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Greetings from Dr. Gunther Voswinckel President International Tube Association

Dear Members, dear Readers,

A warm welcome to this year's first edition of our Journal, an edition which also happens to be a Tube 2018 Special.

Steel prices and production trends tend to be seen as a barometer of global economic activity, since steel is used in so many sectors; car making, construction and manufacturing are all significant steel markets.

"Without being aware of it", says worldsteel, "society now depends on steel. Humankind's future success in meeting challenges such as climate change, poverty, population growth, water distribution and energy limited by a lower carbon world depends on applications of steel."

So it stands to reason that the steel economy not only reflects the health of global economies, but also impacts the wider economy.

China, for example, is a case in point. China's steel production growth is expected to slow considerably in 2018 as state-mandated factory closures and increased efforts to protect the environment begin to take effect.

And for steelmakers and related industries, this could be a good thing: The Chinese slowdown may well restore balance to a global market that was severely damaged two years ago when oversupply caused prices to collapse. Even so, global annual production in 2018 is slated to increase 2.1 per cent, according to an average of the analysts' forecasts.

Research reports also indicate that the outlook for the steel pipe industry has improved slightly since 2016. A major factor here is thought to be the return of investment activities in the energy sector, which the crude oil price collapse in 2015 brought to an almost complete standstill.

Steel continues to be at the centre of innovative processes everywhere, so even as energy production and distribution, construction methods or car making standards progress, new steel – and steel pipe – production methods and new materials are constantly in demand.

The excitement generated by the prospect of growth and innovation within the pipe and tube industry is making itself felt as the next Tube fair draws closer. The Messe Düsseldorf press release tells us that to date, 965 exhibitors from 53 nations have booked over 559,700 square feet (52,000 sqm) of net exhibit space at Tube 2018. This marks the best result ever in the over 30-year history of this industry-leading event.

The range of showcased products will include machinery and equipment for tube production, treatment and processing as well as measuring, control and test equipment. Other segments will cover pipeline and OCTG technology, profiles and machinery, as well as plastic tubes.

Dr. Gunther Voswinckel
President ITA

For more information about this and any other events, do visit us at www.itatube.org. We will continue to bring you news of all the preparations and as always, ensure that our members gain access to every discount and other VIP option we can lay our hands on. We look forward to many great opportunities throughout the rest of the year!

Yours sincerely,

Dr. Gunther Voswinckel

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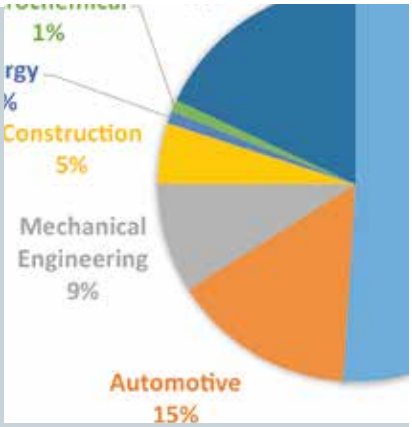

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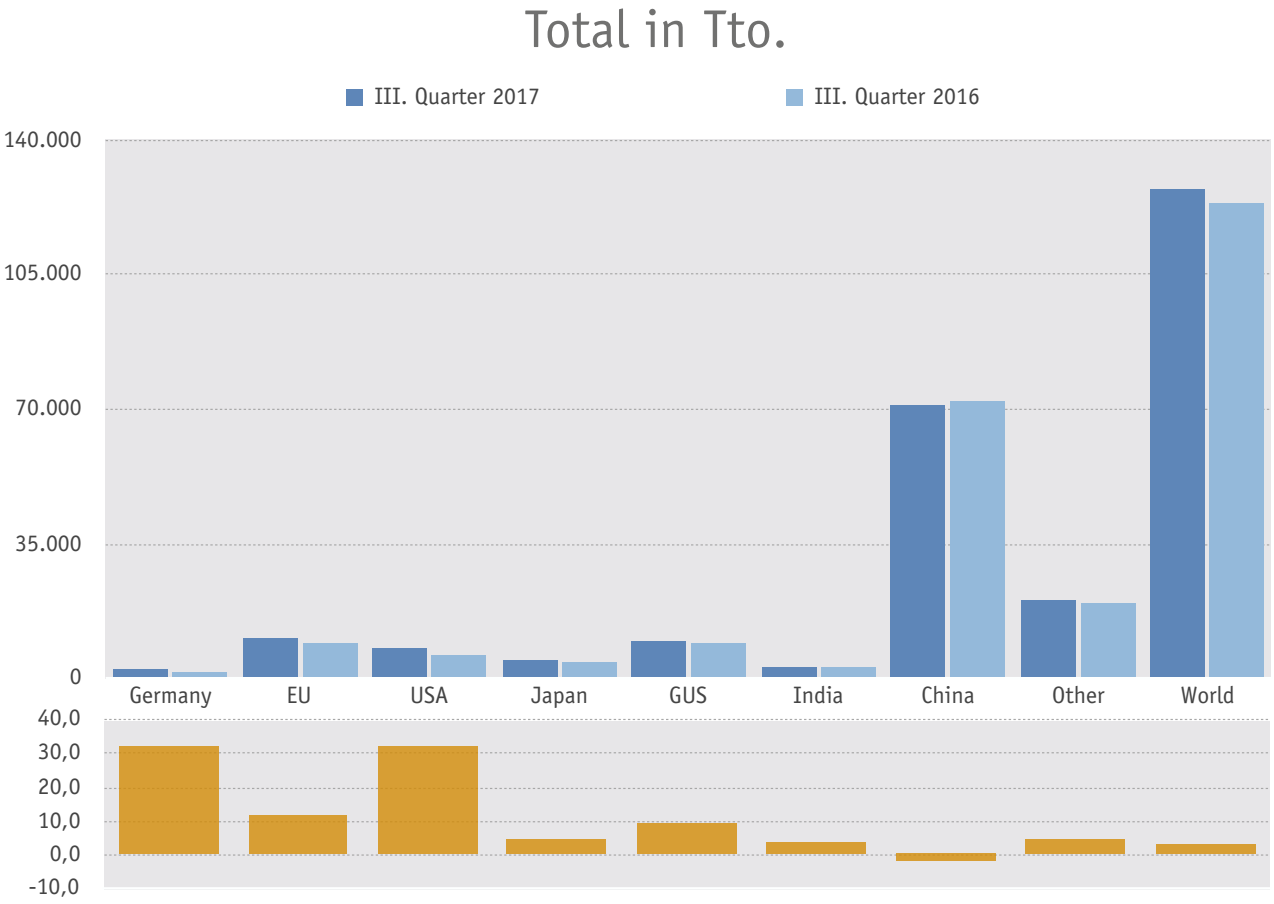
World Steel Tube Production – Forecast

Til the end of September 2017 the World Steel Tube Production reaches 123.9 million tons, an increase of 3.1%. The production of seamless tubes increased 13.5 % to 31.9 % million tons, significant is the increase in the USA with 90.4 %.

Germany reached with an increase of 107.8 % a positive result in the large diameter pipe market.

Chinese steel tube producers achieved a production of 71,0 million metric tons, a minus of 1.7 %

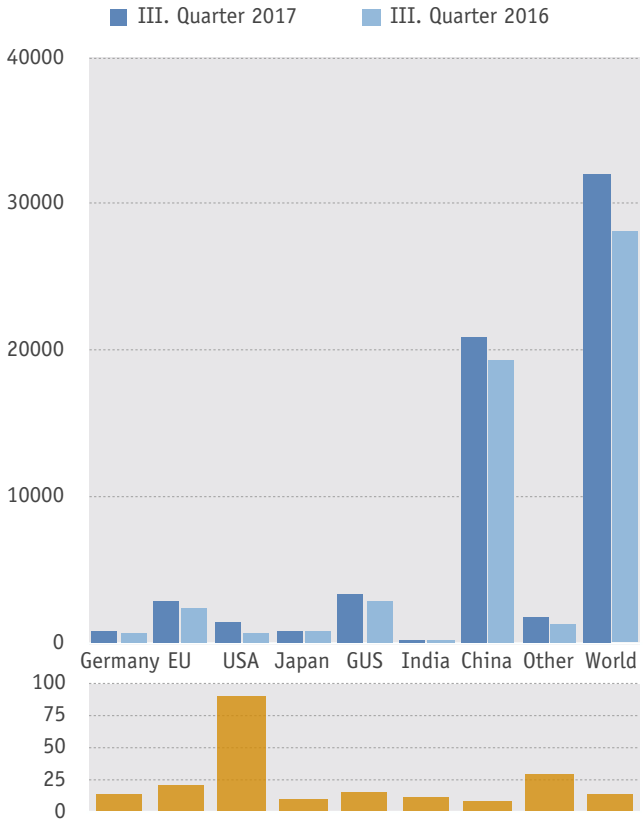


	seamless tubes			welded tubes <406			welded tubes >406			welded tubes			TOTAL		
Region/ country	**1-3.Qtr 2017**	**1-3.Qtr 2016**	**Change in %**	**1-3.Qtr 2017**	**1-3.Qtr 2016**	**Change in %**	**1-3.Qtr 2017**	**1-3.Qtr 2016**	**Change in %**	**1-3.Qtr 2017**	**1-3.Qtr 2016**	**Change in %**	**1-3.Qtr 2017**	**1-3.Qtr 2016**	**Change in %**
Germany	889	788	12.8	698	663	5.3	902	434	107.8	1,600	1,097	45.9	2,489	1,885	32.0
EU(+Germany)	2,920	2,433	20.0	6,267	6,094	2.8	1,229	803	53.1	7,496	6,897	8.7	10,416	9,330	11.6
USA	1,508	792	90.4	5,421	4,068	33.3	717	919	-22.0	6,138	4,987	23.1	7,646	5,779	32.3
Japan	971	889	9.2	2,525	2,402	5.1	1,059	1,056	0.3	3,584	3,458	3.6	4,555	4,347	4.8
CIS	3,424	2,957	15.8	4,647	4,194	10.8	1,848	1,891	-2.3	6,495	6,085	6.7	9,919	9,042	9.7
India	285	255	11.8	1,200	1,125	6.7	1,500	1,500	0.0	2,700	2,625	2.9	2,985	2,880	3.6
China	21,000	19,400	8.2	42,950	45,750	-6.1	7,050	7,050	0.0	50,000	52,800	-5.3	71,000	72,200	-1.7
Other	1,871	1,454	28.7	15,060	14,637	2.9	3,499	3,415	2.5	18,559	18,052	2.8	20.430	19.506	4.7
World	31,979	28,180	13.5	78,070	78,270	-0.3	16,902	16,634	1.6	94,972	94,904	0.1	126,951	123,084	3.1

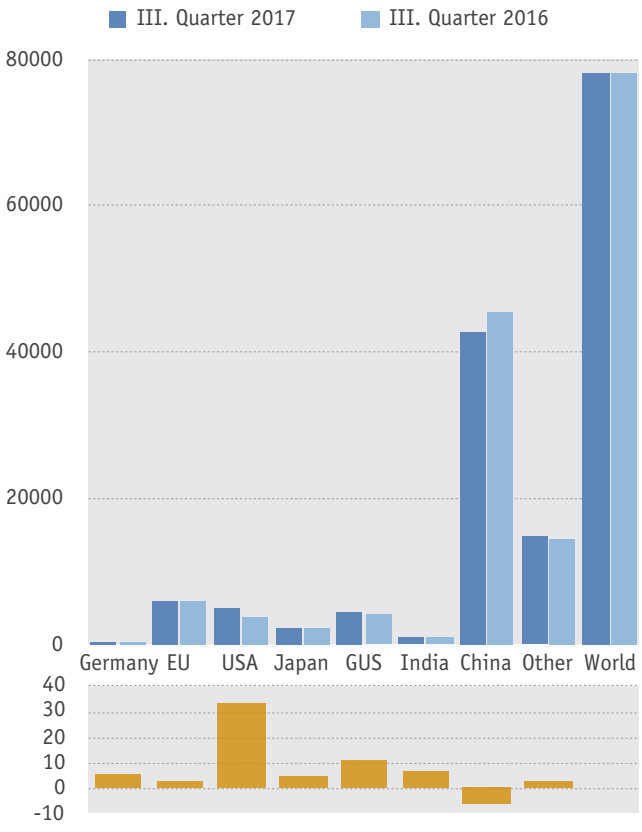
Wirtschaftsvereinigung Stahlrohre e.V.

figures include estimations

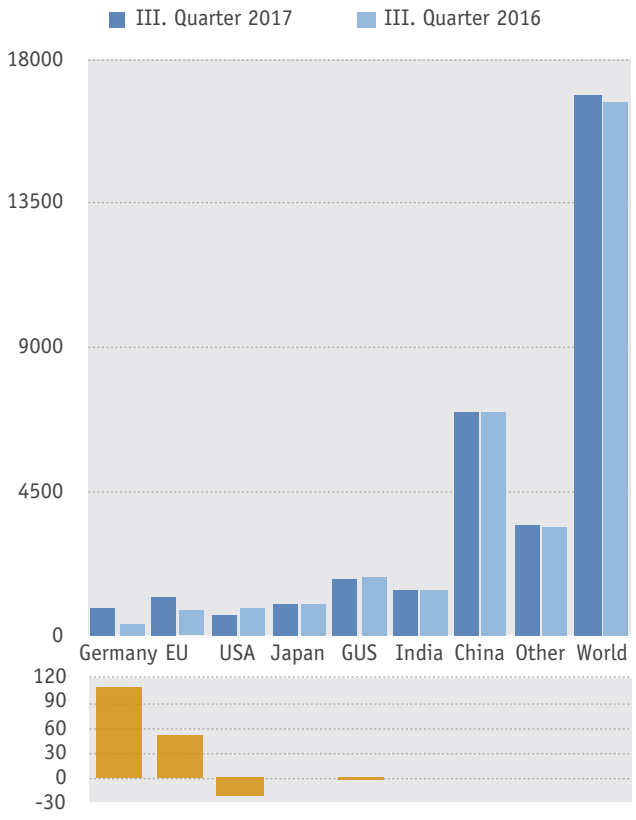
Seamless tubes in Tto.



