam normalising units."

Weldac is EFD Induction's family of highoutput solid-state welders. EFD Induction's patented driver technology lets Weldacs use rugged IGBT transistors, resulting in unrivalled uptime and productivity. "Weldac's reliability, together with benefits such as a constant power factor of 0.95 at all power levels and ease-of-use, are what help make Weldac such a popular choice for tube and pipe makers." adds Runeborg.

But Runeborg is keen to add that outstanding equipment is only part of the reason behind the upswing in demand for Weldac. "Customers want local support at short notice. And since we have a manufacturing facility in India, complete with highly trained staff, we offer the services and training that ensure our customers can maximise the value of their Weldac systems."

EFD Induction has to date installed thousands of heating solutions for a vast 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 – Norway Fax: +47 3550 6010 Email: kln@no.efdgrop.net Website: www.edf-induction.com

## **DIARY OF TUBE EVENTS**

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## **Corr Plastik doubles production capacity**

CORR Plastik Industrial Ltd, one of Brazil's major producers of PVC pipe, has substantially increased production capacity with a new factory in the north east of the country. The extrusion lines for the new plant were supplied by the German extrusion specialist KraussMaffei Berstorff, longtime supply partners for Corr Plastik.

Ever since its founding 17 years ago,

Brazilian pipe producer Corr Plastik has used extrusion lines supplied by KraussMaffei Berstorff. In the intervening years, the company has grown rapidly. It is now looking to double its pipe production capacity, and to achieve this is installing more extrusion lines from Munich.

The Corr Plastik site near Maceió, the capital of Alagoas state, covers an area of



60,000 square metres. In a first construction phase, the company has built a 7,500 square metre plant to produce water, irrigation and drainage pipes. In late 2009, KraussMaffei Berstorff supplied four pipe extrusion lines for the new plant.

Two of the lines were double-strand lines headed by KMD 75-36/R twin-screw extruders from KraussMaffei Berstorff's Performance series. The other two were single-strand lines with KMD 90-36/R Performance twin-screw extruders. The lines are configured to produce pipe with an outer diameter of 20 to 250mm and are capable of producing up to 2,800 tonnes of PVC pipe a month.

In January 2010, Corr Plastik boosted production at the plant to 3,100 tons a month with a line for corrugated pipe.

This tonnage, together with the production at the main plant in Cabreúva in São Paulo state, brings Corr Plastik's monthly pipe output to 6,000 tons a month, making the company one of the three biggest PVC pipe producers in Brazil.

**KraussMaffei** – Germany Fax: +49 89 8899 3092 Email: press@kraussmaffei.com Website: www.kraussmaffei.com

## **Elderfield & Hall acquires Pro-Fusion Technologies**

CHICAGO-based Elderfield & Hall Inc and Idaho-based Pro-Fusion Technologies Inc have jointly announced that Elderfield & Hall has acquired Pro-Fusion Technologies Inc.

The two companies have been closely associated for ten years, jointly developing power supplies and tungsten grinders for the micro welding and orbital welding industries.

"This is a classic case of two companies being able to create greater value for industry when they are combined, than when they function separately," explained Bob Hall, president of Elderfield & Hall. "The central stocking point will be in Chicago which provides significant geographic advantages in serving our customers," he added, "while the production of precision, preground tungsten electrodes and assembly of machines will remain in Idaho where a skilled team already exists."

"Pro-Fusion's products have a large international following," agreed Pro-Fusion president, Lisa Rust, "and Chicago definitely provides major logistical advantages worldwide."

"The core of Pro-Fusion is the DualArc 80 Micro-Tig/Micro-Plasma power supply" she continued. "It has remained the state of the art since being developed by Bob Hall and Pro-Fusion in the late nineties. Our combined resources in Chicago will provide best in class support for present and future customers."

Both companies are privately held and terms of the transaction were not disclosed.

Elderfield & Hall was founded in 1979 as a representative of specialised industrial hand tools for petro-chemical and nuclear construction. In the mid-1990s the company moved into the design and sales of small, precision bandsaws.

Bandsaws led to fabrication and that led to welding equipment, also specialised, and the development of the DualArc 80. The first of its kind, dual function, Micro-Tig/ Micro-Plasma power supply, the DualArc 80 remains the state of the art. Today, thousands of KAMA bandsaws, the world's most accurate, operate reliably around the world and hundreds of DualArc 80 power supplies are in use in micro-welding and orbital welding applications on every continent.

Founded in 1998, Pro-Fusion began as a provider of precision, pre-ground tungsten electrodes and grew to develop and integrate a family of products for the micro-welding and orbital welding industries. In addition to the DualArc 80, Pro-Fusion developed the industry leading Sharp Shooter<sup>™</sup> tungsten grinder of which hundreds are in service around the world providing accurate, repeatable, tungsten grinding capability to their owners.

Elderfield & Hall Inc – USA Fax: +1 312 829 6733 Email: bob@kooltools.com Website: www.kooltools.com

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Arne Heel, Quality Manager, SIKORA AG



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## **Tough conditions for Simona PE 100 SPC RC-Line** pipes at the Simplon Pass

ON account of its North-South axis, the Simplon Pass (Switzerland) is one of the most important traffic routes connecting Germany to Italy. This part of the A9, with a length of 42.5km, runs between Brig in Switzerland and Gondo in Italy at an altitude of over 2,000m. The road was widened in the 1970s and 1980s in order to cope with the higher volume of traffic. It is used by 850,000 vehicles a year, 10% of which are lorries.



Owing to extreme environmental influences and rising demand for water, the existing fire-fighting and supply lines have to be renewed. At the Simplon Pass an old cast-iron pipe (diameter 90mm) is to be replaced by a modern plastic pipe for the Bergalpe-Brig region and the A9 national road. At this altitude the soil is very poor and stony. As regards open



trench laying of new pressure pipelines, however, it is not financially viable to transport fine sandy bedding material up to this altitude. Therefore, Debrunner Acifer AG Visp, as the supplier to the installation company Reinhard Heinzen,



placed particularly high demands on the new pressure pipe: good abrasion resistance; high stress crack resistance; good resistance to point loads (eg stones, fragments); excavated soil to be used as backfill material; and high resistance to slow crack growth.

Simona PE 100 SPC RC-Line drinking water pipes with SVGW and DVGW approval meet all requirements specified. The multi-layered pipe consists of an inner pipe made of PE 100, which is highly resistant to cracking, and a protective jacket, made of modified polypropylene (Simona PP Protect).

The surface of the pipe provides protection against dangerous notches and cracks caused by stones and fragments. Even very deep scores fail to reach the inner pipe when exposed to subsequent service loads.

The individual pipes delivered were welded on the ground by Reinhard Heinzen to make up 60m pipe trains and then flown into position by a helicopter.

A total of 3,000m Simona PE 100 SPC RC-Line drinking water pipes (diameter of 200-250mm) were laid. In order to maintain the water supply during the construction phase, a PE 100 pipe was installed provisionally.

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## Focusing on boosting customer service

FINE Tubes. the UK-based tube welcomed has manufacturer, Andy Whitehouse to its management team. With the creation of the post supply chain director, the producers of stainless steel, nickel and titanium tubing have taken another step to ensure that the availability of its products is supported by reduced lead times and 'happy' customers.

Andy joins the Plymouth-based company with a comprehensive track record in operations management, planning and procurement gained in a range of high value-added product companies such as Airbus, GKN and Princess Yachts Ltd.

His immediate areas of responsibility at Fine Tubes are the planning, logistics and customer services departments. The alignment of his experience to the Fine Tubes customer base is a distinct starting advantage in improving customer focus.

Andy's expertise will support Fine Tubes' strategic focus on key markets, which are higher in technical complexity and also require high flexibility and responsiveness in managing customer needs.

"I am thrilled to be part of an organisation that is obsessed with doing a good job, serving customers and hoping to grow", he added.

Underpinning his appointment, Mr Whitehouse holds a BEng (Hons) degree in mechanical engineering – paired with a detailed knowledge and real life implementation experience of both MRPII and modern lean manufacturing principles. He has been successful in improving the way in which complex manufacturing environments work – helping to ensure they achieved the required standards for productivity, planning processes and supply chain performance.

The appointment of Mr Whitehouse will allow Mark Ayres to assume the role of new product development director, ensuring that new products are introduced with a seamless integration across the entire supply chain.

#### **Fine Tubes**

– UK

Fax: +44 17527 33301 Email: sales@finetubes.co.uk Website: www.finetubes.com

## Welspun Gujarat successfully achieves \$250mn capital market fund raising

Welspun Gujarat Stahl Rohren Ltd (Welspun), the line pipe manufacturer and flagship company of the Welspun Group, has successfully completed a US\$250mn capital raising exercise.

The capital raising was achieved by way of a \$150mn Foreign Currency Convertible Bonds (FCCB) offering (placed in October 2009), and \$100mn in the form of Qualified Institutional Placements (QIP) of equity shares, placed recently. The company's largest ever capital market initiative was well received among domestic and institutional investors.

The funds will be used to invest for capital expenditure, retirement of high cost debt, investments in growth opportunities and other usage in accordance with applicable statutory and/or regulatory requirements. The new shares being issued under QIP will be listed on the Bombay Stock Exchange and National Stock Exchange, and the FCCBs are listed on the Singapore Exchange. JP Morgan has acted as the sole book-runner for both FCCB and QIP.

Mr BK Goenka, chairman and managing director of Welspun, commented, "Successful placement of FCCB and QIP reiterates the trust and belief that the investors repose on us. This fund raising will pave way for the accelerated growth journey of Welspun and the company becoming one of the most respected pipe companies in the world." Welspun Gujarat Stahl Rohren commenced activities in 1995, and has supplied pipes for prestigious projects including the world's deepest pipeline project in the Gulf of Mexico, and other critical projects across the globe.

The company's plate and pipe plants are located in Dahej and Anjar in Gujarat, India.

The company has also commissioned a pipe mill in Little Rock, Arkansas, USA. The manufacturing facilities incorporate hybrid JCO technology from Mannesmann Demag of Germany (SMS Meer).

Welspun – India Website: www.welspun.com





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### GT Metal recoups CADCAM spend in just two months

GT Metal Products, Canada, provides custom fabrication services using two Mazak STX510 MkII 2.5kW lasers. They had previously been running two CAM systems to drive the lasers, but experienced problems that made them consider alternative solutions.

Dustin Sim, production manager, said: "Previously we could only specify one cut condition per thickness, which gave us quality issues. Also, we were looking to find a faster way to nest parts and reduce material waste. Based on our previous CAM experience and the ability for it to allow for multiple cut conditions per thickness we selected Jetcam. We also opted for Jetcam's High Performance Nesting module to maximise efficiency and material usage."

"Two licenses of Jetcam Expert were installed in May 2009, one with the High Performance Nesting module. This allowed for two programmers to design parts and for one machine to be used for generating highly optimised nests. Staff were provided with initial training and were able to learn the system independently due to additional training material provided.

After installation a number of benefits immediately came to light. Programming time was halved, as processes took much less time than the previous systems due to many being automated. Once profiling information is applied to each part it is immediately available for each machine, with any updates reflected automatically on any nests. Nesting time itself saw a 90% reduction, as users simply queue up all parts to be nested for a given material and thickness, specify an amount of time that the nester can run for (which can be overnight to allow the system to consider the most optimised nesting options) and generating NC code. Machine cycle time also saw a 20% improvement due to optimised leadins, common line cutting, path optimisation and finishing cut sequences all playing a part. Finally, material utilisation saw a 25% improvement not only because of the optimised nests from High Performance Nesting but also the ability to store and reuse remnant sheets efficiently."

Dustin commented: "One of the major benefits is that we can quickly queue up multiple jobs and nest them together for efficiency. Added up, these savings paid for the system within just two months."

"Support requirements had previously taken up more of their staff time, with one of their previous systems taking considerably more than the other." Dustin cited: "The support we've had from NestOne has been exemplary. The system is faster to use than all of the others and requires significantly less support than before.

"GT Metal plans to purchase a CNC plasma machine in the future, with Dustin citing that JETCAM will be used to drive it.

The company is also about to convert their two licenses to a server-based floating setup, allowing several PCs to have the software installed and for two to run concurrently." Dustin finalised: "Jetcam is faster and much more flexible than all of the previous systems we've used. It excels in material utilisation and generating optimised NC code."

Jetcam International Sarl - France Email: info@jetcam.com Website: www.jetcam.com



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## EEW banks on the experience of Gräbener

THE company Erndtebrücker Eisenwerk is the market leader for large special pipes and Gräbener said it is proud that its innovative machine concepts have, in a small way, contributed to the great success of the EEW group.

Recently, Gräbener Maschinentechnik (GMT) has put three machines for pipe production into operation at the company EEW Malaysia Sdn Bhd. The pipe mill in Southeast Asia is a brand new factory that was inaugurated by Abdul Ghani Othman, Prime Minister of Johor, the most southern state of Malaysia, together with the management of the parent company in Erndtebrück.



With the supply of three machines, GMT has played a key role in the building of the new factory. A 3,000 ton bending press, a calibration press and a continuous root tacking machine now produce SAW pipes with a length of up to 12,500mm, a diameter of up to 1,220mm and a maximum weight of 20 tons is possible. The maximum wall thickness to be processed amounts to 40mm. Especially the heavy bending press with a weight of 450 tons and a production capacity of between six and 12 pipes per hour depending on the diameter is expected to ensure a reliable annual output of 80,000 tons for pipe diameters of up to 1,220mm.

"In order to reach the ambitious goal of an equal quality standard for all pipes produced in our company group, we deliberately went with well-proven machines, manufacturers and processes", explains EEW Associate Christoph Schorge. Therefore, EEW traditionally banks on GMT's experience and the reliability and quality of their machines.

Gräbener machines are not only installed at the EEW headquarters in Erndtebrück. Numerous Gräbener

Africa

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machines also prove their reliability and high efficiency at the EEW subsidiaries in Rostock, Lubmin, Kiel, and even in Korea. Encouraged by the positive experience made with these machines, EEW even put Gräbener Maschinentechnik in charge of retrofitting a pipe forming press of another manufacturer. The result: A significant increase in productivity and quality.

#### Gräbener Maschinentechnik GmbH & Co KG – Germany Fax: +49 27379 89109

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## 50km of duplex pipes for the Middle East

AS part of a number of projects in the Middle East, Petroleum Development Oman (PDO) has received stainless steel pipes from Butting manufactured from various materials in different dimensions.

Butting said it is delighted that it has been able to produce 50km of duplex pipes for PDO as part of the "well delivery programme 2009".

The pipes, were made of LC65 – 2205 (UNS S31803), produced – in accordance with API 5LC and project specifications, – a total of around 1,500 tons. The longitudinally welded steel coil pipes were produced by Butting in four different dimensions: 273.1 x 6.4mm, 273.1 x 5.1mm, 219.1 x 4.8mm as well as 219.1 x 5.2mm and represent the customer's annual requirement for 2009.

The pipes were used as flow-lines for transporting gas underground from the various fields to the processing plants.

Following their production in Knesebeck, Germany the pipes were coated with polypropylene at a partner company from where they were sent directly to Oman by means of a container ship. In this way, the pipes could be delivered to the PDO Work Management Plant on time to the complete satisfaction of the customer.

Butting – Germany Fax: +49 5834 50 445 Email: andrea.kiel@butting.de Website: www.butting.de

## Free magnetic pull test kit

AS part of Industrial Magnetics' free, no obligation plant audit program, the company has announced an additional bonus: it will provide a free magnetic pull test kit with a minimum, qualifying purchase resulting from the free plant audit, allowing the customer the ability to self-monitor magnetic equipment on a regular basis.

The free plant audit is geared towards companies that are interested in evaluating how magnetic equipment can improve cycle times, reduce operating costs, purify products and protect processing equipment from metal damage.

Trained representatives of IMI can perform objective and measured strength testing of existing magnetic equipment, test end product for metal contaminant levels, identify key areas where magnets could enhance operating performance and offer a comparative cost analysis for new or upgraded magnetic equipment.

Recent advances in rare earth magnet material, magnetic circuit design and enhanced product features allow significant improvements in fine metal capture rates, magnet cleaning operation and overall performance of magnetic separation equipment.

Industrial Magnetics also offers free product testing at its onsite R&D facility, which features hundreds of magnets, weigh scales and PPM analysers for use in determining the proper magnetic solution for an application. In addition, it is currently featuring a limited trade-in/upgrade promotion on certain magnetic separators until 31 December, 2010, which allows a customer to trade-in old magnetic equipment for a discount off of a new, stronger model.

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### Moving into new, bigger dimensions

KRAUSSMAFFEI Berstorff has received an order from the well-known pipe producer PES Co for an extrusion line to produce extra-large, smooth-walled HDPE pipe with diameters up to 2,400mm. Producing smoothwalled pipe in these large diameters is a world first, claims KraussMaffei Berstorff.

PES has been producing HDPE pipe, including extra-large pipe up to 1,600mm diameter, on a range of Krauss Maffei Berstorff single-screw extruders for almost a decade. The extra-large pipes produced by the company in the Persian Gulf region are used in many applications, chiefly in the pipelines supplying seawater to desalination



plants and cooling water to oil refineries. PES has many years of intensive experience in the production of PE pipe and in laying and installing complete pipeline systems. The company said it is enthusiastic about its productive business relationship with KraussMaffei Berstorff. Mohsen Jamalian, PES managing director and owner, said: "Working together with KraussMaffei Berstorff we're setting a new milestone in the world of large scale pipe extrusion. Thanks to KraussMaffei Berstorff and its top technology – from single-screw extruders to pipeheads and spiral distributor concepts – we can transfer the expertise we've accumulated

with our 1,600mm extrusion line to the challenge of producing 2,400mm pipe. Also making a major contribution to our success in this area is the lowsagging polyethylene XLS12B from Total Petrochemicals."

The extra-large pipe extrusion line ordered from KraussMaffei Berstorff

KraussMaffei Berstorff extrusion line for extra-large pipe with a 36D single-screw extruder and a spiral distributor pipehead will enable PES to advance into new dimensions and to add smooth-walled HDPE pipes 1,800, 2,000, 2,200 and 2,400mm in diameter to its production spectrum. The new line, headed by a KME 150-36 B/R single-screw extruder and a KM-RKW 40-2400 pipehead, has all the key features that have established KraussMaffei Berstorff as a leader in extra-large pipe extrusion. This includes the proven design of the 36D single-screw extruder, a pipehead concept where the spiral distributor design incorporates the latest rheological research.

This engineering produces pipe where wall thicknesses, outer diameter and ovality are kept within very tight tolerances. Considering that, for some types of pipe, the cost of material accounts for up to 90% of total manufacturing cost, keeping variation to a minimum delivers huge material savings, especially in production of very large pipe. Furthermore, when the pipe is laid, the pipe sections will fit exactly together, making for uniform, high quality welds.

KraussMaffei Berstorff – Germany Fax: +49 89 8899 3092 Email: matthias.andreesen@kraussmaffei.com Website: www.kraussmaffei.com

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## Toxicological effect of water pipelines on water quality

MAJOR causes of water pollution include industrial waste disposal, organic disposals such as artificial manure and sewerage, agricultural pesticides and the chemical structure of the source.

Various disinfection methods have been in use for a number of years. However, advanced academic research has identified that some disinfection methods that were believed to be harmless have been proved to cause toxicology for human health.

The most common technique for disinfection of water has been chlorination. The reaction of chlorine with organic substances in the water, as well as the reaction with the pipe walls it flows through, have been shown to display a high possibility of carcinogenic toxicology. For instance, the outcome of vinyl chloride in PVC pipes, or the outcome of ethylene chloride in PE pipes, have been proven to create a carcinogenic effect. Therefore, in the USA and many EU countries, ozone rather than chlorine is used as the disinfection agent for water.

For the healthy disinfection of water

with ozone, most pipes need an expensive special lining layer to prevent penetration of ozone inside the pipe walls. However, composite pipes such as glass fibre reinforced polyester (GRP) pipes, have an advantage over other types of pipes for an ozoned-water environment.

Superlit GRP pipes do not need a special lining layer to prevent chemical reaction of disinfection chemicals with the pipe walls. With re-engineering of polyester resin, which forms the pipe structure, GRP pipes become completely resistant for the ozoned-water environment. Since pipe wall deformation does not take place, Superlit GRP pipes do not require complicated and expensive maintenance, even in the longterm. Superlit claims that since both internal and external surfaces of its GRP pipes are highly resistant to aggressive chemicals and structural corrosion, pipe performance displays excellent results, even under high pH conditions.

Superlit production director PhD Eng Alpay Gulcan emphasised the importance



Superlit GRP pipes are completely resistant in

ozoned-water environments

of the issue: "In a world where clean water scarcity as well as the polluting sources are both increasing very fast, the effect of water transmission line on water purity can not be disregarded. Likewise, to avoid carcinogenic toxicology of chlorination, water ozonization is becoming widespread all over the world for a healthy purification. When these two approaches are taken into account, the most feasible water transmission solution, where water purification is kept stable with high corrosion resistance for ozoned-water transmission, is highlighted as Superlit GRP pipe systems."

Superlit – Turkey

Email: sales@superlit.com Website: www.superlit.com



## **Nelson D Abbey obituary**

NELSON D Abbey Jr (Dan) passed away on 1 February 2010 at the age of 82 in his summer home on Pelee Island, Canada. Dan will be remembered for his many adventures around the world and the wonderful stories and life lessons that he shared with his family and dear friends.

He was born in Toledo, Ohio and attended Culver Military Academy and Case Institute of Technology. He enthusiastically led the family business, Abbey Etna Machine Company, which was founded by his grandfather in 1901, into international markets as president and chairman. Currently, Abbey International Ltd continues this legacy, led by his son Nelson Abbey III.

He loved to travel and study diverse cultures. He had particular interest in India, Pakistan, South America, Europe and the Middle East.

Dan was involved in the development and sales of ERW pipe and tube mills and related equipment which he promoted globally. Even up to the day he passed, he took a keen interest in how all of his customers were doing with the equipment he sold to them.

He lived with his family in USA, Switzerland, Paris, and most recently in Spain. Dan has now been reunited with his sons Alex and Lee who passed before him. He is survived by his wife, Barbara; three sons Nelson (Chris), Robert (Mary Beth), and Malcolm (Michelle); and five beautiful grandchildren Sean (Lisa), Matthew, Kevin, Will and Ellie, with whom his spirit lives on.

Abbey International Ltd – USA Tel: +1 419 874 4301 Fax: +1 419 874 8200 Website: www.abbeyintl.com

## International **Steel Tube Expo**

THE 7<sup>th</sup> Steel Tube Exhibition of China will be held at China International Exhibition Center in Beijing from 8-10 August 2010.

According to the present situation of the steel pipe industry in China, the event will integrate with new economic developments at home and abroad, policyoriented by energy-saving reduction, recycling economy and rational use of resources.

To step up cooperation and seek mutual benefit and a 'win-win' outcome, the organisers believe that the 2010 Beijing Exposition will be the top platform for participants to strengthen technological innovation, production expanding and international cooperation through grand displays of products and technologies.

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## Interpipe to supply pipes for construction of new terminal in Kiev

GLOBAL steel pipe and railway wheels producer Interpipe has been chosen to supply seamless pipes for the construction of terminal D at Boryspil International Airport in Kiev, Ukraine. The pipes will be used for the main building at terminal D. The volumes of pipes amounts 1,400 tons.

Oleg Kuzmin, director for corporate affairs at Interpipe, commented: "The construction of terminal D is an important project and part of Ukraine's preparations for Euro 2012. In 2008-2009, Interpipe supplied products for a number of projects linked to Euro 2012. The most outstanding projects are the construction of the Dnipro Arena stadium in Dnepropetrovsk, the Donbass Arena stadium in Donetsk, the Metallist stadium in Kharkov and the Olympic Stadium in Kiev. Interpipe has been able to supply these stadiums through its network of warehouses, which cover all the key regions in Ukraine".

Interpipe – Ukraine Fax: +38 05623 89482 Email: ludmila.novak@interpipe.biz Website: interpripe.biz

## Maillefer names chairman of the board and CEO

WITH the company's chief executive officer Pentti Hätälä having reached the age of 65, the Maillefer board of directors is pleased to announce key changes within its board and management team. The directors elected Mr Hätälä to the active position of chairman of the board of the Maillefer Group. Consequently, Peter Roos was promoted to chief executive officer.

Mr Hätälä leaves his executive position after more than 30 years serving the plastics industries. He joined Nokia Machinery in Finland over 20 years ago and moved up the company's ranks. He became Maillefer's CEO in 2001. In his new role as chairman of the board, he will continue to offer his input in steering the company forward.

As Maillefer's current CEO, Mr Roos benefits from over 20 years of experience in the European automotive industry, including several years in key management positions. He joined Maillefer over a year ago as operations officer and has worked closely with Mr Hätälä during that same period.

