

The international magazine for the tube and pipe industries

TUBE & PIPE TECHNOLOGY



March 2007 | Vol 20 No 2 | US\$28



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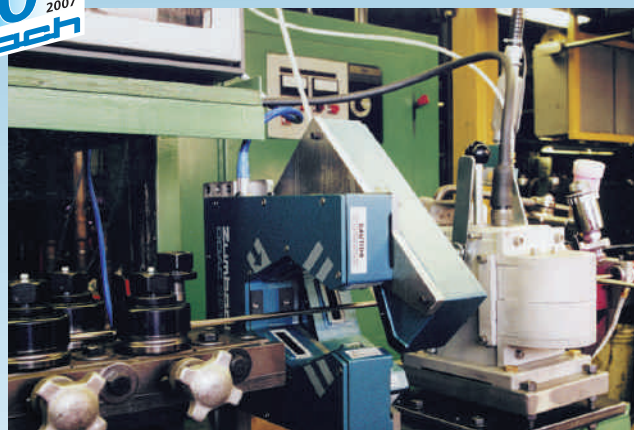
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EDITORIAL INDEX

Accurex Measurement Inc.....	99	Guyson International Limited.....	38	G Rau.....	81
Addison Machine Engineering Inc.....	34	Hebö Maschinenfabrik GmbH.....	70	Reika GmbH & Co KG.....	30
AddisonMckee Ltd.....	15, 86	Ho Chang Machinery Co Ltd.....	81	Roll-Kraft.....	25, 26
Al Fajer Information & Services.....	6	Huzhou Xinyahua Stainless Steel Pipes & Tubes Co Ltd.....	80	RSA GmbH & Co KG.....	68
ALMI Machinefabriek BV.....	67	IFS Applications.....	26	SAET Group (Emmedi).....	6
Apollo Srl.....	62	Inductotherm HWT (Thermatool Europe).....	30	SAET Induction Technology and Equipment.....	6
Applied Thermal Coatings Inc.....	20	InfoSight Corporation.....	90	Salzgitter AG.....	26
Atlantis NDE.....	89	Ingenieurbuero Gurski-Schramm & Partner.....	94	SC Tubinox SA.....	10
Barloworld Ltd.....	22	Inspector Ltd.....	92	Scan Systems.....	100
Basell.....	102	International Tube Association.....	12, 16, 23	Scotchman Industries Inc.....	30
Battenfeld Extrusionstechnik GmbH.....	28	Isgatec.....	25	Seit Elettronica Srl.....	44
Bend Tooling Inc.....	40	Jiangsu Yinhuan Precision Steel Tube Co Ltd.....	85	Seversky Tube Works.....	26
BHR Group Ltd.....	22	Journal of Coatings Technology and Research.....	26	Shanghai Steel Tube Expo.....	25
Borealis AG.....	24	Kemppi.....	37	Sikora AG.....	96
Borusan Mannesmann Pipe.....	12	Kent Corporation.....	43	SMS Demag AG.....	26
Bruderer UK Limited.....	65	Kumz.....	34	SMS Group.....	24
BS Sas.....	63	Kusakabe Electric & Machinery Co Ltd.....	28	Sonatest Ltd.....	93, 103
Cedar Hill Industries Ltd.....	26	Lone Star Technologies Inc.....	7	TAC Technical Instrument Corp.....	98
Cemsa SpA.....	29	Lorch Schweißtechnik GmbH.....	28	Tata Steel.....	26
Changshu Walsin Specialty Steel Co Ltd.....	84	Machinery International Corp.....	26	Technic & Research Precision Co.....	40
Cincinnati Extrusion GmbH.....	42	Magnetic Analysis Corporation.....	87	Tecnofar SpA.....	80
CIPE.....	25	Marshall Manufacturing.....	36, 66	Teekay Tubes Pvt Ltd.....	33
CityPipe 2007.....	25	McMillan Conroy Machinery.....	26	The Joint Perforating Company.....	66
Coburg Engineering.....	40	Messe Düsseldorf Asia Pte Ltd.....	16	Thermatool Corporation.....	30
Companhia Siderurgica Nacional.....	26	Messe Düsseldorf GmbH.....	6, 8	TMK.....	26
Contrôle Mesure Systemes.....	92	MetalCal Inc.....	96	Trumpf Inc.....	18
Corus.....	26	MicroFuze International plc.....	20	Tube Products of India.....	14
Couth Butzbach GmbH.....	87	MID.....	26	Tuf-Lok International.....	83
Datapaq Ltd.....	104	MK Products.....	29	UKF Stainless Limited.....	26
DB Engineering (P) Ltd.....	36	Mueller Europe.....	26	Universal Marking Systems Ltd.....	97
Definox.....	43	Multicyl Inc.....	63	Universal Tube & Rollform Equipment Corp.....	23
Dofasco Copperweld.....	26	NDT Systems & Services AG.....	88	Vallourec Précision Etirage.....	26
Dreistern GmbH & Co KG.....	70	Neel Metal Products Ltd.....	32	Vallourec SA.....	26
Eagle Precision Technologies Ltd.....	8, 26	Oil & Colour Chemists' Association.....	26	Van Leeuwen Wheeler Ltd.....	14
Elcometer Instruments Ltd.....	95	Olympus NDT Inc.....	98	VVT-Vitkovice Valcovna Trub.....	10
Elestar.....	32	OMP Srl.....	32	Wasco-Anbuma (Stainless Branch).....	85
Elmed Dr Ing Mense GmbH.....	94	OP Srl.....	96	Welspun Group.....	7
Enventure Global Technology.....	18	Pedrazzoli IBP SpA.....	71	Westbrook Welding Alloys Ltd.....	45
Essar Steel Ltd.....	26	Friedrich Petig GmbH.....	64	Western Instruments.....	98
Federation of Societies for Coatings Technology.....	26	Phoenix Inspection Systems.....	101	Wuppermann Rohrtechnik GmbH.....	62
FSH Welding Group.....	45	PITCO.....	104	Wuxi Yuanda Machinery & Technology Co Ltd.....	33
Gardner Denver Water Jetting Systems Inc.....	102	Polypipe.....	26	Zumbach Electronic AG.....	88
GE Inspection Technologies.....	99, 105	Polysoude SAS.....	43		
Guangzhou International Exhibition.....	25	Quality Stainless Pvt Ltd.....	84		



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- ◆ Stainless Steel Welded Tube Mill
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- ◆ Square & Rec. Tube Polishing Machine
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Contents

Following the leaders

Although some might say that talking politics is irrelevant to a magazine dedicated to the tube and pipe industry, it is impossible to deny that a whole raft of politically defined policies have both a direct and indirect impact upon our industry. From the environmental issue – which only but a scientific minority now disputes – to the route of new pipelines, free trade agreements, pegging of currencies, export/import quotas, entry into the EU, and decisions of war.

All of these issues – living and breathing with political debate – are affected by the machinations of our governments. And we are about to enter a fascinating new period whereby many notable parts of the world will usher in a fresh set of leaders. There is Russia, where in 2008 a successor to Vladimir Putin will take over, with Dmitri Medvedev and Sergei Ivanov current favourites for the job. With energy and pipelines currently a major issue, the direction of Russia and Russian policy will surely be of great interest to our industry.

Then there is Britain, with the imminent end to Tony Blair's time as Prime Minister, and the prospect of a successor or even a completely new government. And in France too, presidential elections will take place in April with socialist Segolene Royal fighting it out with Nicolas Sarkozy for the leadership prize. These two European elections are certain to have an influence on the future direction of the EU. Then, of course, on the other side of the Atlantic there is the current scrum to find the two runners for the 2008 election in the USA. Will it be Hilary Clinton and Rudy Giuliani? Or John McCain and Barack Obama?

Those countries not undergoing an immediate leadership change, such as China and India, may even benefit from their country's continuity. Whatever picture is formed by this political jigsaw, it is undoubtedly going to affect us all, and our industry with it. We don't have to argue about it, but we can at least sit up, take notice, and give it some thought.



Rich Sears

Editor • Email: richard@intras.co.uk

- 2 Editorial Index
- 6 Industry News
- 28 Technology Update
- 46 Viewpoint
- 72 From The Americas
- 112 Advertisers Index



6



28



TUBE & PIPE
TECHNOLOGY

Incorporating Tube & Pipe Asia

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50

50 BORU 2007: Show Feature

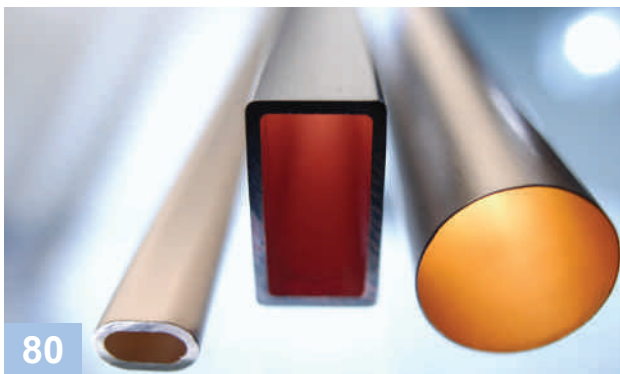
The 3rd international tube, pipe and fittings exhibition for Turkey and the surrounding region, BORU has grown in stature since its inception in 2005. This may be due to Turkey's economic and industrial strength, with ongoing discussions regarding Turkey's full EU membership, but is just as likely down to the unique location of Istanbul, a trading gateway between Europe and Asia. Here we provide show information, together with a selection of exhibitor profiles.



62

62 Drilling, Piercing & Punching

As Muhammad Ali excelled in the sport of boxing, so the process of drilling, piercing and punching must *'float like a butterfly, sting like a bee'*. The aim of this technology is to employ precision, accuracy and productivity to puncture and perforate the surface of tube, pipe and profiles. Whether it be automatic dual punching, non-deformation through-punching, or modular flow-drilling, the experts in this area need to keep on improving to remain competitive in the ring.



80

80 Stainless Steel Tubing: Machinery & Manufacture

One of the most coveted product types on the market, the versatility of corrosion resistant steel tubing lies at the heart of its popularity. A ferrous alloy with a minimum of 10.5 per cent chromium, stainless steel avoids common problems such as rust and corrosion. This benefit is ideal for applications as wide ranging as medical to oil and gas. Here we focus on a selection of the producers of stainless steel tube and pipe.



86

86 Inspection, Measuring, Testing & Marking

The CCTV of the tube world, inspection, measuring, and testing is critical to the success or failure of, for instance, an automotive fuel line or cross-country pipeline. From ultrasonic full-body inspection of pipe weld seams, 3D camera measurement of tube bends, hydrostatic evaluation of OCTG products, and advertising of the resultant quality through specialised marking, the tube maker should leave no stone unturned in the rigorous drive for excellence.

Technical Article

106 Advanced Technologies for Copper Tube Production

By Dr G Voswinkel, Otto Junker GmbH, Germany





Industry News

Powerful debut for Tube Arabia 2007

Tube Arabia 2007, the new exhibition for the Gulf and the Middle East region, closed its doors following a successful show in January. The Dubai event was formally opened by Sheikh Hasher bin Juma Al Maktoum, who is the director of the Department of Information for Dubai, and a member of the UAE's ruling family.

📍 *Dubai – visitors to Tube Arabia could see first hand proof that construction projects are thriving in the region*



Although partner show Tekno has been held seven times previously, this year's event was the first to feature Tube Arabia, with a higher international presence due to the involvement of Messe Düsseldorf GmbH, new exhibition partners of local organisers Al Fajer. Arabplast – a plastic & rubber industry trade fair – also took place alongside Tekno and Tube Arabia in adjacent halls.

The event was a big draw for many important decision makers in the tube and pipe industry from within the UAE, Middle Eastern countries and India. Gulf countries have seen a big increase in demand for industrial machinery, metalwork, tube, pipe machinery and related technology.

This was reflected by a busy show, with attendance from over 170 exhibitors at the combined Tekno and Tube Arabia events. Exhibitors



📍 *Show opener: Sheikh Hasher bin Juma Al Maktoum cuts the ribbon to open Tekno/Tube Arabia 2007*

came from countries including Germany, Italy, India, Russia, Czech Republic, and UAE. The event also attracted a significant number and high quality of visitors.

Exhibitors and visitors alike enjoyed the luxurious and efficient surroundings of Dubai, with first-hand evidence of numerous construction projects throughout the city. The Dubai International Convention and Exhibition Centre proved to be a successful venue, with visitors viewing live demos of CNC machines, lathes, metalworking technology, and tube and pipe machinery.

Emmedi merge with SAET

Italian induction specialists Emmedi have merged with SAET to form the SAET Group. The companies have joined forces on the run-up to their 40th anniversaries, in order to share an ambitious industrial plan for increased global presence on the market and increased development of technological innovation.



Emmedi will assume the role of Tube Welding and Annealing Division within the SAET Group, maintaining its well-known trademark. Mr Erasmo Dominici (president of Emmedi) and Mr Savio Dominici (as the director of the new division) will continue to actively participate in the management of the company. They will closely cooperate with the SAET management, Mr Pietro Canavesio (president) and Mr Davide Canavesio (CEO).

➤ **Emmedi will take the role of Tube Welding and Annealing Division within the SAET Group, maintaining its trademark** ◀

The SAET Group aims to increase customer satisfaction by attending to the fundamental processes of the production system, such as innovation, quality and service. This will be combined with a solid financial structure guaranteed by experienced partners.

SAET Induction Technology & Equipment – Italy
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SAET Group – Emmedi Welding & Annealing – Italy
Fax: +39 011 455 11 12
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Mr Satish Khanna, general manager of organisers Al Fajer Information & Services, stated, *“Best practices in the machine industry and experience with leading industry specific technology solutions is key in helping customers generate high impact results and one of the main reasons for which we organise Tekno/Tube Arabia.”*

Mr Phillip Knight, executive secretary of sponsors the International Tube Association, said, *“The region looks set to become a most important area for ITA membership development and the outcome of the first Tube Arabia fully vindicates the Association's decision to support it officially.”*

With massive industrial demand and growth within the Gulf countries, the region is set to become a hotspot for tube and pipe business, with Tube Arabia ready to establish itself as a regular exhibition. The dates for the next show have already been announced as 11-14 January 2009.

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Lone Star forms JV with India's Welspun

Lone Star Technologies Inc, USA, has formed a joint venture with the Welspun Group, one of India's leading manufacturers of tubular products and textiles. The deal involves the construction of a US manufacturing facility capable of producing 300,000 net tons annually of spiral-welded tubulars in the 24-60" OD range.

Named Welspun-Lone Star Tubulars LLC, the newly formed company is 40 per cent owned by Lone Star with the remaining 60 per cent stake held by Welspun Pipe Inc. Welspun Pipe is a 100 per cent subsidiary of Welspun Gujarat Stahl Rohren Ltd, Welspun's steel pipe manufacturing arm.

Lone Star will invest up to \$26.4mn in the total JV operation of \$66mn, with profits shared according to respective ownership stakes. The new spiral weld mill facility, which is expected to begin production by early 2008, will be located close to Lone Star's existing customer base in the southwest United States.

As a result of this transaction, Lone Star is expected to gain an entry point into the large diameter linepipe market. This market is currently experiencing strong demand due to a number of new construction projects for the natural gas transmission infrastructure. Once completed, the new facility will enable Lone Star to include spiral welded linepipe in its product range.

Both the capacity and location of the spiral weld mill will position Welspun-Lone Star Tubulars within the rapidly growing North American large diameter linepipe industry. The partners expect to source high-quality steel hot roll coil for the spiral weld mill both domestically and internationally.

"We have already established our US presence by supplying pipes for the laying of the world's deepest pipeline in the Gulf of Mexico. The Joint Venture will enable us to strengthen that presence in the fast-growing US market, where demand for spiral pipe continues to increase," said Mr BK Goenka, Welspun's vice chairman and managing director.

Lone Star Technologies Inc – USA
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Website: www.lonestartech.com

Welspun Group – India
Fax: +91 22 24908020
Website: www.welspun.com

DIARY OF TUBE EVENTS

2007

MARCH

15-17 SIPPE 2007
Shanghai, China
Exhibition (pipelines & OCTG) → **Email:** 2007@aiexpo.com.cn
Website: www.sippe.com.cn

22-25 BORU 2007
Istanbul, Turkey
Exhibition → **Email:** info@ihlasfuar.com
Website: www.ihlasfuar.com

APRIL

16-20 Messe Hannover
Hannover, Germany
Exhibition (including pipeline technology) → **Website:** www.hannovermesse.com

MAY

10-12 Shanghai Steel Tube Expo
Shanghai, China
Exhibition → **Website:** www.gangguan-expo.com

28-31 Tube Russia/Metallurgy/Wire Russia
Moscow, Russia
Exhibition → **Email:** wolfgangC@messe-duesseldorf.de
Website: www.metallurgy-tube-russia.com

JUNE

18-20 Nagoya Tube 2007 (ITA)
Nagoya, Japan
Conference → **Email:** jstp@jstp.or.jp
Website: www.jstp.jp/en

21-24 8th Guangzhou Intl Metal & Metallurgy Exhibition
Guangzhou Province, China → **Email:** julang@pub.guangzhou.gd.cn
Website: www.julang.com.cn

JULY

25-27 2nd International Tube & Pipe Exhibition
Tehran, Iran → **Email:** info@amiplastics.com
Website: www.amiplastics.com

SEPTEMBER

24-26 Tube Ukraine (ITA)
Dnepropetrovsk, Ukraine
Conference → **Email:** info@itatube.org
Website: www.tube-ukraine.com

OCTOBER

02-04 Tubotech/Metaltech
São Paulo, Brazil
Exhibition → **Email:** cipa@cipanet.com.br
Website: www.cipanet.com.br

16-18 Tube/wire Southeast Asia
Bangkok, Thailand
Exhibition → **Email:** tube@mda.com.sg
Website: www.tube-southeastasia.com

17 Non-Ferrous Bangkok (ITA Seminar)
Bangkok, Thailand → **Website:** www.itatube.org

17-19 17th international conference on pipeline protection
Conference → **Email:** conforg5@bhrgroup.com
Website: www.bhrgroup.com

NOVEMBER

11-14 Fabtech
Chicago, USA
Exhibition → **Email:** information@mfafabtech.com
Website: www.mfafabtech.com

13-16 Tube & Pipe Central Asia
Almaty, Kazakhstan
Exhibition → **Email:** info@expocentralasia.com
Website: www.expocentralasia.com

2008

FEBRUARY

14-16 Tube India
New Delhi, India
Exhibition → **Email:** kueppersS@messe-duesseldorf.de
Website: www.messe-duesseldorf.de

Moscow's metals supershow back in May

A solid partnership of events for the thriving Russian metals market, Tube Russia will return in May alongside Metallurgy-Litmash, Aluminium/Non-Ferrous, and odd year partner, wire Russia. The event will also welcome the addition of Schweissen and Schneiden, a Messe Essen event for joining, cutting and surfacing technology.

A comprehensive billing, the combined events will take place from 28-31 May 2007 at the state-of-the-art Moscow fairground ZAO Expocentr in Krasnaya Presnya.

Since the inaugural event in 2003, Tube Russia has grown into a leading international business and technology platform for the foundry, metallurgy, aluminium and tube

industries in the Russian Federation. The last event in 2006 attracted over 8,000 Russian and international trade visitors, with 300 exhibitors from more than 16 countries in 3,200m² exhibit space.

Organiser Messe Düsseldorf works closely with all of the key Russian and international industry associations including the International Tube Association (ITA), and the German Machinery and Plant Manufacturers Association (VDMA). National pavilions from Germany, Austria and Italy will be present at the show.

The Krasnaya Presnya venue is one of the most modern locations for trade fairs in the entire CIS. With an exhibition area of 55,000m², the Expocentr has seven halls and attractive open-air facilities located in grounds of 20 hectares.

Taking place in the 'Forum' hall, Tube Russia 2007 will provide the ideal opportunity for exhibitors and visitors to catch up on the fast-paced business in the region.

Messe Düsseldorf GmbH – Germany
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Email: info@messe-duesseldorf.de
Website: www.messe-duesseldorf.de

Ⓣ Krasnaya Presnya fairground: a plan of the halls for Tube Russia 2007



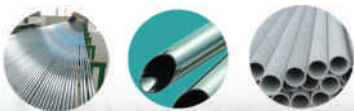
Specifications: Stainless steel seamless tubes

Standard: ASTM A269/ASTM A213 ASME SA213 DIN17456 JIS G3459 G3463

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

Length: Standard 6 meters or 20 feet, or customized, extra long tubes upto 26 meters are specially for Heat Exchanger applications.

Surface finish: Mill's finish/Polished Surface from 180G to 400G/Bright Annealed



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Eagle Precision Technologies opens new China operation

Eagle Precision Technologies Ltd, a leader in tube bending and forming solutions, has opened a new 20,000ft² facility in Shanghai, China.

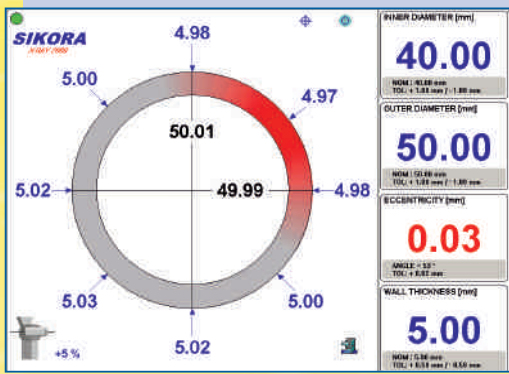
The new operation has been established to support Eagle's continued growth in Asia. In addition to sales and service functions, the Shanghai facility will be used to assemble new equipment to enable the company to offer more competitively priced products for the local market. The facility will also provide rebuild services for the company's large installed base in Asia.

Mr Dennis Hewko, president and CEO of Eagle Precision Technologies, commented, "We are pleased to announce the opening of our new operation in China. The new facility will act as the company's focal point for sales, support and manufacturing in Asia providing enhanced local service to our customers in the region."

Eagle Precision Technologies is a world leader in the manufacture of CNC tube benders, tube end-finishing equipment, custom machine building, muffler manufacturing equipment and tooling. The company is a global machine supplier with a history of over 35 years of machine building experience and an installed base of more than 8,000 pieces of equipment in more than 60 countries.

Eagle Precision Technologies Ltd – USA
Fax: +1 519 756 9062
Email: warren@eaglept.com • **Website:** www.eaglept.com

The new operation has been established to support Eagle's continued growth in Asia



X-RAY 2000 monitor image



X-RAY 2000

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- increased productivity
- approach as simple as a diameter gauge

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Substantial investment at VVT-Vitkovice Valcovna Trub

VVT-Vitkovice Valcovna Trub, one of the largest Czech producers of thick-wall seamless steel tubes, has announced a major investment programme at its facility in Ostrava, Czech Republic. Costing millions of US dollars over three years, the project will involve the revamping and refurbishment of the company's main production line.

ⓘ The company operates two tube production lines, including the 'Big Mannesmann' for 168-406mm OD

The company is currently running two production lines – one producing tubes 60-168mm, and an older 'Big Mannesmann' (BM) for the 168-406mm OD range. The refurbishment work on the BM is due to finish in July 2008.

"The main benefits, beside the overall increase of capacity, will be in the improvement of the tube surface quality, accuracy, extending the variety of production portfolio in steel grades as well as in the lengths, new possibilities of the non-destructive testing technologies or marking and binding of the finished tubes," says the company CEO Mr Jaroslav Sarovsky.



ⓘ The company's investment will open the way for an increased production output, especially tube and pipe for OCTG and pipeline applications

Current annual production capacity at VVT-Vitkovice Valcovna Trub is 105kt, of which almost 60 per cent is produced on the BM. Following the overhaul, the output is expected to increase by 18kt.

This increase will mainly be for oil, gas and water tubes and pipelines. It will also include alloy steel tubes in higher alloy steel grades. The international market accounts for 70 per cent of the company's total sales.

VVT seamless steel tubes, hot rolled on the piercing mill using Mannesmann technology, offer unique mechanical properties. The products are used in machinery and the automotive industry, building and construction, power engineering, geology and chemical industry, pipelines/OCTG, and water well drilling.

The company currently employs 800 people, and in Autumn 2005 became a member of the group of companies Trinecke Zelezarny – Moravia Steel.

VVT-Vitkovice Valcovna Trub –
Czech Republic
Fax: +420 595 956 140
Email: info.vvt@vvt.cz
Website: www.tube.cz

Tubinox acquired by Viraj Group

SC Tubinox SA, Romania, a manufacturer of both hot finished and cold finished austenitic stainless steel seamless pipes, has been acquired by the Viraj Group, India. The Viraj Group is a major manufacturer of stainless steel long products, with its own melting capabilities exceeding 200,000mt per year.

The acquisition will result in Tubinox receiving a regular supply of stainless steel billets and rounds as raw material from the Viraj Group. This is likely to be a major advantage in a turbulent period for the stainless steel industry.

A major modernisation programme has enabled Tubinox to manufacture products competitively and according to international standards. The company has installed state-of-the-art equipment and controls to ensure efficiency and manufacturing quality.

Hot mill extrusion operations are expected to begin in April 2007. The production range of Tubinox will include bright annealed tubes, heat resistant tubes, tubes for machining, cold finished annealed and pickled tubes, and polished tubes. Outside diameters will range from 8mm to 114mm, with wall thicknesses from 1mm to 12mm.

Tubinox plans to target sales to international markets, and intends to be a key player in this segment, especially in the emerging markets of northern Africa and middle east Asia, in addition to serving European and American markets.

SC Tubinox SA – Romania
Fax: +40 21 256 00 80
Email: sales@tubinox.ro • Website: www.tubinox.ro

➤ **The acquisition will result in Tubinox receiving supplies of stainless steel billets and rounds from the Viraj Group** ⇐

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CAGE FORMING SECTION
SHANGHAI TIANBAO

MILLTECH & YODER consortium has completed the equipment supply and production start-up in Dec. 2004 for the pipe mill 8" - 25" O.D, which incorporates the latest technology with full cage forming, spiral accumulator, edge miller, milling cut-off and computerized roll positioning system to produce ERW / API pipes for oil and gas transportation and structural for construction.

MILLTECH



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E MAIL: erw@milltechco.com

Unprecedented interest in ITA's Ukrainian conference

The International Tube Association (ITA) has reported an unprecedented level of interest in its next major biennial conference, Tube Ukraine International 2007. Over 70 speakers have already applied to present papers at the conference in Dnepropetrovsk, which is jointly organised by the local Ukrtruboprom Association.

 Dnepropetrovsk – host city to the ITA's Tube Ukraine International 2007 conference



According to the ITA, there has been tremendous interest from all sectors of the industry, including ferrous, non-ferrous, welded and seamless. With upwards of 250 delegates expected to attend, the conference will be bolstered by the presence of tabletop exhibits.

Titled 'Modern production trends for tube and pipe – welded, seamless & non-ferrous', the final program will feature 65 speakers. Due to this busy programme, the organisers have decided to run concurrent technical sessions in two conference rooms at the event's venue, the Palace of Culture 'Metallurgists'.

In the provisional timetable, conference room one will feature 29 papers on exclusively seamless topics, with room two hosting 32 papers on an assortment of welded, joint welded, seamless and non-ferrous topics.

The Russian and Ukrainian tube and pipe industry will be heavily represented at the event. Many Ukrainian tube companies have indicated that they will be sending groups of their technical staff to the conference.

Full support has also been promised by the Russian industry, which has cancelled its own symposium due to take place around the same date in September 2007. A number of papers from the Russian industry are included in the programme.

The main sponsor of Tube Ukraine is CJSC Nikopol Stainless Tube Mill, Ukraine. Other important contributing sponsors are Messe Düsseldorf GmbH, *Tube & Pipe Technology* magazine, OCTG, LLP, and Nikopol Steel Pipe Plant/Yutist.

The proceedings will be conducted in both Russian and English with simultaneous translation. Scheduled to present at the conference are speakers from Germany, Austria, Japan, Ukraine, Russia, USA, Azerbaijan, Italy, Sweden, Norway and the UK.

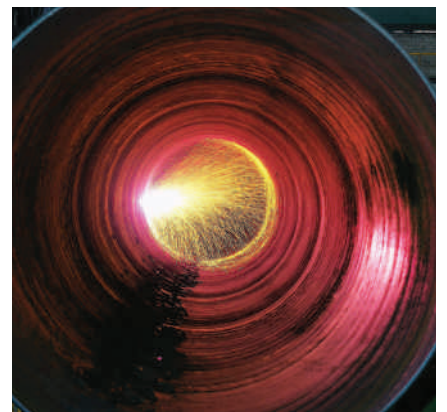
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Turkish pipe market looks toward exports

Last year was an intense period of growth for Turkey's domestic pipe market, with successful completion of several high-profile projects. The sector is now primed for the development of new projects in 2008-2009. However, according to Borusan Mannesmann Pipe, the domestic market will fall off in 2007, particularly in the area of natural gas pipes.

It is believed that the ongoing efforts of the Energy Market Regulation Board (EPDK) – concerning the privatization of natural gas distribution lines – will support growth in the sector, albeit with a limited effect. New players are also expected to enter the market in 2007.

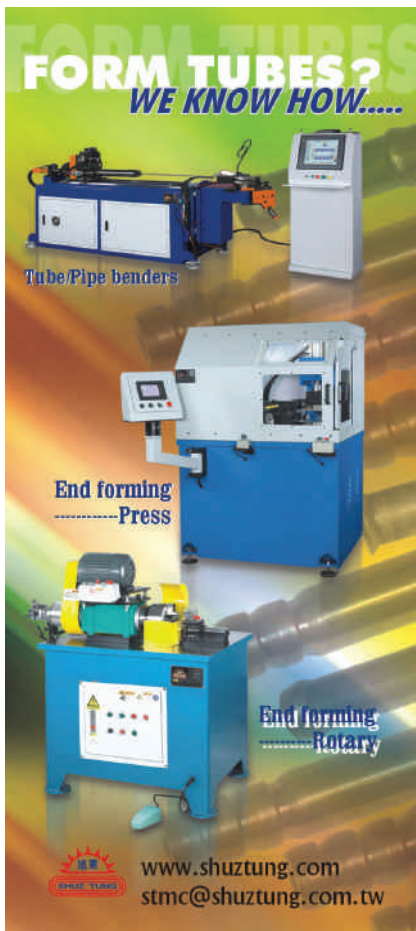
As the pipe sector in Turkey enters a period of contraction this year, contracts are currently being tendered abroad for the excess capacity of spiral pipe production. In this period of fierce competition, it is expected that companies will remain strong if they can offer distinguished and cutting edge products, quality and technology.



 Borusan Mannesmann Pipe expects there to be less demand in 2007 for natural gas pipes in Turkey, with a greater emphasis on exports

Borusan Mannesmann Pipe, an established pipe producer and exporter to foreign markets, aims to increase its efficiency in export markets in line with the changing dynamics of the market and increased competition.

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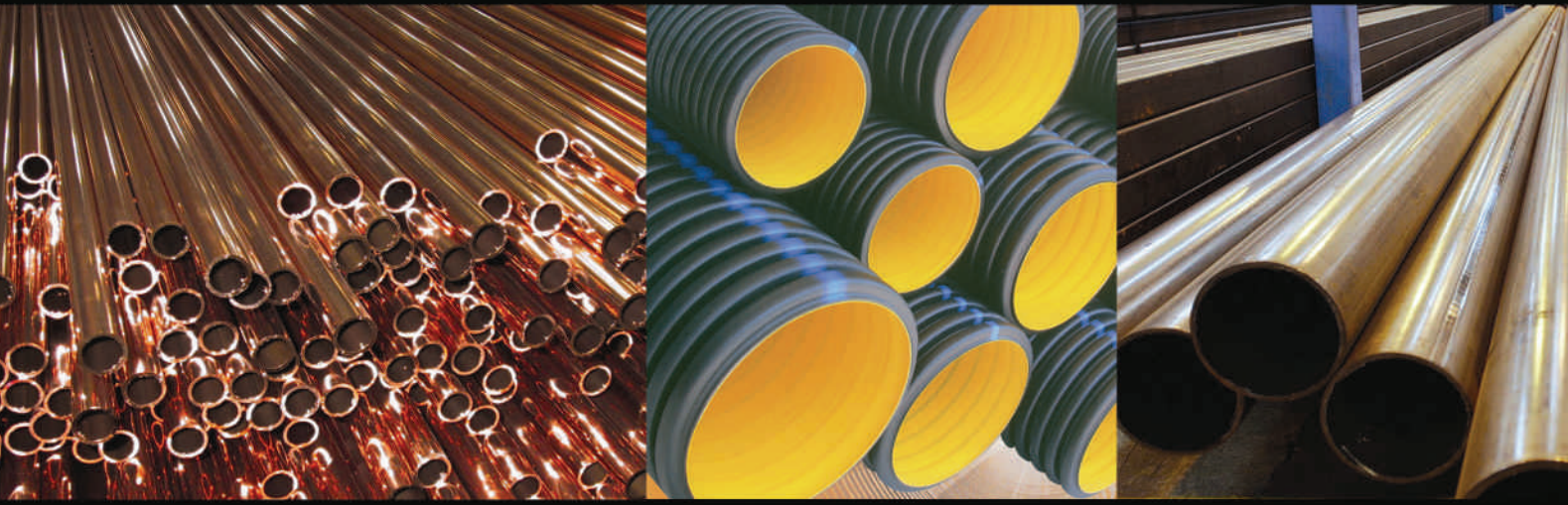
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More expansion for Van Leeuwen Wheeler

Specialist distributor of tube, pipe and bar, Van Leeuwen Wheeler has opened a new sales office at its Middlesbrough, UK warehouse. Orders for the northeast of England were previously handled by the company's Bury sales office, but substantial growth has prompted the creation of an additional office specifically serving customers in the region.

Van Leeuwen Wheeler's Middlesbrough warehouse, where expansion of business has led to a new sales office being opened for customers in the North East of England



This development follows on from the major 2006 investment programme in Middlesbrough, which saw the reorganisation of its 100,000ft² warehousing space and

doubling of its cutting capacity. Last year, the company also created a dedicated facility for the fluid power industry, with the addition of two new cutting machines

Design facility opened at Tube Investments of India

Tube Investments of India Ltd (TII) has established a new engineering design centre in Chennai, to help progress its new product developments. The design centre will use state-of-the-art software to simulate tubular forming, hydroforming, expansion and extrusion operations.

The company designs automotive components using Catia and SolidWorks, with 3D models subsequently analyzed for stress and strain under static and dynamic loading conditions. Alternate designs can be offered in order to save weight and reduce the number of parts while retaining end-performance. These finite element models work on packages including Ansys, LS-Dyna, and Hyperform.

The design centre has been established to support new products such as the company's formable and weldable high strength steel tubing. This tubing, which offers strength levels from 600-1200Mpa, can be used to manufacture high strength tubular components including axles, stabilizer bars and steering linkages for the auto sector.



The design centre has been established to support new products such as high strength steel tubing



This product is the result of the company's special manufacturing facility for value added lightweight components, established with the aim of weight and cost reduction for auto customers. Such components can replace solid bars, forgings/castings and alloy steels, delivering comparable performance levels.

All TPI tube mills are virtually simulated using Copra FEA tube manufacturing simulation software, to assist in roll design optimization. The facilities are also fully equipped for prototype testing under torsion, impact, axial and bending fatigue. The failure analysis laboratory is also equipped with a Scanning Electron Microscope to analyze endurance failures.

Tube Products of India – India

Fax: +91 44 2638 3110

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info@alfinox.com - www.alfinox.com





designed to cut hardened materials for hydraulics applications.

Sales manager Mr Dave Abernethy explains, "The purpose of the reorganisation in Middlesbrough was to boost customer service in the north of England and Scotland. One result has been a substantial growth in our customer base in the north-east which we have responded to by creating a local commercial presence."

Van Leeuwen Wheeler Ltd – UK
Fax: +44 1384 487619
Email: sales@vanleeuwen.co.uk
Website: www.vanleeuwen.com

AddisonMckee Canada acquires Mechtron's bend tooling product line

AddisonMckee Canada ULC has reached an exclusive agreement to purchase the bend tooling product line of Mechtron Innovations.

Mechtron Innovations, located in Cambridge, Ontario, has been providing the Canadian market with quality precision machining and custom tooling since 1998. The company specialises in the design and manufacture of high-quality tooling used on CNC tube bending equipment.

Through this acquisition, AddisonMckee will acquire the assets of Mechtron's bend tooling production. Mechtron Bend Tooling™, a division of AddisonMckee Canada ULC, will continue to manufacture, sell, and support Mechtron's current performance bend tooling product line. This line includes mandrels, wiper dies, bend dies, bend die insert clamps, pressure/follower dies, and collets.

AddisonMckee Canada is a division of tube bending and end-forming technology specialists, AddisonMckee. The company is equipped with the latest computer-aided manufacturing techniques and is renowned for the design, manufacture and supply of CNC tube manipulation solutions. These machines are used for the increasingly complex manufacturing requirements across the global automotive, aviation, truck, and shipbuilding sectors.

"We are convinced that AddisonMckee's commitment to innovation, speed-to-market, and exceptional manufacturing capabilities will significantly benefit our customers," states Mr Aaron Reimann, owner and

president of Mechtron Innovations. "The company has an enviable reputation for the quality of its products and a willingness to provide the finest tube manipulation solutions to organisations of all sizes."

Mr Jim Sabine, vice president and general manager of AddisonMckee Canada, says, "Through the recent launch of our Brantford operations and this acquisition, AddisonMckee has demonstrated its commitment to the Canadian market. We are fully committed to Mechtron customers

and feel fortunate to add Aaron Reimann and members of his staff to our team."

From its state-of-the-art manufacturing centres in the USA, UK, Canada and China, AddisonMckee is committed to providing rapid solutions to market. The company is principally owned by WHI Capital Partners.

AddisonMckee – Canada
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Website: www.addisonmckee.com



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Strong exhibitor interest in Tube Southeast Asia 2007

Messe Düsseldorf Asia Pte Ltd, organisers of Tube Southeast Asia and wire Southeast Asia 2007, have reported that 90 per cent of available exhibit space has already been booked for the event. They have also revealed that many companies absent from the last Tube Singapore in 2005, the forerunner to the new show, are due to attend the Bangkok event this year from 16-18 October.

A number of industry business leaders have already been vocal in their support of the event and its location serving the Thai and other regional markets.

Mr Phillip Knight, executive secretary of the International Tube Association (ITA), says, "The ITA is delighted to support the move of the former Tube Singapore exhibition to Bangkok under its new title Tube Southeast Asia. As Thailand and its neighbours


develop their economies and instigate major infrastructure projects the relevance of being at the centre of this activity is unquestioned. Thailand, for example, is targeting a top ten global position in car manufacture, a market that is extremely important for both the tube and wire industries."

Mr Bob Doran, vice president (sales) of ThermoTool Corp, commented, "One major advantage which ThermoTool sees in the move to Bangkok is that Thailand has a large tube and pipe production industry which is expanding. The exposure to Thailand's market, which the Bangkok location offers, coupled with the usual excellent attendance from the other Southeast Asian countries, will make this a truly valuable show which cannot be missed."

International Wire & Machinery Association (IWMA) chairman, Mr Peter Large,

 Bangkok – at the heart of southeast Asia – will welcome Tube Southeast Asia in October



 The Bangkok International Trade & Exhibition Centre (BITEC), which will play host to Tube Southeast Asia and the Bangkok Non-Ferrous technical conference

commented, "The new location is truly the gateway to other important developing markets like Vietnam as well as Malaysia and Indonesia."

Due to exhibit at wire Southeast Asia, Mr Brad Scherer, vice president (international operations) of the USA's Fort Wayne Wire Die, stated, "The GDP growth rate of the southeast Asian region is among the highest in the world and Thailand has historically been at the forefront of this growth, partly because of their regional leadership role in the automotive industry. Bangkok is geographically located in the centre of the region and has been rapidly improving its infrastructure to handle such events."

During the exhibition, to be held at BITEC (Bangkok International Trade & Exhibition Centre), an international conference will also take place on the 17 October. Co-organised by the ITA and the IWMA (International Wire & Machinery Association), Non-Ferrous Bangkok will comprise a wire session in the morning and a tube session in the afternoon.

Non-Ferrous Bangkok will take place at the exhibition hall, enabling delegates and speakers to attend both the exhibition and the seminar.