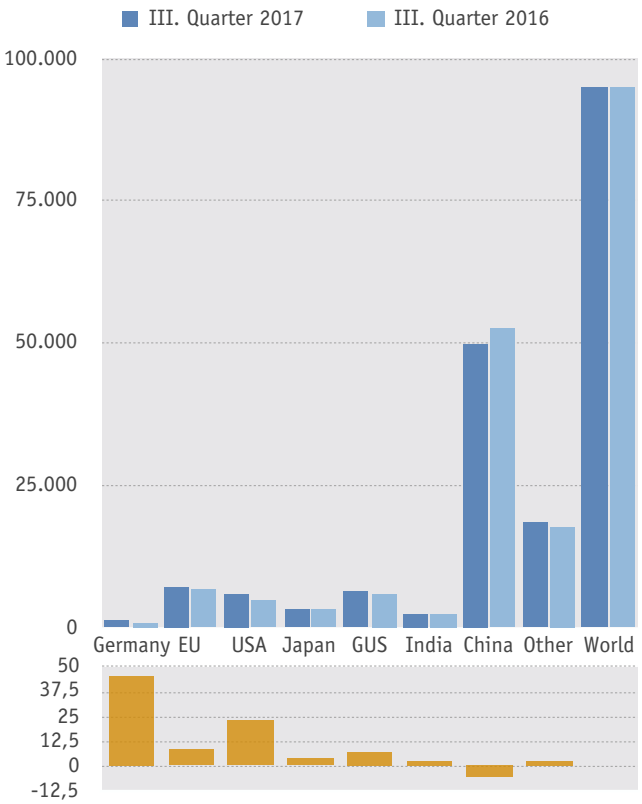
Welded tubes <406 in Tto.



Welded tubes >406 in Tto.



Welded tubes in Tto.



Dr. Gunther Voswinckel, VOSCO GmbH

Pipe & Tube Market – some influencing factors on the present situation

Dr. Gunther Voswinckel – Update as per February 2018

At the end of January 2018, oil prices climbed to a 2 year high of 70 US$/barrel. Compared to 2016, the price of oil had significantly recovered, most particularly so in 2017. This was on the one hand a consequence of reduced oil pumping by OPEC and their partners by about 1.8 million barrels/day, and on the other hand due to the increased world market demand for oil.

However, since January oil prices have fallen steeply once more. In the first half of February alone, the price of a barrel dropped more than 11 % to under 60 US$/barrel. Some US experts are even warning that the current situation bears similarities to the first shale gas flood offensive in 2014, when oil prices plummeted from 110 US$ down to 30 US$/barrel.

The International Energy Agency (IEA) backs up its warnings with figures. The IEA expects oil consumption growth in 2018 of about 1.4 million barrels/day. At the same time it expects the non-OPEC countries, particularly the USA, will raise their oil pumping levels by about 1.7 million barrels/day.

Citigroup analysts are even predicting a rise in output by the non-OPEC producers of about 2.2 million barrels/day.

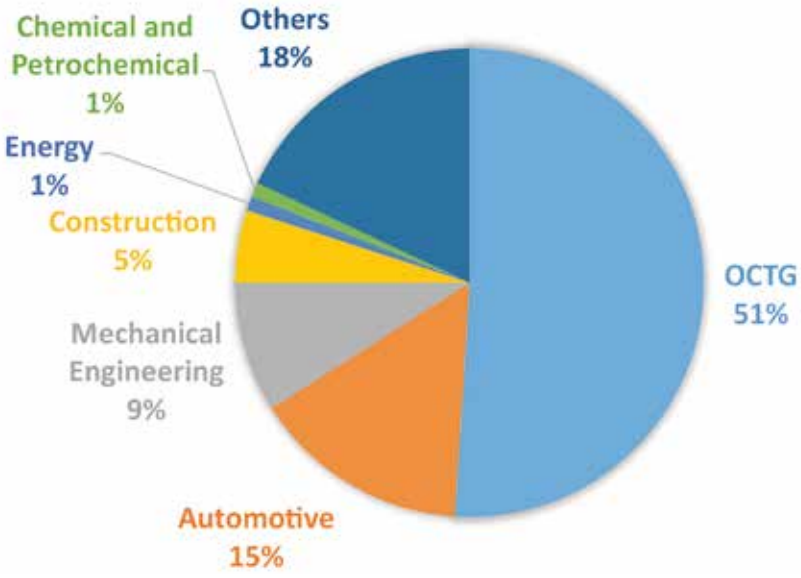


Fig. 1: Markets for Steel Pipe Industries in 2012
Source: ITAtube Journal/Wirtschaftsvereinigung Stahlrohre e.V.

If the IEA and Citigroup are correct in their assumptions, the world will face an oversupply of oil, with its consequences for the tube and pipe industry. In this presentation, several other economic consequences for the sector are discussed. Tube and pipe markets such as the automotive, building and construction industry are attractive market segments for our industry and we look at developments there.

World production of steel tubes extrapolated from the 3rd quarter of 2017 showed a slight increase of 1 % as the markets stabilized. In detail, growth of 30 % is reported for the USA, supported by political trade barriers for tubular products and the strong growth of shale gas exploration.

For welded tubes below 406 mm diameter, a slight production decrease of 2% in the 3rd quarter of 2017 is registered, although the US reports growth of 33% after major losses in 2016 (-18 %). China is facing a decrease of 7%. For welded tubes of 406 mm or larger, 3rd quarter 2017 production showed a total decrease of 7%. But Europe showed a remarkable output increase (+50 %). For seamless tubes, the 3rd quarter 2017 has seen production growth of 5%. The USA, after a bad year in 2016 (-22 %), has reported an increase of no less than 69 %.

Overall, the figures illustrate a remarkable change in trend, since now for the second time in several years, the shift of tube production capacity to China has been reversed in favor of the US and Europe. It would seem that the trade barriers policy is having an effect.

Meanwhile, overcapacity is leading to further consolidation in the steel tube industry. The pipe price index, which rose from 260 in January 2017 to a high of 290 in April 2017, has continued to climb, peaking at 295 in February 2018. Competition in saturated markets is prompting minor investments in those tube markets that display growth. More demanding high-tech products are the strategic targets, rather than commodity-grade tubes.

Tube suppliers located in high-cost countries are successfully taking steps to counter the strong inter-

national competition. As well as seeking to specialize in products with higher technical requirements, they are globalizing into markets with increased demands, and increasing their productivity to reduce the costs of production.

Finally, we also discuss the impact of currency exchange rates on the pipe market. Exports from the euro zone were favored in 2016, but the euro has grown considerably stronger through 2017 and into early 2018; this has led to export disadvantages due to its exchange rates vis-a-vis the other major currencies.

Looking at the main market segments for steel pipe suppliers, this market is dominated by the OCTG industry (51 %). Besides this, the automotive (15 %), mechanical (9 %) and construction industries (5 %) are also strong market segments for the sector (Fig. 1).

The automotive and construction markets in particular are characterized by stability and high demand.

World car production levels grew by about 1.7 % in 2015 (Fig. 2). Regionally, growth rates differed considerably, with Europe (+3.5 %), Nafta (+ 2.6 %) and Asia (+2.6 %, dominated by China at +7.4 %) offset by the Mercosur market (-20 %) (Fig. 3).

The overall health – and hence attractiveness – of the auto market is amply illustrated by German car production which displayed remarkable growth of 13 % from May 2016 to May 2017. Since pipe usage in cars is growing in parallel, the automotive market is likely to remain an attractive market segment for pipe producers.

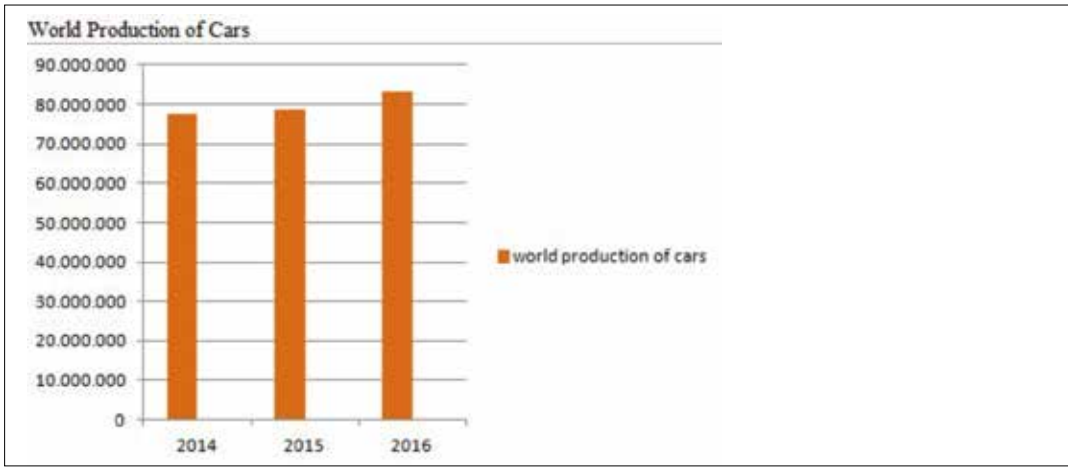


Fig. 2: World car production 2014-16
Source: German Association of Automotive Industry (VDA), January 9, 2017

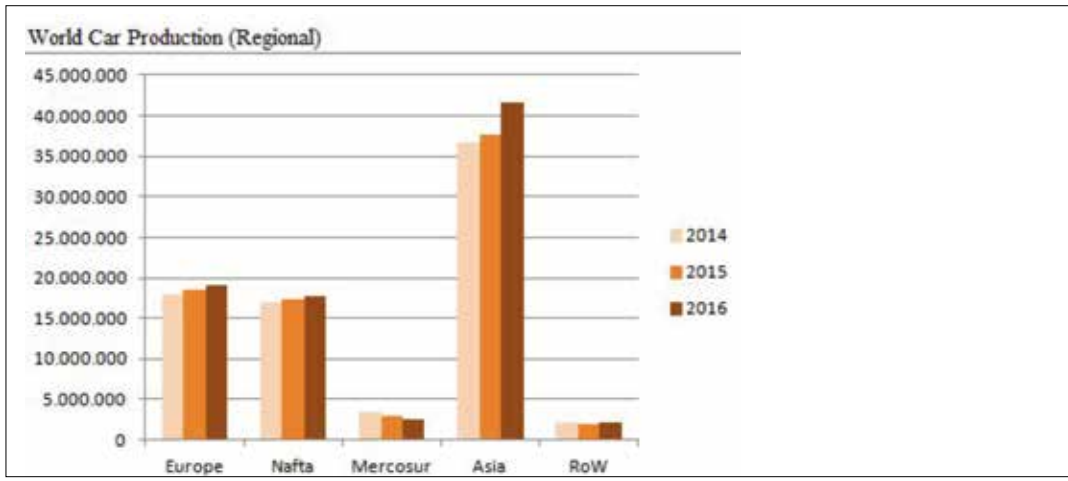


Fig. 3: World car production by region 2014-16
Source: German Association of Automotive Industry (VDA), January 9, 2017

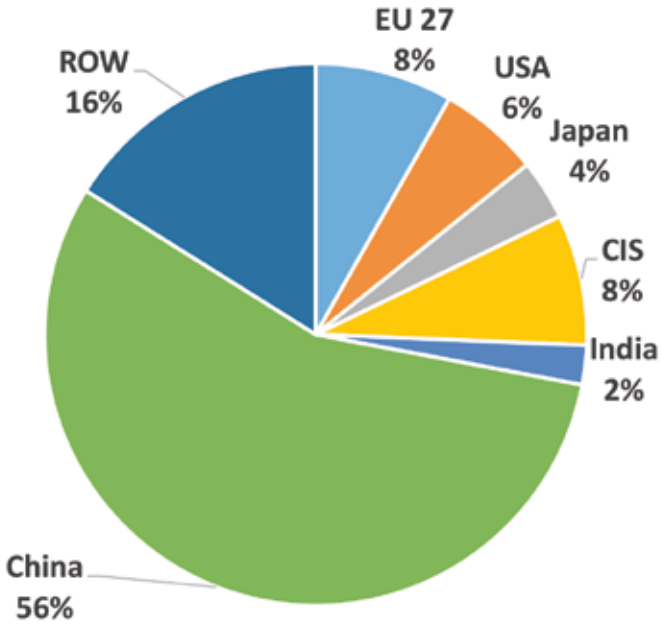


Fig. 4: Global steel tube production by region 3rd Quarter 2017
Source: ITAtube Journal/Wirtschaftsvereinigung Stahlrohre e.V.