By combining stable continuation and fresh experiences in the new management organisation, Maillefer is well prepared to further develop its leading role in providing manufacturing systems to tube and pipe industries.

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## OMS receives Subsea 2010 Award for global oil and gas exports

UK-based measurement technology specialist Optical Metrology Services (OMS) Ltd has announced that it has been awarded the Subsea Global Exports Award 2010, in recognition of the company's outstanding achievements in export sales to the global oil and gas industry.

OMS received the award at the Subsea 2010 Business Awards dinner held at the Aberdeen Exhibition & Conference Centre on 10 February 2010.

The fourth annual awards ceremony attracted more than 700 business leaders and entrepreneurs to celebrate the excellence and hard work of subsea organisations and individuals across the UK sector. Guest speakers included the Rt Hon Michael Portillo and energy minister, David Kidney.

OMS was one of three companies shortlisted for the Subsea Global Exports Award 2010.

The two other finalists were First Subsea and Dominion Gas. The award

was sponsored and judged by UK Trade & Investment.

At the awards dinner, Denise Smiles, director of business development at OMS, accepted the award on behalf of the company: "We are delighted to receive such an award, which demonstrates that OMS has been doing something very right over the last year or so. A key ingredient in sustaining our impressive sales export growth is our people, who deserve a lot of credit for helping to achieve our goals."

Subsea UK is the industry body for the British subsea industry. The organisation aims to increase business opportunities at home and abroad for the sector and acts on behalf of the whole supply chain, bringing together operators, contractors, suppliers and people in the industry. In terms of market size, experience and technology development, Britain's subsea sector is a global leader. Subsea UK now has more than 170 member companies representing the complete subsea supply chain, from operators and major contractors, to manufacturers and small technology innovators.

Headquartered in Bishop's Stortford, OMS has grown company sales revenues by 544% over the last four years – with around 80% of annual turnover from overseas customers.

OMS 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 such as aero engines, process industry tubes or manufactured cylindrical objects, where dimensions are critical.

#### Optical Metrology Services – UK Email:

hugh@optical-metrology-services.com Website:

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Phamitech is a consolidated supplier backed by the best manufacturers of their sectors in China. Choosing phamitech means obtaining immediate access to highly trained technical personnel and high level facilities, reliable information, and unparalleled services, all of which are available at an extremely competitive quality/price ratio throughout the world.

Phamitech has now emerged as one of a few companies in the world who can offer complete Tube Plants and services including all toolings and turnkey solutions by providing plant engineering for all utilities and auxiliary equipment, and as probably the only one in the world that can offer all the tube making technologies such as ERW Tube Mill, LSAW Pipe Mill, Spiral Welded Pipe Mill, Seamless Tube Mill, Copper Tube Plant, Aluminum Tube Plant, as well as all the finishing equipment.

Phamitech machines are one of the most cost effective tube manufacturing equipment available in the world. Our products are working in more than 40 other countries besides China, such as USA, Mexico, Brazil, Venezuela, Ecuador, Korea, Turkey, India, UAE, Malaysia, Indonesia, Iran, Uzbekistan, Kazakhstan, Vietnam, Cambodia, Thailand, Syria, Jordan, Pakistan, Kuwait, Iraq, Nigeria, Egypt, Sudan, Ethiopia, Kenya, Tunis, South Africa, Ukraine, Russia, Belarus, Italy, Belgium, Macedonia, Greece, and so on.

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## Helleren Hydropower Station in Norway receives a durable Hobas penstock

HELLEREN hydropower station is situated along the Helleren River north of the polar circle between Narvik and Harstad in Norway. Its wooden penstock DN 2500 has been in service since 1958 and has reached the end of its lifecycle. Hålogaland Kraft AS, one of the numerous Norwegian electricity companies that bases its business on 100% hydropower, opted for a long-term durable and maintenance free Hobas CC-GRP HydropowerLine DN 2500, PN 6 to replace the penstock.

After years of annual maintenance works, patching up the many leaks along the wooden line had become too costly. Apart from this, the plant's efficiency was increasingly reduced due to down times during repairs.

During Norway's cold winters in which temperatures may drop to -40°C, heavy blocks of ice fed on the line's leaking water and weighed down the heavily deteriorated penstock. In winter 2008, due to the load of the ice, the wooden construction was about to give way at its supports. Hålogaland Kraft AS had to act quickly and decided to exchange the long serving penstock.

Bearing the wood's disadvantages in mind, Hålogaland Kraft sought a long lasting, durable and maintenance free replacement. These characteristics should apply for both underground as well as above ground installed pipes on supports.

A perfect match was found in Hobas CC-GRP pipes, which serve all requirements and were soon the favoured option of the power producer. Not only do they offer a long and maintenance free future, but they maintain their outstanding properties whichever way they are installed. Be it above ground, without additional protection, or in soil, the UV and abrasion resistant outer surface protects the pipes' properties and ensures durability. Their easy assembly through the simple jointing system promised a short construction time, which was seen as a further decisive plus.

Since the storage area at the construction site was restricted, the DN 2500, PN 6 CC-GRP Pipes were partly delivered directly to the supports on site. This was possible thanks to the close and well functioning cooperation between the pipe supplier Hobas, the client Hålogaland Kraft and the contractor Skanska.

Once filled with water each pipe weighs 32 tons. This load is transmitted down into the ground by concrete supports. Each of them has a precast reinforced base and an upper pipe bearing that was cast on site after the line was fitted in place. Steel retainers with plate springs according to EN standards were then mounted to accommodate the strain resulting from working pressure.

The Hobas push-to-fit jointing system with its FWC couplings ensures a rapid and safe assembly for all available pipe diameters. At Helleren, the adjacent pipes were easily pulled together from inside the pipe and with the mere help of jacks. This special method





is employed to join larger diameter pipes such as DN 2500 and allows the crew inside the line to work independent of proceedings in the trench or support construction. The pipes' relatively light-weight contributed to the rapid assembly and the installation ran smoothly as expected.

The Hobas pipe receives its continuously smooth and calibrated outer surfaces from centrifugal casting and can therefore be cut and joined at any point of its length. It is furthermore completely adaptable to other materials and structures. In this case, mechanical couplings were utilised to connect the penstock to the intake at the dam of Helleren power plant.

The Helleren power station looks back on a long history: its two Voith turbines from 1907 and ASEA generators with an output of 1.8 and 2.83 MW from 1905 were originally installed for a power plant in Tinfos further south which was later used to produce electricity for one of the first artificial fertiliser production units. Due to the business' success, larger turbines were employed forming the base of what today is known as the Norsk Hydro company. The smaller turbines – now over a 100 years old – were bought by Vågsfjorden electricity company in 1958 and sent north to Helleren on small bumpy roads.

Hydropower plant operators have a good understanding of how to make long-term investments for the future. And naturally it is important that these pay. With the new Hobas HydropowerLine the owners of Helleren plant have made an excellent choice and face years of maintenance free green power generation.

#### Hobas Engineering GmbH – Austria Fax: +43 4634 82121 Email: info@hobas.com Website: www.hobas.com

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## New show attracts over 300 exhibitors

SPS Industrial Automation Fair Guangzhou opened with over 300 exhibitors from 13 countries and regions. Taking up a display area of 23,000m<sup>2</sup>, this new show is 45% larger than its predecessor – the China (Guangzhou) International Factory Automation and Instrument Exhibition, held last year.

Top brands exhibiting in the show from 8–11 March 2010 at the China Import and Export Fair Pazhou Complex included Autotec, Banner, Beckhoff, Baumer, Harting, Hilscher, Kuebler, Lenze, Leuze, Phoenixcontact, SAMD, Schmersal, Sick, Toyo and Turck.

A wide range of control technology, drive systems, components, human-machineinterface devices, industrial personal computers, integrated systems, motion control sensors and sensor technology were on display.

Recognising the growth potential of the China market, industrial automation giant Siemens presented its most advanced technology and solutions for the automation industry in a booth in excess of 250m<sup>2</sup>. Technology on energy efficiency, industrial identification, wireless industrial communication and safety as well as innovation micro-controller SIMATIC S7-1200, communication standard IO-Link and forward-looking switchgear systems with the SIRIUS innovations were also on display.

In addition, a special showcase organised by the Germany based AMA Association for Sensor Technology (AMA) presented the latest applications and developments in sensor technology from Europe. The AMA represents the interests of organisations engaged in the production of measuring devices and systems.

Renowned Taiwanese electrical and electronics manufacturers like Dinkle, Kai Fang Photoelectric, Jin Tay Industries Co Ltd and Shiun Tai Co Ltd introduced their innovative meter reading equipment, industrial personal computers and sensor technology under the pavilion organised by the Taiwan Electrical and Electronic Manufacturers' Association. SPS-Industrial Automation Fair Guangzhou also featured a variety of fringe events aimed at different industry sectors. This includes the one-day SIAF Sensor Seminar on 9 March 2010. Leading experts from home and abroad will hold 10 discussion forums on topics related to 'European Latest Sensor Technology, Application and Development'. SPS - Industrial Automation Fair Guangzhou was organised by the China Foreign Trade Guangzhou Exhibition Corporation, Guangzhou Guangya Messe Frankfurt Co Ltd, Guangzhou Overseas Trade Fairs Ltd and Mesago Messe Frankfurt GmbH, with the support of the China Foreign Trade Centre (Group) and Messe Frankfurt Exhibition GmbH.

Messe Frankfurt (HK) Ltd – Hong Kong Fax: +852 2519 8632 Email: tracey.robertson@hongkong.

messefrankfurt.com

Website: www.messefrankfurt.com.hk

## Automated welding – forging ahead

POLYSOUDE has posted financial results showing a rise from  $\notin$ 12mn in 2000 to over  $\notin$ 33mn in 2009, and states that its success is the result of continuous forward planning, which can be broken down into a number of key factors.

The company has developed generators and welding heads since 1960, together with the software enabling it to be at the cutting edge of technology. Its innovative equipment combines performance and ergonomics.



Another success factor is its international outlook, with 50% in Europe and 85% exported globally. In recent years, emerging countries/regions such as China, India and the countries of Eastern Europe (including Russia, the Czech Republic and Poland) have played an increasingly decisive part. In these regions Polysoude has become established locally with its own teams.

A major change is Polysoude's focus on mechanised welding with turnkey equipment. Based on the development of a range of generic and modular 'tools' (weld torches, motorised slides, wire feeders, etc) combined with numerical control for all applications, Polysoude has become a key partner in many industries, such as the construction of nuclear and conventional power stations.

Particular attention is also given to another specific feature: cladding by mechanised welding technology, used in many industrial sectors which are faced with abrasion or oxidation which age tubular structures and their components exponentially when manufactured without the use of this technology.

#### Polysoude SAS – France Email: a.husson@polysoude.com Website: www.polysoude.com

## New addition to Scholten management

RAINER Steven, an expert in the field of abrasion protection, has joined the management team of Scholten GmbH & Co in Wülfrath at the beginning of this year. The long-established company is responding to new challenges on fast changing markets in which it intends to continue growing.

Thanks to his distinct experience in this business sector, Rainer Steven will intensively contribute to gearing the company Th Scholten GmbH & Co towards the future by cutting-edge solutions, tailored to the individual customers' needs in the abrasion and corrosion protection sector. After a defined period of transition, the 56-year old is set to take over the general management.

For the past 10 years, Rainer Steven was working as a manager in the field of ceramic wear protection solutions. In addition to his commercial activities, he also co-developed patented wear protection solutions.

#### Scholten GmbH & Co – Germany Fax: +49 2241 97987 Email: info@wedkom.de Website: www.scholten-gmbh.de

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## **TRUMPF wins Stevie Award for sales and customer service**

TRUMPF Inc's customer service department has received a Stevie Award in the Customer Service Department of the Year category. The award was presented during the fourth annual Stevie Awards for Sales and Customer Service.

Stevie Awards organises several of the world's leading business awards shows, including the prestigious American Business Awards.

Nicknamed the "Stevies" for the Greek word "crowned," winners were announced during a gala banquet last month. Nominated customer service and sales executives from the US and several other countries attended the event.

More than 500 entries from companies of all sizes and in virtually every industry were entered in this year's competition. Nine companies were nominated for the Customer Service Department of the Year award by business professionals worldwide during preliminary judging. Trumpf was selected winner from among the finalists. "We implemented important changes in the Service Department and made big steps toward delivering excellence in customer service," said Kevin Domingue, Trumpf's vice-president of customer service.

"This wouldn't have been possible without the dedication and hard work from my people and I would like to say 'thank you' to my team."

"This year's honorees demonstrate that even in challenging economic times, it's possible for organisations to continue to shine in sales and customer service, the two most important funcations in business: acquiring and keeping customers," said Michael Gallagher, president of the Stevie Awards.

Trumpf – USA Fax: +1 860 255 6424 Email: melanie.mcmillan@us.trumpf.com Website: www.trumpf.com

## Offshore oil slug controller is a first

AN offshore slug flow control system that could save millions lost in oil production each year has won the 2010 East of England Energy Group Innovation Award. Cranfield University and a Suffolk company, Neftemer Ltd, together with five other companies and with a support of the TSB, created the Inferential Slug Control, the first

Dr Yi Cao and Elizabeth, David Whittingham's wife holding the trophy. On the back from left, David Whittingham, the director of Neftemer and Gilmar de Souza, business development manager of Neftemer



solution which systematically addresses and detects unwanted accumulations of liquids in pipelines from offshore oil production systems without compromising oil production and using subsea instrumentation.

Severe slugging, in which separated gas and liquid regions run along the pipeline leading to pressures and flow fluctuations is a common threat to hydrocarbon recovery and can even lead to equipment being damaged and facility closures. It is estimated that about 10% of offshore oil fields around the world suffer from severe slugging problems.

Dr Yi Cao, senior lecturer in the Department of Offshore, Process and Energy Engineering, said: "We are delighted to have won this award. The project has achieved all the goals set at the beginning and the outcome of the project provides a realistic solution without large investment to overcome the severe slugging threat as well as to increase in oil production. This possible increase energy recovery and to extend the reservoir operational life."

Cranfield University – UK Fax: +44 1234 758051

Email: mediarelations@cranfield.ac.uk Website: www.cranfield.ac.uk Radius Systems' 710mm water pipe deployed in new water supply main



FOLLOWING investment in new pipe extrusion lines and fittings for polyethylene (PE) pipe diameters up to 1,200mm, Radius Systems was selected for the supply of 710mm dark blue PE for the prestigious new water supply main from Fobney to Tilehurst near Reading, UK, a 7km scheme for Thames Water.

Contractor Murphy Group selected PE over ductile iron due to its engineering performance for this particular application. The installation was in a high water table area, close to a water course, and running across fields in some sections, so long lengths of butt-fused PE proved advantageous. PE's flexibility also negated the need for many bends.

The installation is part of Thames Water's ongoing investment in its water network.

#### Radius Systems – UK

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## Steel backing for internationally acclaimed choir

CAPARO Precision Tubes, an expert in the manufacture and post-production manipulation of steel tube, has provided much-needed support to the famous Caldicot Male Voice Choir. The company donated hundreds of metres of steel tube for use in the construction of the stage for the choir's annual concert in March.

The Caldicot Male Voice Choir, which was formed in 1963, sang alongside the Three Tenors (Pavarotti, Domingo and Carreras) at their concert at Wembley Stadium in 1996, and also performed at Her Majesty the Queen's Golden Jubilee, held at Buckingham Palace in 2002.

While preparing for its 2010 annual concert, the choir's management realised that they would require additions to the current staging for the event, to enable the choir to be staged in an arc formation by using wedge sections of steel frames. They contacted Caparo Precision Tubes with a request to assist in the supply of steel tube for the frames. The stage needed to fit the choir's purpose-built hall

and the local leisure centre, be sufficiently load bearing, and provide a quality longterm solution for the formation. After establishing the exact requirements, Caparo Precision Tubes agreed to provide 170 lengths of zinc plated ERW tube, complete with swaged ends, in order for the stage construction frames to fit together. In addition, CPS delivered 20 lengths of zinc plated flat sided oval steel tube, which were also used for the construction of the frames.

Leon Jones, Chairman of the Caldicot Male Voice Choir, who worked closely with Caparo Precision Tubes on this project, was highly complementary of the business and the support provided: "From the initial point of contact through to the very delivery of the tube components, Caparo were there for us every step of the way."

"We were more than happy to support this internationally acclaimed act," commented Dennis Morrill, managing director of Caparo Precision Tubes.

Caparo Precision Tubes – UK sales@caparoprecisiontubes.co.uk www.caparoprecisiontubes.co.uk



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Messe Düsseldorf GmbH Postfach 101006



## French automaker awards a major contract for TruDisk disk lasers

OVER the next two years, PSA Peugeot Citroën will be equipping its production sites with additional, next-generation TruDisk disk lasers, according to a agreement announced recently with Trumpf.

The French automaker has asked Trumpf to supply the company with disk lasers in a range of output levels and beam qualities from its TruDisk series. PSA will now have a quantity of TruDisk lasers that number in the double digits for welding and soldering body components on its various models of cars.

PSA has used disk lasers for many years for the welding and soldering involved in auto body construction. The company awarded the order based on TruDisk's low operating and investment costs and its high degree of availability in production.

Trumpf – USA Website: www.us.trumpf.com

## Shell and the Technip-Samsung consortium take next step on Prelude floating LNG facility

SHELL has signed two contracts with the Technip and Samsung Heavy Industries consortium for the Prelude floating liquefied natural gas (LNG) project off the coast of Western Australia.

These contracts formalise the announcement made by Shell in October 2009 that Prelude is in the engineering and design phase of development.

The first contract covers the front-end engineering design (FEED) elements specific to the Prelude project, taking into account the composition of the gas, local weather conditions and other site-specific factors.

The second contract details the terms under which the floating LNG facility would be built, if the final investment decision for the Prelude project is made.

Planning for Prelude is progressing well and the signing of the deal follows a July 2009 master agreement between Shell and the Technip-Samsung consortium to work on the design, construction and installation of multiple floating LNG facilities over a period of up to 15 years. The floating design will allow Shell to place gas liquefaction facilities directly over offshore gas fields, precluding the need for long-distance pipelines and extensive onshore infrastructure. This provides a commercially attractive approach for developing offshore fields.

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# Valve World Expo receives early bookings

MESSE Düsseldorf GmbH will be holding the Valve World Expo with an accompanying conference for the first time from 30 November to 2 December 2010. Innovative industrial valve and fittings solutions will be on display during the fair.

Even though the premiere is nine months away, 420 companies from 35 different nations have already registered and will participate. An area of more than 12,000 square metres has been reserved for the event. Numerous gas and oil pipelines are being planned and built worldwide to meet the increasing demand for energy but it is already questionable whether every pipeline can be supplied with sufficient gas and oil. One thing is for certain, namely that the ever increasing construction of transport pipelines will present the valve industry with big economic opportunities. European manufacturers in particular expect to benefit significantly from the major Nord Stream, South Stream and Nabucco projects.



The Valve World Expo will be held from 30 November until the 2 December 2010

Improved living standards the world over will call for a corresponding rise in energy needs. Emerging nations, such as China and India, are therefore cranking up consumption. But West Europe is also hankering for more gas and oil. Experts expect annual worldwide needs to increase from 107,000 terawatt-hours to 160,500 TWh by 2030. The forecast is for this figure to double to about 320,000 by 2060.

Fossil energy carriers, which have an 85% share of primary energy consumption, play the leading role and things will not change over the next few decades. Quite the contrary, as oil and gas consumption will continue to rise. For this to happen, the energy infrastructure will have to be vastly improved. New pipelines or liquefied natural gas terminals should keep everything flowing.

There is a need for action in Europe. According to predictions, gas needs will climb from 314 billion cubic metres in 2005 to 509 billion in 2025. At the same time, production is falling in the North Sea gas fields, whose reserves are slowly being exhausted. A dilemma. Europe is therefore now banking on three new pipelines, Nord Stream, South Stream and Nabucco.

Messe Düsseldorf – Germany Fax: +49 2114 56087 Email: hartmannp@messe-duesseldorf.de

Website: www.messe-duesseldorf.com

# New general manager sales

STEFAN Schwarz has been appointed general manager for the sales division at Friedrich Kocks GmbH & Co KG located in Hilden, Germany.

The new general manager sales, Stefan Schwarz, has been working successfully for Kocks for several years, and for more than 60 years the independent, mediumsize, family-owned company has been successfully operating in the field of rolling mills for tube, wire rod and bar worldwide.

#### Friedrich Kocks GmbH & Co KG – Germany

Fax: +49 21035 4028 Email: v.d.heiden@kocks.de Website: www.kocks.com

# Submerged arc furnaces at China Bluestar International

SMS Siemag, Germany, has successfully commissioned two submerged arc furnaces at China Bluestar International Chemical Co Ltd.

In mid-2009 SMS Siemag was awarded the contract for the supply of the submerged arc furnaces at the Yongdeng, Gansu works. The scope of supply includes the basic engineering for a new production plant and its ancillary units, the layout, design and supply of six electrode columns, the high-current line made of copper and the hydraulic system. SMS Siemag will assist with the installation and metallurgical commissioning.

In addition to 20,000 tons of silicon per year, this plant will supply more than 9,000

tpy of fine SiO<sub>2</sub> dust as a valuable raw material for cement manufacturing.

SMS Siemag had already successfully modernised two silicon-metal furnaces at the same location in 2004.

China Bluestar International Chemical Co Ltd is a Chinese manufacturer of metallurgical silicon which is further processed into material for the semiconductors industry. The process involves the conversion of quartz to silicon using carbon in the submerged arc furnace.

#### SMS Siemag - Germany

Fax: +49 21188 14386 Email: thilo.sagermann@sms-group.com Website: www.sms-siemag.com

# German equipment installed at Chinese tube plant

FRIEDRICH Kocks, Germany, has received an order to supply a stretch reducing block and a rotating hot saw, for the core of a new continuous production plant. The order was placed by China National Petroleum Corporation within the frame of the construction of a welding tube plant at its subsidiary Baoji Petroleum Steel Pipe Co Ltd in Baoji, China.

Baoji Petroleum Steel Pipe was originally founded in 1958, and was the first Chinese manufacturer of tubes using the submerged arc welding method. The company now produces 1.25mn tons of steel tubes per year in several works. Its new welding tube plant has been designed to allow continuous welding and stretch reducing in one step – the tube is in the welding line and in the stretch reducing block at the same time.

After completion, the new plant will produce up to 300,000t/a of high-quality welded tubes. The range of products will include tubes within a diameter range of 60.3 to 177.8mm, with wall thicknesses of 4.83 to 13.72mm, according to international standards for applications in the oil and gas industry. The 3-roll stretch reducing block in

'star drive' design, which will be used for the first time in a tube welding plant, will roll all finished sizes out of only one mother size of 193.7mm diameter.

The SRB will be designed for the use of up to 24 non-adjustable and adjustable stands with a nominal roll diameter of 360mm. The last three stands used in the block are adjustable finishing stands; the other stands are non-adjustable reducing stands.

The quick changing system for the stands and the roll shop with quick roll changing reduce the required quantity of changing stands, for optimum production.

The RHS 1000 rotating hot saw, which will be installed between the SRB and the cooling bed, allows the production of different tube lengths with tight length tolerances. Complicated batch conveyors and saws behind the cooling bed can be omitted, reducing investment and maintenance costs.

The scope of supply also includes roll shop equipment, electrical equipment,



The machinery produces tubes up to a diameter of 177.7mm

automation systems, and basic engineering for local production (obligatory in China), such as gratings, roller conveyors, ejector and cooling bed. Supervision of assembly and commissioning, training of operators, and the transmission of process know-how are also Kocks' responsibility.

Commissioning of the new tube mill is planned for the second half of 2011.

Friedrich Kocks GmbH & Co KG – Germany Fax: +49 2103 54 028 Email: v.d.heiden@kocks.de Website: www.kocks.de



# 2010 China International Special Steel Industry Exhibition to welcome leading Chinese companies

JOINTLY organised by the Special Steel Enterprises Association of China (SSEAC) and the China Council for the Promotion of International Trade (CCPIT), 2010 CISSIE – the 2<sup>nd</sup> China International Special Steel Industry Exhibition will be the highlight of China's special steel industry next year. Many industry core players will be gathered under one roof bringing together an integrated and specialised event, where advanced techniques and equipment will be displayed and cooperation will be developed.

2010 CISSIE – the 2<sup>nd</sup> China International Special Steel Industry Exhibition will be a showcase of plant facilities, equipment and technologies for the production of speciality steel including: furnaces, mills, forging equipment, finishing and surface treatment equipment, automation systems, packing and conveying equipment, analytical and testing instruments, materials like scrap, ore, black lead, non-ferrous metals, alloys and all sorts of steel; research and scientific institutions, professional consultancy organisations and industry media.