Messe Düsseldorf Asia Pte Ltd
– Singapore
Fax: +65 6337 4633
Email: wire@mda.com.sg
Website: www.tube-southeastasia.com

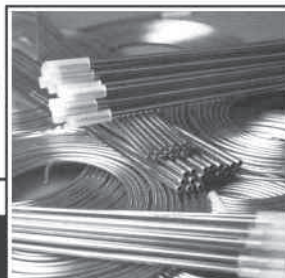
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Trumpf breaks ground on new laser building in Connecticut

Trumpf Inc, USA, has begun construction on a new research and manufacturing facility that will be used to further develop new lasers. This high-tech facility – intended to expand the company's production of laser resonators – will add 83,000ft² to the existing Trumpf premises in Farmington, Connecticut.

The building will feature a new production hall designed for the manufacture of different types of CO₂ and solid-state laser

president and CEO of Trumpf Inc, "It is a concrete example of our long-term commitment to the community, the region, the market, and of course to our employees. The new building means new products, new markets, new jobs, and new opportunities for all of us."

Trumpf Inc is a subsidiary of the Trumpf Group, a privately-held company headquartered in Germany and recognised as a world leader in industrial laser production. In Connecticut, Trumpf manufactures precision laser cutting and punching machinery, and gas and solid-state laser resonators.

With US sales revenue that grew to US\$376mn in the last fiscal year, the company has invested US\$15.1mn in local R&D in order to maintain a leading position in state-of-the-art laser technology. Says Mr Biekert, "This new building will help us maintain our leadership position in the laser industry, further expand our laser production, and stay at the forefront of laser research and development."

Construction of the new building is expected to be completed by the end of 2007, with an estimated cost of over US\$20mn. The company hopes to open the building in early 2008.

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Website: www.us.trumpf.com

Enventure acquires Triad Pipe & Steel Co

Enventure Global Technology, USA, has acquired Houston-based Triad Pipe & Steel Company, a supplier of specialty OCTG to the oil and gas industry. Owned by Shell Technology Ventures and Halliburton Energy Services, Enventure provides expandable tubular and drilling management solutions to operators worldwide.

With the purchase of Triad, Enventure has recognised an opportunity to provide an added element of service to its customers. A leading provider of solid expandable tubular (SET®) solutions, Enventure says its customers will now have the same quick access to speciality pipe provided by Triad to its customers for over 25 years.

Mr Robert Hinkel, president and chief executive officer of Enventure, said, "Triad took the conventional business of supplying oilfield tubulars and created a unique value proposition for its customers by offering outsourced supply chain services. Both companies' cultures and product offerings complement each other, making this a great fit for our growth strategy."

Mr Gene Jorgensen, Triad's president, claimed the acquisition would be mutually beneficial. He said, "Triad can now accelerate its growth beyond the Gulf of Mexico where we've been very successful. With access to Enventure's established markets we will be better positioned. Additionally, Triad customers will benefit from the financial, technical and operating resources Enventure adds."

Enventure Global Technology – USA
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Email: info@enventuregt.com
Website: www.enventuregt.com

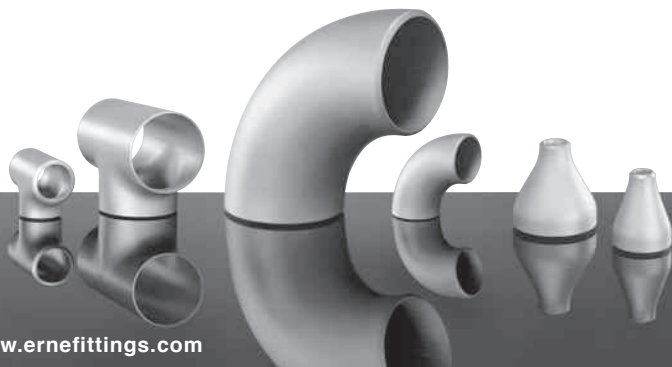


↑ Trumpf management helping to lay the foundation of the new research and manufacturing laser facility in Connecticut

resonators, as well as a laser research lab and laser development department. The building will also house the company's laser marking application and sales group and give the information technologies department a larger area for a state-of-the-art server room.

"This new building means much more than just more space," said Mr Rolf Biekert,

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Cooperation agreement for microwave diffusion treatment (MDT) technology

MicroFuze International Plc has announced the signing of a strategic cooperation agreement with surface treatment specialist Applied Thermal Coatings (ATC), USA, to further develop and assist the commercial roll-out of its Microwave Diffusion Treatment (MDT) technology.

MDT is quick, cheap and clean, and can make cheap steel nearly impenetrable, providing a large number of potential uses for parts, components and accessories which require hardening, lubricity, wear resistance and corrosion protection. Industries that will benefit from MDT include power generation, automotive, aeronautical and general manufacturing.

MicroFuze International, through its 85 per cent owned US subsidiary, MicroFuze Americas Inc, holds the sole licence to commercialise the US Department of Energy's patented process for MDT.

Mr Harley Grant, CEO of ATC, said, "The MicroFuze MDT technology has exciting prospects and, importantly, has immediate

application for the US energy sector and for the power generation industry globally. ATC has been assisting with the development of MDT for some time and welcomes the opportunity to proactively drive the technology across other industries."

MicroFuze and ATC will form MicroFuze Energy LLC, which will be the vehicle to license the technology for the energy sector. The company is in the process of obtaining independent test results on its finished products, and is also testing multiple turbine blades in the development microwave, with reports that the diffusion of boron into hard steel turbine blades continues to bring encouraging results.

MicroFuze will own 90 per cent of the company, and ATC will own the remaining 10 per cent. ATC, whose technologies include conventional diffusion, thermal

coating, solution annealing and specialist heat treatment, will dedicate the time and expertise of its principals in lieu of cash as its contribution to the joint venture.

The company is considering similar joint venture structures in future to exploit other industries and applications such as medical, aeronautics, electronics, automotive and defence.

Mr Doug Parrish, CEO of MicroFuze, said, "We are delighted to formalise our relationship with ATC, who will help drive this platform technology to the next level and provide market penetration in a shorter timeframe."

MicroFuze International plc – UK
Email: info@microfuze.com
Website: www.microfuze.com

Applied Thermal Coatings, Inc – USA
Fax: +1 423 267 0637
Website: www.appliedthermalcoatings.com

China's Metals Fair returns in May

Metals Fair, the 3rd China International Metals Industry Fair 2007, will take place from 18-20 May 2007 in Guangzhou International Convention & Exhibition Centre, Guangzhou. As with the last event, Metals Fair will consist of three exhibitions – China International Sheets, Tube & Wire Exhibition, Guangzhou International Stainless Steel Exhibition, and China International Metal Recycling Exhibition.

Hosted by the China Iron and Steel Association and China Non-ferrous Metals Industry Association, the event is organised by the Metallurgical Council of China Council for the Promotion of International Trade (MC-CCPIT).

Metals Fair is expected to attract a large number of exhibitors and visitors to the region, with product display and technology exchange for the entire metals industry. Exhibits will include iron and steel, aluminium, copper, stainless steel, metalworking, foundry, forging, furnace and heat treatment, ferroalloy, refractory products and metal recycle.

Organisers believe that this year's show will reflect the rapid growth and development of China's economy. With enormous volumes of crude steel and non-ferrous metal production, China is now at the centre of research and development for the global metal industry. Ideally located, Guangdong Province can claim to be the biggest metal consuming market and processing centre in China and southern Asia.

Metallurgical Council of China Council for the Promotion of International Trade (MC-CCPIT) – China
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Metals Fair will take place at the Guangzhou International Convention & Exhibition Centre



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Scotland to host international pipeline protection conference

The 17th international conference on pipeline protection will take place in Edinburgh, Scotland, from 17-19 October 2007. Organisers the BHR Group have signalled a call for papers to gather the latest information on research, development and application in this critical area.

The event presents an ideal platform for those involved in the commissioning, operation and maintenance of pipelines. New legislation and growing pressure from the public and special interest groups is forcing pipeline operators to refocus attention on pipeline integrity. The media is often quick to report news concerning polluting leaks from hydrocarbon pipelines or unacceptable losses from water mains.

Problems can arise in a number of areas. Poor practices during installation or upkeep are often a primary cause. Ageing infrastructures create new problems in terms of maintenance and replacement. Sometimes the cause is progressive and unforeseen deterioration, while on occasion

there can be complete failure of the pipeline assembly and/or corrosion protection systems.

Safety and security are paramount and in some countries certification is already demanded as proof of standard. The oil and gas industry has always sought the latest methodologies for protecting its pipelines. The water and waste industry is also now demanding higher performance to extend the useful life of their pipelines.

A unique forum for debating the future direction of the pipeline industry, the conference programme will offer a range of papers. Likely topics will include integrity, internal drag-reducing coating, monitoring and mitigation, stress corrosion cracking, external and internal coatings, upheaval buckling, and inline/online monitoring.

BHR Group Ltd – UK
Fax: +44 1234 750074
Email: conforg5@bhrgroup.com
Website:
www.bhrgroup.com/confsite/index.html

Barloworld sells steel tube division to consortium

Barloworld Ltd, South Africa, has sold its steel tube division to a consortium representing the division's existing management, staff, a black economic empowerment group and private equity interests. Barloworld Robor Pty, a wholly owned subsidiary of Barloworld, will sell its underlying assets and businesses to Robor Pty Ltd.

According to the deal, Barloworld Robor's CEO Mr Mike Coward will hold 44 per cent of shares, private equity business RMB Ventures will own 28 per cent, black economic empowerment company RBR Investments will have 18 per cent, and the staff of Robor will own 10 per cent of the business.

The takeover is estimated to cost in the region of US\$6.5mn (480 million Rand) which is equivalent to the net asset value of Barloworld's steel tube division.

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Top-class speakers due at Japan's Nagoya conference

The International Tube Association (ITA), organisers of the Nagoya Tube 2007 technical conference in Japan, has announced a high quality line-up of speakers. Due to take place from 18-20 June at the Noyori Conference Hall, Nagoya University, Japan, the conference is coorganised by the Roll Forming Research Committee of the Japan Society for Technology of Plasticity (JSTP).

Nagoya Tube 2007 will run over two days with the third day devoted to a choice of plant visits to Sumitomo, JFE Steel and Sango Co. The programme of 27 papers will include keynote presentations by Dr Ken Hirata, president of Shibaura Technical College, and Professor Kiuchi, both ITA president and chairman of JSPT.

A highlight will also come from Mr K Mine of Toyota Motor Corp, who will present a paper titled 'Application of pipe materials for cars'. Other major organisations scheduled to speak at the symposium include Chiyoda

Corp, Sumitomo, SMS Meer, Nippon Steel, Nisshin Steel Co, China Cold Rolling-Forming Steel Association and Nakata Manufacturing Co.

Apart from Japan, the conference will also welcome speakers from China, Germany, Netherlands, Italy, Ukraine, USA, Australia, Norway and Canada.

International Tube Association – UK

Fax: +44 1926 314755

Email: info@itatube.org

Website: www.nagoya-tube.com

Utube or Youtube: confusion reigns over website names

Universal Tube & Rollform, USA, has reported ongoing problems with its website www.utube.com as a result of the purchase and increased promotion by Google of the YouTube internet user video website. Universal's website was established in 1996,

while Google only purchased YouTube in September 2006 for US\$1.65bn.

Thousands of curious YouTube video seekers mistakenly went to utube.com (instead of youtube.com), leading to around 90,000 unique unwanted visitors a day (8-9 million hits). This unwanted traffic even forced the utube website to shut down on several occasions, meaning Universal has been forced into finding an alternative internet provider with enough bandwidth to accommodate the flood of visitors.

Some frustrated YouTube searchers even sent abusive emails, filled out machinery information request forms requesting video download instructions and made irate phone calls to Universal Tube & Rollform. In an attempt to offset the extra bandwidth cost, Universal has now included a search option at the top of its web page to assist accidental visitors looking for YouTube.

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Borealis invests €90mn to develop its polypropylene business

Borealis, a leading provider of plastics solutions including tube and pipe, has announced it will expand its polypropylene (PP) capacity at Porvoo in Finland and extend the product range from its Borstar® PP plant in Schwechat, Austria.

The company will invest €25mn to expand the capacity of its PP plant in Porvoo, Finland, from 65,000tpa to 220,000tpa by the end of 2008. The increased capacity is intended to meet growing demand for innovative plastics solutions in the pipe and advanced packaging markets and better supply the developing Russian market.

Borealis will also invest €35mn to create a four-reactor configuration at its Borstar® PP plant in Schwechat, Austria, to support the production of superior materials that meet the needs of the automotive, pipe and advanced packaging industries.

The plant is designed to take advantage of the expanding automotive markets in central and eastern Europe. The additional

gas phase reactor will be operational by 2009.

In addition, Borealis will invest €30mn in a four-reactor Borstar PP pilot plant at Schwechat that will strengthen the company's ability to develop innovative, advanced multimodal PP solutions. The pilot plant will be completed in 2009.

Mr Wim Roels, Borealis vice president (innovation & technology), commented, "In addition to these asset investments in polypropylene, the ongoing investment in innovation centres and polymer expertise demonstrates our commitment to maintain our position."

The company also recently announced that it is expanding the plant at Burghausen in Germany to manufacture 330,000tpa of Borstar PP.

Borealis AG – Austria
Fax: +43 122 400 333
Email: info@borealisgroup.com
Website: www.borealisgroup.com

Strong growth at SMS group

The SMS Group, Germany, won orders of over €3.2bn in 2007, an increase the company says is due to the global buoyancy of the steel industry. Other markets fared well such as the hardening and forging industry, the nonferrous metal producing industry and plastics processing industry.

Orders from Germany formed 13 per cent of the company's overall order intake, showing a modest recovery on the domestic market. The most important sales regions for SMS remain China, Russia and India. However, other countries embarking on industrialization or an extensive modernization phase also contributed to the increased order volume.

SMS also noted that the industry in the traditional steel regions of North America, western Europe and Japan invested at a normal rate. However, these countries are facing growing pressure to invest in revamps to retain their competitiveness.

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 Astm a269/a269m

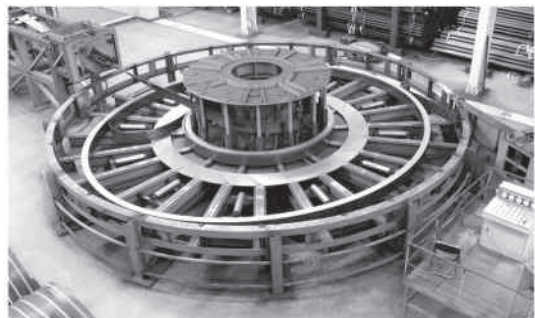
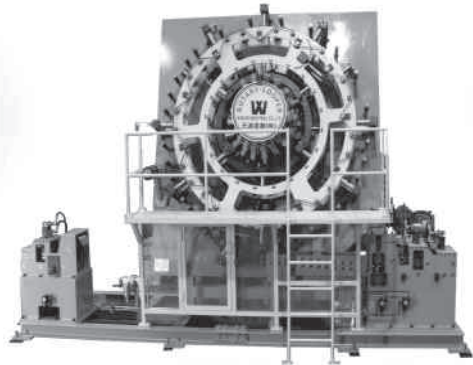
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Events News in Brief... events news in brief...

A leading annual show for industrial technology, **Hannover Messe 2007** (www.hannovermesse.de) will be staged from 16-20 April 2007 in Hannover, Germany. Established for sixty years, the event features a host of mini-shows including Pipeline Technology, Energy, ComVac, Industrial Automation, MDA (Motion, Drive & Automation), Digital Factory, Surface Technology, and MicroTechnology.



CityPipe 2007 (www.citypipe.ru), the 2nd international trade fair and conference for municipal infrastructure piping systems, will take place from 29 May to 1 June 2007 at the Crocus Expo Centre in Moscow, Russia. Organised by Sibico, the exhibition is geared towards construction, diagnostics, repair and operation of piping systems.



The **8th China (Guangzhou) international metal and metallurgy exhibition** (www.julang.com.cn) will return from 21-24 June

2007. The event – which features a special exhibition for plate metal, tube, bar, wire and metal processing – will take place at the Guangzhou International convention and exhibition centre in Guangzhou, China. Organisers Julang Exhibition Co Ltd expect high numbers of visitors to attend from over 25 countries and regions.



Isgatec (www.isgatec.com), the 5th specialised exhibition for sealing and bonding technology, will be held in Nuremberg, Germany from 27-29 March 2007. Exhibits will include dynamic sealing systems, shaft seals, hydraulic/pneumatic seals, chemically engineered seals, industrial adhesives, and bellows/profiles.



The **Shanghai Steel Tube Expo** (www.gangguan-expo.com) will take place from 10-12 May 2007 at the Intex Shanghai & Shanghai Mart in Shanghai, China. Exhibits will include steel tube products such as seamless steel tube, welded pipe, stainless


steel tube, construction tube, and composite steel tube. A range of steel tube equipment will also be on display, including welding equipment, inspection equipment, and surface engineering technology.



Roll-Kraft (www.roll-kraft.com), USA, recently completed a series of tube/pipe and rollforming seminars at their headquarters facility in Mentor, OH. The seminars ran over a two-day period, with tube and pipe topics including integrity and alignment of the mill, various setup preparations, and tooling maintenance. Rollforming topics included roll design, calculating strip width, pass layouts, setups, and downhill forming.




CIPE (www.cipe.com.cn), the 7th China international exhibition on equipment for pipeline, oil and gas storage/transportation, will be staged at the Beijing Exhibition Centre, China, from 3-5 April 2007. The event will include CIOOE – the 4th China international offshore oil and gas exhibition; and CIPPE – the 7th China international petroleum and petrochemical technology and equipment exhibition.



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00306	J 08/02/03 00:00:00		SC.018 OK	PREMIUM
00307	J 10/20/03 00:00:00	WALL REDUCTION		PREMIUM
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Business News in Brief... business news in brief...

Following one of the most publicly drawn out bidding wars ever, **Tata Steel** of India (www.tatasteel.com) has finally beaten Brazil's **Companhia Siderurgica Nacional** to the ownership of Anglo-Dutch producer **Corus**. Due to the industrial tug-of-war, Britain's takeover panel had set up an auction where Tata's offer of 608 pence per share pipped the offer of 603 pence by CSN. The total deal is believed to be worth US\$13.7bn.



Salzgitter AG (www.salzgitter-ag.de), Germany, and **Vallourec SA**, France, have begun the initial stages of Salzgitter's planned acquisition of **Vallourec Précision Etirage** (VPE), France, a 100 per cent subsidiary of Vallourec. VPE is specialised in the manufacture of cold drawn precision tubes for automotive and industrial applications, with expected sales for 2006 of €220mn. With 1,230 staff, VPE operations include five production plants in France.



Eagle Precision Technologies Ltd (www.eaglept.com), Canada, a provider of tube bending and forming solutions, has introduced a new five year warranty programme. The warranty covers new machinery, including the company's line of CNC tube benders and end formers.



Machinery International Corp (www.machyintl.com), **McMillan Conroy Machinery** and **Cedar Hill Industries Ltd**, have moved to a newer, larger and more modern facility. The new address for the facility is 20 Commerce Drive, North Branford, CT 06471-1250, USA.

UKF Stainless Ltd (www.ukfstainless.co.uk), UK, has reported a successful financial year, with turnover increasing to nearly GB£7m, and a budget of GB£9m for the year 2006/2007. During the last 12 months the company has made major changes to its management team. While continuing to be a main UK distributor of automotive tubing, the company has received new business for cut, polished and manipulated tube.



The stainless tubing division of **Dofasco Copperweld**, USA, has announced that its website – www.lasertubes.biz – has been redesigned and expanded to include new technical literature, additional tolerance and size charts, an ecommerce site that will have order entry capabilities, and new product brochures, including Chinese and Spanish versions.



Plastic pipe, components and fittings specialist, **Polypipe** (www.polypipe.com) has chosen **IFS Applications** to bolster its financial, supply chain, manufacturing, distribution and maintenance operations across the UK. IFS Applications 7 will replace numerous disparate legacy systems to automate a range of labour-intensive and costly manual processes. Other IFS customers include Schlemmer Filtrona Extrusion, Nolato Plasttechnik AB, and Euroform AB.



Seversky Tube Works, a subsidiary of **TMK** (www.tmk-group.com), has completed the installation of a new piercing mill, the latest stage of the company's strategic investment program. The piercing mill

is a component of the modern high-tech seamless pipe production complex being created at the enterprise.



A new journal entitled **Journal of Coatings Technology and Research** (www.springer.com/journal/11998) has resulted from the merger of Surface Coatings International Part B: Coatings Transaction and the Journal of Coatings Technology Research. Jointly owned by the **Oil & Colour Chemists' Association** (OCCA) and **Federation of Societies for Coatings Technology** (FSCT), the journal will be published by Springer Science+Media LLC. It will be available in four issues during 2007, both as printed issues and online through SpringerLink.



The Hazira operations of **Essar Steel Ltd** (www.essar.com), India, has commissioned a continuous caster built and supplied by **SMS Demag AG**, Germany. The caster produces slabs in widths of up to 2,000mm and a thickness of 220/260mm. Designed for an annual production of 1.8mn tons of steel, the caster will be used to produce heavy-plate and tube-steel grades.



Roll-Kraft (www.roll-kraft.com), USA, has taken delivery and installed additional CNC's at its headquarters facility in Mentor, OH. This latest addition brings Roll-Kraft's capacity to 36 CNC machines, which will lead to an increase in manufacturing levels.



MID (www.variacor.net), France, is seeking international distributors for its Variacor® joint system. The system is designed to make all hoses flexible and adjustable, whatever the pressure and rigidity. Variacor joints have been designed for applications such as automotive assembly lines.



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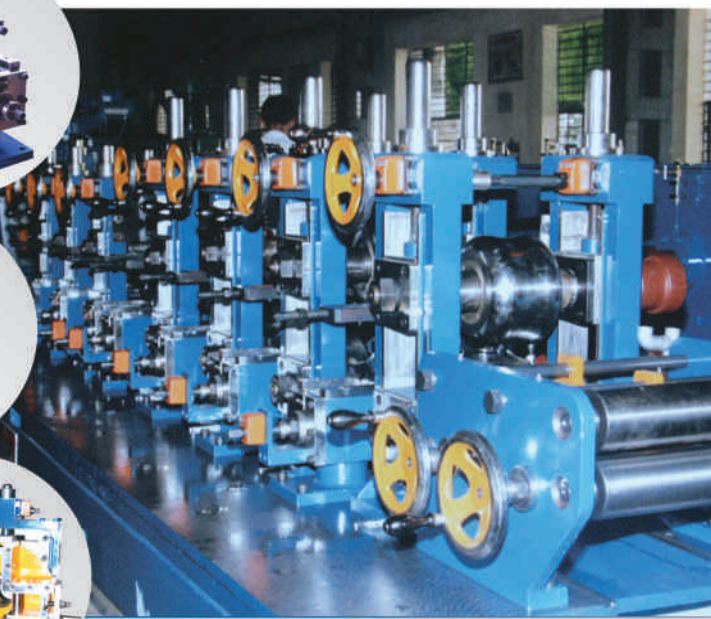
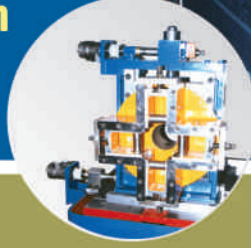
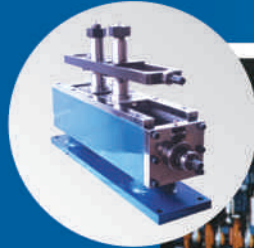


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Technology Update

Perfect TIG welding in all locations

Lorch Schweißtechnik, Germany, has introduced the full digital inverter T-series for mobile TIG and MMA welding.

The new T-series has been developed for TIG-welding quality either in the workshop or in the field.

Available in two versions with 220A as DC or AC/DC, the machine combines pure power, high user comfort and perfect welding results. The ultramodern control concept is based on the theory of 'three steps and

weld', backed up by the Lorch SmartBase expert database. The 'T' calculates the best welding adjustment with just a few parameters.

High-grade steel and aluminium railings can be welded without welding spatters, with thin seams and a perfect optic. In addition, with the newly developed Lorch Macs alternating current procedure, aluminium can be welded perfectly within a thin sheet range and also, with Fastpuls, at up to 2kHz.



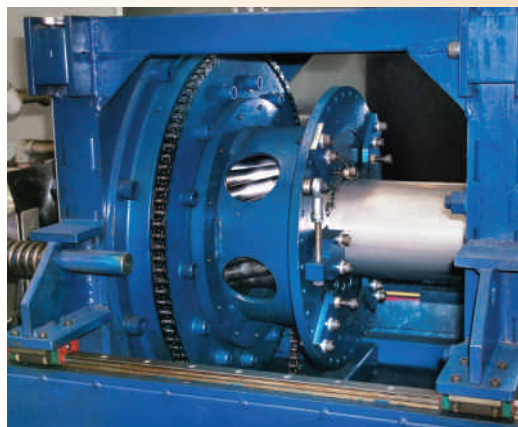
The T-series TIG welding machine from Lorch

Rotary sizing mill for online and offline applications

Kusakabe, Japan, an innovative tube and pipe mill manufacturer, is continuing to expand the applications for the Rotary Sizing Mill concept as an alternative to sizing tube and pipe with a diameter range from 30-650mm (1.2 to 25.6").

The Rotary Sizing Mill (RSM) concept uses two cages of cylindrical rolls in a planetary configuration around the tube. The internal diameter of the cage of rollers is set smaller than the incoming tube. As the cage of rollers rotates around and along the tube, in a similar manner to a nut on a thread, the tube diameter is reduced.

This technology is being applied to both online applications on tube and pipe mills and offline applications where the outside diameter needs to be reduced and surface finish improved. The variable diameter outcome of the RSM makes the machine ideally suitable for sizing small production runs of odd sized tubes without the need to purchase extra tooling.



The Rotary Sizing Mill (RSM) concept is available for a growing number of applications

Mr Yukio Kusakabe, executive director, stated, "The RSM technology brings a totally new concept to the ERW, TIG and laser tube and pipe industry." The RSM is a smaller machine requiring less tooling; the tooling is of a simple parallel design that is easy to manufacture and maintain.

The internal diameter created by the cage of rollers is infinitely adjustable within the upper and lower limits of the cage configuration. Surface finish improvements over the original strip in excess of 30 per cent

have been achieved with roll marks and pick up eliminated, thereby reducing polishing costs. Tooling wear is less than conventional tooling wear and also benefits from the absence of wear impact on tube quality or precision.

Improvements in diameter accuracy are achieved and are comparable to drawn tube capabilities. RSM offers other benefits including reduced energy consumption, floor space, tooling, maintenance costs, changeover times and scrap.

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The T-series has a patented Sine-Power Management system that offers 220A maximum welding current at 230V mains without turning off the fuse, even with a long cable. At only 15kg net weight, the T-series has a strong duty cycle of 35 per cent at TIG and electrode welding, and welding is undertaken without breaks. Due to the strong construction the T-series also offers twice as much dropping security as demanded by law, plus perfect dust protection.

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Email: info@lorch.biz
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Custom-made extrusion lines for the Russian market

Battenfeld Extrusionstechnik GmbH, Germany, manufactures tailor-made extrusion lines for the production of pipes, profiles and thermoforming sheet.

Russia has developed into one of the company's most important export markets, and it has responded to the rising demand for high-performance machinery concepts

Battenfeld Extrusionstechnik specialises in the manufacture of extrusion lines





by offering turnkey extrusion lines with matching machine components, from dosing unit to semi-finished product handling. Each line is entirely synchronised by one control system.

The company has introduced its new techBEX line for the manufacture of small technical profiles, such as IC tubes or decorative profiles for the furniture and automotive industries, as well as for the refrigeration and air conditioning industries. This standardised line is entirely manufactured and assembled by Battenfeld in China for the world market.

For pipe manufacturers, the company also offers a number of machine concepts and has, in the last three years, sold 20 pipe extrusion lines to manufacture polyolefin pipes with diameters of more than 800mm.

Mature line concepts are also available for the growth area of aluminium-plastic composite pipes, which is gaining market share in the heating and sanitary installations industry. This is due to the combination of the positive attributes of the metal (ie easy laying compatibility and dimensional stability), with the resistance to corrosion and incrustation of plastic pipes. In partnership with Templet Deutschland GmbH, Germany, Battenfeld Extrusionstechnik has designed a complete line for the production of aluminium composite pipes at the record speed of 50m/min.



🔦 The techBEX, for small technical profiles and pipes, is manufactured by Battenfeld in China

The company has also met the rising demand for cost-efficient production of top-quality packaging sheet with its High Performance Sheet Line, an extrusion line incorporating a high-speed 75mm single-screw extruder with an output of up to 1,600kg/h. The line is suitable for producing PP, PET, PE and PS sheet with thicknesses from 200µm.

Battenfeld Extrusionstechnik GmbH
– Germany
Fax: +49 5731 27 124
Email: welcome@bex.battenfeld.com
Website: www.bex.battenfeld.com

Projection welding machine for radiator elements

Cemsa SpA, Italy, has designed a new model of projection welding machine for the production of radiator elements for warming houses and plants. Such 'tube-on-tube' products normally consist of two longitudinal tubes, called collectors, welded to numerous cross tubes that are the effective means of warming.



🔦 The LNR-RD-TB/TB projection welding machine from Cemsa

Cemsa's model LNR-RD-TB/TB is designed to provide a flexible manufacturing system with a high level of automation. All dimension parameters are controlled by a CNC system, and the few clamping equipment changes required when changing model can be carried out by a single operator.

The distance of the cross tubes can be easily changed, following the design and effective service requirements. The machine is available in versions for both standard and special solutions, and for tubes of different shapes and combinations.

Cemsa SpA – Italy
Fax: +39 02 253 3307 • **Email:** info@cemsa.it • **Website:** www.cemsa.it

Orbital weldheads for sanitary, ultra high-purity and high-pressure jobs

MK Products, USA, is the manufacturer of weldheads with capacities from 1/8" OD to 6" NPS. Adaptable to unusual weld configurations, the CopperHead® series is an effective and rugged in-place orbital weldhead available in three models.

The CopperHead® models 5001 (1/8" to 1" OD), 5002 (1/4" to 2" OD) and 5003 (1/2" to 3" OD), all offer versatility and high-output production rates. The water-cooled, narrow profile weldheads are lightweight and easy to handle for those awkward welds with limited access. All CopperHead® models are equipped with fingertip controls in the handles, thus eliminating the need for additional remote control pendants.

The model 5006 DiamondBack™ is the company's largest in-place orbital weldhead (3" tube OD up to 6" pipe size). Heavy-duty and versatile, the DiamondBack™ also has a narrow profile and is perfect for process piping and weld fitting applications found in food and beverage, dairy and other sanitary process piping installations. Also great for high-pressure aerospace applications, this easy-to-use weldhead is simple yet robust to meet the demands of field construction or manufacturing production environments.

The model 4000 MiniMicro™ is designed to accommodate a variety of miniature weld



🔦 The high-quality range of weldheads with capacities from 1/8" OD to 6" NPS

fittings and face seal fittings and glands. The MiniMicro™ is capable of welding diameters from 1/8" to 1/2" OD. This water-cooled micro weldhead is ideal for welding tube and fittings with controlled surface finishes that are electro-polished to meet ultra high-purity system requirements.

Established in 1966, MK Products is the original inventor of Cobramatic® push-pull wire feed technology and is recognised worldwide as a leader in aluminium welding systems. MK Products also manufactures MK Orbital™ tube welding systems for exotic alloys and Aircrafter™ tabletop rotary positioners.

MK Products – USA
Fax: +1 949 472 1428
Email: sales@mkproducts.com
Website: www.mkproducts.com

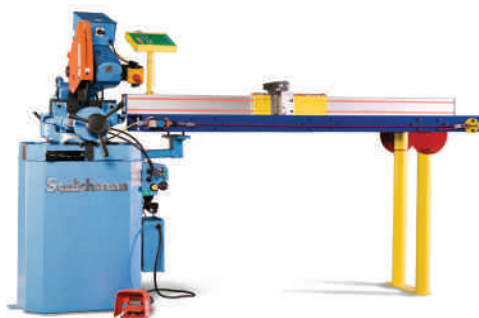


Advanced Feed System enables full automation

Scotchman Industries, USA, has launched its new Advanced Feed System, which allows companies to increase productivity, decrease set-up time, reduce operator errors and eliminate waste.

The Advanced Feed System, coupled with a Scotchman circular cold saw, turns a semi-automatic machine into a fully automated production machine. Once material is secured in the indexing clamp, the system automatically moves the material into position, clamps the material, and cycles the machine with ± 0.004 " repeatable accuracy.

Operators can either manually enter dimensions or pull a cut list from the



 The Advanced Feed System from Scotchman Industries

controller, which can store up to 99 programs.

Cut list information can also be downloaded directly from a PC, reducing the chance of operator error. One-off cuts are completed

by keying in the desired cut length in inches, fractions, or metric, and pushing 'start'.

The Scotchman system can be used as a programmable stop system or a fully automatic programmable push feed system with an optional material clamp. Optional optimising software can calculate how to best optimise selected material for the highest yield.

Scotchman Industries Inc – USA

Fax: +1 800 843 5545

Email: sales@scotchman.com

Website: www.scotchman.com

Latest cutting systems for auto components

Reika, Germany, has delivered another four complete cutting systems for DOM tubes to the largest tube producer in central America. The machines are to be installed in the customer's value-added production centres for tubular automotive components.

The lines are of the new 'Compact' series, with high performance outputs for automotive suppliers, and tube-machining cells consisting of a rotary cut-off unit and a chamfering/facing unit. The rotary cutting heads can either be equipped with standard carbide inserts or with chip-less cutting disks, reducing the tool cost per piece.

As the cutting operation is dry, the parted tubes can easily be transferred into the facing and chamfering unit. Subsequent measuring stations for length, roundness, straightness or specific measuring applications can be integrated with SPC-capability and evaluation.

The energy consumption of the new lines is low, as washing and drying operations are necessary due to the clean and dry cutting process.

Multi-machine operation can be achieved because of the automatic packaging systems on the exit side of the machines. The gantry-type packaging systems are integrated in the machine controls and can be easily programmed according to the necessary box size and the required packaging pattern.

The market for hot rolled tubes is booming, in particular for OCTG applications, and Reika has reported high demand for its new machines and turnkey lines for straightening, cutting and bevelling. The company will participate in September's International Tube Ukraine Conference in Dnepropetrovsk, where it will present new developments in tube finishing lines for seamless pipes.

Reika GmbH & Co KG – Germany

Fax: +49 2331 969 036 • **Email:** info@reika.de • **Website:** www.reika.de



 Reika's 'Compact' series of tube-machining cells

Specialised technology achieves optimal seam weld

Thermatool has announced a new technological development designed to enable tube and pipe producers to achieve the optimal seam weld. HAZ (heat affected zone) Control Technology takes what the tube maker already knows 'works' and 'does not work', and combines it with scientific knowledge. This shortens weld area changeovers, quickly develops new mill setups, and achieves faster mill speeds. HAZ Control allows online production monitoring to help mill operators achieve required quality standards.

HAZ Control Technology is a first step towards directly controlling the pipe or tube seam weld's metallurgical properties. It provides a different approach from the current practice of focussing on the parameters that create the weld – ie mill speed, welding power level, welding frequency.

The technology provides consistent welding of a wide range of materials, coatings, gauges, and d/t ratios (all on one mill if desired).

Also available are optimal ID and OD weld beads, extended life of scarfing tools and impeders, and repeatable optimal welding parameters to maximise yields, increase uptime, and reduce scrap.

Thermatool Corporation – USA

Fax: +1 203 468 4281

Email: info@ttool.com

Website: www.thermatool.com

Inductotherm HWT

(Thermatool Europe) – UK

Email: info@ihwtech.co.uk

Website: www.inductotherm-hwt.co.uk



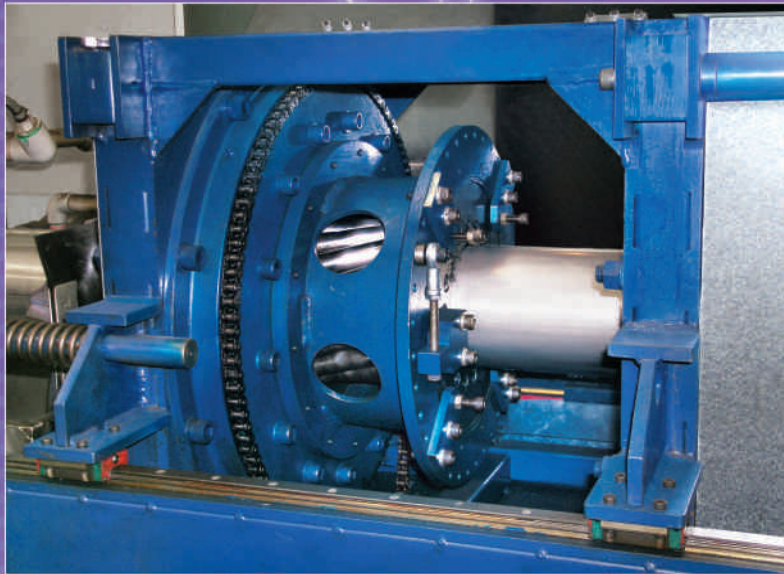
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Technology Update

Welding excellence with high and medium frequency systems

Elestar Srl, Italy, is highly experienced in the manufacture of high and medium frequency systems for welding, hardening, annealing and melting. Longitudinal welding systems for tube are a focus of Elestar's technology, together with the ever-growing demand for new induction heating applications.

The range of high frequency generators encompasses the welding of austenitic, ferritic and stainless steel tubes, carbon steel, copper, brass and aluminium. With an in-depth knowledge of HF technology and

material engineering, Elestar's machinery provides reliability in precision, speed, welding process control and final results.

According to its customer-oriented policy, Elestar can meet any application requirement with customised solutions, designed to match a variety of production parameters.

Elestar – Italy
Fax: +39 0119974066
Email: info@elestar.it
Website: www.elestar.it

Precision tubing for the Indian auto industry

Neel Metal Products Ltd (NMPL), India, part of the JBM Group, is the manufacturer of ERW tubes with a range from Ø 12.7mm to 76.2mm OD and wall thickness from 0.8mm to 4mm. The company also produce CDW tubes ranging from Ø 10-76.2mm OD with wall thickness from 0.8mm to 4mm.

A supplier of auto parts in India, Neel commissioned a manufacturing facility for precision tubes in 2005, and is also currently setting up a green field project for ERW and CDW tube manufacturing.

The company's installed capacity for ERW tubes is 55,000t/year and 7,500t/year for CDW tubes.

NMPL also has a steel service centre for slitting, cut-to-length and profile press blanking, with a capacity of 50,000t/year. The company has full manufacturing facilities with slitters, tube mills, annealing furnace, surface treatment plant for oil draw, draw benches, multi-cutters, tube finishing and testing lines, and a modern quality control facility with a metallurgical lab.

Cutting and tube handling machines

OMP, Italy, produces a range of cutting machines and systems for tube handling. This product range includes automatic cutting machines with circular blades, for cutting tube, bar, and profiles in ferrous and non-ferrous material. Discharge units can be added to these machines, with unloading positions for different lengths, trim cut or rest pieces. Deburring machines can also be added.

The company aims for short delivery times, reliability and flexibility, and continuous technological evolution to meet the demands of the market.

OMP Srl – Italy
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Fax: +91 11 2952 1512
Email: tubesales@jbm.co.in
Website: www.jbmindia.com

Seamless and butt welded pipe fittings

Teekay Tubes Pvt Ltd, India, is a manufacturer of seamless and butt welded pipe fittings.

The company's facility in New Bombay uses up-to-date manufacturing equipment and facilities, including a mandrel press and other high capacity presses, for manufacturing elbows (1/4" to 24"), returns (1/2" to 16"), tees (1/2" to 24"), caps (1/2" to 24"), reducers (1/2" to 24"), stub ends (2" to 24"), and other fittings.

Cold roll forming machines

Wuxi Yuanda Machinery & Technology Co Ltd, China, is a manufacturer of cold roll forming machines.

The company's machines are suitable for producing a wide range of products, including profiled sheet, door frames and panels, light steel keels, roller shutter doors, and goods shelf pillars. They can also be used for cross beams, guard rails, cable bridge rests, bus ducts, electrical cabin frames and elevator guide-ways.


The company also produces a series of slitting and levelling machines, and can design and manufacture forming equipment to meet certain specifications.

Wuxi Yuanda Machinery & Technology Co Ltd – China
Fax: +86 510 8827 7777
Email: sale@wx-yd.com
Website: www.wx-yd.com

The company's products are used in a wide variety of energy-intensive industries, from nuclear power generation and oil refining to petrochemical and chemical processing, and high-pressure service lines from LNG and LPG production to iron and steelmaking and shipbuilding. The butt welding fittings are made under strict quality control, and are subjected to a series of tests to confirm their pressure proof and other properties.

