

The international magazine for the tube

and pipe industries

# TUBE & PIPE TECHNOLOGY

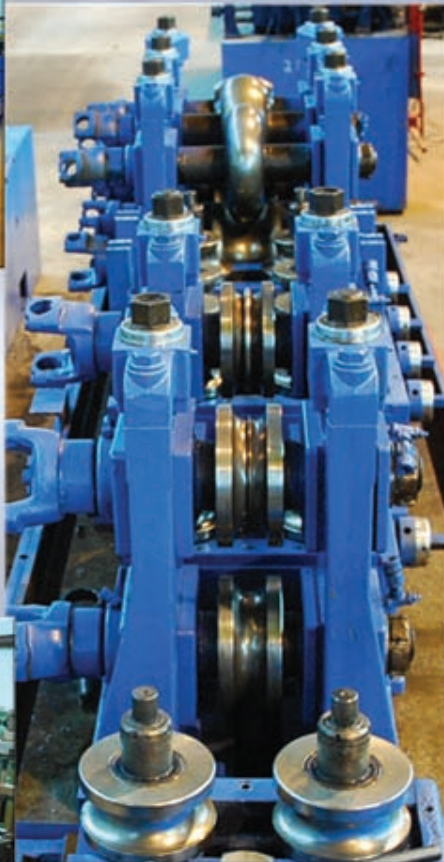


July 2010 | Vol 23 No 4 | US\$33



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- Straighteners
- Presses
- H.F. Welders
- Coil Cars
- Accumulators
- Uncoilers



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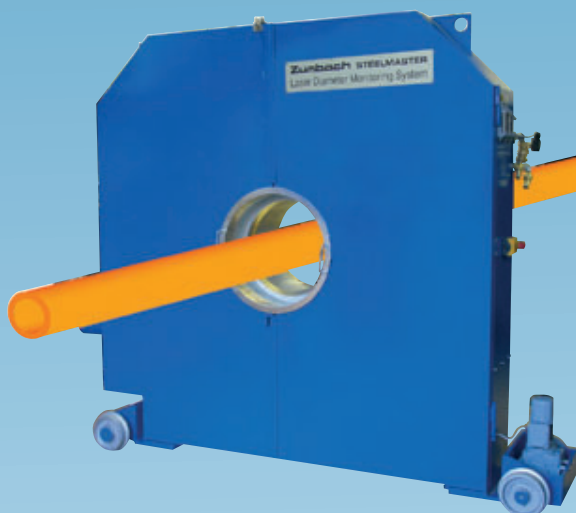
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Pipe End Finishing



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Abbey International Ltd. P: 419-874-4301

European Office: Bronx International, Inc. P: +44 (0) 870 442 2686

Asia Office: Bronx International Inc. P: +86 8526-2010/11

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## ENTER THE DRAGON

Welcome to the latest issue of TPT magazine, which many of you will be reading at the Tube China 2010 show. The Tube & Pipe Technology team will, as always, be there in full force supporting the event as the busy calendar for tube events again takes off with Fabtech not too far around the corner. Please do come and say hello; it's always great to see some familiar faces and to make some new friends.

It's going to be particularly exciting to be in Shanghai in September to see for myself just how efficiently China has emerged from the the global recession. It has really taken the bull by the horns by investing in a series of massive projects around the country, while many other nations around the world have chosen to delay construction programmes as the world slowly sees the green shoots of recovery emerge for which we are all thankful.

Please don't forget to start sending editorials in for the next issue. We are focusing on Fabtech, EuroBlech, bending and endforming.

Rory McBride – Editor



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## FRONT COVER STORY

Since 1985 Universal Tube & Rollform has been committed to being the number one supplier of used tube, pipe and rollform machinery in the world. Its presence in this industry has always been strong and honourable, working with companies locally and all over the world it says.

Its President, Ralph Girkins, has over 35 years of experience in the tube & pipe industry. The company takes pride in its knowledge and ability to mix and match various machinery to fit customer needs. New, used or reconditioned, it can help put it all together to balance clients' budget and increase the value of customer spending.

It has one of the largest selections of used tube and pipe mills in the world. Utilising over 125,000 square feet of warehouse space, it also stocks rollformers – cut to length – slitting lines and more. It has the resources and expertise to satisfy company's machinery needs.



Editor	• <b>Rory McBride</b>
Features editor (USA)	• <b>Dorothy Fabian</b>
Editorial assistant	• <b>Christian Bradley</b>
Production	• <b>Lisa Benjamin</b>
Sales & marketing	• <b>Catherine Sayers</b> <i>English speaking sales</i>
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Advertising co-ordinators	• <b>Liz Hughes</b> • <b>Andrea McIntosh</b>
Subscriptions	• <b>Liz Hughes</b>
Accounts manager	• <b>Richard Babbedge</b>
Publisher	• <b>Caroline Sullens</b>
Founder	• <b>John C Hogg</b>

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46 Holly Walk, Leamington Spa, CV32 4HY, UK  
Tel: +44 1926 334137 • Fax: +44 1926 314755  
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Website: [www.read-tpt.com](http://www.read-tpt.com)

**USA Office (Editorial only):** Intras Limited,  
272 First Ave, Apt 12G, New York, NY 10009, USA  
Tel/Fax: +1 212 614 9266  
Email: [dfabian@rcn.com](mailto:dfabian@rcn.com)

**Indian Office:** Jintras Ltd,  
Subarna (Ground Floor) P21/N, Block A  
New Alipore, Kolkata 700 053, India  
Tel: +91 33 2407 0701 • Fax: +91 33 2407 0700  
Email: [jeroov@vsnl.com](mailto:jeroov@vsnl.com)

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## Tube China 2010

Tube China 2010 will be held from 21 to 24 September 2010 in the Shanghai New International Expo Center and is designed to assist the effort to explore the opportunities offered by the booming Chinese economy – which is now the second-largest worldwide and showing no signs of let-up. This year's event is expected to cover 69,000 square metres and embrace more than 1,200 exhibitors, making it the largest in history in terms of scale.

## Inspection, testing & quality control

Inspection, testing and quality control leave no imprint on the product but without them it could be that the tube or pipe has a fault or minor error that could mean it is not fit for purpose or could present a danger to the public. Without this technology tube and pipe manufacturers would be unable to offer – and stand behind – the superb, high-tech, saleable commodities for which they are justly renowned.

## Extrusion, drawing and reducing

As with most mature and perfected technologies, the reductive processes of tube and pipe manufacture are dependable. Whether the project calls for pushing, as in extrusion, or pulling, as in drawing, the customer of a modern mill, no less than its operator, confidently expects a sound, flawless product, which is remarkable given the variety of requirements tubing or pipe from a typical production run must satisfy.

## 106

### New developments in the field of continuous production of corrugated metal hoses

Stefan Weiss – Rosendahl Maschinen GmbH, Austria,  
Thomas Hatzenbichler and Bruno Buchmayr, Chair of Metal Forming,  
Department Product Engineering, University of Leoben, Austria

[www.read-tpt.com](http://www.read-tpt.com)





Stopaq's tape can help protect thousands of miles of pipeline from corrosion

## Stopaq in running for big order following successful completion of China project

STOPAQB, producer of patented systems that stop and repel corrosion, is in the running to protect 9,102km of gas pipeline from Korla (Xinjiang) to Shanghai against corrosion. This opportunity follows the successful field welding and pipeline repair applications of the Moda Pipeline project, a 970km pipeline running from Beijing to Russia.

Earlier this month CCTV2, China's biggest TV station with 700 million viewers a day, broadcast a news story about the project completed by the Dutch company. There have since also been reports in Thailand and the Czech Republic about the company that is based in the Northern Netherlands.

The new project, which starts a two-hour drive from Korla, a town in the province of Xinjiang in Western China, is being put out

to tender by the Chinese oil company West-East Gas Pipeline Company, a division of PetroChina. The project is situated in a desert-like region that has lengthy rainy periods each year. The current 40" pipeline, with a length of 9,102km, has been in use since October 2004, but the corrosion prevention systems employed at that time are not sufficiently effective for the field welds. Various European and Chinese providers will likely be bidding for the project against Stopaq.

Frits Doddema, the company's CEO, received the invitation to participate in the tender personally last week in China: "Stopaq has a very successful track record in China. There is sharply rising demand for our globally patented technology in the areas of corrosion prevention and acute corrosion rehabilitation. Our experiences in

China have been exceptionally good, and we are even considering manufacturing locally. We see this invitation also as a tribute to our unique and patented production technology, developed in our R&D departments in Stadskanaal and Damman, where Stopaq also has a location to serve the growing market in the Middle East."

Doddema is optimistic about the company's chances of being awarded the new Chinese order: "PetroChina is looking for the latest and best technology. We are a modest company in the North of the Netherlands, but we are the only company in this field that guarantees its products for 30 years."

**Stopaq BV** – The Netherlands  
 Fax: +31 599 696177  
 Email: [info@stopaq.com](mailto:info@stopaq.com)  
 Website: [www.stopaq.com](http://www.stopaq.com)

## High-speed bar mill built in Syria

AN INTERNATIONAL Company for steel rolling (ICSR) in Hassia, Syria, has successfully commissioned a bar mill supplied by SMS Meer, Germany.

Surface-quenched rebars will be produced on this mill at a speed of up to 36 m/s in the delivery section. The bar mill is designed for the production of rebar

with low and medium carbon content and an annual output of 300,000 tons in the dimensions of 8 to 40mm round.

SMS Meer supplied the complete rolling mill, including the electrical equipment and automation system.

The pusher-type furnace for heating the square billets supplies a continuous

single-strand rolling mill comprising a roughing train with six stands and multi-pass intermediate stands of HL design and H/V arrangement. An eight-stand finishing block in V arrangement and two further stands can be retrofitted.

**SMS Meer** – Germany  
 Fax: +49 211 881 4386  
 Email: [thilo.sagermann@sms-group.com](mailto:thilo.sagermann@sms-group.com)  
 Website: [www.sms-meer.com](http://www.sms-meer.com)



# The 7<sup>th</sup> China (Beijing) International Steel Tube Industry Expo

SINCE its establishment six years ago, the Beijing International Steel Tube Exhibition, which attracts a large number of influential experts, purchasers, and decision makers of groups from over 20 countries and regions, has become one of the most influential exhibitions in China.

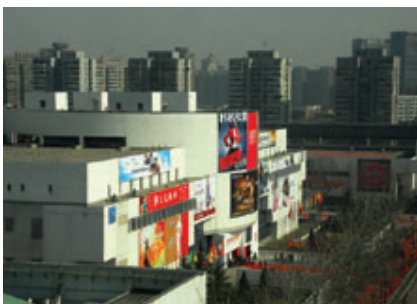
In order to reach the requirements of sustainable development strategy proposed by the state and to help the steel pipe industry develop faster, the Beijing International Steel Tube Exhibition has been playing a positive role in promoting the healthy development of petroleum, petrochemical, shipbuilding, construction, automotive, electrical, hydraulic and mechanical.

The 7<sup>th</sup> Steel Tube Exhibition of China will be held at China International Exhibition Center in Beijing from 10-12 August 2010.

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

To step up cooperation and seek mutual benefit it believes that the 2010 Beijing Exposition will be the top platform for participants to strengthen the technological innovation, production expanding and international cooperation through grand displays of products and technologies.

**Beijing Hai Wen Exhibition Co Ltd – China**  
Fax: +86 10 88680811  
Email: [bjhwexpo@yeah.net](mailto:bjhwexpo@yeah.net)



## Diary of Tube Events

### 2010

#### SEPTEMBER

21-24 **Tube / wire China 2010**  
*Shanghai, China*  
Exhibition → Email: [tube@mdc.com.cn](mailto:tube@mdc.com.cn)  
Website: [www.mdc.com.cn](http://www.mdc.com.cn)

#### OCTOBER

26-30 **EuroBlech**  
*Hanover, Germany*  
Exhibition → Email: [info@euroblech.com](mailto:info@euroblech.com)  
Website: [www.euroblech.com](http://www.euroblech.com)

#### NOVEMBER

2-4 **Fabtech / AWS Welding Show**  
*Atlanta, USA*  
Exhibition → Email: [information@mfafabtech.com](mailto:information@mfafabtech.com)  
Website: [www.fabtechexpo.com](http://www.fabtechexpo.com)

### 2011

#### JANUARY

8-11 **Tekno / Tube Arabia 2011**  
*Dubai, UAE*  
Exhibition → Email: [alfajer@emirates.net.ae](mailto:alfajer@emirates.net.ae)  
Website: [www.tube.de](http://www.tube.de)

#### MARCH

3-6 **Boru 2011**  
*Istanbul, Turkey*  
Exhibition → Email: [info@ihlasfuar.com](mailto:info@ihlasfuar.com)  
Website: [www.borufuari.com](http://www.borufuari.com)

#### SEPTEMBER

13-15 **Tube Southeast Asia**  
*Bangkok*  
Exhibition → Website: [www.tube-southeastasia.com](http://www.tube-southeastasia.com)

19-24 **EMO**  
*Hanover, Germany*  
Exhibition → Website: [www.emo-hannover.de](http://www.emo-hannover.de)

#### OCTOBER

4-6 **Tubotech**  
*Brazil*  
Exhibition → Email: [cipa@cipanet.com.br](mailto:cipa@cipanet.com.br)  
Website: [www.cipanet.com.br](http://www.cipanet.com.br)

#### NOVEMBER

13-16 **Fabtech**  
*Chicago, USA*  
Exhibition → Email: [information@mfafabtech.com](mailto:information@mfafabtech.com)  
Website: [www.fabtechexpo.com](http://www.fabtechexpo.com)

### 2012

#### MARCH

26-30 **Tube / wire Düsseldorf 2012**  
*Düsseldorf, Germany*  
Exhibition → Email: [infoservice@messe-duesseldorf.de](mailto:infoservice@messe-duesseldorf.de)  
Website: [www.tube.de](http://www.tube.de)  
[www.messe-duesseldorf.de](http://www.messe-duesseldorf.de)

## Large pipe bending system commissioned

SMS Elotherm has commissioned a new system to inductively heat large diameter pipe segments for an Italian pipe bending facility.

The inductively heated pipes are bent by the "Hamburg process". The straight pipe is inductively preheated and then worked over a curved mandrel.

A second toroid-shaped induction coil heats the inner pipe region while the pipe is bending on the mandrel.

The resulting bent pipe segments have exceptionally high strength, qualifying them for critical applications such as nuclear and combustion power plants, chemical plants, and oil and gas pipelines.

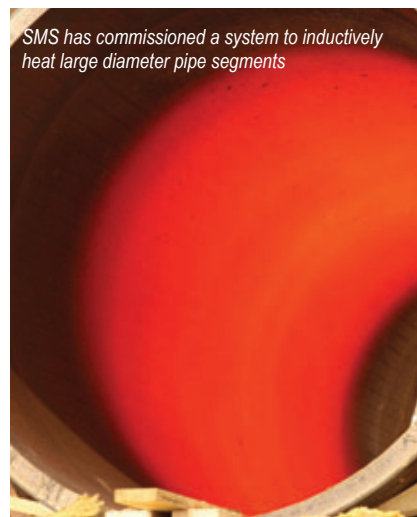
The ability to heat large pipes with diameters up to 1,200mm (4") and wall

thicknesses up to 50mm (2") makes this a remarkable system. A 2,400kW straight inductor coil preheats the pipe to 750°C (1,380°F). The 1,600 kW curved inductor coil brings the tube up the 850°C (1,560°F) on the bending mandrel.

The working throughput is up to 11,500kg (25,000lb) per hour.

With this induction heater, the customer that takes advantage of it can make high quality value-added products for safety critical applications, helping to advance its worldwide leadership in the bent pipe market.

**SMS Elotherm** – Germany  
 Fax: +49 2191 891 726  
 Email: [info@sms-elotherm.de](mailto:info@sms-elotherm.de)  
 Website: [www.sms-elotherm.de](http://www.sms-elotherm.de)



SMS has commissioned a system to inductively heat large diameter pipe segments

## Quaker Chemical capitalises on product portfolio in China's tube and pipe market

TUBE and Pipe capacity in China has increased fivefold in the past decade, with China producing nearly half of the world's tubular goods.

This segment is a key strategic growth segment for Quaker. "We draw on our process expertise, proven solutions, and technology from around the world to act as a 'front-to-back' supplier of lubricants, coolants, and cleaners [for the front-end process], and a complete portfolio of rust

preventives and final coatings at the back end," says Karl Kunkel, Quaker's global director of strategy.

Currently, Quaker supports many tube and pipe customers throughout China. In the north, Quaker supplies a significant amount of welded pipe forming fluids, threading and hydrotesting fluids, and UV curable coatings. In the south, Quaker supplies water dilutable rust preventives, as well as threading and hydrotesting fluids. Quaker

is looking to expand into China's seamless mills with both QUINTOLUBRIC® fire-resistant hydraulic fluids and customised hot rolling lubricants.

"We have established ourselves as a trustworthy and committed partner in China," comments Albert Ma, business director of Quaker Asia Pacific. "We are targeting growth within additional ERW forming lines, and UV-curable corrosion preventives. In particular, UV opportunities are a perfect fit for Quaker, as they give us the ability to work closely with customers on value-added projects – presenting a true win-win scenario."

Quaker has experienced great success in the global process chemical marketplace, thanks to its mission to 'Deliver Everywhere the Best from Anywhere'. Currently, Quaker China has 10 satellite offices and employs over 200 people.

Quaker's Asia/Pacific headquarters are located in Shanghai, and include manufacturing, lab facilities (with 30 chemists, supported by Quaker's global R&D group), and office personnel. Throughout 2010, Quaker expects continued growth and expansion in China, both internally and in its customer base.

**Quaker Chemical** – USA  
 Fax: +1 610 832 8682  
 Website: [www.quakerchem.com](http://www.quakerchem.com)



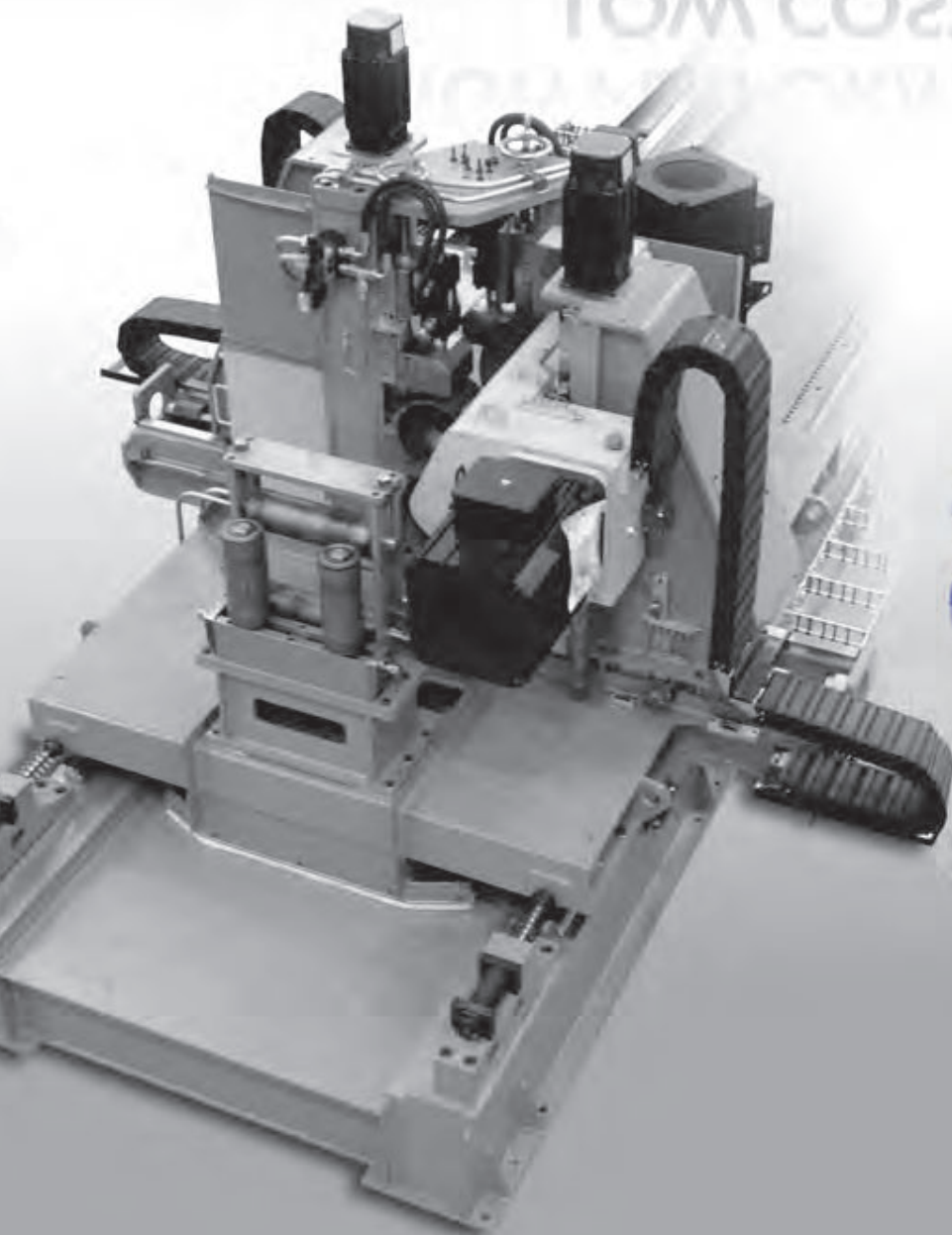
Quaker supplies a range of lubricants, coolants and cleaners



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# OMS appoints Brown as engineering manager

UK-BASED specialist measurement technology company Optical Metrology Services (OMS) Ltd has announced the appointment of Richard Brown as the company's products engineering manager.

Based at OMS' UK office in Bishop's Stortford, Mr Brown will head up the company's tools division, which is responsible for maintaining OMS' growing fleet of service tools used on inspection contracts in the UK and overseas. The tools division also manufactures custom inspection tools and software for specific inspection projects.

He returns to the UK from New Zealand, where he spent eight years working as a product development engineer at Steelbro (NZ) Ltd, a manufacturer of self-loading trailers, mobile cranes and sidelifers.

Mr Brown brings a wealth of experience in embedded control systems development, compliance and software architecture to OMS. In 2006 he won the IPENZ Excellence in Engineering Award for Electrical Systems for his invention, the SMARTlift, a microcontroller-based control system for

sidelifers, which incorporates a novel safe working envelope control algorithm. Prior to moving to New Zealand in 2002, he spent one year working as a consultant engineer for Optical Metrology Centre, a spin out business from City University London, which offered products and consultancy in 3D measurement using Photogrammetric techniques and pipe measurement using proprietary profiling tools.

Mr Brown commented: "Eight years ago, I helped to design some of OMS' original pipe profiling tools, which have since gained acceptance as the gold standard in pipe measurement. The opportunity to come back to OMS was too good to miss out on and I am very excited about the future and the new possibilities on the horizon for the company and its growing range of pipe inspection tools."

OMS is a specialist measurement technology company that provides measurement services and precision measurement systems to the oil and gas industry. A key focus for the company is in the dimensional measurement of oil and

gas pipes or other similar structures such as aero engines, process industry tubes or manufactured cylindrical objects, where dimensions are critical.

**OMS – UK**

Email: [denise@optical-metrology-services.com](mailto:denise@optical-metrology-services.com)

Website: [www.optical-metrology-services.com](http://www.optical-metrology-services.com)



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# Water experts ensure pipeline remains on track

WATER quality engineer Panton McLeod has played a vital role in ensuring a major new pipeline remains on-track in Scotland.

The Borders-based firm, which cleans, inspects and repairs structures used in the UK drinking water industry, was called to sterilise a new mountain pipeline in Glencoe that will help provide drinking water for thousands of people in the region.

The project saw Panton McLeod disinfect and sterilise a 29km section of pipe to prepare it for service. The section is part of a wider pipeline network stretching across the mountains above Fort William that links a new pump house at Glen Nevis with the existing water mains in Glencoe.

Paul Henderson, Panton McLeod's operations director, said that the project had been particularly challenging due to the adverse weather conditions and the high altitude of the pipeline.

He added: "There were some very steep tracks leading up to the areas along the highest sections of the pipeline, so we needed to have our best 4x4 vehicles on hand to get the team into position to carry out the disinfection work.

"We were also battling the elements, as there was a lot of snow and ice on the ground at that altitude and this made the conditions very challenging. However, our team is used to working in all kinds of weather and is capable of performing well even when the odds are against us.

"We were able to use all of our years of expertise in the water sector to ensure that the whole section of pipeline was disinfected thoroughly, allowing it to be put into service on time. This new Glencoe pipeline will assist in providing drinking water supplies for customers in the region and cope with added demand, so it is a very important project to have been involved with.

"I'm very proud of all of the Panton McLeod team that worked on this pipeline, as they once again showed they are able to perform to the highest standards even in the most challenging of conditions."

The project is the latest high-profile work that Panton McLeod has completed for Scottish Water. For the past 15 years, the firm has provided expertise in cleaning and repairing water structures across Scotland – which has included contributions to some of the biggest water projects Scottish Water has undertaken, such as the £120 million Loch Katrine scheme.

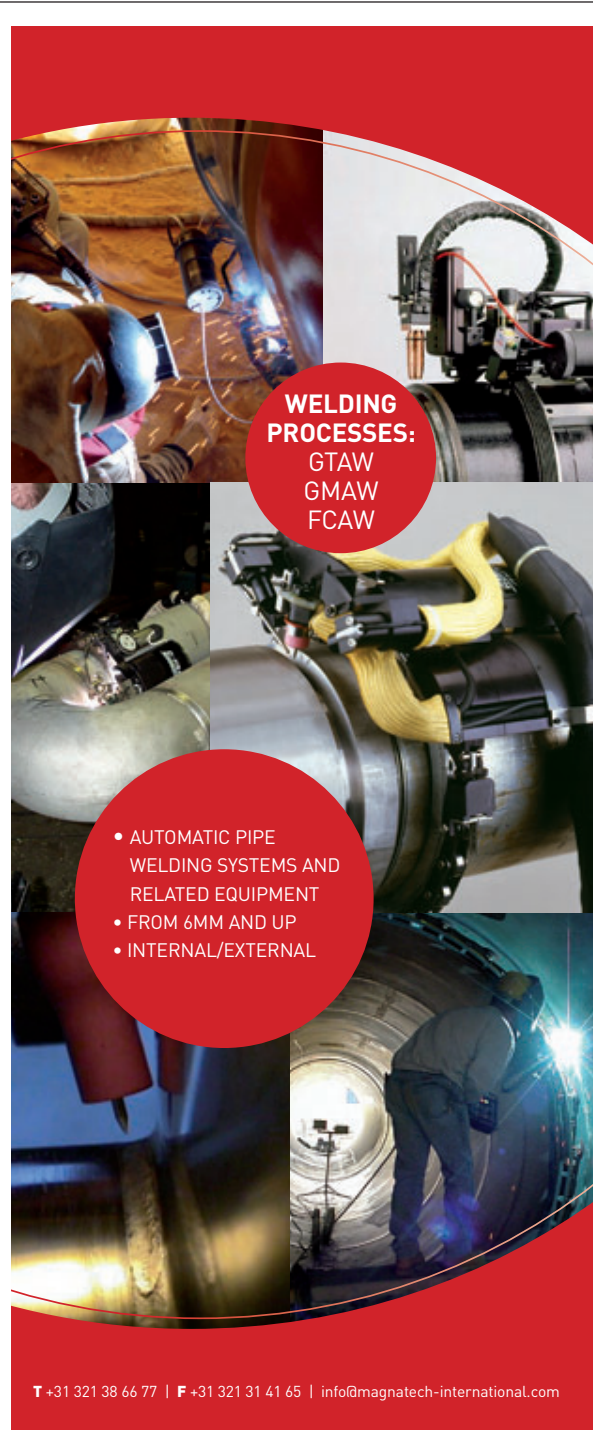
Earlier this year, the firm agreed a new deal with Scottish Water – arranged as part of an ongoing Price and Supply Agreement – that will see it clean and disinfect more

than 400 service reservoirs and water tanks across the Ness, Don, Tayside and Ayrshire regions, helping to further improve water purity for customers in Scotland.

In the past decade, the firm has grown from its headquarters in Newtown St Boswells adding further offices in Nottingham and in the USA. The US base in Denver, Colorado, is the hub for its North American

division Panton McLeod Americas – which is currently revolutionising the way drinking water storage and treatment structures are cleaned and disinfected across the USA.

**Panton McLeod – UK**  
 Fax: +44 1835 822 919  
 Email: [info@pantonmcleod.co.uk](mailto:info@pantonmcleod.co.uk)  
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# CRC-Evans welding equipment chosen for Midcontinent Express Pipeline in USA

CRC-EVANS automatic welding equipment was selected for use on the Louisiana section of the Midcontinent Express Pipeline. Now completed, the 507-mile Midcontinent Express Pipeline is a joint venture of Kinder Morgan Energy Partners and Energy Transfer Partners, and delivers natural gas from Oklahoma, across northeast Texas, northern Louisiana, central Mississippi and into Alabama.

Two contractors worked on the Louisiana portion of the MEP: Associated Pipeline Contractors, Inc constructed 65 miles, and Willbros Construction worked on Spreads A, B and C – a distance of 179 miles. The contractors used various combinations of the CRC-Evans Internal Welding Machine, the P260 External Welder, and the P600 External Welder for their projects. In Louisiana, CRC-Evans equipment completed a total of 14,784 welds in the 42" diameter pipeline.

The CRC-Evans IWM provides faster, more accurate welds in the field by combining lineup mechanisms and an internal welder that automatically deposits the root bead in 1.25 minutes. The P260 welder provides tip-to-work tracking, 32-pass programmable welding, PDA downloads in the field, and position-based

*The pipeline will stretch 507 miles through the USA*



parameter control. The P600 External Welder has single or dual-torch operation, through-the-arc tracking, onboard data collection, and touch screen control.

CRC-Evans Automatic Welding designs and builds the world's most widely used automatic welding system for land or offshore pipeline construction. In addition to renting or selling these systems to contractors on a project basis, the division provides other specialized services such as engineering, on-site technicians, and training. The company is a subsidiary of CRC-Evans Pipeline International, a leading provider of

specialised equipment and services for the construction of pipelines.

CRC-Evans manufactures pipeline construction equipment and automatic welding systems, and provides managed subsea services, field joint coating, weighting, heat treatment, and inspection services. Based in Houston, CRC-Evans maintains offices in North America, Europe and the Middle East.

**CRC-Evans – USA**  
Email: [in.snave-crc@wa](mailto:in.snave-crc@wa)  
Website: [www.crc-evans.com](http://www.crc-evans.com)

## Obituary: Germaine Gibara

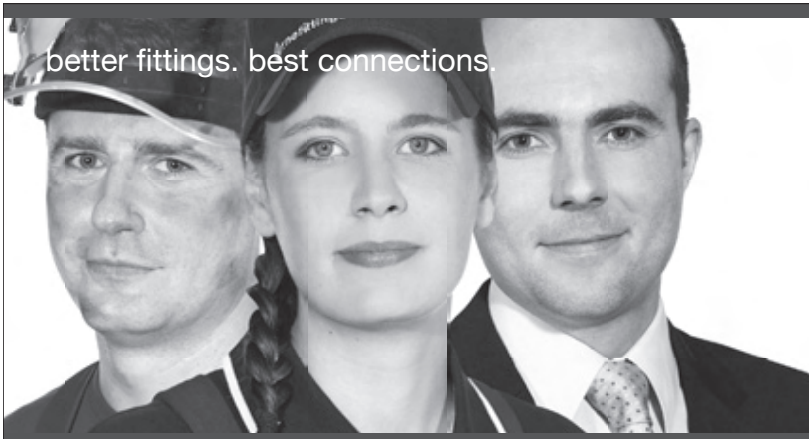
IT is with deep regret and sorrow that Thierry Pilenko, chairman and chief executive officer, and the board of directors of Technip announce the death on 21 April of Germaine Gibara, member of the board of directors, chairman of

the strategic committee and member of the nominations and remunerations committee of Technip.

They extend their sincere condolences to her family and friends. "Germaine joined Technip's Board in 2007 and brought to the

company her strong financial expertise and understanding of strategic analysis. We will all miss her team spirit, friendship and multicultural experience," added Thierry Pilenko.

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# Yichang Three Gorges orders six air-knife systems for galvanising lines

YICHANG Three Gorges, China, has placed an order with Fontaine Engineering und Maschinen GmbH, Germany, for the supply of six air-knife systems inclusive of the electrical and automation package. The systems are to be integrated into six hotdip galvanising lines and will allow easy and precise setting of the zinc coating thickness. All of the plants are virtually identical and will be erected in the immediate vicinity of Yichang, a city with over a million inhabitants, and the Three Gorges Dam.

All of the plants are scheduled for commissioning in the second half of 2010. This short delivery period is only possible due to the high degree of standardisation of the FOEN systems.

The supply scope comprises the design, manufacture and commissioning of the air-knife systems inclusive of the electrical and automation package. The systems include an automatic control facility which regulates the air-knife parameters with the aid of a product database. The coating qualities can thus be generated and reproduced in a reliable manner. To enable continuous testing of the coating quality, X-ray coating-thickness measuring devices from the firm of IMS will be included with each air-knife system supplied by FOEN.

Fontaine Engineering und Maschinen GmbH is a company of the SMS group, which is, under the roof of the holding SMS GmbH, a group of companies internationally active in plant construction and mechanical engineering for the steel and non-ferrous metals industry. It consists of the two business areas: SMS Siemag and SMS Meer. In 2009, some 9,000 employees worldwide generated a turnover of more than €3.8bn.

The plants are designed for coating thicknesses between 40 and 275 g/m<sup>2</sup> (zinc) and between 30 and 200 g/m<sup>2</sup> (zinc-aluminium alloy) at a strip speed of 30 to 130m/min. The strip widths are between 1,000 and 1,250mm at strip gauges between 0.5 and 2mm. 450,000t can be produced each year on each plant.

**Fontaine Engineering und Maschinen GmbH – Germany**  
Fax: +49 211 881 4386  
Email: thilo.sagermann@sms-group.com

## Pipe dictionary

AN English to Russian/Ukrainian dictionary of pipe and tube production has been published for the first time.

It is the result of cooperation efforts between Centraviv Production Ukraine, JSC, State Enterprise "Ya.Ye. Psada Scientific Research Institute" and the International Tube Association.

The dictionary caters for researchers and engineers working in the pipe and tube industry or machine-building industry.

**Nataliya Koryaka – ITA**  
Email: koryakan@gmail.com



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  - ✓ EVALUATION OF THE ECONOMIC VALUE OF COMPANIES / BUSINESS UNITS



## Radius Systems enters joint agreement with Senaat

INFRASTRUCTURE plastic pipe systems manufacturer Radius Systems has struck a joint venture agreement with the highly respected Abu Dhabi-based Senaat Group.