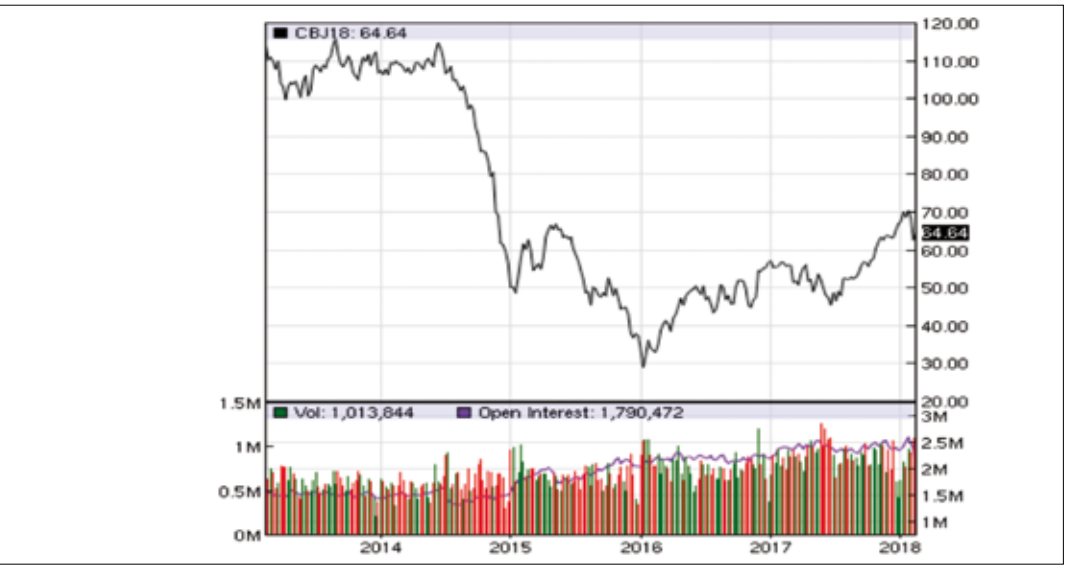


Fig. 5: Crude oil Brent price as per February 16, 2018, Source: NASDAQ

Fig.6: US Crude Oil Stock volume as per 15 August 2017. Source: EIA

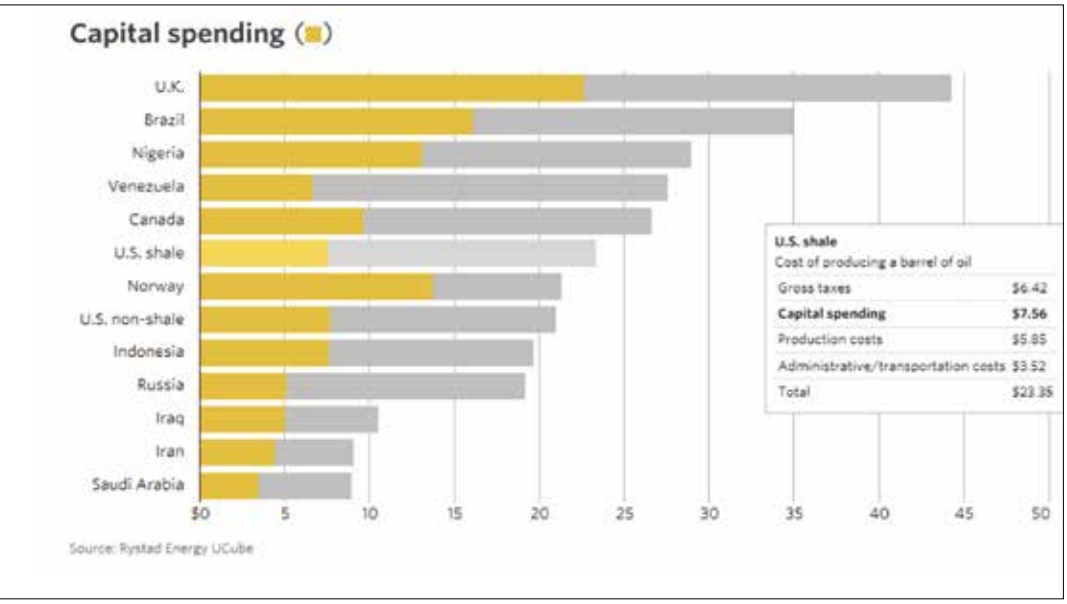


Fig. 7: Cost to produce a barrel of oil
Source: UCube by Rystad Energy, published Feb 16, 2018

The tube and pipe market in the building and construction industry is smaller, but also quite attractive due to a world industry growth of about 3.3 % per year (see also ITAtube Journal 2015-No. 4). Urbanization and population growth are the driving factors here.

In the 3rd quarter of 2017, world steel tube production was again dominated by China (56 %) followed by other/ROW (16 %) (Fig. 4). It is worth noting that China's market share was reduced by 2 % from 58% in 2016 , and that this was compensated by ROW, the EU27 (+1 %) and the US (+1 %).

In 2014 the oil and gas markets were flooded by shale gas products. In the 2nd half of 2014, oil prices dropped – plummeted, in fact – from 110 US$/barrel to 36 US$ in February 2016. Subsequently, they recovered overall somewhat, hitting 52 US$ in August 2017 (Fig. 5), mainly thanks to the OPEC countries and their exploration partners reducing output to minimize the glut. By early February 2018, the oil price had climbed as far as about 70 US$/barrel. Since then, in the first 2 weeks of February alone, it has dropped again by 11% down to 58 US$/barrel. Analysts assume further reduction of oil prices. This is reflected in the fact that the crude oil stock volume in the US has recently been reduced. Normally if rising crude oil prices are expected, the storage volume increases, whereas falling crude oil prices lead to an erosion of the crude oil stock volume.

Given that many oil exploring countries have production costs ranging from 30 US$ to 40 US$, it is clear that the industry is reacting with the utmost sensitivity

to the present oil price developments (Fig. 7).

Moreover, the entire shale gas exploring industry, regarded in 2014 as a highly attractive industry segment, has seen itself forced by the low oil prices to further reduce its cost level to about 24 US$/barrel (Fig. 7) – with the result that its selling price is now much lower than the current price offered for crude oil by the market. In consequence, shale gas production was increased. But some US analysts are warning that the current situation is strongly reminiscent of the shale gas crisis in 2014 when prices dropped to 30 US$/barrel.

The OPEC countries and some other partner countries such as Russia are currently reducing the oil volume offered to the world market by about 1.8 million barrels/day.

International Energy Agency (IEA) figures show it expects oil consumption to increase this year by about 1.4 million barrels/day. At the same time the production from non-OPEC countries such as the US is expected to increase by at least 1.7 million barrels/day. Citigroup analysts expect a rise in output levels of non-OPEC producers by as much as 2.2 million barrels/day. If the IEA and Citigroup are correct in their assumptions, the world will face an oversupply of oil, with its negative consequences for the tube and pipe industry.

As a consequence of oil prices hitting 70 US$/barrel in January 2018, both pumping of oil and gas and exploration activities were restarted. This trend had an immediate effect on the OCTG pipe consumption, particularly in the US. Since January 2017, the pipe

Fig. 8: Producer pipe price index as at August 11, 2017 (January 1982 = 100%)
Source: US Bureau of Labor Statistics/ Federal Reserve Bank of St. Louis

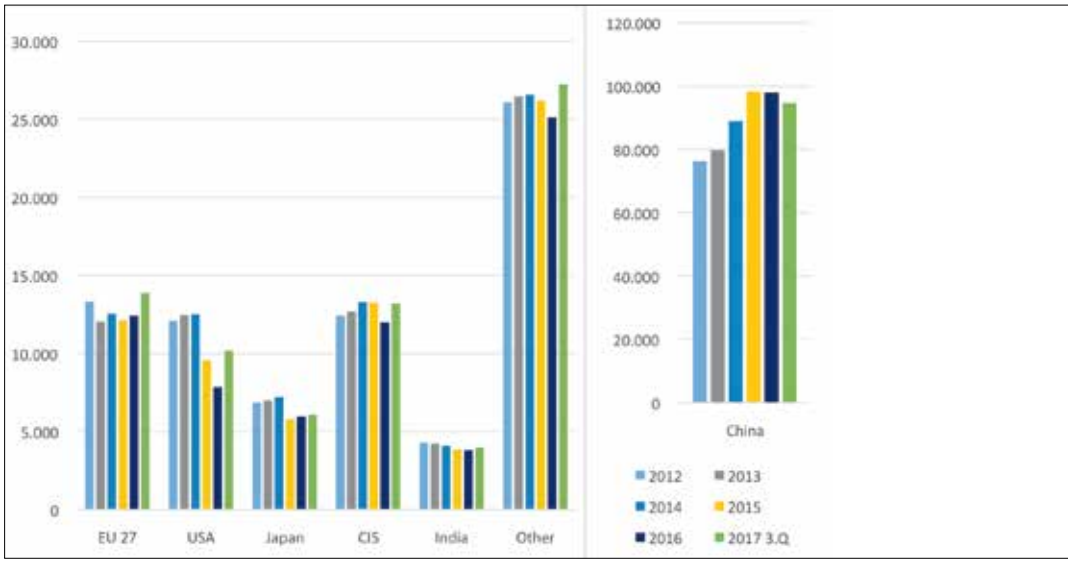


Fig. 9: World Steel Pipe Production in Ttons
Source: ITAtube Journal/Wirtschaftsvereinigung Stahlrohre e.V.

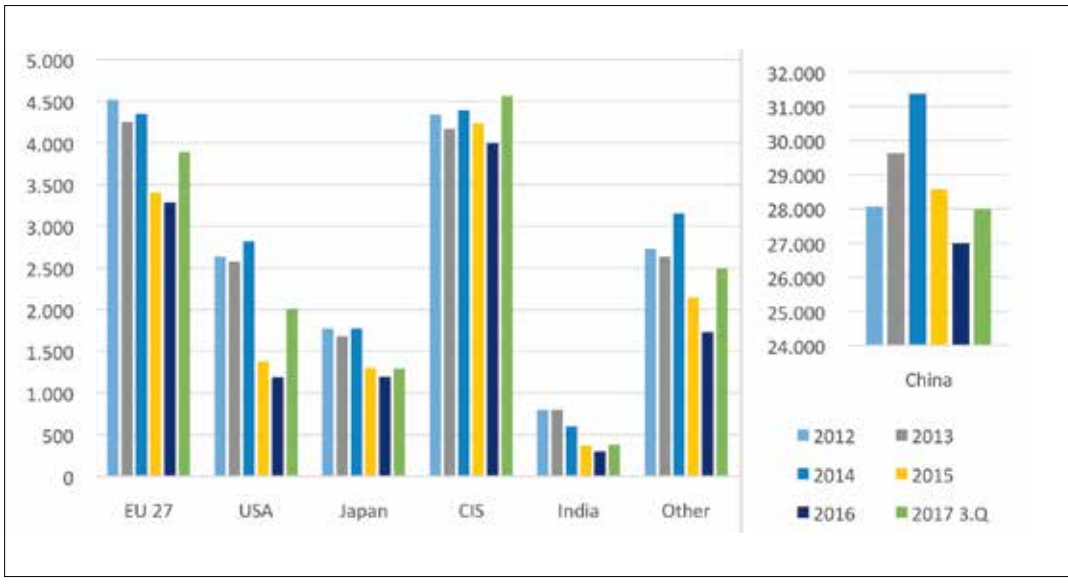


Fig. 10: World Steel Pipe Production in Ttons (seamless)
Source: ITAtube Journal/Wirtschaftsvereinigung Stahlrohre e.V.

price index had risen by about 18% (Fig. 8). The positive signals in 2017 had also prompted traders to begin cautious restocking.

It must be assumed that the renewed erosion of oil prices will once more lead to negative effects on the tube and pipe index.

These pipe price corrections certainly left their mark on the world steel pipe production (Fig. 9). 2016 was considered a no-growth year. In the 3rd quarter of 2017, global tube production increased slightly (1 %). Looking at the regional statistics, it is worth noting that only China (–3 %) actually displayed a downturn in pipe production. All other regions more or less increased their production figures (US +30 %, EU +12 %, CIS +10%, ROW +8 %, India +5 %).

The most significant variations were seen in the market segment seamless pipes and tubes (Fig.10). Global production volumes increased overall by 5% in 2017, dominated by the large volume in China (+4 %), the US (+69 %), other territories/ROW (+44 %), India (+27 %), EU (+18 %), and CIS (+14 %).

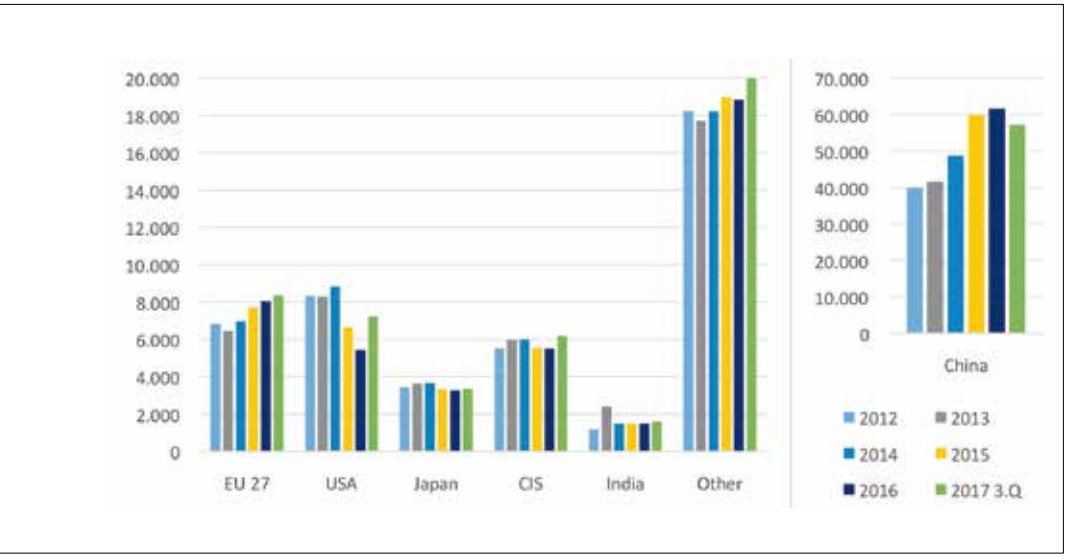


Fig. 11: World Steel Pipe Production in Ttons (welded < 406 mm OD)
Source: ITAtube Journal/Wirtschaftsvereinigung Stahlrohre e.V.