In addition to the mass and specialised production of butt welding fittings made of carbon, alloy and stainless steel, the company is actively working on the development of special alloy, hastelloy and titanium fittings.


Teekay Tubes Pvt Ltd – India
Fax: +91 22 2768 6061
Email: sales@teekay.co.in
Website: www.teekay.co.in






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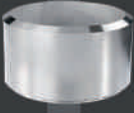



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Hot extruded pipes from aluminium alloys

Kumz JSC, Russia, uses the hot extrusion method and specialised presses with 5-120MN capacity to produce seamless pipes from more than 80 aluminium alloys, and diffused seam pipes from alloys of 3xxx and 6xxx series. These semi-finished pipes are supplied to industries including automotive, chemical, oil and gas, construction, engineering and shipbuilding.

Pipes from 12-100mm in diameter and with 1.5mm to 10mm wall thickness are produced on specialised horizontal hydraulic presses with 5-35MN capacity using mandrel dies. Presses with 15 and 25MN capacity are equipped with spray units,

 Horizontal hydraulic press with 72MN capacity and separate piercing system



allowing quenching by means of an aqua-air mix during extrusion. This reduces production cycle duration and power consumption.

A press with 35MN capacity is used to produce seamless pipes from 70-150mm in diameter and 5-30mm wall thickness, using the indirect extrusion method.

This press is equipped with separate drive, extrusion rate adjusting system and working parameter monitoring system.

Pipe presses with 72MN capacity are used for the extrusion of aluminium alloy weldless pipes, with a diameter of 70-425mm and 5-90mm wall thickness. These presses feature a reinforced piercing system with a stroke limited by limit screws. The system is attached to a moving beam, providing the fixed position of the mandrel and its exact movement to the specified target position.

The piercing system capacity is added to the main press capacity as required. The piercing unit enables the extrusion of weldless hollow sections with an inner



 Drill pipe from D16 alloy with locks screwed on

irregularly shaped hole. In addition, these presses are used to extrude hollow sections with a complicated outer shape, such as the extrusion of electromotor housings from alloy 1925.

Pipes with a diameter of 420-550mm with walls of 10-110mm are produced on a 120MN capacity press. The quenching of semi-finished pipe items is performed in vertical and horizontal quenching units, while box and shaft electrical furnaces with furnace atmosphere forced circulation are used for item ageing.

The company also has a production line to produce aluminium drill and pump-compression pipes. This line includes two horizontal hydraulic presses with 72MN capacity, designed for the production of variable cross-section length-altered pipes. Drill pipes are produced from alloys D16T, 1953T1, 2024T3 and 1570, and supplied in the form of pipe shell, threaded pipe shell, and drill pipes with locks screwed on. These products are particularly useful for horizontal drilling and ultra deep well drilling.

Kumz also produces pipes from 0.5m to 11m in length and 1-3mm wall thickness, from alloys VD1, D1 and AK6. These pipes include round cross-section (\varnothing 16-38mm), square cross-section (16-25mm), and rectangular cross-section (25mm x 28mm).

The company has its own foundry shop for the production of solid and hollow cross-section rounds, and a tool shop for the production of extrusion tools. Products are exported to over 20 countries, with main markets being Europe, Middle East, North Africa, South and Southeast Asia and the CIS.

This article was supplied by Mr Dmitry Cheroskutov (deputy chief extrusion industrial engineer) and Ms Olga Degtyarev (industrial engineer), Kumz JSC.

Kumz – Russia
Fax: +7 3439 395 927
Website: www.kumz.ru


Heavy-duty mill simplifies roll changeover and set up

Addison Machine Engineering Inc, USA, has launched an improved PSU-8000 rafted sizing/powered squaring mill. The heavy-duty mill provides two features that simplify changeover and setup and provide greater operator safety.

The outboard roll stand base has a built-in air bearing, making it possible for one person to easily remove the stand during roll changeover. Additionally, the single point adjusters on each roll simultaneously position both front and rear side rolls and individually position top and bottom driven rolls.

All roll adjustments are made from a safe, convenient access point on the front of the stand, with a digital position indicator providing precise roll position feedback. This sizing/powered squaring section is suitable for round tube diameters of 3" to 7.625", square tube up to 6" x 6", and rectangular tube up to 2" x 10".



 Addison Machine Engineering's PSU-8000 rafted sizing/powered squaring mill

Addison Machine Engineering Inc – USA
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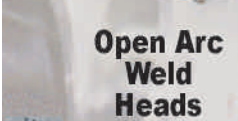
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Custom contoured tube components for medical applications

Marshall Manufacturing, USA, is an ISO-certified manufacturer of medical device components, including custom contoured tube components with induction brazed piston and end connectors, manufactured to specification.

Available in diameters from 0.032" to 1.25" and made from stainless steel, titanium, inconel and other exotic metals, the contoured tube components are electro polished with a 6-16 RMS micro finish. Combined with the company's resources for CNC Swiss machining, CNC milling, custom bending and induction brazing, these capabilities provide medical design engineers with the freedom to create innovative introducers and custom needle presentations, and intricate medical components.



➤ A sample of the components available from Marshall Manufacturing

Many configurations and features can be designed into the specialised contoured tube, wire and machined components, which are available in prototype and volume production quantities.

A full range of points are available including trocar points, taper points, and bullet points. Additional tubular part features include swaged ends (large or small), and

swaged special shapes including chisel, hex, square, flare and double flare. Tubes may be custom threaded, stamped, laser etched, burnished, brazed and finished in addition to contouring.

A variety of hole configurations, from round to special shapes, including grooves and cross holes at various angles, are available for the tubular parts. Additional processes include knurling, milling, stamping, broaching, burnishing, and induction brazing. Finishing options include heat treating, electro polishing and plating. Laser etched parts are also available for part traceability.

The company's custom tubular introducers and needles are available in lengths from 2" to several feet. In addition to induction brazing, assembly options include press

fit, welding, and epoxy fastening, while many specialised secondary operations are available, including packaging with SPC and lot traceability.

Marshall Manufacturing – USA

Fax: +1 800 321 6728

Email: general@marshallmfg.com

Website: www.marshallmfg.com

State-of-the-art forming rolls and cut-off blades

DB Engineering (P) Ltd, India, manufactures forming rolls under the Atlas brand, together with tube cut off blades and alfa shears. The company's roll manufacturing shops use state-of-the-art manufacturing equipment, including CNC machining and turning centres, bore, OD and profile grinding machines, and finishing and polishing machines.

The heat treatment shops house atmosphere-controlled furnaces with

➤ Atlas tube cut-off blades and alfa shears



recording of heat treatment data, together with a metallurgical lab.

DB Engineering has comprehensive in-house design facilities, including special computer software that aids the building of designs to specific requirements.

The company's inspection facilities include the testing of steel, computer simulation of designs to locate stress and wear areas in production, and the checking of accuracy and consistency of profiles, surface finishes and dimensional tolerances.

DB Engineering (P) Ltd – India

Fax: +91 11 2638 6453

Email: sales@skberri.com

Website: www.skberri.com



New wire feed units for FastMig welders

Finnish welding equipment manufacturer, Kemppi OY, has launched two new wire feed units – MF 29 and MSF 57 – for its 3-phase 230V/440V FastMig™ Basic and Synergic MIG/MAG welding systems.

These systems are used in industrial applications such as shipbuilding, offshore, transport and general fabrication industries.



i The new MF 29 and MSF 57 wire feed units from Kemppi

The MF 29 wire feed unit is designed for the FastMig Basic power sources KM300, KM400 and KM500, using 200mm wire spools.

It features the latest DURATorque™ 200 2-roll wire feed mechanism with a low energy consumption motor and accurate gearing and transmission assembly. This enables the unit to respond to rapid wire feed acceleration and deceleration, and makes it easy to start and stop welding.

The feed mechanism has been specifically designed for smaller and lightweight welding machines, and the shape of the feed roll drive wheels allows the wire to be gripped without damaging it during feeding. The unit can also be fitted with an optional gas flow regulator.

The MSF 57 is designed for FastMig Synergic power sources KMS300, KMS400 and KMS500. It uses both 200mm and 300mm wire spools, and features the DURATorque 400 4-roll wire feed mechanism, providing a steady and trouble-free wire feed. The unit can be fitted with either the SF54 or SF53 control panel, mounted on the front of the feeder.

The SF54 control panel has a digital display, stepless welding voltage and wire feed rate controls, gas test button, wire feed switch and an MMA welding option. The SF53 panel is designed for the most demanding welding operations, and has all the features of the SF54 panel plus crater filling, hot

start, creep start, and synergic programs for most materials. It also memory channels for saving MIG/MAG welding parameters.

Kemppi's FastROOT™ software for root pass welding is available as an option for the SF53.

This provides added productivity and fast control of root closure, especially when welding ferrous and stainless steel pipe.

Both wire feed units have a double-skinned impact resistant plastic casing, and optional hanging frames and protective slides for easy moving.

Kemppi OY – Finland
Fax: +358 3899 428
Email: export@kemppi.com
Website: www.kemppi.com

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Conveyorised tube washing systems

Guyson International, UK, have developed a two-stage conveyorised Marr-Line tunnel washer suitable for degreasing ranges of short metallic open-ended tubes.

Tubes can be washed free of mineral pressing oil and shop dirt prior to assembly or subsequent processes.

Varied short tubular components, such as those used in heating boilers, radiators, refrigerators, chillers and cooling products, are washed by loosely packing them upright into wire baskets. This simple method allows a wide range of components to be cleaned.



A two-stage Guyson Marr-Line wash and dry conveyorised washer

Washing is achieved in a high-pressure spray-washing chamber with the 100 l/min stainless steel vertical pumps flushing wash solution through directed wash jets. The stainless steel honeycomb belt can take a maximum belt loading of 100kg of components, and provides good access for

the wash jets below to penetrate the parts, allowing 360° component washing.

Optional extras include an auto-dosing unit fitted to the wash tank to maintain accurate wash strength solution. An external Guyson tramp oil separator can remove the worst excesses of oil contamination from the cleaning solution, thus extending the cleaning solution life and maintaining its

effectiveness. A Filtermist condenser can also be fitted above the wash section for the collection of oil charged water vapour.

The drying section of a typical two stage machine is fitted with a full width overhead air knife that can be adjusted to accommodate different component heights and angled to shear off as much residual moisture as possible before entering the inline heater box, operating at 110°C. Parts exit onto a 500mm out-feed extension fitted with a photo electric cell to stop the conveyor when the basket reaches the end.

All Guyson Marr-Lines include a range of productivity and servicing benefits. These provide users with washable filters, automatic water fill via ball-float valves, low level water sensors, quick release couplings on the spray bar units for ease of cleaning, large easy-opening side doors to all wash and rinse units to facilitate easy access, and sloping tank floors for easier and faster drainage.

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Website: www.guyson.co.uk

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WINNER Winner Stainless Steel Tube Co.,Ltd.

ORNAMENTAL TUBING

SANITARY TUBING

COIL

SHEET, PLATE (No.1, 2B, BA, No.3, No.4, HL)

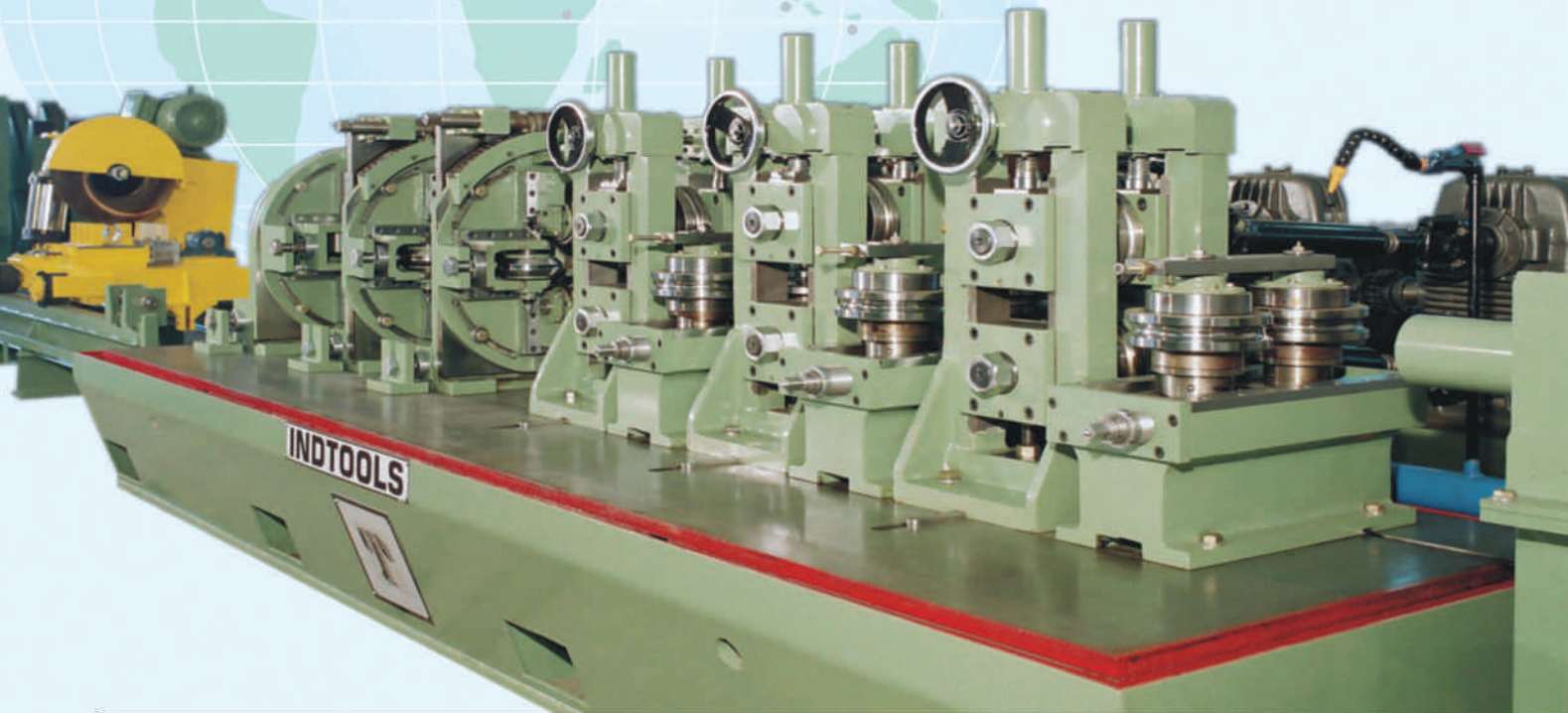
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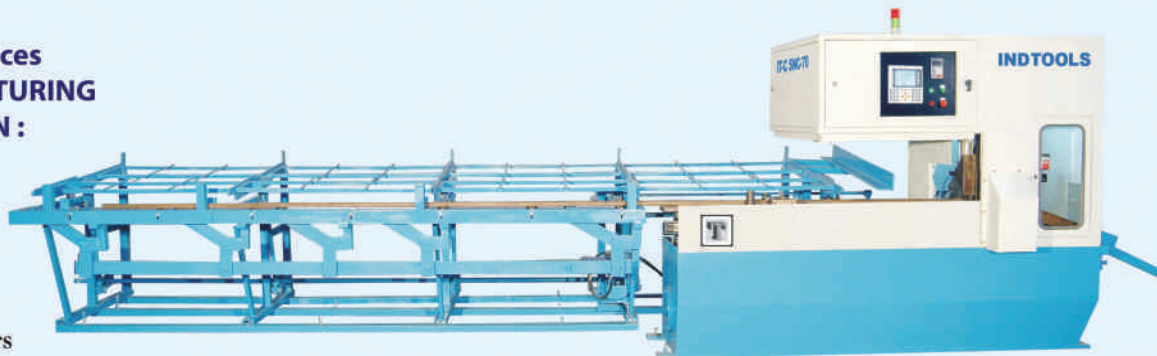
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- Pipe End Threading Machine
- Tube / Rod Straightening Machines
- Draw Bench up to 120 tonnes with single draw double draw and triple draw in one stroke
- Tag End Swaging Machine
- Tag End Hydraulic Pointing Machine
- Hydraulic Push Pointers

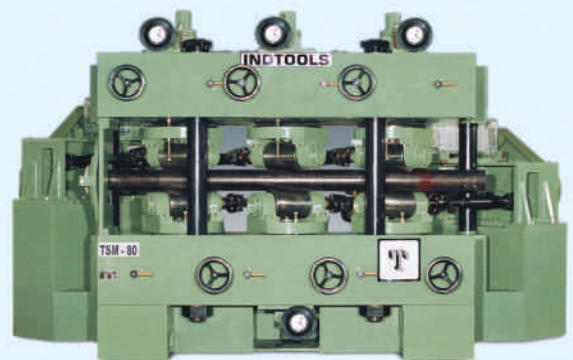


Cutting Machine

ITL, a trail-blazer in High Speed Sawing Technology has commendably established itself in domestic and global markets as a dependable 'Cutting Solution Provider' and in its strive, ITL has achieved yet another milestone by introducing to the country High Speed Circular Sawing Machine, keeping pace with Time and Technology.

Productivity example :

ERW MS Pipe of O. D. 30 mm x 3 mm wall thickness x 100 mm long = 1000 Pieces per Hr.



ITL International LLC.

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New Kensington, PA 15068
USA

Phone : 724-335-5944
Fax : 724-335-5569
E-mail : itlusa@itlind.com
Website: www.itlind.com

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ITL Industries Ltd. 111, Sector-B, Sanwer Road, Indore-452 015 (M.P.) India
Phone : 91-731-2724416, 2724749, 2721767 Fax : 91-731-2722372, 2721110
E-mail : itlindia@sancharnet.in Website : www.itlind.com



Advanced machinery for joints and notches

Coburg Engineering Limited, UK, is a machine-tool company and distributor, providing solutions for tube working and automated machinery manufacture.

The company's product range includes the Arc-Fit Standard unit and Arc-Fit Angular unit for producing specified angular joints in two hits on pipe and heavy wall tubing. This tubing is used for bracing systems and rails for stairs and in the shipbuilding industry. The Arc-Fit 35 Unit has a standard housing that accommodates interchangeable punch and die assemblies to notch equal 90° as well as unequal sizes, and for slots, notches with drain holes and piercing tools for Perf-Arc self-contained piercing units.

The Mitre-Snug is available for fitting mitre joints, while the Arc-Snug is designed for the rapid notching of round, square, oval or rectangular tubing to form 25° to 90° angular joints. These units produce 'true contoured' joints, and can be enclosed in power frames driven by air-oil, creating low-cost alternatives for manufacture and assembly.

Coburg Engineering also supply double notching pipe and tubing tools using the

Arc-Twin 101 DS Die. Power operated Vogel hydraulic Arc-Twin units are available for automated production of 90° 'T-joints'.

The company also offers cut-off machines and heavy duty application shears to cut rod, angle iron, flat stock, channel and other structural shapes, in three capacity ranges.

Coburg Engineering – UK
Fax: +44 1747 854 744
Email: info@coburg.co.uk
Website: www.coburg.co.uk

Cold and hot moulding rolls from Korea

Technic & Research Precision (T&R), Korea, specialises in the production of cold and hot moulding rolls. The company supplies many kinds of rolls for ERW lines, TIG welding lines and light-gauge materials.

T&R has been producing and supplying rolls for 10 years, all over the world, and in particular to Europe and Asia. The company, which introduced a CAD/CAM system in 2001 to maintain product quality, is still

growing through investment and research, and aims to be a leading company in the field of rolls.

Technic & Research Precision Co – Korea
Fax: +82 54 286 1860
Email: hskim@tuberoll.com
Website: www.tuberoll.com

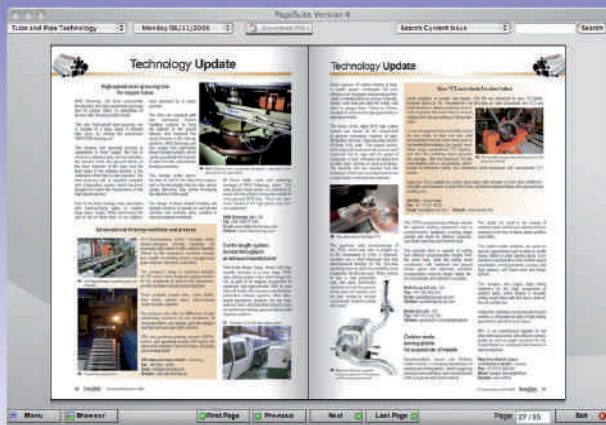
Encyclopaedia of bend tooling

Bend Tooling Inc, USA, is a manufacturer of tube bending tools, specialising in bending dies, mandrels, and wipers for rotary-draw tube-bending machines. The mandrel tube-bending experts make tube-bending tooling for aircraft, automotive, shipbuilding, HVAC, furniture, and other industries.

The company's website features full information on a range of products, and includes a 'Bend Tooling Encyclopaedia'. The company also produces a series of technical bulletins on the art of rotary-draw tube-bending.

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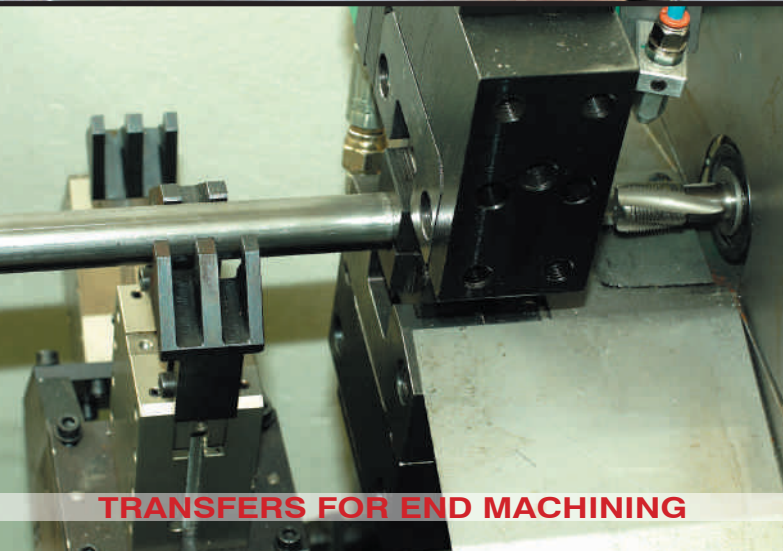
TUBE & PIPE TECHNOLOGY



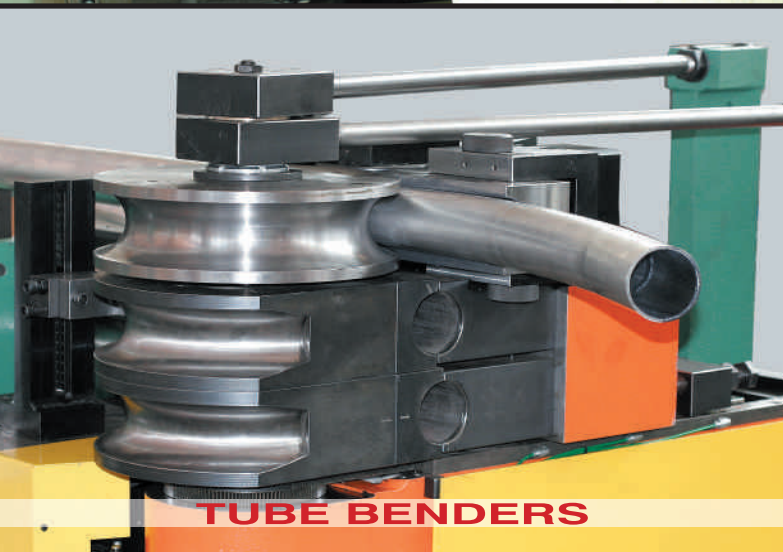
TUBE CUTTING LINES



MEASURING SYSTEMS



TRANSFERS FOR END MACHINING



TUBE BENDERS

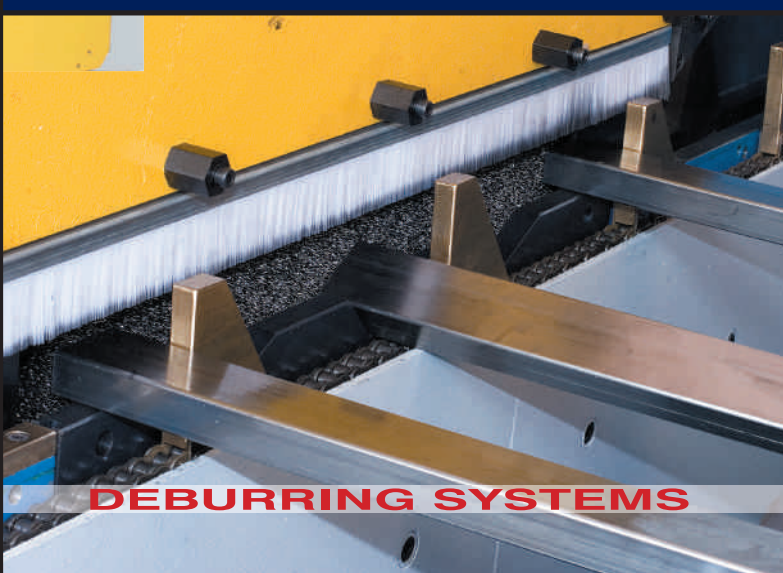


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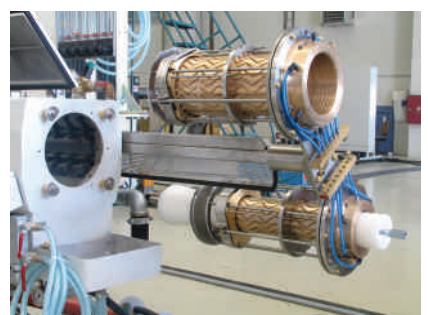
Im Gewerbegebiet 8, D-88693 Deggenhausertal, Germany
Phone: 0049 (0) 7555 - 927510, Fax: 0049 (0) 7555 - 927530
E-Mail: info@atis-germany.de, Web: www.atis-germany.de

Technology Update

High-performance extruders and pipe dimension change systems

Extruder specialist Cincinnati Extrusion GmbH, Austria, manufactures the Monos range, available in six sizes with screw diameters from 45-150mm, and outputs ranging from 270 to 1,850kg/h. The extruders are suitable for all applications that demand optimised melt quality at low melt temperatures, and achieve an increase in output of approximately 30 per cent compared to their predecessor models from the Proton series.

Featuring a 37 D long processing unit and a special Power Feed barrier screw with a Maddock compounding section, Monos extruders can achieve a particularly smooth surface in PE or PP pipes, as well as optimised product attributes in corrugated gas or water transport pipes from PE 100, PE 80 or PP. The bimetallic barrel, which is included as standard, and a special coating in the feed zone of the screw, ensure a long service life for these extruder models.



The new IntelliChange pipe dimension change system from Cincinnati Extrusion

The company also produces the IntelliChange pipe dimension change system. IntelliChange is available for a total pipe diameter range from 40mm to 400mm in three sizes. Each is laid out to accommodate four different pipe diameters ranging from 40mm to 160mm, 110mm to 250mm, and 250mm to 400mm respectively, and all standard wall thickness gauges from 1.8mm to 32.1mm.



The high-performance Monos extruder is available in six sizes, with screw diameters ranging from 45mm to 150mm

The complete system has a dual spiral mandrel pipe head equipped with a hydraulic die gap adjustment facility. In addition, it includes the appropriate set of dies, an adjustable calibration unit, a dual-chamber vacuum tank with rotating calibration sleeves, a haul-off with automatic adjustment and a standard saw with central clamping fixture. As all preparatory steps can take place outside the extrusion line, the line has to be stopped for no more than 10 to 15 minutes to effect a change in pipe dimensions.

Cincinnati Extrusion GmbH – Austria
Fax: +43 1 61006 292
Email: welcome@cet-austria.com
Website: www.cet-austria.com

Technology Update

New de-burring machine for large OD pipes

Kent Corporation, USA, offers a full line of Burrmaster and Buckeye deburring machines for tubing, solids, and extrusions. The company has just launched a new model in its Burrmaster range.

The Burrmaster Model 10 for large OD, short length tubing automatically deburrs both ends of the tubing simultaneously, for high production rates. The machine features quick adjustment mechanisms with built-in scales for quick and easy changeover.

The Model 10 is capable of deburring tubing from 1.7" to 4.756" OD, with lengths from 2.5" to 60", and wall thicknesses from 0.125" to 0.750". A special disc transfer system enables tubing that is larger in OD than the length to be deburred, and the



☛ Kent Corporation's Burrmaster Model 10

machine can achieve rates of up to 1,200 pieces per hour.

Kent Corporation – USA

Fax: +1 440 237 5368

Email: info@continuouscoil.com

Website: www.continuouscoil.com

Orbital welding essential in custom valve manufacture

Custom valve manufacturer Definox has been using orbital welding for 15 years and bought its first system from Polysoude, France, in 1993. The company currently operates five orbital welding power supplies and several weld heads, including a Polysoude PC 300 TR, which is used for welding large, manifold parts.

The Definox product range, produced only from 316L stainless steel tube or bar, is used in the manufacture of food and dairy products, wine making/brewing, and products for chemicals and cosmetics. The company has an extensive line of valves including ball, butterfly, vacuum pressure release, mix proof, changeover, non-return, compression, double block, bleed, and diaphragm.

In the early 1990s the company began designing a special 'push through' pigging system, to be used to empty the remaining product from the pipe into the filling machine. This procedure involves the forcing of the product out of the pipeline using air or water.

At this time, Definox was already producing valves for the pharmaceutical industry, and its welders were adept at producing welds with smooth interior surfaces. This aspect of welding is essential in avoiding the build-up of contamination in products or to eliminate the possibility of weld joint corrosion. The repeatability, accuracy and smoothness of welds accomplished using orbital welding provided the right results.

Because the pusher mechanism on the Definox pigging system contains a seal

that both pushes and ensures no material back-flow, it became even more critical to consistently produce high quality weld joints. The weld on the interior tube faces could tolerate no imperfections, and had to be perfectly smooth, to prevent damage to the seal when it passes welds in the pipeline.

Guidelines from the European Hygienic Engineering & Design Group (EHEDG) even advise the use of orbital welding in pharmaceutical and food processing equipment. The guidelines (released in 1991/1992) specified the interior finish (RA, maximum 0.8µ), joint shape, form, design, material, type of connection, and type of seals. In addition to the EHEDG guidelines, Definox complies with the US FDA A3 regulation, a strict USDA requirement for which the company has determined it is better to use orbital welding.

Definox believe the solution of orbital welding has been consistently met through the use of Polysoude's equipment, particularly with the PC 300 TR welding head. In this mechanized welding set-up – consisting of a column and boom, torch assembly, turntable and wire feeder – the part is fixed to the rotating turntable, and filler wire is used during the application.

Polysoude SAS – France

Fax: +33 240 681 188

Email: info@polysoude.com

Website: www.polysoude.com

Definox – France

Fax: +33 2 40 67 89 00

Email: info@defontaine.com

Website: www.defontaine.com

The USM logo is at the top, featuring the letters 'USM' in a stylized font above a globe. Below the globe is the text 'UTENSILI SPECIALI MONZA'. The main part of the image shows various metal parts and tools, including a yellow metal plate, several brass-colored rings and discs, and a long metal rod with a yellow handle.

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Medium and high frequency induction heating equipment

Seit Elettronica, Italy, is a world leader in the production of medium and high frequency induction heating equipment with variable powers from 1.5 to 50kW. Designed for induction welding, soldering, melting, marking and the laser cutting applications, the company's machines are based on Mosfet and IGBT technology.



Junior induction generators are available in 3.5 and 6.0kW power supplies

Built using Mosfet technology, the Minimax systems are available in 1.5 and 3.0kW power supplies (450-700KHz), and are ideal for bench-top or automated atmospheres. This system is equipped with a compact heating head (transformer) connected by an RF cable to an RF generator.

The heating head is easily mounted to pneumatic cylinders, slides or even robots. The induction generator can be equipped with up to two alternating solder heads, while RS232 serial ports for PC/PLC control are available as an option.

The Minimax systems are based on Mosfet technology



The Junior induction generators are also built using Mosfet technology and are available in 3.5 and 6.0kW power supplies, which work in the range of 700-1,100KHz.

These systems can be configured with one to four alternating heads, and can be fitted with RS232 communication



TSSS systems are built using IGBT technology

ports. These generators are the ideal solution for high temperature brazing, annealing, hardening or tempering.

VEGA ENGINEERING & TRADING CO., LTD.

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 Fax : +886-3-3466579
 E-mail : sales@vegaet.com.tw
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 Pipe O.D Range 1/2"~24"



Bright Annealing



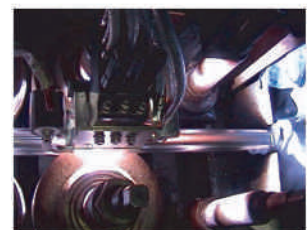
24" Pipe Mill And Annealing



Laser Welding



HF Welding For SS Tube



Tri-Cathode Welding

Technology Update



The TSSS systems – built using IGBT technology – are available with 5-50kW induction power supplies, running in a 40-60KHz frequency range. These systems are ideal for soldering, brazing, heat treating, annealing and hardening large components, including ferrous and non-ferrous alloys. The remote head allows for bench-top applications and full automation.

ISO 9001 and Vision 2000 certified, Seit Elettronica considers quality as its main aim. For this reason, it has developed a quality system that involves all company functions, from the planning to the production and marketing.

Seit Elettronica Srl – Italy
Fax: +39 0423 975785
Email: info@seitel.it
Website: www.seitel.it

Latest range of tubular brazing wires

FSH Welding Group, France, have launched a new range of eight tubular brazing wires. The range consists of an

aluminium tubular wire (TBW Harasil NC 12) for joining aluminium and aluminium alloys; two zinc tubular wires (TBW Zinal4 and Zinal30NCS) for joining aluminium, stainless steels and other alloys; and six silver wires (TBW2040 with cadmium, TBW5034, TBW5038, TBW5040, TBW5045 and TBW5056 without cadmium) for silver brazing and silver braze-welding.

The products are made from seamless tubular wire, which ensures a consistent flux to wire ratio and requires less flux. Labour costs are reduced, because no flux has to be applied separately, the quality of joints is improved, and no post-braze cleaning is required, reducing water contamination.

The wires have been designed for use in both manual and automatic brazing applications. These include steel and copper piping, reparation and maintenance on treated steels, automotive production and repair, electrical household goods, heating and ventilation, refrigeration installation and repair, and precision brazing and medical/optical applications.

For manual operation, the wires are available in diameters ranging from 1.5mm

to 6mm, in 500mm lengths, in 5kg packets. Advantages include no manual contact between the operator and the flux, less required heat input compared with solid wires, and reduced fumes.

For automatic use, the wires are available from 1.6mm to 3mm diameter, on 0.5kg to 7kg spools.

The latest tubular technology and a uniform diameter allow consistent feeding on available wire feed systems and, being seamless, no problems will occur when in contact with the drive rollers. The user can regulate the amount of flux being used through the wire feed speed to meet the requirements of the application.

Westbrook Welding Alloys Ltd is the sole UK distributor for this new range of brazing wires.

FSH Welding Group – France
Fax: +33 3 81 60 57 90
Website: www.fsh-welding.com

Westbrook Welding Alloys Ltd – UK
Fax: +44 1925 245 371
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Length : Up to 30 Mtr. Long

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Viewpoint: The Turkish industry for metal and plastic pipe and fittings

Compiled by Mr Hasan Köse, IGEME (Export Promotion Centre), Turkey

Introduction

The Turkish industry for metal and plastic pipe and fittings has been very active in recent years, with high demand for a wide product range from steel, copper, aluminium, iron and plastics. Natural gas investment projects, the acceleration of infrastructure projects, growth in the building industry and developments in the manufacturing industry, have all boosted growth in the industry.

According to the results of the main companies operating in the metal and plastic pipe and fittings market, investments have picked up speed, especially since 2004. These investments have resulted in a noticeable increase in production capacities.

The main investments are in product development, upgrading of machinery, the establishment of production lines and

technology advancement. It is believed that Turkey's pipe and fittings sector is now on a par with its European Union competitors in terms of technology and quality.

Metal and plastic pipe and fittings are used in various industries such as the automotive, construction, bicycle, furniture, hydraulics and sanitary installations. This usage increases and diversifies with the development of the Turkish industry. For example, the rapid growth of the Turkish automotive industry has increased the demand for tube and pipe used in this industry.

Public purchases constitute 20 per cent of the sector sales. In particular, public departments purchase steel pipes for building natural gas, oil and sanitary pipelines.

There are 50 to 60 companies involved in plastic pipe and fittings, 35 firms specialised in iron and steel pipe and fittings, and 4

firms dedicated to the copper pipe and fittings industry.

Turkey has a strong metal processing industry...

The metal processing industry is one of the most important and developed industries in Turkey. The progress of the metal processing industry has taken place in parallel with the growth in industrialization and the increasing investment in Turkey. The metal resources of Turkey largely support this huge industry.



**Turkey's exports of metal and plastic pipes and fittings
(value: US\$)**

HS Code	Product name	2003	2004	2005
3917.21	Tubes, pipe and hollow profiles in polymers of ethylene	13,878,177	11,882,617	13,831,710
3917.22	Tubes, pipe and hollow profiles in polymers of propylene	19,505,583	37,692,201	60,657,016
3917.23	Tubes, pipe and hollow profiles in polymers of vinyl chloride	6,501,464	23,190,070	15,744,310
3917.29	Tubes, pipe and hollow profiles in other plastics	29,317,980	30,286,164	41,575,251
3917.31	Flexible tube, pipe and hose, with a minimum burst pressure of 27.6mpa	6,505,574	14,797,043	33,012,191
3917.32	Other tube, pipe and hollow profiles, non-reinforced or combined with other materials (and without fittings)	4,654,675	5,263,568	6,630,934
3917.33	Other tube and pipe, non-reinforced or combined with other materials (with fittings)	237,394	727,227	2,674,041
3917.39	Other plastic tube, pipe and hollow profiles	1,345,637	3,204,445	4,458,649
3917.40	Plastic fittings	32,504,199	51,340,520	70,443,183
7303.00	Tube, pipe and hollow profiles in cast iron	4,612,248	6,982,519	13,201,482
7304.10	Linepipe for oil or gas lines	852,854	2,209,838	965,005
7304.31	Iron & steel cold rolled pipe	626,773	2,244,795	4,703,213
7304.39	Other iron & steel cold rolled pipe (circular cross section)	555,934	2,342,623	4,966,067
7304.41	Stainless steel tube, pipe and hollow profiles (cold rolled)	200,719	205,131	293,953
7304.49	Other stainless steel tube and pipe (circular cross section)	249,880	301,052	228,312
7304.51	Alloy steel tube, pipe and hollow profiles (cold rolled)	104,754	286,128	1,904,917
7304.59	Other alloy steel tube, pipe hollow profiles	93,574	297,176	136,626
7305.11	Iron & steel long arc weld pipe and tube used for oil or gas lines	362,484	9,423,797	407,221
7305.12	Iron & steel long weld pipe and tube used for oil or gas lines	40,985	---	1,344,414
7305.19	Other iron & steel welded pipe and tube used for oil or gas lines	42,685	13,139,669	28,646,615



Currently, the Turkish steel pipe industry is the fifth biggest producer in Europe after Italy, Germany, the UK and France



The foundations of the Turkish iron and steel industry were laid in the 1930s. At present, the Turkish steel industry has three integrated works (Kardemir, Erdemir and Isdemir), with a total production capacity of nearly 6.8 million tons per year. These works operate 16 electric arc furnaces, with a total installed capacity of over 16.6 million tons per year.

In 2005, Turkey had a steel production capacity totalling 24.4 million tons. By product type, 86 per cent of total steel production was utilised for long products



Designed to offer a window into the Turkish tube and pipe industry, Boru will take place from 22-25 March 2007 in Istanbul (below centre)

(mostly used in the construction sector). About 12 per cent was used for flat products and 2 per cent for special steel in 2005.

Developments in the Turkish iron and steel sector have also had a positive influence on the growth of production in iron or steel articles. Among iron or steel articles, tube and fittings have considerable importance. The welded and seamless iron and steel tube and pipe industry has a production capacity of about 3 million tons.

Another significant sub-sector is welded and seamless iron and steel tube and pipe, which equated to 1.656 million tons in 2004. Over 6,000t of the annual production of iron and steel tube and pipe is for welded products. MKEK-Çelbor (Machinery, Chemical Industry Institution), which is a state-owned company, is the only manufacturer of seamless pipes.