The Emirates Conversion Industry LLC (Senaat) partnership is one of the emerging investment companies in Abu Dhabi. It has investments in various sectors, including metals, marine, infrastructure and petrochemical downstream developments.

The agreement will bring Radius Systems' manufacturing expertise to the United Arab Emirates and will lead to full-scale manufacturing in Abu Dhabi. It is part of a planned global expansion programme by UK-based Radius Systems, which had a management buyout in 2008 from previous parent Uponor of Finland.

Initially, Radius Systems will introduce high-performance plastic pipes and fittings systems for potable and non-potable water, gas and telecommunications to this key growth area. By providing products – and subsequently full production processes – Radius Systems will bring the benefits of world-class products and expertise to companies operating in the Gulf region.

Senaat's investment objective is to develop industrial downstream projects. These will contribute significantly to the achievement of the Abu Dhabi government's Economic Vision 2030.

Radius Systems CEO Stuart Godfrey, who confirmed the agreement had been 'some time in the making', said: "We were looking for a professional partnership to expand our international operations. The fit with Senaat was perfect, with our respective backgrounds in oil and gas derivatives."

Andre van Uffelt is CEO at Senaat, and he commented: "We are proud to have a partner like Radius Systems investing and delivering a commitment into our region. Based on the Economic Vision 2030 we aim to set up industries offering long-term, sustainable solutions for the Emirate of

Abu Dhabi. With Radius Systems we have a partner offering technology, processing and application expertise. Furthermore, with their product portfolio, we are in a position to enhance and improve piping systems for oil and gas applications.

"It is becoming increasingly important to offer high quality systems for sewage and drinking water."

**Radius Systems – UK**  
 Fax: +44 1773 812343  
 Email: [onenquiries@radius-systems.co.uk](mailto:onenquiries@radius-systems.co.uk)  
 Website: [www.radius-systems.com](http://www.radius-systems.com)

*Radius will use its pipe manufacturing expertise in Abu Dhabi*



## Tube and wire 2010 declared a success as organisers looking ahead to 2012

ALMOST 69,200 trade visitors from over 100 countries attended the trade fairs Tube and wire in April 2010, to gather information on the latest machinery, equipment and products from the wire, cable and tube processing industries. Over 2,400 companies exhibited at the combined event.

Constructive talks, avid interest in purchasing and actual deals, as well as

expectations regarding interesting follow-up business, all characterised the atmosphere. For wire, 63% of trade fair visitors travelled to Düsseldorf from abroad, and for Tube the international proportion of visitors stood at 55%.

Following the successful close of the 2010 event, the new trade fair dates for 2012 have been set: the exhibitions will once again be held concurrently in

Düsseldorf, from Monday 26 to Friday 30 March. Constantly updated information for exhibitors, visitors and press representatives can be found in the periods between fairs on the two web portals: [www.tube.de](http://www.tube.de) and [www.wire.de](http://www.wire.de)

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# Imatek makes first Russia sale

IMATEK has recently installed a 30,000J DWT40-30, drop weight tear tester (DWTT) at Ural Steel in Novotroitsk, Russia.

The DWT40-30 replaces an older machine and will be used to test the fracture properties of steel used in the manufacture of large diameter pipe for the oil and gas industries.

This is a significant installation for Imatek as it represents the company's first sale into Russia following the appointment of new distributor, Uralsibpromservice (USPS) based in Chelyabinsk.

Ural Steel is a subsidiary of the holding company Metalloinvest and is the largest enterprise in the South Ural region and one of the eight leading metallurgical integrated works in Russia.

The company was founded in 1955. Today, Ural Steel is a significant niche steel producer, holding the top market position in production of strips, tube billets, bridge steel, machinery construction steel and billets for exports. The products of Ural Steel are highly demanded in Russia and the CIS as well as on the international markets. Customers include

leading enterprises from such countries as Russia, Germany, UK, Italy, Spain, Belgium, Norway, Denmark, Turkey, Iran, China, Korea, Vietnam, Taiwan and Thailand.

The use of higher grade steels in the oil, gas and manufacturing industries is creating the need for a new generation of specialist impact testers. Imatek offers a range of DWTT systems for measuring the fracture characteristics of steel specimens according to API recommended practice 5L3, EN 10274 and ASTM-E 436. Steel grades of

X120 and specimens of up to 50mm can be accommodated.

A major feature of the Imatek range is the high-quality instrumentation and analysis software that provides detailed information, both graphical and tabular, for the specimen failure. Whereas historically the DWTT test method has not required instrumentation, more recent research indicates that it is of significant benefit when testing the tougher X-steel.

**Imatek Ltd – UK**  
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Imatek has installed a new factory to test steel pipe in Russia





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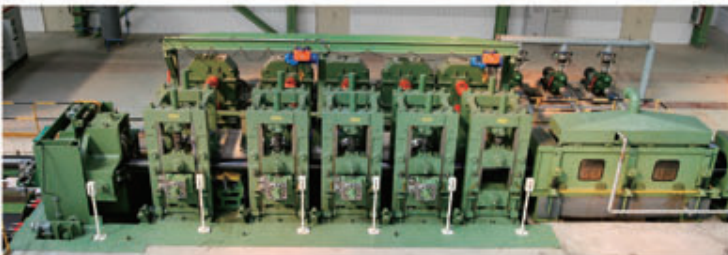
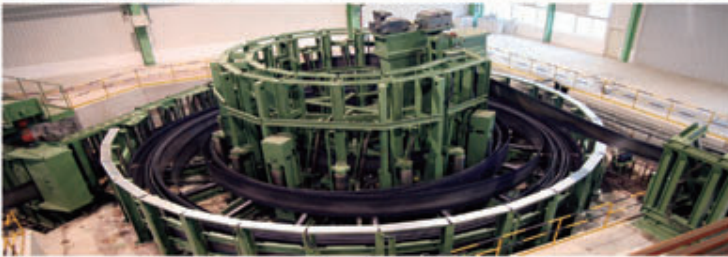
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# Wilkinson welding academy opens for training

SECRETARY of State for Business, Lord Mandelson, officially opened the Wilkinson Welding Academy, a 'state of the art', purpose built, hands-on practical welder training and welding theory training centre as part of Wilkinson Star Limited, the Worsley, Manchester based industrial equipment supplier's strategy to further develop the welding skills needed in today's industrial manufacturing for their distributor partners as well as their customers.

The academy has 12 acoustic welding booths incorporating both high vacuum and low vacuum fume extraction systems, whilst equipment will include the very latest Cebora inverter based MIG, TIG and MMA welding products, including the recently Thatcham certified single phase Jaguar Double Pulse MIG Inverter as well as high definition plasma cutting equipment and a 5-axis robot welding cell to demonstrate the processes and speeds that can be obtained on repetitive component welding. All the equipment will have the latest electronic process controls.

A number of standard and tailored training modules are now available including Health and Safety in welding, Electrics and Power supply requirements, MIG/MAG welding, TIG welding, MMA welding, plasma cutting, resistance welding plus modules on advanced MIG and TIG welding processes including pulse and double pulse welding, Synergic pulse welding and MIG brazing especially for the automotive and furniture manufacturing industries.

The introduction of inverter based welding machines with new high technology process controls has increased the demand for welding high quality repetitive welds on components

including utilising new high strength yet lightweight materials as found in automotive manufacturing and repair. Training at the academy will give experienced and less experienced welders the opportunity to learn and use the latest equipment and see how user friendly the equipment really is, helping to eradicate some of the myths surrounding high technology equipment.

Dr John Wilkinson OBE, chairman, Wilkinson Star Ltd said: "In order to fulfil the needs of today's automotive, industrial and fabrication markets, to obtain and retain the necessary skills required our new Welding Academy is well positioned as one of the

most advanced and best equipped in the UK. Our fully qualified trainers have many years of practical welding experience, which will be invaluable to the trainees."

At the opening, Lord Mandelson said: "The Wilkinson Welding Academy is a model of what everybody should be doing in Salford, the North West and across the country."

**Wilkinson Welding Academy – UK**

Fax: +44 161 728 7945

Email:

info@wilkinson-welding-academy.com

Website:

www.wilkinson-welding-academy.com



Lord Mandelson at the opening of the Wilkinson Academy

# McElroy productivity course

MCELROY University, the training division of McElroy, recently announced the addition of a productivity-focused class to the 2010 class schedule. The inaugural class will take place 17 May 2010. Registration is currently open for the class.

For more than 30 years, McElroy has been the only pipe fusion machine manufacturer to continuously offer advanced training to enhance fusion technicians' efficiency, productivity and safety in the proper use of machines and standards. McElroy University currently offers 23 classes per year at McElroy's technical centre in Tulsa, Okla. McElroy University also conducts training in

the field at various locations throughout the world.

The classes cover topics from operation, troubleshooting and rebuilding fusion machines, ranging from small to large diameter pipes and fusion machines. With the addition of the new Fusion Productivity and Project Management class, McElroy University will offer a total of 10 different courses to the public. Classes usually occur over the course of a few days.

The new Fusion Productivity and Project Management course covers planning fusion projects. Topics include what equipment would work best in certain situations, setting

up job sites for optimal productivity and integrating productivity-enhancing tools into a job site plan.

"This new productivity class was created in response to many of our end users, who are seeking to do more with less," said Larry Gordon, manager of training at McElroy. "If we can teach more fusion technicians the best way to set up their job site, and work efficiently within that job site, it's going to be much better for pipe fusion."

**McElroy – UK**

Email: thenning@mcelroy.com

Website: www.mcelroy.com



# E-marketing award for master of welding website

GYS, the French welding equipment and battery charger manufacturer, has been awarded the 2010 'Prix Coup de Coeur', with its online website game 'Master of Welding'.

The award under the category of strategic communications was presented at the 2010 French e-marketing awards for the best innovations in the field of digital marketing.

This is an annual event that takes place in Paris during January and attracts entries from some of France's and other leading international media companies, producers as well as industrial companies and other organisations.

The GYS game asks visitors to the website to apply spot welds to as many objects on a conveyor belt as possible within 60 seconds.

Every object has at least three welds to be made and every welding mistake creates a fire on the conveyor belt and loses time and electrodes. The successful completion of two items in a row will gain either times or electrodes. The highest number of points gained currently stands at

525. Neil Pulsford, UK commercial director of GYS commented: "We are in the welding business, which is a very serious business because we see so much around us that depends on safe welding practice through quality welding equipment."

"Often in our industry only traditional marketing methods are used but it is good to show innovative ways of brand building in a market such as ours. We created this game as a brand awareness exercise as

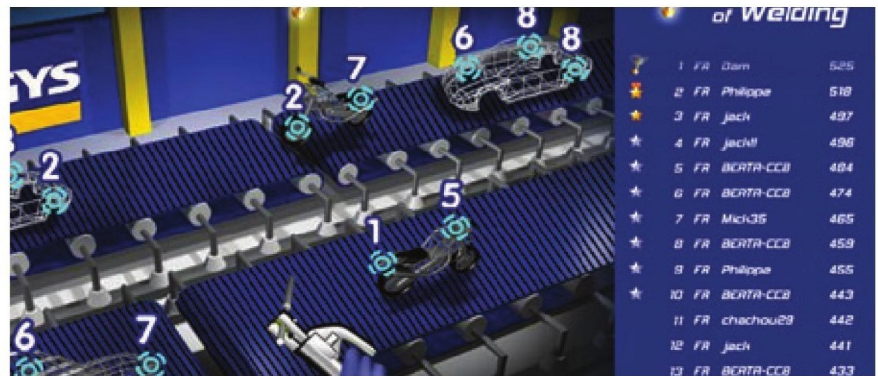
although we are well known in Europe, in the UK we are relatively new and we wanted to make people remember us and return to our website."

The game can still be played by going to the GYS website [www.gys.com](http://www.gys.com) and clicking on e-Awards.

**GYS – France**

Email: [n.pulsford@gys.fr](mailto:n.pulsford@gys.fr)

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A screenshot of the award winning website

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## Fine Tubes flourishes despite crunch

FINE Tubes, a UK manufacturer of stainless steel, nickel and titanium tubing in seamless and welded, has been awarded D&B's 'Rating 1' for its 'highest level of creditworthiness' and 'minimal risk of failure'.

Despite economic turbulence and the frequently quoted 'credit crunch', Fine Tubes' Rating 1 status officially places it among the UK's top 15% of companies. The score represents the highest level of creditworthiness and a minimum risk of failure according to business reporting firm Dun & Bradstreet (D&B).

"The D&B rating is recognised internationally," explained Nicky Keyworth, customer experience leader at Dun & Bradstreet, who personally handed over the certificate to Fine Tubes. "It is a dynamic score which is reviewed with the most current data on an ongoing basis, and Fine Tubes have consistently performed at this highest level for more than the past 12 months. D&B ratings consider financial stability, the company's payment record, public filings, trade payments, business age and other factors to produce one of the most comprehensive reports on a company's creditworthiness that exists anywhere in the world."

Marshall Davis, chief financial officer at Fine Tubes, commented: "A D&B rating can assist or prevent a business from receiving a loan or an extension to a line of credit. It can also cause investors to vanish or panic, suppliers to cease shipments or vendors

refuse to stock products.

"In other words keeping a good Dun and Bradstreet rating is essential to the good operation of any business. To have achieved 'low risk, high creditworthiness' status during one of the worst economic times in recent years is fantastic accomplishment."

Fine Tubes has a fully integrated facility of over 215,000ft<sup>2</sup> for the manufacture, research and development of precision tubes in seamless, welded, welded and drawn forms. The standards and specifications for these tubes and coils are aimed at niche applications in the most hostile operating environments. Fine Tubes products serve a wide range of markets such as the oil & gas and chemical process, aerospace, medical, and nuclear industries.

**Fine Tubes Ltd – UK**  
[sales@finetubes.co.uk](mailto:sales@finetubes.co.uk)  
[www.finetubes.co.uk](http://www.finetubes.co.uk)

## The Kuwait Pipeline Technology Conference

THE Kuwait Pipeline Technology Conference & Exhibition is a new international platform for products, systems and services relating

to the transport of oil, gas and water. The focus will be on the entire value added chain – from planning, construction and operation to maintenance and repair.

the most pressing challenges in overcoming effective planning and management of pipeline systems.

The main objective of the event is to share technological advances, operational experiences and to present important ongoing pipeline projects. It also aims to integrate companies that act in different segments of the pipeline industry: operation, construction, engineering, research and development, training and equipment suppliers. The conference will feature lectures and presentations by major oil & gas companies, utility providers, engineering firms, transport operators, industry associations, industrial providers and users on all aspects surrounding pipeline systems.

### The Kuwait Pipeline Technology Conference and Exhibition

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# Siddhi Engineers receives national award in India

AWARDS are always a welcome acknowledgement of success in any organisation. It was in the year 1988 when two young mechanical engineers, Mr Bhagwat Patel and Mr Prashant Gandhi dreamt of developing an industry that would be seen as an import substitute. Siddhi Engineers, based at Chhatral, is actively involved in manufacturing precision drawn aluminium tubes, rods and profiles and they say that meticulous planning, qualitative production, research & development and continual improvement have been the main attributes of the organisation, catering to a high customer segment from automation industry to defense and this has helped them win the latest of a number of prestigious awards.

The company has achieved various national level awards at regular intervals and the latest that the company has received are two national awards from the MSME – Ministry of Small and Medium

Enterprise, New Delhi, Government of India for Entrepreneurship and research and development at Vigyan Bhavan from Minister Mr Dinsha Patel. The award ceremony had an august presence of the Hon'ble Prime Minister of India, Dr Man Mohan Singh, who inaugurated the function.

**Siddhi Group – India**  
 Fax: +91 79 27545089  
 Website: www.siddhiindia.com



Siddhi Engineers receives its award from the Minister Mr Dinsha Patel

# Tube inspection throughput

PFW Aerospace, UK, has installed four ITP Group Tube inspection systems at its site to cope with the stringent inspection requirements of Rolls Royce Aero Engines.

On PFW's latest contracts, Rolls Royce only need supply 3D CAD models of tube assemblies – without the need for fixtures or drawings. PFW uses the ITP Group Pipe Software to extract the tube and fitting data from the CAD model and then export the data to its tube benders and CMMs with no keyboard data entry required.

The ITP Group systems are used for initial tube inspection, fitting orientation and final pass-off. Rolls Royce praised PFW Aerospace's achievements, stating that the integrated production system based around the ITP Group machines was groundbreaking, and that they had never seen the level of throughput achieved at any other company.

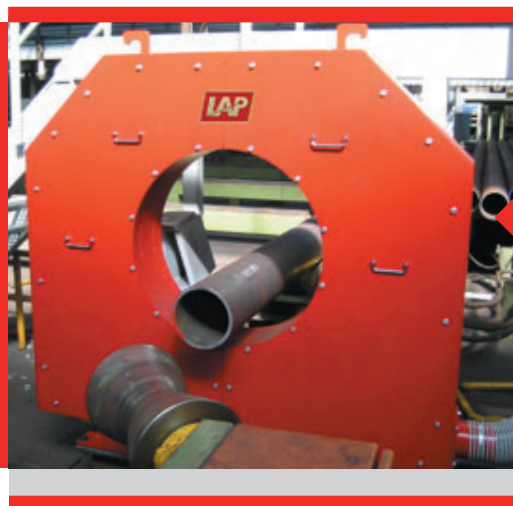
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[www.LAP-LASER.com](http://www.LAP-LASER.com)



## Solving bending challenges

TUBE and pipe bending and endforming machinery expert Felss Burger GmbH, Germany has delivered additional CBC-12 and CBC-22 NC bending machines fulfilling increasing capacity demand at customers in China and the USA. The systems are to produce high precision bent tubes for fuel injection and climate application. Typical dimensions are steel and stainless steel up to OD12x1.5mm and aluminium up to OD22x1.5mm.

The Felss Burger turnkey solutions have up to seven NC controlled axis and are equipped with additional feeding systems as well as deloading stations. All processes are precisely controlled and run with little operator attention beside loading and deloading allowing cost effective multi-machine operation. The CBC features solutions for all bending challenges such as precision, left/right bending, multi radius, mark free, roll- and draw bending.

Controlling is done by the human machine interface SPOB that uniquely allows all FELSS Burger machines to control with an identical and easy to handle logic. In case of

problems tele-diagnosis via internet allows 365 days a year 24 hour direct access by experts. Software updates, new programs, new products and add ons are handled this way and even service stations with spares and tools in China, Japan and the US are in place for quick repairs.

New bending operations are programmed parallel to the production. To shorten change over times the CBC-12 and CBC-20 is to connect to all common measurement systems such as Faro, Ikon or Tube Inspect.

Both customers add their machines to Felss Burger's endforming units MEC-4, a four step unit to precisely form the connectorising endforms. Additionally, in case of dynamically changing pressures in a tube such as diesel-injection lines, autofrettage unit FA02-83 is added to significantly increase fatigue strength of a tube.

**Felss Burger GmbH** – Germany  
 Email: [info@felss-burger.com](mailto:info@felss-burger.com)  
 Website: [www.felss-burger.com](http://www.felss-burger.com)

## Technip wins Visakh deals

TECHNIP has been awarded two contracts by Hindustan Petroleum Corporation Ltd (HPCL) for its diesel hydrotreater project in the Visakh refinery, on the east coast of India.

The two contracts, which are scheduled to be completed by the first half of 2012, will be executed by Technip's operating centre in New Delhi, India.

The first, worth approximately €50mn, covers the license as well as the engineering, procurement, construction and commissioning (EPCC) for a hydrogen generation unit with a capacity of 36,000 tons/year.

The second contract, worth around €65mn, is for the EPCC of a diesel hydrotreater unit with a capacity of 2.2 million tons/year.

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# Lincoln Electric's automated welding robot to be featured in movie sequel

A LINCOLN Electric automated welding robot cell, featuring a Lincoln Electric Power Wave® i400 welding power source and a FANUC® ARC Mate® 100iC robotic arm, will co-star in the movie sequel, *Iron Man 2*. Lincoln Electric's welding equipment and consumables were used by actor Robert Downey Jr's character, engineering genius Tony Stark, to fabricate his superhero suit in the film.

"Being involved with the film was truly an incredible experience," said Brian Simons, robotic programmer of the Automation Application Group at Lincoln Automation. "Responding to immediate client needs at Lincoln prepared me to react on the studio's set at a moment's notice. This was great exposure for Lincoln to demonstrate the level of technology involved in welding today." The original film, *Iron Man*, made more than \$117mn at the box office in its first two weeks. Lincoln Electric MIG and TIG welding equipment was also featured in this film.

The sequel is anticipated to be another box office success. In addition to Downey and Gwyneth Paltrow's character, Pepper Potts, the film stars Mickey Rourke as villain Ivan Vanko, aka Whiplash, Scarlett Johansson as Natasha Romanoff or the

Black Widow and Samuel L Jackson as Nick Fury. As a takeaway, Downey and director of the original film as well as the sequel, Jon Favreau, autographed the Power Wave® i400 and the robotic arm used on the *Iron Man 2* movie set. The complete automation welding cell is currently on display in the lobby at the Lincoln Electric Automation Division in Cleveland.

Lincoln Electric is a leader in the design, development and manufacture of arc welding products, robotic arc welding systems, plasma and oxyfuel cutting equipment and has a leading global position in the brazing and soldering alloys market.

**Lincoln Electric – USA**  
Website: [www.lincolnelectric.com](http://www.lincolnelectric.com)



The welding arm that has found fame in Hollywood

# Expansion of plant in the Asab gas field

THE United Arab Emirates is among the countries with the most extensive oil and gas reserves in the world. However, these resources are not evenly distributed among the seven Emirates: Abu Dhabi, by far the largest in area, has over 90% of the total oil and gas reserves of the UAE. 220km to the south of the city of Abu Dhabi is the Asab gas field, currently the site of one of the largest upstream projects in the Middle East.

In connection with work by the oil company ADCO to expand the existing facilities and increase capacity, two EPC (engineering, procurement and construction) contracts have been awarded. ADCO is a joint venture of the Abu Dhabi National Oil Company (ADNOC), Shell, Total, ExxonMobil, BP and Partex.

Package A covers further exploitation of the onshore Asab field by replacing and enhancing the existing gas production centres and oil and gas cleaning facilities.

Package B covers the exploitation of the neighbouring Sahil and Shah fields by establishing degassing stations, and laying plant and flowline pipes and the main oil pipelines connecting both Sahil and Shah to Asab.

The \$2.3bn Package A was awarded in 2009 to Petrofac, an international provider of plant solutions for the oil and gas exploration and production industry. German manufacturer H Butting GmbH & Co KG received an order from Petrofac for the production and delivery of stainless steel pipes in dimensions from 6" to 48", with the bulk of them being 30" x 35.6mm. The pipes are used as transport lines for the aggressive sour gas in various areas of the expanded plant. The resulting corrosion resistance requirements will be met by the use of super duplex material (UNS S32750). The wall thicknesses of the pipes range from 3.76 to 35.6mm, and the total delivery runs to around 1,400 tons.

The pipes were manufactured by Butting in 12m lengths and without circumferential weld, in its expanded manufacturing facilities. With the optimised production flow, the welded pipes do not need to leave the production hall from the point when they are shaped from 12m plates and worked into open-seam tubes to their final quality assurance inspection. This cost-effective method benefited Petrofac by enabling their requirements to be met while saving on circumferential welds on-site.

Butting has to comply with a tight timetable: the investors have announced that the expanded plant will be completed some time in 2010. By producing and delivering the pipes between September 2009 and April 2010, Butting will help to achieve this ambitious goal.

**H Butting GmbH & Co KG – Germany**  
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Website: [www.butting.de](http://www.butting.de)

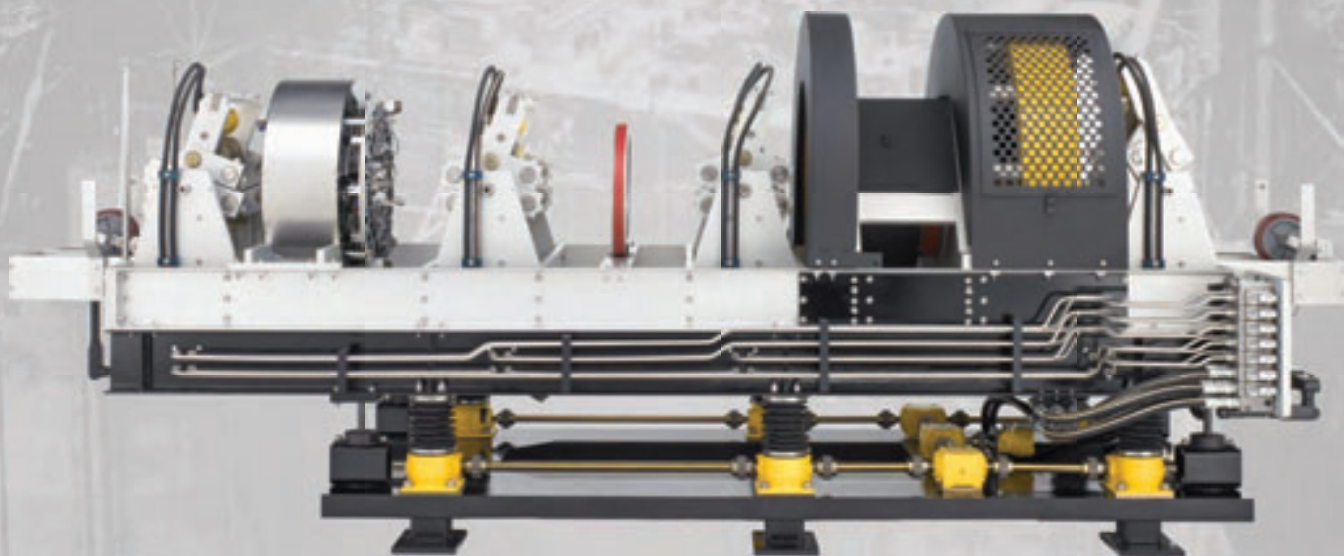


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MODEL

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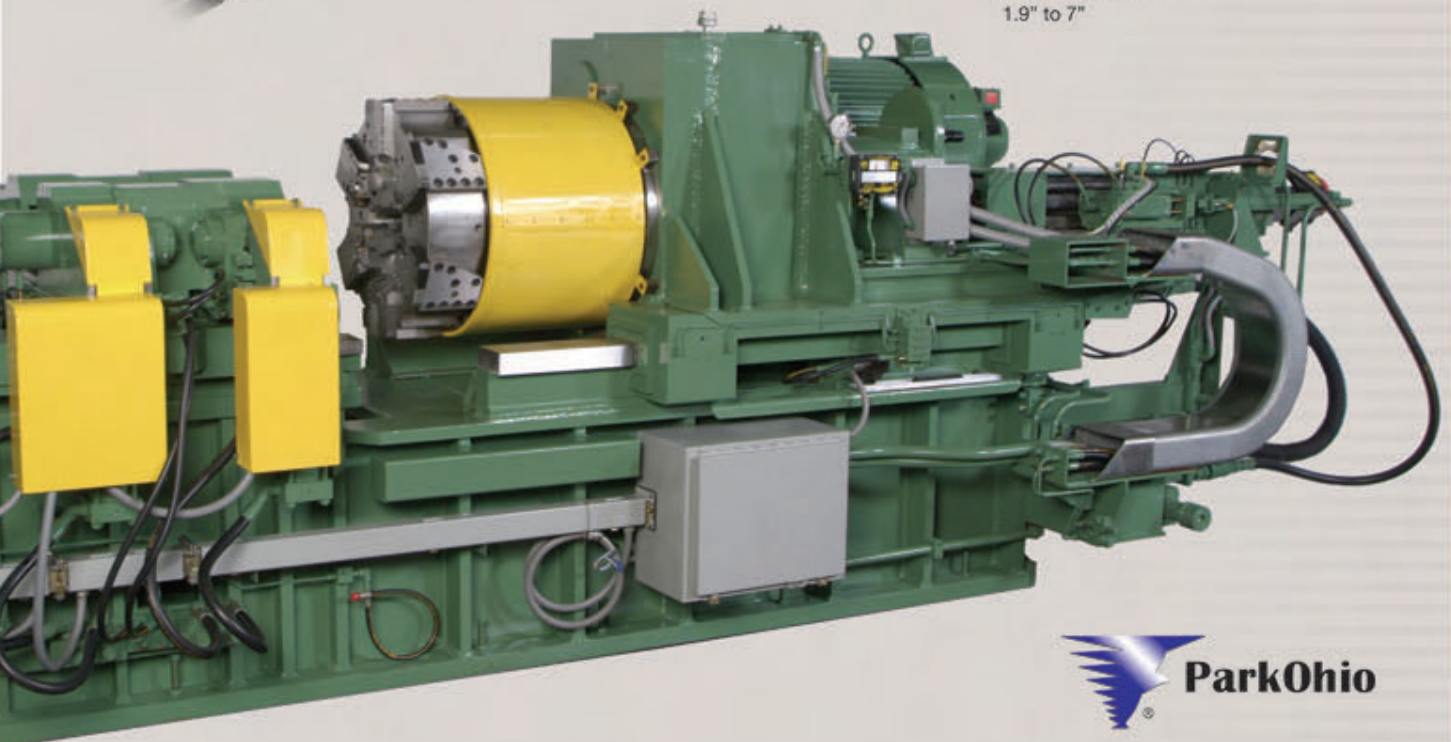
60.3mm to 177.8mm  
2 3/8" to 7"



MODEL

## RTP07-2

48.3mm to 177.8mm  
1.9" to 7"



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# International Tube Association recruits 100 new members at Tube Düsseldorf

THE 2010 edition of Tube may have effectively ended one day early because of the Icelandic volcano eruption but despite that the first four days were very successful for the International Tube Association (ITA).

As a result of the exhibition the ITA signed up 95 new members, a record number for any single event.

A well-attended annual general meeting and members' lunch saw a number of changes in the ITA hierarchy.

Professor Manabu Kiuchi was the 2010 recipient of the John C Hogg Lifetime Achievement Award for outstanding service to the association. He retired as ITA president but was accorded the title of Honorary Life President Emeritus.

In the elections held at the AGM Gunther Voswinckel became ITA President and Tsutomu Nakata the new ITA Chairman.

Retiring Chairman Albert Sedlmaier was elected Vice President (Europe).

During the members' lunch Stephen Loynes, Chairman of the Technical Management Committee, announced the ITA's 2010 speaker awards. The 2010 Professor Hugh Sansome speaker award and the speaker's shield were presented respectively to:

Winfried Heinemann of AWS Schaefer, Germany for his paper at the Pipe & Tube Istanbul 09 conference: "New generation of induction bending machines"

Hans-Joerg Braun of Reika, Germany for his paper, also at the Istanbul conference: "The latest generation of tube straightening machines – cost and quality improvements in tube finishing lines"

A highly commended award went to R Shahandeh, Urmia University, Iran, who was unable to attend the lunch, for his Istanbul

paper: "Experimental and fem investigation on influence of ring stiffeners on buckling behaviour of subsea pipelines under hydrostatic pressure". The Heinemann paper will be published in the next edition of the ITA's ITAN newsletter.



Anecdotal evidence from many ITA members suggests that Tube Düsseldorf 2010 resulted in a very healthy number of positive enquiries with clear signs that the global market is beginning to recover from the economic downturn of 2008/2009 and Messe Düsseldorf is to be congratulated for its efforts in attracting a high level of decision-making visitors to the trade fair.

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# PowerSeries demonstrates performance at the Wittmann Battenfeld Competence Days

VISITORS from more than 30 countries accepted the Wittmann Group's invitation to attend the Competence Days 2010 in Kottlingbrunn (Austria). Experts of the Wittmann group presented latest innovations and process technologies to interested trade visitors. The total of 1,000 visitors exceeded the organisers' expectations for the Competence Days.

In addition to its newly developed PowerSeries range with the EcoPower, MacroPower and MicroPower series, Wittmann Battenfeld presented exhibits from the HM and Vertical machine series, while Wittmann showed its latest developments in the area of peripheral equipment – robots, granulators, dryers and temperature controllers. Several introductory presentations gave the guests an overview of the latest developments in injection moulding and process technology.

The series of presentations was concluded by a speech about the latest developments in Wittman robots and special equipment in automation technology.

During the subsequent machine demonstration, the visitors were able to experience the high performance of the injection moulding machines and peripheral equipment themselves – live on site. The performance show was opened with a show programme, in the course of which the new MicroPower and MacroPower machine models were officially unveiled.

The MacroPower injection-moulding machine with 800 tons clamping force proved its efficient productivity by manufacturing a dryer centre part (with a mould supplied by Coko Kunststofftechnik). The machine concept geared to user benefit offered the advantages of minimal locking and high-pressure buildup times as well as a facility for extremely quick mould change.

The newly developed MicroPower proved to be of special interest for the visitors. This production cell is available with clamping forces of either 5 or 15 tons and consequently ideally suited to the production of micro precision parts and nano parts. At the Competence Days, the production of a micro plug with a part volume of no more than 0.0035cm<sup>3</sup> was demonstrated. Here, the part quality is checked and monitored by a camera integrated in the production cell and the machine's control system. The modular design allows for easy integration of a clean room module, to accommodate medical clean-room applications as well.

The servo-electric machines were represented by several units from the new EcoPower series. On an EcoPower 110/350, an LSR O-ring was produced in a 128-cavity mould supplied by Rico (Austria). With a 32-cavity mould from Schöttli (Switzerland), an EcoPower SE 110/350 produced a 2 ml barrel for medical applications. Another example from this series, an EcoPower 180/750, was shown

producing a PP fitting formed in a mould from IFW (Austria). An HM 180/1330, equipped with the new, energy-efficient ServoDrive drive concept, was presented with the production of a PA media duct. Here, a combination of water injection and projectile technology was used, with a mould supplied by IKV Aachen (Germany). Projectile technology enables constant duct cross-sections, smoother inner surfaces and forming of special cavity geometries.

As an example of Combimould multi-component technology, a two-component oil closure in Gram technology was manufactured in a double stack mould supplied by KTW (Austria) on an HM MK 300/2250H/525V. Here also, the new ServoDrive drive concept was demonstrated.

A TM Xpress 210/1350 injection moulding machine gave an impressive demonstration of manufacturing a cup with 750 ml. The IML automation equipment used in this process, as well as the mould, all came from Wittman.

Robots, dryers, granulators, metering devices, feeders, temperature controllers, chillers and flow regulators were all on display in the showroom.

**Wittmann Battenfeld GmbH – Austria**  
 Fax: +43 2252 404 1002  
 Email: [waltraud.berger@wittmann-group.com](mailto:waltraud.berger@wittmann-group.com)  
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# Leading Chinese producer selects Banyard VSI systems

BANYARD IHWT has been awarded a multi-million dollar contract from another leading Chinese producer of high quality seamless tubing for use within the energy sector. In total, eight Vertical Steel Induction (VSI) billet heating systems will be delivered, five for use at the pre-piercing stage and three prior to the extrusion lines.