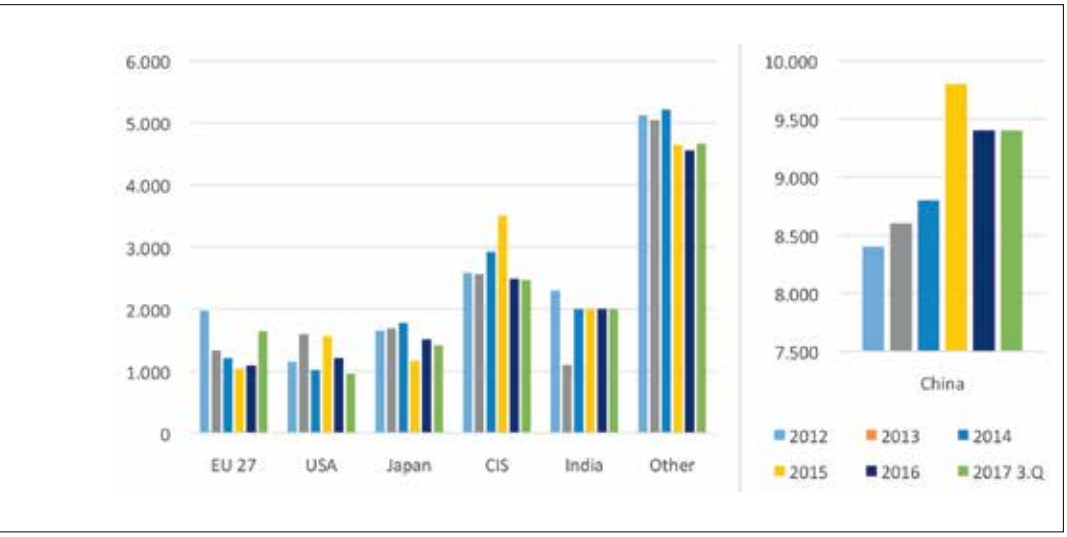


Fig. 12: World Steel Pipe Production in Ttons (welded ≥ 406 mm OD)
Source: ITAtube Journal/Wirtschaftsvereinigung Stahlrohre e.V.

The production of welded pipes < 406 mm OD experienced a slight worldwide production volume decrease in the 3rd quarter of 2017 of 2 %. China again reported the most significant decrease (-7 %). All other regions reported an upturn in production volume, i.e. US (+33 %), CIS (+13 %), India (+7 %) and Europe (+4 %) (Fig. 11).

The figures for welded pipes ≥ 406 mm OD, large diameter line pipe, extrapolated for the 3rd quarter of 2017, also displayed a production decrease of 7 %, this trend being strongest in the US (-21 %). This trend reflects the decreased demand for pipelines in these regions; the pipeline market is dominated by large projects, which are mostly politically driven. Europe, on the other hand, increased production (+50 %) and has further strengthened its position as a technologically advanced producer of large diameter line pipe (Fig. 12). The US administration has recently begun imposing import tariffs on line pipe imports to protect US line pipe producers. This political ploy however seems not to have had the desired effect on US pipe production as yet.

From the second half of 2014, the euro lost about 20 % against the US dollar (US$) (Fig. 13), but throughout 2016, it managed to hold its value against the dollar at around 1.07. Through 2017 up until February 2018, the currency strengthened against the dollar, by about 17 %, to 1.25. This does put pressure on exports into the US.

At the same time, in 2017 the exchange rate of the euro to the Chinese yuan has also improved, by about 7%. This means that exports from PR China currently have a 7% price advantage, which

will probably help compensate for some of the production losses China endured during 2017.

The value of the Russian rouble has remained relatively stable since August 2017 at a level of about 70 rouble/euro. In consequence, local pipe producers mainly serve Russian pipe consumption needs, in order to compensate for the drop in imports (Fig. 14).

The exchange rate of the euro to the Saudi Arabian riyal (SAR) from January 2017 (4.0) to February 2018 (4.7) gained about 18 %. Hence, since 2017, imports from Saudi Arabia to Europe have become significantly less expensive.

In conclusion, these latest figures would indicate that particularly US tube and pipe producers benefit from the economic trends currently shaping the oil market. Increased pumping and exploration activities in the US are the primary driving forces. If we believe the US experts, this will remain even throughout the year 2018. European tube and pipe producers have also participated, though to a lesser degree, in this positive trend.

What measures are pipe producers and plant equipment suppliers taking to overcome current difficulties and to generate sustainable business?

Over-capacity is leading to consolidation in the steel tube industry. Several pipe producing companies are still looking into overcoming such capacity problems by closing production facilities with a questionable economic future.

Still, despite the remarkable boom in the USA, globalization into markets with increased demand remains one of the key answers.

EUR/US$ Chart – 3 Years EURO/YUAN Chart – 3 Years

Fig. 13: Currency Exchange Rates vs euro as per 11 August 2017
Source: Finance.net

EUR/ROUBLE Chart – 3 Years EURO/SAR Chart – 3 Years

Fig. 14: Currency Exchange Rates vs euro as per 11 August 2017
Source: Finance.ne

The Middle East and locations with major automotive production are to be considered. Besides this, shale gas exploration, deep-sea offshore exploration and oil sand exploration remain major challenges to our industry.

Price competition from China and elsewhere demands further specialization in high-tech products. This applies in particular to regions with high production costs. The producers seem to have evaluated their market approach and decided to serve commodities or high-tech products even if they only represent niches. Some countries/regions have also installed trade barriers to control imports from other countries.

Finally, every producer has to make permanent improvements to increase productivity and reduce production costs. Technology suppliers may find interesting business opportunities in this field.

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Messe Düsseldorf GmbH

Humans and robots – side by side

Poor concentration and fatigue – never! Robots have always been seen by their human counterparts as reliable and indispensable "colleagues". They are now increasingly handling the welding, bending, cutting, separation, transfer and storage of pipes and tubes. Thanks to artificial intelligence and machine learning, robots are set to become even more flexible and will eventually replace purely repetitive robots altogether.

You turn up at work in the morning, and the first thing you do is switch on the telly. It doesn't seem very appropriate at first sight. But this is precisely what is being turned into reality with the camera-controlled and fully electric manufacturing cell from Transfluid Maschinenbau – the element which is right at the heart of a smart tube forming system. What you can see "flickering" on a large screen is not the latest news bulletin, but valuable details about the energy consumption, CPK value and quantity of the tubes formed up to now.

Robots as an important module

Robots are an important module at the Transfluid tube forming centre and are used in the production of air conditioning lines. As well as a camera monitoring system, the plant has a magazine, a 4-axle handling system, two combination machines for tube forming purposes, a bending machine, a chamfering unit, a dot-matrix printer and two robots.

Before bending can start, one side of a tube is always handled in combination with a tube forming machine, while the other side is chiplessly cut after the bending process and is then also formed. Should this be required, the robot subsequently holds the tube into a deburring device. "Both ends can be visually monitored via a camera," says Stefanie Flaeper, Managing Director of Transfluid. "Alternatively, the robot holds the tube into a labelling unit where it can then be marked at all the required points – and in fact completely without any clamping device."

100 per cent quality

Using a forming system with a rotary table, it would then be possible to join two tubes together with a flange. For the manufacturing process this means maximum safety, a high yield and 100 per cent documented quality – while informative "entertainment" is provided on a large screen as a nice side-effect.

Robots have definitely proved their worth in pipe and tube forming. Flaeper emphasises that they "ensure controlled handling" because a robot is, after all, ideally suited for the manufacturing of bent components. "On the other hand, they tend to be of lesser significance in the handling of long, straight tubes and pipes. Linear systems are faster for this purpose." Robots are particularly widespread in machining, "because this involves either complex handling or manipulating heavy parts."

Use in welding

For Polysoude and its customers robots are a good supplement to conventional automation solutions. A robot makes it possible to guide the torch along the pipes themselves in manual tungsten inert gas (TIG) welding, even where there isn't much space. It also ensures "a high-quality seam thanks to the precision and reproducibility of movements in complex geometries," says Hans-Peter Mariner, Managing Director of Polysoude.

Robots are generally very widespread in welding, but not particularly in TIG welding. TIG is used "almost never in conjunction with narrow gap welding or the welding of pipe-floor joints." This is due to legal requirements which include, for instance, a shielded zone without user access – unlike conventional automation solutions. Polysoude, however, allows the use of robots in TIG welding.

Robots and nuclear fusion

The essential criterion for choosing a specific type of robot is the level of precision which, says Mariner, "is a matter of the TIG welding itself, even under full load, within a range of 5/10 mm." Furthermore, "it's important for a robot to be easy to program and to have sensors, especially for smart tracking purposes."

TIG welding with the use of robots has achieved a certain amount of fame in one of the most ambitious projects in the world, called ITER (International Thermonuclear Experimental Reactor). The project is to prove that nuclear fusion as an energy source can be used for electric power production without major carbon emissions. 35 countries are participating in the design of the planned Tokamaks nuclear fusion chamber.

Welding together extremely thick walls

Polysoude supplied a robotic welding system to the Italian company Simic where they were used for the construction of radial plates for ITER. The plates were made from stainless steel, each with a wall thickness of 100 mm. Welding together these parts turned out to be an extraordinary challenge. The work is currently performed on site, in southern France, with major requirements in terms of bonding precision and zero error quality.

TIG hot wire narrow gap welding turned out to be the best choice for welding together such extremely thick parts. The tool carriers for narrow gap burners, such as robots and welding trolleys, have been adjusted to suit the target object in both size and geometry. TIG narrow gap welding, incidentally, can also be applied for pieces up to 400 mm in wall thickness.

Reaching for the stars

Naturally, reliability and quality are greatly prioritised on the ITER project which has been in progress at the Cadarache Nuclear Research Centre in France since 2007. The Tokamaks chamber, which is surrounded by super-conductive magnets, is to serve as the place where the hydrogen isotopes deuterium and tritium are to be heated up to a temperature of 100m°C, causing them to fuse. It's a technology that reaches for the stars – quite literally, by seeking to imitate them. After all, it is nuclear fusion that enables the sun and the stars give off energy.

However, ITER has also drawn criticism, due to its immense expenses – estimated at over €15 billion – for one of the biggest building sites in Europe, coupled with a delay in completion. Advocates of the projects, on the other hand, see nuclear fusion above all as a highly efficient form of energy production, apparently generating 10 times as much in output. Moreover, it is considered to be an energy source without carbon emissions and virtually no radioactive waste. The first hydrogen plasma is expected to be produced around 2025. Robots, too, are helping towards the success of the ITER project.

Robots in machine processing

Sometimes it's the combination that matters. Twister, a bending system developed by Wafios, can even be used in pipe/hose combinations. To boost productivity, Wafios has linked the system to a KUKA robot, and operation is amazingly simple. KUKA, a company that makes robots, has seen steady growth in the market for robotic handling for several years now.

Until recently the focus has been mainly on handling processes where the demand on accuracy is relatively modest. Either the process chain included a processing tool with a specific element which compensated for inaccuracies – a polishing disc, grinding head or flexibly deflecting deburring spindle – or the issue of accuracy was more or less irrelevant. "Such handling processes are still often carried out by humans. However, due to increasing cost pressure, yet unchanging quality requirements or lack of human resources, they will be handled more and more by machines or automatically," says Alexander Bailey, Market Segment Manager CNC/Machining at KUKA Roboter.

China as a future market

It's a development which KUKA is prepared for. The general industry is growing very strongly, mainly outside Germany. "All you need to do is look at the electronics market which offers enormous potential for growth in automation," says Bay. Apparently, this is particularly true for Asia, and the focus on the general industry goes hand in hand with increasing internationalism. Germany continues to be seen by KUKA as an important market for a robotic automation solutions. "However, we also believe that the big growth markets of the future

are outside Germany and Europe. This is why we are focusing above all on Asia and, within Asia, on China, the country which – according to the International Federation of Robotics (IFR) – has the biggest and fastest growing market for industrial robots."

There are good reasons why the Middle Kingdom is considered to be the future market for robotics. It is already by far the biggest sales market in industrial robotics and is marked by extremely high growth rates. In three years' time the International Federation of Robotics is expecting China's annual sales of industrial robotics to rise to 160,000 items, which would then be nearly 40 per cent of all global sales.