Currently, the Turkish steel pipe industry is the fifth biggest producer in Europe after Italy, Germany, the UK and France. Turkish



Turkey's exports of metal and plastic pipe and fittings (value: US\$)

HS Code	Product name	2003	2004	2005
7305.20	Iron & steel gas or oil drilling casing pipe (long welded)	38,792,922	249,310	---
7305.31	Iron & steel long welded pipe	129,238	1,441,131	2,119,417
7305.39	Other iron & steel welded pipe	19,308,764	40,074,405	44,598,072
7305.90	Other iron & steel welded pipe and tube	1,285,286	27,936,127	19,456,733
7306.10	Iron & steel pipe for oil or gas pipelines	20,163,580	65,279,057	21,774,837
7306.20	Iron & steel casing pipe used for oil or gas drilling	10,701,800	4,883,824	291,384,015
7306.30	Other iron & steel circular cross section welded pipe and tube	158,461,753	235,555,818	1,831,136
7306.40	Stainless steel circular cross section welded pipe and tube	1,039,086	2,937,449	1,372,170
7306.50	Alloy steel circular cross section welded pipe and tube	1,012,546	1,305,393	293,472,870
7306.60	Iron & steel noncircular cross section welded pipe and tube	110,729,587	282,075,076	10,182,837
7306.90	Other iron & steel pipe, tube, and hollow profiles	5,592,093	9,010,193	21,774,837
7411	Copper tube and pipe	4,223,515	9,229,629	9,793,375
7412	Copper pipe fittings	11,579,799	14,932,259	18,470,436
7507	Nickel tube, pipe and pipe fittings	31,730	154,622	128,815
7608	Aluminium tube and pipe	2,744,042	5,518,449	6,962,950
7609	Aluminium tube or pipe fittings (ie couplings, elbows, sleeves).	932,402	2,420,286	2,880,028
7805	Lead pipe, tube and pipe fittings	144	---	2,515
7906	Zinc tube, pipe and pipe fittings	23,329	148,696	188,591
8006	Tin tube, pipe and/or tube and pipe fittings	---	4,527	2,698
8307	Flexible tubing of base metal	7,117,312	13,522,965	21,066,219
8311	Wire, rods, tube, electrode of base metals	13,523,466	20,847,053	27,912,375
	TOTAL	529,615,967	953,342,852	1,197,357,456

Turkish Exports: Metal and Plastic Pipe and Fittings by Country (Value: US\$)			
Country	2003	2004	2005
USA	66,142,868	122,477,620	196,318,373
UK	57,302,587	100,788,202	91,713,102
Iraq	9,414,233	46,101,632	79,603,020
Germany	39,562,900	60,427,904	63,200,642
Spain	26,826,662	55,368,247	58,523,090
Russian Federation	16,167,127	30,430,570	46,376,111
Romania	22,603,365	27,291,749	46,332,964
Israel	16,136,470	13,575,806	45,680,267
Algeria	11,102,349	60,713,946	40,752,493
Belgium	14,689,804	54,000,479	40,138,587
Italy	26,590,819	40,872,423	39,219,351
Greece	18,416,472	31,894,504	34,904,682
Iran	5,940,955	15,073,279	28,320,227
Egypt	3,372,692	5,375,463	20,840,004
Bulgaria	7,320,419	11,068,469	20,633,744
France	8,899,497	23,819,725	20,573,571
Syria	17,456,494	18,704,490	20,337,827
Others	161,670,254	237,342,474	303,889,401
TOTAL	529,615,967	955,326,982	1,197,357,456



welded pipe technology has developed quite well and the industry is able to produce its own technology.

The aluminium processing industry is also a large sector in Turkey. The production of primary aluminium in Seydisehir Aluminium Works in 1974 opened a new phase in the Turkish aluminium industry. The Seydisehir Aluminium Works, which has a capacity of 60,000 tons of primary aluminium per year, processes the bauxite reserves located in the same region. The bauxite reserves are estimated to be sufficient for at least 70 years of production at this capacity level. More than 400 companies, most of which are small-scale, operate in the Turkish aluminium processing industry.

Turkey has large copper reserves. Karadeniz Copper Works (KBIAS) is a partially state-owned company which was established to process copper reserves in Turkey. At present, seven companies are producing electrolytic copper by processing blister copper via the electrolysis method. The production of blister copper reached 33 thousand tons in 2004.

The production of copper wire and bar reached 300,000 tons in 2004. 96,000 tons of this production is consumed in the domestic industry. In the Turkish copper industry, there are a few large-scale companies processing copper, while the rest are medium and small-scale companies.

The plastic processing capacity of Turkey is increasing...

The domestic production of basic plastic raw materials naturally resulted in a strong plastic processing industry in Turkey. The plastic processing sector follows the latest developments in the plastic processing and machine production fields.

This sector manufactures all types of plastic products ranging from traditional to the latest developed plastic products, including plastic pipe and fittings. Turkey has the sixth largest plastic processing capacity in Europe, after Spain. In 2004, plastic processing industry production rose to 3.7 million tons, of which 200,000 tons was plastic pipe and fittings.

Manufacturing companies in the metal and plastic pipe and fittings industry place great importance on producing in compliance with international standards and norms. Most of the companies have established quality systems consistent with ISO 9000.

Exports

Turkish exports of the metal and plastic pipes and fittings industry have an upward trend. While in 2003 and 2004 exports of the industry were valued at \$529 million

and \$953 million respectively, in 2005 exports reached \$1,197 million, with a 25.6 per cent growth in 2005.

In 2005 the largest product group exported by the metal and plastic pipe and fittings industry was iron and steel pipe and fittings, with a 72 per cent share of the total. The next largest product group was plastic pipe and fittings with a share of 21 per cent. Other important groups in exports were copper pipe and fittings (2 per cent), and aluminium pipe and fittings (1 per cent).

The Turkish iron and steel pipe and fittings industry has important export potential with its production capacity, product quality and competitive prices. Exports of the iron and steel pipe and fittings industry reached US\$865 million in 2005 with a 20 per cent increase in comparison with the previous year.

The main exported product groups are iron and steel noncircular cross section welded pipe and tube. This is in addition to other iron and steel circular cross section welded pipe, tube and iron and steel pipe for oil or gas pipelines. In 2005, the USA, the UK, Spain, Germany and Iraq were the main export markets for Turkish iron and steel pipe and fittings.

Copper pipe and fittings exports reached US\$28.2 million in 2005. The most important markets for these items were Germany, Czech Republic, the Russian Federation, France, Romania and the UK.

Exports of aluminium pipe and fittings were US\$9.8 million in 2005. The main destinations for this product group were Italy, Germany, the UK, Russian Federation, Austria and Romania.

Plastic pipe and fittings exports rose to US\$249 million in 2005, up 40 per cent compared with 2004. The main export products are PVC and PP pipes and fittings. Turkish-made plastic pipes and fittings are exported to a wide range of countries, with major export markets including the Russian Federation, Iraq, Romania, Kazakhstan, Azerbaijan and Syria.

Boru, the 3rd international tube, pipe and fittings fair, will take place from 22-25 March 2007 in Istanbul, Turkey.

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BORU 2007: A Significant Exhibition for a Mighty Industry



Stretching from southwestern Asia to the Balkan region of southeast Europe, Turkey has long celebrated a unique position with feet in both continents. With a rich history both in Europe and Asia, the current Turkish government of Prime Minister Recep Tayyip Erdogan has spent the start of the 21st century getting down to business with a reformist and proactive approach to domestic and foreign policy.

Turkey's aim – and Europe's broad desire – is the accession to full membership of the European Union, with 2015 the earliest possible entry date. Clearly EU accession would see a dramatic increase in foreign direct investment (FDI), with recent big increases in FDI indicating this likelihood. With this potential for EU membership, GDP growth at an estimated 6.4 per cent for 2006, a massive workforce of almost 25 million and consumer market of around 70 million, the prosperity of Turkey is sure to continue.

BORU is about more than just the dynamic, burgeoning Turkish economy...It is an exhibition in an excellent location

This healthy outlook is reflected by that of the Turkish tube and pipe industry, as revealed by the IGEME article on pages 46-48. With growing volumes of tube and pipe exports, it is clear that there will be an increasing requirement for machinery and equipment to support production.

To feed the growth of industry, the recent opening of the Baku-Tblisi-Ceyhan pipeline from Azerbaijan/Kazakhstan to Turkey (May 2006), is expected to pump one million barrels of oil a day by 2009. This increased availability of oil, added to Turkey's abundance of natural resources, is sure to further bolster industrial and manufacturing growth.

But BORU, which takes place in Istanbul for the 3rd time from 22-25 March, is about more than just the dynamic, burgeoning Turkish economy and a healthy tube and pipe industry. It is an exhibition in an excellent location, intersecting southeast Europe, southwest Asia, the Middle East, the Turkic republics and Russia. In short, some of the strongest growth regions for the tube and pipe industry.

Staged at the Istanbul Expo Centre, the event has already attracted over 110 exhibitors (a sample of which is previewed over the coming pages), with equally high visitor numbers expected. Against the striking backdrop of Istanbul and near such a powerful symbol as the mighty Bosphorus river, the exhibition is set to mark an interesting date in the industry calendar.

Source: www.turkisheconomy.org.uk

❖ SHOW FACTS ❖

DATE

Thursday, 22 March –
Sunday, 25 March, 2007

VENUE

Istanbul Expo Centre, Istanbul, Turkey

SHOW HOURS

22-24 March: 11am-7pm
25 March: 11am-6pm

ORGANISER CONTACT

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ENTRANCE FEE

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INTERNET RESOURCES

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Please note: exhibitor list correct at time of going to press –
for updates please contact **Ilhas Fuar** via info@ilhasfuvar.com

BORU EXHIBITORS – HALLS 9 & 10

Akin Plastik.....Turkey	Eroglu Boru Baglanti ElemanlariTurkey	NokselTurkey
Anatomi Terapi.....Turkey	Esen Plastik AS.....Turkey	Novastilmec SpAItaly
Apper Conta San ve TicTurkey	Eurolls SpAItaly	NTG Plastik AS.....Turkey
Arge Plastik San ve Tic.....Turkey	Faber Robu.....Turkey/Germany	Özbal Çelik Boru San Tic.....Turkey
Arsan Kauçuk AS.....Turkey	Ferimpex Steel Inc.....Turkey/USA	Ozplas Plastik Imalat.....Turkey
Axxair.....France	Gallium Industries Ltd.....India	Padana InoxItaly/Turkey
Aydin Boru AS/Saytek Metal AS.....Turkey	Gedikoglu Metal San ve Tic.....Turkey	PakpenTurkey
B Plas AS.....Turkey	Gezer End Ins San Tic AS.....Turkey	Pilsa Plastik San ASTurkey/France
Boru Berolina Plastik San ve TicItaly/Turkey	Gürgenler Corp.....Turkey	Quality Steel.....India
Birlik Makina San Tic ve Ltd StiTurkey	Grazioli Group.....Italy	Raccorderia MetallicheItaly
Borusan Mannesmann Boru.....Turkey/Germany	Haitima CorpTaiwan	Rohr Fittings Stahlhandel GmbH.....Germany
Buhlmann-Rohr FittingsGermany	Hakan PlastikTurkey	Revda Non-Ferrous MetalsRussia
Burak Boru San ve Tic Ltd.....Turkey/Russia	Handle SA.....France	Saint-Gobain Pam SA.....France
Çağlar Plastik AS.....Turkey	Haşçelik AS.....Turkey	Sanpa Elektrik Malz Paz SanTurkey/Italy
Çamlica Yapi San ve Tic AS.....Turkey	Hatboru Çelik Boru San Ve Tic.....Turkey	Sardogan End ve Tic.....Turkey
Combilift LtdIreland	Hatima CorpTurkey	Sarfm Makine San Tic Ltd StiTurkey
Czech Trade Promotion Agency.....Czech Republic	Ita Inox SpA.....Italy	Sarkuysan Elektronik Bakir San ve TicTurkey
Demir Plastik San ve Tic ASTurkey	Inal Plastik San Ve Tic AS.....Turkey	Schulz Export GmbH.....Germany
Detay Plastik Ltd StiTurkey	Inst Dr Foerster.....Turkey	Sintas Plastik.....Germany
Dizayn Teknik Plastik Boru.....Turkey	Lamser Yurekli MDE Sa Tic Ltd StiTurkey	Si-Piping GmbHGermany
Dniepropetrovsk Tube Works.....Russia	Link Tesisat Mazlemeleri ImalatTurkey	Sirius Praha.....Czech Rep
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Engin BoruTurkey	Nimka Boru San ve Tic.....Turkey	Tekyurt ReklamTurkey
Erdemir Celbar Seamless Steel T&P Co.....Turkey	Ningbo Fangli GroupTaiwan	Tenaris Silcotube.....Italy/Romania





EXHIBITOR PROFILES

Borusan Mannesmann Pipe Turkey


Established in 1958, Borusan Pipe was the first member in the industrial sector of the Turkish conglomerate Borusan Group. In 1998, Borusan Pipe joined forces with Mannesmann Röhren Werke AG, when the spirally welded steel pipe operations of both companies in Turkey were merged.

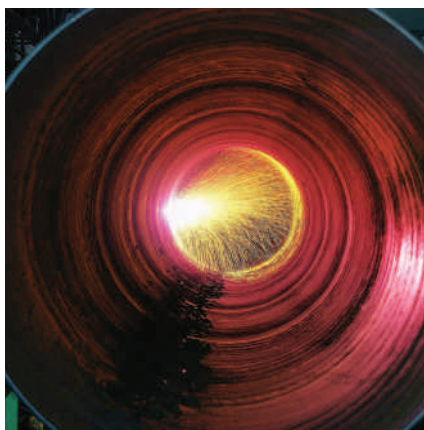
In December 2004, Mannesmann Pipe and Borusan Pipe were brought together under the title Borusan Mannesmann Pipe, following the acquisition of the former by the Borusan Group.

With a turnover of more than US\$519mn and annual production capacity of 750,000t, Borusan Mannesmann Pipe is a market leader in Turkey and among the top five pipe producers in Europe. The company is actively engaged in energy and water infrastructure projects in Turkey, North Africa, the Middle East, the Gulf Region and Central Asia.

The company has production facilities in Gemlik, Halkali and Izmi. Its major shareholder, Borusan Group also owns a production facility in Vobarno, Italy, which mainly focuses on the automotive sector.

Borusan Mannesmann Pipe processes over 4,000 different types of pipes, ranging in diameters from 4.6mm to 2,540mm and thickness of between 0.6mm and 23mm.

 *Borusan Mannesmann Pipe has a wide range that includes spirally welded steel pipe*



The company's Gemlik plant is dedicated to the production of water and natural gas pipe, petroleum pipe, boiler tube, heavy wall tubes, polypropylene pipe and fittings for sanitary and heating systems, in addition to profiles for the building and industrial sectors.

This extensive product range also encompasses linepipes and casing, precision tube, hollow sections, spirally welded and coated pipes, and PEX mobile system pipes.

The Gemlik plant employs a stretch reducing mill (SRM) with hot drawn technology, a unique feature in the Turkish industry. The company caters to industries such as construction, furniture, automotive and bicycle. It also supports water, petroleum, and gas pipeline projects in both domestic and export markets, with its longitudinally and spirally welded steel pipes.

The company has an effective distribution channel system with six district offices managing 125 dealers across Turkey.

Website: www.borusanmannesmann.com

Buhlmann Rohr-Fittings Germany

Buhlmann is a global supplier of tube, pipe and other materials, with a wide range of product stock and a comprehensive service network.

The company's whole product range conforms to relevant standards (ie ASTM/DIN/EN), and includes alloy and carbon steel tube and pipe, seamless and welded stainless steel tube and pipe, and flanges in carbon, alloy and stainless steel.

The company can also provide long and short radius elbows, tees, reducers and caps – seamless and welded – in carbon, alloy and stainless steel.

The Buhlmann-Group specialises in providing complete solutions for pipeline construction. As an industry partner, the company can supply plant contractors and companies in various sectors, including the energy, chemical, petrochemical, shipbuilding and mechanical engineering industries.

Website: www.buhlmann.de


Combilift Ltd Ireland

Combilift Ltd, the originators of the Combilift multi-directional forklift, will provide details of its customised 4-way handling solutions at Boru. The company's 4-way forklifts can handle long and awkward loads in confined spaces, particularly in the tube and pipe, fabricating and manufacturing sectors.

The company have had recent success in the Turkish market, with delivery to Turkish company Cuhadaroglu. According to Combilift, the company took delivery of a Combilift and were so impressed that they designed a new warehouse round the Combilift concept, followed by purchase of a further two models.

The design of the Combilift truck enables it to do the job of a combination of other forklifts, avoiding double handling of products and the expense of multiple trucks such as sideloader, reach truck and counterbalance forklift.



 *Combilift have had recent success in the Turkish market, with sales to Cuhadaroglu*

Sideways transportation of long loads in narrow aisles eliminates the hazardous practice of high-level transportation above machinery or personnel. Resting the load on the platform also increases load stability, further contributing to improved health and safety procedures.

Models are available with load capacities from 5,000lbs to 26,000lbs, powered by diesel, LPG or electric. A model particularly suited to the requirements of the metal sector is the 4-wheel steer GT stand-on forklift for very narrow aisle operation. Available in LPG with 6,000lb or 10,000lb capacities, it can be used indoors and out, as can all Combilift models. It is particularly suited for guided rail operations, which ensure fast and accurate picking and positioning.



Cuhadaroglu have designed a new warehouse round the Combilift concept

The TeleCombi is fitted with a 1 stage boom mounted on a moving carriage, and has a reach of 3m when carriage and boom are fully extended. It can reach across the full width of a trailer at all lift heights.

This key feature enables the driver to offload from one side only, while the moving carriage eliminates the need for constant height adjustment associated with conventional boom machines working in confined spaces.

The Semi-Rough Terrain C 5000L forklift is designed to handle long loads in narrow retail and wholesale yards, two examples

include timber and steel. With larger solid pneumatic tyres, it is especially suited to unpaved yards and semi-rough terrain and offers added suspension for more comfortable material handling for the operator.

Website: www.combilift.com

Dnepropetrovsk Tube Works Ukraine

Dnepropetrovsk Tube Works produces over 3,000 different tube types with a diameter range of 6-169mm, including hot formed pipes, ERW pipes and cold-formed pipes. These products are supplied to markets including eastern and western Europe, Asia, America and the CIS.

The range includes hot-formed seamless carbon steel pipes, seamless steel pipes for oil refinery, electrically-welded steel pipes, water and gas steel pipes, cold-formed seamless carbon steel pipes, precision steel pipes, and seamless steel pipes for boiler equipment and conduits.

With modern technology and equipment, the company is able to ensure quality products due to the use of testing systems corresponding to GOST as well as other international standards such as DIN.

Website: www.dtz.dp.ua

Elmaksan Ltd Turkey

Founded in 1983, Elmaksan Ltd is one of the leading Turkish companies in the design and production of profile machines, slitting machines and cut-to-length lines. The company's slitting lines can be used on a range of materials including ferrous metals, cold and hot carbon steel, stainless steel, copper, brass, and other metal alloys.

With the company's pipe and profile lines, the user can manufacture products with different diameters. Easily changeable equipment is used on these lines in order to reach the fastest manufacturing speed. A flying saw with high performance can also be incorporated into pipe and profile lines, according to user requirements.

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Elmaksan's cut to length lines are designed as manual or automatic, and are intended to undertake sensitive packaging using sheet and plastics. The company's machines are manufactured with the latest versions of CAD (Auto-CAD), CAM (solid CAM, master CAM, mechanical Cobra design, Microstation) and other types of design and construction programmes.

All departments, from engineering to production, are linked to provide an interactive manufacturing process. CNC lathing machines are employed to reduce faults to a minimum.

Website: www.elmaksan.net

Institut Dr Foerster/Yilmer Ltd Germany/Turkey

Located on stand A121 (hall 10), Institut Dr Foerster is a leading manufacturer of non-destructive eddy current and magnetic flux leakage test systems, with almost 60 years of industry experience and thousands of installations worldwide.

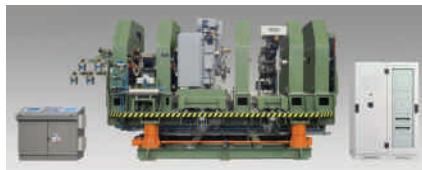
Yilmer Ltd is Foerster's local representative with experienced sales engineers and provision of on-site service support.


The company will provide information on its most modern generation of eddy current testers. This includes Defectomat®, which works with encircling through-type coils, and Circograph®, which works with rotating probes.

Foerster has also recently launched the new Defectomat CI®, an improved version of the original compact eddy current tester. It is the successor of the globally popular Defectomat C® and CP®.

Foerster's product range also includes Rotomat® and Transomat® systems, which are based on the DC magnetic flux leakage method for testing hot rolled seamless tubes (OD 20-520mm).

 Defectomat CI with test coil



 Centric testing section with Rotomat and Transomat

The Circoflux® system is the most sensitive equipment to detect surface defects in hot-rolled ferrous bars. This testing system is based on the high-energy magnetic flux leakage method (OD 10-180mm).

Institut Dr Foerster – Germany
Website: www.foerstergroup.de

Yilmer Ltd – Turkey
Website: www.yilmer.com

Gallium Industries Ltd India

Gallium is an ISO 9001:2000 approved company with 20 years of experience in design and construction of advanced tube mills and finishing machines.

The company's product range is well established in the tube industry and includes high speed forming cold saw cut-offs, automatic bundling machines, multi-tube high pressure hydrotesters and universal forming mills.

The company's wide range of tube mills offers the latest features including quick change mechanisms, helical gear boxes for distribution of high efficiency power, oscillating type OD based cutting tools, inline straighteners (19 roll), and SG cast stands for excellent damping properties. An online stretch-reducing mill is available for small diameter tubes.

Gallium can also supply double mandrel uncoilers, shear end welders, horizontal accumulators, end facing machines, tube push pointers, draw benches and tube straightening machines.

The company has supplied equipment to 29 countries including USA, UK, Japan, Australia, Brazil, Iran, Egypt, Malaysia, China, Taiwan, Thailand, Oman, Jordan, Zimbabwe, Pakistan and many others.


Website: www.galliumindia.com

Haitima Corp Taiwan

Founded in 1984, Haitima is a leading manufacturer of valves and fittings in Taiwan. The company's product range includes ball valves, gate valves, globe check valves, and butterfly valves.

In addition, Haitima can supply pipe fittings, quick couplings and sanitary fittings, seamless steel pipes, welded pipes, ERW pipes, and other accessories (such as expansion joints and flanges).



 A range of valves and fittings are available from Haitima

In its goal to achieve the highest possible standards, the company operates under a quality assurance system, which has awarded it the ISO 9001, API 607 approval, CRN, DVGW and PED Module D1 certificate.

Website: www.haitima.com.tw

Officine MTM SpA Italy

With 35 years of experience, MTM is involved in the design, manufacture and installation of high-productivity machinery and equipment for the tubing industry. The company has several models of complete high-tech tube mills and related equipment. The production range also includes strip entry lines, flying cutoff machines and tube exit equipment.

These high-productivity lines are designed for the production of tubes from high-tensile alloys used widely in the automotive industry. In addition to supplying complete tube production lines, MTM has developed a series of standardised components for the revamping of existing mills.

As a typical example of the company's product program, the flying cutoff machines





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- Slitting lines
- Slitting knives and spacers
- Open profile lines
- Trapeze machines
- Automatic packing machines
- Leveller
- Rotary shears
- Multiple cutting units
- Each of this lines can be custom tailored to meet specific production needs.



We also offer single machines to our customers who need repairing or replacing for some machines of their production line



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← range includes single punch, double-knife dimple-free, cold saw, friction saw, and orbital milling units up to Ø 12" and 14mm width thickness.

MTM's most popular flying cold saw units have undergone an extensive engineering review during the last few years to adapt to the most recent market requirements. The basic models A-50, A-71 and A-100 are now available without any hydraulics. The testing of the machine is performed in-house and the integration and commissioning typically takes 3-5 days. Over 300 units have been delivered worldwide.

Website: www.mtmmachinery.com

Quality Group India

The Quality Group, consisting of Quality Foils Pvt Ltd and Quality Stainless Pvt Ltd, manufactures stainless steel coil and strip and welded tube and pipe. The flagship company Quality Foils is involved in the

manufacture of cold rolled stainless steel strip and coil from Jindal hot rolled strips in Hisar, India.

Quality Stainless is the manufacturer of welded stainless steel tube and pipe for applications including heat exchangers, boilers, condensers, automobile, oil and gas, structural, ornamental and other engineering industries. The product range includes welded SS tube/pipe with OD sizes of ½" to 4", and ½" to 3" NB. The products are manufactured using cold rolled stainless steel strip and coil supplied by Quality Foils.

With certification according to ISO 9001:2000 from TUV and SUD, the entire QSPL plant is equipped with state-of-the-art non-destructive and ultrasonic testing equipment and in-house testing laboratories.

Quality products are used in applications including automobile, heat exchanger, ornamental, fertilizer, sugar, food processing, tube/pipe, oil and gas, and power plants.

Website: www.qualitygroup.in

Revda Russia

Revda Non-Ferrous Metals Processing Works is a leading manufacturer of copper, nickel and alloy bars, and tube/pipe in Russia.

The company not only produces general-purpose tube and pipe, but also manufactures tubes for heat exchangers, pressure gauges, waveguides, linepipes and fittings, together with nickel pipes for radio electronics, capillary tubes for refrigeration and instrument engineering.

The company's wide range of products includes over 15,000 standard sizes made of 67 types of alloys. Revda can produce tubes in coils and in cuts with a length up to 12m each, with diameters from 0.3-180mm and with wall thickness from 0.03-35mm.





Website: www.rzocm.ru

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 <p style="text-align: center; font-weight: bold; color: white;"><i>Impeder core for high frequency welding of tubes</i></p>	 <p style="text-align: center; font-weight: bold; color: white;"><i>Fiberglass pipes for impeder core</i></p>
 <p style="text-align: center; font-weight: bold; color: white;"><i>Tungsten carbide insert for outside tube scarfing</i></p>	 <p style="text-align: center; font-weight: bold; color: white;"><i>HSS-DMo5 saw blades & friction circular saw blades</i></p>

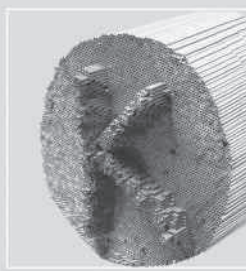
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BIZBA TUBE

Our company manufacture stainless steel capillary and industrial tubes, the product's minimum outer diameter is 0.33mm, bore 0.15 mm, wall thickness 0.09 mm, it is one of the manufacturers which can produce products with such sizes in china.

The steel tube adopts the slide core pulling and drawing which is in the leading position in the world, this solves the requirements of bore size and finishness of the steel tube. Our products mainly are used to produce injectors tube in medical machinery, pen tube, electrical spark tube in mold.



E-MAIL: BIZBACN@gmail.com

Contact Information
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Job Title: manager

Address: Road Longyong No.2, wenzhou, Zhejiang
China (Mainland)
Zip/Postal Code: 325000
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Sirius Praha Czech Republic

Sirius Praha is producer of tools, devices and machines for cutting and punching open and closed profiles, such as round, square, rectangular and shaped tubes.

The complete product line includes various solutions from very simple tools to fully

Ⓛ Sirius will present a range of cutting and punching tools and machinery



automatic CNC machines and production lines.

The company is also a producer of perforated tubes, a capability especially suited to smaller batches, when it is not

Ⓛ Sirius also has the facility to produce perforated tubes in small batches



efficient to purchase an entire machine. The big advantage is the possibility to obtain ready-punched parts, which are constantly in stock.

Website: www.sirius-praha.cz

Tube & Pipe Technology UK

Tube & Pipe Technology is the international trade magazine for the tube and pipe industries, published six times a year in the English language. Covering the production, processing and utilisation of tube and pipe, each issue provides coverage of essential industry news, personnel changes and technology and product updates.

The magazine includes regular topical columns such as 'From the Americas' – an economic and industry report on North and South America, a variety of technical features, and in-depth articles highlighting the latest scientific information and manufacturing solutions.



Ⓛ *Tube & Pipe Technology* is now also available as an online e-zine

The magazine has a worldwide circulation of over 12,000, distributed to managers, buyers, technologists, engineers and specifiers in over 100 countries. Working in partnership with the International Tube Association (ITA), *Tube & Pipe Technology* is sent out to all ITA members.

Tube & Pipe Technology is now also available as an online e-zine, which will reach even more worldwide readers, with selected content available free and the entire digital version available on subscription.

Boru visitors can pick up a free copy of the latest edition at the *Tube & Pipe Technology* stand.

Website: www.read-tpt.com

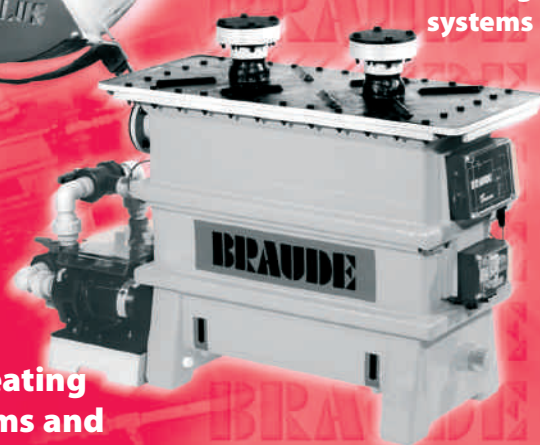
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Ufuk Pipe Industry & Trading Turkey

Ufuk Pipe Industry and Trading Inc is the manufacturer of spiral welded steel pipes under the trademark 'Ufuk'. They operate manufacturing facilities that comprise of 46,000m², with 36,000m² outdoor area and 10,000m² indoor area.

These spiral welded steel pipes are used for natural gas, petroleum and water pipelines as well as piles for ports and construction. Ufuk performs its spiral welded steel pipe production in accordance with the API 5L, DIN, BS, AWWA, UNI, ASTM, NFA, EN, TS standards. The pipes can be coated with epoxy, bitumen, cement mortar, polyethylene, polyurethane and polypropylene.

Website: www.ufukboru.com.tr

**Connect with the
industry @:**

www.tubefirst.com/forum

Ukrtruboprom Ukraine

Ukrtruboprom, an Association of Ukrainian tube plants, is made up of thirteen tube plants and two research/certification facilities, with combined production facilities totaling forty specialised tube departments.

These production facilities can offer a range of more than 1,500 standard and special tube sizes manufactured from 300 different steel grades and alloys.

The level of certified tube products according to international standards – API, EN, DIN, ASTM – now averages seventy five per cent. Tubes are mainly produced for a range of industries including oil and gas, heat and power engineering, chemicals, and municipal construction.

During recent years more than eighty completely new tube products not previously produced in the Ukraine were developed for manufacturing. Ukrainian tube and pipe products are exported worldwide.

Email: trubpr@ptcor.net

Umran Steel Pipe Inc Turkey

Umran is the manufacturer of pipelines by two different processes – submerged arc welding (SAW) and electric resistance welding (ERW). Production is undertaken at three separate mills, with two located in Istanbul and Bolu, and one in Belgium.

Production of SAW spirally welded pipes takes place at the Umraniye mill (OD Ø 8-120" and 4-25.4mm WT). The Akçakoca mill manufactures ERW longitudinally welded pipes on two Yoder lines with an OD diameter range of 2-16", in addition to SAW spirally welded pipes from OD 16-120". The plant in Belgium produces SAW steel pipes with an OD range of 20-68" and wall thickness from 5-25.4mm.

Umran is fully equipped to apply different types of coating and lining in accordance with the major standards. Coating options include three-layer polyethylene coating (PE), bitumen coating and lining, and epoxy coating and lining.

Website: www.umran.com



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USM Srl/Lemser Yurekli Italy/Turkey

USM manufactures a large range of high quality consumables for the steel tube manufacturing industry. This product range includes ferrite cores (TDK – Hitachi/Hinoday), fibreglass tubes as impeder casings, celeron bars for impeder stoppers, custom made assembly impeders and copper inductors, lens, mirrors and ceramic nozzles for laser heads.

The company also offers carbide tin coated inserts with dedicated holders and spares for outside scarfing. They also provide HSS, friction, band saw and guillotine blades for tube cut-off procedures.

In addition, USM provide hydraulic and mechanical inside scarfing tools with spares and carbide rings, ceramic welding rolls, fin pass nozzles, slitting knives and separators, saw blade re-sharpening machines and steel strip edge preparation machines.

Website: www.usm.it

voestalpine GmbH & Co KG Austria

voestalpine Tubulars is a joint venture between the Austrian steel producer voestalpine group, and the Grant Prideco group, US manufacturer and supplier of oilfield drill pipe and other drill stem products.

voestalpine Tubulars produces seamless steel pipes with an outside diameter of up to 177.8mm (7") in API or special grades. In addition to the seamless tubular products used in the drilling and completion of oil and gas wells, the company produces hollows for redraw, mechanical tubes, boiler and heat exchanger tubes, pressure tubes and linepipe.

The company is certified according to ISO 9001, 14001 (EMAS location) and API. The company's customers include the oil and gas industry, boiler and equipment fabricators, tunnel construction companies and the automotive industry.

Website: www.vatubulars.com

YXRAY GmbH Germany

YXRAY GmbH offers modern radiosopic and radiographic X-ray testing systems for the inspection of pipe welds. The company introduced what is believed to be the first digital radiosopic pipe testing system RTS 13.1 onto the German/European NDT market in 2004.

The advantage of digital radiosopic pipe testing over ordinary radiographic or radiosopic testing systems derives from high-speed quality testing. The technology offers digital 12-bit/16-bit X-ray images with high grey-level value, while the test procedure does not require expensive X-ray films and chemicals.

YXRAY GmbH supplies the worldwide NDT market with portable and stationary X-ray equipment, including handling, digital film scanners and image processing systems. The company also sells Kodak X-ray films, film processing systems and radiographic accessories.

Website: www.yxray.de

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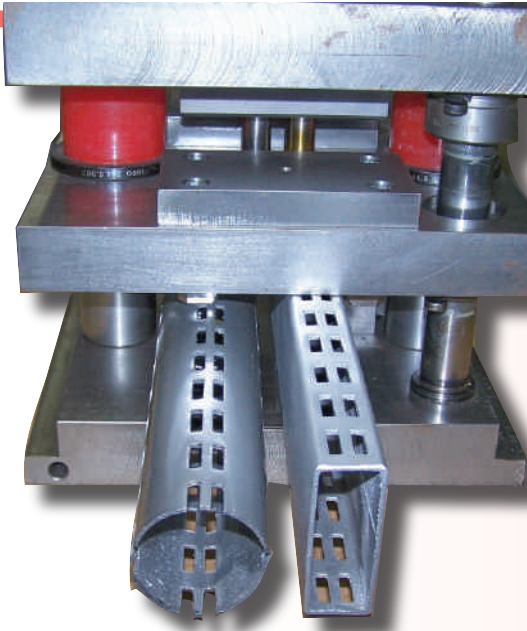
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Drilling, Piercing & Punching Technology



The specialities reviewed here may be ancillary to tube production. As anyone who has struggled with a misaligned pair of openings – in a hardware assembly, perhaps – knows, they are not incidental to it. A badly sited and finished aperture will destroy a perfect workpiece as completely and irretrievably as a miscalculation at any stage in the production cycle.

Precision rates high on the scale of tubemaking values, but never higher than in drilling, piercing, and punching. Advanced uses for tubing, as well as newer and more exotic materials, are always raising the bar for the various fabricating methods. Dimple hole and mandrel hole may still be the basic punching techniques; but ever more rigorous definitions of 'clean', 'flush', and 'tight' propel them well out of the elementary category.

This section of *Tube & Pipe Technology* reviews equipment and services for tube drilling, piercing, and punching – procedures that require the same degree of meticulousness as the tubemaking process itself.

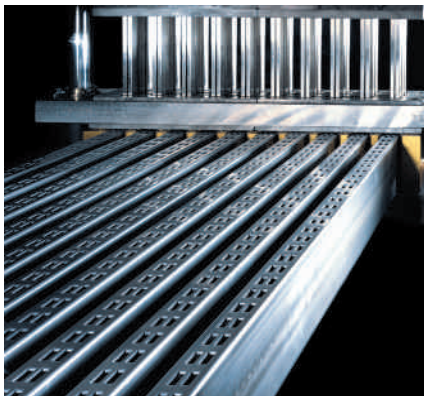
Speciality punched and slotted tube

Wuppermann, Germany, manufactures specialised and high-quality punched tubing, which is produced and slotted in high-capacity production facilities.

These slotted tubes are mainly utilised in shop-fitting, shelving construction, storage and transport technology, furniture, construction and the electrical industries.

They can also be used wherever conventional or unusual slot patterns are required for inexpensive and visually attractive designs such as radiator production.

⚙️ *Wtube: Wuppermann specialises in a range of punched and slotted tube*



With forty years of experience, Wuppermann achieves economic solutions using innovative slotted tube technology. The use of advanced production technology guarantees maximum productivity with the smallest individual and total tolerances in terms of slot patterns and clearances.

State-of-the-art technology is used to develop intelligent tube component solutions, with specific expertise in the field of tube connections. Critical designs are manufactured quickly, precisely and economically, while future design revisions can take place during the project stage.

The high-quality Wtube tubing brand is available as ready-to-use components. From product design, simulation of production processes, and production technology, Wuppermann is geared to supply a range of punched and slotted tubing products. The range includes tubes in a variety of production lengths and diameters, together with welded, coated or assembled tubing components.

Wuppermann Rohrtechnik GmbH –
Germany
Fax: +49 9843 9822 605
Email: info.wrt@wuppermann.com
Website: www.wuppermann.com

Innovative solutions for punching pipes, tubular sections and profiles

For more than 30 years, Apollo Srl has been producing machines for punching pipes without any deformation. A leader in pipe punching machines, the company provides the established Twin machine to the pipe sector, supplied with an automatic loading and unloading mechanism.

Using Twin, the pipes to be punched are loaded into a bundle in the bar storage, where they are separated, aligned, timed, and loaded onto the punching line through a mechanical double gripper. This loads the pipe while unloading the punched pipe into a specific basket or into a special drilled pipe bundling device. An important development has also occurred in the changeover systems, with faster switching from one pipe to another.

The Twin Classica model is the company's fastest machine available. It can punch four slots at a time on two sides of a pipe simultaneously over a length of 3m. It performs up to 60 threads in less than one minute, with an accuracy of circa 0.2mm from the first to the last hole.

Apollo's range of accessories includes expansion cores with grindable interlocked

Drilling, Piercing & Punching Technology



ⓘ Apollo's Twin tube punching machine is provided with an automatic loading and unloading mechanism

matrixes, punches with centring pilot, and Amco pipe guides for high speed sliding (up to 1,000mm per second) and seizure prevention. Many of the company's models have also been fitted for automatic punching of two pipes, which can double production capacity.

The Twin Semplicata model is a hydraulic punching line equipped with two opposed horizontal heads and a bar feeder. This line can be supplied in different lengths with a maximum stroke of 9,000mm. It performs blind and pass-through holes on one or two tubes at a time, with good productivity. Identical punching programs can be carried out for both punches.

Apollo's Modular model is a punching line available in different versions, and offers 1 to 4 punching heads. The machine is equipped with a quick punch changeover and can punch pipes of an average size and with limited thicknesses. A semi-automatic machine, it has a power that cannot exceed 8t. Punches of different sizes and shapes can be fitted in each head.

Another recently launched machine is PMV, available in two tonnages: 30t and 50t. It is a vertical single-punch model suitable

ⓘ Apollo manufactures a range of machines including tube punching and drilling units



for punching both pipes and flat bars. PMV is equipped with a simple and convenient bar warehouse, and provides a maximum endurance of up to one hour, in the automatic mode.

Both the PMV and Modular models are available in the bench version with 1 or 2 heads. These models, designed for small productions, have also been equipped with Speedy, a motor-driven positioner device from 2-6m.

Using these two models, the pipes are placed on the outlet roller conveyor of the machine, and brought flush with Speedy. When the machine starts, Speedy pushes the pipe and places it at the previously set distances.

Every time a pipe is positioned it is also punched, pushing it onto the inlet roller conveyor.

Apollo Srl – Italy
Fax: +39 0536 851273
Email: info@apollosrl.com
Website: www.apollosrl.com

Turnkey tube punching and assembly systems

Multicyl Inc, Canada, designs and manufactures complete systems for punching and assembly for industries including automotive stamping, metal fabricating and tube fabricating.

Multicyl® is a patented air over oil press used for punching applications, originally designed for punching holes and notching in sheet metal. The company's turnkey tube punch station is used to make a series of 18 dimple-free holes in 5/8" diameter tubing. The system combines Multicyl technology with radial gauging, depth gauging, and a slide rail for a turnkey solution.