Inaugurated in 2008 in Shanghai, the first edition of CISSIE – the China International Special Steel Industry Exhibition brought about leading players in China like Baosteel Group Corporation, Dongbei Special Steel, Pangang Group, Zhong Yuan Special Steel, Nanjing Iron & Steel United, Zhengzhou Yongtong Special Steel, Jiangsu Tiangong Group, Heye Special Steel, Jiangsu Shagang Group, Shenzhen Zhaoheng Fushun Special Steel, Jiangxi Nanchang Changli Iron & Steel, Qilu Special Steel, Kunshan Mingyuan Special Steel, SA Copex and Wuxi Fog Systems covering an area of 4,000m<sup>2</sup>.

SSEAC, as one of the organisers, is the only legal national special steel association in China. Formed in 1985, its four committee member companies are Taiyuan Iron & Steel (Group) CoLtd, Dongbei Special Steel Group CoLtd, Baosteel Group Corporation (Baosteel) and Jiangyin Xingcheng Special Steel CoLtd.

Pilatus International Co Ltd – China Fax: +86 85228 380397 Email: svc@pilatus-co.info Website: www.supersteel.cn

# Holding Centravis certified by Aramco Overseas Co

MANUFACTURER of seamless stainless steel tubes, Centravis, has been successfully certified and has joined the ranks of the officially approved suppliers of Saudi Aramco, a leading company in the oil and gas sector.

During the audit of the Centravis Production Ukraine plant (Dnepropenrovsk region, Nikopol), representatives of Aramco Overseas Co visited the cold shop and the hot shop, and reviewed in detail the production technology, new equipment, environmental and social regulations, and product quality management system.

On 29 December 2009, according to the Internal Standards of Quality Management System and requirements to the production process technology of the companies Saudi Aramco Co and Aramco Overseas Co, and also of the International Quality Auditing System, Centravis was granted the status of official supplier of Saudi Aramco. This status ensures the possibility to supply seamless stainless steel tubes with outside diameter up to 114mm and U-tubes with outside diameter up to 38mm.

Yuriy Atanasov, general manager of Centravis Holding, commented, "It is a great honour for us to be in the rank of officially approved suppliers of the biggest company in the oil and gas sector in the Middle East. We plan to strengthen our cooperation by extending the certified product assortment up to the diameter 219mm."

Centravis's product portfolio includes more than 1,000 standard sizes of tubes and pipes of more than 100 types of corrosion-resistant and heat resistant steel grades in seven segments: general tubes and pipes; boiler tubes and pipes; heatexchanger tubing; instrumentation tubing; furnace tubing; hollow bars; and Ni-alloys. Products are used in the chemical and petrochemical industries, nuclear and thermal power engineering, non-ferrous metallurgy, machine and shipbuilding, and the food industry.

Centravis product quality is confirmed by international certificate EN ISO 9001-2000. Products are manufactured according to American standard ASTM, German DIN, French NF, Italian UNI, Russian GOST and TU.

Centravis Production Ukraine Email: info@centravis.com Website: www.centravis.com





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# TECHNOLOGY UPDATE

# New trends for ERW pipe mills

DALIAN Field Company is an ERW pipe mill manufacturer that prides itself on developing quick-change technology. The company has many approved patents in this area such as cage forming for square pipe forming machines, which operate without changing rollers when changing product size. The cage forming square and round pipe forming machine is the first machine to combine cage and directly square and rectangular forming together, less roller quantities, shorter changeover time and a higher degree of automation.

Along with the further development of pipe mill technology, Dalian Field said it has conducted a number of studies on simplifying the operation of a pipe mill. 'Digital – no load – setting – adjustment' (DNSA) technology was brought in following the research. Firstly, all setting points are displayed in a numerical way, as numeralisation is the foundation of DNSA technology and leads to many important improvements.

For example, it is used when building a mathematic model to program the adjustment of the mill. Even an inexperienced worker can adjust the mill to high precision and produce qualified pipes with little or no waste after reading the manual or 10 minutes simple training. The mill with DNSA technology not only has less waste, a shorter time to make adjustments and low dependence on operator's experience, but also has a trouble-free operation. From a practical point of view, the mill has good tolerance with the raw material and strip joint quality, because the rollers are in pinpoint control.

A normal pipe mill is also able to produce qualified products, but often depends on the operator's experience. The adjustment is done wth the eye of an experienced worker. They cannot ensure each roller is in exactly the correct position. They can only adjust the mill to produce qualified pipes.

For the DNSA pipe mill, every roller is in the correct position, so the mill's working condition is stable, and the mill has a strong ability to resist outside interference. For the normal pipe mill, every roller may not be in the correct position and the adjuster does not know which roller is in the wrong position and how much the offset is. They can only can adjust rollers by observing the actual running strip.

Sometimes correct rolls are adjusted and wrong rolls are not adjusted, then all the rollers are adjusted on an offset position. It also can produce qualified pipes, just like the mathematical law – double negatives makes a positive. The problem is that the mill working condition is not stable even in a critical condition. Every tiny change of the mill may break the balance. That is why some adjusters can spend longer than needed making constant changes to the mill. The busier the adjuster, the lower the product quality and quantity and the lower the profit.

In the pipe industry the adjustment time for producing the end products is important to the end user. Some pipe mill manufacturers may fail to notice this, when they are focusing on the methods of changing rolls. The adjustment problems are exposed, after the changeover period is shortened and the workload is reduced by the improvement of mill construction. These problems can be classified as adjustment duration, adjustment workload, raw materials and power consumption. Those who have the experience of producing ERW pipes know how important an adjuster is. Also, to train a qualified pipe mill adjuster can take a verv long time.

Since high quality, speed mills are popular in the market, the company said the ERW pipe mill with DNSA technology could become important for future ERW pipe mills due to its efficient performance.

# Dalian Field – China

Fax: +86 41183 192716 Email: field@asiafield.com Website: www.asiafield.com



# Fresh era in MIG/MAG welding

EWM's alpha Q system provides six fullscale welding processes in one machine: coldArc<sup>®</sup> and forceArc<sup>®</sup>, MIG/MAG pulse and standard processes, TIG (liftArc) and MMA welding. It is possible to switch between applications at any time, as well as to combine different processes, while retaining seam quality and efficiency.

The system allows the thinnest of panels to be joined at low heat, in addition to welding and brazing new materials and mixed connections. EWM states that the system's excellent gap bridging allows root passes to be handled easily and safely, and that deep fusion penetration, simple handling and a high welding speed mean the high pressure, forced welding arc can be used to weld thick panels while claiming saved production costs of up to 50%.

This is provided by a single machine combining the EWM coldArc and forceArc processes, rounded off by a pulse welding arc. These welding processes allow all seam types to be realised from one power source, and result in a welding seam with such low spatter that post weld work is virtually unnecessary.

The alpha Q range – 330, 351 and 551 – provides a system that can be flexibly configured for specific applications, from portable, modular or compact to mobile. For alternating between coldArc and forceArc welding, a twin case or two individual wire feed units are available, so the user always has the required filler wire and gas.

**EWM Hightec Welding GmbH** – Germany Fax: +49 2680 181 244 Email: info@ewm.de Website: www.ewm-group.com



AlphaQ 551 from EWM **Cut-off blades** 

KENT Corporation, in cooperation with a tube-producing customer, has developed a special cut-off blade for use in the most difficult applications.

The new blade resulted in an increase in life of over 200% over the standard blade. Kent Corporation, the tube producer, and the blade manufacturer achieved the results through a vigorous testing programme. This

technical approach to increasing blade life is available free to all blade customers to make sure the blade they are using is optimised for their application.

A new coating SNB is available as well and has shown double to 10 times the life on applications where excessive heat is created.

Kent Corporation – USA Fax: +1 440 237 5368 Email: sales@kenttesgo.com



# Multi-Cut MC3 tube cut-off machine

LINSINGER Multi-Cut features three small diameter circular saws mounted on a rotating frame. The tube is positioned and clamped and the three circular saws cut into the tube while the frame rotates 120°. The very short cycle times enhance the output performance of state-of-the-art tube mills.

The robustly designed control system allows independent operation of each saw blade, and enables uninterrupted production, even in the event of partial tool breakage. This feature reduces unplanned stoppages by automatically allowing production to continue without interruption with two saw blades and the frame rotating 240°.

The lifetime renewal cost of conventional large diameter blades is many times higher than the initial machine investment. The potential savings offered by the smaller Linsinger Multi-Cut blades far outweigh the additional machine investment. For example, for tube diameter range 150–660mm, the renewal cost of a Multi-Cut blade is up to 15 times lower than the renewal cost of a conventional large diameter blade.



The smaller blade diameter with higher blade stiffness used by the Linsinger Multi-Cut MC3 offers the bonus of significantly improved blade life. The resulting additional savings in running cost reduce the pay-back period to two to three years over conventional large blade sawing machines.

As Hans Knoll, Linsinger CEO commented: "The Multi-Cut is a very low

cost solution. Even if others would give away conventional sawing machines for free, the potential operating savings offered by the Linsinger Multi-Cut prove to be more attractive. Multi-Cut technology is not only cheap to operate, but also well proven, having been derived from flying tube cut-off know-how."

#### Linsinger Maschinenbau GmbH – Austria Fax: +43 7613 8840 951 Email: maschinenbau@linsinger.com

Website: www.linsinger.com



# **Combination for thread generation**

TOOLING giant Walter GB is offering the twin force combination of Titex drilling and Prototyp tapping as a tooling package for high-performance yet cost-effective thread generation.

The Walter Titex X-Treme Plus drill provides effective machining of up to five times diameter on steel, cast iron, stainless and non-ferrous materials courtesy of an internal coolant supply coupled with Walter Titex's innovative double performance line (DPL) double coating.

Comprising a basic coating to protect the tool and to optimise the adhesion of the special tip coating, the innovative DPL technology enables the tool to operate at greater cutting speeds than usual while offering extended tool life at conventional cutting parameters.

Complemented by any one of three Walter Prototyp taps, the result is maximum thread generation efficiency. The trio is: Prototyp ECO-HT tap – a universal HSS-E-PM tap with THL coating and innovative surface treatment, capable of operation at three times diameter for use in both short and long chipping materials, and offering high-integrity process reliability without bird nesting and with long tool life even at maximum cutting speeds; Prototex ECO-HT – with spiral point form for through-hole thread generation; Paradur ECO-HT – with R45 helix angle, chamfer form C, bevelled thread run-out and long flutes for blind hole threading.

Walter GB is providing the 'off-the-shelf' kits for blind and through-holes – each equipped with a Titex X-Treme Plus drill and two Prototyp taps – in a range of sizes to suit varying applications.

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# Expanding production of welded steel pipes

MACEDONIAN producer of welded steel pipes, IGM Trade, has expanded its range of welded steel pipes. The company's new pipe line can produce square pipes up to 250x250x12mm and rectangular pipes up to 300x200x12mm, increasing the capacity of the factory to 250,000t per year.

The company has also invested in new slitting lines: one combo slitting line, and one to accommodate widths of 2,000mm, thickness of 16mm and lengths of 15m.

The owner of the factory, Mr Ilija Gechev, said that IGM Trade is the largest green-field investment in South-East Europe, with an area of 400,000m<sup>2</sup> and covered space in buildings and halls of 150,000m<sup>2</sup>. The company's next goal is to invest in a cold rolling mill.

The production programme of IGM Trade also includes round pipes up to 168.3x6mm, tested pipes under pressure of 50 bar up to 88.9x4mm, oval pipes and RP profiles.



IGM Trade's new line will allow it to produce an increased range of welded steel pipes

The company supplies around 10% of its pipes to the domestic market, and exports 90% to the EU and Balkan markets. Production is certified with ISO 9001 and CE-mark.

IGM Trade – Macedonia Email: info@igmtrade.com Website: www.igmtrade.com

# Rotary draw tube bender

THE TB130 Top Bender model is designed to produce consistent quality bends in large diameter pipe, tube, squares, rectangular, solids and other profiles. Easy access to automatic and manual operating modes, programming, system diagnostics and multiple language capability offered with PLC touch screen control. Unlimited program storage is available with USB – up to 12 bends per program.

TB130 bends any angle to 180° with independent spring back compensation for each bend and bends to a centreline radius as small as 2D. The engineered heavy-duty steel gear case accepts bend profiles with CLR to 27½". Patented swing away counterbending die vice and quick-change tooling system with multiple radii are also available.

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# Finishing line for copper tubes

ASMAG, Austria, a leading machine supplier to the non-ferrous metals and steel industry, has developed a new generation of finishing line for copper tubes in the diameter range from 12.7mm to 28.6mm.

The newly designed production line primarily consists of an automatic basket storage and handling system, double basket pay off, automatic pointing including plug feeding and inner lubrication unit, continuous drawing machine, two axis straightener, eddy current testing table, embossing and marking unit, rotary shear and a recutting and de-burring unit.

Tube feeding to the continuous drawing machine occurs alternately from two pay off tables. During drawing of one coil, preparation of the next coil can be accomplished at the second pay off table. An automatic basket manipulator enables discharging of empty baskets and delivery of full baskets. After loading of a full basket to the pay off table the operator takes the tube end out of the basket. Without affecting the productivity of the machine, this quick and simple procedure can be performed at the operator's leisure. Injection of lubrication, insertion of plug, dimpling of the tube, pointing and transport of the tube to the drawing die takes place automatically.

During design and development particular attention has been paid to minimising change-over times. Quick release fasteners and motorised actuators simplify and speed up change-over procedures significantly.

The high degree of automation of the line guarantees a consistent machine cycle time.

This allows the operator to focus exclusively on tube quality checks. Automated basket logistics including alternating charging from double pay-off tables minimises auxiliary process times and ensures interruption-free production. An unprecedented productivity standard comes along with the high line speed.

Asmag GmbH – Austria Fax: +43 7616 8801 44 Email: sales@asmag.at Website: www.asmag.at

The Asmag finishing line







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A403-WP304L,WP304,WP304H,WP316,WP316L,WP316H

#### STANDARD:

ANSI B16.9, ANSI B16.28, MSS-SP-75 DIN2605-1, DIN2616-2, DIN2615-1, DIN2615-2 DIN2616-1, DIN2616-2 EN10253-1, EN10253-2



# Hebei Wenlong Pipeline Equipment Co., Ltd

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# Non-contact in-line dimension measurement for tubes

ZUMBACH systems in the steel and metal industry are used for manufacturing hot and cold rolled products and in cold processes for semi-finished products. Typical areas where Zumbach systems are used are hot rolling mills for wire steel rod, profiles and seamless pipes, for the manufacture of welded pipes, test stands (NDT) as well as all cold processes, like peeling, grinding, straightening and polishing.

Zumbach claims its products offer closer tolerances (1/2, 1/4 DIN), zero fault, quality control, higher productivity, faster start up, less down time and less manpower.

It says its Steelmaster gauges and systems help fulfil the high requirements of the market. Steelmaster systems are based on the latest technology and on the experience with close to 300 units in hot rolling and similar processes and they are backed by many thousand ODAC<sup>®</sup> scanners, operating in cold processes.

The Steelmaster processor is the brains of the system. It processes the measuring data, communicates with the plant network and provides the operator with self-explanatory displays and key data. The process transparency is dramatically improved, especially if multiple measuring heads are installed.

Steelmaster gauges offer a number of advantages for easy integration, dependable operation and data processing and display: hi-tech laser scanners with top accuracy; up to 6,000 measurements/s (1,000 per scanner); compact industrial PC with



The Profilemaster<sup>®</sup> measuring unit (heavy duty and fully protected version for harsh environments with four laser/camera modules)

highest working reliability; highly developed software; sophisticated mechanics and protection system; and close to zero maintenance.

The Profilemaster offers accurate in-line profile measurement using light section principle and machine vision.

One or up to six laser/camera modules measure the cross-section of the moving profile. A powerful PC-based processor adds the partial pictures of the cameras made up of straight lines and radii together to yield the momentary cross-section of the profile.



All relevant dimensions such as width, height, angle and radii are added together to form the full cross-sectional picture. The nominal values for the profile can be directly imported from the CAD construction (as DXF file), which allows easy and problemfree programming. Changes in speed and twist within normal limits have no effect on the measurement.

When designing the system, concentration was focused on the most suitable solution in terms of price/performance ratio for the application. Due to the modularity of the Profilemaster system this goal could be achieved.

The combination of one to six laser/ camera modules allows the measurement of virtually all shapes, achieving an optimal measurement result with the smallest possible number of laser/camera modules.

The ODAC Trio system is based on Zumbach's previous experience of problems faced in the industry, gained over many years of designing and manufacturing optical diameter gauges. The measuring heads features three integrated measurement axes; conventional two-axis instruments with laser or CCD can only provide approximate values for min. OD, max. OD and ovality. The mean value (X+Y/2) is influenced by the orientation of the product ovality within the measuring field.

Zumbach Electronic AG – Switzerland Fax: +41 32 356 04 30 Website: www.zumbach.com





# **TUBIFICIO DI TERNI**

# AN AVANT-GARDE REALITY IN THE PRODUCTION OF ELECTROWELDED STAINLESS STEEL TUBES



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W1.4301 - 304 W1.4541 - 321 W1.4828 -W1.4404 - 316L

# FERRITIC GRADES

W1.4512 - 409LI W1.4510 - 439M W1.4509 - 441LI W1.4513 - 436LI W1.4003 - STR12

# Sandvik demonstrates its development capability

SANDVIK Materials Technology's stainless steel and advanced materials offers comprehensive seamless tube and pipe product in keeping with its reputation for research and development.

The latest hyper-duplex stainless steel, Sandvik SAF 3207 HD<sup>®</sup>, optimises material strength and corrosion resistance and extends the properties of Sandvik's industry standard super-duplex grade, Sandvik SAF 2507. Use of the new grade makes it possible to develop installations and explore new oil and gas fields that were previously thought to be too expensive and technologically unattainable.

Developed for use in deeper, more remote subsea umbilicals operating in aggressive environments, Sandvik SAF 3207 has a higher yield strength to withstand increased pressures, facilitating thinner wall umbilicals that reduce reel sizes and lower installation costs.

It extends the operating capabilities of hyper duplex materials having an extremely

high tensile strength of 980-1,180 MPa and increases the operating temperature to  $90^{\circ}C$  ( $194^{\circ}F$ ).

Another specifically developed hyperduplex stainless steel is Sandvik SAF 2707 HD<sup>®</sup>, designed for service in highly corrosive conditions, such as seawater cooled heat exchangers. It is particularly suited to aggressive, chloride-containing environments and displays excellent resistance to pitting.

This makes it ideal for chemical, petrochemical and refinery industries to meet higher industry demands on performance while maintaining the reliability and safety of equipment.

Manufacturing dedicated seamless tube and pipe for the power generation and nuclear industry, Sandvik is set to increase its production capability as a result of significant orders for steam generator tubes for the US and Chinese markets. Its development programme also includes special tubes for high efficiency, new generation power plants that operate at increased temperatures.

With over 40 years' experience, Sandvik is constantly adapting to the changing market conditions and the requirements of its customers by innovating and adding new, more specialised and higher performance products to its already impressive range of steels.

A number of new material examples were used including duplex grades, developed to meet the increasing demands on construction materials for oil and gas exploration and production materials; the extensively enhanced machinability Sanmac grades, including hollow bar, which boost productivity for machined components; materials that extend seamless tube life in highly corrosive environments such as urea, ethylene and petrochemical plants, in addition to hydraulic and instrumentation tubing in Sandvik SAF 2304<sup>®</sup> that withstand nearly twice the pressure of standard material tubes.

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Friction saw blades Segmental saw blades Circular knives Services

# Cost comparison at the touch of a button

THE new Web Calculator provides transparency when selecting procedures for laying plastic pipelines. For the first time a program reveals which of two procedures is the most cost-effective and, like a compass, indicates the right direction for economic pipe installation. This tool has been developed by egeplast and provides those responsible for projects with a quick overview with detailed comparison of costs.

Installation lengths, diameters and installation depths are entered on the start page. Then the SDR for specific pipes can be stipulated, as can delivery forms and delivery lengths. The Web Calculator then calculates which of the two procedures under consideration is more efficient with respect to the costs it has previously estimated for the construction site. The user is also able to see in the clearly structured overview where the cost advantages of the respective procedures lie. The calculated projects can be saved and called up again at any time for further processing. It is possible to compare seven procedures with each other using the Web Calculator: open trench installation with and without sand bed, horizontal directional drilling, milling and ploughing procedures, pipe bursting and relining.

The Web Calculator can be used free of charge by anybody at www.webkalkulator24. com or at www.egeplast.eu with immediate effect. Those interested simply need to register on the start page. They will be cleared to use the Basic Version and can begin with their desired calculations.

It also costs nothing to register for the Premium Version, which also gives users the opportunity to vary parameters such as unit prices when taking local and regional influencing factors into consideration. Doris Pannwitz from the Web Calculator project team at egeplast helped to develop the program: "We can see that the Web Calculator is a real aid to decision making for everyone involved in a project."

egeplast Werner Strumann GmbH & Co KG – Germany Fax: +49 25759 710110

Email: info@egeplast.de Website: www.egeplast.eu



The egeplast Web Calculator shows which of two installation procedures is more cost effective

# Tube end working processing

AS a manufacturer of machines for the processing of tube end work pieces, particularly for the natural oil and gas industry, Unitube Technology GmbH has gained a position in the market as an independent enterprise since it was first established.

The processing principle of the modular machine tool series "Fixed work piece processed with circulating tools" guarantees a high degree of productivity and manufacturing quality.

Flexibility is another essential aspect of the Unitube machine series. On the one hand, it addresses the size of the machine: apart from four standard sizes (200, 400, 600 and 1,400 depending on the maximum tube diameter in mm) special sizes are feasible as well. On the other hand, the MWZ are flexible when it comes to ways of processing. It enables various operations to be performed such as thread and outline processing (Version G), the tapping of tube ends or sections (Version T) and the processing of welding chamfers (Version F). Some special features of the modular machine tool series are: the core element is a tool holder with individual approach (CNC) of tool slides. For each and every one of the maximum six slides (X-axis) a servo motor introduces a feed movement into the rotating system of the main spindle (C-axis), where the tool holder is fixed. The latter is completely independent from the speed of the main spindle thanks to a patented drive system. The feed motor only has to be used if a tool slide is supposed to move.

A Russian tube factory has been convinced by these advantages lately. For the processing of tube ends according to standards GOST 632-80/633-80 and API 5B/5CT with a nominal diameter between  $4\frac{1}{2}$ " (114.3mm) and 9  $\frac{5}{8}$ " (244.5mm), the

Russian customer

ordered a special size, namely die MWZ 250 G-CNC. The machine produces both external taper and thread in just one single processing step. In addition to that, outlines and seal seat connections are machinable and even the separation of tubes can be effected with this machine.

Thanks to the modular concept of the Unitube Technology GmbH, customers' special requests can be processed quickly, individually and according to quality standards in the future.

Unitube Technology GmbH – Germany Fax: +49 371 400 2969 Email: info@unitube.de Website: www.unitube.de

The Unitube machine series



# TECHNOLOGY UPDATE

# Controlling high frequency electric welding

WESCO has introduced two new developments to improve the quality of pipes in welding applications.

One problem faced by manufacturers of value-added pipes such as water pipes, oil pipelines and structural pipes is how to adjust welding energy when the speed increases. Operators who depend upon their own experience have no exact data, and may have difficulty controlling the speed and adjusting welding energy to the varying speed of the pipes.

Weldcom is a system that controls high frequency electric welding to provide uniform welding quality, controlling welding energy as to the change of the speed. The system detects sparks that occur in the short-circuit when welding, and monitors major welding factors such as plate voltage, welding power, speed and departure frequency.

Wesco's new seam annealing automatic tracking system, applied to seam annealing

apparatus in making high quality tubes such as API standard, automatically traces twists on both sides of the seam, which naturally occur during the welding process, and helps smooth heat treatment through automatic tracking.

The system detects the seam in the tube, and automatically detects welding spots using both image sensor and tilting

sensor. The image sensor processes image data around welding spots and, based on this data, the tilting sensor detects the seam in the tube.

Wesco – Korea Fax: +82 32 582 0725 Email: wesco@wesco.co.kr Website: www.wesco.co.kr







# Ultrasonic flowmeter to create breakthrough in small bore metering

A NEW high-accuracy and low-cost ultrasonic flowmeter is set to create a breakthrough in small bore flow metering. 'The Atrato' will be launched at this year's Mtec Exhibition at The NEC Birmingham. It uses patented technology that enables the direct through meter to handle flows from laminar to turbulent.

With accurate and cost effective flow measurement becoming increasingly important to many industries, Titan Enterprises has developed this exclusive product with one of the foremost fluid engineering establishments, Cranfield University. The Atrato is capable of monitoring flow over a range of 200:1 and has an accuracy better than +1.5% but equally impressive, its simple design and USB interface make it extremely easy to install and use.