Milling gigantic pipes

Another domain that is important for KUKA is the increasingly attractive market of plastic pipes. And so the company makes not only the KUKA 120 R2700 Extra HA robot, but also the KL 1500-3 T linear unit, two KUKA MG 360 servo motors for the external rotational axis and the KUKA CNC controller. These systems form part of a completely integrated automation solution, developed by Eugen Riexinger for the production of pipes for the Weholite licence-holder Asset International Ltd. in Newport, South Wales. The automation solution allows the precise milling of gigantic pipes with diameters up to 3.5 metres.

These oversized pipes are used, among other things, in gravity drainage, in mechanical drainage, in underground channels, in retention basins and in low-pressure applications. As the system is barrier-free, a robot can move directly to the relevant plastic pipe on the linear unit and can then flexibly work on the component, as required. Graham Bennett, Operations Manager at Asset International, is pleased with this solution: It's helped us achieve a significant increase in productivity." For shorter manufacturing times, the company has apparently even increased its capacity by over 50 per cent.

Robots – colleagues of the future

There can be no question that the use of robots already has enormous potential: Whenever the product quality is impacted by the workforce, robots have major potential. One important driver in the application of robots is considered to be the automotive industry.

And the end of this potential is still a long way off. Until now robots have mainly performed repetitive tasks, working at the same level of consistent precision and repeatability. "The requirements of the future will be different – especially in professional service robotics," says Alexander Bay, Market Segment Manager CNC/Machining at KUKA Roboter. "If robots are to move into other areas, they'll need to become more flexible, and this is where machine learning might help."

Part of Industry 4.0

Robots are increasingly also entering Industry 4.0. Serving as flexible production elements, robots will be able to collect data in production and then exchange them with IT systems. "As a result," says Bay, "production routines will become even more efficient, and systems will be able to respond quickly to specific customer requests."

Another trend is the simplification of programming. "This will include online connectivity for robots, enabling them, for instance, to import data from external systems, such as CAD," says Stefanie Flaeper, Managing Director of Transfluid. It's apparently quite a challenge to use robots for very small production sizes – something which is still only possible to a limited extent.

Industrial and private environments

KUKA sees great future potential in the 3C, logistics and service/consumer robotics. Also, says Bay, robotics is increasingly moving from the highly organised sphere of industrial production into the more "chaotic" private environment. This is because artificial intelligence can help to prepare robotic systems for imponderables and changes.

Nevertheless, one thing is certain: "Robots will move closer to people, taking over even more tasks from humans and supporting them in carrying out certain difficult jobs," says Transfluid's Managing Director Stefanie Flaeper. "It would also be interesting if a robot could imitate the movements of a human being in a production process with a high level of accuracy, but without the need to be programmed." Humans and robots side by side, as it were. Generation R will take over ...

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Overstressing your mill? Beware of the weakest link

Universal joint upgrades are necessary for high-torque and high-speed operations

By Rita Nolan

Manufacturing tube and pipe is relentlessly competitive, and it's common practice that tube and pipe producers coax from their mills every bit of productivity that they can. Often this means running at ever-higher line speeds, making products from higher-strength materials, and stretching the time between maintenance intervals. This takes a toll on the equipment and can result in accelerated wear throughout the system. It can also reveal weak links, and in some cases, these are the universal joints. Changing to a more robust universal joint becomes necessary when pushing the mill hard.

The two choices are pin-and-block, which are suited to high-torque situations or installations in which space is restricted, and needle-bearing, which are more suitable to high-speed applications, but they need more space than the pin-and-block type.

However, these are just guidelines. Every application needs a thorough evaluation to determine the best type and size.

A leveler shaft uses two universal joints to deliver torque from one level to another. This one is spring-loaded for fast installation or replacement. The spring-loaded feature eliminates the need to dismantle other portions of the drive system.

Primary Factors

Several main factors determine the type of universal joints to be ordered and the extent of customization. The most crucial factors are the amount of torque the joint will have to tolerate, outside diameter (OD), revolutions per minute, the angle of mating shafts, and the space in which the component operates.

The amount of torque usually is the most important aspect of selecting a universal joint. For a given torque rating, a pin-and-block joint takes up less space than a needle-bearing joint, which is why the pin-and-block design is favored for high-torque applications when space is restricted. Pin-and-block joints are designed to maximize the yoke's OD, which increases the joint's breaking torque capacity while typically maintaining a smaller working envelope than a needle-bearing joint. For example, leveling processes are the highest-torque applications, requiring extremely robust universal joints with an OD as large as 8 inches. Additionally, roll size and material thickness determine the amount of torque applied to the component.

The available space for the universal joint is especially relevant today as machines are expected to occupy an increasingly smaller footprint. Even within those space limitations, for instance when multiple leveling rolls are present, components must be strong and robust. The joint should be as large as possible to maximize robustness, as long as the OD doesn't interfere with surrounding machine parts.

Universal joints are designed to offset various degrees of operational angles among mating shafts. Since small joints occupy less space, they can operate on greater angles than larger ones. Pin-and-block joints, however, tend to require a reduced angle for optimal operation. Specifically, the reinforced ear profile of the yoke increases the torque capacity but limits the angle of operation.

Line speed is another critical factor. High-speed applications generate friction and, thus, heat. Heat can become so excessive that even lubricants or oil drips cannot cool the parts adequately and may pose a considerable fire hazard.

Pin-and block-joints develop considerable surface friction so they can handle moderate rotational speeds. If space allows, lubricant-retaining boots can be added to offset friction and extend the joint's service life. Alternatively, oil baths, drips, and other lubrication systems are helpful.

Applications that run at high speeds and thereby generate significant friction and heat are better served by needle-bearing universal joints. Needle-bearing joints are equipped with roller bearings that minimize friction on the moving parts and reduce heat generation. Some types of needle-bearing universal joints are prelubricated and sealed for the life of the joint, requiring no maintenance in the field; others are equipped with grease fittings for lubrication at scheduled intervals.

Related Factors

Other factors also come into play. Usage pattern, for example, helps to determine the best type of product to install. Does the machine operate continuously or intermittently? If intermittently, does it use hard stops? Hard stops often apply high torque and aggressive force to the components, which would make pin-and-block joints a more suitable choice. Ideally, drive shafts subjected to such drastic force should incorporate a fail-safe solution. In the event that the application seriously exceeds the joint's rated torque capacity, imposing unforeseen failure, the drive shaft should be designed to fail and stop in a safe fashion. This is preferable to – that is, less expensive than – overtorquing the gear box and ruining the motor.

Many grades of steel are available for making universal joints. Higher grades of alloys make stronger components. For example, universal joints in demanding leveling applications typically require the highest grades of steel. In addition, components can be hardened, heat treated, and precision machined to close tolerances to further increase strength, durability, and performance. End bores can be customized to fit any application and can be "blind" to a specified bore depth, rather than through-machined for additional strength and durability.

Ease of maintenance is a crucial but often forgotten aspect of part selection that should be considered in the design phase. If the operating environment is laden with abrasives or dust, ease of lubrication helps the maintenance technicians stick to the maintenance schedule. Lubricant-retaining boots help to extend the life of moving parts and reduce the joint replacement frequency. When replacement is necessary, drive shafts that compress and expand for easy-on and easy-off operation do not need tools and take less time to replace.

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The design of a pin-and-block universal joint contributes to its robustness. It tends to be the best choice for high-torque applications.

Although a needle-bearing type of universal joints has many more components than a pin-and-block style, friction isn't a problem. This style is preferred for high-speed applications.

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EWM AG

In the Face of Extremes

A ball valve clamped in a positioner. On the right is the Phoenix 551 MIG/MAG power source with the drive 4X wire feeder and the additional tigSpeed drive wire feeder.

Cladding with deposition rate up to 13.8 kg

Driven by pressures up to 250 bar, black fluid flows through the pipes. It has done so for at least a quarter of a century. Day and night. Buried deep beneath the earth or exposed to the relentless moods of nature, be they the heat of the Saudi Arabian deserts or the extreme cold of Siberia.

As long as the fluid keeps flowing through the pipes, there is very little danger. But at every shut-off valve and every ball valve there are recesses that disrupt the flow. The crude oil collects at these points in the valves, giving its more aggressive components the chance to attack the surface unimpeded. As a result of the corrosion process, ions are released from the material that make the fluid still more acidic and aggressive. This means that a valve with an expected service life of 25 years can be practically eaten away within just six months.

Withstanding aggressive media

ITAG, a German company based in the Lower Saxony town of Celle, manufactures, among other things, ball valves and shut-off valves for the natural gas and crude oil supply sector. To ensure that the valves can safely withstand conditions over the full required service life, the carbon steel cast and forging blanks have a nickel-based corrosion-resistant layer applied to the inside.

Special requirements for a special layer

NBA 625 is a nickel-based alloy with excellent corrosion resistance. The cladding is applied to the at-risk areas or, when particularly aggressive media are involved, across the whole surface of the valve. The dilution at the surface is limited to an iron content of five percent in order to maintain the corrosion resistance. ITAG employs a procedure that ensures this requirement is safely met.

Quadruple deposition rates

TIG hot wire welding is typically used for cladding. With this method, a mechanised wire feed system continuously transports pre-heated welding consumables to the arc. At around 2.5–3 kg per hour, the deposition rate is substantially higher than with manual TIG welding.

MAG cladding is quicker still. With deposition rates of around 5 kg per hour, this technique is roughly twice as fast as TIG welding.

The requirements that had to be met for the corrosion-resistant cladding were clear: maximum deposition rate with minimum dilution.

ITAG has many years' experience with both TIG hot wire welding and MAG cladding. So it was only natural that they would combine the two. They use the Phoenix 551 MAG power source from welding machine manufacturer EWM in parallel with the tigSpeed hot wire feeder from the same manufacturer. The result is that the cladding process is not only fed with 12 metres of Inconel wire per minute, but also 12 metres per minute of hot wire from the tigSpeed wire feeder. This doubles the feed rate, and therefore the deposition rate, in a single stroke. "We saw good results right from the first tests," reports Hans-Joachim Studte, a specialist welding engineer at ITAG.

Depending on the properties of the components, the deposition rates achieved with the combined EWM MAG hot wire welding system are between 10 and 13.8 kilogrammes per hour. This is more than double

the rate of MAG welding and over four times higher than TIG hot wire welding.

Low rippling – high productivity

The cladding is characterised by tightly packed weld beads. Each bead has a height of about 5 millimetres. The difference in height between the individual runs is only around 0.5 millimetres. By comparison, other cladding methods, such as electroslag, produce ripples measuring around 2 to 2.5 millimetres.

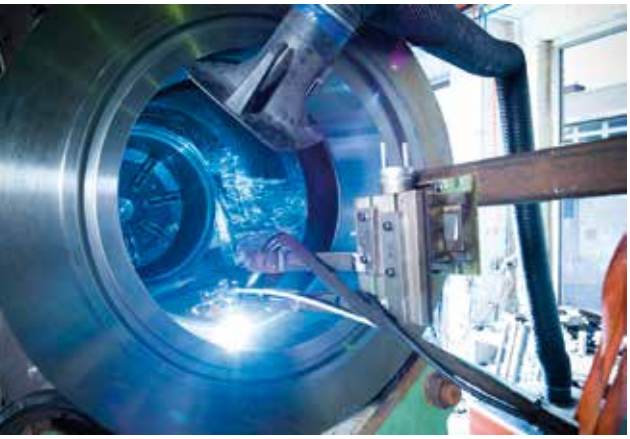
A second layer of cladding is applied to complete the workpiece. To achieve the required surface quality, the workpiece must be finished by machining to remove excess material. This means that larger ripples would result in more expensive material having to be removed later. With EWM MAG hot wire welding, it is enough to apply cladding that forms a layer about 1 millimetre higher than the required depth of the final layer. "It's a quick, clean and stable process – simply elegant. Just reshape the weld, and that's it, finished!" explains Studte, summarising the complete process.

Mechanised welding procedure

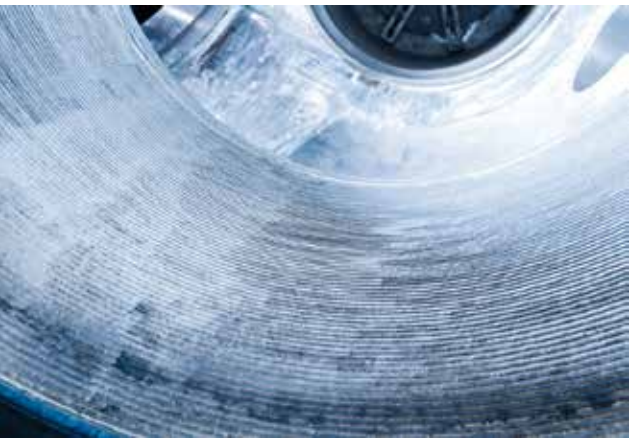
ITAG processes the central areas of the valve using EWM MAG hot wire welding. They achieve this using a mechanised process. The welding parameters are still set manually, but the process runs automatically after configuration. The valve is clamped into a positioner which rotates continuously. The welding torch moves in the longitudinal axis and applies one weld bead after the other until the whole area has been covered.

The ball valve from inside showing the cover hole. The diameter is approximately 1300 millimetres.

The whole valve is rotated during the welding process. This allows a continuous spiral weld bead to be formed from inside to out.



A second wire is fed into the arc in addition to the one from the MAG welding torch's wire feeding.



The completed welding process. Cladding is applied approximately one millimetre higher than the required depth of the final layer. This layer is then reshaped to produce the final surface finish.

High demands on the welding process and the welding machines

A very high-performance welding process is needed for this application. It must be powerful and efficient to apply large quantities of welding consumable. It must be extremely quiet and uniform to keep the dilution in the molten metal to a minimum. And it must be reliable enough to produce a uniform weld bead across the entire surface during the mechanised process.