The company have also offer a simple yet creative punching station. The custom die and frame accommodates the problematic profile of aluminium extrusion, allowing two diagonally positioned Multicyls to punch the required holes.

Multicyl can also combine a series of simple unit tools and a small frame into a progressive punching station to punch, stamp, and shear coil fed sheet metal strips.

Multicyl Inc – Canada
Fax: +1 905 951 0672
Email: punch@multicyl.com
Website: www.multicyl.com

Host of options with automatic tube punching machine

Established in 1963, Italy's BS Sas manufactures a range including punching units, presses and shearing units. The company has launched the advanced BS P80 punching machine, manufactured to satisfy the requirement of automatic punching of tubes (round, square, rectangular), as well as different type of profiles.

CNC controlled, the punching machine can carry out a range of processes including blind or through holes, achieved by changing the stroke of the punch into the control panel. It can also undertake punching of round, square, and rectangular holes, as well as slot punching.

Tools can be changed easily, in a very short time, while the BS P80 can be quickly set to solve a large range of punching problems.

BS Sas – Italy
Fax: +39 033 121 7704
Email: bs@working.it • **Website:** www.bsunitpunch.it



ⓘ The BS P80 punching machine

The benefits of through-punching over single-wall punching

In order to achieve flexible, non-deformation punching of tubes and other hollow sections used as structural elements in shelf construction, considerable manufacturing expertise in punching machines and tools is required. Based on advanced technology, Friedrich Petig GmbH manufactures a range of tube punching machines that use the through-punching method.

The company believes that greater productivity can be achieved from tube through-punching compared to one-wall punching. With only a slight extra outlay, Petig claims that production speed can be boosted by 35 per cent.

Petig's tube punching machines can cope with any tube – rectangular, square or round. Applications include shelf and storage systems, store fittings, fences, fence systems and ladders, steel furniture and cable ducts, railings, stairs, scaffolding, steel structures and light metal work.

Figure 1: Petig's range of tube punching machines utilise the through-punching method

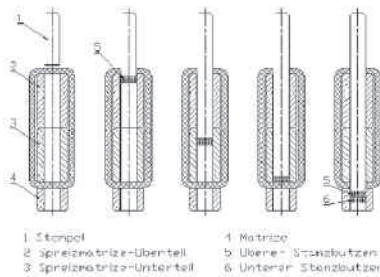


Figure 2: All punched holes with cutting guides must be identical for cluster perforations of shelf systems

Tube through-punching involves use of a punching die to hole the top tube wall and perform the cutting – which is now the die extension – to punch the lower tube wall. The piece punched out is virtually used as a cutter. It is important that the cutting guide in the expansion die and die holder is extremely tight to stop the cutting from shifting. All punched holes with cutting guides for cluster perforations of shelf systems must be identical.

Punched hole quality at the top and below is practically the same. Depending on material thickness, the lower hole can be 0.2-0.3mm larger (see figure 2).

However, this minimum deviation from the design dimension has no effect on the general function.

Another benefit of this punching technology is the complete removal of punched segments. Instead of remaining within the tube, the cuttings drop with every

punch stroke through the table into a scrap box. This allows the square or round tube to be automatically turned onto the appropriate side for further processing.

Using the control system, the collet chucks belonging to the feed measuring carriage can be turned into any tube position.

Depending on the size, four tubes can be simultaneously processed, while tubes of up to 8m in length are not uncommon.

In particular, a highly advanced aspect of these machines is the stamping tools. Due to the large tube diameters often encountered, it is a vital characteristic that the machines are equipped with long tool guides. Die lubrication with a good punching oil also lengthens tool service life.

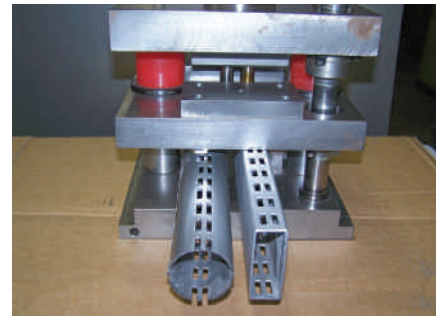


Figure 3: stamping tools are a vital benefit of Petig punching technology

To rule out any cold welded layers, dies are coated when punching is carried out on non-ferrous metals or on stainless steel.

Petig also facilitates the rapid changing of tools, with quick-changing tools fitted on all punching machines.

Friedrich Petig GmbH – Germany
Fax: +49 218 173 108
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Website: www.petig.com





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Inline cleaning and deburring of punched components

A new, modular range of equipment for the degreasing, cleaning and deburring of components as they emerge from a coil-fed stamping press has been introduced by Bruderer UK, under a sole agency agreement with the German manufacturer, SLE Electronic. The systems can be factory fitted or retrofitted for operation with any press line, not just the high-speed presses manufactured by Bruderer in Switzerland.

Continuous cleaning and deburring is essential for parts that are to be painted, plated, bonded, welded or soldered, as is often the case when manufacturing electronic components. The SLE equipment ensures flash and oil-free surfaces, with the user being able to specify the degree of cleanliness to suit the application.

Appropriate modules are combined from SLE's aqueous, chemical and mechanical cleaning systems, which are positioned on the output side of the press. Spraying, rinsing and steaming units are available to remove grease, oil and coolant, while scale, flashes and some burrs can be removed

during the cleaning cycle in high-pressure (180 bar) water jet units.

The component strip then passes through the main de-burring module, whose brushes are mounted on a quick-change unit to assist rapid changeover to suit different strip widths from 20mm to 110mm. Edge chamfering and texturing of the component surface can be included in the deburring cycle, and an integral measurement system checks for brush wear and adjusts their position to within ± 0.15 mm. Strip speed through the SLE modules is adjustable, up to 8m/min.

SLE manufactures additional equipment for use both upstream and downstream of the automated punching, cleaning and deburring section of the press line. On the input side, it offers pre-cleaning and lubrication modules, including in-press



 SLE Electronic's modular cleaning and de-burring system

spray lubrication units, while output modules include those for applying preservatives.

For cleaning discrete components, the company also manufactures units tailored to specific user requirements, complete with component handling systems.

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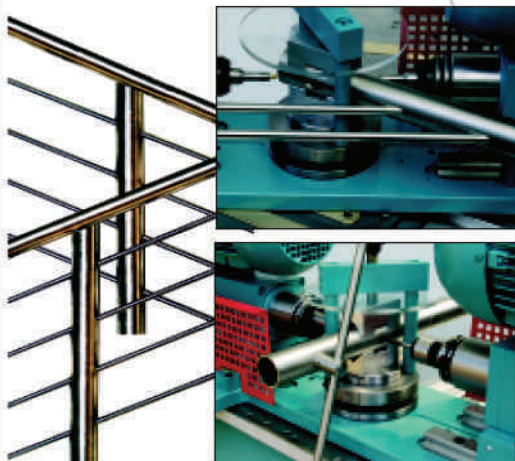
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RBV 12

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- square tubes up to 50x50 mm.
- flat material up to 60x10 mm.
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- production time: tube \varnothing 42,4 mm, material 1.4301, five continuous drillings, approx. 4 min. / post



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Innovative technique for tube perforation

The Joint Perforating Company (JPC), UK, has developed a new perforating process. Traditionally, perforated tube is manufactured through a lengthy operation starting with flat strip, and going through four stages before reaching the end result.

JPC's process perforates pre-formed tube in one operation, which the company claims saves time, reduces costs, and provides an end result that visually enhances the product.

Using the latest manufacturing technology, the company provides perforation of a variety of materials, including stainless steel, titanium, mild steel and aluminised zinc coated steel from 32mm to 80mm outside diameter, in lengths up to 1,000mm. The company's tool design also allows tube perforation in various patterns that can be tailored to customers' requirements.

JPC also offers a full range of in-house manipulation and bending services, and is able to offer fully finished parts without using sub contract suppliers. This allows the company to have total control of the product from start to finish, ensuring both consistent product quality and reliable on-time deliveries.

The company has its own transport fleet, and operates almost daily despatches to mainland Europe.

The Joint Perforating Company – UK

Fax: +44 121 557 2330

Email: info@jpc-ltd.co.uk

Website: www.jpc-ltd.co.uk

Liquid filtration tubes from plastic and stainless steel

Marshall Manufacturing Company, USA, provides custom machined plastic and stainless steel tubular components with precisely drilled holes and precision OD and ID features for use in water and other liquid filtration and RO systems.

The company has hole making capabilities for drilling up to 296 holes in 6 seconds in tube components with ± 0.005 " hole-to-hole accuracy and ± 0.010 " accuracy between the first hole in a row to the last hole in a row.

Roundness on tube outside diameters (OD) and inside diameters (ID) can be held to 0.0005" when required, in addition to similar tolerances on flat tubular part features such as mounting flanges.

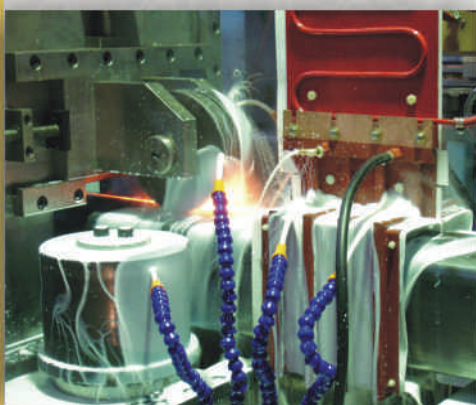
Tube materials include stainless steel, PVC, CPVC, ABS, Polysulfone and others in lengths to 96" and diameters from 0.5" up to 4". Up to 72 holes with 0.75" spacing can be produced in a single drilling cycle. Up to 48 holes with 1" spacing can be produced in a single drilling cycle.

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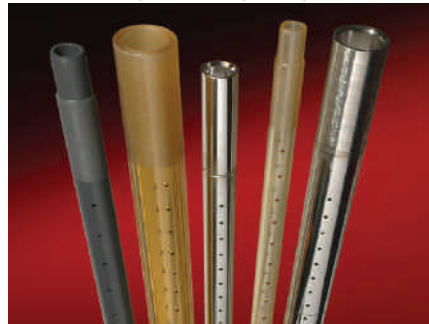


Applications for this machined tubing include separation, filtration and purification in systems for drinking water, beverages and food, as well as industrial applications such as filtration devices for hydraulic liquids, coolants and cutting oils.

Marshall Manufacturing is equipped to provide a wide range of complex precision machining services for just-in-time programs with part turnaround in prototype to large quantities.

These services include complete CAD/CAM capabilities, CNC Swiss machining, CNC horizontal and vertical machining, CNC turning, precision small diameter tube

 Marshall manufactures plastic and stainless steel tubular components with precisely drilled holes



and rod bending, multiple spindle drilling, dual-sided lapping, polishing, stamping, packaging and SPC programs with complete lot traceability.

The company provides precision machining processes that are FDA compliant, ISO 9001:2000 certified and meet or exceed General Machining Practices (GMP).

Marshall Manufacturing – USA
Fax: +1 800 321 6728
Email: general@marshallmfg.com
Website: www.marshallmfg.com

Universal pipe notching machines

ALMI Machinefabriek, Netherlands, has developed a series of manually operated and electrically driven machines for the notching of pipes. The machines are suitable for use with a variety of pipe, including stainless steel, non-ferrous, gas pipes and steam pipes.

The quality of a welded tube construction depends largely upon the right preparation. For applications where pipes need to



 ALMI's range of universal pipe notchers

be welded together at an angle of 90°, ALMI's pipe notching machines ensure that the correct slot is cut quickly and accurately. The pipe is placed in a rotatable clamp, which is mounted on a compound rest/carriage, enabling the grinding of a diameter to the required angle.

The benefits of grinding instead of milling include cost-savings, and an easier, shorter process. Unlike punch-cutting machines, which use separate auxiliary tools, ALMI pipe notchers are ready for work immediately. The machines are also suitable for making double corner joints, and the range includes a notcher for sink outflow.

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Sawing centre solution for perforated tubes

RSA, a specialist for solving sawing tasks for pre-production, has developed a sawing centre that reduces the high labour and material costs for the sawing of perforated random lengths.

In the production of racking systems, the precise distance between each perforation is essential, but naturally there are intolerances between perforations during the manufacturing of perforated tubes. High production costs of the punched pieces are the consequence.

In order to precisely maintain the position and tolerance of punched parts, it has

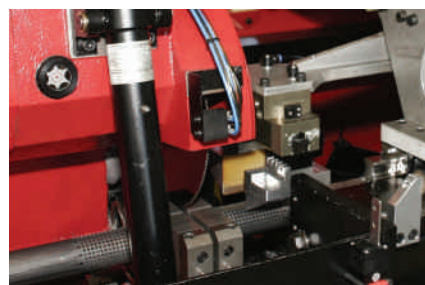
⚠ *RSA's Rasacut OC automatic sawing centre saws perforated tubes and ejects faulty perforations*



always been necessary to use semi-automatic solutions. Time-intensive manual measuring of punched tolerances and adjustment of the saw length stop only allows for a low yield. Companies using a fully automatic saw can achieve higher yields, but consequently need 100 per cent checking of the fixed length, leading to a higher acceptance rate of rejections due to the alteration of the perforation.

The Rasacut OC sawing centre from RSA works quickly and precisely. Tubes are automatically singled from the bundle and transported via a gripper to the saw. This highly precise feeding is controlled by an optical system that automatically measures the tolerances of the individual punching, and ensures precision between the pressings and the tube end according to the set parameters.

The machine includes fully automatic deburring, cleaning and drying of the fixed lengths. Certain parts in the random material which show unsuitable tolerances between the pressings are rejected and removed. This eliminates the need for



ⓘ *The handling system transfers the workpieces to the automatic deburring machine*

additional 100 per cent checking and results in fewer rejections.

The standard equipment of the Rasacut OC is suitable for tube diameters from 10-90mm, and fixed lengths from 30mm to 3,000mm.

RSA GmbH & Co KG – Germany
Fax: +49 2351 995 300
Email: pr@rsa.de
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Modular, prize-winning tube-drilling machine

The Hebo RBV12 is a modular tube-drilling system for the precise working of tube and section. The company has been awarded the Bundesinnovationspreis (Prize of Federal Innovation) for the RBV12, which is used in applications such as plant, heating-elements, rail, staircase and furniture manufacture.

The RBV12 can undertake procedures including drilling, flow-drilling, thread-forming, thread-cutting, core-hole-removal and sawing. In addition to a number of special sections, the machine can be used on round, square, rectangular and oval-tubes.

Comprising of two drilling units mounted on a revolving base plate, the RBV12

is adjusted by an infinitely variable feed carriage. The pivot point of the drilling units is in the middle axis of the section to be worked. The base plate can be revolved under infinite variables up to an angle of 30° to the section middle axis.

Because of the double-sided treatment it is possible to make precisely aligned through-bore-holes with an extremely inclined angle. Each drilling unit can be used for drilling and thread-cutting. Due to machine construction, special drilling-tools and a lubrication device, common problems during drilling of stainless steel can be avoided. The infinitely variable adjustment of the tools allows the drilling of oversized up to 0.4mm.

The new generation of Hebo tube-drilling machines are semi-automatic. Only the fixing of tubes and removal of finished products is manual. The modular system can be extended by further working units. Through combination with a tray-load of poles and a removal-device the machine can be extended to a fully automatic plant.

As of September 2007, it will be possible to combine the RBV12 tube-drilling machine with Hebo reshaping-machines (ie embossing-units, bending-machines, forging-press, passage-heating).

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Start-Stop process for high speed precision rollforming

Used for applications such as precise inline notching and embossing, Dreistern's Start-Stop® rollforming process was first developed 30 years ago, and has benefitted from powerful new drives that have kept pace with demanding applications. Many rollforming tasks would not be possible without the aid of Start-Stop technology.

The rollforming machine works like a precision press feeder. In the Start-Stop operation mode, the progressively advancing profile is stopped briefly during the cut-off and punching operations. The profile is then reaccelerated to normal operating speed. All punching and cut-off tools are stationary.

The advantage of this process can be seen where extensive punching operations are necessary. The tool designer does not have to make any compromises due to weight limitations for the tools. In continuous operation, all punching and cut-off tools must be accelerated to the strip speed, limiting the number and weight of the tools.

In addition, the Start-Stop process offers advantageous higher production output rates for short length sections. Rates of 60 sections per minute are normal, while high-performance lines can reach 120 sections per minute. The drive system catapults the profile with an acceleration of up to 8m/s² to a speed of up to 100m/min, and stops exactly at the programmed punching or cutting position, with a positional accuracy usually better than ±0.2mm.

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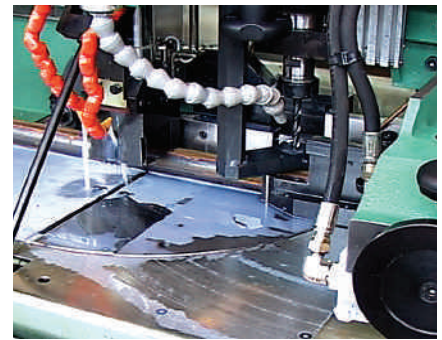
Horizon Brown 1500 AP is the Pedrazzoli branded development in the field of automatic cut-off machines designed to cut set lengths from steel bars or other materials. The machine – which can be supplied with a drilling unit – is suitable for 90° or inclined cutting of solid bars, tubes and sections. On request the company can also supply the machine with a bundle feeder and a scrap remover-selector.

The drilling unit can be supplied for automatic cycle operation on steel, metallic alloy, aluminium and all other materials the machine can cut. This work unit can bore holes on tubular sections and bars up to a maximum diameter of 142mm and thickness of 5mm. The wide drilling diameter range is from a minimum of 3mm up to 20mm.

Drilling tool movement is horizontally controlled by a controlled axis with a 200mm total stroke, while vertical cams keep check on travel stop and start positions as well as on the two speeds (slow/fast). The double slow-fast command capability can be used on tubular sections, which allows drilling of the first face with a slow advancing speed, progression onto the second face with a greater speed and final drilling under a slow speed.

Tool rotation can be undertaken with 4 or 8 gears with manual gearbox. Alternatively, it can be supplied with an inverter for a speed range from 300 to 2,000rpm.

During the work-cycle tool lubrication is fulfilled by coolant liquid or micro-mist lubrication (optional). The drilling chip



 The Horizon Brown 1500 AP can be supplied with a drilling unit

removal is carried out by means of an optional cutting table cleaner.

IMS software, developed by Pedrazzoli's R&D department, ensures simple and quick work cycle programming according to a clear setting of parameters. A set of icons also allows this software to plan the drilling cycle by introducing the most important drilling tool control parameters.

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From the AMERICAS

Metals

Oregon Steel-Evraz deal needs more time for US security review

According to officials of the two companies involved, the unexpected resignation of the head of **Evraz Group SA**, the Russian businesses seeking to acquire **Oregon Steel Mills Inc.**, will probably not sink the \$2.35 billion deal. But both parties expected an extension of the review period well into 2007 to allow additional time for the US government to examine for any national security issues.

In December, Evraz announced in Moscow that its CEO, Valery Khoroshkovsky, was leaving immediately to take up a high-level Ukrainian government post. Mr Khoroshkovsky, who took the helm at Evraz only on 1 January 2006, served as economics minister for Ukraine and in other government posts before joining the company in 2004.

Writing in the *Oregonian* on 12 December, Richard Read noted that the US regulators would be looking for indications of potential ties between Evraz and the Russian government. In 2005, similar issues forced the state-owned Chinese oil company CNOOC to abandon its \$18.4 billion unsolicited bid for the California-based oil producer Unocal. In another, roughly parallel situation, in March 2006 a state-owned Dubai company seeking a contract to manage terminals at US ports dropped out after an uproar in Congress.

Mr Read pointed out that the Evraz-Oregon Steel deal appears different. "Steel lacks the national security significance of oil or ports," he wrote. "And Evraz is a public company with no apparent foreign-government ownership."

The acquisition would involve the largest Russian takeover to date of an American company, one that would sign over an 80-year-old Portland, Oregon firm with 680 workers to a rapidly expanding Russian steel concern. Evraz planned to borrow \$1.8 billion to finance the deal, another aspect needing US approval.

Evraz Group is one of the world's largest vertically integrated steel and mining businesses, with three steel plants in Russia; Palini & Bertoli, in Italy; and Vítkovice Steel, in the Czech Republic. If the Russian company had closed on Oregon Steel within 2006, the newly combined company would have produced 16.8 million metric tons of crude steel.

- As an aside, the aborted ports deal mentioned above came to a second point of closure on 11 December, when the giant Dubai company **DP World** announced the sale of its **US holdings** to the **American International Group**, thus bringing to an end a contentious episode that many financial advisers say helped drive Middle East petrodollars away from the US and into developing market areas in Asia and elsewhere. Under pressure from American politicians, DP World is selling terminal operations in six ports, including New York-New Jersey and Philadelphia; cargo-handling businesses in 16 East Coast and Gulf of Mexico ports; and a passenger terminal in New York City to a unit of **AIG**, an insurance company with little experience in the ports business.

DP World did not disclose the price it received from the sale, but termed it 'fair'. Company executives said after they agreed to sell the assets in March that they expected to realize about \$750 million. Since then, port deals have become increasingly popular for bank infrastructure funds, like that of New York-based **Goldman Sachs**, which headed a group that won control of **AB Ports**, a British company, in June. The world's largest investment bank said its earnings for fiscal 2006, ended 24 November, reached an all-time high of \$9.54 billion, more than the previous two years combined. Its fourth straight year of record results contributed to a stellar return on equity of 33 per cent for the year.

Nucor looks farther afield to feed its minimills

Nucor Corp (Charlotte, North Carolina), has begun production at its Point Lisas plant in Trinidad, the southern Caribbean island off the coast of Venezuela. On 17 January, **Nu-Iron Unlimited** was reported to have completed a five-day performance test, surpassing an average production of 220t/hour. Dan DiMicco, Nucor's chief executive, told the *Charlotte Business Journal* that the Trinidad facility "represents the largest current component of our strategy to control 6 to 7 million tons per year of high-quality metallics for the Nucor steel mills."

In late 2004, Nucor paid \$26 million for an idle steel plant in Louisiana. The company moved the equipment of that plant, which processed the iron ore Nucor uses as a substitute for scrap in electric-furnace steelmaking, to Trinidad. There, where natural gas prices are lower than in the US, Nucor increased capacity to 2 million tons per year. The Caribbean site is also better situated to receive Brazilian iron ore, the company said.

In other news of Nucor, the second-largest US steel company said 17 January that it had agreed to acquire the Canadian family-owned metals producer **Harris Steel Group Inc** in a transaction valued at about US\$1.07 billion. Harris Steel has several business units, including **Harris Rebar** (fabrication of concrete reinforcing steel and design/installation of concrete post-tensioning systems); **Laurel Steel** (manufacture and distribution of cold finished bar and wire and wire products); and **Fisher & Ludlow** (manufacture and distribution of heavy industrial steel grating, aluminium grating, and expanded metal).

These Harris Steel operations serve customers throughout Canada and the US. The company also participates in steel trading worldwide through its 75 per cent ownership of the Swiss trader and distributor **Novosteel** and in the distribution of reinforcing steel and allied products to US customers through Harris Supply Solutions.

US bans recycling 1-cent and 5-cent coins for their higher metal value

Concerned that rising metal prices could prompt widespread melting down or exporting of the two lowest-valuation US coins in circulation, the Mint on 15 December imposed a ban on such use of pennies and nickels. Penalties for violation are stiff: a \$10,000 fine and up to five years in jail.



According to the Mint, the metal value of a current-issue penny, made of copper-coated zinc, is more than one cent. The Mint places the commodity metal value of a pre-1982 penny – composed of 95 per cent copper and still accounting for a large percentage of those coins in circulation – at 2.13 cents.

As to the five-cent piece, made of a copper-nickel blend, its metal value is now 7 cents. When manufacturing costs are factored in, every penny costs the Mint 1.73 cents to produce; every nickel, 8.74 cents. If even 1 per cent of the 150 billion pennies and 20 billion nickels in circulation were to be withdrawn from circulation, the replacement cost to the American taxpayer would be \$43 million, the Mint estimates.

The new ban also forbids the export of pennies or nickels in any significant quantity. The Mint's purpose here is to block large-scale movement of the coins to countries where recycling them for the metal content could be economically feasible.

Elsewhere in metals . . .

➤ In another noteworthy Russian acquisition in the US (see 'Oregon Steel-Evraz deal' above), **Norilsk Nickel** has entered into a definitive agreement to buy all of the nickel assets of **OM Group** (Cleveland, Ohio) for \$408 million in cash. The transaction was expected to close in the first quarter of 2007. OM Group is a vertically integrated international producer and marketer of value-added, metal-based speciality chemicals and related materials, whose management concluded that its nickel business is a non-core asset.

In light of today's historically high nickel prices, OM Group believes that its timing here is ideal. The company operates manufacturing facilities in the Americas, Europe, Asia, Africa, and Australia. Norilsk Nickel is Russia's largest mining and metallurgical company and the world's largest producer of nickel and palladium, as well as a major producer of platinum and copper.

➤ **Alcoa** announced an investment of more than \$6 million to expand core manufacturing capabilities at its **Howmet Product and Services** operation in Morristown, Tennessee. Completion is scheduled for midyear and full functioning by the end of the year. The installations will include a high-temperature tunnel kiln that will boost kiln capacity by some 10 per cent, new prebake ovens, and Tempcraft presses.

Pittsburgh-based Alcoa, the world's largest producer and manager of primary aluminium, said that expanded capability in producing alumina core bodies will enable it to better serve its aerospace customers, who are placing "unprecedented demands on [our] capacity."

In other news of Alcoa, on 4 January the company formally opened its aluminium brazing sheet plant in Kunshan City, China. A joint venture of Alcoa and **Yencheng Engraving** established in April 2006, **Kunshan Aluminum Products Co Ltd** produces heat exchanger materials for automotive and other industrial HVAC applications and complementary common alloy aluminium products. This is Alcoa's third flat-rolled products facility in China. In full operation it will produce 50,000mtpy of aluminium brazing sheet primarily for the Asian automotive market.



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➤ **Phelps Dodge** (Phoenix, Arizona), the world's second-largest copper producer, will be acquired by **Freeport-McMoRan Copper and Gold**, a smaller rival, in a cash and stock deal worth \$25.9 billion. The chairman and chief executive of Phelps Dodge, J Steven Whisler, said the two companies had discussed a possible merger for about a decade. The premium of about 33 per cent offered by Freeport-McMoRan, Mr Whisler said, was a major factor in Phelps Dodge's decision to end its 172-year history as an independent company.

Freeport-McMoRan, based in New Orleans, Louisiana, is the world's lowest-cost copper producer. Best known for its Grasberg mine in West Papua, the company is the largest taxpayer to the Indonesian government. The transaction with Phelps Dodge is the latest in a series of mining and metals consolidations involving US companies. If approved by shareholders, it would create the world's largest copper producer and the largest mining company based in North America.

Spotlight on: Canada

New US passport rules: Canada's business travellers and tourism to suffer

All airline passengers landing in the US are now required to present a passport, not just the driver's license and birth certificate that once sufficed for Canadians crossing the border and for US citizens

returning from Canada, Mexico, the Bahamas, and the Caribbean. On 23 January, when the tougher US rules took effect, passport offices reported applications up 53 per cent in the United States and 33 per cent in Canada from the previous year.

The tighter border controls being instituted five years after the 9/11 terrorist attacks will be extended to the busy US land borders with Canada and Mexico by 1 June 2009. Meanwhile, the new rules on air travel are causing enough problems for the passport services. An official of the US State Department estimated that it will issue 16 million passports this year, up from 7 million four years ago. A spokesman for Passport Canada said that its offices were swamped.

Canadian business executives are predictably unhappy about the confusion and delays to be expected with the new regulations. But the immediate big loser will be the \$50 billion Canadian tourism industry, already suffering from a 28 per cent drop in visitors from the US over five years.

Writing from Toronto in the *Washington Post*, Doug Struck noted that fewer Americans are coming to Canada largely because of the increase in value of the Canadian dollar, which has erased cross-border shopping bargains. A representative of the Canadian duty-free shops at the land borders told him that, even before the new passport requirement took effect, high gasoline prices, the epidemic in 2003 of the viral illness SARS, increased security, and confusion over the border-crossing rules had all hurt business. (*'Canadians fear fallout of US passport rules'* 13 January).

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From the AMERICAS

For Canadians reliant on American shoppers, the worst probably lies ahead.

Mr Struck writes: "Canadian tourism officials are worried the coming land border restrictions will stop the busy two-way traffic along the 3,145-mile land border. School trips will stop, they fear. Bus journeys by senior citizens to Niagara Falls, Ontario, will dwindle. Convention planners will bypass Canada. And communities that straddle the border will be split because many citizens won't want the bother or expense of getting a passport."

- According to the US State Department an estimated 27 per cent of US citizens have passports. In Canada, the rate is 40 per cent. Critics urge both countries to make their passports cheaper and easier to get. In Canada, an adult passport costs US\$75 and is good for five years. A US adult passport, costing about \$22 more, is good for 10 years. In written comments on the new rules, the Tourism Industry Association of Canada said, "An American family of two adults and two children would be required to pay at least \$358 in fees for passports" for a Canadian vacation – influencing that family to stay, play, and shop on its own side of the border with Canada.

Canada's 119 border crossings with the US will come under electronic surveillance

Canada will spend more than \$368 million over the next five years on a plan for monitoring cross-border trade from the United States.

On 12 January, Public Safety Minister Stockwell Day made his announcement of the Canadian initiative against terrorist, economic, and environmental threats at the border crossing between Windsor, Ontario and Detroit, Michigan.

This segment accounts for one-third of the \$1.6 billion in daily trade between Canada and the US which, Mr Day noted, when annualized exceeds the trade between America and Japan.

Some \$337 million will go toward the electronic program eManifest for computer-automated risk assessment of cargo shipments before they reach Canada.

The 18,000 trucks that cross the US-Canada border each day, as well as all railroad, air, and marine cargo carriers, will eventually be required to file electronic manifests before their shipments arrive. This will enable border service agents to decide in advance whether the cargo requires close screening.

Mr Day did not give a precise date when the eManifest program would go into effect at the 119 border crossings along Canada's 4,000-mile border with the US. When it does, background checks on crew and risk assessment of cargo will be in the hands of the Canada Border Services Agency 24 hours in advance of the arrival of shipments by sea, and several hours ahead of railroad, highway, and air cargo.

In the meantime, some \$10 million of the new Canadian investment in border security will go toward expanding Partners in Protection, a voluntary program in which businesses and their employees help border agents detect and prevent contraband smuggling of drugs and weapons.



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eManifest was developed in cooperation with the US Department of Homeland Security as a provision of the Security and Prosperity Partnership of North America.

This was launched in 2005 by then-Prime Minister Paul Martin, of Canada; President George W Bush, of the US; and then-President Vicente Fox, of Mexico.

- Could the combined border-patrol efforts of the Canadian and American governments be thwarted by a new espionage threat lurking among pocket change: Canadian coins with tiny radio frequency transmitters hidden inside? The mysterious coins were reported planted on US contractors with classified security clearances on at least three occasions between October 2005 and January 2006 as the contractors travelled through Canada.

Intelligence and technology experts say such transmitters, if they exist, could be used to track the movements of people carrying the spy coins. The US Defense Department insists the incidents were real and the risk genuine. But details are secret, according to the Defense Security Service, which issued the warning to the Pentagon's classified contractors. (*Associated Press*, 11 January).

"The US report doesn't suggest who might be tracking American defense contractors or why," wrote the AP's Ted Bridis. *"It also doesn't describe how the Pentagon discovered the ruse, how the transmitters might function, or even which Canadian currency contained them."*

Manufacturing

Ohio companies mount an effort to showcase manufacturing jobs

A coalition of businesses in and around Cleveland is spending \$3 million to persuade Northeast Ohio high school and college graduates to pursue careers in manufacturing. As reported by Janet H Cho in the *Cleveland Plain Dealer*, the 'Dream It - Do It' campaign was launched 11 January by the **Manufacturing Advocacy & Growth Network** (MAGNET). It is designed to address a shortage of skilled applicants for factory work. (*'Group Pushing Manufacturing Jobs'* 12 January)

MAGNET president Stephen Gage told the *Plain Dealer* that Northeast Ohio companies are just starting to feel the labour shortages that those on the East and West coasts have been experiencing for years, especially for employees with computer and programming skills. James Griffith, president and chief executive of Canton-based bearings and steel maker **Timken Co**, said: *"Hundreds of manufacturing jobs are currently available in Northeast Ohio, and they need to be filled with a work force that is regionally trained."*

Still one of the major manufacturing centres in the world, the 16 counties of Northeast Ohio employ 330,000 people in manufacturing jobs, working for about 12,000 companies with more than \$90 billion in sales. According to US Department of Labor projections,

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the region will post more than 5,500 manufacturing job openings for skilled workers each year. Salaries start at \$40,000 to \$45,000 a year; a seasoned worker commands an average of \$63,000.

Through print, radio, and television advertisements, as well as billboards and sponsorship of the kind of venues that attract young people, MAGNET hopes to persuade those in the age group 18 to 34 to consider preparing themselves to apply for those jobs.

John Engler, president and chief executive of the **National Association of Manufacturers**, put the initiative in a broader context. "America can't compete without skilled workers," he said in a prepared statement, "Eighty per cent of NAM members are having trouble finding qualified employees for today's high-tech workplace. And this problem is getting worse as the baby boom generation retires."

Meantime, Mr Engler told Ms Cho, "Companies are starting to hire each other's employees," to fill critical jobs.

Boeing returns to No 1 after five years behind Europe's Airbus

According to sales figures released 17 January, **Boeing Co** beat out **Airbus SAS** in total aircraft orders last year for the first time since 2000. The Chicago-based aircraft maker garnered 1,050 orders in 2006 versus 824 for its European rival. Boeing also topped Airbus in production of wide-body jets, probably the most lucrative market in

the industry. Boeing tallied 317 orders for these planes, compared with 134 for Airbus.

Writing in the *Washington Post*, Del Quentin Wilber noted that analysts see the figures as evidence that Boeing has regained the momentum it sacrificed to corporate scandals, business missteps, and sluggish sales. By contrast, Airbus, which has its headquarters in Toulouse, France, had "a rough year." Mr Wilber wrote, "Wiring problems caused production snafus in the much-touted Airbus A380 super-jumbo jet, delaying its delivery to customers by two years. FedEx dropped orders for 10 freighter versions of the jet. Several top executives left Airbus and its parent company EADS NV." ("Boeing takes lead in aircraft orders," 17 January).

Airbus was also forced to redesign its new wide-body A350 XWB because airlines and leasing companies prefer Boeing's 787 Dreamliner. Boeing has taken 448 orders for the 787, which is still in production.

Even so, despite falling behind in orders Airbus had the second-best year in its history. It also delivered more planes to customers than Boeing and has a slightly larger backlog of jets than the US aircraft maker. But Boeing chose to concentrate on its supremacy in sales – and to revel in it.

"We are excited about it," Randolph S Baseler, vice president of marketing for Boeing, told the *Post*. "Like sports teams or anything else you are on, you want to be a winner in what you do. It didn't feel good to be number two."

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Matters of trade

Prospects are dimming for a US-South Korea trade agreement

Officials of both governments resumed free-trade talks on 15 January, but the US and South Korea seemed unlikely to harmonize their differences before the June 30 expiration of President George W Bush's 'fast-track' authority to move an agreement quickly through Congress. After that, the opposition Democrats who control the new Congress can place amendments on the trade deal, making prompt ratification unlikely.

A pact would give Washington its biggest success since the North American Free Trade Agreement (NAFTA) a decade ago. But talks stalled over Washington's demand for greater access for American cars, among other exports, and over Seoul's insistence on changes in US antidumping rules as applied to South Korean steel, cars, and other products. Seoul also wants goods produced by South Korean factories in North Korea included in the agreement.

South Korea is America's seventh-largest trading partner, with bilateral trade topping \$74 billion a year. According to the International Trade Commission, a US federal agency, an accord could lift American exports to South Korea by \$19 billion, while Korean exporters could expect to make an additional \$10 billion in sales in the United States.

- The Bush administration will renegotiate the language covering labour rights in free trade agreements it has reached with Peru, Colombia, and Panama, to help ensure approval for the deals by the new Democratic Congress. John K Veroneau, deputy United States trade representative, said on 18 January that the three countries had been notified and predicted that an agreement on revised language could be reached without too much delay.

The announcement was the strongest signal to date that President George W Bush is prepared to modify his trade policies in light of Democratic control of the House and Senate. Democrats, backed by American labour unions, have long complained that the free trade deals negotiated by the administration do not include enough protections for American workers.

Around the companies . . .

➤ **IDOD Systems** (Grant Park, Illinois) has awarded its first European license to the **Wuppermann Group** (Leverkusen, Germany) for use of the IDOD in-line process for continuous hot-dip galvanizing on both the inside and outside of tube and pipe. According to the *Preston Pipe Report* for January, Wuppermann will employ the process at its Judenburg plant in Austria, with shipments to US customers scheduled to commence in June.

IDOD says that its system applies an ASTM A-53 zinc coating to both surfaces of extremely thin or thick-wall tube and pipe, and that it is guaranteed to yield galvanized product that will not chip or flake during fabrication. The German company will produce round tubulars in sizes 1.3" to 4.5" and shapes in the range 0.39" to 5.12".

➤ **Ipsco Inc**, the Canadian maker of steel pipe for oil and natural gas exploration, on 1 December announced the completion of its acquisition of **NS Group Inc** (Newport, Kentucky) for US\$1.46 billion in cash. With this added capability in energy-related tubular products, IPSCO could achieve combined annual sales of over \$4 billion, compared with \$3 billion in 2005. Canada accounted for 32 per cent (about \$979 million) of those sales. IPSCO now expects to boost its growth in the US, where it estimates sales opportunities for OCTG to be three times greater than in Canada. According to **Tenaris SA**, of Argentina, the world's largest maker of OCTG, the US creates almost half the annual global demand for 10.5 million metric tons of pipe for oilfield applications.

➤ **General Electric** said on 15 January that it would pay \$4.8 billion in cash for **Smiths Aerospace**, the cockpit electronics arm of the London conglomerate Smiths Group. Analysts saw another sign that GE (Fairfield, Connecticut) is acting on its intention to get out of underperforming businesses and redirect capital into areas of faster growth.

Earlier in the month GE had said it would acquire drilling-equipment maker **Vetco Gray Inc** (Houston, Texas) for \$1.9 billion. GE also said it would seek a buyer for its lagging plastics business. The terms of its British deal call for GE to pay about 1.8 times the Smiths unit's 2006 sales. Given the intense activity in the aerospace business, analysts said GE had little prospect of negotiating a lower price.

Dorothy Fabian, Features Editor (USA)

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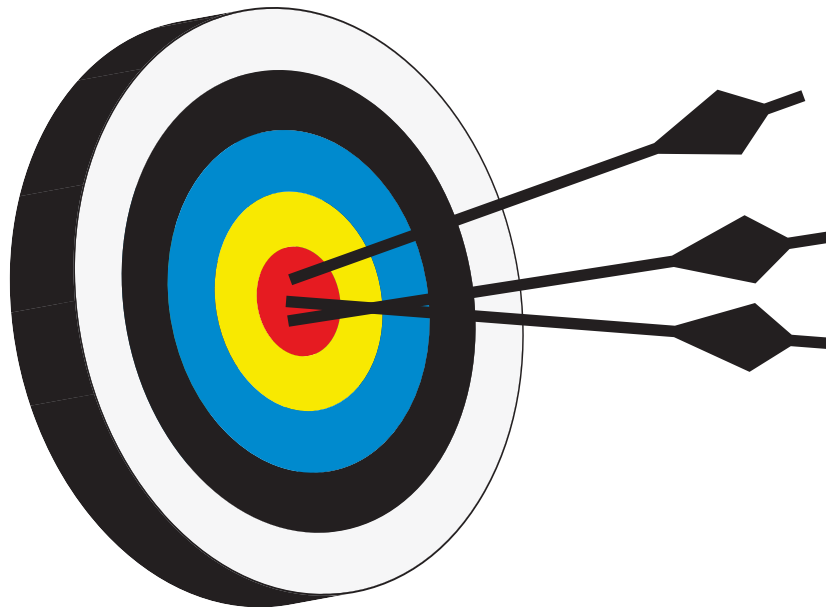
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Stainless Steel Tubing: Manufacturing & Machinery



If there is such a thing as a basic tube, it would be made of stainless steel. However, as a glance at a few tubemakers' websites will attest, the casual designation is not so easily defended.

Typically, a company will group its product list under simple headings: welded and drawn, seamless drawn, As-welded. But from that point on the word 'basic' loses meaning. The number and variety of products on offer – like the number and variety of their applications – are impressive, even overwhelming.