The device uses the favoured 'time of flight' measurement system where a signal is passed along the pipe with the flow and back up the pipe against the flow, the difference in these signals produces the flow rate. Until now, this technology has been deemed expensive and sometimes inaccurate; however Titan's founder Trevor Forster believes the Atrato's fully symmetrical, concentric signals coupled with the ability to achieve desired timing accuracies makes it a new market leader. It being largely immune to viscosity makes the Atrato even more appealing to customers. Titan's Atrato is aimed at the wide customer base and should satisfy critics in industrial engineering, plant operators, medical equipment supply, drink dispensing, and laboratory technicians. According to Mr Forster, one of the unique aspects of the Atrato is the computer interface.

He commented: "The USB connection permits the user to monitor the rate and total on their laptop in addition to operating parameters such as the pulse resolution units. At a later date, data logging and operation statistics will also be possible."

Having championed the technology Mr Forster said: "Fundamentally, my position is that the future of flow measurement is going to be ultrasonic or coreolis. They're the only two long-term viable technologies because they're not intrusive."

He continued: "I am delighted after designing flowmeters for around 40 years, to launch The Atrato, which I believe is a true contender in challenging conventional flow meter thinking, the world over.

"We have a successful business selling well over 250,000 flowmeters and I have an experienced team of staff and family behind me. I think it is our integrity and problem solving approach that has led us to a 95% repeat business rate and customers in more than 40 countries."

Professor Mike Sanderson, Emeritus Professor of fluid instrumentation, Cranfield University agreed. He said: "The Atrato's unique clean bore construction makes it ideal for hygienic applications. The use of low frequency ultrasound and advanced signal processing to interrogate the flow ensures that the flowmeter provides high accuracy over a wide turndown range. In addition the technology developed for the Atrato has the flexibility to provide the basis of a family of flowmeters suitable for an even wider range of flows and applications."

Titan Enterprises – UK Fax: +44 1935 812890 Email: sales@flowmeters.co.uk Website: www.flowmeters.co.uk



The Titan device uses the time of flight measurement system that passes a signal along the pipe



# TECHNOLOGY UPDATE

# Spiral-welded pipes and flat rolled products

US Steel Košice sro, a subsidiary of USS Corporation, is a producer of flat rolled products with an annual production capability of 4.7 million tons. The company produces a wide range of hot rolled, cold rolled and coated sheets for different industries.

In addition to flat rolled products, the company produces spiral-welded pipes, made from structural and micro-alloyed hot rolled coils. The pipe diameter dimensions vary from 406 to 1,422mm, with wall thicknesses from 5 to 14.2mm and lengths from 8 to 18m. The production process is continuously monitored; the pipe surface and welds are systematically inspected using series of non-destructive tests, and all results are recorded and archived.

All pipes are manufactured in accordance with internationally recognised API, EN and DIN standards, with grades up to X70 according to API Spec 5L, or L 485 MB according to EN 10 208-2 standards. To keep up with recent trends US Steel Košice has expanded its production range for extra high-strength steel to X80 or L 555 MB grades respectively. Because of greater yield strength, the X80 pipes are particularly



The US Steel Košice sro pipe products

suitable for high-pressure pipelines, including main gas pipelines. Thanks to a reduction in wall thickness, with all other parameters remaining unchanged, the pipes provide an alternative to longitudinally welded pipes, as well as to spiral-welded pipes of lower grades. In addition, the reduction of wall thickness results in a weight decrease, which allows more efficient transportation.

The company has been producing spiral-welded pipes since 1960. Since then, more than 24,000km of pipes have been produced, representing around 3.5 million tons. The company takes advantage of its strategic location in the heart of the continent for exporting its products to many European countries and further. The pipe mill produces approximately 100,000 tons per year, and the pipes are used in gas distribution, crude oil and water distribution lines, district heating and cooling systems, civil engineering and for structural purposes.

US Steel Košice sro – Slovakia Website: www.usske.sk

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# Metal tube production technology from the Ukraine

BASED on the experience of metal tape forming and welding technology for the international wire and cable industry, Rosendahl has extended its product portfolio for the production of metal tubes. For continuous tube welding lines, Rosendahl offers turnkey solutions including tape forming, tube welding, tube sizing and corrugation technology.

For the production of longitudinally welded tubes, an exact preparation and guiding of the tape edges is required. Rosendahl secures this preciseness by considering material properties, the design of the forming stations and forming tools.

Different materials and applications require different welding technologies. With regard to economic efficiency Rosendahl provides solutions with TIG, plasma and laser welding technologies.

To reach the dimensional accuracy and the product properties in special applications, Rosendahl offers static and dynamic tube calibration. Corrugated tubes combine mechanic stability and bending flexibility. The corrugation profile significantly influences the product characteristics. Depending on the task, Rosendahl offers efficient solutions for the tube production.

The product range is supplemented through adequate auxiliary down stream equipment, including solutions for metal tape handling and preparation and tube coiling, in order to support customised solutions.

The product portfolio covers production lines for solar, automotive, medical and industrial tube applications. Rosendahl provides solutions for copper, aluminium and stainless steel for smooth and corrugated products.

#### **Rosendahl Maschinen GmbH**

Austria
 Fax: +43 3113 5100 51
 Email: office@rosendahlaustria.com
 Website: www.rosendahlaustria.com

# Plastic welding equipment

NINGBO Fangli Group Co Ltd specialises in producing various butt fusion machines, automatic butt fusion machines, angle fusion machines, multi-angle band saw machines and saddle fusion machines. These machines have good configuration, stable performance, easy operation and have been used in Chinese companies as well as exported to Europe, South-East Asia, Middle East and Russia.

The company focuses on plastic welding technology research and development, continuing innovation and improvement and excellent quality and good technology.

Most Fangli welding machines have CE certificates in accordance with European technology and safety standards and Fangli always works with customers on every detail of plastic pipe projects.

Ningbo Fangli Co Ltd – China Fax: +86 574 2888 3265 Email: fl@fangli.com Website: www.fangli.com



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# Vacuum pipe lifting

SCHOENBECK GmbH & Co KG has introduced additional models in its vacuum pipe lifting range, incuding the ELITE 12 and 16TE (tonnage/electrical) vacuum pipe lifter models and the ELiTE LiTE power pack concept.

The ELITE 12TE vacuum pipe lifter is electrically powered by the user's main power supply (380V/420V, 50 or 60Hz). Supplied with either a SWL of 12,000 or 16,000kg (26,500lb/35,200lb) units, both can be delivered with a central single or two outer double hook eyes for tower/ gantry crane applications. The power is transported to an electrical motor, which in turn drives a vacuum pump. This model is available with radio remote control or hard wired cable remote: both can be operated from the ground floor or cabin positions.

In the event of a factory power failure/ power tripping, the machine has sufficient warning power to operate for an additional 8-12 hours. A power pack is loaded prior or during normal lifting operations, and is activated automatically on demand. Standard warning sirens/flash lights are

incorporated, as are safety valves and -40°C solenoids for extreme cold working environments and pre start-of-work system checks. European standards ASME B30.20-22. Australian standards AS 4991. 4024 and the AS/NZS 4268 are reached or exceeded.

Schoenbeck also now manufactures C hooks for steel coils with SWLs of 10,000kg to 40,000kg (22,000lb to 88,000lb).

#### Schoenbeck GmbH & Co KG

#### - Germany

Email: info@schoenbeck-maschinen.de Websites: www.schoenbeck-maschinen.de www.vacuumpipelifting.com

# Wall thickness and ovality measuring

SIKORA's newly developed 3-axis X-Ray measuring system X-RAY 6000 TRIAX is the precondition for a sovereign measuring performance.

For this method the hose or tube is transilluminated by X-rays. The measurement in three planes offers a 6-point wall thickness measurement. In combination with an extremely high measuring rate defects such as bubbles between the vapour barrier (aluminium pipe) and the

inner tube are already detected during the production process.

In particular, composite pipes are often produced with 30m per minute. At a line speed of 30m per minute, i.e. 0.5m per second, the X-RAY 6070 TRIAX measures the tube at 100Hz every 5mm. Thus, even the smallest blisters can reliably be detected.

Besides wall thickness the X-RAY 6070 TRIAX also measures the ovality of the

product with highest precision. The fast and reliable determination of the measuring values allows a fast centering of the crossheads and provides a permanent control of the line in consideration of the minimum value.

SIKORA AG - Germany Fax: +49 421 48900 90 Email: sales@sikora.net Website: www.sikora.net



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### TECHNOLOGY UPDATE

# Optimising tube production processes

ERNST Blissenbach GmbH manufactures tools for the tubing industry that are designed and manufactured in-house and – if the customer so desires – commissioned on-site. Customers benefit from the company's ability to use its experience of production needs, not only for improving the tools, but also to optimise tube production processes. That is how the company guarantees top quality inside weld bead removal and failure-free manufacturing processes in the tube welding line.

HF longitudinally welded tubes have been in use in various fields of technology since the 1960s. Based on advances in process engineering they are now being used for applications that – for quality reasons – used to call for seamless tubes. In



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Metals Technologies

parallel with the more widespread use of HF longitudinally welded tubes, the demands on quality also increased and require even more fine-tuning of tool parameters.

The company will advise customers specifically on what impact the impeder has on weld bead formation and how it influences the scarfing quality and its ability to remove the weld bead or how to improve interaction with the HF-welder to achieve perfect results. In all this Blissenbach always takes individual requirements and conditions into consideration to achieve inside tube scarfing at the highest level.

Ernst Blissenbach GmbH – Germany Fax: +49 2191 9982 24 Email: info@blissenbach.de Website: www.blissenbach.de



# ID scarfing and bead rolling

KENT Corporation has become the worldwide exclusive distributor for Phoenix Tool, offering the company's full line of ID scarfing and bead rolling systems. The Phoenix design is said to be versatile and easy to adjust and set up.

New high-grade materials allow for longer lasting tooling. Kent can offer retrofit tool holders and mandrels to work with almost all manufacturers' ID mandrels. This can save money, by converting to a more standard and less expensive cutting ring.

Kent has also introduced a new Tube Scrap Chopper. Initial designs are for 2" and 3" maximum diameter tube. The heavy duty, robust flywheel design has a separate material feed and multi-sided blades.

By chopping scrap tube, users can save valuable floor space. One dumpster can take up to three times the space of chopped scrap.

Kent Corporation – USA Fax: +1 440 237 5368 Email: sales@kenttesgo.com Website: www.kenttesgo.com

#### www.tube-southeastasia.com

# Dedicated laser welding line for orbitals

TAILORED Orbitals<sup>®</sup> from ThyssenKrupp Tailored Blanks feature a function- and load-oriented structure precisely matched to the conditions in the part. Unlike other tailored products, they are made from tubular starting material, rather than from flat blanks.

The rotationally symmetrical parts are manufactured on a dedicated laser welding line, on which up to five individual tube segments can be joined together end-on. The individual segments can consist of different materials such as carbon steel and stainless steel, and can have different diameters, different wall thicknesses and different coatings. The result is a starting material that is optimised from the outset for a particular application.

Typical areas of use for Tailored Orbitals include car seats, exhaust systems, cockpit support tubes and chassis parts. For example, ThyssenKrupp Tailored Blanks has developed a tailored orbital alternative for a rear seat back reinforcement made from a conventional tube. The new solution reduces weight by around a kilogram because the conventional structure is made from a tube of uniform wall thickness, that thickness being determined by the highest loads occurring in the part. The part made from a tailored orbital on the other hand is of varying wall thickness. In the lower third of the seat back, where the heaviest loads occur, the material is 1.5 to 2.5mm thick. In the other areas, 1 to 1.5mm is sufficient.

Tailored Orbitals for shock absorber reservoir tubes achieve claimed weight reductions of up to 30%. ThyssenKrupp Tailored Blanks has developed a new solution for a current mid-size platform. Unlike the conventional solution, with uniform wall thickness, the Tailored Orbitals solution has a thickness of around 2.5mm only in the highly stressed lower section of the tube. Further up, wall thicknesses of well below 2mm are sufficient.

Tailored Orbitals can be fabricated just like conventional straightseam welded tubes. The orbitals do not have to be cut to length first, because this is part of the manufacturing process, as is machining of the tube ends. Dimensional tolerances are similar to those of straight-seam welded tubes. In addition, Tailored Orbitals can shorten production processes by combining several manufacturing steps.

The orbitals are available in lengths of up to 2,500mm, and in diameters that can vary between 30 and 90mm within one tube. They can be made in all carbon and stainless steels suitable for laser welding.

ThyssenKrupp AG – Germany Email: info@thyssenkrupp.com Website: www.thyssenkrupp.com









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# Software to convert solid models to tube data

ADVANCED Tubular Technologies Inc has released the VTube-STEP software, designed to overcome the solid model CAD translation problem faced by tube fabricators of how to quickly and safely import many competing generic CAD solid models sent to them by customers to derive master tube data.

VTube-STEP imports solid model files from any CAD program that can export in the well-known STEP file format designed by ISO (International Organisation for Standardisation) – including CATIA, Inventor, MicroStation, Pro/ENGINEER, Unigraphics-NX, Solid Edge, SolidWorks, and any other STEP AP214-compliant CAD package.

After the models are imported, the VTube-STEP learns which geometry it can use to calculate tube data by allowing the operator to teach it through a simple collection process where the geometry from each straight is located. VTube-STEP uses this knowledge to precisely calculate the tube centreline and tube bender data while safely bypassing non-essential data in the model.

Then VTube-STEP creates files that can be imported into the ROMER DOCS and Supravision-based measuring centres like multi systems. It also includes the advanced tubular benderlink engine so it can send data directly to any bender using the supravision network protocol. Supported benders include SMT Industries, AddisonMcKee, Techno Industrial Machinery, Horn Machine Tools, any Advanced Tubular CNC Bender ProControl-based bender, and any CurrentTech BendPro-based bender.

Data reports include all the values available in the VTube-STEP system including XYZ centreline, bender data, outer diameter, tube length, part number, and an image of the solid model used for measurement. The reports are based on HTML templates for report design. These templates are completely customisable so that users can build their own custom reports with a custom logo.

#### Advanced Tubular Technologies Inc – USA Email: mcone@advandedtubular.com Website: www.advancedtubular.com

# **Design software**

BLUE Ridge Numerics, Inc, a leader in upfront CFD software, has announced that CFdesign 2010 has been fully tested and is compatible with Microsoft Windows 7. The process ensures that CFdesign 2010 has passed Microsoft-designed tests for compatibility, reliability and performance on the Windows 7 platform, using both 32- and 64-bit processors. CFdesign is also compatible with Windows XP and Windows Vista.

In addition, CFdesign 2010 supports the new Core i7 processor from Intel, providing users with up to 2.5 times faster processing times than with earlier processors.

CFdesign upfront CFD software integrates comprehensive fluidflow and heat-transfer simulation into early phases of design and engineering, when companies can improve product quality, time-tomarket, and ultimately profitability through the product life cycle.

#### Blue Ridge Numerics – USA Email: paul.whalen@cfdesign.com

Website: www.cfdesign.com

## TECHNOLOGY UPDATE

# Steel piping products and services

DYLANGROUP provides a complete package of steel piping products and services, and distributes pipe, fittings, flanges, bar and valves to all kinds of industries worldwide, ranging from petrochemical and offshore, to power generation and shipbuilding. In addition the company also supplies specialist turn-key services, including project management and consultancy – for every project, small or large-scale.

DylanGroup claims to stock the largest range of steel piping materials in the world, held in strategically located warehouses. This guarantees fast delivery of materials in all sizes and grades. Its warehouses also carry a large quantity of specials and semi-finished products. Dylan's own production facilities, where steel is processed into customised products, are unique. Its advanced CNC machines with experienced operators are able to satisfy any requirement, quickly and competitively.

All incoming and outgoing products are subjected to stringent checks or additional testing and the quality department with expert technical staff can provide strength calculations in-house. DylanGroup holds AD-WO approval from TüV, and all remarking of steel products is carried out in compliance with the technical requirements of the Pressure Equipment Directive (97/23/EC). DylanGroup received ISO9001 certification in 1993.

The supply of piping materials for power generation is a major part of DylanGroup's business. It provides complete energy industry piping packages quickly and reliably and has thousands of tons of pipes, fittings, flanges, bar and valves in stock to be distributed directly from the major mills in any location worldwide.

DylanGroup provides worldwide products and services to major customers in the energy industry such as Alstom, Siemens, EDF, RWE, Essent, Iberdrola, Austrian Energy and Doosan Babcock. It has offices throughout Europe, the Middle East and the Far East, and additionally, expert partners representing DylanGroup exclusively in Eastern Europe and in North and South America.

**DylanGroup** – The Netherlands Fax: +31 1866 12157 Email: info@dylangroup.com Website: www.dylangroup.com



DylanGroup supplies a range of pipe services

An DIN EN ISO 9001: 2000 (QMS) Company readily offer the product and services



certification & approval of ELL, UHDE, TDC, GNFC, IFFCO, ISGEC, Atomic Energy of INDIA, ADMA, TAKREER, OMAN Refinery, ADNOC, Lloyds, TUV, TATA Projects Ltd, IRS, SGS, BAX COUNSEL & many other reputed Co nsultants & TPI Agencies to meet up all the specified and implied requirements to ensure "Quality First ..... Customer always" TÜV= τυ Certified & Approved by ENGINEERS INDIA LTD. (EIL) KRYSTAL TE S E Manufacturing Pvt. Ltd.  $\langle \Xi \rangle$ **Creating Core Values**  $(\mathbf{z})$ Manufacturer & Exporter of Seamless & Welded Stainless Steel Tubes.Pipes & 'U' Tubes PRODUCT RANGE TP-Type of Welded 'U'-Tubes Seamless Tubular Products Austenetic (300) Series Austenetic (300) Series Austenetic (300) Series \* Grades & Super Alloy Steel & Super Alloy Steel & Super Alloy Steel 3.175 mm to 219.08 mm 6.35 mm to 219.08 mm 0.D / N.B 19.05 mm to 38.10 mm & 1/8" NB to 8" NB & 1/8" NB - 8" NB Thickness 0.6 mm to 8.18 mm 0.71 mm to 6.02 mm 1.2 mm to 3.05 mm Length / Upto 22 meters Upto 18 meters Upto 8 meters Leg Length ASTM Std (eqv. A213/A269/ A249/A269/ A688 / A213 / TEMA to ASME & DIN) A270/A312 A270/A312 Grades: In addition to Austenitic 300 Series, we now manufacture to cater applications of P11/T11, P12/T12, P22/T22, Monel 400 (UNS NO 4400), 904 L (UNS No8904), Duplex Steel (UNS No 32205, 31803, 32750 etc) and other Super Austenitic Steel Grades also. Regd. Office: Office # 6, 4th Floor, Alankar Cinema Bldg., SVP Road, Mumbai-400 004, INDIA Tel. : + 91 - 22 - 2388 5471, 6639 4035 Fax : + 91 - 22 - 2388 1890 Works: Plot #. KV-2, GIDC Manjusai, Ta: Savli, Vadodara - 391 775. Gujarat, INDIA Telefax : + 91 - 2667 264 777 / 8 (e) : info@krystalsteel.co.in / export@krystalsteel.co.in

# Inline measurement of tube geometry

AT Tube 2010 in Düsseldorf LAP presented laser systems for inline measurement of the diameter, straightness and contour of tubes.

LAP for the first time showcased its new ProfileCheck system, a light-section based profile measuring solution for cold and hot applications. It is the ideal solution for rolling mill operators looking for a way to measure with utmost accuracy the entire profile around the complete circumference of the rolling stock.

Another novelty is the StraightCheck system, an inline straightness gauge that derives the straightness values from measurements of the tube diameter.

LAP will also have on display the complete array of systems for the measurement of tube and wire diameters. The LAP systems are designed for a wide range of different measuring tasks and individual line-specific factors. For example, the ANTARIS SCAN laser scanners were on display as well as camera systems with a backlight unit and the laser scan micrometers of the new METIS series, developed for a wide span of diameters from just a few millimetres through to more than one metre. Fair visitors also had the opportunity to see a presentation of the new tube end gauge which checks the tube ends for APIcompliance. While being mounted on the arm of a robot, a laser triangulation sensor measures the inner and outer contours and the wall thickness of tube ends during a 360-degree turn of the robot arm.

#### LAP GmbH Laser Applikationen – Germany

Fax: +49 41319 51196 Email: steel@lap-laser.com Website: www.lap-laser.com



Measuring the contour of rolled bars

# Portable outside clamping pipe facing machine

THE Protem OHSB-C 6-14 is designed to carry out bevels or compound bevels by copying. A carriage with hydraulic radial movement, mounted on the tool holder plate, enables the machine to perform bevelling works while using a copying cam. The tool holder is equipped with carbide plates.

The maximum wall thickness of tube is 60mm on a height of bevel lower than 30mm and a maximum angle of 37°. The clamping range is 6" to 14", and the maximum tool holder plate speed is 170rpm.

Protem SAS – France Fax: +33 4 75 57 41 49 Email: contact@protem.fr Website: www.protem.fr

Protem GmbH – Germany Fax: +49 7247 9393 33 Email: info@protem-gmbh.de Website: www.protem-gmbh.de





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# **TECHNOLOGY UPDATE**

# Two new models boost productivity on job sites

MOST pipelining job sites require a mix of heavy machinery to manoeuvre pipes into place. McElroy's new MegaMc<sup>®</sup> pipe stands are self-contained, gasoline-powered pipe stands that alleviate the need for a piece of heavy machinery to hold the pipe in place.

Two models are available: a large 36 to 65" model accommodates pipes up to 16,000lb (7,257kg), while a smaller 8 to 36" model handles pipe up to 9,000lb (4,082kg).

Besides the productivity gained from allowing heavy machinery to be used elsewhere on the site, the MegaMc Pipe Stands offer 24" of lateral movement, as well as 34" of vertical adjustability. This freedom of movement allows the operator to manoeuvre the stick of pipe to the height of a thermoplastic pipe fusion machine.

"We believe the MegaMc Pipe Stands will offer great benefits on medium and large diameter pipe fusion job sites," said Chip McElroy, president and chief executive officer of McElroy. "The new pipe stands represent our dedication to creating modular productivity equipment that helps contractors do more with less."

The MegaMc Pipe Stands are gasoline-powered but will not churn through gas. In fact, the units are designed to hold a set height after the operator turns the hydraulic power unit off. Since the unit is self-contained, no hydraulic hoses will be running across the ground of the job site. Rugged rollers with low-friction pillow block bearings allow the pipe to move easily. Even with a wide stable base, the pipe stands can be stacked for storage or shipping and are moveable with a forklift or crane.

# McElroy - USA

Email: thenning@mcelroy.com Website: www.mcelroy.com

# **CE-marked steel and** aluminium tubes

PRECIS Inter Holding JSC, a producer of electro-welded steel and aluminium tubes, is continuing to expand its product range and to adapt to market developments. Since 2008, one new steel tube production mill has become fully operational, and another one is to be installed, enabling the company to cover the broad range of steel tubes from 9.75 to 168.3mm in diameter. The company has also added new sizes to its range of aluminium tubes.

The company is able to apply the CE mark to its steel and aluminium tubes for use in construction, in compliance with the EU Construction Products Directive, as most of the company's production is intended for the European market. In addition to construction, the steel and aluminium tubes produced by Precis Inter Holding also find wide application in the furniture and household and sporting equipment production.

Precis Inter Holding JSC – Bulgaria Email: sales@precis-inter.com Website: www.precis-inter.com

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ITALIAN TECHNOLOGY

# XXL clamps with modular system

STAUFF has launched two lines of tube and pipe clamps for XXL applications. Pipe clamps in the 'heavy' series to DIN 3015 are intended for securing tubes and pipes with outside diameters of up to 406mm. The clamp bodies and fastening components can be configured to suit the individual application. The user can select between various clamp body materials as well as different mounting and fastening techniques. One advantage of the 'heavy' series is that its design and recess shape ensure a very high retention force.

The engineering class is worth considering when the pipes to be fastened have a diameter of up to 800mm. These clamps consist of two U-shaped welded structures, plastic jaws for holding the pipe, and two M30 bolts for tensioning. The clamps are available in types KS (standard), DKS for extra heavy pipes (two KS clamps welded in tandem), as well as KSV and DKSV (anchorbolt fastening).

The clamp is made of primed steel St37, which can be hot-dip galvanised on request. Sales engineer Frank Schröder: "Because

these are standard clamps made of steel, the components in the KS series can, in principle, have extremely large dimensions. Once, for instance, we supplied clamps for pipes with a diameter of more than one metre".

Stauff – Germany Fax: +49 2392 916 4130 Email: k.petri@stauff.com Website: www.stauff.com



The KS series in standard dimensions is suitable for tubes and pipes with a diameter of 220 to 800mm

# Waterjet cutting systems

KMT Waterjet Systems is a manufacturer of waterjet cutting systems, high pressure pumps and components for water jet systems.

The company's product offerings include UHP pumps, waterjet cutting nozzles, focusing tubes, pneumatic cutting valves, intensifier and high pressure parts, abrasive cutting systems, waterjet spare parts, high pressure valves, fittings and tubing products, diamond orifices, sapphire orifices, ruby orifices and robotic applications.