The EWM machines, produced in Mündersbach, Germany, are ideally suited to these requirements and guarantee maximum process reliability. Because even small deviations in parameters can cause marked changes to the welding process, it is substantively important that all parameters remain constant. Consistent arc energy performance and precise, reliable wire feeding are crucial here. This applies to both drive 4X (for the Phoenix 551 MIG/MAG power source) and the tigSpeed drive45 hot wire feeding system. Such a high degree of reproducibility could only be achieved with such a delicate process thanks to the high reliability and substantial power reserves of the machines used, combined with the ability to mechanise the process.

Studte is convinced there is another factor too, "We also rate EWM highly because of their astoundingly good service." In particular, he is referring to Siegfried Lieske of Lieske & Zydra Schweisstechnik, a subsidiary of Linde Schweisstechnik GmbH in Hanover, Germany. "We just call the service centre, and half an hour later somebody is there. I have never known anything like it!"

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More than happy with the high deposition rate: specialist welding engineer Hans-Joachim Studte, Head of Specialist Welding at ITAG; Siegfried Lieske, Branch Manager at Lieske & Zydra Schweisstechnik, a subsidiary of Linde Schweisstechnik GmbH in Hanover, Germany; and welding expert Norbert Stempniewicz, Deputy Welding and Testing Supervisor at ITAG.

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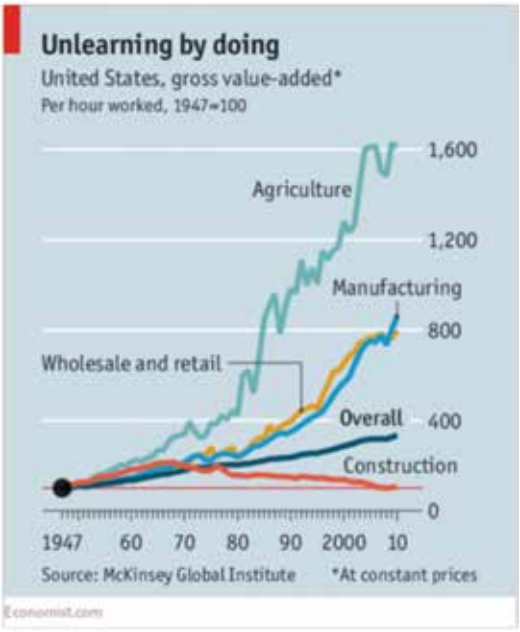
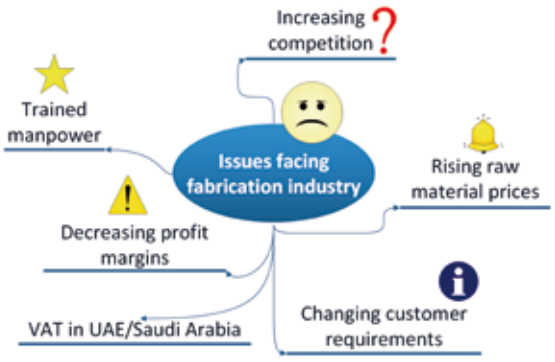




Are you facing these issues today?

Introduction

This article is intended for senior managers, leaders and owners of companies who are in the metals fabrication and its allied businesses. Metal fabrication industry is quite fragmented with main activities of such companies that include structural steel fabrication, piping spool fabrication, fabrication of mechanical equipment, pressure vessels and storage tanks. Some of these concepts also apply to Architecture, Engineering and Construction industry commonly known as AEC or EPC companies. Hence, wherever we refer to fabrication company it also means engineering or construction or EPC/AEC companies interchangeably as they mostly mean the same for the purpose of this article. Similarly, a project or a product is also meant to be read interchangeably for companies that are either in the cycle of executing unique projects every time or those that fabricate and produce similar products repetitively.

Construction has the lowest productivity of any industry

A recent article from the Economist states that more than 90 % of the world's infrastructure projects are late or over budget. The article also gave some stark examples of this, the Berlin Brandenburg airport took over 6 times the original budget of EUR 1.2 B with over 66500 building errors, Apple's new HQ cost over $ 2 B more and is 2 years behind schedule.

Mckinsey, a leading global consultancy, states construction industry has the lowest productivity gains of any industry with Germany and Japan showing no growth in construction productivity and surprisingly in the USA, productivity has plunged over 50% in the last 50 years or so. Of course, there are a wide variety of reasons and causes for such statistics too.

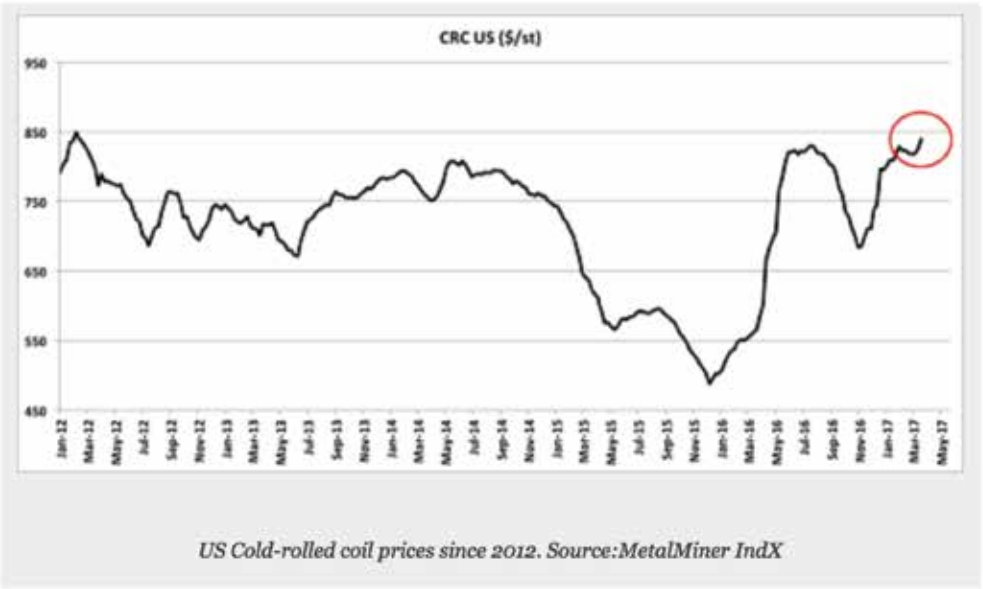
Challenges facing the fabrication industry

Fabricators around the world today are increasingly facing a variety of challenges in running their businesses profitably, especially in the last couple of years.

Some external factors include increasing competition from low-production cost countries dumping their metal products in the developed countries, rising raw material & commodity prices from mid-2016, new import duties likely from the US administration in the first quarter of 2018. Customers' ever-growing expectations and dynamically changing design requirements due to the advent of BIM are also challenging the margins of main EPC contractors, consultants, engineering firms & fabricators, as project variations and contractor delays take their toll on project profitability.

Many owners and investors are not well informed about the details of mechanical engineering or its associated production processes. In a

recent survey done by Final Quotient, it was found that most production managers are old-timers in their companies and usually spend ten or more years with the same company. These managers have been found slower in terms of adopting new technologies and software. Quite a few gaps in communication and business processes between engineering, design, procurement, production and site installation teams have also been commonly found in fabrication companies. It is not uncommon to see people scrambling internally to assemble data from various departments in order to provide manual project status updates and profitability reports for management to be able to take decisions.



US Cold-rolled coil prices since 2012. Source:MetalMiner IndX

Affects cost of construction
Reduces profitability

With a multitude of IT systems to manage, internal IT teams are found developing internal point IT systems to meet the production business requirements since many commercial off-the-shelf software applications do not fit well with fabrication industry's unique requirements. This creates fresh challenges for integration of data from disparate IT systems as internally developed systems are usually heavily dependent on the very people who develop such systems.

This industry increasingly faces consolidation of small players and quite a few companies are quitting the business since it is unsustainable for them to continue their businesses.

Choose intelligent fabrication software

Different stakeholders in fabrication companies like to look at their business information in a wide variety of dimensions. While CEOs/GMs mainly spend their time on increasing revenue, decreasing costs and mitigating risks, CFO/Cost controllers look at how the company can maintain gross margins right from sales stage to execution stage of a project lifecycle and try and overcome challenges in combining financial and operational reports. Operations/production managers focus on improving utilization of resources across projects and how to respond to project scope changes, variations and other external delays.

At a minimum, fabricators can implement a stand-alone production planning & control software to start their journey of business process automation.

A good IT system has to be able to satisfy all these dimensions and generate reports from automated business processes. IT software systems of fabricators range from engineering design & detailing, production planning & control, nesting, project management, plant maintenance,

financial systems of record, document management and if all these systems are not well integrated, it is difficult for management to make effective decisions. Ideally, a software platform that combines at least the most important systems on a single technology stack will be valuable for fabricators to invest in.

What we have observed in most fabrication companies is a lack of software solutions to automate the production planning and control (PPC) or site installation/erection processes even if the other departments are using software for their respective functions (like Finance, HR, Procurement). In fact, production and installation processes and their associated costs probably form 60-80% of the overall direct cost of a fabricator's yearly profit and loss statement. If this area is left out from the use of software, it is not easy to get the real-time tracking of production progress or costs associated with work in progress or the actual real-time status updates. Automation of these processes, can give a variety of business value benefits to fabricators and data from a production planning & control system can be shared with other departments to provide real-time status updates of project, construction and erection progress. The single biggest benefit to the business will be the ability to predict future cash flows.

Another common area of challenges for existing IT systems is also the automation around item/part creation and flow of information from material takeoffs from engineering to production departments. A good IT solution should be able to automate the creation and flow of part information between these two departments. Nesting function is usually performed by CNC machine-makers but such nesting functionality is stand-alone from the rest of the IT systems. It will be beneficial to have a PPC system that also takes care of nesting functionality (both 1D and 2D nesting). It is not uncommon to see that optimization of raw materials can save the fabricators between 2 % - 5 % of their raw material costs.

Quality control inspectors and teams can be freed from their heavy documentation work if the system can generate important quality control documentation in an automated fashion. The time thus freed can be used more effectively by quality teams in spending more time on the shop floor than working behind their desks. The system should have the ability to capture entire metallurgy library for each project or job so that the rest of the production teams can work within the unique quality framework defined for each project or product. The system should also have the capability to record every joint/weld and track the performance of welders and fabricators against preset acceptable performance targets.

Fabricators should also try and have a library of actual jobs executed in the past so that when they receive a similar enquiry in the future, they easily refer to the past work done to improve the quality of estimation thereby improving profits for the company.

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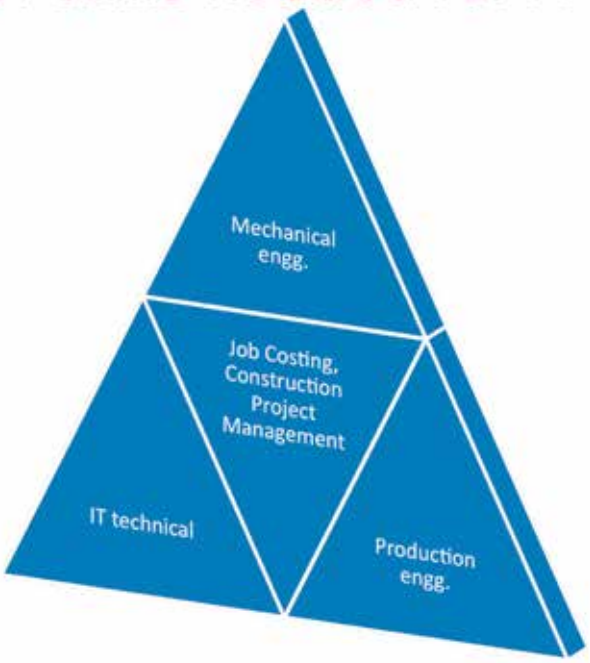
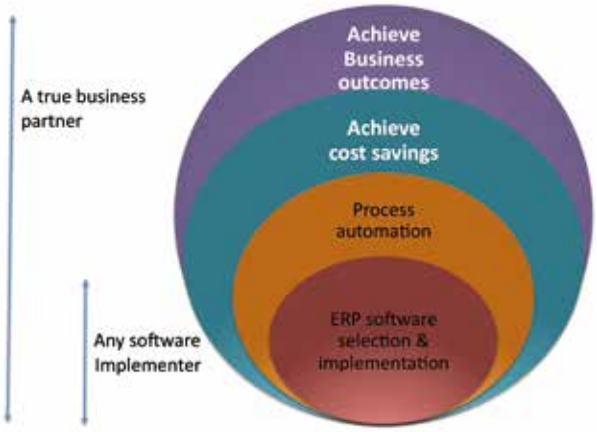


Variety of skills needed for IT success



Engage differently with your IT partner

Choose the right IT software partner

In the midst of all these operational and business challenges, fabricators who are already behind in technology adoption for their business process automation also face challenges associated with digital transformation of their business - software applications implementations are widely known to have a high rate of failure globally. This is especially true in the case of fabricators because successful implementation of software applications for this industry requires a critical combination of skills including but not limited to, mechanical engineering, production engineering, construction project management, job costing as well as IT technical skills. Choosing the right IT partner usually is to find a good mix of expertise in all these areas.

With the advent of cloud, more and more customers are less focused on technology and more focused on achieving their business outcomes because they don't have to worry about managing their IT systems internally. A true business IT partner should enable realization of business value of the IT investments rather than just be an implementer of technology.