The installation will benefit from Banyard's fully electric, heavy duty mechanical handling systems. These include billet up-enders fitted with electric drive mechanisms capable of lifting billets in excess of 1,100kg into a high efficiency induction heating coil.

Based upon proven Inductotherm VIP induction power technology, all heat stations can be controlled from one single PLC with the very latest in fully programmable, switchable, dual frequency power control giving accurate temperature distribution both linearly and axially to guarantee quality extruded product. Banyard VSI systems also provide a better environmental solution

for the future, burning no fossil fuel and having limited water consumption. The process flexibility offered by the Banyard

VSI systems are particularly suited to manufacturers of tubing made from high temperature, corrosion resistant alloys including nickel based alloys, austenitic and duplex stainless steels.

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 Fax +81 (0) 58795 7226  
 sales-ex@kanefusa.co.jp

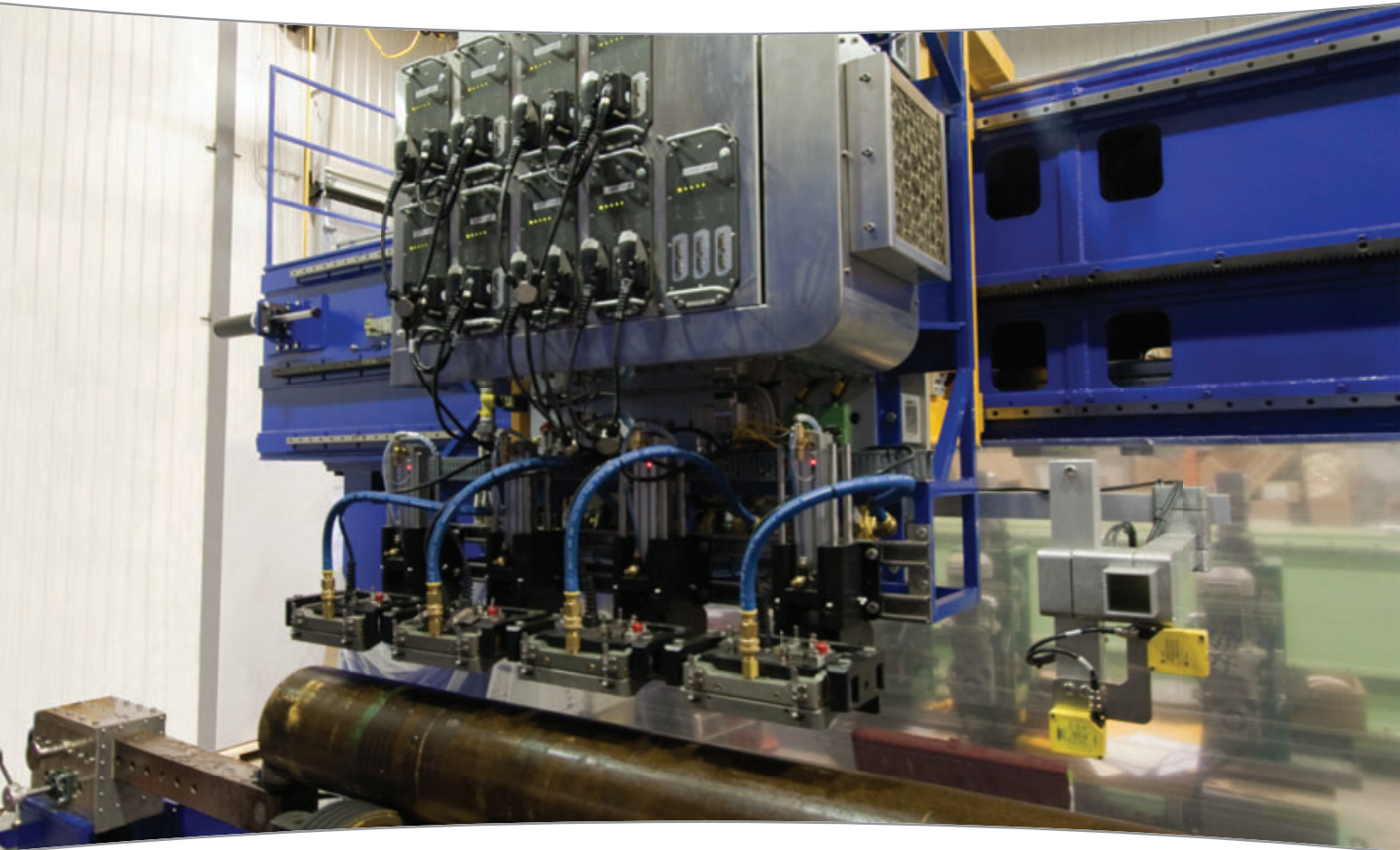
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- Fulfills testing regulations such as API-5CT and API-5L. Qualified by major oil companies in the world (Exxon-Mobil, Shell, BP, and Chevron).



**NEW**

Olympus has recently introduced the QuickScan LT-PA. This new phased array acquisition unit is designed especially for the industrial environment with improved integration capabilities (compact, IP55, no air-conditioned needed). It can be mounted directly on the inspection head allowing a fully integrated inspection system with less phased array cables, and innovative inspection configurations.

# Radar station gets emergency power upgrade

PIPE Center has supplied specialist fuel pipe for a new emergency power system at Stornoway radar station on the Isle of Lewis, off the West coast of Scotland.

The Durapipe PLX pipe is being used as part of a refurbishment of the National Air Traffic Service (NATS) radar facility, which monitors and controls aircraft and collects weather data.

The emergency power system is designed to provide vital back-up in the event of mains electrical failure, to ensure the safety of domestic and international airplanes.

The refurbishment is part of a £127mn programme to replace and upgrade the entire NATS radar network by 2012.

The installation was carried out by Ness Engineering, which undertakes specialist engineering and construction projects throughout Scotland's highlands and islands. Durapipe PLX pipe was specified to transport diesel oil from the storage tank to the stand-by emergency generator, as it

meets critical requirements for integrity and reliability. It replaced existing steel pipework installed previously.

Available in sizes 32mm and 160mm, Durapipe PLX secondary contained systems have exceptional resistance to rapid crack propagation and long-term stress cracking. PLX is also highly cost-effective and much easier to work with than traditional metal alternatives.

Pipe Center also supplied Ness Engineering with a bespoke railing system for the fuel pipework support structure.

Lindsay Crockett of Pipe Center's Glasgow branch, which handled the order, said: "Ness Engineering sent us outline drawings for the project. We worked closely with Durapipe to assess the materials and component requirements and ensure everything was delivered on time – including a 6.30am ferry trip to the island!"

The design chosen was based on a dual containment pipe system. This has a primary inner fuel pipe running inside a larger outer

pipe that encloses the primary inner pipe. In the unlikely event of a rupture, fuel flowing through the primary pipe is securely captured

and delivered to the generator, ensuring continuous power supply to the radar station.

Key to the design is the use of electro-fusion jointing technology, used to bond pipe together. This uses an electrical heat induction process to create a simultaneous bond of both inner and outer pipes, to form a completely enclosed fail-safe system.

Components and jointing equipment, some sourced from Italy, were supplied to site via the early morning 6.30am ferry from the mainland to Lewis, arriving at Stornoway in time for work to begin.

Commenting on the project, David Williamson from Ness Engineering Ltd said: "This refurbishment of the emergency power supply was a large part of our development at Stornoway this year, and we required a product that we could be certain would deliver quality and reliability in the case of an emergency.

"We found the quality of Durapipe PLX excellent and were particularly impressed with the superb customer service we received during the project itself, as well as the after care and communication. We look forward to working with Pipe Center and Durapipe UK again in the future."

Following the success of the project, Pipe Center has orders for seven similar emergency power refurbishment projects in the pipeline.

**Wolseley UK**

Email:

francesca.hanikova@wolseley.co.uk

Website: www.wolseley.co.uk

## Trumpf expansion

TRUMPF Inc has announced that Hegman Machine Tool Inc is now the exclusive representative for Trumpf products for the entire State of Wisconsin, USA.

The company has long covered Nebraska, Western Iowa, Minnesota, North Dakota, South Dakota and Western Wisconsin for Trumpf, and now the distributor has added the remainder of Wisconsin and the Upper Peninsula of Michigan to the territory it represents for Trumpf.

Hegman Machine Tool Inc is a privately held Twin Cities-based machine tool distributor that promotes high quality machine tools and provides a combination of services and support.

"We have been in business for more than 27 years and are excited at the prospect of working with the exceptional companies located in the Eastern portion of Wisconsin and Michigan's Upper Peninsula," said Ralph H Hegman, president. "Our accomplishments over these past many years have been because our customers have been so successful with our Trumpf machines and automated systems."

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# Would you compromise a multimillion-dollar project with dirty tubes?

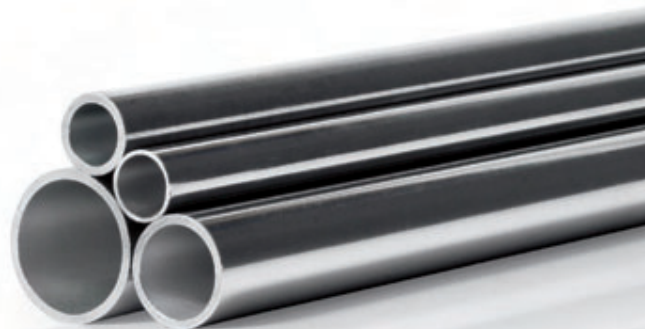


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# Atlas Tube Canada reaches new record in change over

ATLAS Tube Harrow, Canada has reached a record change over time of 55 minutes from “good tube” to “good tube” on its 16” ERW tube welding line. The line was manufactured by SMS Meer. The success was mainly driven by the huge experience of the Atlas Tube operators combined with the innovated quick-change system of SMS Meer.

The market for ERW tubes is facing tremendous changes. For the tube manufacturers this means that they mainly receive small production lots of many different tube sizes. Therefore, the rolls need to be changed very often. In this respect, the most economical benefit for ERW tube mills is to shorten the change over time and to increase productivity.

SMS Meer offers a highly efficient quick-change system which gives the customers a significant lead over the competition.

For in-line roll changing of the patented SMS Meer URD® stands (URD® = Uniform Rigid Design) with rigid double closed frame plates, the change carriages are positioned in front of the stands to be changed. The roll assemblies with the ‘used’ rolls are pushed out by hydraulic cylinders into the free position of the change carriage.

The change carriage is moved aside so that the prepared roll assemblies with the ‘new’ rolls can be pulled into the stands. The rolls are automatically adjusted to their working position and accurately set according to the stored values. All roll

adjustment mechanisms, such as motors and encoders, remain in the URD® stand during changeover. The whole change procedure – pushing out/pulling in and positioning – takes place fully automatically in an unbelievably small timeframe. All movements and adjustments will be done by the SMS Meer CSS-Quicksetting® system.

The URD® stands (fin-pass-, squeeze-and sizing stands) are designed to be equipped with the same roll assemblies.

This permits the use of the same changing facilities. To complete the possibility of quick-changing, SMS Meer have developed off-line quick-change systems for the URD® stands like rebuilding devices and change presses for quick and simple changing of the rolls, and for handling the rolls and roll chocks.

Presently, SMS Meer is commissioning a similar 16” ERW tube welding line, amongst others, with these latest developments of the above mentioned quick-change system in Severstal, Russia.

**SMS Meer GmbH – Germany**  
 Fax: +49 2161 350 1667  
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*Atlas Tube Harrow reached record change over times with the ERW tube welding line*

# Elastopipe growth met by Trelleborg factory

TO meet continuing high demand for its innovative Elastopipe™ offshore and marine fire safety prevention system, Trelleborg Offshore Norway AS has invested in increased production capacity. Output volume has been doubled by building a completely new factory and production line inside its existing premises at Krokstadelva, 50km/30 miles south of Oslo, Norway.

“Demand for Trelleborg’s Elastopipe corrosion proof seawater deluge system, and its many other applications including hydrocarbons and gas transport, has rocketed despite the recession,” commented Thor Hegg Eriksen, president of Trelleborg Offshore Norway AS. “Contractors and operators are realising its minimal

maintenance and low lifetime cost benefits, and 80% of our output is now exported.”

The new 1200m<sup>2</sup> factory and production line are built to the highest efficiency, automation and safety standards improving output volume, product quality and reducing waste. The new facility took 18 months to build, and was opened in the presence of Trelleborg Group management, local politicians and dignitaries.

“Trelleborg has supplied and installed the Elastopipe system in the Netherlands, Denmark, UK, Russia, Qatar, Canada, Singapore, Brunei and Australia,” added Eriksen.

The proven advantages of Elastopipe over conventional rigid steel pipes have already made it an established solution

for seawater-based deluge and sprinkler systems due to its corrosion-free and fire resistant performance with lower installation costs and reduced maintenance. Elastopipe achieves 24/7 system availability for seawater fire prevention duties with considerably less need to be offline for testing, and regular planned maintenance.

Elastopipe offers significant weight advantages over steel. Its ease and speed of installation make it suitable for fixed and floating platforms, support vessels and onshore oil and gas installations.

**Trelleborg Offshore Norway AS**  
 Fax: +47 32 23 22 73  
 Email: jan-hugo.nilssen@trelleborg.com  
 Website: www.trelleborg.com



# Tenova delivers enhanced furnace safety module

TENOVA Goodfellow has successfully closed another EFSOP® project, at Evraz Claymont Steel, Delaware, USA, with the commissioning of the EFSOP Holistic Optimization® technology on the existing 160 ton electric arc furnace (EAF). The application of the EFSOP technology provided automation of the fourth-hole damper and burn injector profile.

Final acceptance for project closure included sign-off on the new Enhanced Furnace Safety Module that was implemented in late 2009. The EFSOP Enhanced Furnace Safety Module proved the ability to detect abnormal water. Examples are snow in the charge bucket and a water panel leak. The plant has defined and implemented appropriate levels of operator response to their process operation in order to improve the safe operation of the electric arc furnace.

Evraz Claymont Steel is a carbon plate mini-mill specialising in the manufacture and sale of custom-order discrete steel plate in the United States and Canada.

With an annual capacity of over 500,000 tons, Claymont Steel's facilities are specifically configured to provide low-cost steel plate in small order sizes and non-standard dimensions.

Tenova Goodfellow's EFSOP technology is an off-gas-based process control system for EAFs. It measures and analyses EAF off-gases (CO, CO<sub>2</sub>, H<sub>2</sub>, O<sub>2</sub>) continuously at the fourth-hole for real-time closed-loop process control of EAF steelmaking, resulting in improved operations, energy savings, lower conversion costs and safety benefits.

**Tenova Goodfellow Inc – Canada**  
 Fax: +1 905 567 3899  
 Email: goodfellow@ca.tenovagroup.com  
 Website: www.tenovagroup.com

**Claymont Steel Inc – USA**  
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 Website: www.claymontsteel.com

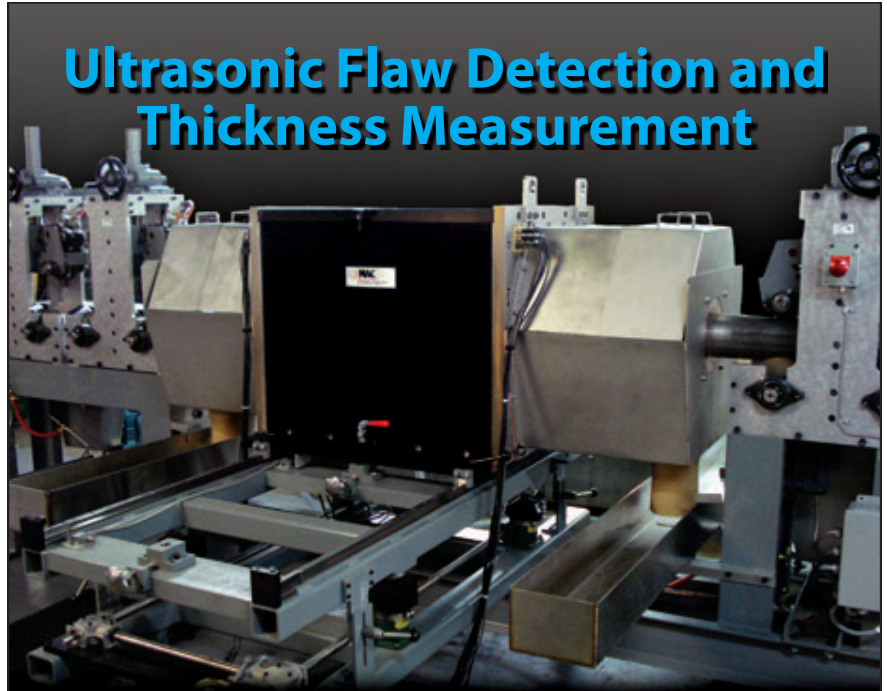
# New line for steel authority of India

TENOVA Strip Processing has recently received an order from SAIL (Steel Authority of India) for a Tension Leveling and Inspection Line for the Bokaro steel plant, in the Indian state of Jharkhand. The project will be executed on a turnkey basis in consortium with Mumbai's Multiform, now part of Tenova

Group, and Kolkata's Sunag Engineering, in charge of local supplies and services.

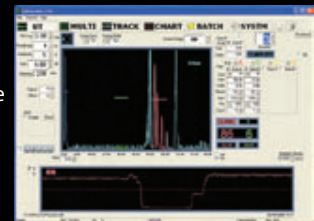
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# VCC rolling mill supplied to Daehan Steel in South Korea

DAEHAN Steel, South Korea, has placed an order with SMS Meer, Germany, for the supply of a VCC® (vertical compact coiler) rolling mill for compact coils. The mill with an annual capacity of 450,000 tons will be the world's first rolling mill that concentrates exclusively on the production of compact coils.

SMS Meer is to supply the key equipment, such as six housingless stands each in H/V arrangement for the roughing and intermediate trains, an eight-stand finishing block in V arrangement, heat treatment equipment, VCC® facilities, the electrical equipment and the automation system. In addition, SMS Meer will be

responsible for the coordination of the erection and commissioning. The production line processes billet sizes of 130 x 130mm. It is planned that the mill will be expanded to cover billet sizes of 150 x 150mm.

The rebar sizes correspond to the Korean standard D10 to D16; the production of corresponding round bar sizes is also possible.

SMS Meer GmbH is a company of the SMS group, which is, under the roof of the holding SMS GmbH, a group of companies internationally active in plant construction and mechanical engineering for the steel and non-ferrous metals industry. It consists of the two business areas: SMS Siemag and

SMS Meer. In 2009, some 9,000 employees worldwide generated a turnover of more than €3.8bn.

The VCC® plant is currently regarded as the most modern hot coiling process. The VCC® technology is also highly suitable for integration into older plants with wire rod blocks and loop laying heads in order to permit production of compact and stable coils. The vertical compact coiler (VCC®) from SMS Meer can wind bars directly in vertical position. Thanks to this technology, customers can do without turning manipulators in future. The pass time is significantly reduced with the VCC® system, as the coils are already formed in their natural finished position. The plant is scheduled to go into operation in April 2011.

**SMS Meer – Germany**  
 Fax: +49 211 881 4386  
 Email: thilo.sagermann@sms-group.com

# Welspun Infratech to acquire MSK Projects India

WELSPUN Infratech Ltd, a subsidiary of Welspun Gujarat Stahl Rohren Ltd and part of US\$3bn Welspun Group, has signed an agreement to acquire a majority stake in construction company MSK Projects India Ltd.

Welspun sees huge potential in the \$500bn infrastructure sector in India, along with synergy it can drive in pipe laying business. Welspun has a special focus on oil and gas pipelines, water and wastewater systems, highways, civil and industrial projects, and power plant construction.

MSK has three decades of experience, and its business model includes EPC projects in roads, industrial construction and PPP (public private partnership). MSK also

owns several BOOT (Build Own Operate Transfer) assets in the road sector, water and bus terminals, most of which are nearing completion with toll income commencing in the near future.

Welspun aims to acquire a stake of around 75% through a combination of share purchases from promoters, associates, investors, preferential allotment and open offer. The company will make a mandatory open offer to the public shareholders of MSK Projects.

The transaction has been unanimously approved by the boards of directors of both companies. The closing of the transaction will also be subject to customary conditions including regulatory approvals, and is

expected to be completed in around 90 days.

The total investment in the acquisition will be around Rs 400 crore, of which approximately Rs 200 crore will be used for future business growth in both EPC and BOOT assets. The entire investment will be funded by the existing cash flows of Welspun Gujarat.

The acquisition will enable Welspun to move a step towards complete integration by being a one-stop-solution in the line pipe segment. It will capture the full value chain, from manufacturing of plate and coil, to line pipe, and pipe laying.

**Welspun – India**  
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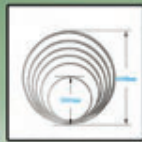
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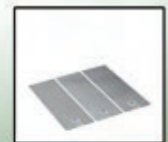
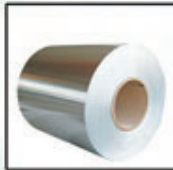


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# Three-roll plate bender that forms plates to pipes and cones without changing rolls

MACHINES with multiple talents are always sought after due to their versatility. The 3-roll plate bending machine made by Gräbener Maschinentechnik from Netphen-Werthenbach, Germany, is one such all-round talent. The smooth and fast production of pipes and half-shells, pressure vessel shells and cones is possible – without having to change rolls.

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

The 3-roll plate bending machine from Gräbener has few rivals in terms of flexibility. This was witnessed by the management of an important pipe manufacturer during a visit at another Gräbener client that operates the most recently built 3-roll plate bending machine. Upon this client's express request and according to his specific requirements, Gräbener designed a multi-talent machine that is able to bend plates to pipes, half-shells, pressure vessels, and cones.

After smartly having pre-bent the plate



The Gräbener 3-roll plate bender in action (and below)



edges, the 3-roll plate bending machine, of compact design, bent the 80mm thick plate to a cone with radii of 2,592 (1) / 2,698 (2) mm – also in near-record time. The decision-makers were caught by surprise when looking at the short straight end because on this Gräbener machine, the bottom roll can approach the top roll to within a distance of 100mm. This is enabled on the one hand by the flexible adjustment of the rolls, and on the other hand by the fact that the conical bending device, which controls the bending of cones, can be slewed away completely. The operator constantly obtains exact information on the relevant position, as well as on the individual contact pressure of the rolls. All data are displayed on instruments integrated in the control panel.

The visitors were even more impressed when they were told that the bending capacity (plate thickness) of this machine for plates of material grade S355, over the entire roll length of 3,100mm, is 120mm. Heavier thicknesses of up to 200mm, depending on material grade and plate width, can also be bent efficiently. One of the visitors stated: "The 3-roll bending machine is a genuine multi-talent."

Another product within the Gräbener roll bender family is the 4-roll bending machine

which can be equipped with a supporting yoke. This machine type performs the highest quality requirements, reduces the calibration efforts to a minimum, and will – no less than the 3-roll bending machine – fulfil various bending tasks. With a supporting yoke, it is possible to install a top roll of smaller diameter, which allows the production of smaller pipe diameters. And what is more, a discussion on the top roll camber layout, which would enforce to determine a certain pipe production range in advance, is avoided.

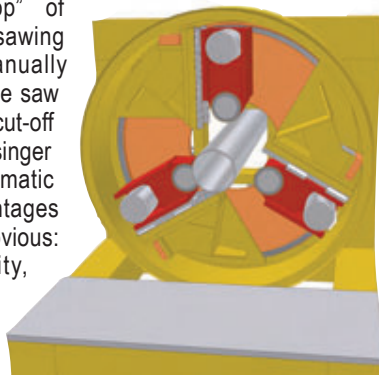
With the Gräbener concept, the plate thickness range from small up to the maximum possible sizes can be realised without any restrictions, owing to the fact that the supporting yoke can be hydraulically adjusted to the individually required bending force. The plate edges are in parallel; convexly respectively concavely shaped pipes become a thing of the past. Thus, an optimum precondition for welding is achieved.

**Graebener – Germany**  
 Fax: +49 27379 89109  
 Email: [info@graebener-group.com](mailto:info@graebener-group.com)  
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# Competitive advantages with tool changer

WHILE the “pit stop” of conventional large sawing machines is manually performed, changing the saw blades of the new tube cut-off machine MC3 from Linsinger is an entirely automatic process. The advantages for customers are obvious: higher productivity, increase of job safety as well as improved convenience and reduction of errors.



The tube cut-off machine MC3

Linsinger showcased in public for the first time the Linsinger Tube Cut-off Machine MC3 at Tube Düsseldorf. Linsinger reached its high aims to cheaply and quickly cut tubes as well as profiles in fully automatic production lines by replacing the conventional large saw blade with three small circular saws. The three small diameter circular saws are mounted on a rotating frame and always cut simultaneously into the tube. The effect: significant shorter cutting times and enormous cost savings. It is possible to save ca. 50km tubes in the course of a machine life cycle due to the small cutting width (ca. 3mm) of the three saw blades. In comparison, a large sawing machine would produce about 2,650m more scrap per year with its cutting width up to 10mm.

In addition the tools contribute to lower costs. One cut of the sawing machine MC3 costs altogether not more than 44 cent. This is 69 cents less than the costs of one cut with a large saw blade. This cost saving alone gives a payback period for the basic machine of three years. True to Linsinger's motto “Always On Top”, the research and development team took it to the next level and developed an additional feature. Described as follows: the completely automatic tool changer with a robot.

The robot was originally designed to remove the cut-off parts and to select and remove testing rings. Now it has a multifunctional program which is able to change three saw blades within 90 seconds. Comparable with a pit stop in Formula One motor sports – the shorter the pit stop time, the faster across the finishing line. The incredible saving times correspond approximately one year of extra production during a three shift operation with 20 years life cycle in comparison with a manual saw blade change of a large sawing machine. Next to this immense increase in capacity the increased automation also reduces the number of errors. The operator-free tool changing operation is initiated by control system tool life tables fully automatically. All tool life and cutting performance data are electronically stored for easy access.

Linsinger offers fully automated production flow to support sustainable production cost reduction to the benefit of customers in their endeavours to reach the pole position and win the race for the most efficient tube production.

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ASME : ANSI B16.9, ANSI B16.28, MSS–SP–75

DIN : DIN2605, DIN2615, DIN2616, DIN2617, DIN28011

SGP : JISB2313

EN : EN10253-1, EN10253-2

## MATERIALS:

ASME : A234 WPB, A234 WP1, A234 WP5,

A234 WP9, A234 WP11, A234 WP12, A234 WP22,

WP91, WP92, A420, WPHY42, WPHY52, WPHY60,

WPHY65, WPHY70, WP304, WP304L, WP304H,

WP316, WP316L, WP321, WP347, WP347H

DIH : ST37.0, ST35.8, ST45.8, S235JR, P235GH,

P265GH, 10CRMO910, 15CRMO, 12CR1MOV

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## New ultrasonic flowmeter for the hydrocarbon industry

SIEMENS Industry Automation Division has developed the Sitrans FUT1010, an ultrasonic flowmeter for the hydrocarbon industry. It features the nearly maintenance-free TransLoc mounting system, which allows the transducers to be mounted on the outside of the pipe, preventing contact with the medium.

This approach allows the externally mounted transducers to be calibrated for higher accuracy, and also has the additional benefit that it alleviates clogging of cavities by high paraffin liquids, which is typically seen in conventional flowmeters used in hydrocarbon applications. TransLoc ensures less maintenance and downtime, leading to low cost of ownership and improved return on investment.

The combination of WideBeam ultrasonic transit time flow technology with the delivery of the entire meter run, including the segments for upstream, downstream and the flow conditioner, can be calibrated to American Petroleum Institute and American Gas Association specifications. It also ensures that the Sitrans FUT1010 achieves highly accurate flow measurement.

Sitrans FUT1010 is available in two versions: one for gas and one for liquids measuring viscosities up to 2,800 cSt (centistokes). Its versatility makes it suitable for up-, mid- and downstream measurement tasks, such as check metering, process control and underground storage surveillance.

Since it can be installed on small as well as large pipes it is suitable for many applications, including custody transfer applications that require laboratory calibration.

**Siemens AG – Germany**  
Website: [www.siemens.com/sitrans](http://www.siemens.com/sitrans)

The Sitrans FUT1010



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## Easy tool change tube mill

THE Oto 40616 ETC (easy tool change) tube mill includes flexible forming as conceived by Nakata. Forming rolls need not be changed, but simply adjusted according to what is required as a function of tube diameter. Finishing and sizing sections are designed with interchangeable 4-roll stands.

The tooling change has been designed to minimise change-over time and operator involvement throughout the tube mill. Using existing forming concepts, the company has automated the tooling pick and set-up operations.

In the finishing and sizing, the quick change-over does not occur by replacing the entire stand (as typically executed on smaller mills), but by swapping the assembly, including rolls, shafts, bearing blocks and side rolls from the top of the stand.

All driven stands are mounted to the mill base and universal joints are provided with an automated engagement/disengagement hydraulic system from the

mill shafts allowing for the roll, bearing block, shaft, and side rolls (if provided) to be moved in and out of the stands, which are designed with an opening at the top to enable the change-over operation via crane.

Jacks and absolute encoder for top shaft adjustment are part of the removable assembly. Adjustments on the roll, shafts, and bearing block assembly are performed through electric gear motors and absolute encoders.

The entire change-over operation is automatic, so operators are simply involved in the lifting of the roll assembly in one motion.

The Oto 40616 ETC tube mill comes with a second set of shaft, bearing block and side roll assemblies to enable off-line roll change-over.

Extra shafts and bearing blocks may be purchased, which can be permanently assembled to the rolls for even faster roll replacement. A special tool designed to help the off-line roll change-over is also offered.

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[info@saetgroup.com](mailto:info@saetgroup.com)

## Bevelling benches for use on- and off-shore

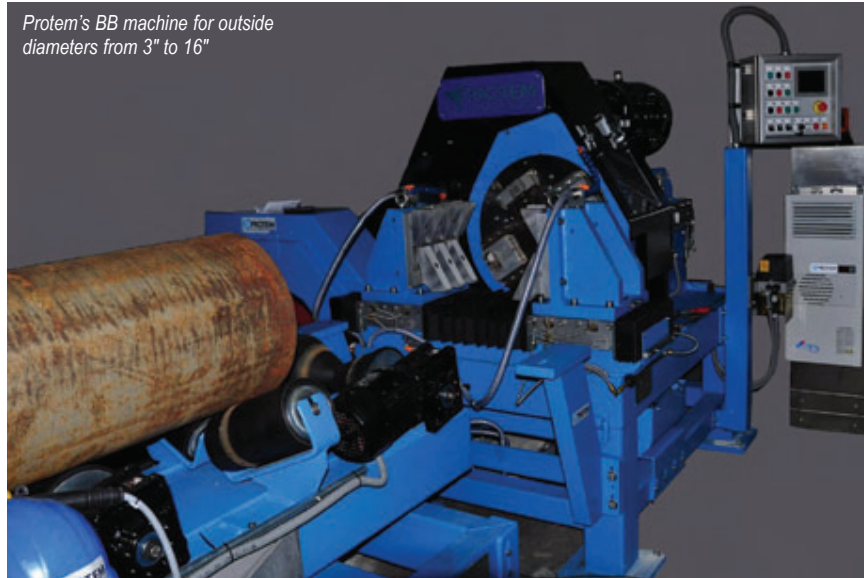
PROTEM specialises in the design and manufacture of portable pipe-end preparation tools such as pipe bevelling, tube cutting and surfacing machines, ranging from three to 3,600mm OD. The

company also designs specific machining and welding equipment according to customer needs.

The company's electric BB machine can be used either on-site or in the

workshop. The heavy duty beveller will bevel, face and counterbore heavy wall pipes individually or simultaneously. It will perform repeatable high quality weld preps on most metal pipes including stainless, duplex, super duplex from 3" to 16" outside diameter (88.9 to 406mm), or from 12" to 24" outside diameter (323.9 to 610mm).

The bench beveller can be fixed to the floor and is easily installed. It clamps the outside diameter of the pipe, and can be controlled by one operator. Used with an optional profile tracking device, it will machine oval pipes, leaving a root face of a consistent width, which is required when using orbital welding heads.