'KMT Waterjet: Take 2' is a series of twominute performance videos showcasing a variety of materials being cut with a waterjet.

A recent video features the KMT Waterjet Streamline PRO 125hp cutting ½" stainless steel using an intricate design pattern. The stainless steel is cut at 14" per minute, with one pound abrasive feed rate.

KMT Waterjet Systems – USA Email: sales@kmtwaterjet.com Website: www.kmtwaterjet.com



# Denlok technology reduces disruption

DENLOK, manufactured by Yorkshire based drainage solutions company Naylor, is available from 150mm to 700mm diameter and has been widely used to minimise the impact of civil engineering works in our streets and cities.

Production and installation of Denlok also has an exceptionally low carbon footprint – clay is a naturally occurring material, is in abundant supply, and has low embodied energy and unrivalled longevity.

In contrast to open cut installation the environmentally beneficially, trenchless technology is characterised by minimal surface disruption over a much shorter period of time, less soil going to landfill, and less newly quarried materials being needed for backfill. On a well-managed trenchless project, the public will not be aware that major construction work is actually going on below them.

Trenchless technology is no longer the preserve of the specialist with expensive kit and a high degree of expertise. It offers a lower cost alternative to open cut pipe laying; it will save the costs of lane rentals, road closures, reinstatements, landfill and aggregate tax.

The tunnelling equipment has become less expensive and easier to use. When pipes need to be installed under waterways, railways and heavily trafficked areas or in ground conditions where it is simply too difficult for trenches to be economically constructed and worked, trenchless installation is the only sensible approach.

Naylor Industries – UK Email: sales@naylor.co.uk Website: www.naylor.co.uk



The Denlok tehnology in action

# Bending and end-finishing

WAUSEON Machine & Manufacturing produces a wide range of equipment, specialising in tube benders, end-formers, end-finishers and crimpers.

It also specialises in customisation, automation and 2D and 3D design.

The company also performs tooling design, tryout and validation, capability studies, mechanical and electrical

engineering support and field service as well as other services that are requested by customers.

Wauseon Machine & Manufacturing Inc – USA

Fax: +1 419 335 1640 Email: sales@wauseonmachine.com Website: www.wauseonmachine.com



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#### Nine new heavyweights from Hyster

HYSTER has launched a new range of 25-32 ton heavy duty forklift trucks and dedicated container handlers, delivering performance. maximum versatility. excellent visibility and lower operating costs for heavy industry and ports.

"The new H25-32XM range comprises nine new models spanning 25 to 32 ton lifting capacity, three of which are ultra compact", explains Antoon Cooijmans, big trucks product manager for Hyster Europe. "They are all designed to offer a unique blend of high productivity, reliable proven components, fuel efficiency and outstanding driver comfort in the ports or in heavy industry."

The range includes four standard forklift models (H25XM-12, H28XM-12, H30XM-12, H32XM-12) with between 25,000kg and 32,000kg lifting capacity at 1,200mm load centre. The three new ultra-compact models (H25XMS-9, H30XMS-9, H32XMS-9) are designed to assist in operations where space is at a premium, with wheelbases of between 3.655m and 3.935m. In addition, there are two new container handlers (H28XM-16CH, H32XM-16CH) with a dedicated carriage for the container spreader.

All new models offer class leading lifting performance and feature the QSC8.3 Cummins diesel engine with low exhaust emissions conforming to EC Tier 3 NRMM emissions standards. The powertrain ensures increased dependability for long periods of peak power operation with protection for the engine and the 3-speed transmission. The trucks have also been designed for all operating environments and have the flexibility to operate in ambient temperatures from -18°C up to +50°C.

"The H25-32XM range is packed with features to reduce energy consumption and save fuel and ensures drivers maintain comfort and concentration throughout a shift", added Mr Cooiimans, explaining that the trucks only provide maximum power on demand, when it is really needed, with load-sensing hydraulics that 'feel' the load weight that is lifted. As maximum loads are not always handled (and many lift modes are without load), the trucks do not always require maximum engine power and therefore less fuel will be consumed, with savings of 5% to 15%. The operating speed of the hydraulic functions (lift, tilt, sideshift, fork-positioners) can also be adjusted to suit the requirements of a specific application.

The trucks are also highly versatile thanks to the 'dual-function' carriage, setting a new standard for large forklift trucks, by offering unique built-in flexibility for various fork handling duties. The hook-style design with a 'guick-disconnect' dismounting feature for the forks enables fast exchange between forks and attachments such as a coil ram. Sideshift and fork-positioning functions are featured as standard, and include two fork-positioning working ranges, enabling a uniquely wide 'in-to-in' or 'out-to-out' working range of the forks. The robust masts offer extra strength thanks to the unique '6-roller' construction, for heavy lifts up to 6.2m high.

For the operator, the industry leading design of the Hyster 'Vista' Operator Compartment offers excellent comfort, outstanding ergonomics and a low noise level. The design of the cab provides the operator with excellent all-round visibility. and particularly of the operating area. For example, the doors feature upper and lower glass panels enhancing sideways visibility and the convex, curved design of the front screen means that the front corner pillars of the cab can be positioned relatively far back, to ensure maximum visibility of the load.

"Visibility is outstanding for the driver with details that make a real difference. For example we have designed a unique 'angled' positioning of the hose group over the mast and the sloping design of the counterweight helps with rearwards visibility", said Mr Cooijmans, adding that the cab is ideally positioned, mid-high and towards the front, for optimal visibility, which offers excellent vision sideways and rearwards, boosting driver confidence and performance.

Hyster Europe – UK Fax: +44 1252 770702 Website: www.hyster.co.uk



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#### TECHNOLOGY UPDATE

### Semi-finished and finished parts made from copper

BUNTMETALL amstetten has two production plants in Austria, one in Amstetten, one in Enzesfeld. It produces tubes, rods, bars, wires, profiles and also finished parts and slide bearing elements. Both are certified to ISO 9001, with an export share of more than 70%. The company is an internationally recognised partner of the industry and well known on the world market for its products of highest quality. Owing to the most modern production facilities and an international distribution network a high flexibility in products and service is achieved.

Industrial tubes in straight lengths and in coils are produced in dimensions of 4 to 230mm outside diameter and wall thickness of 0.28 to 40mm. Layer-wound tubes are manufactured to the state-of-theart technology in the size range of 4–30mm outside diameter with wall thickness of 0.28–1.75mm. For the processing industry the long lengths of the level-wound tube coils mean small processing scrap and long machine running times. Coil weights up to 450kg are possible.

Further product lines are tubes, fittings and bars from copper-nickel alloys of the trademark EUCARO, aluminium multi-alloy bronzes alcaro and carbronze – a cold drawn tin bronze – for heavy-duty slide bearings.

buntmetall is in a position to offer an interesting range of finished products. This programme includes parts ready for assembly, machined on the most modern CNC machines from the company's own semi-products. Competent customer advisers from production and sales are at your disposal for detailed problem solutions. buntmetall amstetten is a member of the Wieland Group in Ulm, Germany.

**buntmetall amstetten GesmbH** – Austria Fax: +43 7472 606 287 Email: juergen.karlstetter@buntmetall.at Website: www.buntmetall.at

### New scarf tool coating for galvanised tube

KENT Corporation has introduced a new coating for OD scarf tools. The new coating was created for longer life on materials such as galvanised and aluminiumised tubing.

The new GR coating is being used by several tube producers and they have seen increases in the life of the tool by as much as 100% or more. When scarfing coated materials, the coating often gums up under the tool causing it to wear prematurely.

The new GR coating is very slick and reduces the build up on these applications resulting in a much longer tool life. Kent has a full line of ID and OD scarf tools along with complete ID scarfing and flash roll systems.

Kent Corporation – USA Fax: +1 440 237 5368 Email: sales@kenttesgo.com Website: www.kenttesgo.com



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#### High-tech tubular products of stainless steel and alloys

OSCAR Production Group is one of the leading manufacturers of high-tech tubular products of stainless steel and alloys. It was established on the basis of Tube Drawing Workshop 4 (TDW-4) which has been successfully working since 1975 at Nikopol Yuzhnotrubny Plant (NYTP), Ukraine.

The enterprise specialises in the manufacture of products intended mainly for nuclear-power engineering, aircraft and rocket building, special-purpose machine building, shipbuilding, defense industry and other industries of the national economy.

Oscar Production Group uses cold working technology (cold rolling and cold drawing). Its product line includes tubes of stainless steel and alloy steel grades and alloys including titanium and zirconium based alloys: 0.3-133mm diameter, 0.08-15mm wall thickness seamless tubes; 16-76 mm diameter multilayer (from two to 12 layers) tubes with thickness of individual layers of 0.16-0.25mm; extremely thinwalled and ribbed tubes of titanium alloys in a standard size range.

The company operates a unique 1.4mn sq feet facility equipped with 60 units of basic rolling equipment: 10 cold pilger mills, 41 tube rolling mills of roller type and nine drawing mills. The plant also has powerful facilities for thermal treatment of tubes in a non-oxidising atmosphere of ultra-pure hydrogen ("bright annealing") and in vacuum. This advantage provides wider possibilities for the manufacture of superhigh-duty tubes of special stainless steel grades and alloys and titanium based alloys for aerospace engineering, etc.

Technical capacities of Oscar Production Group are comparable to those of the leading world manufacturers of seamless stainless steel tubes in terms of manufacture of high-tech tubes. Oscar



Production Group has qualified personnel and all necessary technical facilities for control and testing procedures, set out in domestic and foreign standards applied to manufactured products. The company has a certified central testing laboratory, a metrology laboratory and a department for non-destructive testing of pipes.

The quality of products is controlled at all stages: starting with the launch of production and until shipping to the customer. The special technological processes are controlled and results are documented in accordance with the direct instrumented measurement. Oscar Production Group provides the following types of tube control:

- Visual inspection of external and internal surfaces with the usage of optical facilities.

- Instrumental measurement of geometrical parameters.

- Instrumented control for estimation of the quality of tubes' external and internal

surfaces, metal denseness control, microstructure analysis, measurements of tube surface roughness and for measurements of geometrical parameters (diameter, length and wall thickness) over the entire tube length.

- Control of steel grades by steeloscopes (for alloy steels) and chemical or spectral analysis.

Oscar Production Group's products comply with national standards and specifications and foreign standards (EN, DIN, ASTM). The enterprise's Quality Control System is certified by ISO 9001: 2008, VNITI-TEST national certification centre in UkrSEPRO system and by the international certification centre TUV Thuringen – 463 words (including articles).

Oscar Production Group – Ukraine Fax: +380 056 770 12 34 Email: mail@oscar-tube.com.ua Website: www.oscar-tube.com.ua



### High performance tube cutting TCT saw blades

TRU-CUT Saw Inc is now offering its Aggressor-XL line of thin kerf, carbide tipped saw blades for cutting tube, pipe and solid ferrous materials in flying cutoff and re-cutting applications. Available with carbide and cermet inserts, these PVD coated blades offer huge performance gains over high-speed steel and friction saws.

As the name suggests, Aggressor-XL blades cut fast – up to 1,500 SFM. Test data on a 350mm x 2.8mm x 100 tooth blade running at 250 RPM achieved a 3.7 sec. cut time and was able to cut six square metres of 52100 bearing steel.

A special chip breaker on the face of the inserts allows faster chip removal and more aggressive cutting speeds.

Tru-Cut Saw is the only circular saw blade manufacturer in the US with its own PVD coating chamber. This allows the company to tightly control coating quality and uniformity, and allows adjustments for individual customer applications.

A Tru-Cut Saw Inc spokesman said: "We customise saw blades and mounting patterns to individual customer requirements and provide them with the exact blade for the job."

Tru-Cut Saw Inc – USA Fax: +1 330 225 4741 Email: trucutsaw@trucutsaw.com Website: www.trucutsaw.com

#### **Pipe expanders**

FONTIJNE Grotnes is a specialist in the design and construction of pipe-end and full length pipe expanders for the pipe industry. The Fontijne Grotnes Expander ensures a constant, reproducible process regarding diameter and mechanical properties. The design maximises the radial forces in order to obtain maximum output in relation to pipe dimensions.

A full length pipe expander is an essential part of the production process in a pipe mill. The pipe expander process makes the welding of the pipeline in the field easier, even for cut pipe sections. Fontijne Grotnes is constantly improving and preparing the full length pipe expander process for new market demands, such as higher outputs, thicker wall thicknesses, higher material grades up to X120, and stricter ovality and straightness tolerances.

The company's Straightening System is designed for small pipes ranging from 16" to 30". The system controls the straightness of the pipes in all directions within  $\frac{1}{2}$  -API- and DNV-standards.

The Fontijne Grotnes pipe-end expander sizes the end of large diameter pipes to parallel-, spherical- and semi-spherical joints. The joints are applicable for, among others, SSAW pipes, mainly used for conveyance of water and sewage.

In February, Fontijne Grotnes opened a new office in Beijing, China. This office represents the company in the Chinese market, and is expected to strengthen its position in the pipe, wheel and metal forming industry.

Fontijne Grotnes BV – The Netherlands Fax: +31 10435 2655 Email: info@fontijnegrotnes.com Website: www.fontijnegrotnes.com **PULYSOUDE** THE ART OF WELDING



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## MM1 computer-controlled pipe cutting machine

THE MM1 is a computer-controlled machine that automates the cutting of profiles, holes and shapes on pipe with diameters from 10 to 40cm (4" to 16"). It rotates the pipe on its roller bed with a three-jaw chuck, while simultaneously moving a cutting torch back and forth along the pipe's axis.

Pre-programmed shapes such as saddle, hillside, lateral and mitre cuts can be made by simply selecting the type of cut from the menu, then entering the diameters of the pipe being processed and pressing the run button. Templates are not required, and there is no time-consuming layout or calculation. Irregular or uncommon shapes can be plotted, programmed and saved for future use.

The machine's pipe bed is designed for handling lengths of pipe up to 1.83m (6ft). Additional pipe bed extensions of 2.44m (8ft) can be added to make a bed of up to 11.6m (38ft).

The method of cutting can be oxy-fuel or plasma. If oxy-fuel is used, the machine will be equipped with solenoids and a three-hose cutting torch. When plasma is used, a rotary ground is installed on the machine. The machine can be delivered with plasma torch leads and power source, or the customer may provide their own plasma equipment.

Cypress Welding Equipment Inc – USA Fax: +1 412 331 0383 Email: jwhite@weld.com Website: www.cypressweld.com

## Tube end conditioning machine from the UK

AS part of its ongoing innovation programme, Nuke Tool has announced the introduction of the Sidewinder tube end conditioning machine.

The Sidewinder is a machine dedicated to the power and process industry, and especially to those involved in the manufacture and repair of boilers, shell and tube heat exchangers, condensers, economisers, element and membrane wall panels.

In operation, the Sidewinder pilots within the bore of the tube while its powerful conditioning motor orbits the outside diameter, carrying out the cleaning/polishing process. Tube sizes from 19 to 88.9mm (0.75" to 3.5") can be handled, and the whole procedure is carried out in seconds.

The Sidewinder is a pneumatically operated unit (electric drive option available), and supplied in a double walled, injection moulded case, complete with low speed pneumatic drive motor, choice of three pilots, and a choice of three conditioning heads.

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## **GLOBAL** MARKETPLACE

#### Automotive

#### Beleaguered Toyota makes offers that cannot be refused in the US, stresses concern for safety in China

The ear on the Automotive News story (10 March) read "Toyota Recall Crisis," but the information conveyed was that unprecedented incentives being offered by Toyota Motor Co – zero percent financing, subsidised leases, free maintenance – were boosting the company's US sales "big time" in early March; and analysts forecast a 30% bounce for the full month. The disjunction was not untypical of the Japanese car maker, most of whose famously loyal American customers are better satisfied with its products than some other interested parties – notably a federal Cabinet department. The US Dept of Transportation is investigating reports of 52 deaths resulting from unintended acceleration in Toyota vehicles.

In January, Toyota said that it would be recalling 5.6 million vehicles in the US, on complaints of problems great and small. On 9 March the company said further that it would likely issue a recall on all Prius models made between 2004 and 2009; and, on 10 March, that it will expand its recall on Tundra pickups to include all 2000 to 2003 US vehicles.

Even so, according to Toyota spokesman Win Finklehorn, Toyota is trying moving forward into the new decade. "Our sales are up and so is morale," he told a press conference reported by the Huffington Post (12 March). "We have no plans of slowing down."

Toyota faces a steep climb if it is to regain its position as of 1 January when it was the top-selling brand in the US, with a 14.3% market share for all of 2009. By the end of February the company had gone to No. 3, with 11%, indicating that Toyota loyalists cannot by themselves rescue the company's American fortunes. A restoration to dominance of the US market clearly rests with new customers, who will need stronger persuasion than ever before.

Given the obvious effectiveness of the incentives offered by Toyota Motor Sales USA Inc in March, the company was considered likely to extend them. But more than one observer noted that such sweeteners have a short shelf-life. And, they are expensive, even for the world's largest auto maker by sales.

Many months or even years before Toyota's troubles began, could some intuition have inspired the company's decision to sponsor an extreme-heavy metal festival named for one of its models? The Scion Rock Fest, held 13 March in Columbus, Ohio, and accorded high praise by *New York Times* jazz and pop critic Ben Ratliff, could hardly be surpassed for making friends and influencing people.

Mr. Ratliff noted that the event had enabled him to hear Yob – in his view perhaps one of the best bands in North America – and hear it properly, in a "festival with midsize clubs and good sound, surrounded by people who didn't have to pay admission and bands who'd been flown in, put up in hotels, fed and allowed to play sets of at least an hour." ("Metal Variety: Death, Doom, Black and Cars," 14 March)

As he need not have observed, none of that is usual at metal festivals. This one offered free admission in four clubs on a stretch of a major street, with staggered set times. The "satanic bargain" (apparently, Toyota's bid to call itself to the attention of the festival-goers) was that the metal fans were offered "rivers of rather handsome Scion bags and T-shirts, which of course they took with them on their endless back and forth between Ohio State University and the [festival] neighbourhood."

Struck by this "envelopment without hard sell," the *Times*'s critic sought to learn what Toyota hoped to gain from its extraordinary generosity. The company would not grant interviews on the subject. It sent word through an intermediary – the festival's booker – that Toyota Motor Co "wanted the music to speak for itself."

While the US is an essential market for Toyota, it is by no means its sole problem-child. In January, Toyota announced that it was responding to reports of accelerator problems with the recall of up to 1.8 million cars across Europe, including about 220,000 in the United Kingdom. And on 1 March, on his way back to Japan from Washington where he testified at a congressional hearing, Toyota's president Akio Toyoda held a press conference in Beijing to try to shore up his company's share of its main market: China.

As reported by *Yomiuri Shimbun* staff writers Yasushi Kouchi and Tomoko Echizenya, Mr Toyoda spoke to more than 400 reporters about the massive recalls of his company's vehicles worldwide; apologised; and stressed the Toyota corporate principle of safety as a top priority. As an indication of the interest taken by Chinese media in what he had to say, the auto maker was obliged to arrange a second press conference conducted in Japanese.

According to Daily Yomiuri Online, the news site of the Tokyo-based paper, questions from the reporters gathered at the JW Marriott Hotel Beijing focused on safety, such as whether Toyota planned to install a brake override system in cars it builds for the Chinese market. A reporter even asked whether the quality of Toyotas produced overseas was lower than that of domestically produced cars.

The Yomiuri reporters wrote, "[Mr Toyoda] carefully answered individual questions."

#### **Pipelines**

#### In a first-ever offer of its kind, the EC pledges significant funding for the Nabucco gas pipeline from Turkey to Austria

In what Günther Oettinger, the bloc's commissioner for energy, termed a "milestone" for European energy policy, the European Commission on 4 March pledged \$273 million for a pipeline that would start delivering gas westward by around 2015 from the Caspian Sea region, bypassing Russia and Ukraine.

"We're not just supporting an idea any more, we're talking about funding," Mr Oettinger said in a news conference in Brussels.

In the first instance of an EC offer of money for the construction phase of a gas pipeline, intended to avoid future crises over supplies, the pledge was significant in another respect: it suggests movement away from the commission's stated goal of encouraging the development of biofuels, at least for the time being.

Europe is only too well aware of the geopolitical and environmental risks of fuel dependency. It has apparently decided to address those risks by traditional means.

The pipeline, the Nabucco project, would stretch more than 2,000 miles from Turkey, across Bulgaria and Romania, to Austria. Its cost is estimated at \$10.9 billion, or about 40 times the sum pledged in March. But Mr Oettinger said the offer still represented a "trump card on the table" for Nabucco, and he is probably right. Certainly it puts pressure on the backers of the pipeline, including RWE of Germany and OMV of

Austria, to start ordering their pipe, probably by autumn, if they are to come in for any of the EC money.

In other news of the Caspian Sea, Iran state TV reported on 14 February that the Iranian company North Drilling Co had begun drilling its first exploratory oil well there in the previous week. The well, one of three planned to gauge the amount of recoverable oil in Iran's territorial waters, was reported as taking place 5,085 feet under the seabed. The move is the latest in an Iranian initiative to exploit more of the resources of the Caspian, which Iran shares with Russia, Azerbaijan, Kazakhstan and Turkmenistan. Iran's first offshore oil platform in the sea was inaugurated last year.

#### Europe's energy aims get a boost from Finland's go-ahead for the Nord Stream pipeline under the Baltic Sea

The European Commission is not basing its hopes of broadening the sources of its natural gas supply solely on the Nabucco pipeline projected for the Caspian Sea. ["Pipeline from Turkey to Austria," *above*.]

The EC's commissioner for energy, Günther Oettinger, has noted the bloc's interest as well in South Stream, also set for commissioning in 2015, which would take Russian natural gas under the Black Sea to Bulgaria. From there it will branch off northwest to Austria and south to Greece and Italy. South Stream is a joint project of Russia's Gazprom and the Italian oil and gas corporation Eni, with Électricité de France a possible additional participant.

A third pipeline project of keen interest to Europe – involving a third sea, the Baltic – cleared a last major hurdle on 12 February with the approval by the Finnish regulator of a permit needed for beginning construction work off the coast of Finland. The pipeline company, Nord Stream, under mainly German and Russian auspices, now may go ahead on offshore work in all five countries under whose waters the pipeline will pass – Germany, Russia, Sweden, Denmark and Finland.

If the Nord Stream pipeline proceeds on schedule, it will begin advancing the EC's energy-sufficiency aims rather quickly. From its headquarters in Zug, Switzerland, the consortium on 12 February reported an April start date for constructing the first of the two parallel legs comprising the pipeline, which would begin transporting gas late next year. When completed in 2012, the project will be able to transport 1.9 trillion cubic feet (tcf) of gas a year from Russia to Germany, where Nord Stream will join the European energy grid.

Gazprom owns 51% of Nord Stream; Wintershall and the chemical company BASF, of Germany, a 20% stake each; Nederlandse Gasunie, 9%. Gaz de France has negotiated to join the consortium.

Gazprom signed long-term contracts to supply over 700 billion cubic feet (bcf) of gas a year through Nord Stream to customers in European Union countries including the United Kingdom, the Netherlands, Germany, France, Belgium and Denmark.

At 759 miles, the projected Nord Stream pipeline is longer than South Stream (300 miles), shorter than Nabucco (2,050 miles). But as the likely first to the finish line, and the one which circumvents the countries of central Europe, it holds potential for changing European energy politics, at least in perception and possibly also in fact.



#### **GLOBAL** MARKETPLACE

Unquestionably Russia holds the best hand in the continental energy stakes, and will for some time to come. But the proliferation of interested parties, both as contractual purchasers of Russian oil and partners in transport systems, increases the number of influences on Moscow.

If, as seems probable, Ukraine continues to be a thorn in its side, Russia now must consider other factors (eg the extension to 2037 of the contract under which Gazprom will supply gas to Poland's PGNiG gas monopoly, to an expanded maximum of 359 bcf a year) before weighing interruption of the flow of fuel westward.



The rise in the number of Indian billionaires – to 49 last year, up from 24 in 2008 – on *Forbes* magazine's latest "rich list" reflects the growing prosperity of India and the entrepreneurial skills of its nationals. One of the billionaires, Mukesh Ambani, whose petrochemicals fortune makes him the richest person in the Asia-Pacific region, ranks fourth among wealthy individuals worldwide, behind only Carlos Slim Helu (of Mexico) and the Americans Bill Gates and Warren Buffett. Mr Ambani's fellow-Indian Lakshmi Mittal, the steel magnate, came fifth.

The Indian showing on *Forbes*'s "World's Billionaires" is the more remarkable vis-à-vis the Chinese. While China can boast more billionaires than India (and every other country besides the US), the Indian billionaires have more billions. According again to *Forbes*, in a local edition from November 2009, the wealthiest 100 Indians are collectively worth \$276 billion. Their Chinese counterparts in the Top 100 are worth \$170 billion.