Fortunately, the number and variety of experts in the design and operation of the machinery and peripheral equipment of stainless tube manufacture are more than a match for the heavy demands put on them.

The companies reviewed in this section of *Tube & Pipe Technology* know that each grade of stainless steel tubing is unique – in marked contrast to the uniform conditions of the tubemaker's outside world. Here, every competitor is keen, the lead times are all short, the standards to be met are tougher almost by the day, profitability is paramount.

Stainless steel seamless tube and pipe

Xinyahua Stainless Steel Pipes & Tubes Co Ltd, China, is a manufacturer of high quality stainless steel seamless tube and pipe. These products can be supplied in grades including austenitic 304, 304L, 316, 316L, 310, 310S, 317, 321 and 347, in addition to duplex tube and pipe S31803.

The product OD range is from 6-406mm, with a wall thickness from 1-30mm. The company, certified according to Lloyds ISO9001 and PED/97/23/EC, operates a quality assurance system and uses only the highest quality raw materials. The entire manufacturing procedure is controllable and fully traceable.

The company's tube mill is in the first phase of investment, and is equipped with two cold pilger lines and four cold drawn lines with a production capability of 500 metric tons per month.

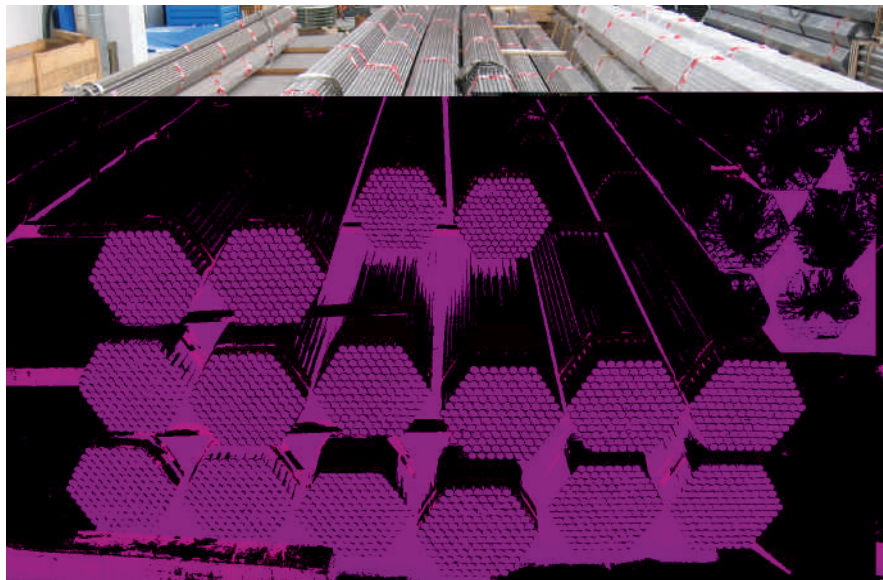
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Redrawn precision stainless steel tube

Founded in 1974, Italian company Tecnofar Spa is a specialist in the manufacture of stainless steel and nickel alloy tubes. With advanced technology, the company has two production units located in Delebio and Gordona, covering a total surface area of 7,000m².

The company produces redrawn precision tubes, both in bar and coil form, by using the TIG welding process. The company offers a modern, well-equipped department for tube cutting and is able to produce cut pieces measuring just a few millimeters in length, completely burr-free.

 Tecnofar manufactures high-quality stainless steel and nickel alloy tubes





① The redrawn precision tubes are available in both bar and coil form

Tecnofar can adhere to a range of dimensional tolerances, with a stainless steel tube range of 0.3 to 76mm and wall thickness from 0.10 to 3.5mm. These tubes are produced using stainless steels provided and guaranteed by leading steel mills.

ISO 9001:2000 accredited (by Italcert), the company has been certified by RINA for its welding system and heat treatment for the production range of OD 6-19mm and wall thickness of 0.40 to 1.10mm.

Tecnofar SpA – Italy
Fax: +39 0342 684500
Email: info@tecnofar.it
Website: www.tecnofar.it

Range of production machinery for SS tube

Established in 1976, Ho Chang Machinery Co Ltd is a manufacturer of whole-plant machinery and equipment for the production of stainless steel tube and pipe. The company designs and manufactures a range including heat-treatment machines, sizing machines, straightening machines, polishing machines, chamfering machines, and hydrostatic test machines.

All equipment, important parts and rolls utilise computer 3D analogue design and CNC unit processing. The company's main products are complete sets of production line equipment for welded stainless steel industrial pipe and mechanical tube, which are in conformity with ASTM standard of A312, A554, and A249.

The products are widely applied in the industries of petroleum, gas, petrochemical, paper-making, sanitation, and machinery. They are used and supported by customers in Canada, Hong Kong, Malaysia, Thailand and China. The company can also undertake the design and manufacture of rolls, in addition to the construction of a whole plant.

Machinery specifications include complete sets of tube making equipment (HC-AP-40-130). The production range of this equipment is pipe OD 21.34-406.4mm (thickness: SCH5S-40S), and tube OD 15.9-114.3mm (thickness: 0.6-3.0mm). The material types include AISI-304, 304L, 316, and 316L.

Ho Chang Machinery Co Ltd – Taiwan
Fax: +886 4 8730618
Email: hochang9@ms35.hinet.net

Advanced procedure assures narrow tolerances on SS thin-walled tube

G Rau GmbH & Co KG, Germany, is a leading specialist for innovative metal solutions and a preferred supplier to various fields including electrical engineering, the automotive supply industry and measurement and control engineering.

The company's subsidiary Euroflex, founded in 1993, is a European market leader in semi-finished products in the field of medical engineering.

The company is specialised in the production of high precision semi-finished products made from precious metals, stainless steel, special alloys and composite materials as well as in the production of parts and assemblies.

Stainless steel tubes are available in grades including 1.4301 304, 1.4571 316 Ti, and 1.4441 316 LVM (for surgical implants). They can be supplied with a seamless or welded finish together with common austenitic alloys.

These tubes are manufactured with an OD range from 0.50-12mm and a wall thickness range of 0.04-0.3mm, depending on the ratio of outer diameter to wall thickness. In special circumstances, the company can even supply tube with an OD up to 20mm, and wall thickness of >0.3mm.



① G Rau manufactures large, thin-walled tubes with very narrow tolerances

The tolerance requirements for stainless steel tubes are continually increasing. As most seamless stainless steel precision tubes are manufactured by the drawing process, there are natural limits to the attainable dimensional accuracy. This becomes especially apparent when tubes are manufactured with larger outer diameters relative to the wall thickness.

For about five years there has been an increased demand for large thin-walled stainless steel tube with narrow tolerances. Consequently, G Rau has developed a new procedure that enables the production of large, thin-walled tubes with very narrow tolerances on wall and outer diameter.

This product is available with an OD range of 0.5mm-8mm = ± 0.02 mm and 8mm-12mm = ± 0.03 mm, and a wall thickness of ± 5 per cent standard (minimum of ± 0.01 mm).

These stainless steel tubes are available in soft, hard or special strength conditions, and usually in lengths of 3-4m or fixed lengths according to user specification.

G Rau – Germany
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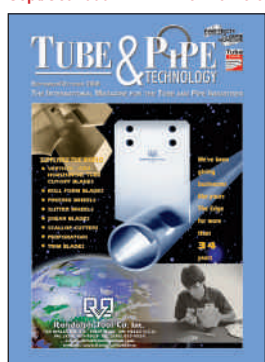


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Nov/Dec 2006 Vol. 19 No 6



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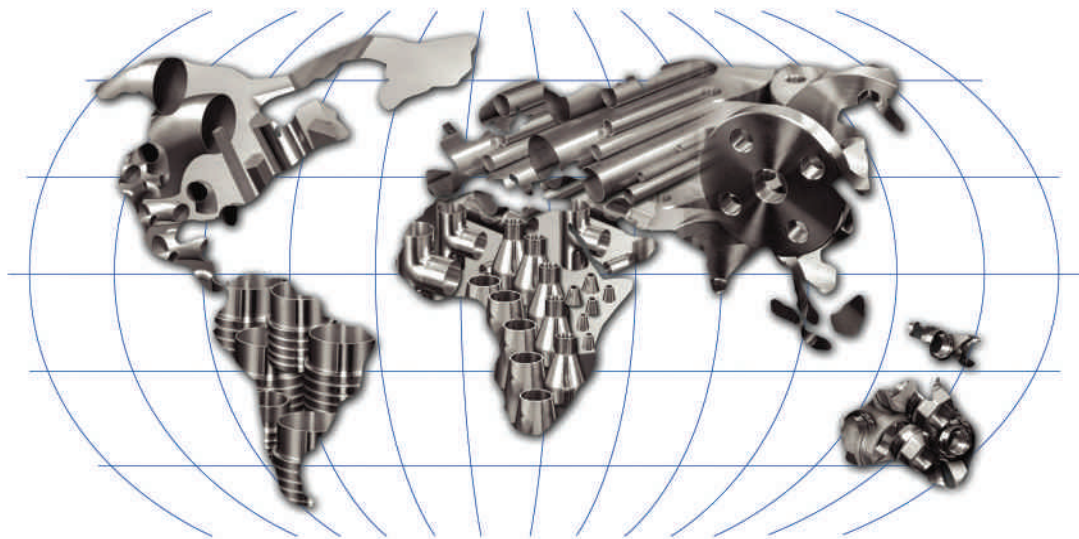
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These ring grip pipe couplings are very rugged and have an extremely high end pull capability. This toughness is important for many applications, including those with high dynamic loads or applications where the pipeline integrity is extremely important.

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DOBELIANS

Increased capacity for Chinese stainless steel tube manufacturer

Changshu Walsin Specialty Steel Co Ltd, China, is a leading supplier of stainless steel seamless tube and pipe. The company has recently completed a successful expansion of its No 2 plant, which now has a production capacity of 2,000mt per month.

Two of the latest hot piercing machines were placed into operation in October 2006, while 28 cold drawn benches and cold pilger machines were installed in February 2006 at the new plant.

Ⓣ The facilities at Changshu Walsin manufacture stainless steel tube and pipe



Ⓣ The No 2 plant at Changshu Walsin has recently been upgraded

In December 2006, the company received an 80mt order from Ling Dong Nuclear Power Project, with goods due for delivery in February 2007.

Changshu Walsin Specialty Steel Co Ltd – China
 Fax: +86 512 5256 8027
 Email: rui_zhang@walsin.com
 Website: www.walsinstubing.com

Quality stainless steel tube and pipe

Quality Stainless Pvt Ltd, India, part of the Quality Group, manufactures welded stainless steel tube and pipe for applications including heat exchangers, boilers, condensers, automobile, oil and gas, structural, ornamental and other engineering industries.

The product range includes welded SS tube/pipe with OD sizes of 1/2" to 4", and 1/2" to 3" NB. The products are manufactured using cold rolled stainless steel strips and coils from hot rolled strips supplied by Quality Foils Pvt Ltd.

With certification according to ISO 9001:2000 from TUV and SUD, both Quality plants are located next to Jindal Stainless, Hisar, India. The entire QSPL plant is equipped with state-of-the-art non-destructive and ultrasonic testing equipment and in-house testing laboratories.

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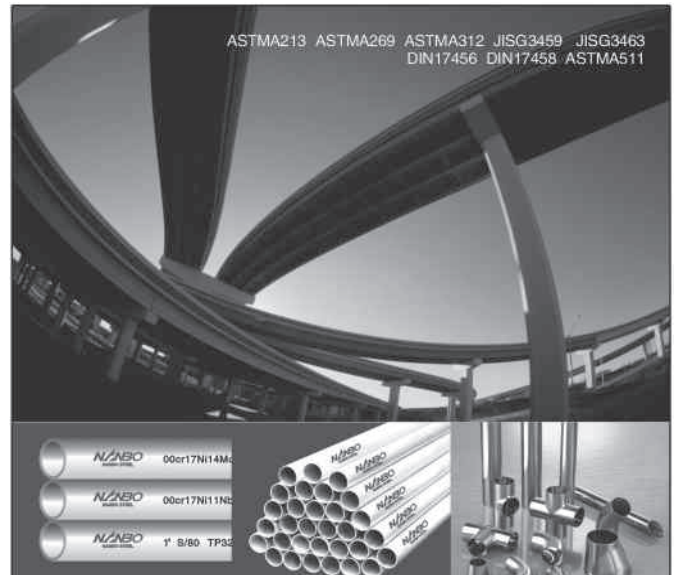
Features

- High pressure rated
- Full vacuum rated
- Usable on thin or thick wall pipe
- Smooth internal connection
- Low cost
- Reusable
- Absorbs vibration
- Externally leakproof



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Stainless Steel Tubing: Manufacturing & Machinery

Stainless steel tube at the heart of an expansive range

Jiangsu Yinhuan Precision Steel Tube Co Ltd (JYP), China, produces stainless steel tube, alloy steel tube, carbon steel tube and U-bent tube. These products are used in industries including petroleum, petrochemical, metallurgical, automobile, power station, aviation, and nuclear.

The company's product range is Ø5-426mm x 0.2-25mm, with an annual capacity of 50,000t. The company is equipped with around 300 pieces of machinery to manufacture precision steel tubes, including 150 cold-rolling and precision-rolling mills, a Ø110-type hot-rolling machine, a Ø450-type cold-rolling mill, a 1,000t hydraulic pressure cold-drawing mill and other advanced test and inspection facilities.

With many patents for its advanced tubes, the range includes duplex seamless steel tube, titanium complex tube, titanium alloy steel tube, Monel 400, Inconel 600, T91, TP347H, and Super 304. In 2002, JYP invested in production facilities for high-pressure/low-pressure feed water heater U-bent tube.

The company supplies its products to Dongfang Boiler, Harbin Boiler, Shanghai Boiler and Shanghai Power Equipment Company. It is also approved as a qualified supplier of Toshiba, Hitachi, Mitsubishi, and other well-known international companies.

JYP has also signed a joint-stock agreement with Bao Steel Company for developing nuclear tubes, with the aim of producing vital products used in nuclear power station.

**Jiangsu Yinhuan Precision
Steel Tube Co Ltd** – China
Fax: +86 510 8712 5822
Email: linda200285@yahoo.com

Stockist and distributor of seamless stainless steel pipe

With 10 years of experience in the stainless sector, Wasco-Anbuma (Stainless Branch) is a leading stockist and distributor of seamless stainless steel pipe, tubing

and fittings in Belgium. The company provides a wide range of products and delivers to countries including Belgium, the Netherlands, France, Spain, and the UK.

The company delivers tube and pipe in accordance with the recognised standards of EN and ASTM. Wasco-Anbuma has an important and extensive stock in several steel grades and dimensions, stocked in a new 1,200m² warehouse in Hamme (with 3,000m² open space).

In addition to this new stainless warehouse, the company operates a 12,000m² warehouse (with 12,000m² open air stock facilities), at its headquarters in Lokeren.

The company also offers an important range of tube, pipe and fittings in carbon steel. These hot or cold formed products are available as round, square and rectangular. Another division of the company offers hard chrome plated bars and roller burnished cylinder tubes.

Wasco-Anbuma (Stainless Branch)
– Belgium
Fax: +32 52 25 80 69
Website: www.wasco-anbuma.be



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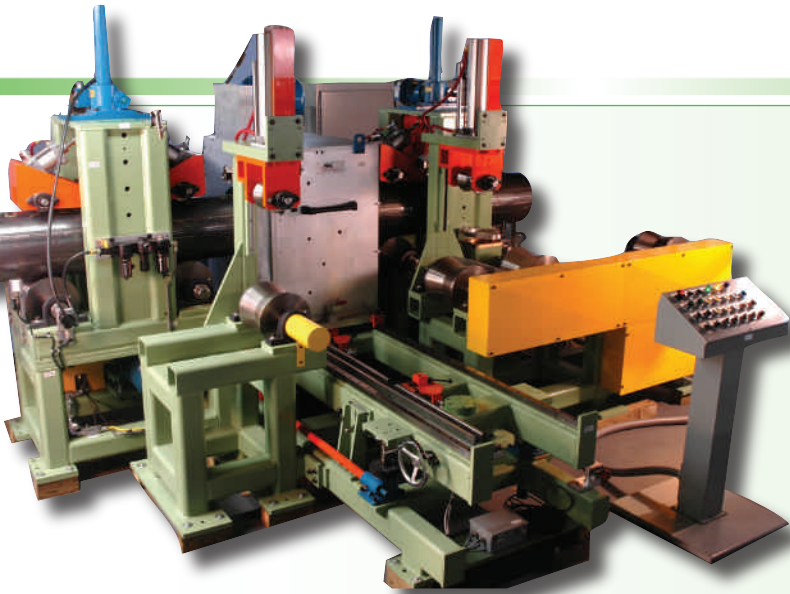
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Inspection, Measuring, Testing & Marking



It is unlikely that anyone in today's highly evolved tube and pipe industry has ever confronted a production run that reaches the stage of bundling for shipment without having been inspected, measured, tested, and marked. Even to imagine such a thing is difficult.

It is much easier to imagine the likeliest buyer (perhaps the only buyer) of that perfectly formed material: the scrap dealer, who would negotiate a rock-bottom price for it, or even impose a fee for taking it off the tubemaker's hands. Products intended for the high purposes of the aerospace, nautical, oilfield,

and construction industries have a long service life built into them. *Uncertified*, those same products are good for nothing but recycling – the quicker, the better.

The output of a modern tubemaking plant has to satisfy its criteria absolutely, and be proved to do so. It must, like Caesar's wife, be above suspicion, hence the critical function served by inspection, measuring, testing, and marking. Without making any changes in the tube or pipe, the specialties under review in this section of *Tube & Pipe Technology* even so mean everything to its saleability – and to the producer's bottom line.

Ultimate tube measuring and inspection machine

AddisonMckee has further enhanced its highly proven AdData™-Plus tube measuring system with innovative software designed to make inspection even easier.

Branded the AdData™ 'G' Plus, this latest model was created to further simplify the transition between non-contact and

co-ordinate measuring requirements. It harnesses the latest 'G-tube' measuring technology, developed in association with French software specialists, Romar.

The AdData™ 'G' Plus system incorporates a range of powerful features designed to make the process of component inspection, measurement and data collection exceptionally user friendly. AdData™-Plus technology is recognised as a 'total tube data' solution for virtually every industry involved in the manufacture of tubular components.

Designed to interface with all AddisonMckee CNC Databend machines, the system is based around a 'V-probe' non-contact light beam that requires no clamping devices and provides distortion-free measuring.

Information generated can be used to program any number of CNC bending machines to replicate a given component, compensate for

material bending springback/stretching and inspect manufactured components against specified requirements.

By changing the 'V-probe' measuring head for a contact ball probe, the machine can be converted to a coordinate measuring machine (CMM) for the accurate measurement of components incorporating flanges and brackets. This method can also be used to measure numerous non-tubular shapes and fixings.

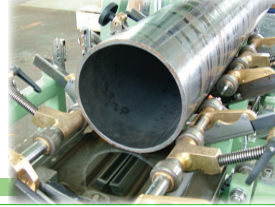
For those requiring less functionality from their non-contact tube measuring equipment, AddisonMckee have also introduced AddiCheck™. Benefiting from the development expertise behind AdData™ 'G' Plus, AddiCheck models offer levels of capability and functionality more suited to mid-market tube manipulation organisations.

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Fax: +44 1772 323227
Email: sales@addisonmckee.co.uk

 Tube measuring and inspection with the AdData™ 'G' Plus



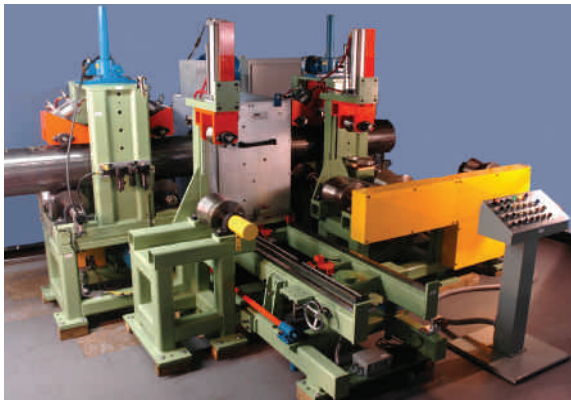


Flux leakage testers find growing demand in expanding API tube market


Accelerated technical development in countries such as Kazakhstan, Russia and the Ukraine has resulted in a strong demand for flux leakage test systems for large diameter steel and cast iron tube, typically used for oil and water delivery systems.

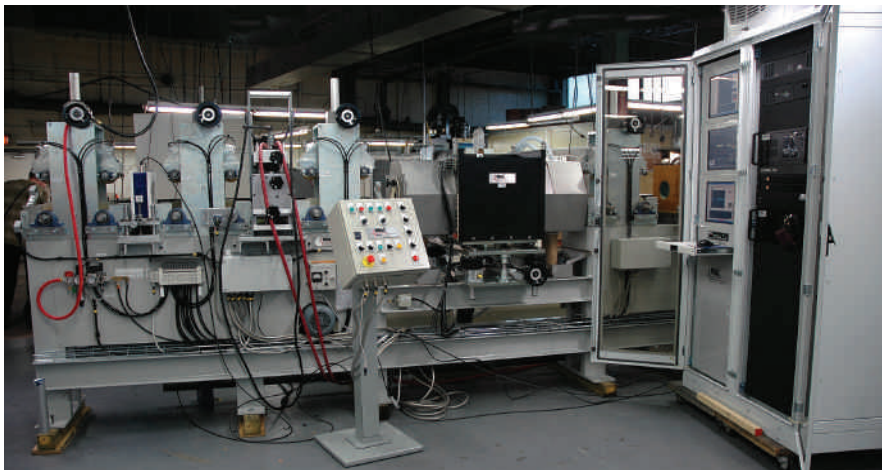
Magnetic Analysis Corp, USA, has recently delivered a 16" capacity flux leakage test system for inspecting 14" diameter steel tube. It features 24 channels of multiplexed electronics derived from 24 separate test probes that rotate around the tube during the test.

 *Magnetic Analysis Corp's Rotoflux® flux leakage inspection station for large diameter API tube*



The test screen display, modeled on MAC's highly successful EchoHunter® FD-4 software, simultaneously shows 24 channels of OD and 24 channels of ID signals. A strip chart display shows the maximum ID and OD signals from any of the 24 channels during a selectable time period, within milliseconds.

 *Combination UT/ET system for testing API tube in the Ukraine. The system includes Echomac® FD-4 electronics and rotary ultrasonic tester, MAC 250 eddy current tester, and a production comparator*



The short, sensitive probes can detect longitudinal notches as short as 0.5" (12.7mm) and through holes as small as 0.032" (0.8mm). Thresholds for ID and OD can be set independently and each channel is viewed separately on screen with zoom-in capability. These combined features result in ease of setup and data interpretation by the operator.

The robust 16" Rotoflux mechanics include a built-in calibration station and AC variable speed belt drives for the pinches. There is also a slide and elevating platform on rails with a crank powered chain drive for the slide and a motor driven vertical elevator. The slide has 3 preset stop positions – testing online, calibrating offline (for setup and checking standards), and totally offline for maintenance tasks.

The new calibration station, parallel to the test line, and with its own pinch stands and conveyor, is integrated into the welded structural steel frame of the full test system. The square tube steel frames provide the extra strength and rigidity required to handle the heavy, large diameter steel tube. A jib crane is also incorporated for handling the standard calibration piece. If required, the adjustable test probes allow convenient testing of smaller diameter tube.

MAC has also supplied equipment for another tube application involving

inspection of 5" diameter carbon steel alloy or stainless steel in the Ukraine. This equipment comprised a multi-test system incorporating a 10-channel 5" rotary head Echomac® FD-4 ultrasonic tester, a MAC 250 encircling coil eddy current tester and a production comparator unit.

The use of all three combined technologies has ensured detection of multiple conditions in the tube. The UT can sense long, shallow ID defects specified by API standards. The eddy current detects surface transverse defects and holes, while the production comparator verifies alloy or grade.

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Website: www.mac-ndt.com

Marking steel and non-ferrous cylindrical products

Couth Butzbach Product Marking GmbH, Germany, are specialists in hard material marking technology. With a range of marking tools, the company enable conventional methods by hand stamps, machine stamps or dies. These tools can be built into presses or unrolling machines in order to work semi-automatically.

These tools are produced as standard products or according to customer requirements with consideration of standards including ASME. In addition, a fully automatic controlled dot marking system can be supplied for constantly changing marking of each workpiece with text or a data matrix code.

A control unit carries out the marking of numbers, letters, brand names and 2D code. Marking speeds of up to 16 characters per second and a penetration depth up to 0.8mm can be achieved with these dot matrix marking systems.

The dot matrix marking system is available as a hand held or table marking unit or as an installation system for integration into the manufacturing process. Couth Butzbach also produces special marking units to mark products with temperatures up to 1200°C, particularly used for the steel plant industry.

Couth Butzbach GmbH – Germany
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Ultrasonic full-body inspection system for ERW and seamless tube

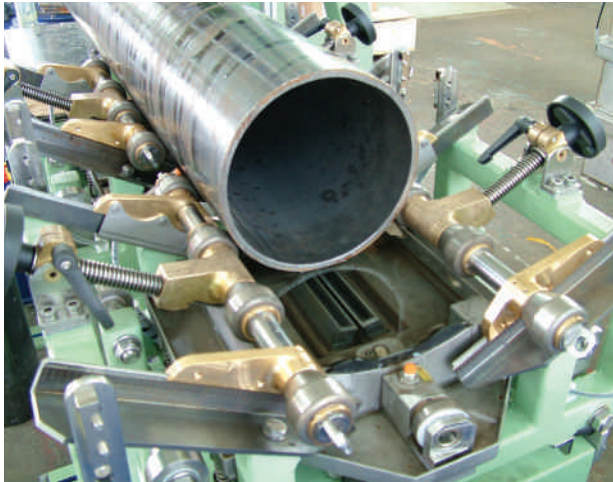
NDT Systems & Services AG, Germany, have designed an inspection system for the fully automated ultrasonic inspection of ERW and seamless tubes with diameters from 140-400mm and wall thicknesses from 3-25mm. For full-body

inspection, the tube is spirally guided through several inspection basins where probes are installed at different angles of incidence.

Coupling is achieved by utilising the partial immersion technique (PIT). In order to obtain a high inspection speed, a total of 60 probes are utilised, covering longitudinal, transverse defects and wall thickness measurement. Inspection is carried out on a helical track width of 150mm.

To ensure 100 per cent inspection coverage, a 10 per cent overlap of the neighbouring scanning tracks has been implemented for the effective tube feed of >135mm/revolution.

Ⓢ Inspection basins for the detection of longitudinal defects



➤ **A total of 60 probes are utilised, covering longitudinal, transverse defects and wall thickness measurement** ◀

Depending on the tube diameter, inspection velocities of a maximum of 0.35m/s are achieved.

Angularly adjustable pairs of the helical rolls driven by motors are used for the helical transport of the tubes. The angle setting depends on the tube diameter and ranges from 7-30°.

The inspection basins, two for each inspection mechanics, are lifted towards the tube and lowered by a sensor-controlled pneumatic system, ensuring that the inspection basins are lifted only when the leading edge of the tube has reached a defined position. The vertical and horizontal transverse movement of the helically transported tube is transmitted to the inspection basins by means of guiding rolls.

Due to the small immersion depth and the helical movement, coupling water is prevented from entering the tube. When the trailing edge has reached the corresponding probe, the ultrasonic electronics are automatically switched off in order to avoid false indications.

The tubes pass the inspection line at a distance of 1.5-2m from each other. True-to-location in axial direction, spraying guns mark the location of detected flaws on the tube.

For each tube, the inspection results are stored in the form of a strip chart recording of the ultrasonic signal (A-scan). In addition, they are provided as a C-scan with coloured marking of the type and location of the detected flaws, together with a summarizing tube protocol.

Depending on the inspection results, the kick-out unit sorts the inspected tubes according to accepted or rejected.

Scanners for wall thickness measurement

Swiss manufacturers of in-line measuring, monitoring and control systems, Zumbach Electronic has launched a new range of ultrasonic wall thickness scanners, branded UMAC® Z50 and Z100.

The transducers of the scanners can be synchronously adjusted to the best possible measuring position within seconds, and can be motorised on request. The scanners cover an outside diameter range from 5mm to 100mm (0.2" to 4") depending on the model, and provide a simple solution for fully non-contact, in-line wall thickness measurement of cable jackets, tube and hose.

The scanners are compact, allowing installation into the cooling trough directly after the extruder. They are manufactured using non-corrosive materials for maintenance-free long-life operation underwater. Available for four and six point measurement, the scanners feature a quickly removable segment to enable easy product change within a few seconds.

In combination with the Wallmaster data acquisition, processing and display system from Zumbach, a full process control can be achieved.

Zumbach Electronic AG – Switzerland
Fax: +41 32 356 0430
Email: sales@zumbach.ch
Website: www.zumbach.com



Ⓢ UMAC Z50 scanner with 6 measuring points

NDT Systems & Services AG – Germany
Email: Alexander.schmid@ndt-ag.de
Fax: +49 7244 7415 97
Website: www.ndt-ag.de

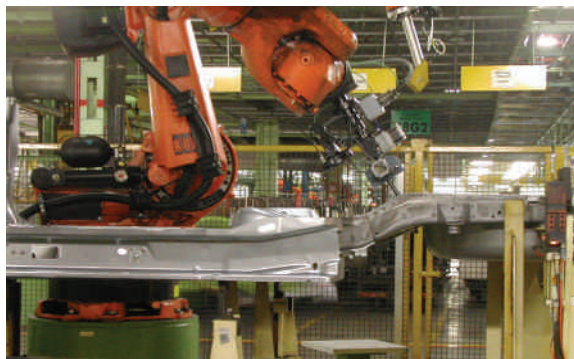


Inline spot weld testing systems

Part of the Sonatest NDE Group, Atlantis NDE is the independent manufacturer of ultrasonic flaw detectors, x-ray equipment, scanning systems, thickness gauges, transducers and NDT accessories.

The company produces the Cyclops automatic inline system for the inspection, evaluation and monitoring of spot welds via ultrasound, using artificial vision for position control. The system is adaptable for any industry where inline spot weld testing is required.

 The Cyclops system for the inspection, evaluation and monitoring of spot welds



Cyclops provides traceability, consistency and repeatability of ultrasonic tests, and a wider scope for quality control due to faster inspection processes which allow a larger number of spot welds to be tested. The typical inspection time of a spot weld, including positioning, varies from 3 to 6 seconds.

Weld process monitoring is another advantage, as it allows real time data output at critical points throughout the line for statistics and control. The system also eliminates the need for offline testing, removing the costs of manual inspection, reducing line stoppages, and cutting down wastage by faster identification of errors.

The Cyclops system features a specialised, high-resolution ultrasonic probe with a dry contact solid interchangeable rubber delay, developed to give the best performance for spot weld inspection. It allows a dry contact test for a



 A Cyclops installation at work in a Ford factory

wider scope of sheet thicknesses and weld diameters than can be inspected using a traditional bubble probe.

The application software automatically evaluates the ultrasonic signal and visual input, then classifies the weld, adds the result to the database and updates the history records and statistics. Single or multichannel boards allow independent operation of up to four units.

Atlantis NDE – Spain
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Website: www.atlantisnde.com

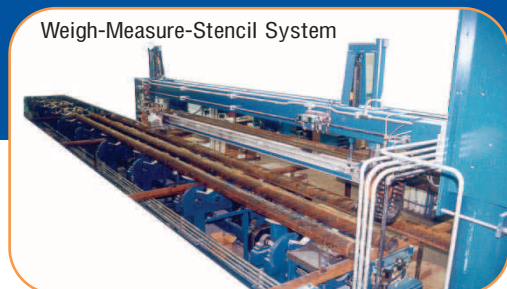
Weigh-Measure-Stencil System (WMS System)

InfoSight WMS systems are usually custom-designed to fit the user's pipe flow geometry and passline height. In-line Systems, Lateral Transfer Systems, and "Hybrid" systems (Hybrids use a combination of both In-Line and Lateral Transfer subsystems), are possible. In-line Systems are designed to fit into an in-line pipe conveyor. Lateral transfer systems include pipe handling and are designed to receive a pipe at a "pickup" station, and then process the pipe laterally through length, weight, colorband, stamp, and stencil operations, and then discharge the pipe to a "drop-off" station.

FEATURES

- Fully integrated weighing, measuring, and marking system
- The WMS System typically performs:
 - Weight Measurement
 - Length Measurement
 - Pipe-by-Pipe Production Report printout, with time, length, weight, and message data record
 - Colorbanding (optional)
 - Stenciling, dot matrix
 - Tally Report printout totalizes length and weight, for both GOOD pipe and REJECT pipe
 - Stamping, dot matrix (optional)


InfoSight Corporation
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Weigh measure stencil (WMS) system from identification specialists

Tube manufacturers need to accurately weigh, measure, record and tally tube weights and lengths for their own records, and to stencil and stamp these tubes with order information. These markings provide identification and traceability. In the past, measuring and marking systems for tubes were typically manual operations, leading to inevitably frequent errors.

The current application of the Weigh Measure Stencil (WMS) system, from Infosight, offers a number of minimum automatic capabilities. These include weight and length measurement, stenciling, and report generation. In addition, optional automatic capabilities are possible and include stamping and colour banding.

The inline version of the WMS system typically makes use of the user's existing tube conveyors to move the tube during length measurement and stenciling. A typical inline plan layout is shown in figure 2. Typically, weighing of a static tube is performed at an upstream weigh scale. The captured weight is then stored in the WMS system memory.

Using the inline WMS system, length measurement is performed as the tube moves through the conveyor. An encoder roller used in combination with a number of sensors measures the tube length on-the-

fly. Length accuracy is typically guaranteed at API (American Petroleum Institute) tolerance of (30mm or 0.1ft). The captured length value is stored in the WMS system memory.

The system performs a tolerance check of weight to length by comparing the actual weight to the actual length and by memorizing the theoretical weight per foot. If the comparison falls outside of allowed tolerances, the tube is automatically marked as a reject. A length range check is also performed, to confirm the tube length falls within a programmable min/max length range.

After a tolerance and length range check, the good or reject message is 'compiled' by combining the weight, length, and stencil data into one message for stenciling onto the tube.

Stenciling is then performed as the tube travels in the V-roll conveyor. The tube approaches the stencil jib and sensors detect the tube's passage. The stencil jib lowers the marking head, and marks the compiled message onto the tube. The marking head rises upon completion of marking.

On the second system version – the cross transfer WMS system – length measurement is performed on the tube in a set of idle rollers. The tube is pushed along by a pusher cylinder and the length is measured by an encoder roller and an array of sensors. Length accuracy is typically guaranteed at a tolerance of 10mm or 0.4". The captured length is stored in the system memory.

Weighing of a static tube is performed on a weighbridge supported on load cells, with the weight stored in system memory. A tolerance

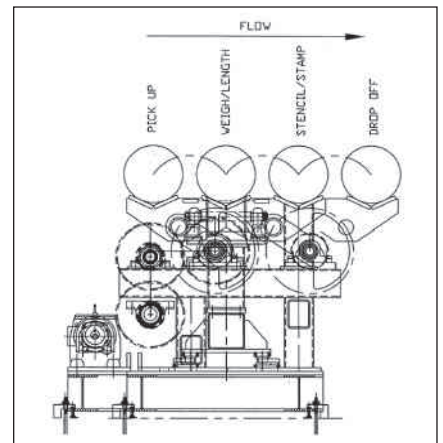


Figure 3 (top) a typical cross section through walking beam WMS system, and (above) highly advanced marking technology for barcoding tube and pipe

check of weight-to-length and length range check are then performed. Following this, the message is 'compiled' by combining the measured weight, the measured length, and either the good or reject stencil data into a message for stenciling on the tube.

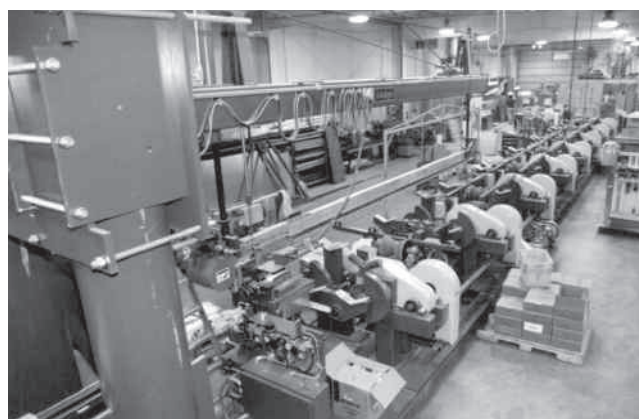
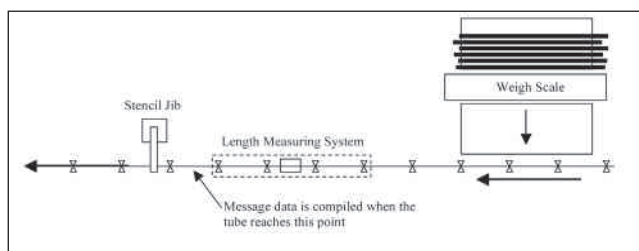
Stenciling is performed by lowering a marking carriage to bear on the top of the tube with a contact roller, with a marking head then traversed longitudinally to mark the stencil message along the tube's axis. Specialised logos such as the API logo can then be marked.

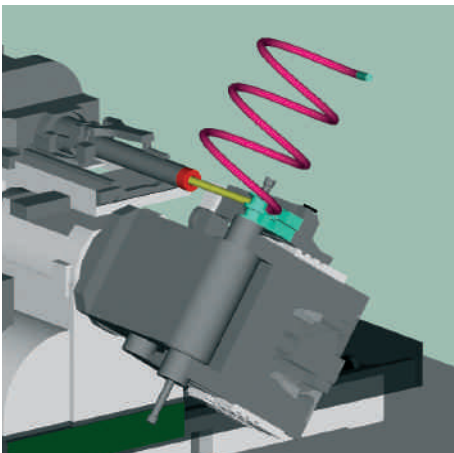
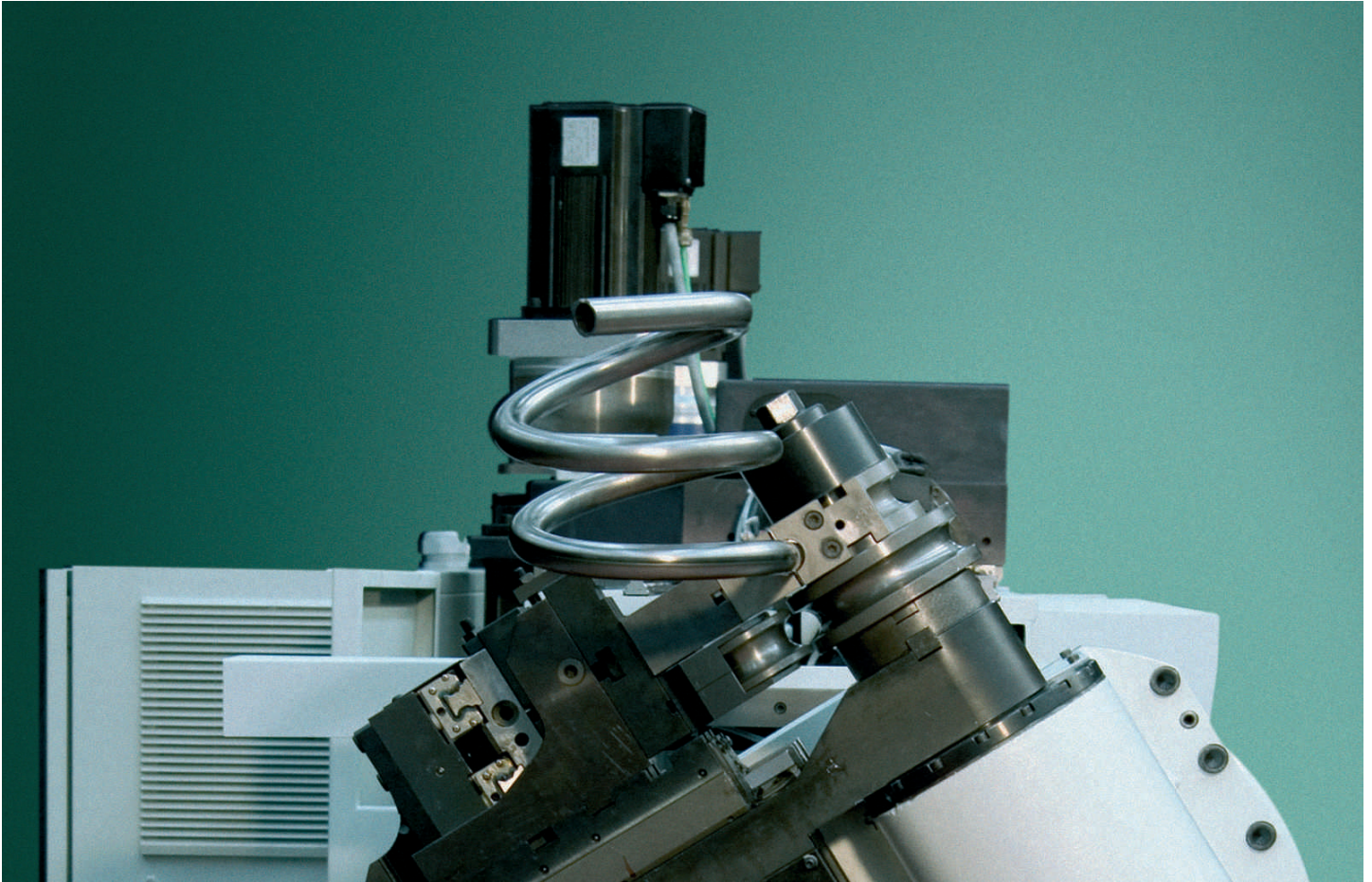
Stamping is performed to mark up to 40 characters, with typical character height ranges from 6mm (0.25") to 10mm (0.4"). Dot matrix character density typically ranges from 5x7 to 7x9 (width x height).