Business outcomes that matter to various stakeholders can only be achieved by identifying and achieving cost savings by automating the right processes and not just every process. Fabricators hence have to carefully choose IT partners that not only do ERP selection and implementation but also those that are able to demonstrate more than 80% of the technology solution before signing a commercial contract for system implementation.

Fabricators also should seriously consider re-engineering their business process design especially for production planning and control processes that meets the Lean Six Sigma process quality standard. Such exercise could enable reduction of avoidable process steps and elimination of wastage can be quantified by qualified master black belt consultants for management to approve investment in such initiatives.

Top 8 business benefits of Fabrication Production planning & Control software:

1. Helps improve your cash flow by monitoring production process (which is 70 % - 80 % of overall direct cost with 150+ production reports)
2. Helps save 2 % - 5 % of material cost every year
3. Helps to save 10 % - 20 % man-hours of production process
4. Helps automatic import of items from PLM/CAD directly without manual data entry errors
5. Helps improve quality of jobs executed
6. Helps increase profitability of future jobs by accurately estimating jobs based on actual data of past jobs
7. Improvement of 15 - 45 % increase in production capacity, more than 50 % efficiency between engineering/procurement/production departments, around 20% optimization in manpower costs by using our production module alone.

8. 20 % reduction in inventory carrying costs, 8 % - 15 % improvement in net profits, streamlined business processes, effective communication between departments, full view of profitability of each project, one-click dashboards/reports for the CEO/Chairman etc.

* These figures and benefits are indicative only and may vary for different companies, geographical locations, operational process maturity, years in operations, existing IT systems etc.

Summary of the article

1. Fabrication industry needs to adopt technology fast to improve profits
2. Most think they have ERP system but don't cover production process.
3. Many production managers in large or small companies, mostly use Excel sheets
4. 70 % of operational cost of a fabricator is production related costs so implement a PPC system to track your production progress and improve your profits
5. Try and reduce the usage of multiple IT systems wherever possible

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MSG Maschinenbau GmbH

Visual straightness measurement of pipes and rods in production

With the latest member of its GCS family (Geometry Control System), MSG Maschinenbau sets new standards in straightness measurement of long workpieces. Recording the 3D progress of the longitudinal workpiece axis leads to advantages that could not be implemented before in production as well as quality assurance where setting of parameters for the systems as well as documentation of every single profile is concerned.

Straightness of the material plays an ever-increasing role in the production of tubes and rods. There are ways to correct straightness - but the producers are still facing the problem of recording straightness. For example, solutions that exist on the market will cause the profile to rotate. The deviation of the actual from the optimal cross-section, arising vibrations and the bend of the material due to gravity may strongly distort the results of measurements.

Straightness measurement with compensation for gravity

The patented GCS straightness measurement comprises two essential basic components. On the one hand, there is the special static support of the workpieces in the measuring position. On the other hand there is the optical measuring technology.

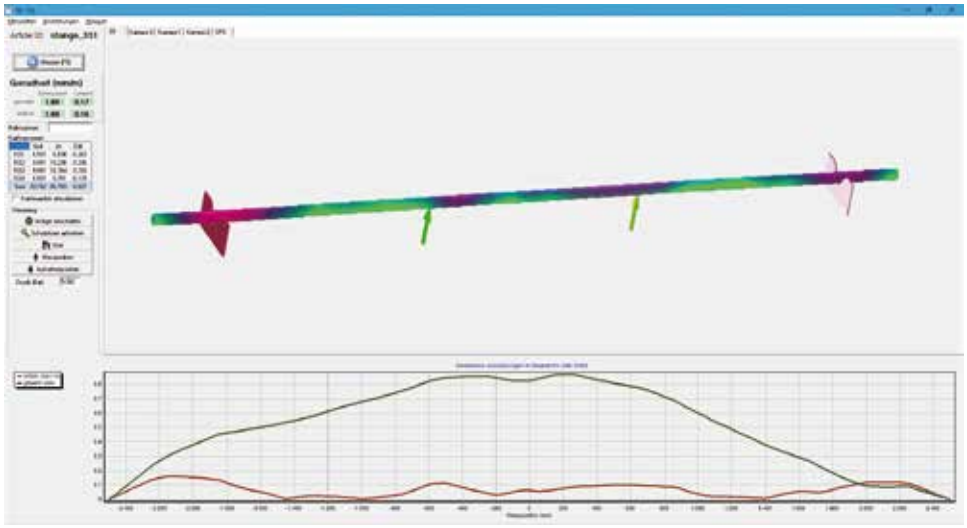
The support system developed for this special measuring procedure is equipped with multiple weight sensors. These weight sensors determine the respective supporting forces in two axes that are orthogonally to each other, which are converted into a bending module together with the theoretical values (calculated from the cross-section and length).

Additionally, three linearised cameras arranged stereoscopically to each other record images from various perspectives. This second measurement results in the actual course of this workpiece with standard-compatible measuring results.

By overlaying the results from the supported and the linearised images in the dedicated evaluation software, the deformations resulting from the material's actual intrinsic tensions can be determined for the first time. The negative influences from gravity or vibrations are eliminated.

Beyond this, the customer may use the in-house engineering by MSG Maschinenbau when expert know-how from a special machine manufacturer is required. The great advantage of MSG Maschinenbau is in processing turnkey solutions, with the entire know-how from mechanical engineering, electrical systems and programming available in house. Integration of this revolutionary measuring technology was already implemented in the outlet of an existing straightening facility.

The manufacturer generally offers a pioneering option for meeting the continually increasing market requirements to all quality officers, test technicians and system operators with the optical straightness measurement. A measurement available in the factory makes it possible to measure customer profiles for test purpose.



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Promet Consulting Ltd. – Andrew C. Houghton

Design your own Cold Pilger Dies and Mandrels?

Introduction

Amongst the many cold deformation processes the Cold Pilger Process is perhaps one of the most difficult to manage. Tooling materials, lubrication types, raw material quality, engineering resource and the overall calibre of personnel are all crucially important matters yet in most cases getting the tooling design fully optimised is perhaps the most difficult issue. This becomes even more so in cases where multi pass schedules are being used. Not least because defects initiated in the first pass can be made much worse in the second.

In the early 90's desk top computers and spreadsheets became widely available allowing a task that could take a week of manual calculations to now be done in seconds. Previously the use of mainframe computers was advocated which many users would not have access to1. Computers allowed the designs to be more complicated and data to be produced relating to roll forces and especially to the production of strain path simulations. Before long it was possible to convert these designs to CAD files which could be used for input into CNC machines and also as input into Finite Element Analysis Packages.

I imagine that many will have attempted making their own tooling on CNC machines and running FEA packages but encountered some difficult issues and yet they remain attractive options in certain circumstances.

Many will have found that managing change in a cold pilger mill production environment is not particularly easy!

Some Key Questions

- Want control over your key asset?
- Want Optimised Production and a Competitive edge?
- Sometimes need tooling in a hurry?
- Have arguments over the cause of defects?
- Need new designs from time to time that need to be right first time?
- Have someone with a high level of perception and a logical mind who you can train and keep?

A Holistic Approach

Before designing tooling for an existing reduction it can pay to look a bit wider and consider what might be possible if you could run your machine in a different way.

The example shows the effect of reducing a multi pass route from two reductions to one reduction.

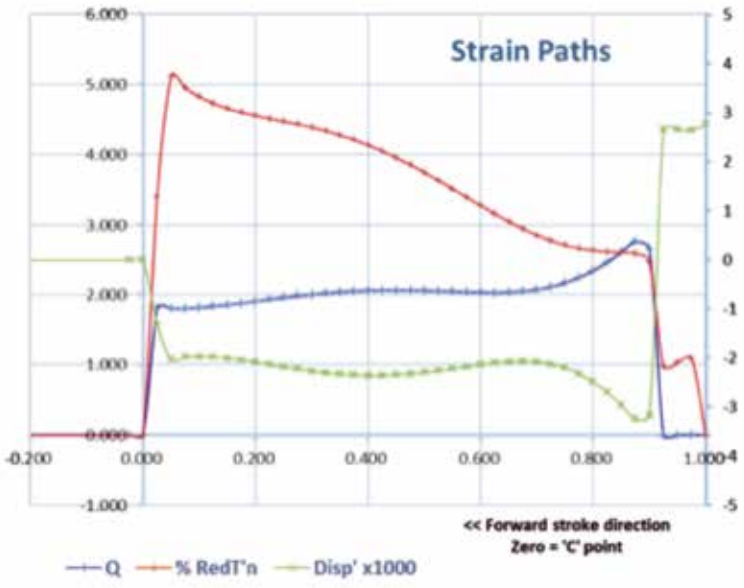
Two Reduction of times three elongation												
	OD	WALL	Q LN.	Elong.	Strokes per min	feed	make	metres/ hour	minutes/ metre	minutes/ metre accumlativ	shop hrs per week	Total metres
	38.000	4										1800
Large T/R	24.666	2	1.71	3	150	6.67	20	180	0.333	0.111	30	5400
Small T/R	16.111	1	1.71	3	300	4.00	12	180	0.333	0.444	90	16200

Replace with one reduction of times 9 elongation												
	OD	WALL	Q LN.	Elong.	Strokes per min	feed	make	metres/ hour	minutes/ metre	minutes/ metre accumlativ	shop hrs per week	Total metres
	38.000	4										1800
Small T/R	16.111	1	1.71	9	250	1.33	12	180	0.333	0.333	90	16200

Essentially we can see that two modest reductions of x3 elongation reductions have been replaced with a big reduction of x9 elongation. There are a number of materials that can stand this level of elongation if the strain path maintains the tube wall in compression. Some of the advantages are obvious such as a saving in tube reducing capacity on the large machine and fewer inter operations like degreasing. What might be less obvious is the much lower feed of 1.33 millimetres instead of 4 millimetres. This can result in savings in loading and cutting time and scrap material if producing fixed lengths. It significantly reduces the amount of side relief that needs to be incorporated on the dies. Perhaps surprisingly this can lead to quality improvements such as lower defect levels and rounder tube.

Strain Path Simulation

This becomes particularly useful if you wish to maintain the tube wall in compression to avoid defect formation. Every tube making student should be aware that if the 'Q' factor falls below a value of '1' a strain disparity can result in the ID. So it is useful to calculate this at every segment of the reduction and if a 'Q' factor of less than one is inevitable to note the severity of the strain disparity.



Of course in some materials – notable the close packed hexagonal structured alloys – how the 'Q' factor is distributed through the stroke segments can affect the crystallograhic texture2. For this one also needs to consider how much strain is taking place at each corresponding segment. Ideally use true engineering strain but in this case percent reduction might be more readily understood.

Data used for the above can also be used to estimate the roll separation and with experience it becomes possible to estimate this reasonably accurately. This information can also be used in side relief determination and especially in getting the mandrel dimension just right at the end of the work length so that the intended mandrel segment dimensions always line up with the intended die segment dimensions. The effect of using the mandrel out of position or perhaps none-standard tooling can also be demonstrated.

Example of Strain path simulation

The chart below shows strain paths for the combined x9 elongation shown in the earlier example schedule.

It can be seen that the 'Q' factor is fairly constant around a value of 2. The percent reduction is increasing through the reduction but not exceeding 5 % per segment. The strain disparity (secondary axis) stays negative for nearly the whole reduction. This means that the ID circumferential strain is bigger than the OD circumferential strain and hence the ID is under compression in the circumferential direction.

It is normal to employ a degree of smoothing between the work length section and the sizing section. By carefully controlling this it is possible eliminate the abrupt change observed in the above chart. Note that the plots will change if the work length is changed. It should be noted that the strain paths shown are computed with quite a long work length. Shortening the work length significantly results in more segments with a 5 % reduction but barely a change in the maximum percent. By changing tooling tapers and curve exponents it is possible to achieve a near constant percent reduction just below 5 % and still maintain a constant 'Q' factor- even with the reduced work length. The feed could be reduced somewhat and overall the economics would still be favourable.

The example is chosen entirely for illustrative purposes. To the author's knowledge it is not currently being carried out in any plant. However neither is it on the limit of known capability for with some materials. Strain disparity issues are usually worse when dealing with thick wall tubes.

Finite Element Analysis

Of course when a tooling design is going to be used day in day out for years just a small improvement could have large financial implications and similarly when new tooling has to work first time to fulfil a key contract additional assurance might be prudent. FEA can help here but remember to old saying – 'garbage in –garbage out'! Whilst FEA simulation of cold drawing process is relatively simple, unfortunately simulating cold pilgering is not. It is not an axisymmetrical situation nor is a small amount of material that has to be considered.

Summary

In summary it is clear that for some companies it will be a potential game changing decision to start designing their own cold pilger tooling. There is quite a lot of information in the literature 1,3 on how to do this but a degree of guidance may often be beneficial in developing a computer program and more especially in using the output in a beneficial manner.

Finally this approach is also being taken for looking at the deformation profile produced by a heavily modified three roll tube rolling process – often used for thin wall tube making. The results are quite intriguing.