China on 10 March announced that its exports climbed 46% in February from a year earlier, marking the third consecutive month of increases and the fastest export growth in three years. Economists attributed the results to a rebound in consumer demand from the US, the European Union, and Japan, which together accounted for almost half the growth after a two-month period of higher demand for Chinese wares from emerging markets.

Signalling a revival in trade after the financial crisis last year, the pickup in Chinese exports could move Beijing closer to letting its currency, the renminbi, appreciate against the US dollar. While China's prime minister, Wen Jiabao, still publicly rejects the contention of Western governments that the yoking of the two currencies keeps Chinese exports artificially cheap and therefore hyper-competitive, a close China-watcher might have picked up an early hint of a shift. On 6 March, the governor of the central People's Bank of China, Zhou Xiaochuan, said that pegging the renminbi to the US dollar was a "special foreign exchange mechanism" that would be abandoned "sooner or later."

Last time in this space, China's edging-out of Germany as the world's No. 1 exporter was termed "largely symbolic" – and so it is. According to the European Union's statistics office Eurostat, the German trade surplus reached \$184.9 billion in 2009, by far the largest in Europe. Germany's surplus was more than triple that of the Netherlands, in second place.

But Germany does not relinquish first-place positions gladly, even when the displacement is both inevitable and years in the making. As early



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Jiangsu Guoqiang Zinc Plating Industrial Co.,Ltd. Tel:0086 519 87741212 fax: 0086 519 87733270 www.steeltube.info e-mail: daicoke@hotmail.com as 2005, on the strong urging of the Ministry of Transportation and with the backing of Chancellor Angela Merkel, the German Parliament voted overwhelmingly to protect Germany's role in trade by strengthening its system of freight transport. Less than two years later, a national strategy was in place for integrating all transportation modes – rail, roads, waterways – to accelerate the movement of freight across the country.

"None of this was a minor accomplishment," wrote *New Republic* blogger Julie Wagner, who hailed Germany's determination and focus and observed that the Germans are now well positioned to "make sure they remain at the top of the list of the world's top exporters." She particularly commended the National Port Concept: essentially a list of priority ports that, given their national importance as trade gateways, are to receive federal infrastructure investment funds. Modelled after a similar initiative for German airports, the Port Concept helps to implement the most direct connections to high-speed railways and highways. ("Learning from Number Two: Germany and Its Exports," 23 February)



#### Breaking the mould for coking-coal contracts, BHP signs a three-month accord with a Japanese steel maker

According to *Bloomberg News*, the Australian mining company BHP Billiton has won a 55% price increase from a key Japanese steel maker as supplies of coking coal tighten along with the global economic recovery. Masumi Suga (in Tokyo) and Jesse Riseborough (in London) reported that a spokesman for JFE Holdings said the Tokyo-based steel producer will pay US\$200 (\$A220.25) per metric ton (mt) under a threemonth contract that commences in April. For the year through 31 March, US\$129 per mt was the price agreed upon by Japanese steel makers and BHP, the world's largest mining company. ("Fifty-five Percent Price Rise a Steal for BHP," 8 March)

Jim Lennon, a commodities analyst at Macquarie Group (Sydney), told *Bloomberg* that this represents the first time a three-month supply accord will have been signed for the vital steel making ingredient. BHP had proposed that Asian mills accept quarterly iron ore supply accords in place of the customary annual contracts. The JFE coking coal settlement "signals that the Japanese are moving towards the idea of flexibility of pricing," Mr Lennon said.

China is the largest importer of iron ore. The *Bloomberg* reporters noted that the four-decades-old iron ore pricing system was "fractured" in 2009 after Chinese mills failed to reach agreement with suppliers. In their view, BHP, Teck Resources (of Canada), Xstrata (Swiss), Rio Tinto (British-Australian), and Alpha Natural Resources and Massey Energy (both American) are among the mining companies that might expect to benefit from more frequent pricing contracts.

#### Elsewhere in steel . . .

Severstal, Russia's biggest steel maker, announced plans to increase capital expenditure to \$1.4bn in 2010 from \$1 billion last year, despite disappointing results for 2009. According to the e-commerce marketplace AliBaba.com, Severstal's capital investment programme this year will focus on growth in the Russian infrastructure and construction markets and also seek to enhance the company's competitive position in higher value-added markets in the United States. The ambitious plans reflect the market outlook of



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#### **GLOBAL** MARKETPLACE

Severstal's chief executive and major shareholder, Alexei Mordashov, who said, "I am optimistic that we will see a broad improvement in the industry this year." (10 March)

In MetalMiner, a blog for purchasing professionals in the metals industries, Stuart Burns made the observation that Severstal's position is typical of most global players now, certainly outside of China. In this view, steel makers are not interested in significantly increasing capacity. Rather, they are focused on moving upstream to more value-added products, in securing raw material supplies to insulate themselves against iron ore and coking coal price risk, and in improving their own quality and efficiency. Mr Burns wrote, "Even Severstal, whose highly competitive Russian plants are running at 95% capacity utilisation, are earmarking only a portion of their capital expenditure to expanding mini mill capacity." (11 March)

Metal components manufacturer Precision Castparts Corp. (Portland, Oregon) announced it has acquired a 49% equity stake in Yangzhou Chengde Steel Tube Co, Ltd, a manufacturer of carbon steels and alloy steel seamless steel tubes. As reported by the financial newswire RTTNews (15 January), the American company said its lack of capacity for seamless boiler pipe manufacture would have forced it out of that market.

Through its new Chinese affiliation, Precision expects to gain immediate access to the boiler pipe market in China. From there, the distribution network of another US forgings and castings maker – Wyman-Gordon Co (Grafton, Massachusetts) – will introduce Precision Castparts products around the world.



Yangzhou Chengde Steel Tube manufactures seamless extruded pipe for boilers in coal-fired power plants, as well as pipe and tubing for energy-related applications such as the transport of compressed natural gas. It operates a single facility, in China's Jiangsu Province.

#### Legal proceedings

#### In California, a 'whistleblower' suit against PVC pipe maker JM Eagle will go ahead without the participation of Washington

JM Eagle (Los Angeles), the world's largest manufacturer of PVC pipe, and its former parent company Formosa Plastics Corp (USA) are being sued for millions of dollars in damages for allegedly supplying substandard water and sewer pipe to states, cities, and municipalities across the US from 1995 to 2005.

The new "qui tam" (whistleblower) lawsuit, like an earlier such suit filed by former employee John Hendrix, stems from an assertion by Mr Hendrix that the tensile strength of PVC pipe sold by the company was below that required by Underwriters Laboratories to qualify for the UL mark stamped on its product.

JM Eagle moved its corporate headquarters from Livingston, New Jersey, to the West Coast in 2008. The plaintiff, an engineer in the product assurance division of J-M Manufacturing (the company's name before its acquisition of PW Eagle in in 2007), in Livingston, was given the job of fielding customer complaints. He was, he said, trained to find ways of attributing leaks and ruptures to the governments and contractors who installed and maintained J-M pipes.

"Only when he was assigned to oversee certain tests did Mr Hendrix begin to think the complaints stemmed from the company's own costcutting measures," Mary Williams Walsh wrote in the *New York Times*. "He said he realised JM Eagle had started buying a lower grade of raw materials from Formosa and had speeded up its production lines without reporting the changes to the certification agencies" as required. ("Bursting Pipes Lead to a Legal Battle," 12 February)

Mr Hendrix told the *Times* that he was asked to oversee the certification of a new manufacturing process that put the pipes through a prescribed battery of tests. He concluded that JM Eagle had been selling substandard plastic pipe since 1996, and that it had subsequently manipulated test results. According to his original complaint, filed in 2006, when he told his superiors of his concerns they said the problems were a normal "business risk." When he pursued the issue, he was fired.

The filing of Mr Hendrix's second qui tam suit followed on the announcement by the US government that it had decided against intervening in the matter. The decision, announced on 16 February, was hailed by JM Eagle as a finding of innocence, but that is to assert too much. The purpose of qui tam is to enlist the public in the recovery of civil penalties and forfeitures; the government rewards with a portion of the recovered proceeds those who sue in the government's name, or otherwise assist in the recovery. A civil action brought either by the United States or by a relator – whistleblower or other private party – in the name of the government involves the same considerations (of expense, available time, and likelihood of success, among others) that inform any decision to go to law for the recovery of damages.

Writing in *Plastics Today* after the government announcement, Clare Goldsberry observed that the law firm representing Mr Hendrix includes among those alleged to have sustained damage from JM Eagle pipes the states of Nevada, Virginia, Delaware, and Tennessee; the California cities of San Diego, Sacramento, and San Jose; and the Los Angeles Dept of Water and Power, as well as 39 other California municipalities and water districts. ("Whistleblower Lawsuit Targets JM Eagle," 18 February)

In a press release, the law firm Phillips & Cohen said, "As a result [of the substandard JM Eagle product] PVC pipes will have to be replaced sooner than expected – a budget nightmare for cash-strapped states, cities, and local agencies."

In a telephone interview with Ms Goldsberry, a JM Eagle spokesman said that the company denies these allegations and "stands 100% behind their products."



## Higher US passport fees irk Canadians and Americans alike

Since June 2009 the US State Department has required that its citizens travelling to and from neighbouring Canada show a passport to cross the border. Now, citing the high-tech screening features that are making passports more expensive to produce, the agency is raising passport fees by as much as 35%. An adult applicant can expect to pay \$135, up from \$100. Passports for children under age 16 would go to \$105, up from \$85, and other fees would also rise.

As noted by business reporter Madhavi Acharya-Tom Yew of the *Toronto Star,* the higher fees that were to take effect in mid-March would mean that US passports for a family of four would cost \$480.

Not surprisingly, Canadian tourism industry officials in the busy bordercrossing area spanning the province of Ontario and upstate New York are among those most unhappy about the new regulations. ("Higher US Passport Fees Could Put a Damper on Local Tourism," 28 February)

"It's very difficult to get our American visitors across the border for so many reasons right now," Niagara Falls Tourism chair Wayne Thomson told the *Star*. "This is certainly not good news for people in the US who may not be able to afford a passport and it's certainly not good news for tourism destinations."

Until fairly recently, visitors to Canada from the US plied an active cross-border route. Because only some one-third of US citizens hold a passport, the requirement to present one for entry to Canada has had a dampening effect only intensified by the rising Canadian dollar (now on a par with the US greenback) and the economic downturn in both countries.

The huge boost Canada's image has received from the Vancouver Winter Olympics will no doubt help reverse the trend. In the meantime, according to David Ogilvie, chair of Tourism Toronto, the increase in passport fees is unlikely to deter American business travellers. "That's not going to stop them from coming to Canada or Toronto to get business done," he told the *Star.* "But it could deter leisure travellers."

Dorothy Fabian, Features Editor (USA)



## PRODUCTION OF FITTINGS, COUPLINGS & TUBULAR JOINTS

A catalogue of these wares can give the impression that it illustrates more designs than any other collection of its kind. Page after page of single-purpose devices – each one developed, produced and tested to the same advanced degree as the tubulars to be joined – offer solutions to an extensive range of ordinary and specialised connecting applications.

Reducers. Tees. Unions. Elbows. Caps. Studs. Bushings. Spacers. Plugs. Swivels. Wyes. Ferrules. Flanges. Bulkheads. As varied as the product line may be, these closely engineered pieces all have one thing in common: precision fit, with gaskets, seals and rings as well as with the long pieces.

To ensure that fittings, couplings and joints serve the purpose for which they are intended – making and maintaining the connections that turn individual lengths of tube or pipe into flexible mechanisms with greatly amplified possibilities – is the province of the companies profiled here.



#### **PRODUCTION OF FITTINGS, COUPLINGS & TUBULAR JOINTS**

## Butt-weld fittings manufacturer begins production at Gujarat plant

Gujarat Infrapipes Pvt Ltd (GIPL), an Indian manufacturer of butt-weld pipe fittings made from ferrous and non-ferrous materials, ranging from 2" to 76", has begun production at its new plant located in Managlej, Baroda, Gujarat.

The company has doubled its capacity to 10,000MTpa, and claims to now have the largest and most modern facility for manufacturing pipe fittings in India. The company has installed new equipment such as induction heating mandrel machines,

### Thermoplastic fittings fabrication

RITMO SpA, an Italian manufacturer of plastic welding equipment and tools for thermoplastic pipes, offers a complete range of workshop fittings fabrication machines for the production of segmented fittings such as elbows, wyes, crosses and tees, in the range 40 to 1,600mm.

The fabrication of plastic fittings involves the use of two different machines: a band saw to cut the pipes into segments and a fittings fabrication machine.

Sigma is a line of band saws for cutting plastic pipes, designed and manufactured by Ritmo to allow the creation of segments of pipes up to 1,600mm in diameter, with angles between -45° and +67.5°. The pipe cutting procedure follows fixed patterns and angles in order to create segments of pipe to be welded in a matter of seconds.

Alfa is the company's line of hydraulically operated machines for the manufacture of fittings, featuring special jaws, which allow the user to lock and weld pipe segments at fixed angles.

With the Alfa range it is possible to manufacture elbows up to 1,600mm, and wyes, tees and crosses up to 1,200mm. Thanks to the CNC/Easy Life operating system and the practical and intuitive control panel, it is possible to perform the welding cycle in a simple and repeatable way, eliminating operator error.

Ritmo SpA – Italy Fax: +39 049 9901993 Email: info@ritmo.it Website: www.ritmo.it hydro-forming machines, and automatic material handling equipment.

The new plant will enable GIPL to serve customers with quality products and committed on-time delivery, and will also allow the company to serve international markets, especially the Middle East and Europe.

Examples of recent special orders carried out by the company include: welded Y-piece BW, MOC Inconel 625 Size 20" x 14mm; seamless elbow, tees and reducers,



MOC A403 GR 347 of size 18" to 24", and thickness of 42 to 60mm; and seamless cross, MOC A234 GR WP9 of size 10" and 18" x Sch 100.

**Gujarat Infrapipes Pvt Ltd** – India Email: mail@gujaratinfra.com Website: www.gujaratinfra.com

## Steel, stainless and alloy steel fittings for the chemical industry

DELCORTE sas is composed of five production plants, producing steel, stainless and alloy steel fittings for water, gas, chemical, petrochemical and nuclear applications.

The company is approved by major oil and gas companies (BP, Exxon Mobil, Qatar Petroleum, Saudi Aramco, Shell and Total), making the group a reliable partner for EPC companies such as Bechtel, Chyoda, Fluor Daniel, Foster Wheeler, Hyundai, JGC, Saipem, Technip and stockists. 85% of the company's production is exported, to more than 60 countries.

Product ranges include carbon, stainless and alloy steel high pressure

fittings as per ASME B16.11; reinforced branch outlets (BW, SW, THD, NIP and ELB) as per MSS SP 97; steel threaded couplings for water and gas from <sup>1</sup>/<sub>8</sub>" to 6" (ISO, BS, DIN, ASTM and UL6); conduit couplings; wrought threaded steel fittings as per BS1740-EN10241; tailor-made fittings for special applications; API line pipe couplings as per API 5L; and API casing and tubing couplings up to 20" as per API 5CT.

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## Simple and efficient clamp fittings now accommodate PE-Xa

TIME- and cost-saving installation in water and in industrial applications is of great importance. Additionally, the used materials should be long-term, efficient and easy to assemble. FIP (Formatura Iniezione Polimeri SpA), a subsidiary of Axialis group, offers the Magnum<sup>®</sup> compression fittings system as an alternative to conventional joining techniques to bond or weld.

Magnum clamp fittings made of PP are said to be particularly resistant, with high hardness, thermal stability and chemical resistance. The fittings are suitable for high tensile strength, and the detachable



connection of plastic pipes of equal and different plastic types, such as HDPE 80/100, LDPE, PP, PVC-U/C (with special ZCKO clamping ring), and now also for PE-Xa (up to d63).

By tightening the nut, the clinching ring is released and clamps the pipe while the compression bush compresses the O-ring, creating a permanently tight connection, which can be further re-tightened for maintenance if necessary. The Magnum system, which is distributed in Germany by Akatherm FIP GmbH (Mannheim), provides a secure connection of the pipeline thanks to the dynamic user-sealing system, and it is mainly implemented in the field of irrigation, household connection, swimming pools, horticulture, mining and telecommunications.

By DVGW approval, it is a reusable system for drinking water pipes up to a

maximum operating pressure of 16 bar (d20-d63) or 10 bar (d75-d110) in water at 20°C applications.

In addition to the standard fittings, Magnum transition fittings, with a onesided plastic or metal thread, solve the critical problem of transition to plastic or metal counter. Through the use of Magnum universal transition fittings, metal pipes such as copper, lead and steel can also be easily connected.

The Magnum clamping system includes fittings, couplings, elbows, tees, reducers, end caps, transition fittings with tapered external or internal threads, universal flanges, universal transition fittings and accessories.

FIP SpA – Italy

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Akatherm FIP GmbH – Germany Fax: +49 621 486 2925 Email: info@akatherm-fip.de Website: www.akatherm-fip.de

### **Press-fittings manufacturing**

EMS, France, produces a large range of tube processing equipment dedicated to press-fittings manufacture. From simple manual feeding end-forming machines to fully automatic production lines, the company delivers machines adapted for each particular need.

The press-fittings equipment is designed under the most modern configurations, and according to recent standards, including the bending of tube serpentines for 45° and 90° elbow fittings, hydroforming for tee part fittings, de-burring, end-forming and washing units. All equipment is adapted for stainless steel, steel, copper or brass tubes.

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#### **Butt-welding fittings**



ERNE Fittings is a manufacturer and supplier of butt-welding fittings such as elbows, tees and reducers from 21.3 to 1,016mm (½" to 40") external diameter and wall-thicknesses up to 50mm, made of alloyed, unalloyed, stainless steels and exotic materials.

Production takes place in the company's four plants in Austria, Germany and Saudi Arabia, where special demands for short production times are accommodated. Erne Fittings offers a high degree of product availability and ability to deliver on urgent demands.

Products from Erne Fittings

The company is a flexible partner for both stockists and project specialists, and offers services on the basis of individual, customised system solutions.

Erne products are used worldwide, in power stations, oil and gas fields, pipelines, refineries, chemical plants, ships and other areas of industry.

Erne Fittings GmbH – Austria Fax: +43 5524 501 930 Email: office@ernefittings.com Website: www.ernefittings.com

### Flanges and fittings in stainless steel

EUROFLANSCH manufactures flanges and fittings for wholesalers and large consumers. Products include small and large flanges, fittings and elbows made of carbon steel or stainless steel.

The company is approved as a material manufacturer according to AD 2000-W0, and has established a certified quality management system in accordance with the Directive 97/23/EC for Pressure Equipment, as well as being certified according to DIN EN ISO 9001:2000. With the approval CRN 0B12002.5ADD1, the company supplies flanges according to B16.5 in all Canadian provinces. By the receipt of the Lloyd's Certification, Euroflansch is able to supply all authorised flanges for shipbuilding.

Euroflansch GmbH – Germany Fax: +49 5723 798291 Email: info@euroflansch.com Website: www.euroflansch.com

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## Complete line of pipe and coupling finishing equipment

PMC-COLINET, A Park-Ohio Company, designs, manufactures and provides support services for a complete line of pipe and coupling finishing equipment. Its machine designs are optimised for the production of oil country tubular goods, in accordance with worldwide industry standards; most notably those for API and premium connections. It also builds a full range of end-finishing machines for the commercial market such as gas/water pipe and conduit.

PMC-Colinet offers both rotating product and rotating tooling technologies. Its applications group analyses the customer's product mix and recommends the most appropriate technology. Due to the increasing production of premium connections, a combination of both technologies is often the best solution.

PMC-Colinet designs true, mill-duty equipment renowned for its durability and long life and offers state-of-the-art equipment for each step of the end-finishing process: pipe and coupling cut-off machines, bevelling machines, pipe and coupling threading machines, coupling starter and buck-on machines, short stroke or full length (mandrel type) drifters, protector applier machines and material handling tables. Its latest generation of rotating tool, CNC, pipe threaders features, two independently controlled x axes that allow for greater flexibility in the creation of end geometries. The dual axis design also reduces durable tooling requirements.

These threading machines can be programmed to perform the facing and bevelling operations to eliminate the need for separate bevelling machines in the finishing line.

PMC-Colinet has recently developed a rotating product, coupling cut off and OD turn machine. It converts coupling stock into turned and cut-to-length blanks that can be fed into a manufacturing cell that contains rotating product or rotating tool coupling threading machines.

PMC-Colinet is a single source for equipment and for the durable and perishable tooling consumed during the production process. Its carbide and highspeed steel thread chasers produce thread configurations that comply with industry standards around the world.

#### PMC-Colinet – USA

Email: sales@pmc-colinet.com Website: www.pmc-colinet.com

## Fully automatic machines for the fittings industry

SCHWARZE-ROBITEC is a family-run manufacturer of tube and pipe cold bending machines. The company has developed special machines for the fittings industry, and also manufactures machines with different features and capacities for the copper fitting industry (eg according to DIN 2856).

The company's fully automatic machines with a maximum capacity of Cu Ø 130x4mm are able to produce cut elbows of maximum 90°. Model SR 32 CU is a servo-hydraulic controlled machine using a compression bending system with mandrel guidance and integral sawing unit. The machine is fed from coiled copper tube, up to four tubes Ø 16x1mm simultaneously, or one tube Ø 28x1.3mm, with a cycle time of approximately three seconds, to achieve an output of around 5,000 bends per hour.

Models SR 60 CU and SR 100 CU both work from bar material with a maximum length of 7m, and have a magazine on the side for automatic loading and an integral sawing unit. All tubes can be bent on a bending radius of R=D, depending on the elongation of the material, the wall thickness and maximum allowed thinning.

Schwarze-Robitec builds machines for cold bending of tubes and pipes with a capacity up to Ø 420x17.5mm for all kinds of industries (automotive, petrochemical, aircraft, aerospace, shipbuilding and furniture), and special booster bending machines (for boiler and power plants) up to Ø 168.3x12.5mm.

For tube measuring equipment, software applications and other tube working processes, Schwarze-Robitec cooperates with companies specialised in those applications.

Schwarze-Robitec GmbH – Germany Fax: +49 221 890 0829 Email: sales@sch-r.com Website: www.sch-r.com

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89

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# WELDING TECHNOLOGY



Anyone whose project involves the joining of metal knows that welding is crucial to a smooth manufacturing process. More than that, the professionals whose products and services are reviewed here think of the welded joint as the essential link in a structure. Their welding culture of soundness and dependability has been evolving ever since it was discovered that two pieces of metal can be made – in the right hands, and with the right technique – into a third thing of greater utility and value.

But every point of that development is only a way-station. As materials are formulated for greater strength, corrosion resistance, and other performance factors, welding can only become more challenging. Ever-closer monitoring of the auxiliaries of the welding operation - the base metal, filler metals, gases - will be required. Welding will have to be performed under water and in other liquids, with no adverse effect on the weldment. Pre- and post-weld heat treatment and other techniques will enhance weldability; but for broad acceptance their costs must be brought well down.

Welding is a mature process. But given the greater demands made of a welded joint all the time, very possibly the glory days of welding lie ahead of it.

#### WELDING TECHNOLOGY

## Customised laser tube welding and cladding machines

LASER welding solutions from Balliu Machine Tool Corporation include hybrid welding, combining GMAW-welding and laser welding acting in the same welding pool.

This combination allows higher welding speeds and deeper penetration. By adding filler material, the tolerance requirements on gaps between parts and fixture positioning is reduced. An alternative method is laser welding with wire filler material.

Balliu's laser welding machines are frequently custom made: length and diameter of the tubes, degree of automation, type of welding process, type of fixtures, degrees of freedom of the welding head, and type of processed material are some of the parameters that are defined according to the user's needs. Laser cladding is a method of depositing metallic material using powder or wire,



and melting it on a workpiece with the use of a laser beam. Common applications include adding coatings to new workpieces to improve mechanical properties and/ or corrosion resistance; and the repair or resurfacing of worn or damaged parts.

Balliu is an export-orientated company, and has an extensive international service team.

Balliu MTC nv – Belgium Fax: +32 9 340 66 30 Email: info@balliu.be Website: www.balliu.be





#### Intelligent high-power welding head

FOR the challenging task of welding variable joint positions, the tools of choice are intelligent welding heads, which measure the position of the joint in order to place the weld seam at the correct position. Each welding task also requires a spot size that is adapted to the application, and the effective width of the laser beam can be flexibly optimised from one seam to another, ensuring a stable process. The weld seam width is therefore only as wide as necessary, enabling the highest possible welding speeds.

Precitec's YW52 high power welding head features controlled welding position and weld width. All functions are integrated into the new welding head, without the need for additional external sensors, cameras or external linear positioning drives.