For either geometry, a printed Tally report is generated (showing totalized length and weight by shift, day and order), while a production report is also generated (showing message data printed on each pipe).

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Website: www.infosight.com

Figure 2 (below) a typical in-line WMS plan layout, and figure 1 (bottom) a cross transfer walking beam WMS system





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Further main features include: right and left in-process bending, in-built load and unload, automatic adjustments and a combination of fixed and variable radii.



Advanced eddy current instrument for premium testing

The new Zet@ Premium, an eddy current instrument from CMS, offers an impressive set of technical features for tube and bar testing. Equipped with various probes, the Zet@ Premium detects any type of opening defect located on metallic products.

A small and compact instrument, Zet@ Premium offers a simple and intuitive Windows based interface, available in many different languages such as English, French, Chinese, Russian, Turkish, Portuguese and Italian. It has a wide and bright colour screen and the panel keyboard

 The new Zet@ Premium eddy current instrument



and mouse allows use in demanding environments.

The remote control feature makes Zet@ Premium particularly easy to interface with the factory supervision system and provides user support directly from CMS technical engineers. The accuracy of its electronics used with relevant probes, chosen from the wide range available from CMS, make virtually all testing tasks possible.

Applications that have experienced successful testing include fine wire testing (with detection of 10 microns cracks), and hot rolling mill production with speeds of up to 110m/s.

These instruments are sold and supported worldwide through a network of qualified CMS partners. The company can offer customised testing systems according to user specifications.

Contrôle Mesure Systemes – France
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Website: www.cmseddyscan.com

Meeting the NDT requirements of Russia's pipe-rolling plants

Improving product quality is currently a major issue for the Russian metallurgical industry, with growing requirements for NDT equipment and services.

Inspector Ltd, Russia, was established in 2003 to meet the obvious demand for professional NDT consulting and engineering services, as well as for complex supplies of a range of NDT equipment.

The company claims to be the first in Russia to provide consulting and engineering services to pipe-rolling and metallurgical plants. Due to cooperation with NDT equipment manufacturers throughout the world and with the largest Russian metallurgical companies, Inspector has gained vast experience in high-quality NDT.

Inspector serve leading Russian plants including Chelyabinsk Tube-Rolling Plant, Volzhsky Pipe Plant, Vyksa Steel Works, Seversk Tube Works, Sinara Pipe Works and Taganrog Steel Works. In 2007, the

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- Sch5S – XXS
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Specifications

- ASME B16.9
- MSS-SP43 SP75
- ASTM A403 304 304L 316 316L
- ASTM A234 WPB WP11 WP91
- ASTM A420 WPL6
- ASTM A815 S32205 S32750
- JIS B2311 2312 2313
- DIN 2605 2615 2616 2617
- EN 10253-1

Inspections

- RT UT MT PT IGC PMI
- Hardness, Tensile
- Bending, Flattening, Flaring
- Impact, Hydrostatic Test
- Spectro-analysis



Zibo Wel-Fit Metal Products Co Ltd

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Inspection, Measuring, Testing & Marking



company is due to complete a number of major projects such as the installation of NDT systems at Chelyabinsk Tube-Rolling Plant and Vyksa Steel Works.

The company also provides personnel training and certification to a number of Russian manufacturers, with UT, MPI, X-ray and eddy-current methods, according to ISO 11484, SNT-TC-1A, EN 10256 and EN 437 (including level III).

Inspector has also helped to organise several technical seminars on automated NDT equipment selection, with international and Russian participation of equipment manufacturers and technical experts.

The company's quality management system, relating to NDT consulting and engineering services for pipe-rolling and metallurgical industries, meets ISO 9001:2000 and GOST R ISO 9001-2001 standards.

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Website: www.inspector.ru

Range of flaw detectors for weld inspection

Sonatest Ltd, UK, has launched its new SITESCAN flaw detector series, which consists of three different models. Typical applications for the SITESCAN are weld inspection, corrosion testing, small castings/forgings and lamination checking.

The SITESCAN 123W is an ideal training school flaw detector and is used by leading training organisations. The interface is designed for ease of use, so that familiarity is achieved in minutes, leaving the user free to focus on theory.

The 150S and 250S models both feature DAC, AVG, AWS and API sizing techniques. The 150S has enhanced software features designed to improve operator efficiency and accuracy, including advanced measurement modes, full

screen waveform display and automated calibration.

Improvements to the keypad and user interface include fast setup, full screen A-scan and improved menu navigation systems. Drop-down menu lists make operation more intuitive and the added 'Help' facility provides further ease-of-use.



The Sonatest SITESCAN 150S

The transfective colour display gives high visibility in direct sunlight and does not suffer the restrictive temperature range of conventional LCD screens, while a robust IP67 case provides toughness and reliability.

Sonatest Ltd – UK
Fax: +44 1908 321 323
Email: marketing@sonatest.com
Website: www.sonatest.com

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www.rsa.de



Next generation of ISO-Automat inline holiday detectors

With the successful completion of an order placed by one of Germany's leading pipe mills, Elmed has developed the next level of the ISO-Automat inline holiday detection system. The unique combination of the high-capacity impulse voltage unit and the sensitive DC module for film and epoxy coatings enlarges the scope for testing of corrosion protective coatings.

Ⓢ A feature of the new generation of ISO-Automat is the new twin line testing electrode (conductive rubber/ brass brush)



The new twin line testing electrode (conductive rubber/brass brush) completes an effective piece of equipment. The company can provide a professional analysis of specific requirements with flexible implementation based on decades of experience in high-voltage testing.

With numerous references, Elmed undertakes continuous development work. This ensures successful construction of complete turnkey systems with the adaptation to international test standards and specific coating processes. These processes include side extrusion and crosshead extrusion and also semi and fully automatic testing.

The network-compatible industrial PC checks and documents the parameters of the modular test system and acts as part of an individual quality assurance system.

Elmed Dr Ing Mense GmbH – Germany
Fax: +49 2056 93 29 33
Email: info@isotest.de
Website: www.isotest.de

Online non-contact wall thickness gauge for hot tubes

Tecnar, a world leader in non-contact thickness gauges, has now made the LUT gauge available in four different configurations. The new configurations offer greater flexibility for installation at several key locations on a tube mill.

With the fixed configuration, the LUT gauge is a low-cost solution for on-line wall thickness measurement, excellent for monitoring the output of a reeler or rotary sizer.

In the dual-fixed configuration, the LUT gauge provides simultaneous wall thickness measurements along critical angles of the processing machine. This enables, for example, real-time feedback of roller positions. With the scanning configuration, the LUT gauge gives cross-sectional information on a tube processing system with only a linear motion, such as a reducing mill.

Finally, the LUT gauge is also supplied with a robotic arm, which is useful when the probe must be removed from the production

中国 山东四方

Shandong Province SiFang Technical Development Co., Ltd.

The Popularization Center of High Chromium Alloy Roll of The Productive Forces Promotion Center of National Metallurgical Industry

High Chromium Alloy Roll is used in cold and hot straightening of steel pipe, H-steel and ordinary shape steel. Through a lot of applications in tens of large-scale metallurgical enterprises at home, as Tianjin Steel Pipe Co., Ltd, Shanghai Bao Steel Group, etc, results have proved that the technical level and service life of the High Chromium Alloy Roll has achieved international advanced level. The technical level and service life of High Chromium Alloy Roll, used in big size welding pipes and cold bending shape steel machines such as 24"ERW straight welded tubings and 500mm rectangular pipes, reaches that of products such as the America's D2, H13, Germany's X155CrVMo121, Japan's SKD11, SKD61 and China's Cr12MoV, 3Cr2W8V.

High Chromium Alloy Roll has high service life and can produce excellent pipe and shape steel.

Max weight of single product is up to 10 tons.

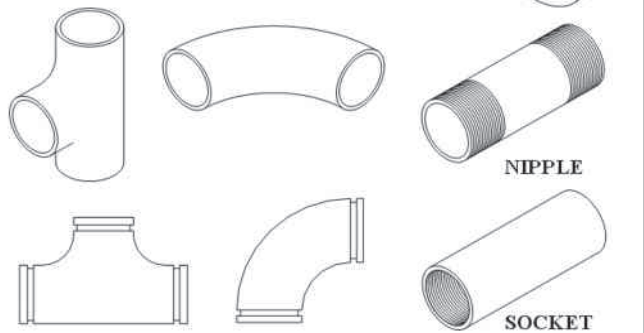


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Our product lines:

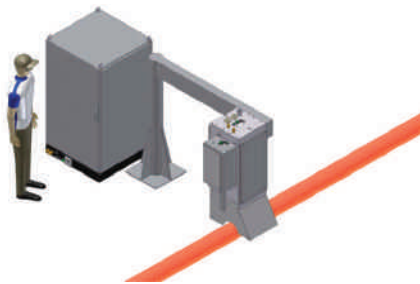
- ⊗ Forming machines of butt-weld pipe fitting.
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Inspection, Measuring, Testing & Marking



① The fixed configuration assembly of the LUT gauge

line as a result of the complex motion of the tube manufacturing process.

The LUT gauge is a non-contact laser-ultrasonic thickness gauge that combines the accuracy of ultrasonic thickness measurement with the flexibility of optical devices. In the LUT gauge, light is used to carry the signals and no contact is needed between the LUT gauge and the tube.

Real-time wall thickness profile, temperature profile and length of tube are obtained for every unit produced. Unlike the radiation method, real wall thickness measurement is obtained at precise locations along the length of the tube. Measurement accuracy

is not affected by bouncing motions of the tube. With the simple graphics display, production problems can be quickly identified and corrected.

Ingenieurbuero Gurski-Schramm & Partner – Germany
Fax: +49 203 3780926
Email: info@gurski.biz
Website: www.gurski.biz

Inspection expertise for coatings and metal detection

Elcometer, a leading manufacturer of inspection equipment, operates specialised divisions dedicated to coatings inspection, concrete inspection and metal detection.

The company provides a range of equipment including fine grind, film application, gloss and abrasion testers for the laboratory. In addition, Elcometer provides dry film coating thickness gauges, adhesion and porosity detectors in the field. This equipment provides accurate measuring and monitoring of the coating process.



① The Elcometer 236 DC holiday detector

Elcometer also offers a range of concrete inspection equipment including covermeters capable of determining corrosion potential of rebars as well as detecting stainless steel reinforcement. The industrial metal detectors complete the range of inspection equipment available from Elcometer.

The company invests significant levels of resources into research, with development of some of the most advanced inspection equipment available.

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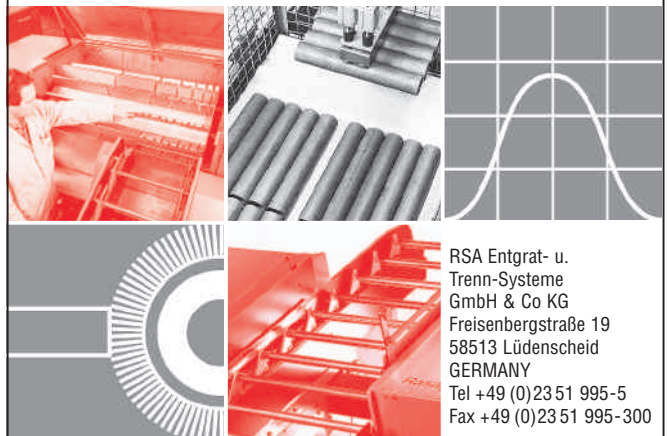
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Increased quality and optimum material consumption

Sikora, Germany, offers a range of precise measuring and testing devices for tube and hose extrusion. For continuous online quality control of tube and hose, the company provides state-of-the-art devices for diameter, wall thickness, eccentricity and ovality measurement, and detection of lumps and neck-downs directly on the extrusion line.

Important for extrusion operations, Sikora technology features outstanding quality and reliability, through the use of advanced X-ray and laser technology with no requirements

Ⓣ The X-Ray 2300 testing device for tube and hose extrusion



for calibration. The use of very fast digital signal processors eliminates the effect of vibration or environmental influences. This ensures unprecedented accuracy and long-term stable measurement data.

The company presents the measurement data through operator friendly display and control interfaces. The display options provide simple to comprehensive statistical analysis, data collection and print capabilities. The proven automatic control of the extruder output or the line speed provides optimum return on investments through material consumption savings.

A highlight of Sikora's future-oriented product development is the innovative X-Ray 2000 series. The success of the X-Ray 2000 derives from Sikora's X-ray experience in online measurements of the wall thickness, diameter, eccentricity and ovality without any time delay during the production process.

Start-up scrap is minimized, material consumption is optimized and line productivity is increased dramatically. The design principle of the X-Ray 2000 is based on the latest X-ray technology working without any moving parts. X-Ray 2000 is available for diameters from 30-270mm.

Sikora AG – Germany
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Website: www.sikora.com

Pneumatically operated marker for roll-marking

OP, Italy, recently expanded the range of its markers with the pneumatically operated HP1PN marker for roll-marking fittings. Suitable for small/medium quantity productions, the marker can be equipped with a 1-line or 2-line character holder, with a character height of 3mm.

The HP1PN can be used with hoses up to a maximum diameter of 2", and is supplied with a double control system, in order to ensure operator safety.

The marker can also be equipped with an optional pneumatic pedal and progressive counter.

OP Srl – Italy
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Email: info@op-srl.it
Website: www.op-srl.it



'World first' handheld metal weight calculator

MetaliCal Inc, Canada, has introduced what is claimed to be the world's first dedicated handheld electronic calculator for calculating the weight of steel and metal profiles including tube and pipe. The company has also introduced MetaliCal Weight & Cost Calculation software for PCs, Palms and Pocket PCs (PDAs).

The MetaliCal MWC (Metal Weight Calculator) calculates the theoretical weight of different profiles of steel, aluminium, copper and brass. By keying in the dimensions of a desired profile, the MWC will provide the accurate weight. It also contains a database of steel profiles with weight/dimensions of long profiles.



Ⓣ The MWC device for weight calculation

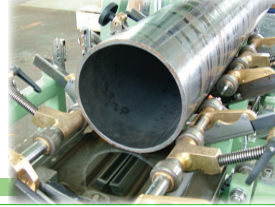
The MWC has revolutionized the methods previously used for weight calculation by replacing sliding cards and reference printouts because of its compact size, wide coverage, accuracy, and convenience.

MetaliCal software – available for PCs, Palms and Pocket PCs – is an innovative solution that enables the user to calculate the weight and cost of 50 different profiles and shapes of 58 different metals. The software covers all known shapes and sizes produced by the industry.

Weight can be established by inputting the dimensions. The dimension units are flexible and can be customized in metric, imperial or a combination of both. The weight unit can also be displayed in kilograms, pounds or metric tons.

The cost function enables the user to calculate cost for stock or requirement in local and foreign currencies.

MetaliCal Inc – Canada
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Email: info@metical.com
Website: www.metalical.com



New range of portable dot markers for permanent marking

UMS Ltd, have introduced a new range of SIC portable dot markers for marking human readable data including serial numbers, date/time codes and logos. Data matrix codes can also be marked allowing significant amounts of information to be encoded in a small area, for reading by portable or integrated optical readers. These systems are ideal for marking large diameter pipes, fittings, flanges and valves.

The new upgraded E8 controller is available in two versions – one with integrated keyboard and display and one without. The latter is ideal for integration applications where data is pre-programmed into the controller or accessed from a PLC or PC type environment. Both of these controllers have an optional Ethernet card allowing greater network connectivity.

The E8 controllers are also fitted with a USB port as standard allowing easier communication with the latest PCs that no longer possess an RS232 connector. Both controllers can be supplied on a purpose

built trolley meaning air supply and external power source is no longer required. The system can be interfaced with a 1d barcode scanner for data entry.

The new P62 and P122 hand-held portable markers can be supplied with a column and base attachment for benchtop marking applications. The P62 offers user-friendly programming with a marking preview and roll-down menus to ensure fast and simple operation. The SIC range also includes a broad range of integrated systems (I series marking heads) for production line marking.

UMS manufactures its own range of Metaetch digital electrochemical marking systems. The Print-on-Demand (POD) system is ideal for thin walled section marking where deformation of the wall is not permissible for applications such as aerospace. The system meets all aerospace standards including UID.

Electrochemical marking gives a permanent, stress free or minimal stress



UMS manufactures a range of SIC portable dot markers for tube and pipe

mark onto the surface of the material either as a black oxide mark or below surface etch mark. Some aerospace applications use a combination of etch followed by oxide for permanent traceability.

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Ultrasonic testing systems for welded tube and pipe mills

Western Instruments, USA, is a specialist in the manufacture of ultrasonic testing systems for welded tube and pipe mills. These tube and pipe UT systems are designed to meet industry specifications such as API, ISO, ASTM, and CSA, for both mill-line and conveyer-line applications.

Systems are offered for both electric resistance welded (ERW), and spiral/

straight seam submerged arc welded (SAW) processes.

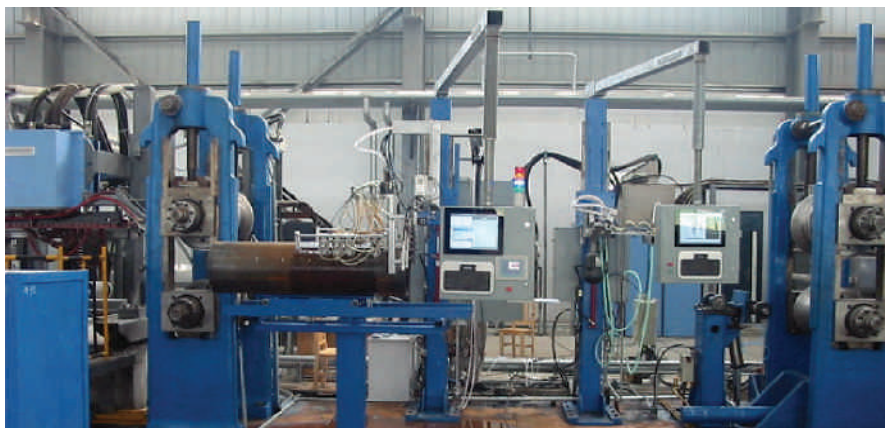
One of Western's highly regarded innovations was the introduction of the Inside Flash Gauge in 1987. The Flash Gauge is installed on the mill-line immediately downstream of the welder and flash cutting tools, and draws a profile of the outside and inside weld geometry. With continuous improvements to this product,

the company has since installed over 60 Flash Gauges around the world.

Like the Flash Gauge, Western's mill-line weld testing systems are renowned for testing the weld area immediately after flash removal. Exclusive pipe mill probes form the basis of these tubular testing systems.

These probes, with their integral transducers, have been developed specifically to follow the surface of welded tube and pipe. Western's multi-channel systems are highly advanced due to their superior mechanical designs.

Ⓣ A 24" mill-line installation (630mm) OD, with a 6 channel weld testing system (left) and a Flash Gauge (right)



Western Instruments has always tailored its ultrasonic instrumentation and controls to the specific application of either mill-line or conveyer-line installations. The company has introduced a number of innovations including high speed gating, multiple gates per channel, multi-channel operator displays, and coupling monitoring.

Western Instruments – USA
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Website: www.westerninstruments.com

Tactic line of ultrasonic inspection systems

TAC Technical Instrument Corp, USA, manufactures the Tactic™ line of ultrasonic inspection systems for bars, billets and tubes for the production of precision parts for critical applications.

This equipment is used for testing material of round, rectangular and hexagonal cross sections. System configurations are designed for high-volume, semi-automatic production tests or for lower quantity manual operation. The company also provides instrument calibration services, reference block certifications and transducer profiling. Typical ASTM standards accommodated include A 450A 450M, E 127, E 213, E 273, E 314, E 317, E 1001, E 1065, E 2375 and others.

The company's systems provide material handling and transducer positioning apparatus and can utilise a range of flaw detection instruments. These are connected to TAC's specialised instruments for automatic stopping, marking, or sorting of defect indications.

TAC Technical Instrument Corp – USA
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Website: www.tactictest.com

Advanced ultrasonic flaw detection system

Olympus NDT, USA, has launched the OmniScan iX advanced ultrasonic data acquisition system for tubular flaw detection, designed for high-speed immersion or non-immersion testing of critical components.

The system can be configured for 2, 4, or 8 conventional ultrasound channels, and features a high-resolution VGA display, strip chart, 16 logical alarms, 16 analogue outputs, and helicoidal scan mode.

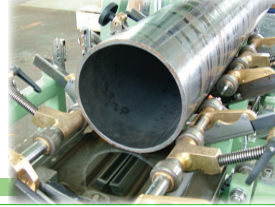
The compact OmniScan iX is housed in a rugged bench-top casing, and is also available in a rack-mount version for integration into inline production testing systems.



Ⓣ Olympus NDT's OmniScan iX

Tubular flaw detection can be configured using multiple channels to achieve 100 per cent inspection of critical defects. Inspections often require the ability to interrogate for ID and OD notches and internal flaws or delaminations. Five pulse-echo channels are often required: two transducers diametrically opposed for axial-flaw detection, two transducers diametrically opposed for transverse flaw detection, and one 0° probe for thickness- or laminar-flaw indications. Additional channels can be used for oblique angles.

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Effective ultrasonic phased array testing with Phasor XS

The new ultrasonic flaw detector from GE Inspection Technologies, branded the Phasor XS, provides phased array flaw-imaging capability and easy-to-use, portable inspection. Designed to reduce inspection times and improve detection probability, the Phasor XS is suited to applications including aerospace, oil and gas, and automotive.

When used in phased array mode, the instrument offers up to 64 individual channels. This means the operator can electronically multiplex a multi-element probe for precise control over the angle of inspection, the amplitude and the depth of focus of each individual ultrasonic beam.



 The Phasor XS ultrasonic flaw detector

The inspection image is presented as a full colour, sector B-scan on the unit's high resolution TFT screen, providing comprehensive data in real time. All A-scans can be selected for separate display or for simultaneous display with the sector image to allow instant and reliable sizing. Sector images and A-scans can be stored on a removable SD card for off-line data analysis and management.

Suitable detector probes include dialog probes, containing probe identification data to be transmitted back to the instrument. This increases inspection reliability, minimises set-up errors and assists in probe operation calculations. In conventional mode, the Phasor XS can use standard ultrasonic probes to carry out conventional inspection, including corrosion and thickness measurement.

GE Inspection Technologies – UK
Fax: +44 1727 795400
Email:
geinspectiontechnologies@ae.ge.com
Website:
www.geinspectiontechnologies.com

Fully automated 3D measuring system


TubeInspect, from Accurex, is a fully automated 3D measuring system that can measure a bent tube in a few seconds without any fixtures or tools. The tube is placed in a large light box where sixteen permanently mounted high resolution cameras accurately measure the tube's geometry.

Tubes with diameters ranging from 4-200mm with bends between 1° and 180° can be measured. Tube measurements are compared to CAD data or to a master tube. TubeInspect has the capability of measuring tubes with connected bends even when they are not separated by a straight section.

Optional software modules allow the measurement of flexible parts including soft hoses, molded hoses and hoses with fixtures or mounting attachments.

TubeInspect provides online corrections for bending machines. When adjustments to the process need to be undertaken, corrections are directly transmitted to the bending machine.

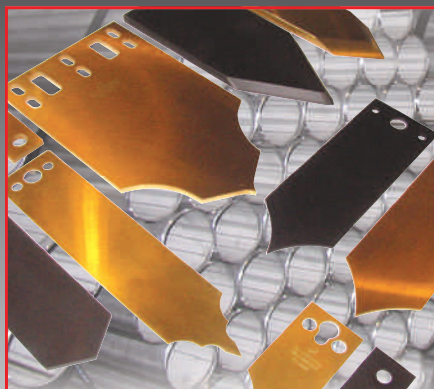


 TubeInspect uses sixteen high resolution cameras for 3D measuring

TubeInspect is suitable for all types of industrial tube manufacturing from highly flexible thin brake lines and aerospace tubing, to large exhaust pipes for heavy trucks as well as tubes designed to carry hydraulic and cooling liquids or fuel.

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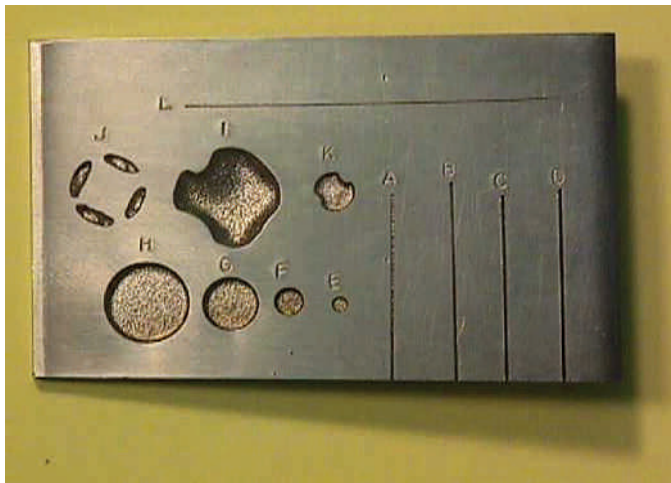


Calibration specimens vital to all inspection processes

Now, more than ever, the inspection process is being included as a part of production rather than an added service. The end result is that mills provide pipe inspected to API (American Petroleum Institute) or ISO (International Standards Organization) published standards before shipping.

These pipe producers are investing millions of dollars in a variety of inspection techniques such as UT (ultrasonic testing), EMI (electromagnetic inspection), and EC (eddy current). Speed and accuracy are the important qualifications for the test equipment.

⬇ A calibration specimen is used in all three main inspection techniques



The common element in the three methods is the need to calibrate the inspection equipment. A requirement in the calibration process is nearly always the use of a calibration specimen. Also referred to as test blocks, cal blocks, coupons, and cal standards, the specimen is a sample of the same (or near same) metal as that being inspected.

The specimen has one or more artificial flaws introduced into it. These flaws are as simple as a hole or can be an intricate series of notches on both the inside diameter and outside diameter of the pipe. The specimen can be as small as a few inches of pipe cut from the production run to a full length pipe.

The process that meets the requirements to make the artificial flaws is known as EDM (electric discharge machining), while the process is also referred to as metal erosion.

Scan Systems Corporation (USA) has been making calibration standards for over 20 years. The company creates the standards at its Houston, Texas facility with EDM or conventional machining, and ships material worldwide.

In addition, the company manufactures and market the EDM Notch Master used in pipe mills, the same unit used at its own facility.

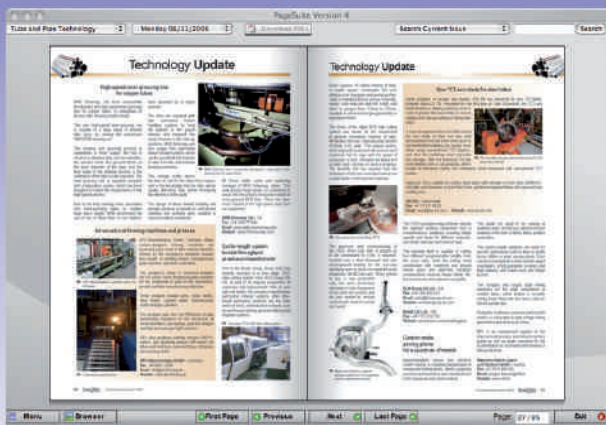
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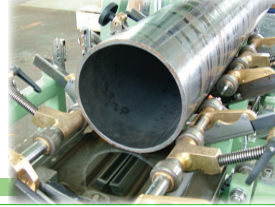
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TUBE & PIPE TECHNOLOGY



Sound way to find the source of the problem

Phoenix Inspection Systems Ltd, UK, is a specialist in the design and manufacture of non-destructive testing (NDT) equipment. The company has developed a unique device that can detect defects and blockages in pipework and tubing.

The AR 5000 emits a soundwave that travels inside the pipe, following it around

Ⓣ The Acoustic Ranger 5000 can detect defects and blockages in pipework and tubing



bends and even complex spirals to monitor its condition. It is suitable for use on everything from large-scale heat exchangers to general pipework, small-bore circuits and fibre optic conduits.

The AR 5000 is a more powerful, long-range version of Phoenix's Acoustic Ranger that has proved popular with petrochemical and process plant operators around the world.

This latest version was developed for German-based Linde Engineering for use on its LNG plants, which liquify natural gas for easy transportation by tanker.

The plants contain spiral-wound heat exchangers consisting of a complex system of tubes. The AR 5000 is being used to maintain and improve product

quality and will help during possible maintenance campaigns on site.

Phoenix managing director Mr Karl Quirk says: "The original Acoustic Ranger has also proved popular with the energy and petrochemical sectors for checking pressure relief and vent lines and with food, drink and process industries for detecting holes and blockages in the line. Operators often tell us it has saved them many thousands of pounds and is a vital tool for achieving compliance with pressure systems regulations."

"The AR 5000 has up to four times the range of the original and also better resolution and sensitivity. Apart from heat exchangers, it is ideal for use on a wide range of systems providing a rapid inspection of pipework. For hole and blockage detection in tube and pipe from 1/4" to 20" and over lengths of up to 600m, the AR 5000 is the instrument of choice."

Phoenix Inspection Systems – UK
Fax: +44 1925 838 788
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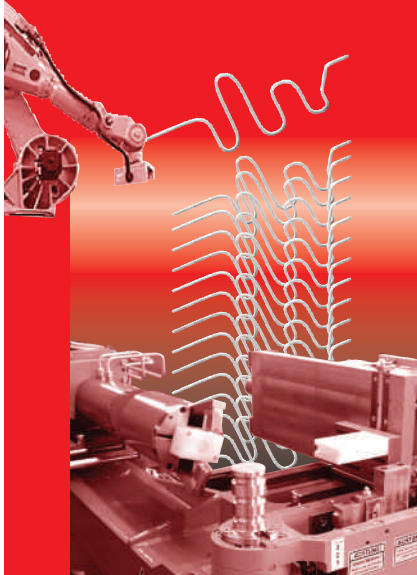
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Hydrostatic testing units for oilfield and pipeyard applications

Gardner Denver Water Jetting Systems, USA, manufactures continuous duty hydrostatic testing units, specifically for oilfield and pipeyard pipe testing at pressures up to 20,000psi.

The company produces both diesel and electric units, which are designed for portability, and may be trailer or skid mounted. The units feature an exclusive 'Pressure-Trol' system, which allows the operator to regulate testing pressure and bleed-down with two centrally mounted levers, without having to 'clutch' the engine or shutdown the electric motor.

All engine gauges and start/stop controls are located on centralised control consoles. Only one operator is necessary to conduct a complete hydrostatic evaluation, to test the strength and integrity of drill, production, and casing pipe.

The electric and diesel units both use the Partek Triplex Pump, which consists of components fabricated from precipitation hardened stainless steel to maximise

(Below) an electric HT-120ES-001 electric hydrostatic tester; and (bottom) a skid-mounted HT-610ES electric hydrostatic testing unit featuring V-belt drive, Pressure-Trol, control panel, and charge pump. The compact design of this unit makes it practical and popular in pipeyards



A close-up of the patented 'Pressure-Trol' valve, which eliminates the need to stop and restart the unit for each test, which minimises productivity

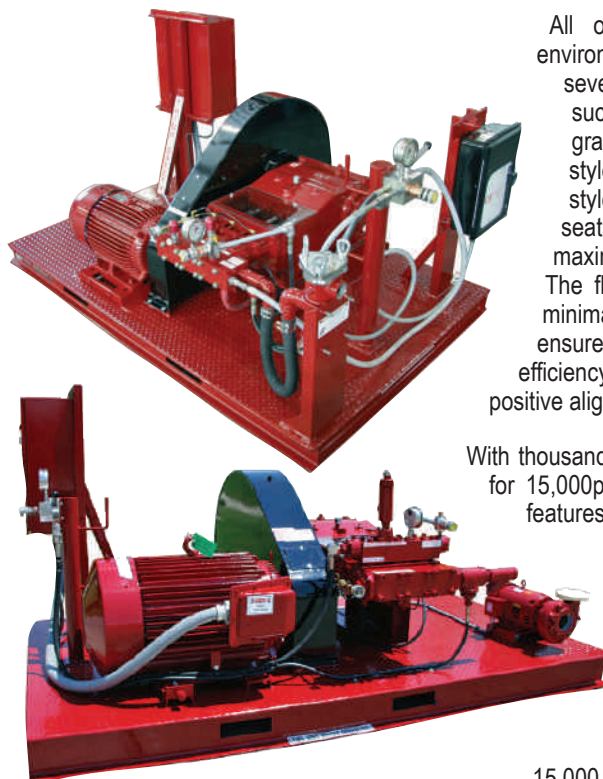
corrosion resistance. Pump valve and valve seats are field replaceable in 30 minutes, using ordinary hand tools. Advantages include high testing rates, continuous duty, elimination of motor and pump interruption, and 20,000psi working pressure.

Every component of Gardner Denver hydrostatic testing units is designed with a specific benefit in mind. The 100 HP T-300 pump includes a power end that transmits power from the pump driver (either diesel or electric) to the fluid end. Two standard fluid ends are offered – the standard 'L' for pressures from 8,000 to 15,000psi, and the inline (T-300H) for pressures from 15,000 to 20,000psi.

All of Partek's fluid ends are environmentally safe and share several features including suction manifolds (from aircraft grade aluminium), standard 'L' style fluid cylinders, and inline style stuffing boxes and valve seats (autofrettagged to provide maximum strength and reliability). The fluid end is characterized by minimal internal clearances to ensure highest possible volumetric efficiency. Plungers are collet style for positive alignment and rapid removal.

With thousands in service, the 'L' fluid end for 15,000psi has a simple design that features easy removal of valves, plungers and packing. Plungers are colmony coated stainless steel, a material that is unaffected by thermal shock.

With inline operation from 15,000 to 22,000psi, the Partek



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inline fluid end contains horizontal, inline suction and discharge valves and seats that eliminate intersecting bores. These bores can lead to premature fluid end failures at pressures above 15,000psi.

The power end includes an extra-heavy steel crankshaft, tapered roller bearings and large cylindrical crossheads. A high-capacity, gravity splash oil system provides thorough lubrication. Double-lip baffle seals and splash deflectors avert power end oil contamination. It is equipped with sight gauge and safety system to shutdown the unit if power end oil undergoes excessive fluctuations.


Options include oil drip plunger lube systems, 15' and 25' suction and discharge 'C' pump hoses with foot valve. This in addition to high-pressure pump discharge hoses, tool boxes, pressure recorders, water filter assemblies, centrifugal fill pumps, offshore unit packages, and caged units.

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Fast and accurate coating thickness gauges

Sonatest Ltd, UK, has launched Sonacoat, a coating thickness gauge providing fast and accurate measurements in an easy to use format. The Sonacoat range consists of two different models, Sonacoat Easy and Sonacoat II, each with an F (ferrous) and FN (ferrous and non-ferrous) version.

The Sonacoat Easy is used for quick and easy testing, and is suitable for checking the thickness of varnish, paint and chrome on all metals. Its integrated transducer has

 The Sonacoat Easy coating thickness gauge



a measuring range of 3,500µm, with an accuracy of ±3µm.

The Sonacoat II measures coatings on steel and non-ferrous metals with automatic substrate recognition, activating the appropriate measuring mode. The easy to operate menu structure includes a scan mode for fast measurement response when checking a large area.

The separate probe improves access to parts and can measure accurately on small diameter parts. Coating statistics and measurements can be transferred via an infrared interface to a PC. The measuring range is 0-1500m/60 mils.

Sonacoat products can be used for many applications where the thickness of the coating is important, either for visual or mechanical purposes, including paint shops and electroplaters, automotive and shipbuilding industries, and aerospace.

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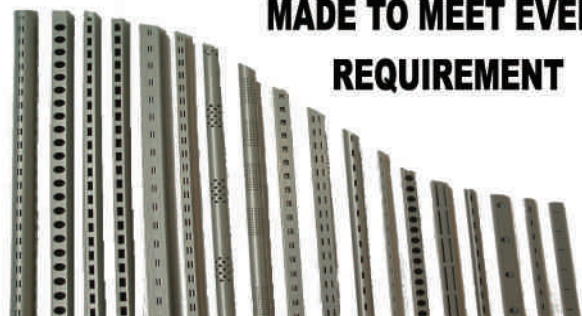
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Furnace surveying system meets new AMS 2750D spec

To ensure compliance with the new requirements of the AMS 2750 specification, Datapaq has carried out a comprehensive review of their thermocouples, data loggers and analysis software.

The company's thermocouples and loggers already exceed the accuracy requirements, but changes to the calibration were necessary and all equipment is now supplied with a certificate that satisfies AMS 2750D requirements.

Datapaq has updated its Furnace Insight Survey analysis software to comply with the new revision, with inclusion of extra features for ease-of-use. These features include user alert supervision of the Temperature Uniformity Survey (TUS), and data inclusion and calculation of all thermocouple and logger correction factors. The TUS report can be automatically configured to include all the requirements of AMS 2750D.

Additional software features include automatic calculation of furnace class from raw survey data, instant thermocouple

mapping of the hottest and coldest spots, and fast input of correction factors using the TUS Wizard.

Many heat treatment plants, large and small, are already using Datapaq systems to monitor surveys from within the furnace saving unnecessary downtime and reducing costs.

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Pipe mill inspection equipment in significant demand

Pipe inspection equipment of all technology and sources is in great demand as the international markets continue to push pipe mills to their manufacturing capacity. Scan Systems, USA, manufactures a wide range of inspection equipment, spares, and supplies, with a number of operational divisions.

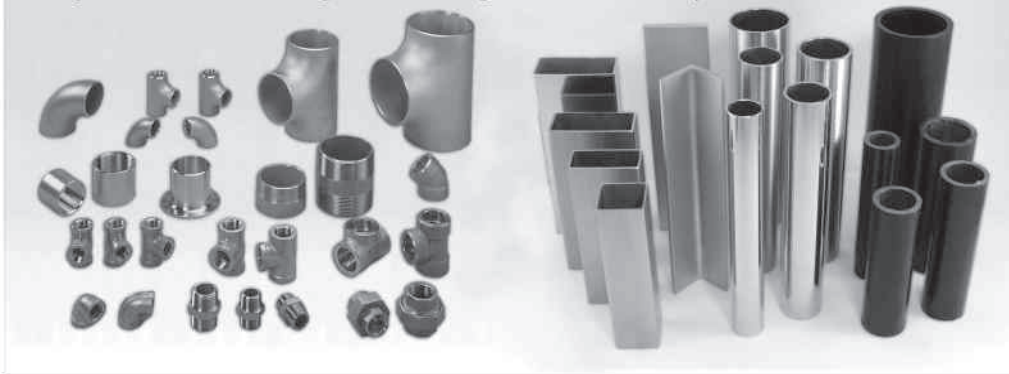
Scan's Pipe Inspection Technologies (PITCO) Division manufactures inspection equipment for plant operations as well as mobile units for field inspections. PITCO also re-manufactures, repairs and supplies spares and operation of NDT inspection equipment.

PITCO's speciality is digital electromagnet inspection (EMI) equipment designed to operate at high speeds for mill production runs. From its Houston, Texas facility PITCO sells new and used equipment and components. The company also has the ability to work with ultrasonic inspection (UT) manufacturers to help customers design their complete inspection requirements.

The company's proprietary inspection equipment is highly advanced. During the inspection process, the signal created by magnetic flux leakage is digitized at the source of contact with the sensor.