Protem's BB machine for outside diameters from 3" to 16"

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Email: [contact@protem.fr](mailto:contact@protem.fr)  
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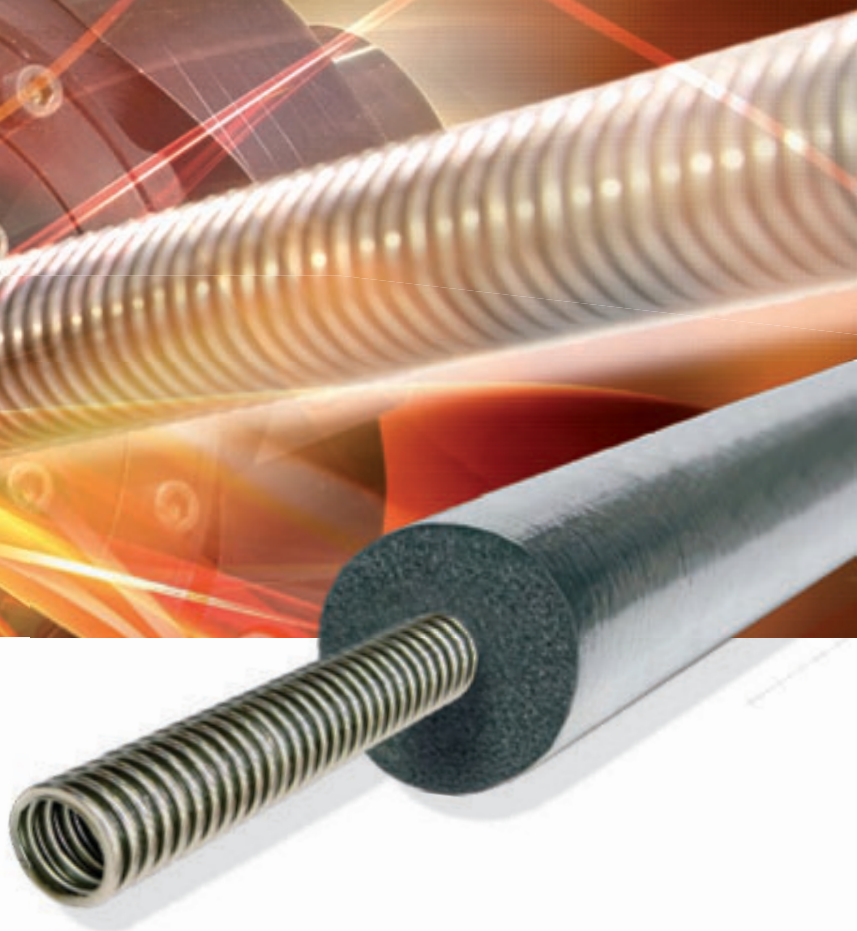
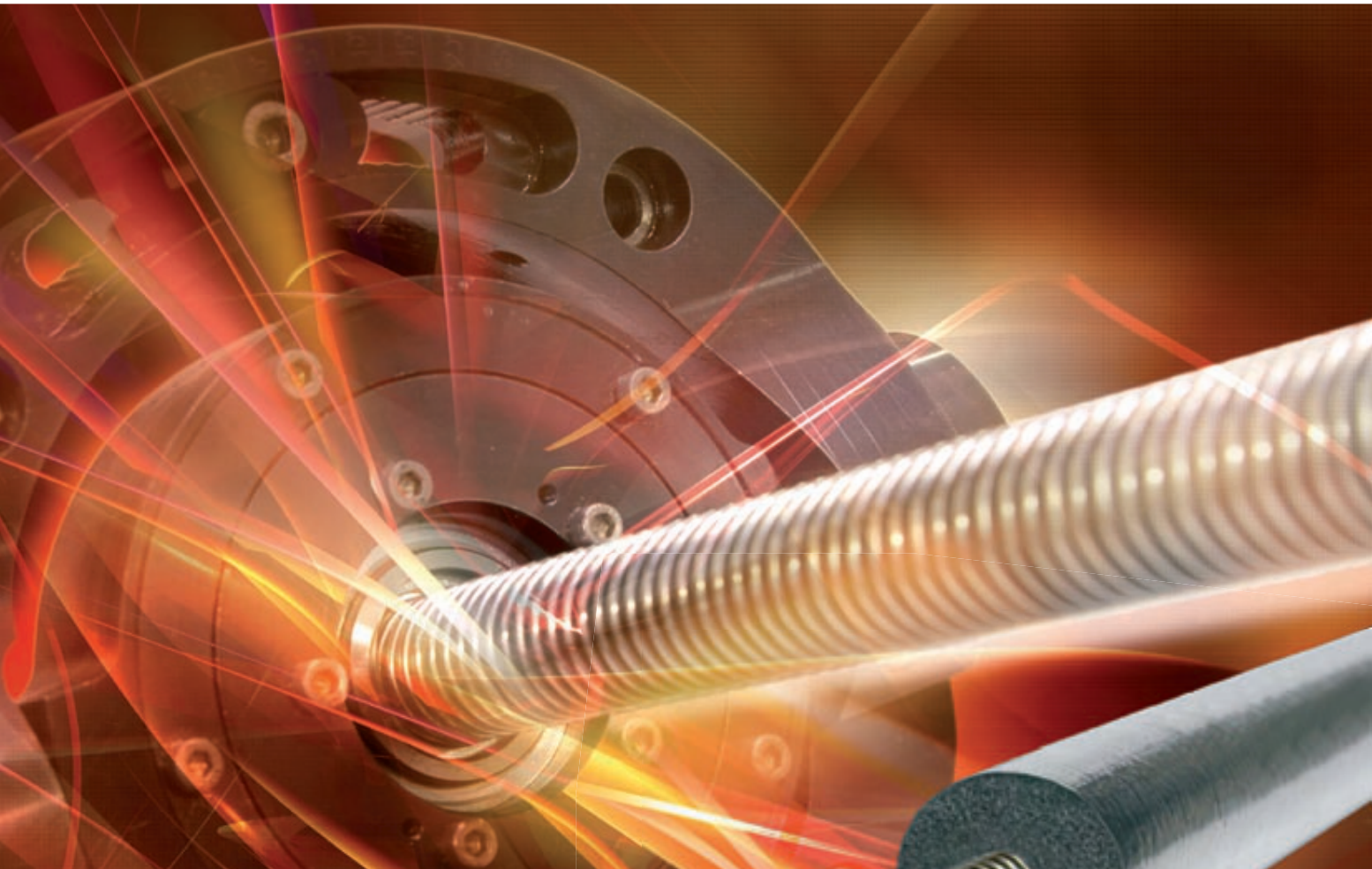
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## DataMatrix code for industrial marking applications

DATAMATRIX codes frequently face challenges related to readability when used in industrial environments. Laser marking specialist Rofin and VisionTools have introduced a new, perfectly tuned solution for laser marking and code recognition. Error Correcting Code – Industrial (ECCI) uses a 2D coding that has been developed to meet the specific requirements of industrial marking applications.

ECCI is a promising option for marking applications in industries such as automotive, machine tool, medical devices, packaging, photovoltaics and aerospace engineering.

The DataMatrix code was originally designed to be printed on paper, but flat, homogenous, non-reflecting surfaces that can be marked with high contrast are not the standard application in industrial manufacturing. Marking areas can be very small, curved, or show unfavourable aspect-ratios. In-homogenous or reflective materials, or substances that only allow low-contrast markings add to the readability problem, as well as wear and tear. Therefore code recognition, and especially the required lighting, can be complex and challenging. In contrast, the new ECCI code was specifically designed and field-tested for industrial marking applications and their requirements.

Unlike the ECC 200 code, the ECCI code uses differential decoding and majority decisions. The code is therefore highly resistant against changing contrasts often found on in-homogenous or curved surfaces. As long as anything is visible, decoding works, even in case of contrast inversions within the marking. Markings on cylindrical parts like medical devices or implants are easily readable, as well as on polycrystalline solar cells or multicoloured packaging foils. Whereas the ECC 200

code uses a fixed aspect ratio of 1:1 or 1:2, the new code offers virtually any aspect ratio up to the point of one dimensional coding. Even tiny, elongated marking areas, for instance on high-power LEDs, can be utilised completely. This allows for larger marking spots and for robust and cost-effective marking solutions.

ECCI code redundancy is adjustable (ECC 200 has a fixed redundancy of 30%). Markings that might be subject to damage or heavy wear and tear can use a highly redundant coding. Containers of hardening machines in casting houses are already being marked with ECCI.

Within local areas the new code always marks a defined percentage of spots. Unlike ECC 200 it needs neither finder patterns nor quiet zones. ECCI markings show an unremarkable, homogenous appearance and can be placed next to other markings. In addition, the coding flexibility offers best prerequisites for forgery-safety applications. Marking with

ECCI is royalty free, and recognition with VisionTool's standard V60 software requires no extra license.

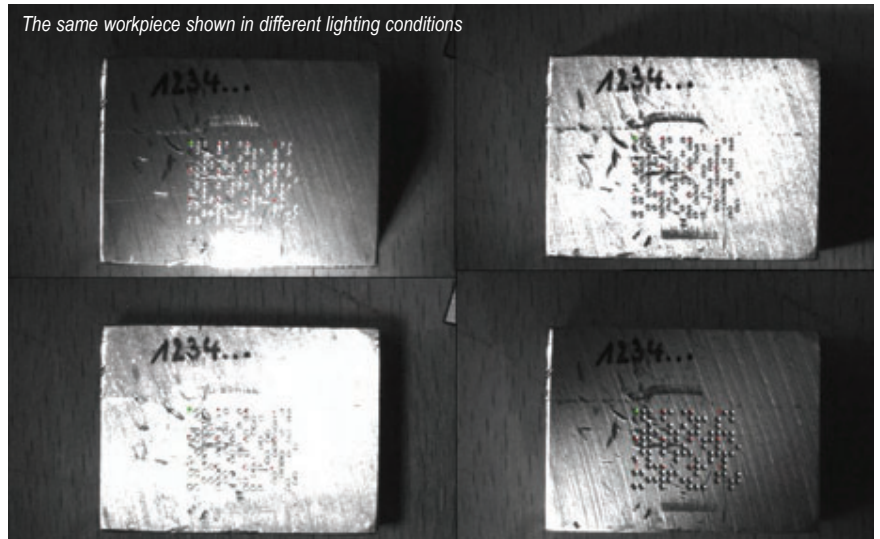
Rofin offers a comprehensive range of marking lasers, including end- and transversally-pumped solid-state lasers, fibre lasers, CO<sub>2</sub> and pico-second lasers. In combination with a wide choice of optics and handling systems, there is an optimum marking solution for any material and any geometry.

A mark inspection system for immediate readability verification can be added. This verification assures correct and consistent markings.

VisionTools is one of Germany's leading suppliers for industrial image processing, and is the originator of the code.

**Rofin-Sinar Laser GmbH**  
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The same workpiece shown in different lighting conditions



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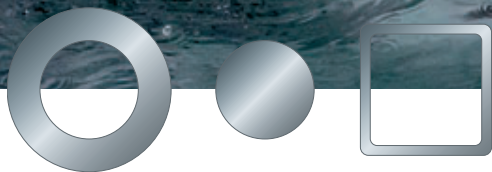
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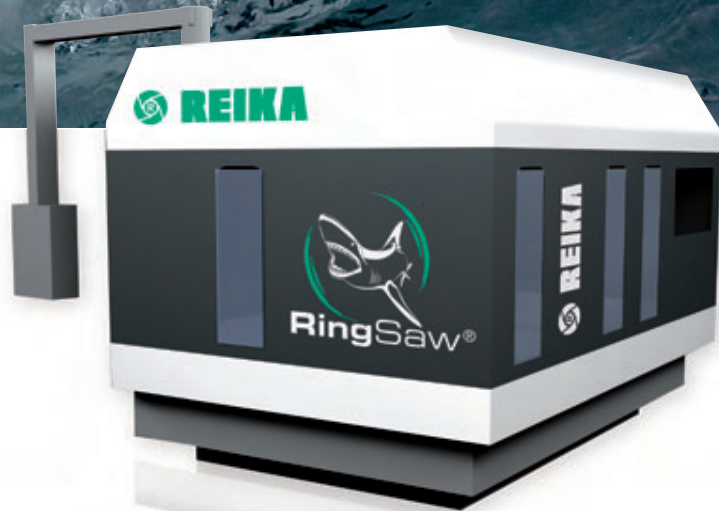


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## Calculation of specialised tooling based on tube geometry

MODERN tube bending machines offer a wide variety of options to bend tubes at angles and radii that just a few years ago would have been considered impossible. Options like multiple bending-levels or movable bending heads allow the manufacture of complex pipe geometries for a variety of uses.

One problem that persists even with modern bending machines, however, is the difficulty of bends that are too close to each other. Since the clamp jaw that secures the tube has a certain length, this amount of straight tube is required between two bends for proper bending. Efficient bending simulation software, like RoniKolli7 by 3R software solutions will test every tube design, to make sure that this minimum length is provided, so the machine operator does not receive an order that is impossible to fabricate.

But for some projects it is indispensable to have two bends that are closer than the normal minimum distance required by the tooling. Especially for tubes that have to conform to confined spaces it is important that particular angles and radii are fabricated. For this situation special tools are required, that have to be manufactured specifically for this particular bend in this particular tube. These tools accommodate the shortened distance between the two bends by clamping part of the previous bend.

In order for a tool to clamp a bend instead of a straight pipe, the exact bending angle of the previous bend, adjusted for overbending

and springback has to be known. In addition the rotation angle between the two bends has to be known, so the tube can be clamped after it has been rotated into the correct position by the collet. And finally it is necessary to calculate how much of the straight tube has to be clamped, to make sure that the groove for the first bend is positioned correctly. When these three values, commonly referred to as Traction, Rotation and Bending have been calculated correctly, the tooling manufactured to these specifications is capable of clamping this particular bend. But to successfully manufacture the second bend it is also often necessary to remove part of the tool elements in other bending levels, to allow for proper alignment and movement of the tube.

Until now the difficulty in creating special tools was that the calculations take a long time, and once the tool is designed the tube still has to be tested for collisions. By using simulation software it is at least possible to test the bending process without the need of a physical tool. But if the simulation result indicates that the tube is unbendable, and the bending order has to be reversed, then a new special tool has to be designed and tested. All of this takes time and effort, and reduces productivity, even if no actual physical tool is created, but merely virtual models for testing. Tool designers often spend days at a time designing a tool for a single bend, and then have to start over, if they realise that the tube is not bendable with this tool.

A new optional feature for RoniKolli7 by 3R software solutions makes this process faster and more convenient. Using

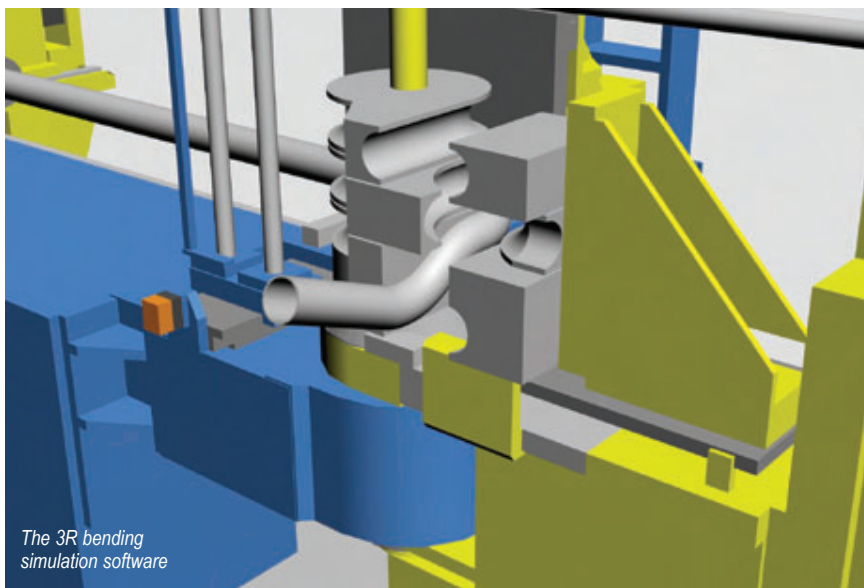
this new function the bending process is simulated as usual. But the clamp die and its counterpart at the bending die are initially presented as solid blocks, without any groove for the tube. When the tube is now clamped by these blocks, the module automatically determines which parts of the blocks are displaced by the tube and have to be removed from the tooling. This way RoniKolli7 not only calculates the required specifications for the special tooling, but it immediately tests the tube for collisions. Springback and overbending are automatically taken into consideration, so the special tool that is created is the special tool that is required.

If a collision is reported at any time in the bending process, the software will automatically attempt to find a solution, to the extent that the machine's capabilities allow. If this requires recalculating the special tool, the new specifications are saved. Once the tube is found to be bendable the CNC data required to fabricate it can be printed out on worksheets or exported in a variety of formats, so the data can be used directly at the bending machine. Data for the special tool is also provided, so the tool can be manufactured according to specifications. All of this is done within minutes, saving many hours, if not days of design time for every single bend.

But beyond the mere calculation of the tool specifications themselves, the feature offers even more to the tool designer. It not only indicates which parts of the tool dies on this bending level have to be removed, but also if parts of the tool levels above and below have to be ground off to avoid collisions. It calculates what percentage of the clamp die and bending die clamp have been removed, and whether the remainder is sufficient to securely chuck the tube. And if a tube requires multiple levels of special tooling, the software also determines which bending level would be best suitable for which part of the bending process.

By using this function a tool designer can perform calculations that previously took days within a few minutes. And since RoniKolli7 is used by many tube shops around the world, it is also interesting for construction departments without their own tube shop. They can design their tubes, test them for collision, and then give the data and the specifications for the tooling to the customer or contractor that bends the tubes.

The feature is now available as option for customers purchasing RoniKolli7. Existing versions of the software can be retrofitted with the feature upon request.



The 3R bending simulation software

**3R software solutions** – Germany  
 Email: [info@3-r.de](mailto:info@3-r.de)  
 Website: [www.3-r.de](http://www.3-r.de)

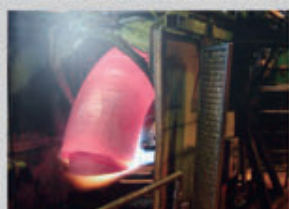




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## Melt temperature measuring system for hose and tube production

ULTRATEMP 6000 is a non-contact polyethylene melt temperature measurement system based on non-invasive ultrasonic technology. It is specifically tailored to the production of hoses and tubes.

The system precisely measures the melt temperature during production and does not influence the melt flow properties, as the ultrasonic sensors are positioned outside of the flow channel. Therefore, melt shear heating effects do not occur.

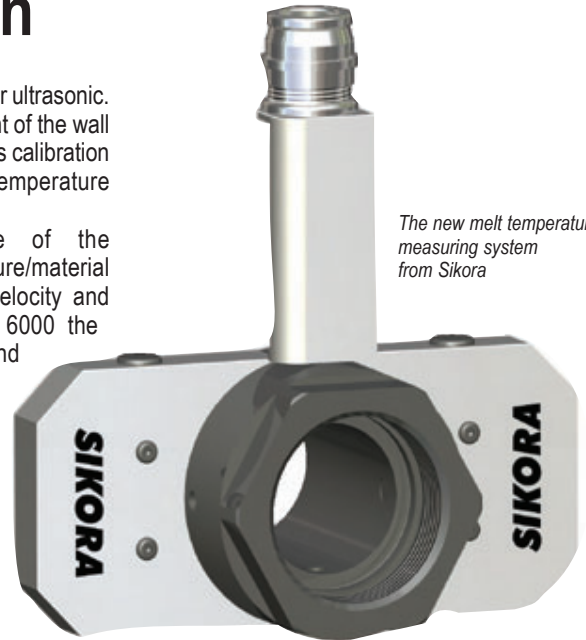
Besides temperature measurement the Ultratemp 6000 detects inhomogenities in the melt. Early cross-linking after screens, which may lead to ambers and scorches in the polyethylene material is avoided. The extremely high measuring rate allows a fast response time as well as the registration of small temperature variations.

The propagation velocity of sound is generally dependent on material and

temperature. This also applies for ultrasonic. It is known that the measurement of the wall thickness with ultrasonic requires calibration in order to compensate temperature influences.

Sikora takes advantage of the knowledge about the temperature/material connection of the ultrasonic velocity and measures with the Ultratemp 6000 the melt temperature reliably and precisely. The distance of the ultrasonic signal is known as well as the material. Hence, the temperature directly results from the running time of the sound.

**Sikora AG** – Germany  
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*The new melt temperature measuring system from Sikora*

## Tracto-Technik presents new generation of all-electric CNC pipe bending machines

TRACTO-TECHNIK (TT) has successfully launched the Tubrotron Vario 40, which is the first of a new generation of all-electric CNC pipe bending machines. These machines offer a broad application range due to their modular construction. The complexity of each machine is determined by the customer respectively by the technical requirements of the bending job.

Based on a common main frame the Tubrotron Vario can be configured as right bender, left bender or right-left bender with up to three tool levels for each bend direction. These levels can be equipped with forming tools for rotary draw bending as well as a roll bending tool for free form bending. That way tubes and pipes can be bent in small and large bending radii in one clamping. For free form bending a powerful booster drive is applied which helps push the pipe through the pipe bending tool. Due to the interaction of booster axis, pipe rotation and positioning of the forming roll, pipe figures can be bent in different radii and free form shapes. In the highest stage of extension the bending machine's motion sequence is controlled via 15 servo axes.

The all electric drive of the Tubrotron Vario guarantees utmost bending precision and

repetition accuracy as well as distinctive noise reduction and energy savings compared to common electro-hydraulic pipe bending machines. For the machine control TT has chosen the Simotion solution by Siemens. Operating the machine via a Touch PC with graphical user interface and menu guided user guidance is simple and comfortable.

The all-rounder convinces with its robust construction and the solid and clean machining using high quality components from renowned manufacturers. The main components are easily accessible and the machine meets the latest safety standards. To keep the software permanently up to date, the all electric bending machine is equipped

with a remote maintenance interface. The Tubrotron Vario is especially suitable for creating complex pipe bending parts as they are required, for example, for aerospace or automotive technology. But also tube figures with small and large bending radii (such as in the furniture industry) can be produced by means of this tube bender. For the production of large series the pipe bending machine can be extended with an integrated automatic loading and unloading device.

**Tracto-Technik** – Germany  
 Email: tubomat@tracto-technik.de  
 Website: pipebending.tracto-technik.com



*The Tubrotron Vario 40*





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## Adoption of laser welding starts with prototyping

AWL is a developer and producer of state-of-the-art automated welding machines for customers based all over Europe.

Laser welding is a fast and clean process, and has a broad scope of applications. High welding speeds and short weld-to-weld times are key to the high output laser welding can generate, and the weld made by a laser can be a cosmetic one, requiring no post-process treatments.

The adoption of laser welding is not always easy. Different opinions and ideas about the benefits of new and existing methods, the parameters of the process, and compatibility with the current production process are the main reasons for discussion when thinking of adopting laser welding as the new standard. In order to get a better understanding of the advantages laser welding can offer, companies can test the new technology in AWL's laser-test facility.

AWL sees three major drivers for

moving into laser welding: cost savings, uniform quality and product design.

When using laser welding on products with high production numbers, long welding lengths and/or many subparts, the cost savings, in comparison with traditional welding methods, can be impressive. These savings are primarily created by high welding speeds, quick weld-to-weld times, fast change-over times and the possibility for automated loading of the parts. Automated loading can also result in the use of fewer machines and operators. The unique product design needed for successful laser welding, combined with accurate fixture clamping, makes uniform quality possible. High welding speed and low heat input enable long continuous welding lengths, due to the fact that the reach ability and weld accessibility are easier than with other welding methods. It is now possible to develop new product designs, gaining maximum results in weight

reduction of the end product and reduction of waste materials.

With welding, sometimes the reason for prototyping is just for gaining information about the possible cycle times and the quality. However, in most cases it is for the validation of the welding process. At its test facility AWL defines the weld parameters based on the following characteristics: the right heat-affected spot; necessary weld depth; welding length and width; optimal welding speed; and ideal welding patterns. The most common reasons for carrying out weld-process validation are: new product development; change from conventional to laser welding; optimising ROI; and improving the weld process.

As laser welding can be used for both creating cosmetic welds and creating high output by keyhole welding, the technique is applicable to a large variety of markets in the general sheet metal industry and the automotive industry.

**AWL-Techniek BV**  
– The Netherlands  
Fax: +31 341 411822  
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## Battery-powered IP54-certified absolute tracker

THE new Leica Absolute Tracker AT401 is a highly accurate portable CMM for 3D measurements over ultra-long ranges. It is said to be the first laser tracker to be battery operated and designed for cable-less operation. It is IP54 certified and includes enhanced features such as PowerLock and Automatic Target Recognition (ATR).

The portable AT401 has a weight of only 8kg, including controller, a height of just 29cm and a minimal configuration that allows it to be transported as carry-on luggage on most large international airliners. The all-new laser tracker incorporates an advanced power management system that allows the batteries to be hot swapped, as well as allowing the system to be run off Power over Ethernet (PoE+).

Both the instrument's horizontal and vertical axes allow infinite rotation, and when the quick release handle is removed it has a full vertical measurement dome of  $\pm 145^\circ$ . The ADM in the Absolute Tracker AT401 has a maximum uncertainty of just

10 microns over the full certified volume. The laser tracker comes with enhanced Leica Geosystems technology such as PowerLock beam recovery, Automatic Target Recognition (ATR), maintenance-free Piezo drives and survey grade precision level to gravity sensor.

"The Leica Absolute Tracker AT401 allows us to take laser tracker solutions into a wider application base," commented Duncan Redgewell, Hexagon Metrology's vice president portable products. "Together with the proven AT901 we are now able to offer the very best price versus performance ratio from a variety of Absolute Laser Trackers thereby enabling our customers to choose the right tool for the job in hand."

**Leica Geosystems Metrology –**

Switzerland

Fax: +41 62 723 07 34

Email:

info.metrology@leica-geosystems.com

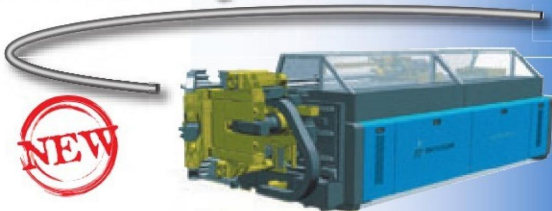
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The Leica Absolute Tracker



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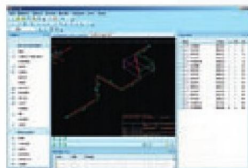


#### TUBOTRON VARIO

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- Rotary draw bending and free form bending

#### PIPEFAB 4.0

- Production management software for the pipe shop



#### TUBOSCAN S

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### Better Steels Call for Better Testing

Imatek offers a range of Drop Weight Tear Testers (DWTT) for measuring the fracture characteristics of steel specimens according to API recommended practice 5L3, EN 10274 and ASTM-E 436. Steel grades of X120 and specimens of up to 50 mm can be accommodated.

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## Stent cutting system with femtosecond laser advance

THE new StarCut Tube Femto is one of the first systems to offer cold laser cutting for medical device manufacturing.

Femtosecond lasers process materials faster than energy can diffuse within the atomic lattice. Therefore no heat is transferred to the surrounding material, which eliminates any recast and burr. The StarCut Tube Femto integrates a compact laser source with field-proven high reliability and long-term stability – properties that are essential for industrial manufacturing but have been hard to find in ultra-fast laser sources.

Manufacturing of medical devices from tube stock typically relies on laser fusion cutting with pulse widths in the  $\mu\text{s}$ -scale. Even with an optimum setup this cutting process is not free from burrs and recast inside the tube. Thus post-processing of stainless steel and CoCr requires ultrasound polishing. The nitinol material (memory shape alloy) is prone to chemical and mechanical damage during post-processing in many cases. With femtosecond lasers, post-processing is shortened to a simple ultrasound cleaning. This improves post-processing efficiency, in particular with these sensitive materials.

Bio-absorbable stents are at the heart of numerous research and development activities, but the use of bio-absorbable polymers like polylactic acid and polyglycolic

acid suffer from their low melting points, making them difficult to machine with traditional cutting lasers. The large heat affected zone was responsible for heavy micro structural changes. In contrast, femtosecond lasers have already achieved excellent results with vascular stents, showing high-precision edge quality.

The StarCut Tube Femto mechanics were adapted to the specific requirements for handling thin-walled, mechanically fragile semi-finished products. The established StarCut18 and StarFiber laser remain state-of-the-art choices for stainless steel and metallic alloy cutting.

**Rofin/Baasel Lasertech** – Germany

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*StarCut Tube Femto for processing polymer and metal tubing*



## Reconditioned second-hand machinery

FRANZ Teutenberg GmbH & Co KG was founded in 1966, and since then has specialised in the worldwide purchase and sale of first-class, fully reconditioned second-hand machinery and complete installations for the production and treatment of semi-finished steel and non-ferrous wires, bars, tubes, sheets, strips and plates.

The company carries equipment from a wide range of major manufacturers, and stocks more than 100 special machines in a floor area of around 3,000m<sup>2</sup>. The company can also offer new or hardly used machines that have been sold by their previous owners owing to reorganisation measures or company liquidations.

The special-purpose production machines and installations can still give many years of service, enabling considerable savings in capital expenditure.

The company can provide detailed quotations, and also invites enquiries for machines not mentioned in its stock list, as it acts as agent for the sale of large-scale plants still standing on their owners premises.

**Franz Teutenberg GmbH & Co KG** – Germany

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# Hydraulic clamping retrofit added to machine size

McELROY has launched hydraulic clamping retrofit kits for the 500 line of fusion machines, following a successful introduction of the same product for 412 and 618 fusion machines last year.

The Hydraulic Clamping kits are installed at local McElroy distributors or ordered preinstalled on new machines. Once installed, operators will find increased speed and productivity of the fusion process. Time usually spent manually clamping the knobs shut can be redirected to performing the fusion. Workers on site will also experience less fatigue, by letting hydraulic power do the heavy work instead of hand-wrenching the knobs into position.

"Hydraulic Clamping is a customer-driven product," commented Chip McElroy, president and chief executive officer of McElroy. "Customers that knew our complete line of machines asked for this large-diameter feature to be introduced for our mid-range machines."

Besides the clamping benefits, McElroy engineers designed the clamping system with quick disconnect hydraulic fittings that

allow a fusion technician to easily prepare the machine to fuse tees, ells and tie-ins.

The retrofit kit consists of a manifold block for the machine's carriage that controls the two fixed jaw cylinders and two moveable jaw cylinders independently. The two inner-upper jaws are specific to clamping-enabled machines.

Pipe fusion is a process that joins two pieces of thermoplastic pipe together with heat and pressure. Commonly associated with high-density polyethylene pipe (HDPE), the butt fusion process starts by 'facing' or shaving the pipe ends simultaneously, so they can be joined together with heat to

create a continuous, sealed pipeline. The welding of the pipes is accomplished by using a hot plate in contact with the pipe ends, which heats the plastic to a molten state. After its removal, the ends are pressed together under a controlled force to form a weld that is as strong as, or stronger than, the pipe itself. Third-party industry research indicates that HDPE pipe and joints can have a lifespan of more than 100 years.

**McElroy – USA**  
 Fax: +1 918 831 9256  
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The McElroy clamping kit

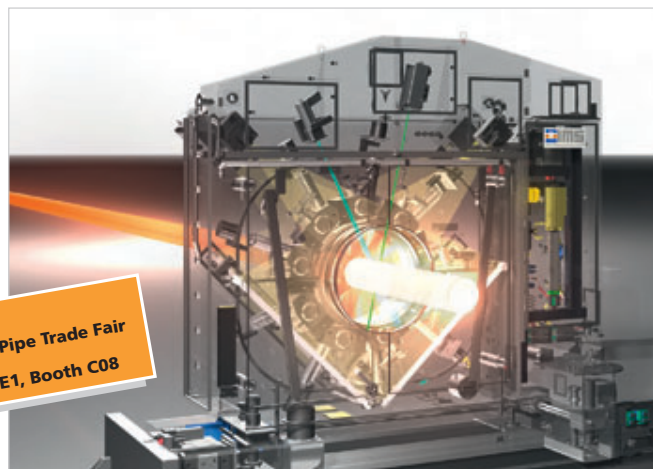
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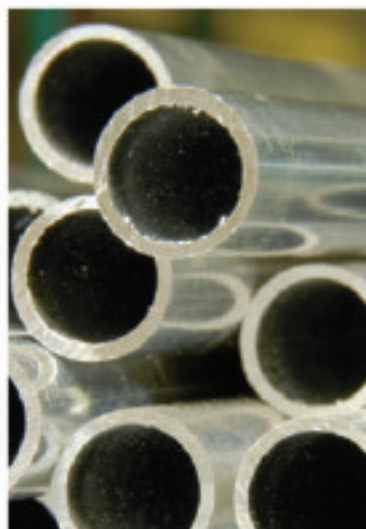


# Int'l Tube & Pipe Conference 2010

September 19-21, 2010 Plaza Royale Oriental Shanghai, P.R. China

- Host:** China Iron & Steel Association
- Organizer:** Metallurgical Council of China Council for the Promotion of International Trade
- Co-organizer:** Steel Tube Association of China Steel Construction Society  
Cold-forming Steel Council of China Steel Construction Society  
Welded Tube Academic Committee of Chinese Society for Metals  
Seamless Tube Academic Committee of Chinese Society for Metals
- Supporter:** International Tube Association (ITA)

The Int'l Tube & Pipe Conference is engaged in improving the steel tube product quality, pushing forward the industrial upgrading, expanding the application of steel tube products and propelling the sustainable, healthy and fast development of steel tube industry in China and the world at large. Besides, Int'l Tube & Pipe Conference has proved to be an indispensable platform for the world tube & pipe industry to communicate and exchange experiences & ideas in aspects of production & trade, market & price, consumption & application, technology & equipment, and raw material, etc.



## Top-notch speakers confirmed at this stage are:

### 1. Demand for high performance steel pipe in oil industry

Mr. Li Helin, Academician, Chinese Academy of Engineering, Senior Consultant, Tubular Goods Research Institute, China National Petroleum Corporation

### 2. Production status quo and development trend of China's seamless steel tube in China

Mr. Yin Guomao, Academician, Chinese Academy of Engineering

### 3. Enhance international competitiveness of line pipe in China

Mr. Wang Xiaoxiang, Director, Welded Tube Academic Committee under Chinese Society for Metals

### 4. Status quo and development trend of cold-formed steel and welded pipe in China

Mr. Ding Guoliang, President, Cold-forming Steel Council of China Steel Construction Society

### 5. Application of steel tube in construction engineering and its prospect

Mr. Chen Luru, Consultant, China Steel Construction Society

### 6. Production standard in China's steel tube industry

Mr. Cheng Haitao, Vice President, Pangang Group Chengdu Steel & Vanadium Co., Ltd.

### 7. Analysis of steel tube billet technology, production and market in China

Mr. Zhang Wenji, President, Jiangyin Xingcheng Special Steel Co., Ltd.

### 8. Construction of seamless steel tube production line in China

Mr. Lan Xingchang, Deputy General Manager, Steel Rolling Engineering Technology Institute, Capital Engineering & Research Incorporation Ltd.

### 9. Opportunities, problems and strategies of marketing China's steel tube products in domestic and overseas market

Mr. Yan Zesheng, President, Tianjin Pipe (Group) Corp.

### 10. Development status quo, problems and strategies of China's steel tube industry

Mr. Zhuang Gang, Secretary General, Steel Tube Association of China Steel Construction Society

### 11. Production, technology and development of UOE Welded Pipe

Senior executive from Baosteel

### 12. Study on modern high collapse OCTG

Mr. Gustavo Lopez Turconi, Product Engineering Director, Technology, Tenaris

Mr. Juan Carlos Gonzalez, Product Development and Research Director, Technology, Tenaris

**Companies invited are:** TMK, Metal Expert, Reika GmbH & Co. KG, Nuclear Fuel Complex, Friedrich Kocks GmbH & Co. KG, Vallourec Mannesmann Oil & Gas, Institut Dr. Foerster GmbH & Co. KG, Graebener Maschinentechnik GmbH & Co. KG, data M Software + Engineering GmbH

## If you need further information, please contact event organizer:

Ms. Zhai Jing, Mr. Meng Jianbin

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## The welding of difficult tube

APPLICATIONS for small diameter, heavy wall mechanical tubing continue to increase, particularly in the automotive, recreational vehicle, agricultural and garden machinery sectors. Typical applications include car headrest restraints, seat frames and side impact systems. Commercial considerations are such that this type of tube needs to be produced at mill speeds which are economically viable.

Often considered to be the hardest tube to weld, many producers simply have no option other than to apply excessive weld power to try and achieve a weld. This is far from ideal and will deliver "blue" tube at best or a major increase in scrap in extreme cases.

This is not the case for mills installed with the latest generation of Thermatool HF welders fitted with patented HAZControl Technology™, designed to provide precise, independent control of weld power and weld frequency on each and every mill run.

To achieve higher mill speeds and increased productivity the weld conditions must also be optimised and correct selection and positioning of both the work coil and the

impedor is essential, as is the installation of correctly sized squeeze rolls.