The WobbleTracker uses the welding optics to coaxially measure the joint only a few millimetres in front of the TCP. The position acquired is immediately transferred to the controllable deflection mirror (also fully integrated) and a preselected Wobble amplitude and frequency is then overlaid. The minimum pre-process times (less than one tenth of a second) and the optimal distribution of the energy input per unit length over the weld seam width guarantee short cycle times in a fully optimised process.

E-Z Gold pipe

clamp series

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for the preparation and fabrication of all

Based on the modular concept of the YW30 welding head, the YW52 is designed to operate with maximum aperture and minimal overall size, and is suitable for use with fibre, disk or diode lasers in the high power segment. In the basic version, the head is inexpensively priced, and its range of functions can be expanded to match the requirements of customerspecific applications.

All well-known pre-process, in-process and post-process modules by Precitec can be integrated for fully automated production.

The combination of quality monitoring systems and processing heads provides a complete solution for highly-automated processing. One example of Precitec's extensive experience in laser joining with concerted process assurance and monitoring of quality is the welding of power train parts with the Souvis<sup>®</sup> 5000 system.

The inspection head can be automatically switched from the preceding operation mode (for highly accurate control of the laser beam) to the succeeding measurement of the seam position and quality.

Circumferential weld seams allow correlating the joint position to the seam position and therefore the system detects

types of pipework and plate for many industries, including oil refineries, chemical, petrochemical, nuclear, shipbuilding, offshore and boiler manufacture and repair, as well as for food and dairy production sectors.

The latest addition to the company's range of rapid fit-up pipe welding alignment clamps is the E-Z Gold series, boasting an increased range of up to 14" OD and manufactured from forged steel for increased



lack of fusion caused by faulty seam positioning even on seams with perfect appearance.

Precitec KG – Germany Fax: +49 7225 684 900 Website: www.precitec.de

strength. Stainless steel roller balls are fitted as standard to the wing bolts.

The E-Z Gold clamps can be used on stainless steel by fitting the optional stainless steel feet to prevent pipe contamination.

Prestige Industrial Pipework Equipment Ltd – UK Email: sales@pipe-Itd.com Website: www.pipe-Itd.com



## High frequency induction welding

THE induction high frequency welding method is a key process technology for the production of ferrous and non-ferrous tubes with a diameter range from a few millimetres up to 26" at wall thicknesses up to 25mm, for a variety of applications.

Due to the growing product spectrum of tube and pipe mills, flexible welding systems are increasingly essential. SMS Elotherm's welders accommodate a broad range of new materials and their alloying elements, particularly high strength steels and stainless steels, in a wide variety of dimensions. Through the optimum configuration of system parameters and welding frequencies, a single induction welder reliably produces high quality weld seams.

The quality of the welding seam produced is dependent on a variety of parameters,



including material quality, material presentation, welding angle, impeder (ferrite quality), and frequency.

Considering the influence of the frequency on the seam quality, higher frequencies are generally to be preferred for small steel tubes and thin walls. For wall thickness greater than 4mm, lower frequencies below 150kHz are favoured.

The required impeder-system concentrates the current flow in the strip edges and increases the efficiency of the welding process.

The impeder has to match in diameter and length with the given tube size, and should have the maximum possible values for saturation flux density and amplitude permeability.

SMS Elotherm has more than 70 years of experience as a supplier of complete

induction systems for an array of applications in the tube and pipe industries. To help tube and pipe makers improve their energy efficiency, SMS Elotherm develops and builds state-of-theart converters (power supplies) for induction systems.

SMS Elotherm GmbH – Germany

Fax: +49 2191 891 726 Email: info@sms-elotherm.de Website: www.sms-elotherm.de

## Chicago area tube mills opt for EFD Induction Weldac

EFD Induction has delivered two of its Weldac 600kW high frequency induction IGBT (insulated gate bipolar transistor) tube welders to tube mills in the Chicago area. Both systems replaced older vacuum tube technology in existing tube mills.

The tube producers will use the EFD Induction Weldacs to weld tube to customer and industry standards. Both Weldacs delivered can use contact welding or induction coil welding methods.

Commenting on the delivery, Mark Andrus of EFD Induction in the USA said, "The customers have chosen EFD Weldacs based on the welders' high efficiency, uptime performance, and excellent EFD Induction customer support. In addition, these customers now have reported gains in weld quality." The EFD Induction Weldac 600 high frequency tube welders have a single footprint layout, automatic load matching, and customised control packages to offer a wide range of operational flexibility. The Weldacs use of IGBT for high frequency switching allows for maximum ruggedness in the area of power electronics for solidstate high frequency tube welding.

EFD states that, along with the good power factor rating, high electrical efficiency and high current handling capabilities of the Weldac, tube production and quality can be increased.

EFD Induction Inc – USA Fax: +1 248 658 0701 Email: sales@us.efdgroup.net Website: www.efd-induction.com





#### GLOBAL MARKE

A Main

The UBS deal Will Switzerland's culture of discretion in banking matters never again be the same? Or, will it forever be the same?	Department lawyer Shart D Obson that it had been initialied by parties, and that they would ask the folderal jobge presiding in case to diamise the mather when the final documents were signed This outcome had not seemed to be in the casts. As noted in food when the minal breakthough was announced. "[[] followe long-nning legal battle that had already undermined Switzerlen legendraty basis service; exposed what the US alleged was alleged with the service."
Sec. A	consprincy at the head of Swiss banking pilot UBS, and threader to demage relations battween two otherwise finally countries." Now some closure had been achieved, to the rejoicing of everyo except, participa, the 4,450 American clients of UBS whose nam were to be made known to the IRS.
The Series Leaving system will be forced to change	A garalized quartition de just from much change can be expected in the Swiss bank inclusity is outhine of discussion? While American automoties are start their porsion of the wedden with one start using an ULBS, the calcula- ities and the start of the scale and an August is the from canter. As not y napoter Lynneigh Bowning of the Numer's Work Trees, Their Swiss banks any they are confident that they can burt is with and confirms to port by finding new, more allocated away protect the privacy of oliverts. (Names Dael Discks Swiss B) Sciency: 24 August)
UBS's mistakes have opened a gaping hole in banking secrecy that can no longer be closed. The US has blown up a dam that was considered unsikeable and without weakness? This analysis, attributed to the Swiss newspaper Le Temps by an English-language website of Swiss Brackcasting Corp, refers to the nervisited ont illimatube corresolid afford of the UIS to the nervisite and without were self-afford or the tot the secret of the secret secret of the secret of the tot the tot the secret of the secret secret self-afford or the tot the secret secret secret secret secret sets afford or the tot the secret secret secret secret secret sets afford the tot the secret secret secret secret secret secret secret sets afford the tot the secret secret se	Interact to the IRS' UBS is obligad to give them up to the SM tax authority for forwarding to Washington. But, under the terms a new tax theatly between the USS and Switzealand, full transmit of the names could take more than a year. In the meanting UBS will have notified these clients, who may then appeal I disclosures in Swits could.
and then Seltstatistic's larged bark, UBS, the neares of scene Americans supported for donging large structures of the scent already accounts. Joint 11 August, it was reported that negotiation from the two countries had marked a selference that avended a large abrahodown over. Washingto's request for a feeter count fully comparing UBS comparison. In brief, UBS, the work's accord loggest manager (after Bank A function) of more than of hypothe-work individuals, in February 2009 according to this phot-e-work individuals, in February 2009 according to the theorem of the scenario of the scenario of comparison.	In light of the "we policial cirvati" in the US, another Tre combabit aclonological that we may expect to see a line American's shifting uncontrolled); "But, Carbien Boakey wroke: "Although the United Statis is supported to leare the ideal of a line thosaind tax exaders, those names all go find to immendiate tax existent, those names all go find to process of accounting the names may become bait in bareaccr and load charging;" (A Phileged World Begins to Dive Up Secrets, "23 August)
and also to share with the US Internal Revenue Service (IRS) the names of some 250 UBS clients. A day later, the IRS suad the bank for information on as many as 52 000 of its clients.	Of related interest
On 31 July the US and Selbacked and they had nached an agreement in principle on the lawsuit. This was followed quickly by word of the satisfament and, on 1% August, by policitation of its amended terms: USS would turn over the names of 4,450 American citetis suspected by the IRS of employing Swiss accounts for fair evasion.	> nevery vy specime. Untillately double / Harmanny 14,000 private bankess and 7 200 weathyr refrictalias show that private weath managed by banks and mestherest manage around the world decreased nearly 17% is 5144 bits in 2008 fit a year serier. The fail in managed weath, this first since 20 highlights the industry pressures of the global francial crisis a weakening bank secrety in offshore certess after years of buoy growth, iconormece-javani.com. 6 July
Enthusiatic response This resolution of the landmark challenge to Swiss bank secrecy was widely applauded. IRS: Commissioner Doug Shutman was quoted as saying that the agreement "protects the US government's	Pacific Rim





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## Strip welding machines for coil joining

IDEAL-WERK is a manufacturer of coil joining equipment, and offers various models of strip welding machine for the coil joining operation. The company's LBS 043/080 is made for TIG welding of steel and non-ferrous strip up to 80mm wide. The machine has a pneumatic double cutting shear and a pneumatic clamping device, together with adjustable automatic torch drive. It offers ease of operation for the coil joining operation in front of tube and roll forming lines.

In addition to other strip welding machines and flash butt welders for tubular components, the German manufacturer produces a laser welding machine for coil joining: Ideal type LAS 300. This machine can be integrated into continuous production lines for steel strip, and is designed to weld steel strip from 600 to 2,200mm wide and from 0.4 to 3mm thick.

The laser coil joining machine produces a tight weld seam of deep-drawing quality, eliminating nearly all damage that might occur when coiling up the steel strip. The laser welder is operated by a  $CO_2$  slab laser with an output of up to 8,000W. The laser beam is used for rectangular cutting and welding of the strip ends by mirror optic, and it is possible to join different strip widths and thicknesses together at one time.

For carbon steel, Ideal also offers also an annealing device, and a weld seam control system is also available as an option. Upon request, the machine can be equipped with pinch rollers for lengthwise positioning of the in- and outgoing strip ends, making it possible to position the strip ends of the coils precisely in the clamping device of the welding machine.

The LAS 300 laser welder produces weld seams of high quality and surface finish. The weld joints may remain in the product, and they show a thin heating zone and possess high solidity.

Ideal-Werk – Germany Fax: +49 2941 206 169 Email: info@ideal-werk.com Website: www.ideal-werk.com

## Solid-state high frequency welder

EMMEDI is the tube and pipe division of SAET Group, and specialises in induction welding and annealing processes. The company's MosWeld is a solid-state high frequency welder, available in power sizes from 100 to 1,000kW with output frequencies ranging from 150 to 450kHz.

MosWeld, with a very compact and robust design, uses a modular MOSFETbased inverter with very high efficiency. Easy maintenance and long-lasting performance are granted by the use of standard power components not subject to obsolescence, together with a special remote troubleshooting, process follow-up and simple inductor coils design.

Emmedi – Italy Fax: +39 011 9974328 Email: info@saetgroup.com Website: www.saetgroup.com

## Submerged arc-welding technology in the pipe and pressure vessel industry

PIPE welding facilities from Weldec GmbH are developed for longitudinal and circumferential submerged-arc welding (SAW), inside and outside. Weldec has concentrated its efforts on the main demands of the industry: mechanisation,

SAW technology from Weldec

![](_page_96_Picture_16.jpeg)

automation and a high efficiency of the SAW process.

Starting with the analysis of the client's requirements, the welding stand, the welding head and the pipe driving/turning device are individually designed to provide the best technical and economical solution. Based on hydraulic and electro-mechanical functions, the welding process can be started very quickly. The CNC-controlled multi-wire technique ensures a high melting deposit rate, especially at heavy wall thicknesses.

The Weldec product range of welding facilities covers equipment for SAW longitudinal and circumferential welding and U-groove back milling; SAW plate welding; MAG pre-welding; RES overlay welding; LaserHybrid longitudinal welding; and PlasmaHybrid longitudinal welding.

Weldec GmbH – Germany Fax: +49 2753 50703 30 Email: info@weldec.de Website: www.weldec.de

![](_page_96_Picture_21.jpeg)

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## Boiler pipe preparation where space is at a premium

THE BRB 4 series from Orbitalum Tools, developed for boiler applications with the lowest space availability, makes precise welding preparations possible using optimal torque, together with low weight.

While processing boiler pipes, the ability to change quickly from one pipe to another is required.

With the new BRB 4 Pneumatic/Auto with pneumatic tension, the machine is precisely centred in the pipe and pneumatically clamped or released.

The BRB 4 Pneumatic/Auto is suitable for series processing, for example in heat exchanger applications.

In the future, there will be two different clamping systems available: Standard or 'NC'.

The new NC clamping system, with its clamping wedges firmly anchored in the mandrel, is suited to applications where no foreign bodies may enter the inside of the pipe or a container. The NC clamping

![](_page_97_Picture_8.jpeg)

system provides extra safety, particularly for vertical use.

The Standard clamping system is established as stable and reliable, and continues to be available to order.

The machines are constructed modularly. The company offers five different machine kits for selection as auto, pneumatic and electric variants, depending upon the field of application. Depending on the machine kit, the inner pipe diameter can be processed in a range from 19.1 to 110.8mm (0.752" to 4.362"), with a maximum outer pipe diameter of 114.3mm (4.5").

![](_page_97_Picture_12.jpeg)

The BRB 4 from Orbitalum Tools

The BRB 4 is ideally suited to pipe wall thicknesses between 2 and 15mm (0.079 to 0.59").

The speed range of the electric motors as well as the gears were optimised for the higher chamfer requirements. The drive is available in both voltage types: 110V, 50/60Hz; and 230V, 50/60Hz.

The new brass brush attachments prevent chips and other foreign bodies from unintentionally falling into the inside of the pipes. This attachment is particularly useful for vertical work on containers. The brushes can be mounted quickly and easily on the threaded spindle of the new BRB 4, and all brushes can be used for both clamping systems.

With the patented Quick-Tool-Change (QTC<sup>®</sup>) from Orbitalum Tools, the user is able to change tools quickly and easily. The integrated multifunctional tool has two to four cutting edges and a high-performance surface coating that prevents wear and tear.

Pipe-ends made from unalloyed, lowalloy and high-alloy steels, with a high percentage of chromium and nickel, can be processed quickly, cost-effectively, and precisely.

**Orbitalum Tools GmbH** – Germany Fax: +49 77 31 792 500 Email: tools@orbitalum.com Website: www.orbitalum.com

### Wortelboer introduces the new TPP 5090

AFTER making a weld preparation, most pipes and tubes have to be polished in order to avoid pollution of the weld. As a result Th Wortelboer Bv in the Netherlands has developed a revolutionary solution to clean the inside and outside at the same time in one cycle.

The compact TPP 5090 is a safe machine for cleaning welding preparations quickly and easy. Tubes, pipes as well as plate edges can be prepared for welding quick and safe.

The two polishing wheels of the TPP 5090 can easily be adjusted according to the thickness of the material. The inevitable wear of the wheels, which decreases the wheel diameter, can easily be corrected. The new innovative TPP 5090 conditioning machine is a registered design.

On the company website www. wortelboer.ws a film is available. You can even find more information about pipe end preparation as well.

Th Wortelboer Bv – Netherlands Fax: +31 2435 87079 Email: info@wortelboer.nl Website: www.wortelboer.ws

## Lincoln Electric's new Pipeliner 80Ni1 MIG wire

THE Lincoln Electric Company designs, develops and manufactures arc welding products, robotic arc-welding systems, plasma and oxyfuel cutting equipment, and has a leading position in the brazing and soldering alloys market.

The company has introduced new Pipeliner<sup>®</sup> 80Ni1 MIG (GMAW) wire to its line of consumables developed to meet the demands of the global pipe welding industry. It is designed for semi-automatic or automatic welding of root, hot, fill and cap passes on up to X80 grade pipe and root passes on up to X100 grade pipe.

Pipeliner 80Ni1 is capable of producing impact properties of 69-95 J (51-70 ft.lbf) at -50°C (-58°F), to meet the demands of tough pipeline jobs. The new wire features enhanced arc characteristics and provides optimal wire placement for narrow groove joint configurations.

All Pipeliner products feature ProTech<sup>®</sup> foil bag packaging to ensure reliable performance, and are manufactured to lot control standards and tested per AWS A5.01, Class S4 Schedule H. Certificates of test are available at the company's website.

Lincoln Electric – USA Website: www.lincolnelectric.com

![](_page_98_Picture_13.jpeg)

Welding consumables from Lincoln Electric

![](_page_98_Picture_15.jpeg)

**Specifications:** Stainless steel seamless tubes for Instrumentation & Hydraulic, Heat Exchanger

Standard: EN10216-5, ASTM A269/A213, DIN17458

Sizes: O.D. 1mm -O.D.89mm\* W.T.0.2mm-W.T.10mm

**Length:** Standard 6 meters or 20 feet, or customerized, extra long tubes up to 26 meters are specially for Heat Exchanger applications.

Surface finish: Mill's finish/ Polished Surface from 180G to 600G/Bright Annealed

![](_page_98_Picture_21.jpeg)

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#### Welding products and accessories

ROHRMAN Schweisstechnik, Germany, supplies a wide range of welding products.

TIG torches supplied include standard TIG torches (SR-series); Weldtec® premium TIG torches (WT-series), a professional tool for weld performance, with a wide selection of gas- and water-cooled flexible torches; Speedway® TIG torches (SW-series), high amperage performance for welders on the 'fast track'; i-Head® TIG torches (WTF/WTB/ WTR-series) with interchangeable heads for problem solutions in pipe welding; Weldtec Micro TIG torches (WTM-series) to weld in confined areas; Weldtec machine and robotic torches (WTA-series) for professional automation; and Fron TIG torches (A/Pseries), similar to Fronius® TIG torches.

The company's MIG/MAG torches include the MEP range, compatible to the European standard, MAP series compatible to Fronius, and consumable parts compatible to Dinse<sup>®</sup>.

Rohrman produces interconnection

cable packages for any welding unit, up to 50m in length, and is able to adapt to special requirements for the use in tough environments such as shipbuilding or packages for robotic applications. The company also supplies extension packages for existing interconnection packages or TIG torches for long reach applications.

Along with a selection of necessary components such as welding cable plugs, power connectors, nuts, nipples, central connectors, handles, switches, PVC and rubber hoses and welding cables, the company can supply the automatically darkening welding helmets Autodim shade 9-13 and i-ProTector.

Rohrman Schweisstechnik GmbH – Germany Fax: +49 2162 106065 55

Fax: +49 2162 106065 55 Email: info@rohrman.de Website: www.rohrman.de

![](_page_99_Picture_0.jpeg)

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We are ready to take part in modernization of tube plants operating in Russia and abroad as well as to supply new equipment.

Piercing mill, eversky Tube Works" J

![](_page_99_Picture_4.jpeg)

Breakdown mill, inarsky Pipe Plant

![](_page_99_Picture_6.jpeg)

All units are manufactured in accordance with customer's specifications and satisfy its individual requirements.

> Tube Russia 2010 Moscow

# EZTM

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### Recommended practice for inspection of weld corrosion

ESR Technology has announced that HOIS, its joint industry project concerning improved non-destructive testing in the oil and gas industry, has published a Recommended Practice Guide for the Inspection of Weld Corrosion.

This recommended practice document is the result of a research project funded by HOIS to provide the oil and gas industry with guidance on the inspection of weld corrosion where there are currently no international standards or recommended best practices.

The document has been produced to present a unified recommended practice for the in-service inspection of weld corrosion in carbon steel components.

"The publication of this document provides a recommended practice to oil and gas producing companies and inspection companies on the preferred inspection methods and techniques for a variety of conditions," said Dr Steve Burch, ESR Technology's head of inspection technology and HOIS manager. "Increasing our understanding of asset condition leads to improved safety, increased efficiencies and reduced costs".

The document is available to the entire industry and can be obtained by registering and downloading a free copy from the HOIS section of the ESR Technology website: www.esrtechnology.com/hois/publications

ESR Technology provides independent technical expertise, products and services to help customers ensure asset integrity, improve reliability, manage safety and risk and transfer best practice. The company was previously the engineering, safety and risk division of AEA Technology, which was formed from the commercial arm of the United Kingdom Atomic Energy Authority.

ESR Technology also hosts five internationally renowned Centres of Excellence: the National Centre of Tribology, the National Non-Destructive Testing Centre, the European Space Tribology Laboratory, the Pump Centre, and HOIS.

**ESR Technology Ltd** – UK Fax: +44 1925 843500 Email: info@esrtechnology.com Email: steve.burch@esrtechnology.com Website: www.esrtechnology.com

## Orbital welding power source with 6 axes and auto-programming

POLYSOUDE'S launch of the P6 300 ampere mobile TIG welding system for tube assembly, using automated orbital welding, opens up new production possibilities for plant construction – technologically, economically and qualitatively. This is made possible by intuitive operation combined with a modular system concept.

A large touch-screen provides the human-machine interface. All interactions with the system take place via this interface, which issues all commands to the internal electronics via the software and transmits the status of the joining process to the operator.

The P6 has autonomous system configuration and auto-programming, and also features real-time welding data recording for reproducible welding results.

The machine not only detects the type of tool connected (such as open or enclosed weld heads), but also knows within which limit values the tool can work. Auto-programming adjusts the welding parameters down to the last detail.

Other features include program control by time or angular degrees calibrated in mm/ min or inch/min; error-diagnostic system; a built-in printer for welding procedure archiving and documentation; Ethernet compatibility; closed loop regulation of torch rotation and wire speed; arc voltage control

The system features an intuitive touch-screen interface

(AVC) and torch oscillation control (OSC); torch gas control with safety valve and flow detection; and closed loop water cooling system with safety valve for welding head and torch.

Polysoude SAS – France Fax: +33 2 4068 1188 Email: a.husson@polysoude.com Website: www.polysoude.com

P6 power source with CNC control for orbital and mechanised welding

![](_page_100_Picture_20.jpeg)

![](_page_100_Picture_21.jpeg)

### Welding pipelines, tubular parts and fittings

THE purpose of a pipeline is to transport media from one place to another. In this type of a pipeline only a few pieces are required: threaded joints in smaller pipelines and flange joints in bigger pipelines, unless the pipes are welded. But most pipelines have further purposes in addition to merely transporting media. Pipelines distribute media from feeder point to several locations or reversely collect media from several feeder points to collection locations. A pipeline built for distributing/collecting media differs from a pipeline built for transporting media by one critical tubular part – a tee.

There are several types of tees according to different usage purposes and standards. With the use of a tee the aim is to create a situation at the installation on-site where joining the pipeline's distributing part would correspond to joining it to a straight pipe with different joining techniques.

The requirements set by the usage purpose define the material and surface quality requirements of tees in addition to joining techniques. Particularly in the food, pharmaceutical and semi-conductor

![](_page_101_Picture_5.jpeg)

industries the surface quality requirements are such that tee-joints made on-site do not fulfil these requirements. For these reasons tees have become industrial products and commercial goods.

A common problem for all manufacturers is the geometry of the joining point of two tubular parts. This joining point turns into a continuously changing arc, which follows the surface of the main pipe. The arc of cutting branch pipe is identical to the arc of the main pipe. These arcs joined together form the joining surface which is to be welded. In addition to continuously changing arc the joining point of pieces to be welded form an angle which changes between 0-90 degrees. Controlling the full penetration of the weld and smoothness of the inner surface is difficult, causing lots of expensive after-work.

In order to eliminate the welding and after-work problem, several pipe branching methods have been developed where a collar is formed to the branch's joining point and in this way the branch location resembles the end of a straight pipe. This type of joint is easily welded manually and for this kind of welding there are several good orbital welders, which produce qualitative results on-site.

As the pipe diameters get smaller and the wall thickness in relation to pipe's diameter grows (becomes thicker) there are no working collaring methods (for branching) available. For manufacturing this kind of "small" tee a new welding method has been developed by Lacol Ltd. This welding method is named Larikka CylinWeld. Larikka CylinWeld is excellent for manufacturing tubular parts.

Joining the surfaces of two round parts forms a mathematical pattern and the simplest approach is from inside and on the central line of either tubular part. Larikka CylinWeld utilises the TIG-welding method and the welding takes place inside the tubular part. The welding process is fully automatic and the inner surface quality of the weld area is smooth. This result is achieved from the light arc travelling over the sharp corners of the joining point as the corners melt forming a round corner. Further, the root is on the part's outer surface making the visual check of full penetration of the weld simple.

Larikka CylinWeld is also very suitable for the welding of collared and straight seams. Larikka CylinWeld is applicable for the welding of single parts where the part rotates and the welding is down-hand welding, which is theoretically the best welding situation. However, with Larikka CylinWeld it is also possible to weld long manifolds. Equipment's functions can be applied so that the pipe is stationary and the electrode rotates inside the pipe. The operating range of Larikka CylinWeld is wide with the smallest diameter being 4mm and the largest 200mm, and in special cases it can be even larger.