This response is quickly processed and analyzed for potential flaws by PITCO's Digi-Tech software and presented in user-friendly computer screen format and reports.

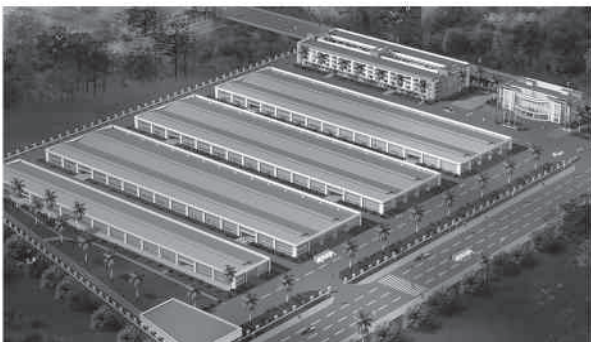
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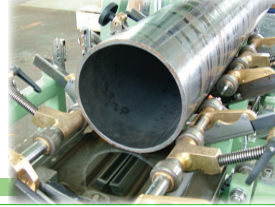
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Versatile Everest XLG3 VideoProbe boosts inspection capabilities

The new Everest XLG3™ VideoProbe, from GE Inspection Technologies, offers the versatility for fast and reliable internal visual inspection to boost productivity. It can be used for applications as wide ranging as on-wing turbine engine inspection in the aerospace sector, turn-around inspections on process plant components, boiler outage inspections in the electric power industry and cylinder-head checking in automotive manufacture.

With a host of advanced features such as QuickChange™ probes that quickly



The new Everest XLG3™ VideoProbe

reconfigure probe length and diameter, the new RVI system dramatically reduces inspection and post-inspection times. Using an on-board DVD/CD drive, the XLG3 VideoProbe allows inspection information to be stored in real-time, for transfer using flash drives or the internet.

A high-resolution display, intuitive software control buttons and drop-down menus guide

operators effortlessly through the control functions and give step-by-step instruction for each component until the inspection is complete. Images can be tagged for future identification and to incorporate inspection comments. The instrument's software allows text and arrow overlays and custom logos.

Portability is a major feature of the new system, which is built for durability to withstand the rigours of field inspection.

Mr Ed Hubben, product manager for GE Inspection Technologies, comments, *"Digital imagery and live video are critical in all industrial and process sectors. With the Everest XLG3 you can now capture very high quality digital data and transmit this in real time direct from the point of inspection to remote quality control and maintenance teams to deliver fast and reliable diagnosis, allowing accurate, critical decision making."*

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Advanced technologies for copper tube production

By Dr G Voswinckel, Otto Junker GmbH, Germany

1. Introduction

Innovative equipment developments are required to address the ever-increasing demands for high quality copper tubes. The main requirements for the production process of these tubes are tighter manufacturing tolerances and better process safety, together with the reduction of energy and personnel costs. For the tube production, alternative technologies have been developed for different copper tube applications, eg for installation of tubing or tubes for air conditioners and refrigeration (ACR).

Solid billets can be made by continuous casting, and then extruded into tubes and brought up to their final dimensions by cold-rolling or drawing. Alternatively, hollow bar can be instantly achieved through continuous casting and rolled and drawn to the requisite tube dimensions. Figure 1 shows an overview of these different technologies.

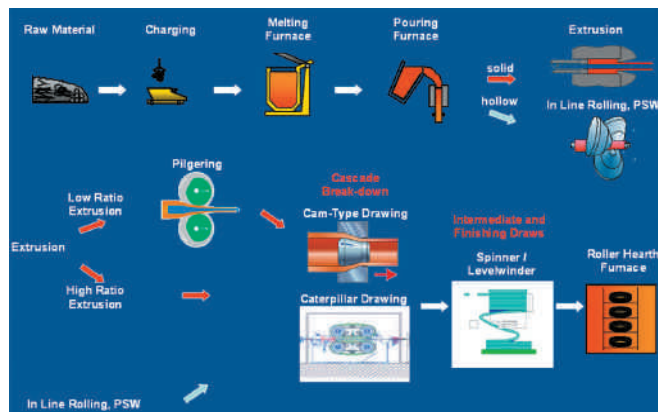


Figure 1: Process technologies

Regardless of which technology is adopted for the production of seamless copper tube, there are always thermal processes at the start and end of the process chain. Copper melting and pouring marks the start of the cycle, which is completed by heat treatment of the net-shape tubes.

The melting and pouring steps at the start of the manufacturing process irreversibly determine the material quality with regard to analysis accuracy and purity, while recrystallization annealing firmly sets the mechanical properties of the tube. This shows the importance of the thermal processes.

The following text describes the advanced equipment solutions used for these process steps today, ie for inductive melting and pouring of the metal and the heat treatment of copper tubes in roller-hearth furnaces.

2. Induction melting and pouring

The technical and economical advantages offered by induction melting and pouring furnaces have made them more in demand.

Induction heating allows for an accurate temperature regime and process control, low firing losses and precisely controllable bath movement. In the past couple of decades induction furnaces have become increasingly popular. As compared to fuel-fired furnaces, their main advantages are:

- The direct heating of the load (no overheating)
- The exact temperature regime
- The precisely controllable bath movement resulting in low fire losses
- Being friendly to the environment and working conditions regarding heat, dust and noise

Last but not least, the induction furnace stands out because of its extremely neutral metallurgical behaviour. Induction heating enables an efficient and high-quality melting control and process automation. These advantages have been extended further with the transition from the traditional mains-frequency technology to the digitally controlled medium-frequency technology.

The diverse technologies and design options for induction melting, in conjunction with the basic process advantages of induction furnace systems, ensure the availability of optimum solutions for various process technology requirements.

2.1 Melting: coreless or channel-type furnace?

The two basic principles of induction furnace technology, ie melting by a coreless or channel-type furnace, both constitute viable alternatives in copper melting. Nevertheless, depending on the technological requirements and process objective, one or the other furnace type is preferable. In a channel-type unit, the inductor(s) can be fitted to the bottom and/or to the sides of the furnace. This gives virtually unlimited options in furnace vessel design, in addition to outstanding compatibility with siphon solutions.

In particular, the significant energy savings achieved by channel-type furnaces in copper melting environments (almost 100kWh/t compared to a coreless furnace), have made them an important competitor in this field.

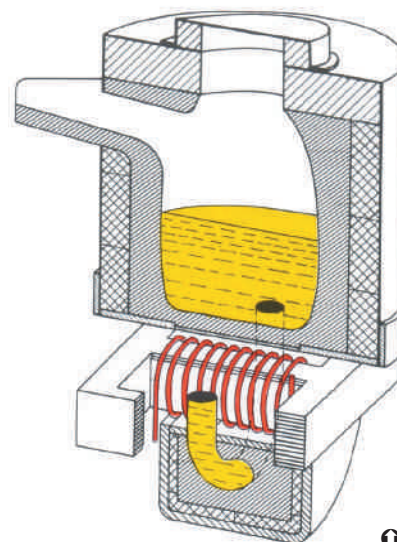


Figure 2: Channel-type furnace

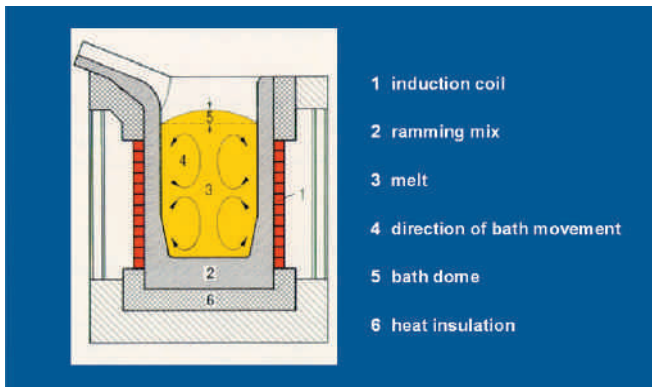


Figure 3: Coreless furnace

The comparison of the two furnace types can be summarized as follows:

Channel-type induction furnaces (see figure 2) are used in processes involving –

- Low power densities
- Large furnace capacity
- Bulky charge materials (cathodes etc)
- High pouring weights
- Continuous operating regimes

Coreless furnaces (see figure 3) offer significant benefits in applications characterized by –

- High specific melting rate
- High power density
- Small-sized charge materials
- Frequent alloy changes
- Likelihood of segregation
- Long breaks or interruptions in operation

Due to the intensive bath movement, the coreless furnace is undoubtedly the ideal melting tool for small-size material and swarf.

2.2 Holding and pouring

The channel-type induction furnace, offering the following benefits, is undisputedly the preferred pouring system.

- Geometrical design versatility
- Simple siphon and forehearth integration
- Provision of separate chambers
- Pressure-tight design options

The type and design of a holding and pouring furnace is determined primarily by the pouring technology in place. The melt feeding situation is a key consideration here.

If the molten metal is supplied via launder or tundish, a practical solution can be found in the gravity-flow pouring from the spout of the coreless or channel-type furnace vessel where the alloy composition permits the associated gas pick-up. Otherwise, the molten metal must be poured via a siphon on a channel-type furnace. With a coreless furnace this can only be obtained by pouring the metal through the furnace pivot bearing.

For direct pouring into a mould or die via a stopper/nozzle system, a channel-type furnace with forehearth may be the solution of choice, as it prevents melt exposure to the atmosphere and thus ensures a high degree of metal purity. With this furnace configuration, however, heating can also be effected by a coreless inductor.

In horizontal continuous casting, the ingot mould defining the strand geometry is built into the wall of the pouring furnace. As a result, channel-type induction furnaces are usually selected for this application.

The use of a standalone pouring and holding furnace of the coreless type is reserved for exceptional cases; in some instances, such furnaces are designed as short-coil units. Short-coil coreless furnaces have a slightly lower electrical efficiency than channel-type furnaces. As the heat losses are low, however, their holding power consumption exceeds that of a channel-type only by narrow margin. Moreover, a short-coil furnace can be operated with full power input even at low heel levels, and it provides superior conditions for alloying when compared to a channel-type furnace system.

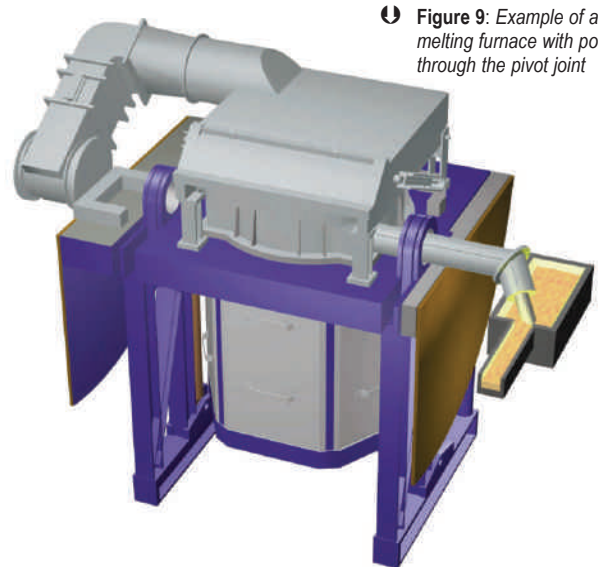


Figure 9: Example of a melting furnace with pouring through the pivot joint

2.3 Rated power and power density

The potential power density of a channel furnace is limited by the maximum power per inductor and, of course, by the number of inductors. Currently, the maximum inductor rating for the melting of copper is approximately 2,500kW. For design reasons, no more than two high-power inductors per furnace vessel should be used.

The power density of the coreless furnace is limited by the flux level or bath movement which in turn rises with increasing power and lowers with increasing frequency. The upper limit for mains-frequency plants is 200-250kWh/t, but with 250Hz medium-frequency plants, power densities of 500kWh/t are fairly common without the risk of metal throw-outs.

The higher power density delivered by medium-frequency melting furnaces is associated with an increased efficiency and hence, reduced melting power needs. While a coreless-type mains frequency furnace with a capacity of 10t and a 1,200kW power rating

consumes about 400kWh/t, a unit of identical size but powered via a medium-frequency converter system with a nominal rating of 4,000kW at 120Hz will require only 350kWh/tonne (see figure 4).

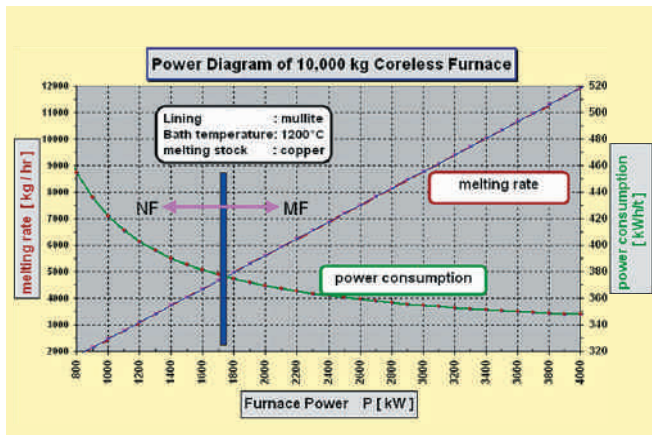


Figure 4: Power consumption of a 10,000kg coreless furnace

2.4 Innovations

Converter technology

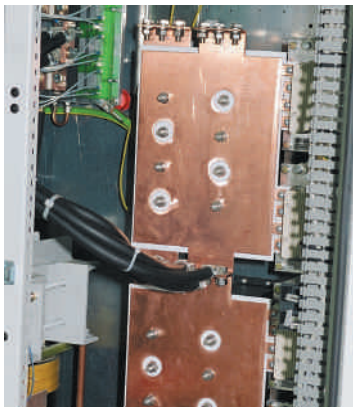
Apart from the proven thyristor-based converter technology, the successful development of special IGBT (Insulated Gate Bipolar Transistor) converters for use in electro-thermal applications has gained increasing significance. Numerous successful IGBT converter systems testify the performance, reliability and flexibility of this technology.

The Otto Junker IGBT converters are noted for their standardised, modular design. The inverters and dc link circuit capacitors form one integral unit. This unit can be used in a variety of circuit configurations. Typical examples are:

- Independent inverters for several furnaces
- Several inverters for induction billet heater coil sections
- Parallel connection for power increase
- Series connection for voltage increase

High-power converters for induction melting and heating applications are normally cooled by water. As the IGBTs are mounted on electrically isolated water-cooled heat sinks there is no need for cooling water treatment as in the case of thyristor-based converters.

Figure 5: IGBT basic unit



This significantly reduces the demands made on the water recoler as well as its maintenance requirements.

The converter system is based on one and the same fundamental unit, irrespective of its application. This basic unit is shown in figure 5. The output range of the Otto Junker IGBT converter systems reaches up to several MW and the operating frequency covers the full range of applications.

These advanced IGBT converters are characterised in particular by:

- Extremely high inherent protection against load peaks
- Consistently high power factor (cosinus phi) of nearly 1.0
- Electrically isolated cooling
- Simple and easy maintenance

In addition to the successful use in power supply to coreless medium-frequency furnaces, IGBT converter systems are used for channel-type induction furnaces. Figure 6 shows an IGBT converter system for a medium-frequency furnace.



Their use for induction billet heater plants is described in a different paper (by Willi Johnen).

Figure 6: IGBT converter for a medium-frequency furnace

Safety and reliability

Dependable protection of the induction coil against overheating and, more importantly, against contact with molten metal is vital for ensuring safe and reliable furnace operation. Addressing this requirement, various technical solutions were proposed and implemented in the past but an optimum solution has not yet been found.

Otto Junker's Optical Coil Protection System (OCP) sets a new standard in coil monitoring.

OCP is a latest-generation temperature measuring and monitoring system using fibre-optical sensors that are particularly suitable for interference-free monitoring in induction melting furnace applications. They provide direct and independent temperature field data. The system includes the sensor cable as well as an evaluator and display for visualisation of the measured temperature fields. Figure 7 shows the arrangement of the OCP sensor cable in a coreless induction furnace.



Figure 7: OCP sensor cable

The advantages of this system are outlined below:

- Very high local resolution and temperature measurement with an absolute accuracy of +5°C
- Recording and visualisation of temperature profile over the entire crucible
- Direct optical temperature measurement not based on electrical circuitry
- Early warning of impending critical temperature conditions.

Normal lining wear and local erosion/cracks are reliably detected and localised as shown in figure 8 (typical example of crack formation in the crucible).

The system has conclusively demonstrated its reliability, accuracy and economic efficiency and, needless to say, it is likewise suitable for temperature monitoring in channel-type induction furnaces, eg in monitoring the inductors.

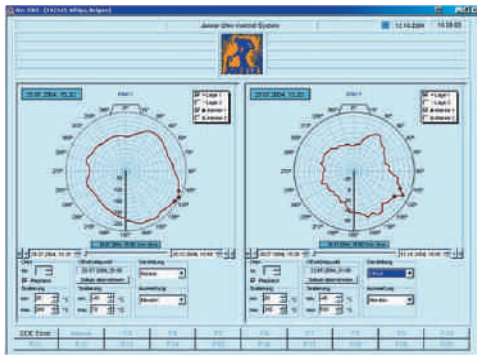


Figure 8: Visualisation of temperature profile

3. Final annealing

Finished pancakes and level-wound coils are normally delivered in soft state, which is why they must undergo an annealing process. Copper tube annealing has in recent years been carried out almost exclusively in roller hearth furnaces that are in continuous furnace lines.

Over the last couple of decades, Otto Junker has supplied a large number of high-convection roller hearth furnaces for the bright annealing of copper tubes with throughput capacities ranging from 1.5 to 7.2t/h.

The main advantages over batch furnaces (chamber and bell type) are:

- Reduced heating energy consumption as the furnace is maintained at a constant temperature. The continuously operating roller hearth furnace dispenses with the need for cyclical heating and cooling of the inner bell and furnace base and the repeated heat-up of the furnace bell to setpoint temperature.
- Significantly reduced process cycle times by elimination of heating and cooling of the furnace inner bell and base station. This leads to a handling time otherwise required for positioning of heating and cooling bells.
- Reduced capital cost for throughput capacities in excess of about 1t/h
- Reduced floor space requirements

Figure 10 shows a furnace installation for the bright annealing of 5 t/h of copper tubes. It was installed at one of the largest copper tube producers in China. The equipment is controlled by two operators. It is arranged on a floor area of 60 m x 12 m and has a total energy consumption of approx. 220 kWh/t.



Figure 10: 5t/h stacker type furnace for the annealing of level wound copper tube coils

3.1 The Otto Junker high-convection heating and cooling system

Product arrangement is similar to that in a bell furnace, which has multi-tier stacks. This applies primarily to layer-wound coils but the same principle can also be used for pancakes and straight tubes.

Heat transfer is almost exclusively by convection. For this purpose the furnace has powerful circulating fans. Atmosphere flow through the load is from bottom to top. This offers the following benefits:

- Due to the high air velocity a high temperature head is not needed to reach full throughput (5 Kelvin above product temperature is normally sufficient)
- Temperature distribution in the furnace is extremely uniform due to the short air flow circuit. This provides uniform heating of the product
- No overheating of the product
- Short overall furnace length
- The high-convection system takes the heat from the electric or gas-fired radiant tubes uniformly and thus keeps their outside temperature low. This adds to the long radiant tube lifetime

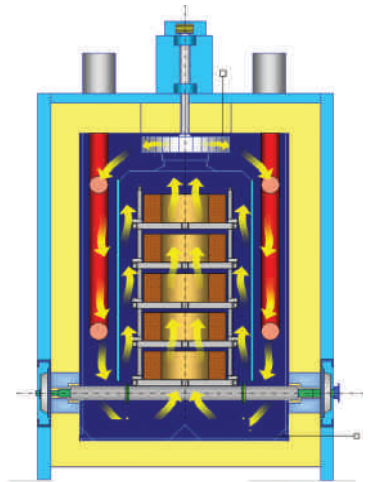


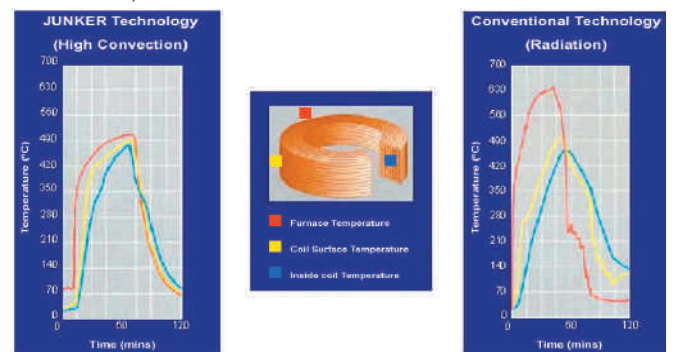
Figure 11: Cross sectional view of the furnace

The cooling zone is of same design as the hot zone of the furnace line. The radiant tubes are replaced by water-carrying cooler banks.

Comparison of heat transfer by radiation versus high convection

Many conventional roller hearth furnaces for copper tube annealing transfer the heat in the hot zone by radiation. However, for heat transfer by radiation it is necessary to have a furnace temperature well above the product temperature in order to reach a reasonable throughput rate. This system works to some extent with straight tubes and single-layer pancake loads.

Figure 12: Conventional technology (radiation) + Junker technology (high convection)



With level-wound coils, however, the set temperature cannot be attained inside the coil, as is apparent in the charts. This results in grain size and hardness variations. With the Otto Junker high-convection technology the temperature of the furnace chamber at the end of the annealing cycle is almost identical with the outside and inside coil temperature. This means extremely uniform annealing quality.

3.2 Equipment options

Following are three typical designs presented from the multitude of roller hearth system configurations.

A high-convection multi-tier roller hearth furnace is used for bright annealing of level wound coils (LWC and pancakes), with a vacuum lock chamber.

The equipment is made up of the following units:

- Loading table
- Entry vacuum lock chamber
- Entry vestibule
- High-convection furnace – indirectly gas-fired or indirectly electrically heated
- High-convection cooling zone
- Exit vacuum lock chamber
- Unloading table
- Tray return track with cross conveyor, stacker and destacker
- Electrical equipment control and temperature control by PLC
- Visualisation and data logging by PC

A multi-purpose single-tier high-convection roller hearth furnace is used for the bright annealing of level-wound coils, pancakes and straight copper tubes up to 2.5m long. It has vacuum lock chambers and is up to 6m long in continuous operation.

Figure 14 shows a multi-purpose high-convection roller hearth furnace for the bright annealing of level-wound coils, pancakes and straight copper tubes with a throughput capacity of about 2t/h.

Design is similar to the furnace just described, with vacuum chamber, furnace and cooling zone and indexing conveyor system. A special feature of this furnace, in addition to the vacuum chamber, is entry and exit lock chambers with curtains for sealing the furnace ends. The curtains are used for annealing of straight tubes exceeding the length of the vacuum chamber. In this mode



Figure 14: Multi-purpose high-convection roller hearth furnace

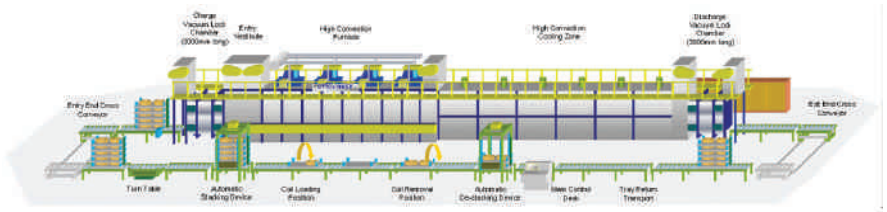


Figure 13: Longitudinal view of the furnace

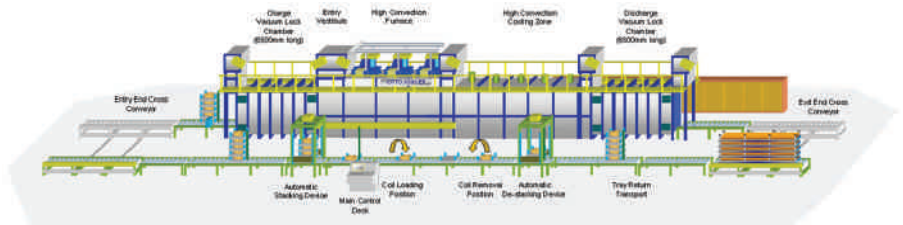


Figure 15: High convection roller hearth furnace

of operation the vacuum chamber is not in use. The furnace is then sealed only by the curtains that are lowered in position in the entry and exit lock chambers when this mode of operation is used. For continuous operation of the line all drive sets, in this case thirteen, are equipped with servo motors enabling them to be run together at a slow speed.

A high-convection roller hearth furnace is used for bright annealing of level-wound coils, pancakes and straight copper tubes up to 6m long. As you will see from figure 15 this furnace is similar to that of the first example. However, this furnace line has entry and exit vacuum chambers about 6m long. This line can anneal up to 5t/h of copper tube, either straight, pancakes or level-wound coils, with vacuum lock chambers.

3.3 Innovations

The Otto Junker Copper Tube Purging (CTP) system with connection to one end of the tube coils

This system produces clean, high-quality copper tubes by expelling the lubricant vapours from the tube bore as they form during heat-up in the furnace. This reduces the carbon and lubricant deposits on the inside surface of the heat-treated tube.

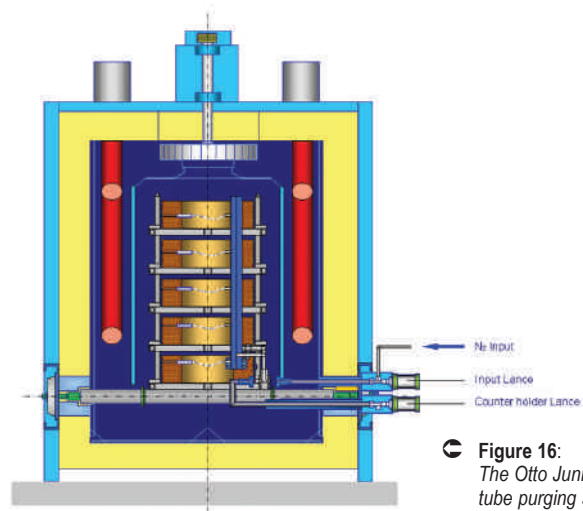


Figure 16: The Otto Junker copper tube purging system

The principle of a copper tube purging system is shown in figure 16. The purging station comprises of an atmosphere supply lance and a clamping lance. The purging system is connected to one side of the coils, which means that the oil-laden purge gas is blown out of the coils and into the furnace chamber. The inert gas passes through a lance to a manifold pipe at the tray and then into the tube coil.

This inert gas tube purging system is available for all the above-mentioned furnace types. The only condition is indexing product conveyance through the furnace.

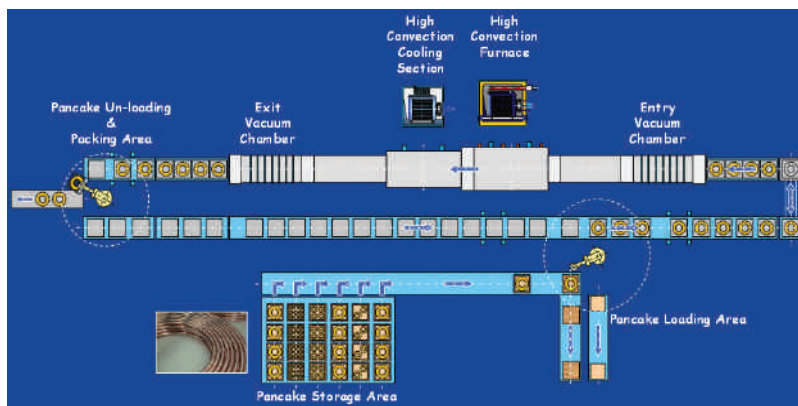


Figure 17: Example of an annealing and packing facility

Results

Otto Junker have equipped many roller hearth furnace lines with this copper tube purging system. Examinations have shown that this reduces the carbon deposits or residual oil inside the copper tube by up to 90 per cent as compared to furnaces without this purging system. This satisfies the exacting demands made on copper tubes for air conditioners.

Inert gas tube purging system with connection to both coil ends

In this case the inert gas blown through the coils is discharged from coils and led out of the furnace. The advantage of this system is data logging of the purging operation is possible. Instruments are connected to measure flow and pressure of the purging gas flow to guarantee and record that each coil has been purged with the required amount of inert gas.

This system requires some special skills of the operators because the inside of the coil is especially difficult to connect. To date, in Europe this system has not normally been required.

Oil trap

Evaporation of the drawing oil from the inside and outside tube surfaces increases the oil concentration of the recirculating inert gas atmosphere. This oil condenses in lower temperature regions of the furnace or local to the entry vestibule and cooling zone where oil drops may form. These drops in turn may reach the product causing unwanted marks. Hence it is necessary to clean the furnace atmosphere.

One possibility would be a permanent exchange of inert gas by permanent input and discharge of a certain inert gas flowrate but this is of course very costly. Certainly a better solution is the installation of a filtering system. Otto Junker have designed and improved such a filtering system in recent years.

The Otto Junker concept for automatic handling of pancakes

The workflows involved in the heat-treatment of copper tube pancakes are traditionally labour intensive, requiring multiple loading and unloading steps.

- Loading into baskets at the coilers
- Loading onto the furnace line
- Removal from furnace line
- Handling in the packing area

These repeated handling operations also increase the risk of damaging the coils – particularly when thin-walled tubes are concerned.

With the new concept, only a single loading and unloading operation takes place between the coilers and despatch. This is achieved through the use of recirculating coil supports (trays). Moreover, these steps are robotized, ie all coil handling by human operators is eliminated.

The return of empty coil trays from the packing line to the coiler is achieved via a forklift truck or roller conveyors.

A schematic view of this system is given in figure 17.

The benefits of this materials handling concept include the following:

- Fewer handling operations, meaning a reduced risk of damaging coils
- Full integration into existing plant configurations is possible
- Capability for full integration of the Otto Junker furnace
- Automation can be introduced in several stages
- Payback period of about 2 years for each loading/unloading station

4. Conclusion

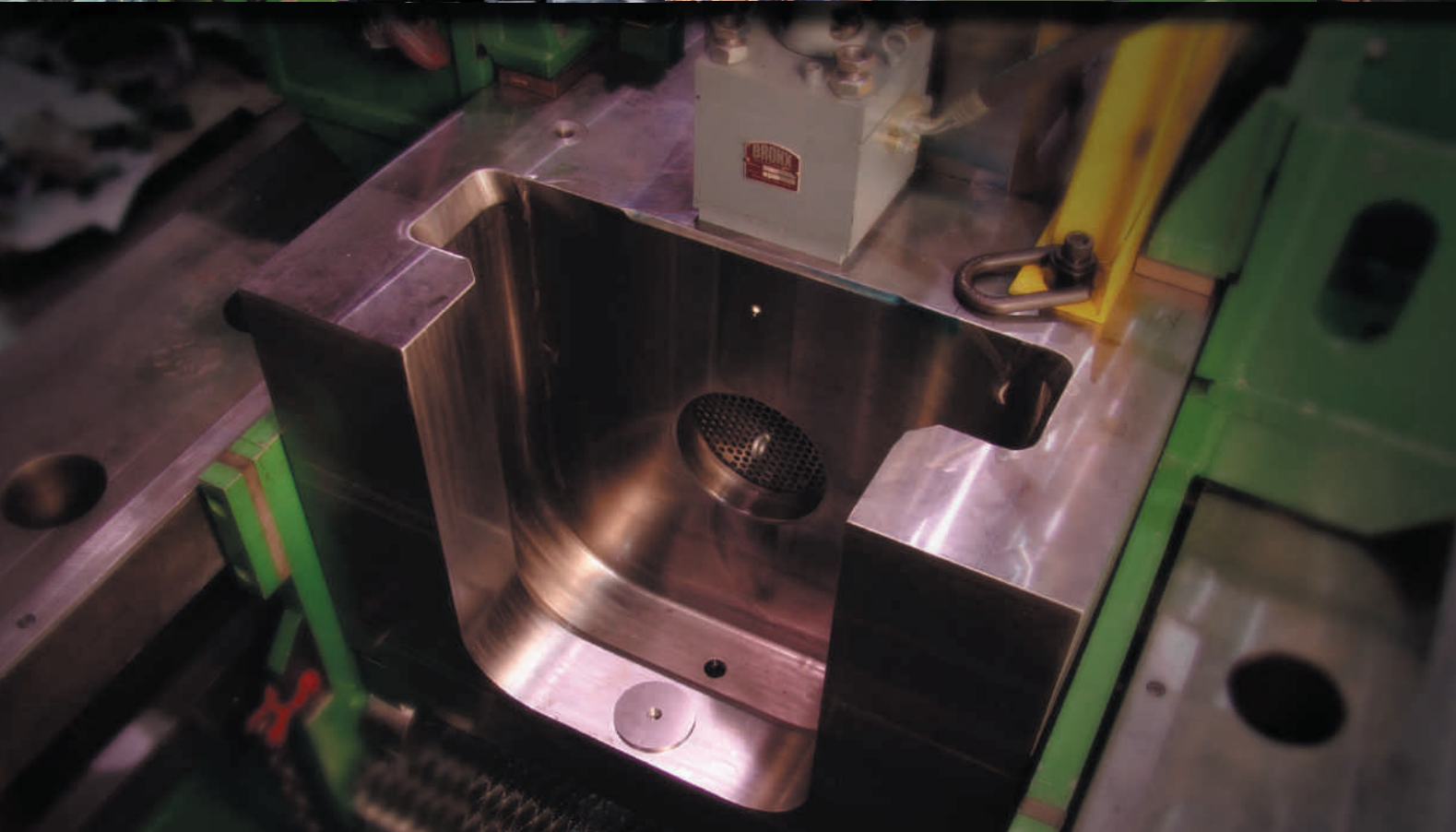
Based on the complete process route beginning from the metal melting to the final annealing of the high quality copper tube, some very innovative technologies for the thermal processes are available.

Despite the fact that the overview could not touch all areas in detail, it should inspire technological discussion among the specialists.

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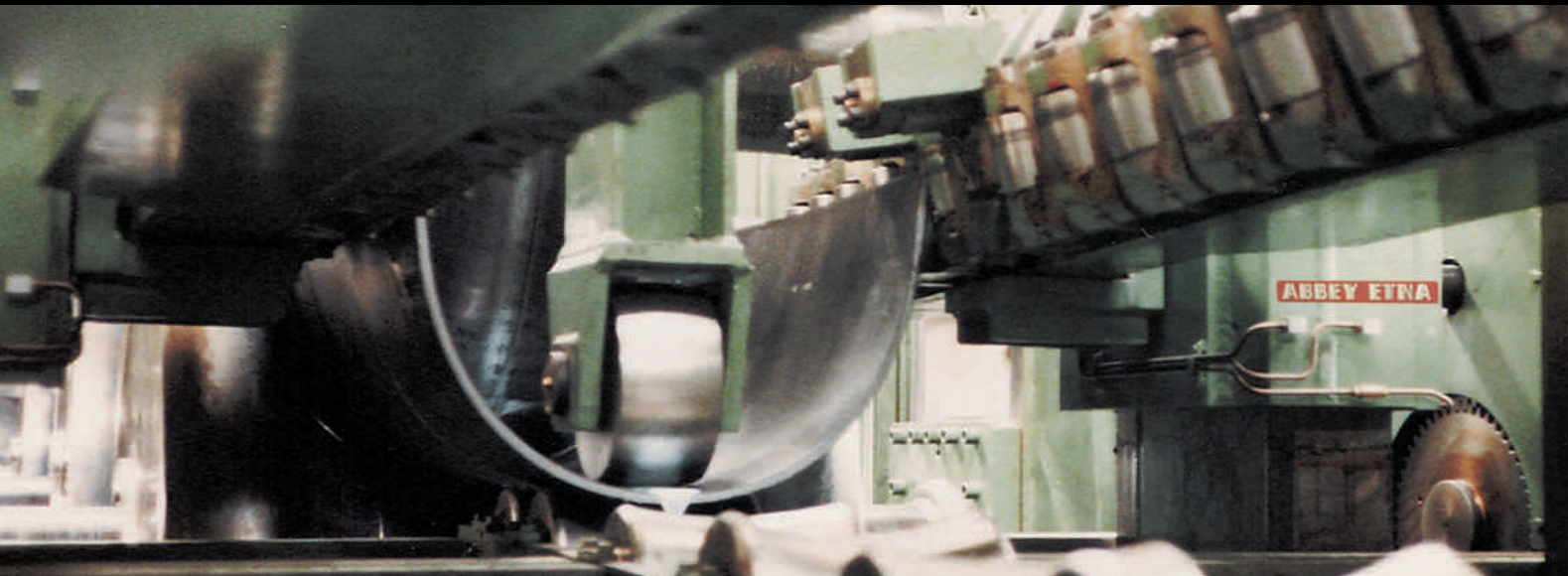
Abbey International.....	Inside Back Cover	Orbimatic GmbH.....	36
Alcobex Metal India Ltd	70	Ozimeks Ltd.....	53, 83
Alfinox SpA.....	14	Pedrazzoli SpA.....	41
Apollo Srl.....	103	PITCO – A Division of Scan Systems Corporation	25
Atis GmbH	42	PMC Colinet Inc.....	21
Ava-Matic (UK) Ltd	77	Randolph Tool Co Inc	103
Axxair S A.....	33	Richardson Electronics Ltd.....	76
BLM Group	91	RSA Entgrat & Trennsysteme GmbH & Co KG	93, 95
E. Braude (London) Ltd	58	Scan Systems Corporation.....	15
Bronx/Taylor-Wilson Ltd.....	Inside Back Cover	sema Systemtechnik Sewing GmbH & Co KG	66
Combilift Ltd.....	59	Sen Fung Rollform Machinery Corporation	32
CON.T.R.A.S.T di Carlo Icardi	56	Shandong Province SiFang Technical Development Co Ltd.....	94
Contrôle Mesure Systèmes	77	Shanghai Want Industry Co Ltd.....	74
CSM SpA.....	22	Shuz Tung Machinery Industrial Co Ltd.....	12
data M Software + Engineering GmbH.....	93	Sikora AG	9
Decostyle Technics Pvt Ltd.....	26	Sinico SpA.....	3
Dee Tee Industries Limited	78	SIT SpA	85
Elmaksan.....	55	Sofratec	20
Emmedi SpA.....	1	SST Forming Roll Inc	17
Entech Engineering Co Ltd.....	45	Stappert Spezial-Stahl Handel GmbH	60
Erne Fittings GmbH.....	18	Steelcraft Tool Company	19
Eurolls Group.....	61	Suraj Stainless Ltd.....	45
Gallium Industries Ltd.....	27	Tanitec Corporation	59
Gardner Denver Water Jetting Systems Inc	32	T-Drill Oy.....	75
Gin Lien Hsin Machinery Co Ltd.....	73	Technic & Research Precision Co	101
Haitima Corporation.....	104	Thermatool Corporation.....	Back Cover
Han Sum Enterprise Co Ltd.....	94	Thermatool IHWT	Back Cover
Hannover Fairs	23	Tracto-Technik GmbH.....	95
hebö Maschinenfabrik GmbH.....	65	Transfluid Maschinenbau GmbH.....	102
Hilton Metal Forging Ltd	57	tubefirst.com	71
Hisen Enterprises Co Ltd.....	66	TubeTech Corp Ltd.....	8
Huzhou Xinyaohua Stainless Steel Pipes & Tubes Co Ltd.....	Front Cover	Tuboscope Vetco International	35
Ihlas Fairs Inc	13	Tuf-Lok International.....	84
InfoSight Corporation.....	89	USM Mazzucchelli Srl.....	43
ITL Industries (P) Ltd	39	Vaishali Metals Pvt Ltd	16
Fr. Jacob Söhne GmbH & Co	64	Vega Engineering & Trading Co Ltd	44
Jang Wuel Steel Machinery Co Ltd	2	Wenzhou Bizba Tube Mfg Co Ltd.....	56
Julius Maschinenbau GmbH.....	74	Winner Stainless Steel Tube Co Ltd.....	38
Kusakabe Electric & Machinery Co Ltd	31	Wonjin Industrial Co Ltd	24
Loeser GmbH	105	Th. Wortelboer BV	71
Officine di Lombardore SpA.....	67	YXRAY GmbH	97
Magnetic Analysis Corporation.....	37	Zhejiang Jingning Jiejing Steel Tube Co Ltd	24
Milltech Co Ltd.....	11	Zhejiang Nanbo Steel Ind Co	84
New Form Tools Ltd.....	99	Zhejiang Yuanan Liquid Equip Co Ltd	38
Novero SpA.....	68	ZIBO Wei-Fit Metal Products Co Ltd	92
Olimpia 80 Srl.....	69	Zumbach Electronic AG.....	Inside Front Cover



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