HAZControl Technology™ enables the mill operator to store product process parameters for all types of tube (including small diameter/heavy wall) providing quick and easy, automatic operation on future mill runs. HAZControl Technology™ is therefore ideal for "difficult to weld" product such as small diameter/thick wall tube. It enables mill operators to start at a higher weld frequency, then reduce it to a point where the optimum weld properties are obtained, or to just above the point where the impedor begins to lose its magnetic properties.

Thermatool applications engineers are always available to discuss smarter ways to weld even the most difficult products.

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 Email: info@ihwtech.co.uk

**Thermatool Corporation – USA**  
 Fax: +1 203 468 4281  
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## New laser weld seam inspection

KENT Corporation has introduced a new post-weld seam inspection system for TIG and laser welder mills. The system records mis-match, roundness, concavity and undercut. Standard equipment is accurate within 0.001" and higher resolution cameras are available. The touch screen is simple to read and use.

An alarm can be set to notify the operator before the tube is out of spec to prevent scrap and returns due to bad welds. The system also makes set up faster and easier. Some users report that the set up time was reduced by more than 50%. The system can be justified easily with a decrease in scrap as high as 70% or more. One user reported that their return rate for tubing was reduced to almost nothing.

**Kent Corporation – USA**  
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# 全自动化钢管检测系统

## Integrated Turn-Key Pipe Testing Systems

### SMLS 无缝钢管超声波和涡流探伤组合检测

#### SMLS SEAMLESS TUBES TESTING with ULTRASONIC and EDDY CURRENT COMBINED

SONOTRON™ FB 系统可装备超过120个测试通道，系统可根据API和其他国际标准对直径范围为90~460mm (3.5~18in) 的无缝钢管进行全管体范围的内部和表面的探伤。

SONOTRON™ FB system is equipped with more than 120 test channels and is capable of providing full volumetric and surface coverage of tubes, according to API and other International standards, for diameters ranging between 90~460 mm (3.5~18 in).

纵向缺陷，横向缺陷以及100%连续钢管壁厚的监控以管体的展开图像形式实时显示，内径缺陷和外径缺陷以不同的颜色显示在管体展开图像中。角度固定或变化的斜向缺陷检测可在不降低测试速度的情况下实现。

Longitudinal and transversal flaw detection, as well as 100% continuous thickness monitoring is carried out in real-time and is graphically displayed as open pipe view, where I.D. and O.D. flaws are color-coded. Detection of oblique oriented flaws in fixed or variable angles is available without reducing testing speed.

本系统具有管端测试盲区短的特点，因而不需要附加的管端测试设备。另外，本系统使用非常健全可靠的实时操作系统在线同时完成上百个通道的高容量的数据采集和处理。

The system features short untested ends and additional inspection of pipe ends may not be required. A robust real-time operating system is used to perform high-level data acquisition and processing of hundreds of channels simultaneously.



### SAW、ERW 焊管超声波在线焊缝检测和离线水压测试后的超声波检测

#### SAW、ERW ULTRASONIC INSPECTION of WELDED TUBES ON-LINE and OFF-LINE AFTER HYDROSTATIC TEST

SONOTRON™ ERW 是用于检测焊管产品的焊缝或管体中的异常状况的超声波检测设备。本次系统可用于以下焊管生产阶段：

SONOTRON™ ERW is an ultrasonic testing system for detection of anomalies in (Electric Resistance Welded) tubular products. The system can be supplied in stages for:

- 成形前板卷的在线质量监控  
On-line monitoring of strip coil quality before forming
- 在线内毛刺刮除状况的监控  
On-line monitoring of internal scarf condition
- 在线焊缝和热影响区 (HAZ) 的缺陷检测  
On-line flaw detection in weld and Heat Affected Zone (HAZ)
- 离线切定尺焊管的焊缝/热影响区和全管体的缺陷检测  
Off-line full body inspection of cut-to-length product



## NDT Technologies Inc. Web:www.ndt.ca

20275 Clark Graham, Baie D'Urf é □ Montreal, Quebec, CANADA, H9X 3T5

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联系人：周国建 电话：13701191909 E-mail: tom.zhou@hongjian-autome.com.cn



## Rosendahl offers metal tube production technology

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 tube production.

The product range is supplemented through adequate auxiliary down stream equipment, including solutions for metal tape handling and preparation, tube coiling, etc 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](mailto:office@rosendahlaustria.com)

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## Reels, spools and drums

LIGHTNING Reels is a new reels supplier with a wide product range of reels and handling equipment. All reels are manufactured in Asia by DIN Standards or on customers' request. The quality is supervised by German or European engineers.

Lightning Reels™ supplies quality reels up to 8m flange diameter. They deliver reels, which are single produced in high quality for professional use. Certainly the product range of lightning reels should have something to meet your requirements, the company said. It said it hoped customers would be inspired by the large product range and excellent level of service provided.

**Lightning Reels – Germany**

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SGP: JISB2313

EN: EN10253-1, EN10253-2

**MATERIAL:**

ASME: A234 WPB, A234 WP1, A234 WP5, A234 WP9, A234 WP11, A420, WPHY42, WPHY52, WPHY60, WP304, WP304L, WP304H, WP316, WP316L, WP321, WP347, WP347H, ETC.  
 DIH: ST37.0, ST35.8, ST45.8, S235JR, P235GH, P265GH, 10CRMO910, 15CRMO, 12CR1MOV  
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## New additions to forklift range

COMBILIFT has added two new products to its range of 4-way handling solutions.

The company has responded to feedback from customers needing to handle ever-larger loads by steadily increasing the size and lift capacity of its range since its 'core' C4,000 model was first developed. It has now broken another size barrier with the launch of its 25ton capacity C25,000 model, the largest Combilift 4-way forklift built to date, with dimensions of around 5x5m, three double sets of wheels, an unladen weight of 32ton and a 170 HP John Deere engine.

The C25,000 was developed for the requirements of UK firm BladeRoom, which supplies energy saving factory-built modular data centres to the IT sector. The company considered other handling options for manoeuvring the finished modules but ruled out the alternatives. Overhead cranes would have been very costly to install and inflexible in use, and the sheer dimensions of a counterbalance truck capable of lifting the 18t units at extended load centres would have taken up too much space in the production area.

BladeRoom's CEO Paul Rogers commented: "The ideal solution from our point of view was a machine that could move our 14m x 4.2m, 18t modules in the same way as other operations move pallets – just on a much larger scale of course. Thanks to the Combilift's flexibility to go anywhere and do anything this is exactly what we have in place."

The second new Combilift product is the Straddle Carrier, designed as a cost-effective container handling solution for haulage, distribution and shipping operations even with relatively low throughput levels. MD Martin McVicar explained the rationale behind the new product: "We saw a gap in the container handling market for a cost-effective, very light but nevertheless extremely stable alternative to container handling forklifts, reach stackers or mobile cranes. This latest addition to our range offers customers complete independence when it comes to moving products around a site. Savings made by not having to hire other equipment make for a very quick return on the initial capital investment."

Aggreko plc, a supplier of temporary power and temperature control solutions, is the first company to take delivery of

the Straddle Carrier, which will work at the company's site where generator and container units are manufactured. Aggreko supplies a wide range of industry sectors as well as high profile events such as the Olympic Games.

Aggreko's project co-ordinator Derek Neilson commented, "We wanted to cut the very high costs of crane and trailer hire, but conventional reach stackers with sufficient load capacity for our requirements have unladen weights of around 70t. The loading on each wheel would result in considerable extra costs for reinforcing the ground surface. As the Combilift Straddle Carrier is around four times lighter than this, the ground pressure is greatly reduced even when it is used to carry two generators to its full capacity of 35t. It is also three times faster than the crane/trailer combination."

The standard Combilift Straddle Carrier is a three-wheel patented design model (Aggreko chose a four-wheel design due to its requirement to double stack generators from the ground up), with a 35t capacity, and is suitable for all ISO containers. Two-wheel hydrostatic drive, synchronised hydraulic steering and super elastic tyres offer extremely stable operation on uneven surfaces and in harsh weather conditions. Diesel and LP gas power options are available, and overall dimensions can also be customised to handle non-ISO containers.

"The introduction of these two new products underlines our engineering and manufacturing expertise and demonstrates our commitment to the ongoing provision of innovative handling solutions for an ever wider range of applications," said Mr McVicar.

**Combilift Ltd – Ireland**  
 Fax: +353 47 80501  
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## Breakthrough welding solution

THE Saet Group has been present in China for more than 15 years mainly offering its heat treatment solutions. The welding line solution under the EMMEDI name has been presented and successful in China for some years now. The SAET Group has two facilities in Shanghai and Jiashan to serve its customers and its growth with manufacturing and design capability.

EMMEDI has been selling for several years its new century generation breakthrough welding solution using its unique

transistor power module. Its MOSFET unit, capable of induction, contact or dual welding with fixed or variable frequency, offers an extensive range of power capabilities from 100 to 1,200kW and output frequencies from 150 up to 450kHz.

MosWeld, with a very compact and robust design, has an efficiency higher than 85% thanks to its modular MOSFET based inverter. Very easy maintenance and long-lasting performances, even in heavy-duty conditions, are guaranteed by the

use of standard components that ensure no components' obsolescence and very low ownership costs. In coordination with its unique remote process troubleshooting and simple inductor/coils design, MosWeld is the answer to all the tube and pipe manufacturers that need a reliable and robust induction welder. Several MosWeld welders have been successfully installed worldwide in the last few months.

**Saet Induction Equipment (Shanghai) Co Ltd – China**

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## Complete finishing line

CARTACCI can now offer its customers complete finishing lines, including pointing machines, drawing, straightening, cutting, chamfering, control, bundling, drainage and weighing systems.

The lines are able to meet the highest production and quality standards required by the regulations of many different application

areas of pipes, thanks to the philosophy that is always behind the work of Cartacci: first get to know the product of customer and around it create the machinery for its production.

Cartacci has currently in production, among other facilities, two complete finishing lines: one for the production of

cylinders with diameters up to 235mm, and the other for the production of shock absorbers with diameters up to 70mm: both lines have innovative solutions, designed to limit handling and storage, both to ensure high productivity and quality of surface finish and to limit the use of manual interventions of operators.

**Cartacci SRL – Italy**

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# Digital mass flow meters offer high accuracy

BRONKHORST UK has introduced the latest Mass-Stream® D-6300 series of digital mass flow meters and controllers for gases, to bring new levels of performance and sophistication to direct inline measurement.

The new design has more powerful processing capabilities, a modern graphic display with push-button control, improved accuracy to ±2% or better and a greatly increased measuring range from 0.01 to 5,000Ln/min air-equivalent. The through-flow instruments offer IP65 protection as standard and are equipped with a digital pc-board for all measuring and control functions.

The Mass-Stream D-6300 won a category prize at this year's Golden Gas Awards, which are judged on the basis of technical innovation and staged by international publication Gases & Instrumentation. Andrew Mangell, Bronkhorst UK's managing director, picked up the award at Pitcon 2010 in Orlando, in March.

Also available as compact controller units with integrated or modular solenoid control valves, the Mass-Stream D-6300 instruments

are suitable for use in the chemical and pharmaceutical industries, food and beverage processing, and mechanical engineering, as well as gas production. Usable for virtually every kind of gas or gas mix, including dirty or wet gases and those with a tendency to particulate, measuring applications include biogas from landfill sites and digesters, dirty exhaust gases from combustion processes and powder-carrier gas for pharmaceutical research. The technology is also ideal for N<sub>2</sub>/O<sub>2</sub> generators, gas consumption metering, medical gas monitoring, airflow control in paint spray lines and burner ratio control.

Part of the Bronkhorst BV Group, the manufacturer of the Mass-Stream range, M+W Instruments, has always specialised in thermal mass flow metering and control of gases, and was the first company to introduce the through-flow measurement principle commercially, as distinct from the bypass technique. The instruments feature a metal body and straight-through base, with two stainless steel probes protruding into the base, one a heater and the other

a temperature sensor and as a result there are no moving parts.

With the D-6300 series, the through-flow technique can be applied to much lower flow ranges, previously only covered by the bypass technique. The model series extends from 0.01-0.2Ln/min at the lowest scale, to 100-5,000Ln/min at the highest range, with a turndown ratio of up to 1:100. Standard accuracy is ±2%, with ±1.5% available on request, and repeatability is better than ±0.2%. When configured as a mass flow controller, a solenoid control valve is integrated into the body, for flow rates up to 1,000Ln/min, while a separate modular valve is used for the control of higher flow rates.

The through-flow design means that no inlet pipe is required, and gas connection inlet/outlet fittings are available between 1/8" and 1" OD, as well as custom sizes.

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AV85C  
Twin Head.



## Efficient blast cleaning of different size steel pipes

TEREX, a leading crane manufacturer, has purchased the new Rösler RDR 500 pipe blaster for its lattice boom crane production plant.

At this location Terex produces lattice boom cranes with payloads of more than 300 tons, which can move under full load ('pick & carry'). Products include the CC 8800-1 TWIN, which the company claims is the biggest and strongest crane in the world, able to lift 3,200 tons and still move under full load.

An essential section of this type of crane is the lattice boom that is fabricated from steel tubes of different diameters and lengths. The new RDR 500 tube/pipe blaster allows Terex to de-scale and de-rust tubes with a length of up to 18,000mm and a diameter of up to 500mm prior to flame cutting.

A major factor in choosing the RDR was that Rösler had already supplied a number of nearly identical tube blast systems to OEMs and steel trading companies. Another

important point was that Rösler was able to adapt the machine design to the Terex requirements by conducting processing trials in the Rösler test lab. The trials showed that the required degree of cleanliness, according to the Swedish Standard of SA 2.5 ('near white') surface conditions are achieved in the machine with travel speeds from 2 to 6.5m/min due to the two high performance Hurricane® H42 blast wheels, which are driven by 22kW motors. The blast chamber itself is fabricated from wear resistant manganese steel. The precisely defined blast angle ensures that the required blast results are consistently achieved in the specified time, even with tubes with a relatively large diameter.

Since the Terex specifications only call for the blast cleaning of the outer tube surface, the open tube ends are masked. However, Rösler also offers solutions for applications where blast cleaning of the inside and outside of the tubes is required.

Besides blast performance and a robust machine construction, the maintenance-friendly design of the tube blaster was another factor that convinced Terex to buy the Rösler equipment. Very large inspection/maintenance doors in the entrance and exit vestibules, as well as in the blast chamber, allow easy and ergonomic access to all areas requiring maintenance.

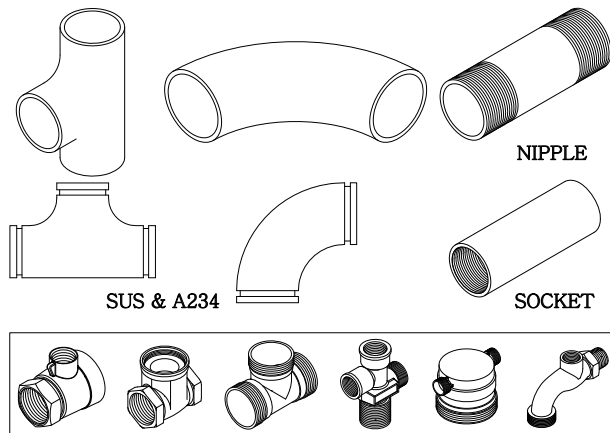
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<b>Coils / Foils</b>	<ul style="list-style-type: none"> <li>➤ Thickness: 0.06 to 4.00 mm</li> <li>➤ Width: 5 to 525 mm</li> <li>➤ Finish: CR, 2B, BA</li> </ul>
<b>Grades / Standards</b>	<ul style="list-style-type: none"> <li>➤ Grades: 201,202,301,304,304L,316,316L,317L,321,409L,4106,430,904L</li> <li>➤ Standards: ASTM, A.S.I., DIN and Any other International Standards</li> </ul>
<b>Pipe Fittings</b>	<ul style="list-style-type: none"> <li>➤ Size: 1/2 to 8"</li> <li>➤ Material: Carbon Steel &amp; Stainless Steel</li> </ul>

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## Linsinger brings out the best in tube layers

LINSINGER tube layer sawing machines have been hailed as a success story in leading seamless tube mills for the rapid and clean-cut tube layers they produce.

The extremely high output productivity provided by Linsinger sawing machines has been the ultimate deciding factor with the global market leaders.

The company claims that customers get more efficient results for their investment in the ultra-robust Linsinger machines, which operate at high speed continuously and reliably under the harshest conditions.

Working conditions in seamless tube mills are not known as particularly friendly environments for man and machine. These especially rough conditions can be found just after the cooling bed near the steel mill. Every minute and for 24 hours per day, the rolled tubes are transported onto the cooling bed for tube end processing. Tube layers are formed to cut several

tubes to length or to remove the drop ends.

Linsinger's tried and tested state-of-the-art sawing system for cutting of tube layers in 3-shift-operation provides the perfect answer. Using the latest vibration-free technology, Linsinger design specialists have once again set the benchmark with sensational cutting results.

Crack-free and practically burr-free cutting of the highest quality is the result, with no hardening or thermal influence. The emission-free cutting process produces cutting chips that can be easily reprocessed.

As a result of the enormous potential output volume, the savings generated by the exceptionally low cost per cut far outweigh the comparatively small investment within a short payback period. Tubes with material tensile strength up to 1,400N/mm<sup>2</sup> can be cut easily. The

frictionless machine design without drive belts ensures very tight tolerances. The resulting cut quality can be sold to market without any further de-burring. All that right beside the cooling bed.

Linsinger's long lasting proven leadership has grown thanks to satisfied customers worldwide, who benefit from the many attractive additional features such as transport systems, length measuring stops, and additional clamping devices for layer formation.

Finding the perfect match between sawing machine and tooling is the key to low production costs. Linsinger, with its unique in-house fully automatic tooling manufacturing facility, offers perfectly matched sawing machines and tooling from a single source.

Linsinger also provides turnkey saw blade repair shops and operator training in close support for customers aiming for more competitive production costs. With all these benefits, Linsinger says it is cutting lengths ahead the others.

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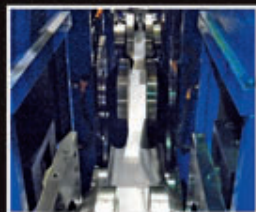
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## Insulated GRE pipes for heating

VEM is an Italian manufacturer and supplier of filament winding equipment, specialised in the continuous filament winding of GRP/ GRE pipes. For years the company has been working on the introduction of new equipment and design of new products. One of VEM's latest priority directions is the continuous manufacturing of insulated GRE pipes for district heating, used in hot water transportation up to 110°C (peak temperature up to 150°C).

VEM technology for district heating pipes regards the continuous, thermally cured epoxy pipes insulated with PU foam and covered with a protective PE coating. The foaming system has been specially designed by VEM for its own winding machine for small diameter pipes, the Continuous Lamellar Winding Machine, which allows manufacturing GRP and GRE pipes ND 100-800 mm, NP up to 32 bar GRP and up to 40 bar GRE, SN 1,250-10,000N/m<sup>2</sup>. VEM patented invention, the Lamellar Machine, is characterised by a series of peculiarities like the continuous production of diameters below 300mm, compact dimensions, high

productivity, reduced downtimes and manpower of the plant.

Online insulation of GRE pipes allows one to obtain a very uniform expanded foam layer on the surface of a cooled wound pipe. The spray application over an extremely short path creates virtually any insulation thickness according to the design diameter and insulating efficiency. The PU hardened layer allows a subsequent application of a protective PE coating by the melt extrusion of filled polyethylene or the spray application of a non-foaming PU-based formulation. These operations are completely integrated in the continuous filament winding process and are characterised by the following advantages: a consistent density of the insulation, no insulation voids, full concentric application onto the pipe and the jacket fully bonded to the insulation. Finished products comply with EN 253 standard for PU insulated pipes.

**VEM SpA** – Italy  
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## Small grain copper tubes

UPCAST® – the leading upward continuous casting technology – is best known for the production of Cu-OF rod used within the wire and cable industry. Now this proven method has been applied to the casting of Cu-DHP tube. UPCAST®-SGTube technology produces thin-walled cast tubes suitable for direct drawing to sanitary and ACR tubing. Cast tubes come in heavy coils straight from the casting line. The fine cast grain structure lends itself to excellent drawing performance, which has been validated in testing.

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## SHANGHAI YUEYUECHAO STEEL TUBE

Established in 1994, Shanghai Yueyuechao Steel Pipe Group mainly deal with seamless steel pipe, seamless square/rectangle steel pipe, large OD LSAW manufacture. The specification for LSAW of Shanghai Yueyuechao Manufacture Tube Co., Ltd is  $\Phi 356-1422 \times 8 \sim 60\text{mm}$ . The specification of cold drawn seamless steel tube for Jiangyin Yueyuechao Manufacture Tube Co., Ltd, ranges from  $\Phi 6-426 \times 1 \sim 20\text{mm}$ , hot expanded tube specification ranges from  $\Phi 168-630 \times 4 \sim 50\text{mm}$ . Quality standards are API/ASTM/GB/ISO/DNV/JIS.



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# Thermo-mechanically rolled seamless pipes

THE tendency towards lightweight construction in the automotive industry and structural steel works is increasing. In addition the applied load for construction parts is rapidly growing. Therefore the demand for seamless steel pipes with optimised mechanical properties combining high strength with improved toughness continues to rise. Until now the only process for reaching high strength in steel pipe production has been heat treatment. The thermo-mechanical treatment has been used as a successful tool to produce speciality steel products with optimal mechanical properties, but up to now it has not been available for seamless pipes.

The objective of a joint R&D project between voestalpine Tubulars and the chair of metal forming at the University of Leoben was the application of thermo-mechanical treatment in the seamless pipe rolling process. Based on a comprehensive analysis of this process the main parameters to reach a fine grained microstructure and optimised mechanical properties were identified. The work was continued by parameter studies through the DoE (Design of Experiments) method and process modelling of the pipe rolling mill. The rapid cooling after the final deformation step at the stretch reducing mill produces the biggest effect in strengthening the material. For this purpose the rapid pipe cooling system was developed and finally installed in the production line in the fiscal year 2007/2008 supplemented by the installation of other necessary equipment.

The implemented process technology is the basis for further material and product development for seamless pipes. In addition to the classical approach to increase the mechanical properties through the carbon equivalent by adding more alloying elements the thermo-mechanical treatment provides the tool to influence the mechanical properties through the process parameters in a wide range. The properties can be adjusted in a tight range and fine tuned to customers' requirements.

To implement the innovative project results to the production of seamless pipe the thermo-mechanical treatment was applied to two different products for the utility vehicle industry.

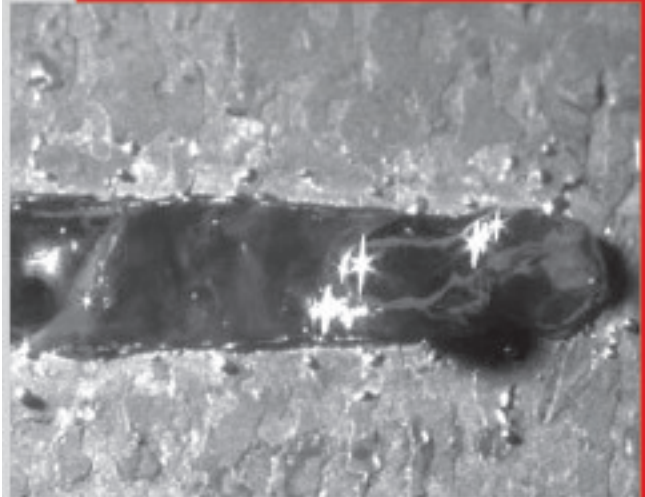
The conventional heat treatment was substituted for one product and for the second product the steel chemistry was modified by reducing the volume of expensive alloying elements.

Thermo-mechanically rolled seamless steel pipes from voestalpine Tubulars are sold under the brand name ToughTubes. This new product fulfils the following requirements on high strength seamless steel pipes: high hardness, tensile and yield strength combined with exceptional toughness, extremely fine-grained microstructure, improved weldability through the low carbon equivalent, excellent cold formability and improved surface quality.

These characteristics make ToughTubes suited for: high-strength line pipe, mechanical tubes, pipe for crane construction and for the automotive industry.

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## Eagle CP40 series hydraulic universal roll benders

EAGLE Bending Machines has introduced the powerful and versatile CP40 Series Universal Profile Bending Machines with 4 Versions so customers can match features to a budget. CP40s are 2" capacity section benders and will roll bend all rated profiles, tubes and pipes without using external shaft tie bars. Eagle CP40 main frames are constructed of precision machined solid steel and have no cast steel parts.

All Hydraulic CP40s are equipped with the programmable MPR-40 auto-repeat system with 400 position memory and high brightness LED digital readouts. The CP40-M with manual bending roll positioning also includes a large, high brightness digital readout. The programmable MPR-40 and standard LED readouts make repeat positioning easy and accurate for repetitious jobs. Large format controls are easy to use and are protected from harsh shop conditions by a tough moisture and dust proof polycarbonate overlay.

The All CP40s have dual foot pedals to engage powered forward/reverse rolling

and an 18 piece universal roll set in 55 HRC hardened tool steel. Universal Rolls bend most standard profiles the day the machine is delivered. The user can choose the 3 driven roll CP40H with smooth tooling or the 2 driven roll CP40H2 where the lower shafts are motorised and equipped with knurled rollers for traction. The pyramid design has the top roll rapidly adjust to set the bending radius.

Attention to detail shows in the flush electrical panels, e-stops, over-load protection as well as in craftsmanship and fit/finish. CP40s operate in both vertical and horizontal positions (long parts w/large bends in horizontal or easily change to vertical for short parts or where shop space is critical).

Additional benefits include steel protective dual foot pedal covers, flexible accordion 'anti-pinch' mill scale covers, concealed oil lines on the ram that cannot be damaged by accident, dual emergency stop buttons (one on machine and one on console), safe 24-VAC control voltage, completely flush mounted electrical panels are safer and out of harm's way in a busy shop

environment. CP40s have large easy access tool storage compartments and mobile control consoles allowing a safe operator distance from the workpiece. Top brand name OEM components are non-proprietary and available worldwide.

**Eagle Bending Machines – USA**

Email: [sales@eaglebendingmachines.com](mailto:sales@eaglebendingmachines.com)

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## Portable machines for facing and boring

HSB machines from Protem are designed to bevel, face and counter bore tubes and pipes at high speed, required when time and efficiency are crucial – especially in the oil and gas industry.

Fully hydraulic – starting with the inside clamping system, the tool holder rotation and the feeding of the tools – the machines can be used either in the workshop as prefabrication PFM, or in the field as bevelling tools for high quality orbital welding. They will perform repeatable high quality welding geometry preparations from standard steel pipes to the most developed ones such as stainless steel, duplex, super duplex and others.

The machines are easily transportable and it is possible to insert them into the tubes to be bevelled with their lifting bracket. This can be done while two inside profile tracking tool holders rotate simultaneously on the tool holder plate to perform the bevelling, facing and counter boring, if required, at a very high speed on any oval pipe, leaving a root face at a constant width. Several models are available ranging from 6" to 60".

Serco's on-site machining units are

positioned and locked by means of a column/arm system resting on the outside diameter of the part to be machined, allowing internal machining.

Machine installation is quick and easy. After a first visual positioning, using a simple device, a parallelism and concentricity within a 0.01mm precision can be achieved. A powerful air motor drives the tool rotation (hydraulic motors on request) and radial

automatic feed, with a choice of two speeds.

The Serco range of portable products includes machining equipment, boring and surfacing machines, surfacing machines, grinding machines and lapping machines.

**Protem GmbH – Germany**  
 Fax: +49 7247 9393 33  
 Email: [info@protem-gmbh.de](mailto:info@protem-gmbh.de)  
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## Weld head calibration becomes obsolete

DESPITE orbital welding technology having passed the 50-year milestone, many orbital welding users are frustrated by the old-technology analogue controls used in many orbital weld heads, which constantly require calibration.

According to John Emmerson, president of Magnatech, LLC, the industry has demanded that current digital technology replace older analogue technology controls, to maximise 'arc on' productivity and eliminate needless calibration.

Electronic technology has made great advances in quality, performance and size reduction. Magnatech has recognised that digital technology must be integrated into the orbital welding marketplace, and has introduced a new line of enclosed autogenous orbital weld heads that use 100% digital technology.

The company's new 800 Series weld heads incorporate digital encoder drive motors, eliminating the need for weld head calibration.

New construction techniques make the 800 Series cost effective, simple to field service, and engineered to be extremely durable. An 'over-close' collet clamping system and exclusive 'full exchange' water cooling system allow for true 100% duty cycle.

**Magnatech LLC – USA**  
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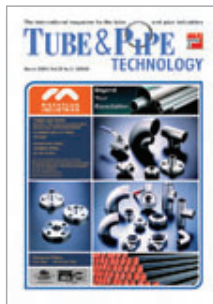


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GLOBAL MARKETPLACE

The UBS deal

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Switzerland's culture of discretion in banking matters has long been a key selling point for the country...

UBS issues have raised a tricky topic in banking circles as the Swiss bank's earnings have been hit...

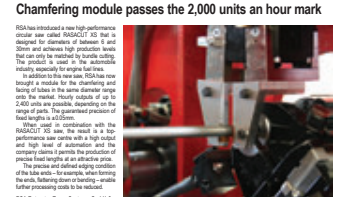
In total, US\$ 50 billion of money for high-net-worth individuals, in February 2009 acknowledged annual earnings...

Enthusiastic response
The resolution of the landmark challenge to Swiss bank secrecy was widely expected...

A survey by specialist consultancy Scorpio Partnership of 14,000 private bankers and investment managers...

TECHNOLOGY UPDATE

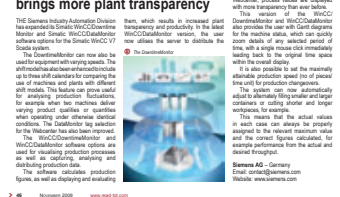
Chamfering module passes the 2,000 units an hour mark



Chamfering module passes the 2,000 units an hour mark

ISA has introduced a new high-performance ovalise unit model RASCOFF 102 that is designed for diameters of between 6 and 30mm...

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## Honing system for precision finishing

SUNNEN'S new SV-400 Series vertical CNC honing system combines a wide choice of tooling options, large work envelope, and up to 1,524mm stroke for bore sizing of small and medium-sized gas/diesel engine blocks, oil/gas components, hydraulic/pneumatic parts, compressors, bearing sleeves, gear hobs and similar small or large multi-bore parts.

A work envelope of 915 x 1,015mm (36" x 40") and weight capacity up to 90kg (2,000lb) provide versatility for processing a wide range parts. An optional tool-guide assembly and variety of bore-diameter gauging systems combine with a servo-controlled X-axis travel of 1,143mm to allow automated honing of multi-bore blocks with high precision.

Straightness sensing capability provides a display of the bore profile during the cycle. Combined with a patented, servo stroking system, it allows the SV-400 to auto-dwell in any part of the bore to correct straightness automatically in the shortest cycle time. The SV-400 can be used to hone parts with inside diameters from 19 to 200mm, or diesel liners up to 150mm, depending on the tool options selected.

Designed for automated processing of mid to high part volumes, the SV-400 Series features full-height access doors and enclosure pre-configured for use with robotic part loading systems, while the CNC control includes a built-in automation interface. A 20-amp power supply and multiple E-stop contacts add versatility and allow convenient automation control. Setup is simplified with a multi-axis hand wheel for fine-tuning vertical stroke, tool feed, column position (SV-410 only) and optional cradle position. Automatic tool feed can be selected for constant load or constant rate.

The PC-based, colour touch-screen control features multi-language capability, pull-down menus, unlimited capacity for job setups, and programmable custom tools. In addition to optional in-process air gauging, a variety of optional post-process air-gauge systems can integrate with the control for SPC data collection, as well as automatic compensation of size, taper and straightness. The control allows easy programming of multiple bore positions.

The SV-400 Series is built on a malleable iron base for rigidity and vibration damping.

The machine's servo-controlled, straight-line stroke motion is driven by a ballscrew with rates of 1-160 strokes per minute, while a powerful 7.5kW (10 HP) spindle provides ample torque for fast metal removal with tools outfitted with metal-bond cubic boron nitride and diamond abrasives or standard aluminium oxide and silicon carbide stones.

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## Integrating new and revamped machines

EUROMAQUINA sells and revamps new and second hand machinery. It can also match the demand for revamped machines being integrated in line. This means that the manufacturer of tubes does not only have the choice between a new line and second hand stand-alone machines, but also can go for an integrated line in which some of the machines are reconditioned.

Three items have been newly designed under modular concepts: loading tables (including a special feature for diameter selection linked to channel size); roll ways; and exit cradles.

The design was made in 3-D, which is close to manufacturing and assembly and allows to "play" with all perspectives during conceptual layout discussion. Offers can be prepared very easily to match a general layout idea of the customer.

The premises were reducing pieces by fixing standards also for options, facilitating expandability by easy interfaces and standardised dimensions, easy access for assembly, disassembly and maintenance. The result is that Euromaquina may offer finishing machines revamped to new – from pointing to packaging machines, including draw bench, straightener, cutting, bevelling or de-burring machine within an integrated solution at a very reasonable price and within a relatively short delivery time.

**Euromaquina – Spain**

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## Complete finishing lines

REIKA's NDT systems are used by producers of steel tubes and stainless steel tubes, and the lines are often directly linked to straightening lines, which can also be delivered by Reika. Complete finishing lines as turnkey solutions are Reika's speciality.

The testing lines can be equipped with electromagnetic and ultrasonic testing systems. Typical testing brands are GEIT and Foerster, but other brands can be integrated in the existing standard interfaces. According to the demand of the tube mill, the adequate electronic devices can be chosen and integrated in the workflow.

Before testing tubes, it is usual for loose scale from straightening and chips remaining after cutting to be removed. The tubes are transported individually with high speed into the multi-testing NDT-section. The lines are able to run up to at 5m/s throughput rate for eddy current testing only. The testing mode can be selected for continuous end-to-end testing in case of ultrasonic testing,

therefore the length of the untested ends is minimised. In front of the NDT-bench, a rotary wet brushing device can be installed. Two planetary driven steel brushes rotate around the axially transported tube, cleaning the surface of loose scale and dirt. Wear of the rotating probes and pollution of the water circuit are reduced, and 'false defects' with second testing can be reduced by 80%.

The high precision concentric driving units and the complete transport mechanics are set-up within two minutes. The tube guiding precision of the constant centre drivers is proved by the high testing repeatability during the tube calibration mode. Tube eccentricity and orientation of the tube in the probe can be neglected, because the distance of the testing probe and the outer tube surface is almost constant along the circumference.

Start-up of the complete lines can be executed within four weeks. Control interface to HOST computer systems are available for production reports and line status reports. The lines can be

completed by bypass repair sections with manual and automatic grinding and final inspection.