LACOL Ltd – Finland Fax: +358 2071 21449 Email: maarit.aalto@lacol.com

### Welding pre-insulated district HDPE pipes and valves

RITMO SpA, a manufacturer of welders and accessories for plastic pipes, has launched ALFATEL-800, a workshop machine designed to weld pre-insulated district HDPE pipes and valves for both heating and cooling lines.

ALFA TEL-800 produces pre-insulated HDPE elbows within the 400-800mm diameter range, and jackets for valves within the 400-710mm diameter range.

District heating is an efficient and lowenvironmental impact system for distributing heat generated in a centralised location for residential, commercial and industrial heating requirements. Heat is distributed to the customer via a network of insulated steel pipes under pressure. An insulating foam wrapped around the pipe minimises heat dispersion, and the external HDPE jacket protects the lines.

ALFA TEL-800 has a machine body with facer and interchangeable heating elements. The fitting segments are loaded onto the machine carriages and tightened by clamps. The hydraulic movements of carriages, heating element, facer and clamps are driven by a handy control panel.

Ritmo SpA – Italy Fax: +39 049 9901993 Email: info@ritmo.it Website: www.ritmo.it

#### WELDING TECHNOLOGY

### Robotic TIG welding with integrated wire feeder

A NEW robotic TIG welding process has been developed by Oerlikon Schweißtechnik combining the quality of TIG welding with the productivity of MIG welding. The key part of the technology is an original torch design: the wire feeding is orientated in an angle close to the tungsten electrode and running through the gas nozzle. This configuration provides the advantage of reduced overall dimensions and enhanced accessibility of the torch for robotic welding of complex geometries.

Several technical features are associated to the new torch design, such as an automatic electrode changing system and a push pull wire feeder.

The filler metal is fed through the nozzle directly into the arc with an angle of 20° to the electrode, precisely where the temperatures are the highest. This concept guarantees a high deposition rate and an efficient metal transfer. Parameter adjustment permits the choice of a liquid bridge transfer or a droplet transfer mode. In addition, the wire speed can be pulsed and synchronised with the current, giving a waved weld bead appearance. Whatever the parameters selected, thanks to the precise energy control, the TOPTIG process ensures a TIG-quality result with a complete absence of spatter and avoids distortion on thin sheets.

Besides the good welding performance, compact the TOPTIG torch simplifies parameter adjustment and robot trajectory programming. The torch permits multidirectional travelling, which is faster, easier to program and makes

the sixth robot axis available for other purposes. Electrode changing is simple and guick, and can be performed manually or automatically, improving the productivity of the installation.

TOPTIG is a flexible process that can be installed on a robot or on an automatic machine. It can be used effectively on

![](_page_102_Picture_9.jpeg)

carbon or stainless steel plates up to 3mm as well as on titanium or nickel alloys or on galvanised sheets with weld brazing.

Oerlikon Schweißtechnik GmbH – Germany Fax: +49 63 514 76335 Email: info@oerlikon.de Website: www.oerlikon.de

![](_page_102_Picture_12.jpeg)

EMS equipments for press fittings industry are including bending in snakes for elbows, hydroforming machines for Tees, cutting, machining, end forming and washing units for stainless steel, steel, copper and brass. EMS is offering those equipments in manual feeding or in complete automatic production line.

![](_page_102_Picture_14.jpeg)

E.M.S. 18, Rue du Maréchal Joffre F 67701 SAVERNE Cedex Tél. +33 (0) 3 88 01 83 83 - Fax +33 (0) 3 88 91 05 37 - E-Mail : info@ems-sa.com - Internet http://www.ems-sa.com

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### **Processing of large diameter pipes**

FOLLOWING a number of enquiries from large pipe manufacturers, Maschinenfabrik Liezen und Gießerei GmbH (MFL), Austria, decided to develop the RFA 24/56 welding seam processing machine, for removing the welding seam of large diameter pipes by a fully automatic milling operation.

The machine mills the inner and outer welding seam of large diameter pipes over a length of 400mm. This process offers a number of advantages compared to the manual grinding process.

The largest advantage is that the milling process provides a better quality of welding seam – an important criterion for the delivery of large diameter tubes to Gazprom and other important customers. The complete process occurs automatically. Grinding pencils are not required, which prevents the operator from injury, and the milling process does not generate swarf or sparks. The chips are totally removed by an effective suction device.

The welding seam is measured by a scanning device, and by a second scanning process the removed welding seam is recorded.

Due to customers' differing capacity requirements, MFL has developed two machine concepts. The single head solution is designed for a capacity requirement of a maximum 13 tubes per hour. Both ends of the tube are processed by a 180° rotation of the machine. The double head solution is designed for a high capacity requirement of up to 24 tubes per hour. The double machine, with two milling heads, processes both tube ends (one tube end per unit).

Maschinenfabrik Liezen und Gießerei GmbH – Austria Fax: +43 7613 8883 30 Email: m.mayr@mfl.at Website: www.mfl.at

MFL's RFA 24/56 welding seam processing machine

![](_page_104_Picture_10.jpeg)

E-mail : wjico@chol.com

www.wesco.co.kr

![](_page_104_Picture_12.jpeg)

<section-header><section-header>

www.read-tpt.com May 2010 103 <

Website: www.wjico.co.kr

### Welding equipment at work on GRTgaz pipeline project

CRC-EvansAutomaticWelding is providing equipment for a gas pipeline project that is currently underway in France.

Known as the Beauce-Mantois Link, the project is designed to supplement the existing Beauce pipeline with a pipeline between Saint-Arnoult-des-Bois and Fontenay-Mauvoisin, an area westsouthwest of Paris.

Pipeline owner GRTgaz and contractor Ghizzoni SpA are constructing the pipeline link that will comprise approximately 40 miles (65km) of 36" pipe.

Ghizzoni has chosen to use the Internal

Welding Machine, and the P260 and P600 fill pass automatic welding machines manufactured by CRC-Evans.

The P260 welder provides tip-to-work tracking, 32-pass programmable welding, PDA downloads in the field, and position-based parameter control.

The P600, the latest generation in external welding equipment, features either dual or single torch, a secure smart card and an onboard computer that ensures precise control of parameters.

"Our experience has led to technology innovations that make a real difference in

quality and productivity on jobs like this," said Brian Laing, president and COO of CRC-Evans Pipeline Equipment and Automatic Welding Group. "The P260 and P600 welders will be powerful assets on the French pipeline project."

CRC-Evans Automatic Welding designs and builds automatic welding systems for land or offshore pipeline construction.

In addition to renting or selling these systems to contractors on a project basis, the division provides other specialised services such as engineering, on-site technicians, and training.

#### CRC-Evans Automatic Welding – USA

Email: autoweld@crc-evans.com Website: www.crc-evans.com

## Global process aims to help to improve workshop efficiency for welders

AXXAIR, which specialises in orbital cutting, bevelling and welding equipment, has unveiled the Global Process, a complete solution for preparation and manufacturing facilities piping workshop and on site, largely present in the pharmaceutical markets of the food processing, semiconductor, petrochemical and chemical industries.

AXXAIR offers three applications with a single machine: preparation tube (cut, bevel) to orbital welding (welding and prefabrication online).

The global process, which AXXAIR

claims is economic and simple to implement and use, increases the rate of productivity and quality of work. It allows full traceability in welding through the integrated memory card in the generator.

As part of its strategy of innovation and product differentiation, the company regularly develops new products and recently the range of orbital welding has been enriched with a new head closed SATF-40ND, a new head open SATO-220 and a stroke unit/oscillator that mounts on the range SATO (weld line) and SC (welding machine in prefabrication). The company is present in over 30 countries, either through commercial subsidiaries in South Korea and China, through office in Germany and Spain, or through its network of channel partners. AXXAIR said it also offers customers feasibility studies, samples, training and after sales service as requested.

AXXAIR – France Fax: +33 475 575 080 Website: www.axxair.com

### A tough choice: laser or HF resistance welding?

IN the majority of applications, carbon steel tubes are HF welded, while stainless steel tubes are welded using TIG or laser. Profile producers face more complexity when deciding on the optimal welding process. Multiple factors influence the selection of the optimal joining method.

One of the first considerations is the cross section of the profile and respective position of the weld-seam. Is the position of the weld-seam suitable for HF welding? Does the profile geometry allow proper set-up of squeeze rolls in order to provide the required squeeze pressure?

Another consideration must be the wall thickness of the profile, especially when using a laser. Achievable welding speeds decrease as material gauge increases. At the same time required laser power, cost for the installation and day-to-day operating cost of the welder will increase with thicker materials processed. However, it might not be possible to exploit the higher speeds yielded by the HF welders, due to speed restrictions caused by in-line punching operations.

These are only few of the considerations entering the selection process for the bestsuited welding process. The deciding criteria might not even be found within technical considerations, since it might be: which process is expected to improve product positioning in the market and therefore produce larger sales to the company?

Dreistern, Germany, has produced a profile welding system for a renowned company investing in laser technology. The state-of-the-art system demonstrates the considerations made during the selection of the welding process. The main product run on the system is a profile with large pre-punched holes that reach extremely close to the weld seam location. These holes prevent the delivery of high squeeze pressure evenly along the profile.

Other factors favouring the laser were tight tolerance requirements with respect to profile form and hole pattern. The comparably small heat input of the laser is favourable in achieving these tolerance requirements.

Dreistern can integrate any suitable welding process available on the market, and describes itself as a strong partner to work with when selecting the best welding process for a profile.

Dreistern GmbH & Co KG – Germany Fax: +49 7622 391 205 Email: sales@dreistern.com Website: www.dreistern.com

## Experimental and FEM investigation on influence of ring stiffeners on buckling behaviour of subsea pipelines under hydrostatic pressure

H Showkati – Civil Eng. Department, Urmia University, Urmia, Iran R Shahandeh – Civil Eng. Department, Sama organization (affiliated with Islamic Azad university), Khoy branch, Khoy, Iran

#### Abstract

Submarine pipeline is considered as a thin walled structure and, therefore, buckling is an important consideration at design stage. Initial buckling is created on pipeline because of problems such as additional force on a point of pipeline, existing imperfections on it or because of forces increasing and because of this buckling propagation is started on the pipeline. These occurrences cause the estimated strength of pipelines to decrease. For the prevention of this problem the application of ring-stiffeners is a good solution. For this purpose experimental and FEM analysis programs are arranged for investigating the influences of ring stiffeners on buckling strength of pipelines.

Pipelines are subjected to many forces such as hydrodynamic and hydrostatic pressure, the dynamic effect of waves, free span and so on. Because of the importance of hydrostatic pressure and experimental limitations, this type of force is modelled and studied in this paper. All models in experimental and FEM methods are geometrically corresponded together. The modes of initial buckling, buckling propagation and post-buckling of pipeline are evaluated and compared in both methods. It was found in this research that these quantities are highly influenced by attached light weight ring stiffeners. Some new phenomena appeared with increasing the number of rings such as torsion effects and lateral displacement on pipeline. Keywords: pipeline, initial buckling, post-buckling, ring stiffener.

#### Introduction

Pipelines include the most valuable of the oil and gas industries and because of this, investigation of its characters its very important. Important problems are included, pressure of initial buckling, buckling propagation pressure and modes of collapsing. Until now, many researchers studied these problems. According to these studies most of these researchers and designers and reputable standards suggested some relations for designing. Shell Development Company lab studied about initial buckling pressure and presented relation (1):

$$P_i = 5.S_{\gamma} \left(\frac{t}{D}\right)^2 (Mpa) \tag{1}$$

And some standards such as BSI, API, ABS, DNV <sup>[1, 2, 3, 4]</sup>, presented for buckling propagation following relations, respectively (2,3,4,5):

$$P_{p} = 10.7\sigma_{Y} \left(\frac{t_{nom}}{D_{0}}\right)^{3.4}$$
(2)

$$P_p = 24S \left(\frac{t}{D}\right)^{2.4} \tag{3}$$

$$P_p = 6SMYS\left(\frac{2t}{D}\right)^{2.5}$$
(4)

$$P_p = 1.15\pi\sigma_{\gamma} \left(\frac{t}{D} - 1\right)^2 \tag{5}$$

"Palmer" and "Martin", according to their experimental and theoretical studies, presented first theoretic relation for buckling propagation pressure. "Mesloh" et al (1976), "Kyriakides" and "Babcock" (1981), studied this problem experimentally and presented their relations <sup>[5,6]</sup>.

"Hutchinson" and "Charter" (1984) according to the principle of virtual work studied pipeline's elastic-plastic collapsing under external pressure. "Kamalarasa" and "Calladine" (1988) developed Palmer's manner to a 3-dimensional model which had good corresponding with experimental results <sup>[7]</sup>. "Murray" and "Zhou" (1994) according to theory of shells investigated on local buckling behaviour of pipelines under complex loads <sup>[8]</sup>. "Pasqualino" and "Estefen" (2001) theoretically studied about buckling propagation of pipelines <sup>[9]</sup>. "Kyriakides" and "Netto" (1999) experimentally and theoretically investigated on dynamic propagating of buckling of pipelines under external pressure <sup>[10, 11]</sup>.

Notations

$P_P$	buckling propagation pressure	Е	material tangent modulus
D	pipeline diameter	SMYS	minimum characteristic yielding stress of pipeline steel
$P_i$	initial buckling pressure		
t	pipeline thickness	$t_{nom}$	nominal wall thickness of pipeline
L	rings spacing	S	minimum characteristic yielding stress of steel pipeline
L	specimen length		
$S_y$	minimum yielding pressure	$D_0$	outer diameter of pipeline
n	number of waves	$q_{\scriptscriptstyle cr}$	critical buckling pressure
$\sigma_{v}$	yielding stress of pipeline steel		

#### ARTICLE

In this paper the buckling and post-buckling behaviour of stiffened pipeline is experimentally and theoretically investigated under hydrostatic pressure. These ring stiffeners were used as buckling arrestors which cause the buckling capacity to be increased. The geometric imperfection of specimens is carefully measured and applied on FEM models but residual stresses are disregarded. The obtained results are discussed and compared. Also, the effect of stiffener section as well as the rings spacing are evaluated.

#### Experimental set-up and procedure

All specimens were manufactured in three small and equal length parts, and then ring stiffeners added to specimens. All junctions between these three parts of specimens (circumferential and longitudinal directions) and specimens-rings junctions were performed with soldering. Hydrostatic pressure on pipeline was modelled

Figure 1: Strain gauges and transducers set-up

![](_page_107_Picture_5.jpeg)

Figure 2: Set-up of experiments

![](_page_107_Picture_7.jpeg)

with a vacuum pump on specimens which absorbing the air in specimens under loading. Measuring the strains, displacements and internal pressure of specimens were performed by strain-gauges, transducers and monometer respectively which were set up on specimens. For exactly modelling the conditions of specimens on FEM software, all specimens' geometric imperfections were measured and circumferentially and longitudinally meshed (figures 1 and 2).

#### **FEM** analysis

All specimens that were tested had both material and geometric nonlinearity models created. This study was performed by using the nonlinear finite element program LUSAS. All models were meshed to 48 parts circumferentially and 96 parts longitudinally (figure 4), by using 4-noded quadrilateral shell elements (figure 5). The properties of steel were applied according to the result of steel tension tests that are shown in figure 3. Material properties and boundary conditions of models exactly corresponded to experimental conditions.

![](_page_107_Figure_11.jpeg)

Figure 3: Strain-stress curve of material

![](_page_107_Picture_13.jpeg)

Figure 4: FEM meshing type

![](_page_107_Picture_15.jpeg)

Figure 5: Type of using element
#### Tested and analysed models

In total, in experimental part, four experimental specimens were tested after manufacturing. All specimens had similar geometric properties such as 2.46m length, 10.2cm diameter and 0.25mm thickness. Rings had 10.2cm inner diameter, and 12.2cm outer diameter and 2mm thickness. The only difference between specimens was the number of attached rings on specimen. For identifying specimens they were labelled such A4. This label shows that the specimen has geometric properties such was mentioned elsewhere, with four ring stiffeners where two of them were end rings and two others were middle rings. In fact, in each specimen, rings had equal spacing.

In FEM analysis, all experimental specimens were exactly modelled and analysed. Three other models were also analysed, which had no corresponding experimental specimen, because of the difficulty of manufacturing them experimentally. Two of them had four rings such as model A4 but with different thickness. They were labelled as A4 t20 that shows the model is a similar model A4 with four rings but with 20mm thickness. These models were analysed for comparing with model A4 to investigate the effect of the ring's thickness on behaviour of pipeline. Another model had no rings but different thickness which labelled B0. This model had geometric imperfections such model A0, and weight equal to model A13. This model was analysed, for comparing two same weight models A13 and B0 with model A0 to investigate the economic benefits of using of ring stiffeners. Geometric properties of models and specimens and their labels are shown in table 1.

#### Experimental buckling and post buckling modes

As is shown in table 1, in total four specimens were experimented with, buckling behaviour of specimens are shown in figures 6, 7, 8, 9, 10 and 11. In these figures behaviour of specimens are about axial, circumferential-pressure strains and radial displacementpressure.

Figures 6 and 7 are about axial strain of specimens. Figure 6 shows axial strain-pressure curve of specimen A0 as basic specimen. Initial buckling of test occurred at 6.0 Kpa. Figure 7 shows comparisons between specimens A4. A7 and A13 with the buckling pressure 17.0 Kpa, 27.8 Kpa and 61.9 Kpa respectively. When comparing figures







Figure 7: Comparison of axial strain-pressure curves of specimens A4, A7 and A13

6 and 7, differences between initial buckling of specimens and their behaviour are identified (table 2). When comparing the curves it is clearly indicated that a specimen's buckling pressure was increased when rings spacing decreased.

At this point, firstly initial buckling was started in a small part of specimens in circumferential and longitudinal direction of specimens, then buckling propagation gradually started on postbuckling region.

With test continuing, inner pressure of specimens reduced. In fact, increasing value of buckling pressure intensively related with  $2L_c/D$ .

Study type	Label	Rings number	Length (m) L	Diameter (m) D	Thickness (mm) t	Rings spacing (m) $L_c$	Rings inner radius (m)	Rings outer radius (m)	Rings thickness (mm)
EXP	A0	0	2.46	0.102	0.25	-	-	-	-
	A4	4	2.46	0.102	0.25	0.82	0.102	0.122	2
	A7	7	2.46	0.102	0.25	0.41	0.102	0.122	2
	A13	13	2.46	0.102	0.25	0.205	0.102	0.122	2
FEM	A0	0	2.46	0.102	0.25	-	-	-	-
	A4	4	2.46	0.102	0.25	0.82	0.102	0.122	2
	A7	7	2.46	0.102	0.25	0.41	0.102	0.122	2
	A13	13	2.46	0.102	0.25	0.205	0.102	0.122	2
	A4 t20	4	2.46	0.102	0.25	0.82	0.102	0.122	20
	A4 t0.25	4	2.46	0.102	0.25	0.82	0.102	0.122	0.25
	B0	0	2.46	0.102	0.3625	-	-	-	-

Table 1: Geometry of test models and specimens

#### ARTICLE



Figure 8: Circumferential strain-pressure curve of specimen A0



Figure 9: Comparison of circumferential strain-pressure curves of specimens A4, A7 and A13

Figures 8 and 9 show circumferential strain-pressure curves of specimen A0 and comparing between specimens A4, A7 and A13, respectively. Nonlinear elastic behaviour before occurrence of initial buckling is visible in curves, clearly. In Figures 10 and 11 the radial deformation of specimen A4 and comparing between three other specimens in experimental study are plotted in some selected nodes of pipe wall.

#### FEM buckling and post buckling modes

Figures 12 and 13 show radial deformation of models in FEM analysis study. Figure 12 shows radial deformation-pressure curve of model A0 with 7.1 Kpa and 18% difference with experimental result. Figure 13 shows this character for models A4, A7 and A13 with 18.1 Kpa, 32.4 Kpa and 49.8 Kpa which have 6%, 16.5% and 24% differences with experimental results (table 2).

When comparing experimental and FEM curves, some differences are shown, such as value of initial buckling pressure or postbuckling part of curves which occurred with pressure decreasing in the experimental study and with the constant load carrying capacity in the FEM study. This is because of some problems such as unabling in modelling residual stress.

As mentioned above, additionally, two models were analysed in terms of investigating the effect of rings thickness on the behaviour of pipeline. These models are compared with model A4. Models A4 t20 and A4 t0.25 had four rings with 20mm and 0.25mm thickness respectively while the basic model (A4) had 2mm thickness. Model A4 t20 was 26.05Kpa and model A4 t0.25 with 18.8 Kpa initial



Figure 10: Radial deformation-pressure curve of specimen A0



Figure 11: Comparison of radial displacement-pressure curves of specimens A4, A7 and A13



Figure 12: Radial deformation-pressure curve of model A0



Figure 13: Comparison of radial displacement-pressure curves of models A4, A7 and A13

Specimen label	Experimental buckling pressure (Kpa), pressure ratio with basic specimen (A0)	FEM analysis buckling pressure (Kpa), Difference with basic specimen (%)	Differences between experimental and FEM study (%)
A0, Basic specimen	6, 1	7.1, 1	18%
A4	17, 2.83	18.1, 2.54	6%
A7	27.8, 4.63	32.4, 4.56	16.5%
A13	61.9, 10.31	49.8, 7.01	24%

Table 2: Comparison between experimental and FEM studies results

buckling pressure with 43% and 3.8% differences to the basic model (table 3). As indicated, deceasing or increasing the ring thickness does not have a great effect on pipeline behaviour against the amount of steel that is used in rings. It is so economical that as thickness of rings decreased if it will be enforceable. These curves are shown in figure 14.



Figure 14: Comparison of radial deformation-pressure between models A4 t0.25 and A4 t20  $\,$ 

Model label	Buckling pressure (Kpa)	Difference between basic specimen (%)
A4, basic model	18.1	0%
A4 t0.25	18.8	3.8%
A4 t20	26.05	43%

Table 3: Comparison between models A4, A4 t0.25 and A4 t20

In addition, another model was analysed without rings, but with more thickness and the same weight was used with the model. This model was for investigating the economical aims of the study. As indicated in figure 15 initial buckling of this model is 20.5 Kpa and the pressure ratio of the basic model (A0) was equal to 2.88 whereas this ratio for model A13, with the same weight model B0, was 7.01 (table 4). This shows the economical benefits of decreasing the amount of steel used.



Figure 15: Radial deformation-pressure curve of model B0

Model label	Buckling pressure (Kpa)	Difference between basic specimen (%)
A4, basic model	7.1	1
A13	49.8	7.01
B0	20.5	2.88

Table 4: Comparison between models A13, B0

#### Circumferential buckling mode

Another observation in experimental and FEM studies, was made to do with circumferential waves on wall of specimens and models which identified with n and strongly depend on geometric ratios of D/2t and  $D/2L_c$ . The higher ratios have higher number of n and therefore higher value of buckling pressure. There were some differences in this case between two studies, such as the made-up waves number on the specimen panels in experimental study were different but these values were constant in the FEM study (table 5). As shown, initial buckling of specimens was increased by increasing the number of circumferential modes of specimens. Figures 16, 17, 18 and 19 indicate the number of waves which were used on panels of specimens.









Figure 18: Three wave mode of specimen A0 in experimental study

Figure 19: Three wave mode of model A0 in FEM study

Specimen label	Maximum experimental mode number	FEM mode number
A0	2	2
A4	3	3
A7	3	4
A13	5	5

Table 5: Comparison of mode number between experimental and FEM studies

#### Comparison with batdorf parameters

Figure 20 shows experimental and FEM comparison with batdorf parameters. This curve indicates that FEM and experimental results correspond well together. But there are few differences between these results with batdorf parameters. This is because specimens were considered in ideal condition such as long length or sections without imperfections and too elastic a behaviour was considered for them. In this graph X and Y direction

were considered,  $N = \left(\frac{2L_c}{D}\right)^2 \left(\frac{D}{2t}\right)$  and  $Q = \left(\frac{2L_c}{D}\right)^2 \left(\frac{D}{2t}\right)^3 \left(\frac{q_{cr}}{E}\right)^3$ respectively. Which  $q_{cr} = 0.92E \left(\frac{D}{2L_c}\right) \left(\frac{2t}{D}\right)^{2.5}$ .



Figure 20: Comparison of experimental and FEM studies with batdorf parameters

#### Conclusions

Important results of this paper include:

- Buckling pressure of pipeline is increased with a decrease of ring spacing.
- Buckling strength of pipeline is related to the number of waves made-up on specimens.
- Thickness of rings has no great effect on buckling pressure against value of used steel in specimens.
- Using of ring stiffeners has economical benefits over same weight specimens without rings.
- Geometric properties of specimens such as length or rings spacing or diameter of specimens has considerable effects on buckling behaviour of specimens.
- There is good corresponding data between experimental and FEM results according to comparison of buckling pressure and circumferential modes of specimens.

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