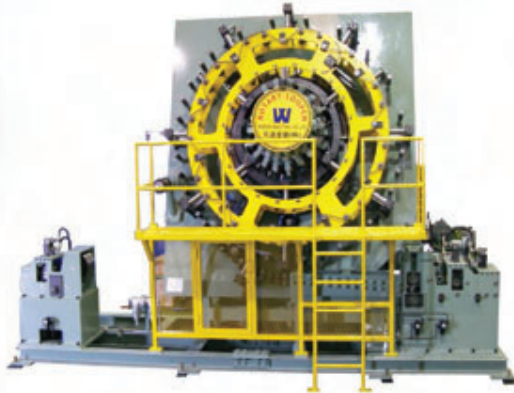
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## Revealing the secrets of the welding process

ACHIEVING high image quality in the visualisation of welding is a formidable challenge due to the powerful radiation generated by the process.

To overcome this challenge, Cavitar Ltd has developed a welding monitoring solution based on pulsed high power diode laser illumination.

High quality images from the core of the welding process provide valuable information for scientific and industrial R&D purposes. This information can be utilised for process development and optimisation as well as for troubleshooting. High quality video of welding is also powerful tool in educational and training purposes.

High quality images also enable reliable and accurate online image processing. In addition to seam tracking, features such

as keyhole and melt pool properties can be analysed. Numerical process data can be utilised for documentation, alarm or process control purposes.

The Cavilux welding monitoring solution consists of combined illumination and camera system with other necessary components. The volume of the monitor unit (camera + illumination) can be less than 1dm<sup>3</sup> and the weight less than 200g. The solution can be applied in arc, laser and hybrid welding processes.

The monochromatic nature of laser light enables efficient filtering of thermal light. In addition, the use of short high power light pulses accurately synchronised with camera exposure time of similar duration further suppresses the effect of thermal light. As a result, high quality images showing both hot and cold regions simultaneously obtained.

Cavitar Ltd's welding monitoring systems can provide high quality images and videos for both real time and high speed applications. For more information, please contact Cavitar Ltd.

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## The new X-RAY 6000

SIKORA has made more advances with its X-ray technology. Thanks to a technological fine tuning SIKORA launches the second generation of the X-RAY 2000, the new X-RAY 6000-series for the measurement of the eccentricity, wall thickness, ovality and the diameter in hose and tube extrusion lines.

For example, innovations have been made with the XLL-X-Ray tubes (eXtra Long Life) as well as a selectable measuring rate. Additionally, the X-RAY 6000 offers precise measurements even under difficult climate conditions. The measuring values are displayed at the processor system ECOCONTROL 6000 on a 15" or 19" TFT monitor. In combination with the display and control device, the new dual and triple-axis measuring systems ensure an optimum process control in automatic mode.

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## The oil spill


### As plumes of hydrocarbons pollute the Gulf of Mexico, experts discuss alternatives to responses – detergents, bioremediation, burning – that can do more harm than good

At this writing, the only certainties about the leak from the Deepwater Horizon seabed oil well are that it continues, and that it is very bad. A 13 May announcement from President Hugo Chávez, of Venezuela – via his account on the social networking site Twitter – suggests the near-certainty that more of the same must be expected. Mr Chávez reported that an offshore natural gas exploration rig leased to the national oil company Petroleos de Venezuela, SA (PDVSA) had sunk off the country's northeastern coast. The platform is owned by a subsidiary of India's largest oil rig company, Aban Offshore.

Given the high probability that such events will recur, and the consequences for nations and corporations when they do, it may be worthwhile to canvass informed opinion on ways to offset the effects of these disasters. Here, in summary, are the views of five experts consulted by the *New York Times* as oil and gas still streamed from the riser of the Deepwater Horizon, the estimates of the leak's extent went higher, and the oil slick moved ashore in Louisiana. ("Plan B in the Gulf," 10 May)

 Riki Ott, author of *Not One Drop: Betrayal and Courage in the Wake of the Exxon Valdez Oil Spill*:

Citing the high school chemistry maxim "Like dissolves like," this marine toxicologist argues against the use of dispersants in oil spills on grounds that crude oil responds only to oil-based solvents, which are extremely toxic. Drums of Corexit 9527, a dispersant used to clean up the Exxon Valdez spill in 1989, came with the warning label: "Prevent liquid from entering sewers, watercourses, or low areas." Little has changed in 20 years, according to Ms Ott, whose interview took place when over 300,000 gallons of dispersants had already been used in the Gulf. She warned, "They can linger in the water for decades, especially when used in deep water, where low temperatures can inhibit biodegradation."


 Ken Arnold, energy industry consultant and former Royal Dutch Shell engineering manager:

In Norway and Brazil, offshore oil rigs are required to have switches that close valves whenever they sense an acoustic pulse in the water, signalling a possible blowout. The Gulf spill has prompted calls for these acoustic sensors on American rigs. But Mr Arnold noted that the Deepwater Horizon had manual switches at several different stations and two backups. Either these all failed, he said, or they worked and the valve still failed to close. Moreover Mr Arnold considers these switches dangerous in their own right. He said: "When a safety switch is thrown, a device cuts the drill pipe, letting it fall into the hole. Fishing it out, and even testing it regularly, is a dangerous proposition, putting worker safety at risk – precisely what such systems are designed to avoid."


 John Hofmeister, former president of Shell and author of *Why We Hate the Oil Companies: Straight Talk from an Energy Insider*:

This source would concentrate on prevention, with a recommendation that the trend toward outsourcing in the oil and gas industry be slowed or even reversed. Mr Hofmeister observed that many American oil and

gas companies have been outsourcing critical, high-risk operations for several decades, sacrificing control to save money. The potential for mixed signals is just too great on platforms like the Deepwater Horizon, home to distinct chains of command from various subcontractors. "Workers for different companies may hardly know one another despite working side by side," he said. "They often answer to different bosses."

 Terry Hazen, microbial ecologist at Lawrence Berkeley National Laboratory (a US Department of Energy unit at the University of California):

Mr Hazen favours soaking up the oil in the Gulf by seeding the affected waters with such absorbent materials as cellulose fibres or animal hair. He points out that these are cheap and readily available, and there is a fleet of commercial fishing vessels already in place for dispersing them. Once they've done the job, he said, "These materials can be retrieved and either compressed into blocks for burning or, better still, fed to microbes in quarantined spaces."

 Kevin M Yeager, assistant professor of marine sciences at the University of Southern Mississippi:

Do nothing, is the terse advice of this geologist. Mr Yeager urges recognition that nature can do many things far better than we can, and with less collateral damage. Oil is a natural byproduct of biological and geological processes. He noted that – if left alone in coastal environments – hydrocarbons will be broken down, naturally, by wave action, sunlight, and microbes in the sediment. Meanwhile, he said, "Money saved can go to helping local economies deal with the loss of income, improving safety regulations and enforcement, and developing a clean energy policy."

Jon Bowermaster of the blog Take Part is not among the experts who spoke to the *Times*. But on 15 May he made an interesting contribution to the discussion: "The Deepwater Horizon was a sophisticated drilling rig that cost nearly \$600mn to construct and \$500,000 a day to lease. Is anyone insulted by the fact that BP's next best shot at stopping the leak is something called a 'junk shot,' which involves cramming a bunch of old tires, carpet, and golf balls into the well?"

## Metals

### World Steel Association: quarterly iron ore pricing will compel steel makers to pass on their higher costs

Chairman Paolo Rocca of the World Steel Association (WSA) considers the abandonment by iron ore exporters this year of the 40-year custom of annual ("benchmark") pricing in favour of quarterly contracts "a very negative trend." In a 9 May interview with *Bloomberg News* in Beijing, Mr Rocca said that the higher materials costs entailed by the change would compel steel makers – now paying much more for iron ore – to raise their prices to their own customers.

The 180-member WSA comprises 19 of the 20 leading steel makers, which together account for 85% of global output. It had previously called on authorities worldwide to examine the iron ore market after the Brazilian mining multinational Vale SA (formerly Companhia Vale do Rio Doce, or CVRD) won a 90% price increase from Japanese mills for quarterly contracts taking effect in April. Posco, Asia's #3 steel maker, cited escalating costs when it raised May prices for its products by as much as 25%.



"We [steel makers] have no alternative but to transfer the increase in costs to the market," said Mr Rocca, adding that the quarterly ore pricing would render the steel industry less competitive than the aluminium and raw materials industries.

An estimate by Credit Suisse Group cited by *Bloomberg* gives Vale, Australia's BHP Billiton Ltd, and the British-Australian Rio Tinto Group about two-thirds of the globally traded iron ore market, worth \$200bn a year.

Billiton and Rio Tinto, the second- and third-largest exporters of the ore, are considering a 50-50 joint venture to meld their operations in Australia. The combination, presented as a means of saving at least \$10bn a year in costs, is under review by competition authorities in Europe, Australia, South Korea and China. In Mr Rocca's view, the resulting "excess concentration" would "severely hamper our steel industry."

➤ The debate over annual vs quarterly pricing pitted mining companies seeking to cash in on higher spot-market prices against steel mill customers demanding guaranteed prices for 12 months. The quarterly system now in place calls for the price in a given quarter to be based on the indexed, or averaged, spot price paid in the previous quarter. When Mr Rocca spoke, steel makers were still in talks on pricing for iron ore purchases in the April-June period, and discussion of the quarter beginning in July had not yet begun. Even so there were reports that BHP was getting more than \$130 a metric ton for its ore under April-June contracts – more than twice last year's fixed price.

➤ A 13 May item in *American Metal Market* illustrated the dependence of any iron ore pricing scheme on local conditions. Traders in China

reported that enquiries there for spot iron ore imports had dried up as steel prices fell on concerns about oversupply and unexpectedly soft demand. The Chinese steel mills became reluctant to resume spot iron ore imports without further price declines. AMM was told by an iron ore trader in Lianyungang, in China's northeastern Jiangsu Province, "Steel mills couldn't easily pass on the high costs of iron ore to end-users during the May-June period, which is the traditional prime consumption season. They have become wary about spot imports."

## Elsewhere in metals . . .

➤ Kobe Steel, Ltd, of Japan, will establish a company in China to produce and market aluminium forgings for automotive suspensions. Plans called for a June start on a plant in Suzhou New District, Jiangsu Province, with production to commence in August 2012. The new company, Kobe Aluminum Automotive Products (China) Co Ltd, will install a 6,300-metric-ton mechanical forging press and heat treatment equipment. Total investment is estimated at \$27mn.

Aluminium forgings for automotive suspensions are increasingly used in luxury cars to reduce weight and meet environmental regulations. As noted by the materials magazine *AzoM*, (14 April), Kobe Steel has a large share of its home market for the forgings, produced at the company's Daian Plant in Inabe, Mie Prefecture, Japan. Kobe Steel's US subsidiary in Bowling Green, Kentucky, supplies aluminium forgings for suspensions to auto makers in North America.

➤ According to data released in April by the International Copper Study Group (ICSG), the market for refined copper could show

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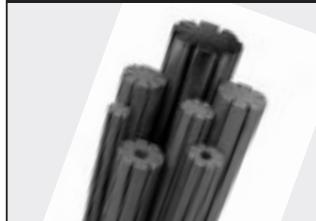


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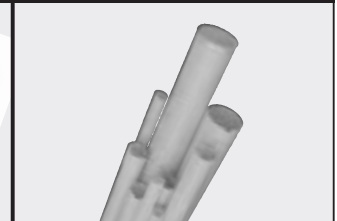
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a surplus of about 580,000 metric tons this year as growth in copper supply exceeds projected growth in industrial demand. For 2011, the Lisbon-based ICSG projects a smaller surplus of around 240,000mt as an expected increase in economic activity boosts demand in copper end-use markets. Limited by operational constraints and temporary cuts in 2009, world copper production is projected to increase by 6.7% (1.1 million mt) to 16.8 million mt this year. Capacity utilisation rates are expected to improve from around 80.7% in 2009 to an average of 84% in 2010.

## Energy

### New Delhi's assumption of final say over natural gas pricing could dampen international interest in gas development in India

Another disagreement over commodities pricing (See "World Steel Association," above), this time at the national level, recently played out in India. A ruling by a three-judge bench of the Supreme Court of India endorsed the right of the government to set prices for the country's natural resources. As reviewed in the *International Herald Tribune*, the ruling has its roots in a bitter falling-out between two billionaire heirs to India's largest industrial fortune. ("India's Top Court Settles Dispute on Energy Prices," 7 May)

The brothers Mukesh Ambani and Anil Ambani parted ways over one of Mukesh's companies, Reliance Industries, which five years ago won development rights to an offshore natural gas field and agreed to sell gas to Anil's business Reliance Natural Resources at a set price. Three years ago, the government set another – 79% higher – price for gas from the field.

In considering whether Mukesh Ambani's company should be permitted to withdraw from the existing contract, and command a higher price for all its gas, the Supreme Court had to address the question of whether India has sovereignty over its natural resources. For the brothers, billions of dollars hung in the balance.

Reporting from New Delhi and Mumbai, respectively, Heather Timmons and Vikas Bajaj wrote, "The Supreme Court tilted the billions in Mukesh's favor, [and] Anil's company will be forced to pay a higher price for the gas. The government, in turn, will get much more in royalties."

The judgment in the case runs to 268 pages, suggesting that the reasoning required some extenuation, even to the judges themselves. One of the three judges said in court that Reliance Industries, India's largest private company, did not have an "absolute right" over the gas it offers for sale. The upshot of this – the head of contract dispute at a Paris-based business law firm told the *Herald Tribune* – is, "The [Indian] government has the right to tell investors how to price."

Another of the judges wrote that the brothers' agreement was "a private pact between the members of the Ambani family" and therefore not legally binding upon the government. According to Ms Timmons and Mr Bajaj, "Lawyers who have been following the case said that the ruling's specific reference to the family nature of the agreement was an indication that the court *might not intend* to overturn other legal contracts between publicly traded companies."

On the other hand, the Ambani ruling might be interpreted as meaning exactly that. And, in its potential for deterring foreign investors interested in India's abundant natural gas reserves, it has implications for the Indian energy sector. With the domestic industry falling well short of meeting demand, the country must import about 70% of the oil it uses. But India has sizable coal and natural gas reserves and New Delhi has been soliciting bids from foreign energy companies able to develop them.

The *Herald Tribune* reporters wrote, "So far, though, international interest has been lukewarm, in part because of questions about profit sharing with the government and other companies."

## Canada

### The Canadian economic rebound will likely outpace that of the US

The International Monetary Fund in January predicted that Canada this year would have the highest growth rate of the G-7 industrialised nations, and recent indications support that forecast. Canadian economic expansion accelerated sharply during the first quarter, and the Bank of Canada is now projecting output growth of 3.7% this year and 3.1% in 2011.

The independent strategic-consulting firm Oxford Analytica also sees a good period ahead for Canada, at least in part because it avoided a housing bubble and its financial system is not overburdened by problematic assets.

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The Canadian recession of 2009 roughly paralleled that of the US. Real gross domestic product (GDP) contracted by 3.9%, compared to 3.8% in the US, and industrial production declined 16.4% against a 14.3% US fall – the discrepancy there attributable to a more severe downturn in Canada's automotive sector.

However, according to Oxford Analytica, despite concerns about persistent unemployment and the risk of exchange-rate appreciation of the currency, the Canadian economic rebound seems set to be stronger than the American. A broad-based Canadian upturn this year is expected to include:

- An increase of 2.7% in consumer spending, up from 0.2% last year;
- A rise of 6.4% in private fixed investment, after a 14.1% contraction in 2009;
- A jump in exports of at least 7% after last year's 14% tumble, despite a strong Canadian dollar;
- As a result of the recovery in exports, a reduction in the current account deficit to C\$15 billion (US\$14.6 billion) this year and C\$9 billion next year – “a vast improvement,” Oxford Analytica notes, on the \$41 billion Canadian shortfall of 2009; and,
- A dip in the unemployment rate to 7.8% this year and 7.2% next year, from 8.3% in 2009.

Even as it is outpaced by Canada, the US has seen its economy grow since last summer. The Labor Department reported on 6 May that

American productivity was still growing in the first quarter, though more slowly than in the last nine months of 2009. The narrower 3.6% rise in productivity for the first three months of this year was a welcome indication that companies in the US are approaching the limit of how much they can expand output without hiring more workers. Analysts consider this the crucial turning-point for a sustained recovery. A rebound in hiring would prompt an increase in consumer spending, which accounts for 70% of economic activity in the United States.

## Matters of money

### The World Bank awards a greater say to China, acknowledging its rapidly growing influence on the global economy

The 186 members of the World Bank have decided to increase China's voting power from 2.77% to 4.42%. This is still well behind the voting strength of the United States, whose 15.85% share gives it effective veto power, and also short of Japan's 6.84%. But the boost does confirm the Chinese seat as No. 3 on the bank, and signals recognition by the international lending body of China's stature in the world economy.

The enhancement of China's voting rights also reflects a broader World Bank decision to raise the share of votes held by developing countries to just over 47%, giving those countries a greater say in setting the agenda. The bank requires an 85% affirmative vote to implement any new policy.

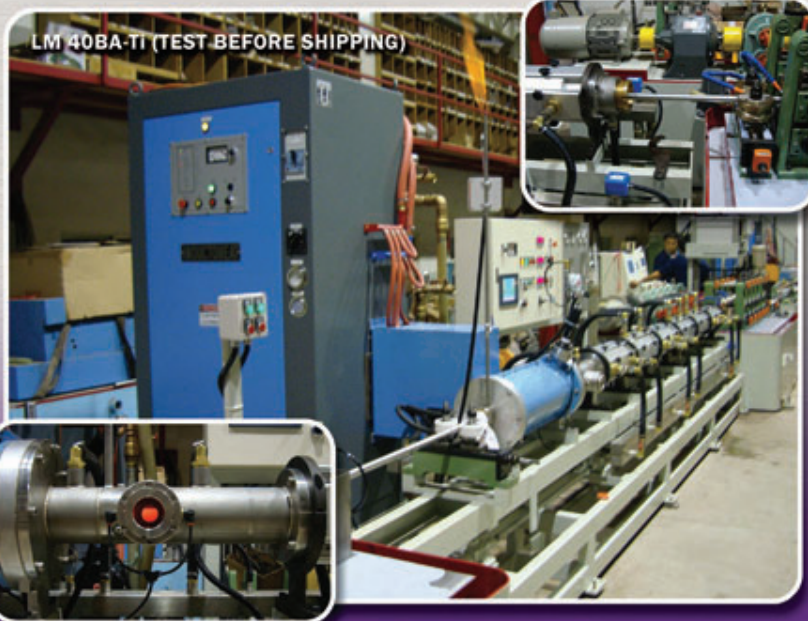


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- ❖ Tri-cathode Welding Equipment  
for SS Tube
- ❖ Eddy Current Test Equipment



The Washington-based World Bank was instituted after World War II to advance money to low- to middle-income nations at modest interest rates to spur economic development and fight poverty. Since June 2008 its chief economist has been Justin Yifu Lin, a Chinese national on leave from an economics professorship at Peking University, who plays a key role in shaping the economic research agenda of the institution.

In a sense, the 25 April announcement of China's higher profile at the World Bank merely took official notice of the obvious. With an economy by gross domestic output second only to that of the US, China bulks larger on the international economic scene all the time. It is a leading member of the G20 group of developing nations, representing some 60% of the world's population. The bloc has become more influential in setting global policy than the G8 group of foreign ministers from developed capitalist countries.

China's finance minister Xie Xuren indicated that he sees the move to amplify Beijing's voice within the World Bank as an important step forward – but he clearly looks for more. Mr Xie said in a statement, "The future shareholding principles should continue to be based on economic weight and aim to achieve the ultimate goal of equitable voting power."

## Change in voting rights is also afoot at the International Monetary Fund

The World Bank is not the only august international institution to turn its attention to redistribution of internal voting power. The wealthiest nations have made policy at the International Monetary Fund since its founding in 1944, and the original quota-based voting apparatus has

not changed much over the decades. Now the IMF, thrust into new prominence by global economic turmoil, is looking within and mulling a voting shift to reflect the rapid growth of economies in Asia, Latin America and elsewhere.

Also Washington-based and 186 members strong, the IMF shares with the World Bank a primary function to provide low-cost loans to countries in financial crisis. But critics have charged that, too often, this was tough love of the bullying kind. IMF loans were generally conditioned on deep spending cuts and/or currency devaluations, when borrowers might have had other ideas of how to work themselves out of their troubles.

While officials from smaller nations want more input into decision-making at the IMF, they do not want to shake an organisation with tremendous capacity for rescue. Recently the IMF has extended loans of \$2 billion to Latvia and \$16bn to Hungary, and has brokered aid for Pakistan, Iceland and Ukraine. Coming up is an expected contribution of as much as \$20bn to the relief package for Greece.

But the pressure for more equitable voting power within the IMF has been building. In Spring 2008 the governing board approved a plan for substantial changes in the system. On 24 April of this year, officials of nations including the US urged consideration of a proposal that would redistribute 5% of IMF voting power from the wealthiest countries toward emerging economies – like those of Brazil, Russia, India and China – and developing nations.

"The goal is to achieve legitimate representation based on countries' economic weight in the world," US Treasury Secretary Timothy F Geithner said in a statement. "The current quota formula, however, falls short of this objective."

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From their beginnings the International Monetary Fund has been led by an official from Western Europe and the World Bank by an official from the US. When realignment of voting power is implemented at both institutions, can a change in this arrangement be far behind?

▶ That the International Monetary Fund and the World Bank should be considering voting reform at the same time is only the latest example of their similarities. Distinguishing between the two institutions – both established to help maintain the stability of the global monetary system – taxed no less an intellect than that of John Maynard Keynes, a founding father of both and considered by many the most brilliant economist of the 20<sup>th</sup> Century. On the IMF website, David D Driscoll notes that, at the organisation's inaugural meeting, Lord Keynes disclosed that he was confused by the names: he thought the Fund should be called a bank – the Bank, a fund.

Mr Driscoll writes, "Confusion has reigned ever since."

## Despite the unsettled outcome, does the rescue of Greece represent a triumph of the euro?

Between them, the European Union and the International Monetary Fund have approved a \$136bn rescue for debt-riddled Greece, part of an overall \$1tn loan package to protect the euro. As with the oil spill in the Gulf of Mexico, only time will tell whether the means employed to deal with the emergency and offset collateral damage have been effective.

But two financial experts who write a weekly column for *Forbes* have not waited to declare the Greek rescue a test that the 16-member euro zone passed with colours flying.

Brian S Wesbury and Robert Stein, chief economist and senior economist, respectively, at First Trust Advisors (Wheaton, Illinois), asserted that without the loans advanced by the EU and the IMF it is doubtful that Greece would have been able to roll over its debt at any interest rate. It would, simply, have defaulted. ("Greece Bailout Plan Represents Triumph of the Euro," 4 May)

Because Greece uses the euro rather than the drachma, default was avoided. Otherwise a major devaluation of the currency would have been inevitable, and the punishment for profligate ways would have fallen indiscriminately.

As it is, the austerity measures to be imposed as a condition of the loans will be concentrated in the sector blamed for the problem: government. Salaries will be frozen, annual bonuses (equivalent to two months' pay) eliminated, and the retirement age raised from 53 to 60. Athens will also be required to make other significant cuts, not yet specified, in its spending.

Messrs Wesbury and Stein wrote, "With a devaluation, everyone would have taken a haircut – including those who earned wages and salaries in drachma in the public and private sectors alike – and domestic or foreign investors locked into earning drachma-denominated interest or investment returns from bank deposits, government and corporate debt, or equities."

Dorothy Fabian, Features Editor (USA)



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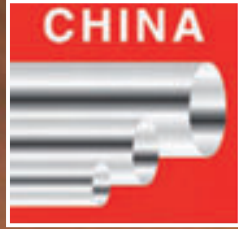
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**Tube**



**21-24 September 2010**

**The 4<sup>th</sup> All-China Exhibition and Conference  
for the Tube and Pipe Industries**

Shanghai's reputation as the Paris of the East may rest on the vibrancy of its 20-million-strong consumer market, abounding as it does in high- and middle-income earners generating demand for the best of imported wares. But the largest city in the People's Republic of China serves a much wider constituency than this demographic. Geography has placed Shanghai on China's east coast. Its preeminence in commerce, finance, industry, and communications puts it squarely at the center of the ever-widening sphere of Chinese influence in the world.

As the megalopolis of this mega region, Shanghai furnishes the ideal site for Tube China, whose delegates need no convincing of the importance of the Greater China marketplace. China has emerged as the leading destination for



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**Opening times**

9.30am – 4.30pm

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manufacturing investment and purchasing by multinational companies in a range of businesses. Of particular interest to those in the tube making industry is the Chinese aviation sector. Industry forecasts predict a 300% increase in air travel in China, from 230 million passengers in 2009 to 700 million in 2020 – and a further doubling to 1.5 billion passengers by 2030.

Tube China 2010 in Shanghai is designed to assist the effort to explore the extraordinary opportunities offered by the blazing Chinese economy – second-largest worldwide and showing no signs of let-up.

[www.tubechina.net](http://www.tubechina.net)



# INSPECTION, TESTING & QUALITY CONTROL

None of the processes reviewed here affects the strength, soundness, and serviceability of a production run of tubing or pipe. Yet they figure importantly in its value, to both producer and customer. Taken together, they command the fulcrum point at which a length of perfect tube is known to be a length of perfect tube, and can be certified and sold as such.

These specialities require the creation and maintenance of statistical databases on every element that contributes to tube manufacture: from materials through coatings, finishes, and insulation; including the fail-safe procedures for excluding all flaws and aberrations from an exacting, high-speed operation. The data collected must be defensible, available in graphic form, and preserved indefinitely for reference purposes.

Here, too, inspection, testing, and quality control leave no imprint on the product. But without them tube and pipe manufacturers would be unable to offer – and stand behind – the superb, high-tech, saleable commodities for which they are justly renowned.



## Remote display units expand capabilities of image sensor and barcode reader

BANNER Engineering is a manufacturer of vision sensors, photoelectric and ultrasonic sensors, fibre optic assemblies, indicator lights, machine guarding systems, precision measurement and inspection systems and wireless network products.

The company has introduced remote display versions to extend the capabilities of its iVu TG image sensor and iVu BCR bar code reader.

Designed for applications where the sensor must be placed in a difficult-to-reach location, the new units allow setup and inspection monitoring to be performed

at a remote control position.

For example, the sensor could be located inside a machine or on an elevated conveyor, with the control unit placed adjacent to a central human-machine interface for easy operator access. One display unit can control and monitor multiple sensors, reducing overall cost.

Applications for the new sensors are found in a wide range of industries, including automotive, packaging, material handling, pharmaceutical, plastics, electronics (PCB and assembly), appliances and metalworking.

The iVu TG image sensor monitors parts for type, size, orientation, shape and location. It includes a match sensor to determine whether a pattern on the item being inspected matches a reference, an area sensor to detect presence or absence of a particular feature, and an area sensor that adjusts for motion.

The iVu BCR reads all common linear and DataMatrix (ECC200) codes and includes the ability to read multiple codes of different types in the same image.

With intuitive user interface and LCD touch-screen display, the sensors are easy to configure with no need for image

processing expertise or an external PC. A USB 2.0 compliant host allows easy updating and diagnostics. They have IP67 rated housings for use in harsh industrial environments. Appropriate cables and mounting brackets are available for all applications.

Single-unit models of both products with identical functionality are available for use where remote display is not needed.

**Banner Engineering Belgium BVBA**

Fax: +32 2 456 07 89

Email: [mail@bannereurope.com](mailto:mail@bannereurope.com)

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*New remote display versions of iVu TG image sensor and iVu BCR barcode reader from Banner Engineering*



*Remote display of new iVu Series TG image sensor controls several sensor units in hard-to-reach locations*

## Hydrostatic and pneumatic testing machines

BE. CA. Engineering Soc Coop, Italy, specialises in hydrostatic and pneumatic testing systems that are usually required to inspect tube or pipe after manufacturing, bending, processing and tooling.

The company's research and development division has developed a low-cost hydrostatic and pneumatic testing machine able to satisfy industry standards and specifications such as ASTM, UNI, ISO, DIN and TEMA.

The hydrostatic test is carried out using pressure decay method: a pressure sensitive transmitter detects the drop in pressure inside the tube during the test.

The pneumatic test can be carried out using two methods: air-under-water test and pressure decay method. The hydrostatic and pneumatic pressures are regulated by the operator up to 200 bar (around 2,900 psi) and 10 bar (about 150 psi) respectively; the maximum pressure can be increased on request.

The standard operation is semi-automatic: the regulation of the system is provided off-line by the operator; the loading and the unloading of the tube or the pipe are manual; and the execution of the hydrostatic and pneumatic tests are automatic. Fully automatic systems

can also be supplied. Both systems are flexible, and it is possible to test different diameter sizes and lengths of the tube on the same system. The automatic control of the pressure and the brief operating time make the testing operation fast and easy to conduct.

Be. Ca. Engineering is able to satisfy customer requests (including turnkey projects and training), and can supply the proposed machines all over the world.

**Be. Ca. Engineering Soc Coop – Italy**

Email: [salesoffice@beca-engineering.com](mailto:salesoffice@beca-engineering.com)

Website: [www.beca-engineering.com](http://www.beca-engineering.com)

## Defect detection using eddy current technologies

INNOSPECTION Limited is a provider of innovative and advanced inspection solutions and services, specialising in electromagnetic inspection technologies for tubes and pipes.

The company offers high defect detection capabilities and accurate defect analysis by using eddy current technologies that include

multiple frequency eddy current, magnetic biased eddy current, remote field eddy current, RotoScan (rotational eddy current systems), and Iris (rotational ultrasonic systems).

With high inspection speed and low cleaning requirements, the inspection technologies are able to inspect ferro- and non-ferromagnetic tubes, as well as fin fan tubes.

Coupled with advanced and comprehensive reporting software, a precise and accurate condition overview of the tubes as well as inspection results for the individual tubes are provided in real-time while the inspection is in progress.

Innospection also provides pipe inspection services using the advanced Slofec™ (saturation low frequency eddy current) technique, which offers the following advantages: fast screening of large areas within a short time; low surface preparations and limited cleaning

prior to inspection; high sensitivity in detecting internal and external corrosional defects (individual pitting, microbiological corrosion, carbon dioxide corrosion, etc); differentiation of the different defect positions or other occurrences; provision of real-time inspection analysis, including wall loss severity classifications; and provision of separate reporting for both internal and external conditions with advanced colour defect mapping capability.

The company's pipe inspection capabilities for both on- and offshore applications using the Slofec technique include: pipes with diameter ranging from 1" to 56"; pipes with wall thickness up to 30mm; pipes with temperatures up to 170°C; the ability to inspect horizontal and vertical pipes both internally and externally; and the ability to inspect different pipe materials, including carbon steel, stainless steel, duplex, super duplex and monel.

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Pipe scanning with Innospection technology



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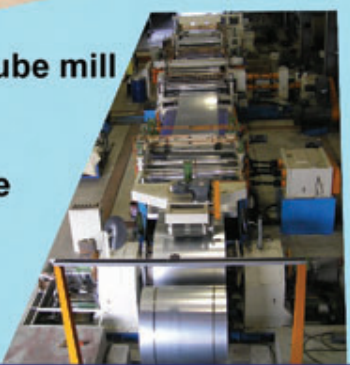
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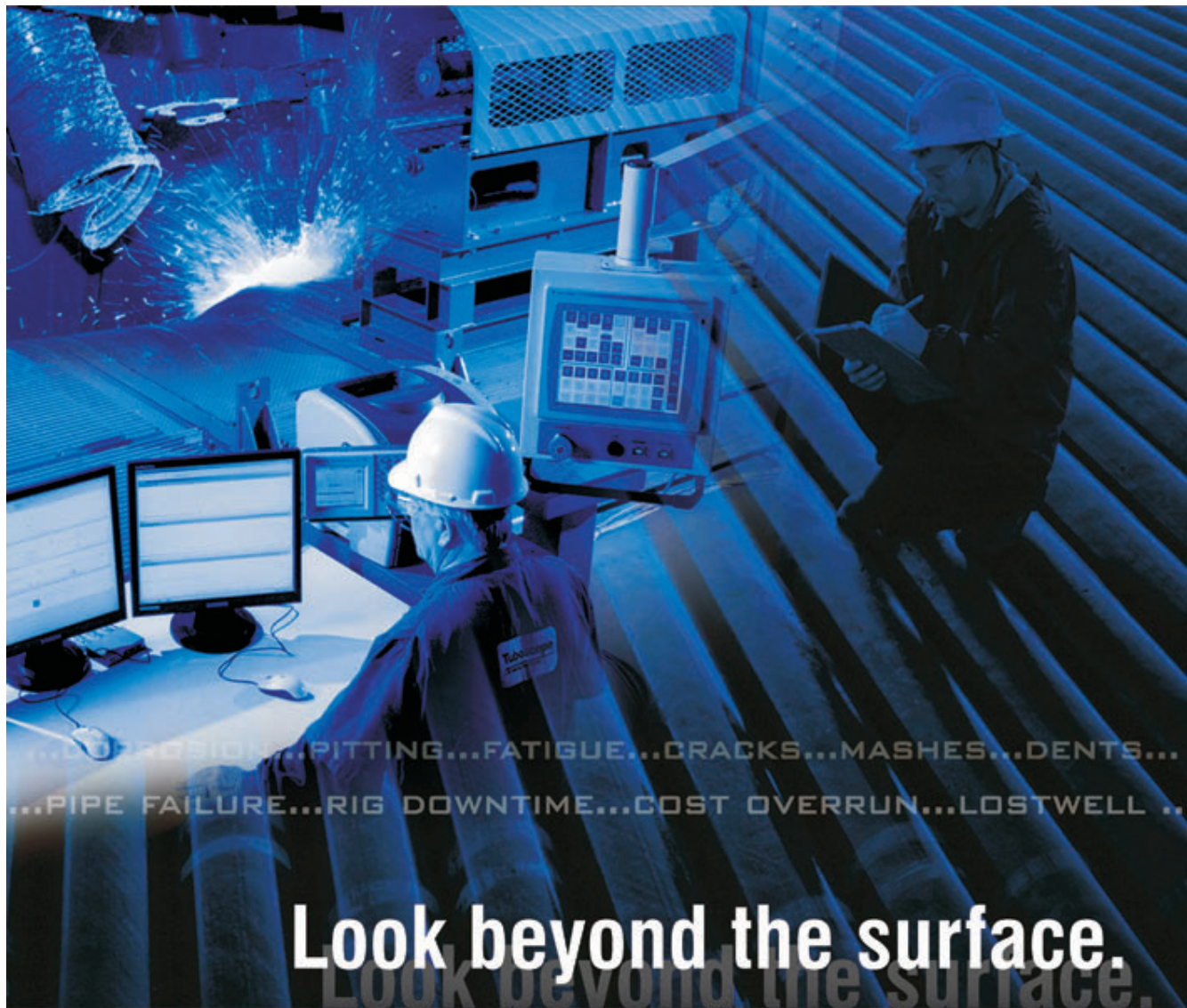
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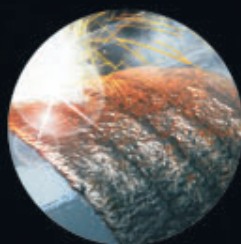


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## Automatic correction on free-form bending machines

DEMAND for free-form tubes is generated from all areas of industry, rather than primarily from the furniture business as in the past. As a result, more tube benders need measuring systems that take into account the particularities of complex free-form tubing.

Aicon's Tubelnspect optical measurement system carries out very precise testing of free-form tube geometries with the help of high-resolution digital cameras. Aicon now also offers an additional interface that connects Tubelnspect directly with the free-form bending machine. This results in automatic correction values being identified for the formed tubes and transmitted to the bending machine, and reduces set-up time. Close cooperation with bending machine manufacturer Wafios made this new development possible.

Peter Seidel, sales manager of the Tube business unit at Wafios AG, explained how the cooperation came about: "It's really important to us that our customers not only get the most innovative bending technology but, parallel to this, get reliable testing methods to carry out their quality assurance. That's why, when Aicon approached us about working together, we immediately agreed to being a development partner for a direct interface between free-form bending machines and Tubelnspect – even though this means giving a very intimate insight into our company's own bending technology and software."

In contrast to tubes manufactured conventionally by draw bending, which consist of calculated lines and bends and feature constant radii, free-form tubes manufactured by push bending have a completely different set of parameters. In a CAD system they are often shown as a

spline, a tube geometry in which, theoretically, at any point a different radius can exist. When correction takes place on a conventional bending machine, only the LRA values at the individual bending points have to be corrected.

In comparison to this, to achieve the desired tube geometry using free-form bending, a multitude of different settings on the bending machine have to be adjusted and the bend radii optimised until the exact tube form has been bent. This set-up has – to date – been a very time-consuming process with high material usage, so both automation and shortening of the process were the two main aims. Tubelnspect's newly developed interface enables smooth communication between the bending machine and the measurement system.

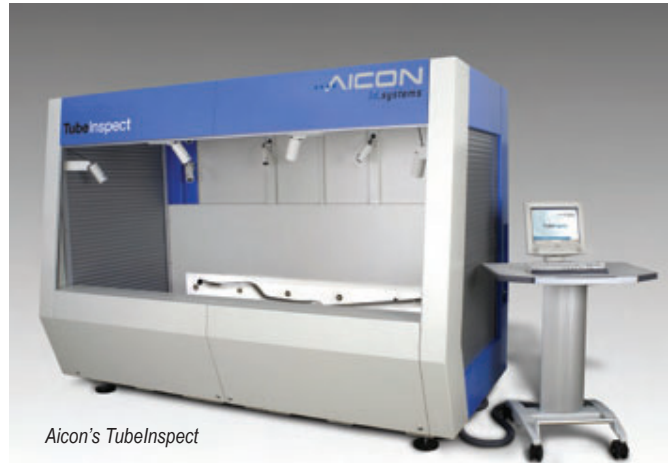
Dr-Ing Werner Bösemann, managing director of Aicon 3D Systems GmbH, explained why the demand for free-form bent tubes has increased dramatically, especially from the automotive industry: "Design demands or technical necessities call for tube forms, which often can no longer be manufactured on conventional machines.

"Maximising efficiency, however, is another reason why many companies are migrating from conventional bending processes to free-form bending. One of our customers is currently testing the possibility of manufacturing its brake lines using push bending, a form of free-form bending. Their calculations show that employing this method would achieve significant cost-reduction, as the bending time per tube is lower."

The Tubelnspect system can, thanks to Aicon's new development, connect directly to the Wafios B10 tube bending machine or the BMZ series, to reduce set-up and cycle time.

**Aicon 3D Systems GmbH – Germany**  
 Fax: +49 531 58 000 60  
 Email: info@aicon.de  
 Website: www.aicon.de

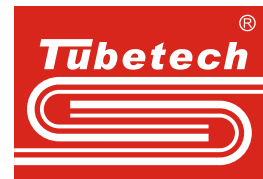
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Aicon's Tubelnspect



A Tubelnspect screenshot



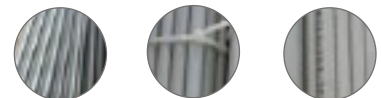
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Free-form tube placed in the Tubelnspect measuring cell

## Better steels call for better testing

IMATEK Ltd is a UK-based manufacturer of materials testing equipment used primarily in the fields of impact testing and polymer melt rheology. The company's machines are used to test the properties of materials, components and assemblies, within a wide range of industries including aerospace, polymer processing, automotive, academic research and steel production.

The use of higher grade steels in oil and gas pipeline construction is creating the need for a new generation of specialist impact testers. Imatek offers a range of drop weight tear testers (DWTT) for measuring the fracture characteristics of steel specimens according to API recommended practice 5L3, EN 10274 and ASTM-E 436.

Steel grades of X120 and specimens of up to 50mm can be accommodated.

A major feature of the Imatek range is the instrumentation and analysis software that provides high quality information, both graphical and tabular, for the specimen failure. Historically the DWTT test method has not required instrumentation, but recent research indicates that it is of significant benefit when testing the tougher x-steels. Instrumentation enables crack initiation and, most importantly, propagation energies for the specimen to be determined which is considered a better measure of 'in-use' performance for these steels.

Imatek also offers an integrated high-speed video option that enhances understanding of the behaviour of a specimen as it undergoes impact.

Imatek's Integrated High Speed Video system uses its C3008 data acquisition system to combine signals recorded during a test event together with high-speed video imagery, all under the control of the ImpAcqt software. Since the camera and the data acquisition share the same trigger, data points and images can be precisely correlated.

A video sequence provides qualitative information about the test event, and the software also allows quantitative information to be extracted.

Integrated high-speed video offers an advantage in many application areas and is available as an option for any of the Imatek range of impact testers or in a stand-alone mode, making it a general purpose tool that can be utilised by other parts of a user's operation. The system is already proving useful in the testing of steel tensile specimens at high rate, enabling detailed analysis for the deformation of the specimen gauge length to be undertaken.

**Imatek Ltd – UK**  
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Imatek offers a range of drop weight tear testers

Test specimens



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# Tube Products INTERNATIONAL

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- PVC, PE and XLPE Tubes
- Structural Tubes (inc. HSS)

### January 2011

- OCTG & Pipeline Products
- Profile Materials for Tube Making
- Show Feature: Boru 2011



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## In-line gauges for diameter, ovality and shape

FOLLOWING new developments in high-tech laser optics, Zumbach Electronic has introduced the new Odac 550 laser scanner with HLF (high-accuracy large field) technology. This technology allows the generation of a highly collimated and accurate measuring field of 550mm (22") without any dead zone. It also means that the tube position in the field has no effect on the readings.



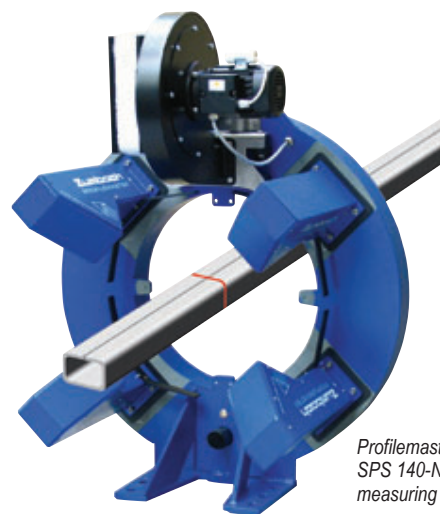
Steelmaster SMO 550 measuring unit

Single axis or multiple axis systems are available, in both static and oscillating configuration, applicable for hot or cold processes. Applications cover solutions for quality control (NDT) in cold status to hot processes like MPM sizing mills, SRM mills, conveyors, pilger mills, piercing mills, radial forges and extrusion presses. The sophisticated protection/cooling system ensures reliable operation and minimal maintenance.

Other highlights include CSS (calibrated single scan) technology, 1,000 true measurements/s, mach 3 scan speed (meaning no dynamic errors), accuracies to within a few hundredths of a millimetre, and EPM method/software for polygonal deviations.

Zumbach also produces Profilemaster® systems, based on the latest technology, with laser contouring and CCD camera vision and processing. The systems capture the full product circumference/section and measure and monitor the relevant profile dimensions, angles and radii.

The range of Profilemaster gauges includes versions for small precision profiles starting from a dimension of 2mm (0.08"), cold formed tubes and profiles, as well as medium size products, hot or cold, up to



Profilemaster SPS 140-N4 measuring unit

dimensions of approximately 250mm (10").

Depending on the process, maximum product temperature and size range, a number of standard models are available. Special systems are conceived and built upon specific request.

Features include the latest 'light cut' technology; modular design with one to six laser/camera modules, depending on the type of profiles; fully static system; easy 'teach-in' from CAD product files; integrated protection and air cleaning system; and close-to-zero maintenance, with no wear parts.

**Zumbach Electronic AG** – Switzerland  
Email: sales@zumbach.ch  
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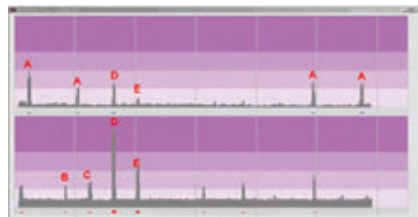
## Improved test results for seamless and welded steel tubes

INSTITUT Dr Foerster provides a comprehensive product range for non-destructive testing, metal detection and magnetics. The worldwide presence of the group of companies provides local qualified support.

Rotomat is the company's solution for detecting longitudinally oriented inner and outer defects for oil field and boiler tubes with test material diameter from 20 to 520mm.

Test results:

- |                              |                                |
|------------------------------|--------------------------------|
| A represents 5% outer defect | D represents 3.2mm Ø bore hole |
| B represents 6% inner defect | E represents 1.6mm Ø bore hole |
| C represents 8% inner defect |                                |



The pole shoes are the precondition of magnetic flux leakage testing with rotating probe to obtain an optimum magnetic flux within the test material. A new generation of pole shoes in the Rotomat sensor system improves the test results.

Quick and simple set-up is possible, because the new pole shoes are mechanically compatible with the existing ones. A steel tube with 406mm diameter and a wall thickness of 13mm is used as test material. Several artificial 5% outer defects with different length and width, two inner defects with 6% and 8%, as well as two bore holes with 1.6mm and 3.2mm diameter are inserted. The improved results are shown in the following result window of Rotomat DS test electronics.

**Institut Dr Foerster** – Germany  
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# EXTRUSION, DRAWING & REDUCING



As with most mature and perfected technologies, the reductive processes of tube and pipe manufacture are dependable. Whether the project calls for pushing, as in extrusion, or pulling, as in drawing, the customer of a modern mill, no less than its operator, confidently expects a sound, flawless product. Reproducibly excellent results are taken very much for granted.

This is fairly remarkable, given the number and variety of requirements that tubing or pipe from a typical production run must satisfy. It must be exact as to tolerances; strong and corrosion-resistant, internally and externally; immune to galvanic or electrolytic attack; receptive to finishing and coating processes; cost-effective, maintenance-free, environmentally robust during rated life in service; and more.

It is much to ask of tube extrusion, drawing, and reducing – methods which, in contrast with compressive processes, do not increase density but rather subtract from it. Even so, that the demands will be met, time after time, is taken for granted. The suppliers whose products and services are reviewed here would not have it any other way.



## Boston Matthews introduces new extrusion line for automotive fuel lines

A COMBINATION of over 50 years of extrusion line manufacturing experience together with the incorporation of the latest technology has produced an extrusion line to meet with high demands for quality and performance associated with manufacturing components for the automotive industry. The line is capable of producing fuel lines in accordance with the known automotive industry standards including tube structures, tolerances and polymers (PA, PVDF, PBT, ETFE, EVOH, etc)

In addition to producing the necessary accuracy and performance to meet the quality levels required, the new line from Boston Matthews provides manufacturers with such features that allow them to remain competitive in today's global market. These include complete production flexibility; fast set-up and change-over; energy efficient operation; quick and easy maintenance; and product traceability.

Advanced screw design, AC vector and direct-drive technology ensure precision accuracy and maximum energy efficiency at all times as well as providing a clean extrusion operation with maintenance reduced to an absolute minimum.

Precision accurate and easy to adjust vacuum calibration and cooling systems ensure the tube is produced to the exact tolerance specification required and with a high quality surface finish. AC flux vector caterpillar haul-off and servo-cutting ensure

precision accurate, clean, swarfless cut lengths are continuously produced. If the fuel lines are required to be coiled then a choice of semi-automatic and fully automatic winding systems are available to meet the exact requirements of the production operation.

Understanding the pressures faced by today's manufacturers Boston Matthews have designed the line so that any routine maintenance required can be quickly and easily undertaken by the operator without the need for dedicated maintenance personnel. This not only reduces (and in some cases eliminates) the need for dedicated maintenance personnel, it ensures the line is only out of production for a minimum amount of time. Sales director Simon Brookes states "The design philosophy behind all Boston Matthews extrusion lines is to satisfy the production demands faced by our customers today and at the centre of that is the ability to be completely flexible and maintain performance at all times."

Boston Matthews Helix Die Head Technology has many essential advantages over 'alternative' die head design including the ability to produce mono and multi-layer fuel lines on the same line without any disruption and therefore allowing the manufacturer to benefit from complete production flexibility. Material change over or die head cleaning is very fast

and non-complex and can be undertaken completely in-house and therefore remains under the complete control of the fuel line manufacturer.

Automatic Laser Diameter Control Measuring System further ensures tube specification is always adhered to as well as providing assistance during line start-up.

Complete PLC control through the SMART system is also available with the Automotive Fuel Line. The SMART colour touch-screen control system allows for simple line operation and quick start-up as well as providing essential tools for the tube manufacturer's management. Password protection ensures line settings and production security is always controlled and maintained. Production data, including all process variables, is fully accessible and transferable through a variety of means including Ethernet and modem. This allows for production data to be used for product quality analysis, traceability and efficiency reports.

Simon Brookes states, "The Smart control system provides the manufacturer with the means to control the extrusion operation as well as the ability to access a large amount of data if required."

**Boston Matthews – UK**

Fax: +44 1905 763101

Email: [sales@bostonmatthews.co.uk](mailto:sales@bostonmatthews.co.uk)

Website: [www.bostonmatthews.com](http://www.bostonmatthews.com)

## Excellence in die technology

BALLOFFET, France, is one of the largest worldwide manufacturers of a complete range of diamond dies. The company claims to ensure higher productivity, lower maintenance cost, high-quality surface conditions, diameter accuracy, and optimum technical characteristics of tube/pipe and wire/cable.

To manufacture tubes on a bullblock, the company advises the use of diamond dies to guarantee consistency of the tube's final diameter. When manufacturing on drawbenches and wire drawing machines, PCD dies are used for a longer die life and a better return on investment.

The Balloffet range includes natural diamond dies from 6µ to 2.5mm, mono-crystalline dies from 6µ to 0.5mm, and poly-crystalline (PCD) dies from 50µ to 28mm. The company also provides compacting,

stranding and special shape dies, together with extrusion tooling (guides and dies), and polishing machines and equipment.

The ISO 9001-2000 company offers a range of services including repolishing, training of operators/technicians at Balloffet or at the customer's plant. Balloffet is a forerunner in manufacturing innovation (drilling, forming, sizing, polishing), and expert product control.

Established in 1870, the company has several subsidiaries: Balloffet Die Corporation USA (since 1904), BDWD UK (since 1925), Balloffet GmbH (since 1996), and a worldwide network of agents.

**Balloffet – France**

Fax: +33 4 74 35 79 01

Email: [balloffet@balloffetdie.com](mailto:balloffet@balloffetdie.com)

Website: [www.balloffetdie.com](http://www.balloffetdie.com)



*Balloffet manufactures a range of dies, including PCD dies and diamond dies*

## Innovative PVC foam-core pipeline delivers impressive performance

RAW material costs can account for as much as 90% of the manufacturing cost of plastic pipe. Targeting the cost-saving potential in this area, KraussMaffei Berstorff has made it a high priority to develop

machines and systems that reduce raw material consumption while maintaining highest pipe quality.

KMB's foam-core pipehead series is headed by two twin-screw extruders



*KraussMaffei Berstorff has recently supplied this complete extrusion line for PVC foam-core pipe to a Russian customer*

## Die-head developments

IN order to keep up with sky-rocket performances of latest generation extruders, Tecnomatic has extended its range of die-heads for the production of PE and PP pipes by introducing the new Venus series, improved mostly in the dynamics of flows in order to reduce the thermal stress of material thanks to 40% lower pressure and the optimization of the temperature trend inside the die-head. Model 500.16-160 (the first of the currently available three die-head models, suitable for pipes with max. diameter 630mm) is currently being tested at a firm producing HDPE pipes (63mm diameter) for gas transport. The development of these die-heads also meets specific needs such as an increasingly extended range of processable materials as well as fields of application ranging from the above-mentioned water networks to telecommunications.

The new distributor of reduced dimensions allows producing pipes having a bigger diameter than the distributor itself. Concerning this last feature, the die-head has been shortened by 50% and allows producing three pipe sizes with one die-set. Die-sets, on their turn, have been redesigned too in order to allow the user for a quick size change with reduced downtime.

Model 500.16-160 is able to produce pipes ranging from 10 to 160mm with throughput up to 500kg, whereas models 800.16-160 and 1200.50-630 are suitable respectively for diameters from 20 to 400mm and from 50 to 630mm, with max. respective throughput of 800 and 1,200kg/h.

**Tecnomatic Srl** – Italy  
Fax: +39 035 311286  
Website: [www.tecnomaticsrl.net](http://www.tecnomaticsrl.net)

(KMD 90-36 B/R and KMD 75-36 B/R) plus a completely reengineered multilayer pipehead (KM 3 LRK 43). The line can produce PVC foamcore pipe with 400mm diameter and 11.7mm wall thickness at a rate of 900 to 1,000kg per hour.

Foaming reduces the density of the pipe's core layer to as little as 0.6kg per cubic decimetre. This has the effect of reducing the total density of the 3-layer pipe by up to 30% – with proportionate savings in material costs. A typical application for PVC foam-core pipe is pressureless wastewater pipe.

KraussMaffei is world market leader in machines and systems for plastics and rubber processing. With its three divisions – injection moulding technology, extrusion technology and reaction process machinery – KraussMaffei is a premium partner for the plastics and rubber processing industries worldwide.

**KraussMaffei Technologies GmbH** – Germany  
Fax: +49 89 8899 3092  
Email: [matthias.andreesen@kraussmaffei.com](mailto:matthias.andreesen@kraussmaffei.com)  
Website: [www.kraussmaffei.com](http://www.kraussmaffei.com)

## De-burr aluminium extrusions

KENT Corporation has a new Burrmaster de-burring machine designed for de-burring the cut ends of aluminium extrusions. The new model 2-ex can de-burr a wide range of profiles, with lengths from 10" to 12ft (250mm to 3,657mm). The machine uses a special nylon grit cup brush that is specifically designed for de-burring aluminium extrusions.

The machine is capable of de-burring both ends of an aluminium extrusion at a range of up to 2,700 parts per hour depending on size and burr condition.

The set up and changeover from one profile to another is very quick and easy. This machine will compliment a full range of Burrmaster machines from manual to automatic with sizes from 1/8" to 7" OD (3mm to 178mm) and 1" to 76ft long (25mm to 23,164mm). Single ended automatic de-burring machines are also available.

**Kent Corporation** – USA  
Fax: +1 440 237 5368  
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这一栏目专为我们的中文读者介绍国际管道行业的最新技术和行业新闻的综合信息。

我们期待着在展会上与您相见。

## PE 100 SPC RC-Line管道在辛普朗山口遇到了恶劣条件

由于位于南北中轴线上，辛普朗山口(瑞士)是连接德国到意大利的交通要道之一。A9这部分，长度为42.5千米，位于瑞士布里格与意大利Gondo之间，海拔超过2000米。为了解决较高的交通流量，这条道路分别在20世纪70年代和80年代被加宽了。一年有850,000辆车通过，其中10%是卡车。

由于极端的环境影响和对水需求的增加，现有的消防和供应管线必须被更新。在辛普朗山口，位于Bergalpe-Brig地区和A9国道上的旧铸铁管道(d 90mm)将被替换成现代塑料管道。在这一海拔高度的土壤是非常贫瘠和多石的。至于新压力管线铺设沟槽，不过，运输细砂垫层材料到这种高度在经济上是不可行的。因此，Debrunner Acifer AG Visp，作为安装公司Reinhard Heinzen供应商，对新的压力管道要求特别高：好的耐磨性；高耐应力开裂性；良好的耐集中荷载性(如石头、碎片等)；开挖土壤作为回填料材料以及高耐慢裂生长性。

得到SVGW和DVGW认证的Simona PE 100 SPC RC-Line饮用水管满足所有规定要求。这种多层管道由高耐裂性PE 100制成的内管以及由改性聚丙烯制成的保护套(Simona PP Protect)组成。管道表面提供由于石头和碎片造成的危险的刻痕保护和开裂保护。甚至当承载后续服务荷载时，很深的裂缝也不能到达管道内部。

运输到场的The individual管道由Reinhard Heinzen当场焊接组成60米管队，然后通过一架直升机飞抵预定位置。共铺设了3000米Simona PE 100 SPC RC-Line饮用水管(直径为200-250mm)。为了保持施工阶段水供应，安装了PE 100临时管。

**Simona AG – 瑞士**  
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崎岖的地形需要提供最大的性能保护的管道

## King-Mazon与Pines达成战略合作

KING-MAZON宣布已成功生产出了世界上最大的数控冷弯管机，该机最大可处理外径325毫米壁厚27毫米的管道。King Mazon在中国和德国的研发中心有助于成功交付，并致力于重型弯管机研究。King-Mazon的重型弯管机是专门开发用于需要弯制大直径厚壁管道的造船和石化行业。King-Mazon 数控重型弯管机采用了以个人电脑为平台的工业计算机，利用伺服电机控制进料、回转角度和刀具更换。它还有一个三维仿真功能和干扰检查功能。

2009年，King-Mazon与PINES Technology在美国签署了首次相互合作的协议。他们将一起分享技术和

市场。Pines将得到King-Mazon对重型弯管机的支持，而King-Mazon将得到Pines对用于飞机和国防市场的高精度弯管机的支持。欲了解更多关于合作关系和King Mazon的产品信息，请与我们联系：

**King-Mazon Machinery Co Ltd – 中国**  
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网址: www.king-mazon.com

**Pines Technology – 美国**  
传真: +1 440 835 5556  
电子邮件: ksnyder@pinestech.com  
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## Multi-Cut MC3切管机

LINSINGER Multi-Cut有三个安装在一个旋转架上的小直径圆盘锯。管子被定位并夹紧。当架子旋转120°时，这三个圆盘锯切入管道。

非常短的循环时间增加了一流钢管厂的生产效能。设计稳健的控制系统使每个锯片可以单独作业，还能够实现不间断生产，即使是在部分刀具破损的情况下。这一特征可以减少自动停工，使用两个锯片和架子旋转240°，使生产能继续进行而不中断。

传统大直径锯片在整个寿命期的更新费用比最初机器投资高出很多倍。较小的Linsinger Multi-Cut锯片省钱的潜力远远超过机器增加的投资费用。比如，用于直径150 - 660毫米范围内的钢管，一个Multi-Cut锯片的更新费用比传统大直径锯片的更新费用低15倍。

Linsinger Multi-Cut MC3使用较小的锯片直径以及更高的锯片硬度，能够大大提高锯片使用寿命。与传统大直径锯机相比，由此生产的额外节约的运行成本使投资回收期减少到2到3年。

Linsinger首席执行官 Hans Knoll说：“Multi-Cut是一种非常低成本的解决方案。即使有其他人会免费出卖传统的锯切机，但Linsinger Multi-Cut提供的节省潜力被证明是更有吸引力的。Multi-Cut技术不仅操作便宜，并且也被得到很好的证明，这是源自管道飞切专业技术的启发”。

**Linsinger Maschinenbau GmbH – 奥地利**  
传真: +43 7613 8840 951  
电子邮件: maschinenbau@linsinger.com  
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## 使用新的轨道砂光机和气动模具磨床实现更好的控制



气动模具磨床以及一系列附件

3M的研磨系统分部提供一系列完整的气动工具，用于切割、研磨、混合和精加工。公司新的两手操作的随机轨道砂光机可以提高需要额外力量和功率应用方面的处理和韧性。设计用来与3M公司Hookit研磨纤维盘一起使用，该砂光机供应时立即可用，并带一个低糙度的支撑垫，可提供顺畅连续的精加工以及给操作者带来更舒适的感觉。它具有带或不带可移动侧手把或使用推荐用来减少震动的把手的两手操作功能。该砂光机9.5毫米的轨道可提供快速和有效操作。

与3M公司Hookit Disc 255P配对的该砂光机可用于对喷漆的硬质或软质木材、油漆、固体表面材料以及金属的中间的和最后的砂光。使用3M Hookit Disc 245，该砂光机可以进行研光、轻微的去毛刺，以及适用于木料、金属、油漆、填料和塑料。

3M研磨系统系列还增加了一系列新的气动模具磨床。该系列有两种发动机供选择，并设计用来与3M公司磨料磨具及附件一起使用。

使用于所有应用中的该系列包括四种型号，有一个强大的1HP高扭矩气动电机以及一个8,000、12,000、

18,000以及20,000的最大转速选择。为了更加方便，还提供三个较小型号的带0.5 HP电机的磨研机。

凭借紧凑的设计，该模具研磨机有内置安全装置，包括可调节的排气装置，使气流可以在任何首选方向直接远离操作者。以最小的投入获得一个安全的控制，该磨床用3M Greptile夹持材料加工完成。

与3M公司Scotch-Brite Radial Bristle Type C-RB-ZB一起，该气动磨床适合金属、木材、塑料和复合材料有极端顺应性需要的清理、精加工和去除毛刺等方面的应用。与Roloc+ Cut and Polish Flap Brush PF-ZR一起，该磨床可用于木材和金属表面，可以为使用该机器部分的较大部件进行研光以及轻微的去毛刺。

英国分部是除美国以外3M最大的子公司之一。在英国生产的产品包括砂纸、职业健康和环境安全的设备、胶带、工业微生物产品、药物传输系统、高性能涂料、安全文件和护照扫描仪。

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电子邮件: [aparris@mmm.com](mailto:aparris@mmm.com)  
网址: [www.3m.co.uk](http://www.3m.co.uk)

## 感应高频焊接

高频感应焊接方式是生产从几毫米到26英寸直径、壁厚25毫米的黑色和有色金属管的关键工艺技术，应用范围广泛。由于管轧厂的产品范围有所增加，灵活焊接系统就显得越来越重要。SMS Elotherm焊机可容纳范围广的新材料及其合金元件，尤其是各种尺寸的高强度钢和不锈钢。通过对系统参数和焊接频率进行最佳配置，感应焊机生产的焊缝质量高、值得信赖。焊缝质量取决于各种参数，包括材料质量、材料配备、焊接角度、磁棒(铁素体质量)和频率。考虑到对焊缝质量的频率影响，对于小钢管和薄壁管一般而言选择较高频率。对于壁厚大于4毫米的，选择低于

150KHz的较低频率。所需impeder系统将电流集中到钢带边缘，从而提高了焊接过程的效率。该磁棒的直径和长度都能满足给定的管尺寸，尽量达到最大饱和磁通密度值和最高振幅磁导率。

SMS Elotherm作为感应系统供应商有70多年经验，应用于管材行业多个领域。为了帮助管材制造商提高其能源效率，SMS Elotherm开发和建造了最先进的感应系统转换器(电源)。

**SMS Elotherm GmbH - 德国**

传真: +49 2191 891 726  
电子邮件: [info@sms-elotherm.de](mailto:info@sms-elotherm.de)  
网址: [www.sms-elotherm.de](http://www.sms-elotherm.de)

## 固态高频焊机

EMMEDI是SAET集团旗下的管材公司，专营感应焊接和退火处理工艺。该公司的MosWeld是一种固态高频焊机，功率大小从100到1000千瓦都可用，输出频率从150至450k赫兹。

MosWeld设计紧凑、牢靠，使用很高效率的MOSFET逆变器模块。使用的标准功率元件都不过时，它维护方便、性能持久，有专门的远程故障诊断系统，简单的感应器线圈设计，可过程跟踪。

**Emmedi - 意大利**

传真: +39 011 9974328  
电子邮件: [info@saetgroup.com](mailto:info@saetgroup.com)  
网址: [www.saetgroup.com](http://www.saetgroup.com)

## 无缝管设备

TAIYUAN Tongze Heavy Industry Co Ltd (TZCE) 设计和制造无缝管生产设备并为中国主要钢管厂提供了100多套设备。

TZCE成立于2001年8月，公司的设计中心是山西省省级技术中心。它配备了13个技术办公室和8个子公司，公司有480人，260个工程师和技术人员以及16名高级工程师。它拥有116项专利，其中35项发明专利和81项的创新专利。

其产品主要用于生产高等级石油管、核电管、超临界高压锅炉管、高压容器管、壁厚管和大直径薄壁管。这些包括保留在MPM连轧生产线的芯棒、锥形钻孔器、阿塞耳轧管机、精密轧管机、轧机、张力减径机/定径机、矫直机、型钢矫正机、长度测量生产线、重量测量和标识、较大尺寸无缝管挤出机、其他锻造设备以及很多技术设备电气自动控制系统。

TZCE作为一个专业的团队，专门设计和组装电动、液压、润滑、机械处理系统。在中国，它有一个最大的组装车间，专用于管道设备组装，以及最大的5500\*6000\*18000毫米数字桥式铣床。

TZCE制作了28套圆锥型钻孔器，36套三辊张力减径机/定径机，27台六辊矫直机、5条管道连轧机生产线以及11套管轧机。其产品在中国20个省市和地区畅销，并成功地出口到国际市场。

**Taiyuan Tongze Heavy Industry Co Ltd - 中国**

传真: +86 35178 52106  
电子邮件: [tongze@163.com](mailto:tongze@163.com)  
网址: [www.tzce.com](http://www.tzce.com)



## 法国汽车制造商授予 TruDisk 盘形激光器重要合同

根据最近宣布的与Trumpf的一项协议，在接下来的两年中，PSA Peugeot Citroën将为其生产基地装备额外的下一代TruDisk盘形激光器。

法国汽车制造商已经要求Trumpf供应来自其TruDisk系列，具有一系列产出水平和光束质量的盘形激光器。PSA目前将有以两位数计算的一些TruDisk激光器，用于其各种型号车辆上的车体部件的焊接。

PSA使用盘形激光器进行车身结构焊接已有很多年了。该公司给予订单是由于TruDisk的低操作和低投资成本以及生产的高度实用性。

Trumpf – 美国

网址: [www.us.trumpf.com](http://www.us.trumpf.com)

## 管端加工

EMAG的USC 11 / 21系列管端加工机可为各种类型螺纹加工提供量身定做的解决方案。这些一流的加工机床可以在OCTG元件上加工各种螺纹，不管是国际标准(API, GOST)的或专有标准的。USC系列最显著的特征是其坚实的机械构造。所有机械组件机械性能都非常稳定，这是因为机械底座是Mineralit®（聚合物花岗岩）的缘故。所有内部和外部的加工操作都可由一台机器完成。这一理念使得USC可以完成所有符合API和GOST标准以及专有标准常见螺纹的加工。

钢管加工中心的主轴动力构成主轴部件的主要组成部分以确保高功率和扭矩值。直接驱动由一个高速、频率控制和免维护交流异步主轴电机组成。钢管被安全地夹在气动、液压或机械操作的夹头前端和尾部。最新的两种平台转台，都在复式刀架上运行，可确保加工操作精度最高。每个转台有四个刀具站可以配备各种不同的刀具系统。转台更换刀架含有外圆和内圆车刀。机座的垂直设计以及大尺寸的切削输送机可以确保畅通的切削流。钢管内径和外径可通过带自动定心夹具的定心装置对中。在加工管道内部的过程中，可以自动密封防止碎片和冷却剂的侵入。加工薄壁管的固定式或可拆卸式阻尼芯棒可以选择使用。

EMAG Gruppen-Vertriebs- und Service GmbH – 德国

传真: +49 7162 17199

电子邮件: [jchristoph@emag.de](mailto:jchristoph@emag.de)

网址: [www.emag.com](http://www.emag.com)

## 来自印度的研磨抛光机

GRIND Master生产一系列从固定垂直砂带的低成本LMCL型到用于不锈钢管、硬铬棒材和液压缸制造物的复杂的FH系列的无心机。提供各种型号重型研磨和高切削加工机器，用于达到0.05微米Ra的超精加工应用。机器是模块化的并可以进行配置以适应不同需要。Grind Master的全自动多头机，用于直径150毫米长6米圆管的细微加工以及镜面抛光，有多达16个的抛光头，自动装卸机以及液体抛光剂喷雾系统。本机可设置达20m/min的进给率。

该机器有两种类型的抛光头：从顶部气动操作的横向抛光头以及与之垂直的纵向抛光头。有了这两个头的组合，用户可以实现高品质的镜面抛光。抛光头还提供机轮磨损自动补偿。

公司还提供自动抛光机用于方形管和矩形管的细微加工和镜面抛

光。这种有输送设备的机器有14个抛光头以及高达14米/分的生产量。抛光头有机动上/下调整功能以及砂轮磨损自动补偿。叶提供轮振动，以实现更好的加工效果，液体抛光剂喷淋系统和冷却系统也包括在内。抛光轮有150毫米宽，可以使较小尺寸的各种钢管一起抛光。

Grind Master的输送带式研磨机，用于不锈钢扁钢和方钢除锈和加工，并由两个可同时作业的带式磨头组成，一个在顶部一个在侧面。这使得棒材可以从四个方向分两步完成。该机器有一个浮动带式磨头可以确保一致的研磨加工质量，并可用于干磨或湿磨。

Grind Master Machines Pvt Ltd – 印度

传真: +91 240 2376205

电子邮件: [sales@grindmaster.co.in](mailto:sales@grindmaster.co.in)

网址: [www.grindmaster.co.in](http://www.grindmaster.co.in)

## SIKORA AG将其在不来梅的总部扩建到三层

为响应过去几年来业务的积极发展，Sikora AG扩大其设在德国不来梅的总部。随着将现有的三栋建筑之一扩建三层，公司为未来的发展提供了更多的空间。

预计2010年春天开始施工。2007年，Sikora增加了一座新的研究、开发和服务楼，从而扩大了总部。该新的办公楼目前将扩建三层。Sikora寻求在国际市场进一步增长的机会，因此这座新楼将用来支持这一

增长。特别是在新兴市场中，供电网的扩展是广阔的，Sikora预测到这是一个强劲的增长。目前，Sikora拥有600多个用于电力电缆生产的X射线测量系统，并且在全球都有安装。

Sikora AG – 德国

传真: +49 42148 90090

电子邮件: [sales@sikora.net](mailto:sales@sikora.net)

网址: [www.sikora.net](http://www.sikora.net)

## 完整系列的管道和管接头精加工设备

A Park-Ohio Company, PMC-Colinet公司设计和制造一套完整系列的管道和管接头精加工设备，并提供辅助服务。其机械设计优化了石油管材生成，符合全球行业标准；最显著的是API和特殊螺纹接头。它还建造全套的端面精加工机，用于商业市场，如气管/水管和导管。

PMC-Colinet提供旋转产品和旋转刀具技术。其应用小组分析客户的产品组合并推荐最合适的技术。由于特殊螺纹接头生产的不断增加，将全部技术组合起来是最好的解决方案。

PMC-Colinet设计的准确的滚压设备，以其经久耐用、使用寿命长、并能为端面精加工过程每一步提供一流的设备而著名。管子和管接头切割机、磨边机、管子和管接头螺纹机、管接头起动机和管接头起动机和推动机、短程或全长(芯轴型)钻孔机、护

套填充机和物料运输平台。它的最新一代旋转刀具、数控机床、管道螺纹机有两个独立控制的x轴，以更大的灵活性完成端面几何构型。双轴设计还可降低对工具耐用性的要求。这些螺纹机可编程执行修面和磨边操作，这样加工生产线就不需要单独的磨边机。

PMC-Colinet最近开发了一种旋转产品，管接头切割和外径车床。它将管接头转换成可以车削并切割成展开长度，使其可以喂入包含旋转产品或旋转工具管接头螺纹机的制造单元。PMC-Colinet是生产过程中设备和耐用以及易损工具的唯一来源。我们的硬质合金和高速钢螺纹梳刀生成符合全世界工业标准的螺纹。

PMC-Colinet – 美国

电子邮件: [sales@pmc-colinet.com](mailto:sales@pmc-colinet.com)

网址: [www.pmc-colinet.com](http://www.pmc-colinet.com)

## 管道内毛刺清理和波纹轧辊系统

KENT Corporation已成为全球Phoenix Tool独家经销商,提供公司的全套管道内毛刺清理和波纹轧辊系统。Phoenix设计据说功能很多并且方便调节和设置。

新的高等级材料允许更长时间的加工。Kent能够提供改型的刀杆和芯棒,几乎可以和所有制造商的内径芯棒一起使用。这样可以省钱,通过转换至更标准更便宜的环刀。

Kent也推出了一种新的Tube Scrap Chopper。最初的设计是为了最大直径为2"和3"的管道。这个重型的稳健

的飞轮设计有单独的材料供给和多侧面刀片,使用寿命更长。

通过切碎报废管,用户可以节省紧张的地面空间。一个垃圾站能占用切碎废料多达三倍的空间。运输和装卸成本也减少了,公司声称一些废料经销商将为这些废料多支付30%或更多的费用。

**Kent Corporation – 美国**

传真: +1 440 237 5368

电子邮件: sales@kenttesgo.com

网址: www.kenttesgo.com

## 全球工艺改善工厂效率

AXXAIR 专营轨道切割、坡口和焊接设备,已经推出了全球化进程方案,为焊缝清理、生产设施管道车间和现场施工提供了完整的解决方案,目前主要应用于食品加工、制药、半导体、石化和化工行业。

AXXAIR单机有三种应用:从管制备(切口、斜面)至轨道焊接(焊接和在线预制)。

AXXAIR声称的全球工艺实施和使用起来经济、简单,提高了生产效率和工作效率。它可通过发电机里的综合记忆卡全面实现焊缝追踪。

作为其创新和产品分化战略的一部分,该公司定期开发新产品,最

近的轨道焊接产品丰富,拥有新的头部封闭式SATF - 40ND,以及新的头部开放式SATO - 220,冲程单元/振荡器安装在SATO(焊接线)和SC(预制焊接机)上。

该公司目前通过在韩国和中国的贸易分公司,设在德国和西班牙的办事处,或者合作伙伴网络渠道在30多个国家发展业务。AXXAIR还称他们应客户要求为其提供可行性研究、样品、培训和售后服务。

**AXXAIR – 法国**

传真: +33 475 575 080

网址: www.axxair.com

## 管道施工用刷

德国LESSMANN生产用于工件和表面清理和处理的技术刷。其主要应用领域是管道施工用刷。

例如用于去除切割边毛刺的Lessmann刷。使用该刷子可以完全去除管端的毛刺或达到一个指定的圆度。可以很经济地去除管道切割边的毛刺。这些刷子是唯一可以达到管道内部和外部边缘的工具,并且处理它们只需要一步就能完成。下一步是手工处理切割边,像使用刷子在磨床工作台上去除毛刺一样,就是很平常地使用滚筒刷在自动去除毛刺装置里达到高质量的处理。

钢材制作的管道通常要用钢丝刷处理,对于不锈钢材料、有色金属或黄铜管,要优先使用不锈钢材料或磨料尼龙填充材料。

另一个典型应用是清理管线焊缝。必须清理焊缝焊渣和残留,这样多层焊接焊缝的下层焊缝可以被很好的完成焊接。借着干净的焊缝,可以立即发现先前的焊接过程

里的误差或错误并且立即进行纠正。

在此应用中通常使用高强度钢丝制成的曲丝轮刷,因为他们工作效率高并能节省时间。

用于输送原油管线时,油是被加热的。加热引起固体石蜡从原油中以及管道内部末端中分离出来。

必须定期检查钢管有无裂纹,因此固体石蜡和其他残留物必须清除。同样为了达到钢管稳定的高性能,有一个清洁的表面是很重要的。

相对于用化学品清除管道内部石蜡的解决方案,用刷子清理是非常环保的。没有在清理后必须处理的化学废弃堆积物,生态问题也是可以避免的。

**Lessmann GmbH**

– 德国

传真: +49 9082 70778

电子邮件: info@lessmann.com

网址: www.lessmann.com

## 在China Bluestar International的埋弧炉

德国SMS Siemag为China Bluestar International Chemical Co Ltd成功安装两台埋弧炉。2009年中期 SMS Siemag获得合同,向甘肃Yongdeng项目提供埋弧炉。供应范围包括新工厂基础工程和配套设备,六个电极柱的规划、设计和供应,大电流铜线和液压系统。SMS Siemag将协助安装和冶炼调试。

除了每年产20,000吨硅,工厂将供应9000多吨每年细二氧化硅粉尘作为水泥生产一种重要的原料。2004年, SMS Siemag在同一地点已经成功完成两台硅金属炉的现代化。

China Bluestar International Chemical Co Ltd是中国冶金硅材料制造商,为半导体行业提供更高层次原材料加工。这个过程包括使用碳在埋弧炉里将石英转换成硅。

**SMS Siemag – 德国**

传真: +49 21188 14386

电子邮件:

thilo.sagermann@sms-group.com

网址: www.sms-siemag.com

## 芝加哥地区的管轧厂选择EFD 感应公司的Weldac

EFD 感应公司的两台Weldac 600千瓦高频感应IGBT(绝缘栅双极晶体管)管焊机已交付给芝加哥地区的管轧厂。这两种系统取代现今管轧厂使用的旧真空电子管技术。

管生产商将按行业标准使用EFD感应公司的Weldacs管焊机为客户焊接管。交付的这两种Weldacs都使用接触焊或感应线圈焊接方式。

谈及交货,美国EFD 感应公司的马克安德鲁斯说:“客户选择EFD公司的Weldacs是从焊机的高效率、运行时间性能良好、能得到大力支持多方面考虑的。此外,如今这些客户还表示焊缝质量有所提高。”

EFD感应公司的Weldac 600高频焊接机布局单一,配有自动荷载,定制成套控制让作业十分灵活。将其用于高频开关,为固态高频管焊在电力电子领域提供了最强大的后盾。EFD声称由于Weldac额定功率因子良好、电气效率高以及电流处理能力强,管材生产和质量都有所提高。

**EFD Induction Inc – 美国**

传真: +1 248 658 0701

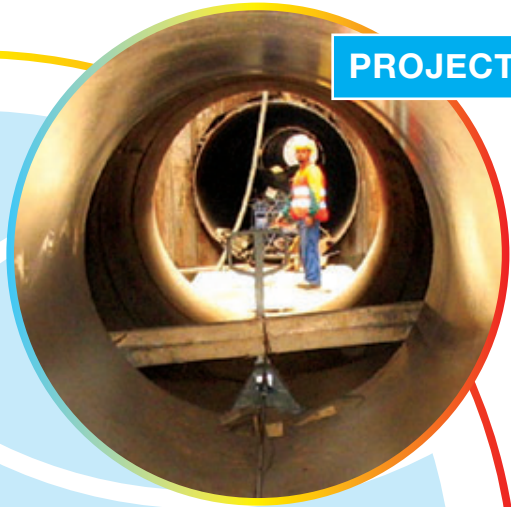
电子邮件: sales@us.efdgroun.net

网址: www.efd-induction.com

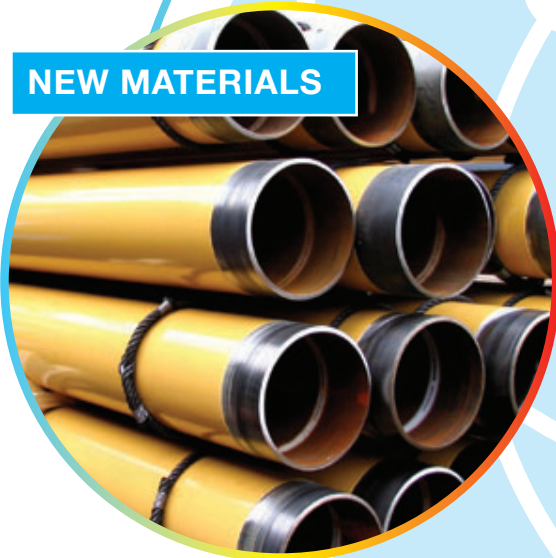


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# New developments in the field of continuous production of corrugated metal hoses

Stefan Weiss – Rosendahl Maschinen GmbH, Austria,

Thomas Hatzenbichler and Bruno Buchmayr, Chair of Metal Forming, Department Product Engineering, University of Leoben, Austria

## Introduction

### Benefits of corrugated tubes

Corrugated metal tubes are a well known alternative to smooth metal tubes or hoses made of plastics for different applications for many years. Using a corrugated design makes it possible to improve these mechanical product properties generally:

- bendability
- flexibility
- form stability
- compression strength

Higher flexibility offers movement in axial, angular and lateral direction as shown in Figure 1. Due to these characteristics corrugated shaped tubes can be used in addition for transportation of fluids and as constructional elements.

Figure 1: Flexibility of corrugated tubes<sup>(1)</sup>

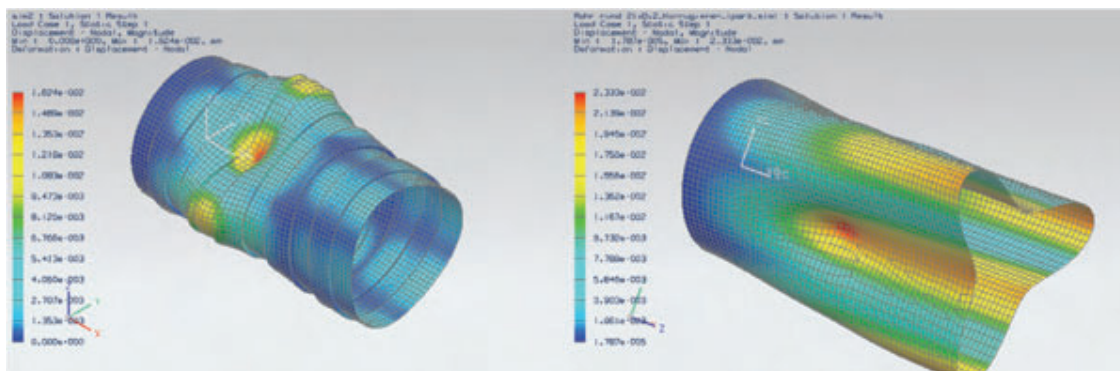
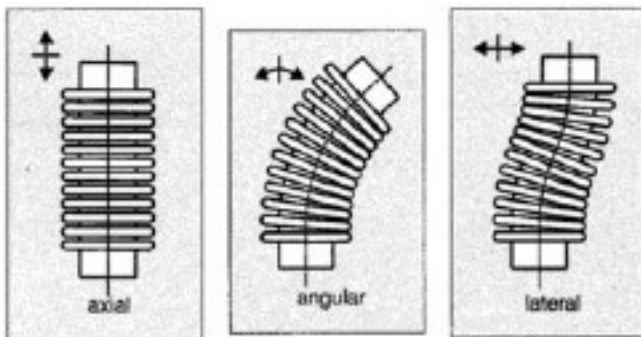


Figure 2:  
Cross pressure  
resistance of  
corrugated tubes

By the time compensators with corrugated shape are wide spread in mechanical engineering. One further application is the use as hoses to protect eg cables against damage due to mechanical forces and as sealing against atmospheric exposure. So, different product properties can be assigned to one constructional element in the sense of value engineering.

Especially for mechanical protection application the cross pressure resistance is a main criterion. The goal is to find an optimum between flexibility and compression strength for hauling. Using a smooth tube the only way to improve bendability is to reduce the wall thickness or change the material which often leads to disadvantages in stability and costs.

Figure 2 shows the elastic deformation of a smooth and a corrugated tube in principle computed in a FE-Simulation with NX Nastran. The main input data for this simulation are:

- tube outer diameter 20mm
- wall thickness 0.2mm
- material AISI 304 (1.4301)
- corrugation depth 1mm<sup>3</sup>

A concentric force of 10N is applied three times from the outside to a smooth and a corrugated tube to show the difference in deformation. Comparing the magnitude of displacement shows a 2.1 times higher value for the smooth tube.

So the cross pressure resistance can be increased in a very pronounced way without losing flexibility. Further on it is possible to reduce the wall thickness which gives a positive effect on costs and weight.



### Production process

Focussing on corrugated tubes for transportation of liquids or gases, it is necessary to subdivide between continuous corrugated metal hoses and metal bellows with short length and special end preparations for connection. Both of them have to be gas or water tight construction. The main difference is the product length. For a corrugated metal hose the needed length goes up to 1,000 metres and even more. So also the manufacturing technology has to be different even for both cases metal forming techniques can be used. The corrugated shape for metal bellows has a limited length and is formed out of a tube section using a tooling from the in- and outside. The outer mould shows the final corrugated shape and from the inside the tube is bulged till there is full contact to the mould. To expand the tube elastic dies or liquids (hydroforming) are used. For the continuous production of an endless corrugated hose it is not possible to work from the inside. So a metal forming process is required, which is able to produce a corrugated tube solely by working at the outside of the smooth tube. Figure 3 gives an overview of a continuous corrugated hose production line.

Base product is a coiled metal strip which is pulled from a reel and forwarded to the forming section. In several steps the flat tape is formed to a tube using bending operations. Afterwards the edges of the formed tube are bonded together using seam welding. The movement of the tube is done by pulling it through the line using a capstan after the forming unit. Afterwards the smooth tube enters the corrugation unit where the wave form is applied. Finally due to the higher flexibility the corrugated tube can be reeled up.

So the forming of a smooth tube and the corrugation process is linked to one manufacturing step. That ensures a continuous production for very long length and reduces time losses due to handling operations.

To do this in an economic way continuous and stable processes must be provided<sup>[2]</sup>. One possibility for this purpose is a corrugator with a free rotating corrugation disk as shown in Figure 4. The main tool of this device is a ring with a specific inner geometry which is positioned under a certain angle relative to the tube's axis. Eccentric rotation of the ring leads to a wobbling motion of the tool. This ensures a continuous and nearly frictionless process, where a corrugator rotation speed up to 8,000 rpm can be realised. Depending on the tool geometry and on the process settings a helical or an annular corrugation can be produced with this process. It is clear from this description that a lot of input parameters have to interact to obtain a stable corrugation process with sufficient results.

Figure 3: Corrugated hose production line<sup>[2]</sup>

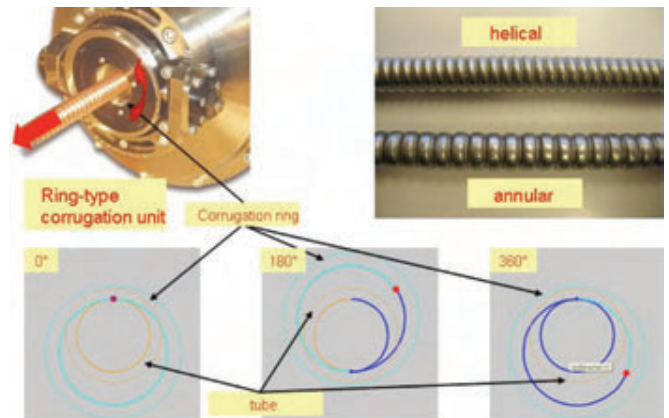
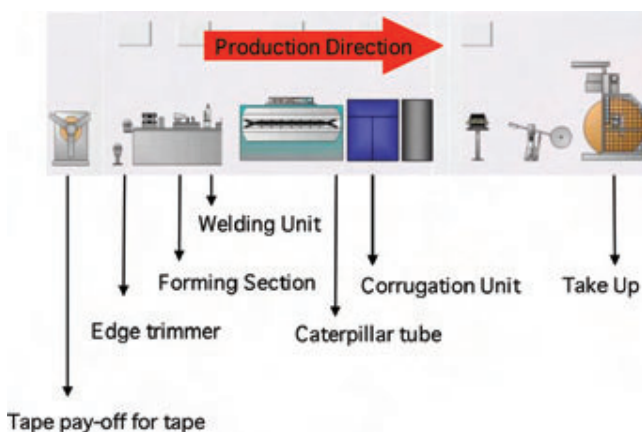


Figure 4: Ring type corrugation process<sup>[3]</sup>

### Demands out of application

Nowadays metal flexible hoses are very widespread in applications which can be summarised as follows:

- Automotive and aircraft industries
- Chimney tubes pipes
- Cryotechnique
- Floor wall heating
- Fuel/oil conduit
- Gas supply line
- Heat exchanger
- Liquid natural gas transfer lines
- Petrol transfer lines
- Solar tubes
- Solar boilers

The needed product properties vary significantly for these applications out of different geometry, material and conditions of use. So for validation whether a manufacturing technology is applicable a robust simulation tool is required. Testing by trial and error is very time consuming and cost intensive because endless hose production is a continuous process. One first step into this direction is to develop a finite element model of the ring-type corrugation process described above and in Figure 4. The main goal is to provide a better understanding of what happens inside the tooling.

For reduction of complexity the examination was focused on flexible hoses for solar application (compare Figure 5). This product with annular type of corrugation is used for connection between solar panel and the storage unit for heated water or for the heat exchanger tubing itself. In general stainless steel is used for corrosion resistant design. The main advantage of using annular flexible hoses for this field of application is the easier installation and end connection. No welding or brazing is needed. The end connection is done by clamping, so the demands for precision in geometry are very high. To ensure proper quality over a lifetime greater 15 years product characteristics (eg bend ability, pressure resistance) are specified by several standards like DIN EN 14585-1<sup>[7]</sup> and DIN EN ISO 10378<sup>[8]</sup>.

Figure 5: Flexible metal hose for solar application



FEM-Modelling and Simulation is done in cooperation with the Chair of Metal Forming in the Department Product Engineering at the University of Leoben in Austria. The simulation model is based on an actual corrugation process to produce an annular corrugated tube for solar application which is performed at Rosendahl Maschinen GmbH in Austria. Verification of simulation results based to trials carried out under different process parameters was a multistep interactive procedure.

## Modelling Strategy

### Software

The corrugation process as described above is performed at high rotation speeds and so it is a highly dynamic process. Furthermore a lot of contact openings and closures will occur during simulation. To handle these problems in a numerical analysis is a challenging task. Usually explicit finite element codes are more appropriate for this kind of simulation than implicit codes. Hence, the commercial finite element software Abaqus/Explicit<sup>[4]</sup> was chosen for modelling and computation of this process.

### Model Parameters

The basic material is a welded smooth tube with an external diameter of 21mm, a wall thickness of 0.18mm and consists of the austenitic stainless steel AISI 316L (1.4404).

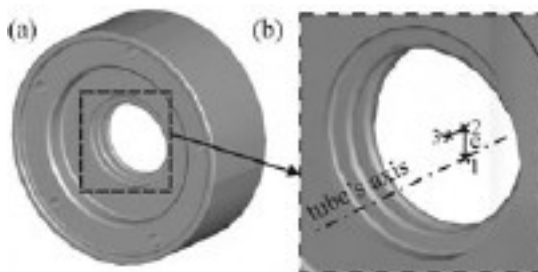
Though the process speed is high, practical experience shows that the increase of temperature due to plastic deformation in the forming zone is not more than 10°C. Hence, the influence of temperature can be neglected and the computation is performed isothermal at room temperature (20°C). Flow curves for the tube's material at room temperature are taken from the work of Feaugas<sup>[5]</sup>.

To obtain sufficient results from a simulation in the field of cold forming it is necessary to use an elastic-plastic material model. So, the Young's modulus for the steel is set to 210,000 MPa and Poisson's ratio to 0.27, respectively.

Non-linear kinematic hardening of the material is set by using the "combined hardening" option in Abaqus to consider the cyclic elasto-plastic behaviour of the steel.

The tool geometry provided from the company partner is shown in Figure 6a. The forming zone of the corrugation disk consists of a hole with a helical shaped engraving. The angle  $\alpha$  between the disk's and the tube's axis is in the range between 1° and 6° (see Figure 7). The eccentricity  $e$  of the tool acc. to Figure 6b lies between 2 and 6mm. The revolution speed for the investigated process is 1,400 to 1,700 rpm and the feed rate is 6.4m/min. In a further simulation the feed rate will be increased up to 7m/min to

**Figure 6:** Geometry of the corrugation disk (a) and forming zone with eccentricity  $e$  regarding to the tube's axis (b)



investigate the influence of the feed rate on the geometry of the corrugated tube. Elastic deflection of the disk is neglected in the simulation. Hence, the corrugation disk is implemented as discrete rigid part. To obtain a stable process an infeed and an outlet bearing must be placed close to the corrugation tool (Figure 8). These two bearings were also assumed to be rigid and implemented as analytical rigid bodies.

The contact zone is not lubricated in the actual process and so a friction factor of  $\mu = 0.1$  has been set for the contact between tool and tube.

### Implementation of the tool motion

One problem in simulating this process is the complex movement of the corrugation disk as described earlier in this work. To realise this complex tool motion in the simulation model the tool is driven by two connectors [4]. Point 1 rotates on the tube's axis and drives the connector, a so called translator, with the fixed length  $e$  between the points 1 and 2 acc. to Figure 6b. The axis between the points 2 and 3 in Figure 6b represents the tool's axis (see Figure 7) and is implemented by a so called "cylindrical connector". With this connector the rotational degree of freedom for the axis between the points 2 and 3 can be released to provide a free rotation about this axis.



**Figure 7:** Tool position regarding to the tube's axis

### Mesh strategy for the tube

Because the wall thickness of the tube is low (0.18mm) and a significant change in wall thickness is not expected the tube is meshed with linear continuum shell elements<sup>[4]</sup>. The expected wave length for the corrugated tube is about 4mm. Hence, the element length is set to 0.4mm to be fine enough to provide about ten elements over one corrugated wave. This leads to a specific element number of 410 elements per mm tube length. To prevent rotation of the tube during corrugation a torsion lock is placed 1,160mm behind the corrugation disk. This distance must be considered in the model.

So it is necessary to model an entire tube's length of 1,200mm. With the mesh density mentioned before, this would lead to a very high element number of 492,000 resulting in very low computation speed. To reduce the number of elements on the tube only the part of the tube which contacts the workpiece during the simulation (ca. 150mm length) is meshed with shell elements. The rest of the tube is modelled with beam elements which have a tube shaped profile assignment (Figure 8).

The coupling between the shells and the beam elements is done by a kinematic coupling condition<sup>[4]</sup> which is shown in Detail A in Figure 8. Detail B in Figure 8 shows the back end of the beam, where  $v_3$  denotes the feeding velocity while all the other translational and rotational degrees of freedom are locked for this point.



## Results

Figure 9 shows the situation during the corrugation process. At this point a steady state is reached and a periodic annular corrugation is achieved on the tube. Steady state is reached when the tube gets in contact with the outlet bearing. Before the outlet bearing is in contact with the tube, wrinkling occurs, which can be seen at the front end of the tube in Figure 9.

### Model validation

Validation of the simulation results is done by comparing the actual geometry of the corrugated tube with the simulation results. For this purpose a corrugated tube is sliced axially and the wave period, the amplitude and the profile length ( $l$ ,  $u$  and  $s$  in Figure 10) as well as the inner and outer diameter of the actual geometry produced with a feed rate of 6.4m/min are compared with the computed values (see Table 1).

The values in Table 1 represent an average over nine waves and show a good agreement between the measured and computed values for the outer diameter.

The inner diameter and the wave period as well as the amplitude show a small deviation between the experiment and the related simulation (simul 1). Considering necessary simplifications in the numerical model the agreement between the computed and measured values is sufficient.

### Influence of the feed rate on the tube geometry

To investigate the influence of the feed rate on the results of the corrugation process the feed rate is increased from 6.4m/min to 7m/min. This leads to increased axial pressure in the forming zone and to a change in the resulting tube geometry. Table 1 summarises the main geometric results for this simulation (Simul 2).

Figure 9: Geometry of the tube and corrugation disk during the corrugation process

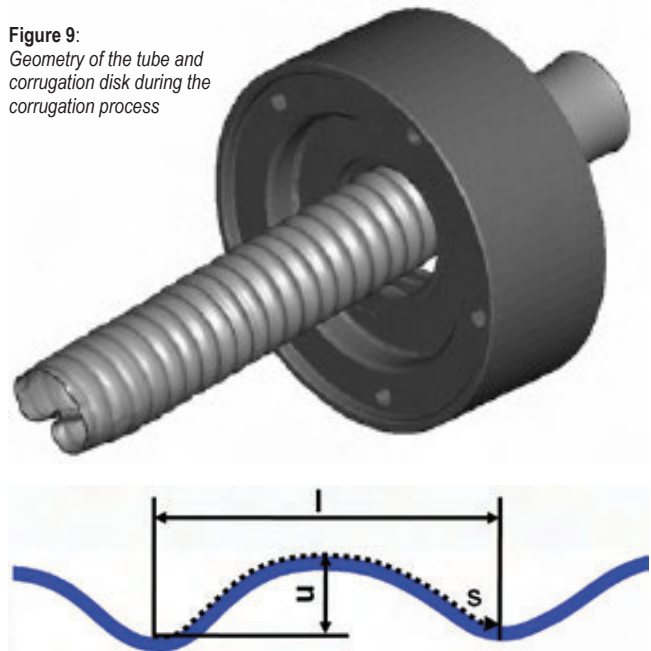
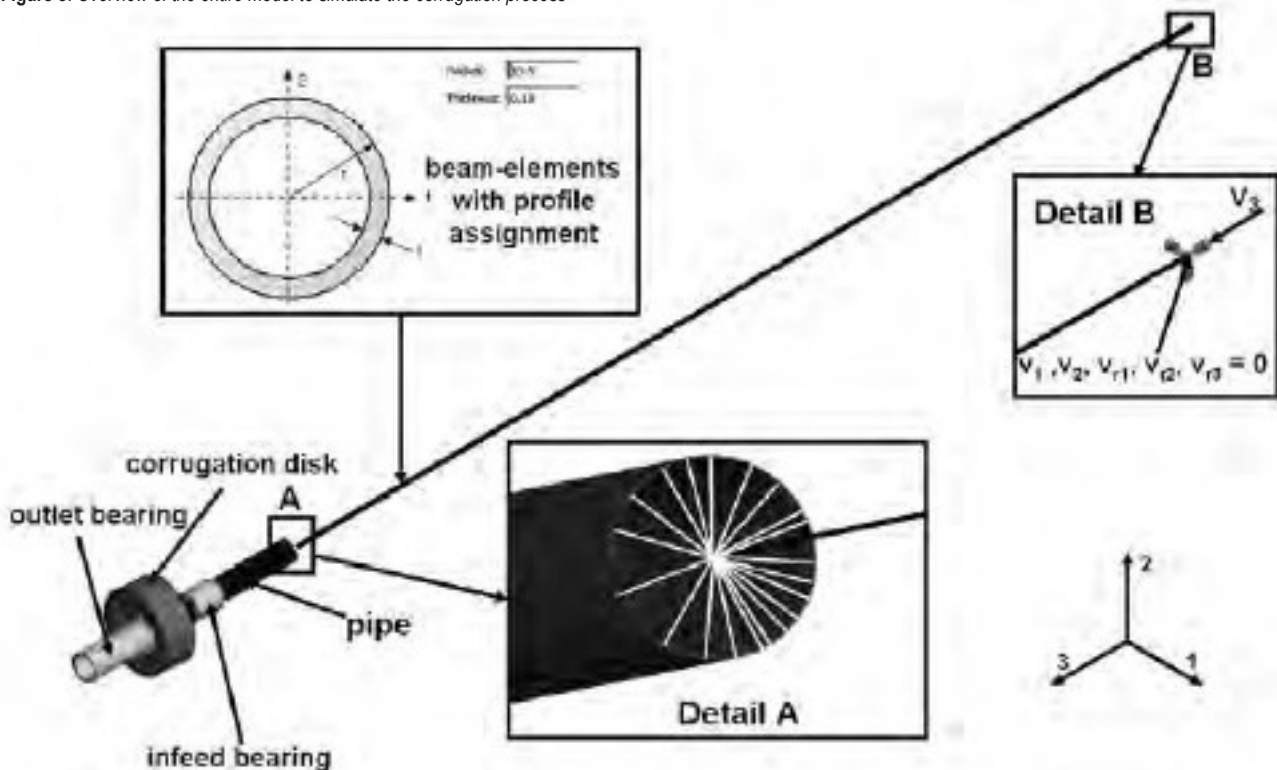


Figure 10: Wave period  $l$ , amplitude  $u$  and profile length  $s$

	Experiment	Simul 1	Simul 2
Feed rate	6.4m/min	6.4 m/min	7m/min
Inner Diameter	19.5mm	19.3mm	18.5mm
Outer Diameter	21.3mm	21.3mm	21.3mm
Wave period $l$	4.71mm	4.59mm	4.87mm
Amplitude $u$	0.7mm	0.8mm	1.2mm
Profile length $s$	4.65mm	4.6mm	4.84mm

Table 1: Comparison between the actual geometry produced with a feed rate of 6.4m/min and the computed geometry with a feed rate of 6.4m/min and 7m/min, respectively – average for nine waves

Figure 8: Overview of the entire model to simulate the corrugation process



The increase in feeding rate has no influence on the outer diameter of the tube but the inner diameter decreases from 19.3mm to 18.5mm. Consequently the amplitude of the wave increases from 0.8mm to 1.2mm. Further, the simulation shows that the wave period also increases with increasing feeding rate.

#### Computed strain and wall thickness of the corrugated tubes

Figure 11 shows the simulated true strain distribution on the corrugated tube. For both investigated cases the true strain lies between 20% on the wave peak and 80% in the wave trough. The case with lower feeding rate shows a homogeneous strain profile over the tube while the strain for the version produced with higher feeding rate is very inhomogeneous. This leads to the conclusion that the feeding rate of 7m/min is near the upper limit for the investigated parameter set. A higher feeding rate would lead to an unstable process, ie wrinkling will occur.

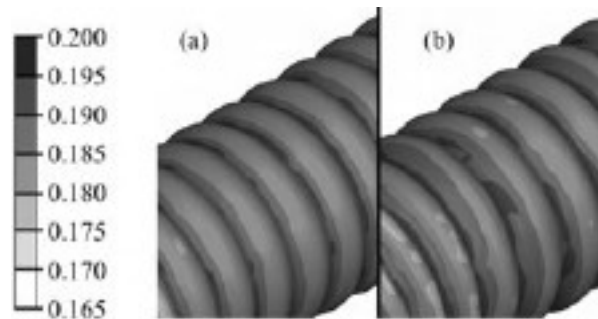
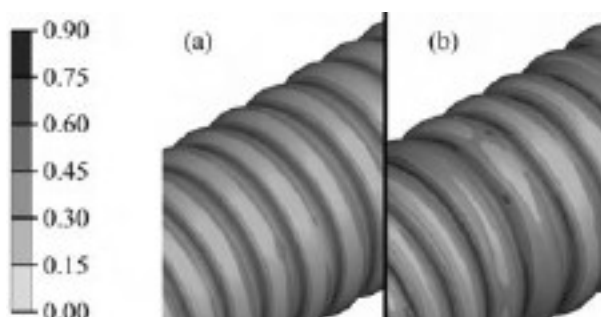
The resulting wall thickness on the corrugated tube (Figure 12) lies between 0.17mm on the wave peak and 0.2mm on the wave trough. The wall thickness at the wave peak experiences a small decrease compared to the initial wall thickness, while the wall thickness in the wave trough increases for 0.02mm. The main difference between the two cases with the different feeding rates is, analogous to the strain, that the wall thickness is more homogeneous for the case with 6.4m/min feeding rate.

## Conclusion

The corrugation process of tubes presented in this work is a very complex manufacturing process. In many cases the variation of different process parameters directly on the machine is a very fast way indeed but often the interaction and impact of different process parameters on the corrugation result can not be found by experimental work. Hence, a simulation model of the corrugation process was developed. With this model it is possible to perform a systematic parameter variation to investigate the influence of different process parameters without blocking any production devices.

The first trials to simulate this process are presented here. It is shown that it is possible to model this process with finite elements. By varying the infeed rate the sensitivity of the model on changed process parameters is demonstrated. However, a lot of specific assumptions and a complex model are necessary to obtain accurate results in suitable computation time. In future work this model will be used to look on this process in more detail and to obtain better knowledge about the interactions of the most important parameters which influence the performance of the corrugation process.

**Figure 11:** Strain distribution on the corrugated tube produced with a feeding rate of (a) 6.4m/min and (b) 7m/min



**Figure 12:** Computed wall thickness on the corrugated tube produced with a feeding rate of (a) 6.4m/min and (b) 7m/min

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**Rosendahl Maschinen GmbH**  
Schachen 57, PO Box 45, A-8212 Pischelsdorf, Austria

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