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KNOW-HOW FOR TOMORROW

SMS group GmbH

Intelligent coating with PERFECT spray®

SMS group wire arc spray systems as used for the robot-assisted coating of a turbine blade

Thermal spraying conquers new markets

Some 1.8 million kilometers of oil and gas pipelines crisscross Europe under water or over land. The world's longest pipeline, at 4,700 kilometers, transports oil from Siberia to the Pacific coast. The global network of long-distance pipelines consists of more than three million kilometers and is growing each year by some 25,000 kilometers. Pipelines are the veins that supply our world with vital substances. They are essential for transporting oil, gas, and drinking water over long distances. However, they are often exposed to extreme conditions. Whether above ground, under ground or under water – the right corrosion protection is crucial for the long life and resistance of the pipes used here.

This is where wire arc spraying is ideal. It's a process that stands out for high deposition rates and low energy consumption. Corrosion protection systems applied by thermal spraying have long been successfully used in steel construction, civil engineering, container construction, or wind turbine construction. That's because steel must be protected from corrosion to retain its functionality over a long time period.

During thermal spraying, the feedstock in wire form is always completely melted and applied to the surface. Due to its cost-effectiveness and relatively safe procedure, the method has become established in many branches of industry for corrosion and wear protection. A typical application is repair coating after wear damage, e.g. to plungers or transmission housings. In the offshore sector, corrosion protection is the primary aim, e.g. on pipelines or vessel walls.

Wire arc spraying involves feeding two metallic wires into a spray gun at a controlled feed rate. Electric current is applied via copper, conductive wires. Once the wire feed starts, the two spray wires move forward until they touch each other. At the touch point, the wires are heated due to a high short-circuit current. This melts the coating material. A gas jet, usually consisting of compressed air, atomizes the molten material, accelerates the particles, and deposits them onto the surface to be coated.

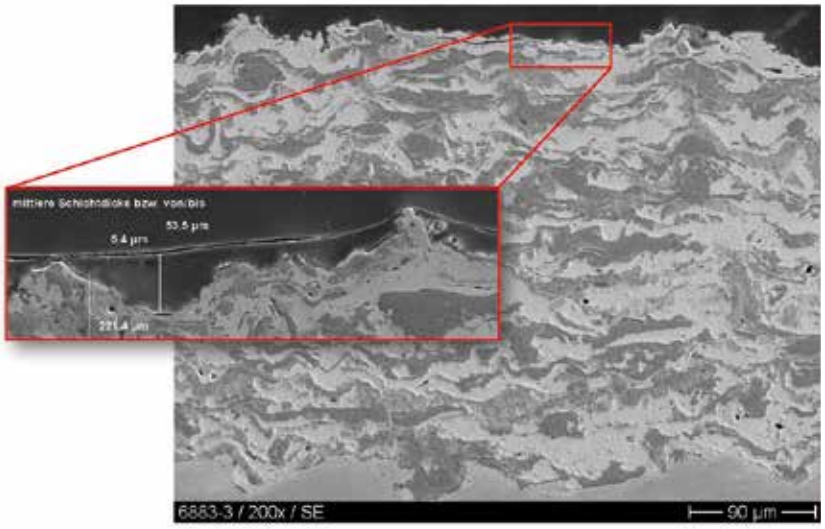
Now SMS group has developed PERFECT spray®, a new thermal spraying process for treating metal and non-metal surfaces. This innovative wire arc spraying system for thermal spraying conforms with DIN EN 657. It opens up completely new markets for SMS group in the areas of corrosion and wear protection as well as repairs. The linear, open design delivers significantly better layer quality and process efficiency than conventional, closed systems. The new arc burner works with almost all metal materials that are available in wire form. The option of separately controlled wire feeding enables the use of different mate-

rials on the cathode and anode sides. That means the process can also create alloys and pseudo-alloys such as steel-nickel and aluminum-copper combinations or aluminum-zinc coatings for lasting corrosion protection.

Current issues and problems raised by a political commitment to an energy transition are generating a new focus on coating methods such as wire arc spraying. That is because this technology offers cost, energy, and material-efficient long-term corrosion protection. Especially suitable here are aluminum-zinc (Al-Zn) alloys. They can be used in the form of pre-alloyed Al-Zn wire or by using different wires (anode: zinc; cathode: aluminum). PERFECT spray® applies a virtually pore-free coating. Furthermore, the layers are post-treated with a special sol-gel sealing. In compliance with current standards, this guarantees corrosion protection for 20 to 50 years depending on coating thickness, even under severe seawater conditions.

Arc-sprayed coatings are also applied in many other branches of industry. Examples include: the automotive industry (coating interior cylinder walls, especially lightweight-construction crankcases in combustion engines), turbine construction (primer coating for plasma coatings), repair and maintenance (e.g. of shafts and bearing seats), coating polymers or fiber-reinforced materials (e.g. to improve EMC shielding effectiveness), medical technology (e.g. for antibacterial surfaces), the aerospace industry (wear protection of leading edges), the polymer industry (heating pipe coatings for local extruder temperature control), power generation (high-temperature corrosion protection of waste incineration plants), and generative manufacturing (coating 3D printed lightweight metals and polymers). Apart from applications in industry, the method also offers attractive application options in science and research.

CAD image of the optimized arc burner PERFECT GUN (on the left: linear/open type) by comparison with the standard spray burner LD/U2 with its closed design and high pressure losses (on the right)coating of a turbine blade



Corrosion protection coat, 300 µm thick, based on zinc (dark phase) and aluminum (light phase) with a subsequently applied sol-gel seal (see red highlighted area), providing long-term protection for offshore wind turbines.

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Johannes Sordi

Factory improvments in pipe-plants

I. Situation

Pipe Plants are in need of permanent Improvements at all Pipe-Production-Processes, enabling continuous optimized operation and output .This allow the pipe companies to stay competitive as well as meet changing market demand.

But in reality Plants initiate “Improvements” only gradually in replacement of specific production machinery, characterized as “partial improvements” or “re-investment” or “replacement” of aged, defect machinery, only.

Most Pipe plants don’t follow permanent Improvement Programs, covering a whole Plant, or even lacking Department or People who beside day-to-day operation systematically compare Actual Process Achievements against State of Art Technologies and recommend changes to increase Productivity.

II. PIPE-PLANT IMPROVEMENT CONSULTANCY

Especially pipe companies which do not have own dedicated improvement teams may benefit by seeking consultancy to assess and utilize potentials of their mills. This will grant them access and knowledge to latest technologies and production know how of state of the art process employed today in plants worldwide. A consultant could also assist companies with new investment or modernization teams in defining and implementing continuous mill improvements plans.

Increasing Out-put-rates, Idle Time Reduction, Cost Savings in Welding Consumables, Spare & Wear Parts, Shop floor management-training in welding and QC including welding Defect Training, Procurement and Production Planning and implementation of Pipe-Plant Incentive Programs are a round-up of the available Consultant Spectrum.

III. IMPROVEMENTS-PROJECT-RESULTS

Below are some typical Improvements from various Pipe Plants:

1. A reduction of Idle-Times (≈ 40 %) resulting in Out-Put Rate increase of + 400 pipe/Month

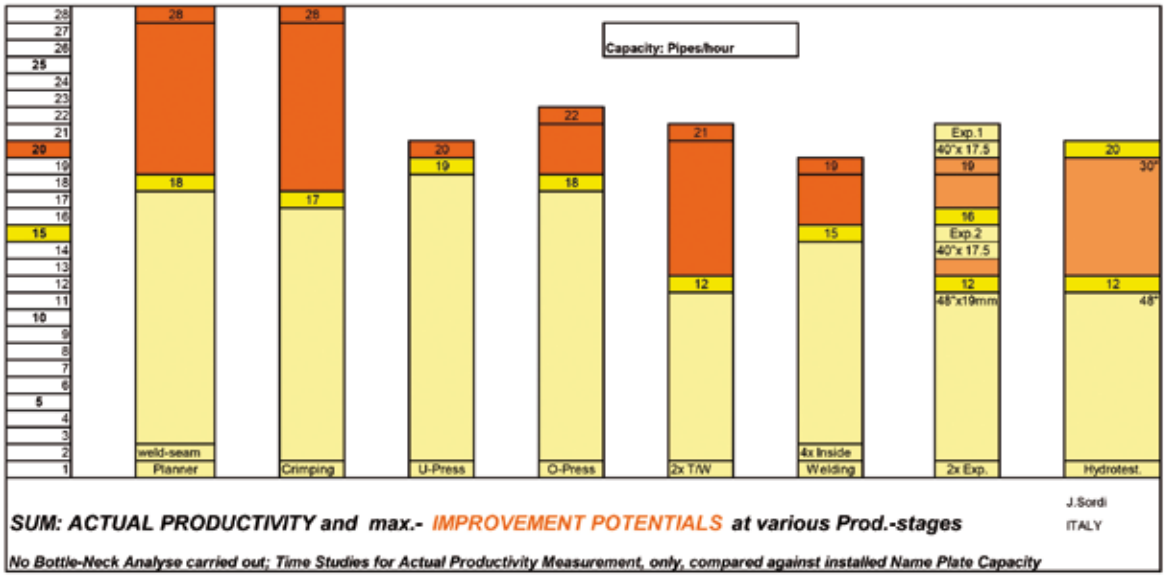
   1. IRAN

ACTIONS TAKEN to ACHIEVE the TASKS: ACTIVE DAILY MANGEMENT to reduce Idle Times in Production & QC, i.e., by stringent Plate/Pipe acceptance, effective usage of Production-hours; Welding- Process review, Training Welder & QC, Change to reliable communication/ reporting at all Departments.

2. ITALY

Fact-Finding (listing of all possible Improvements) showed that this plant, from mid-60-ties, was under-performing at nearly all production steps.

2.1 Time Studies confirmed that underperforming of the Pipe Plant varied between 50 % - 100 % of Name Plate Capacity guaranteed by the Supplier. The diagram below shows the actual Productivity (yellow) compared to the 100 % possible Name Plate capacity (brown).

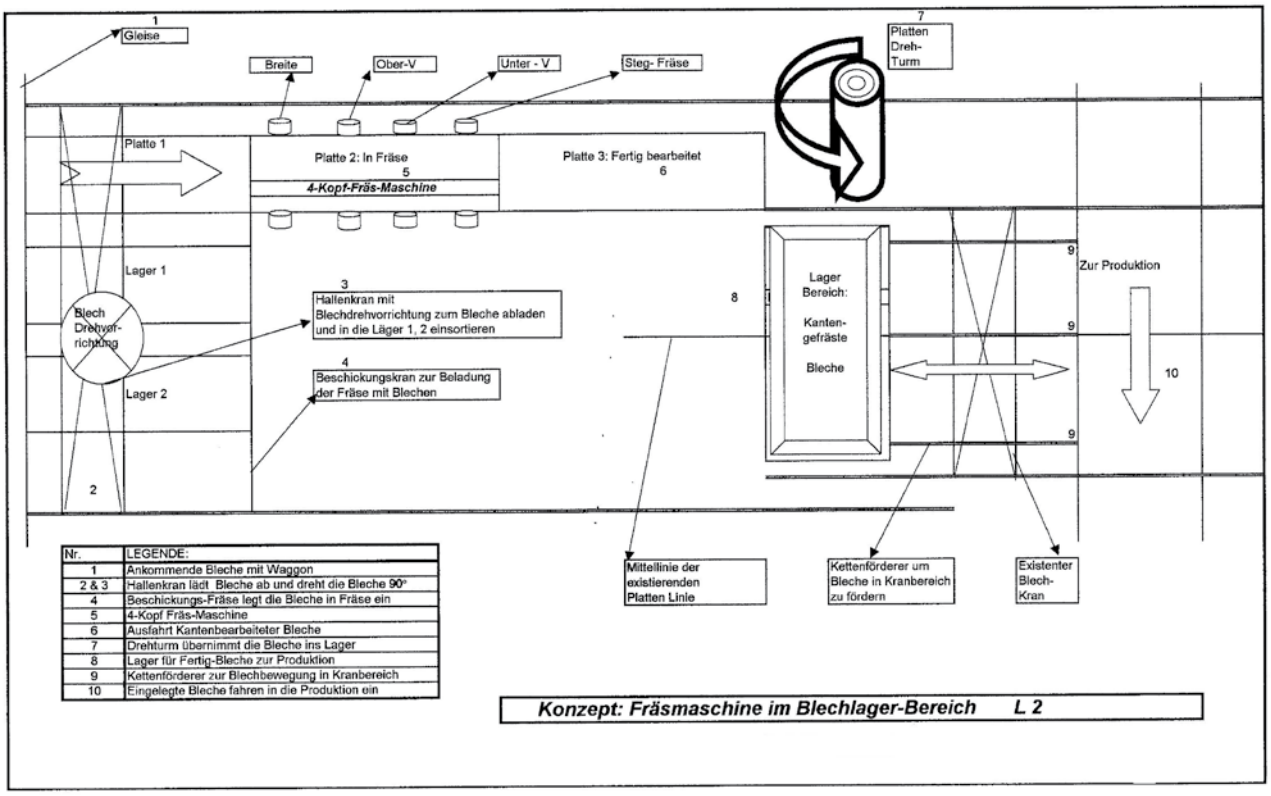


ACTION TAKEN: I. Time Studies

- Production Machines
- Pipe Transport-Systems

Analyze time-saving potentials of the two areas and prioritize Improvements based on direct Machinery related Productivity-Improvements. Another Time Study sequence was executed to evaluate all Pipe-Transport Areas at the whole Pipe Production, as a comparable measure to differentiate Cycle Times in Production & Transport related Times, to receive an orientation to Prioritize further Implementation arrangements.

II. Design-Recommendation for improved Plate Storage & Transport, as shown next for Plate-Storage extensions, High-Speed-Milling Machine Integration



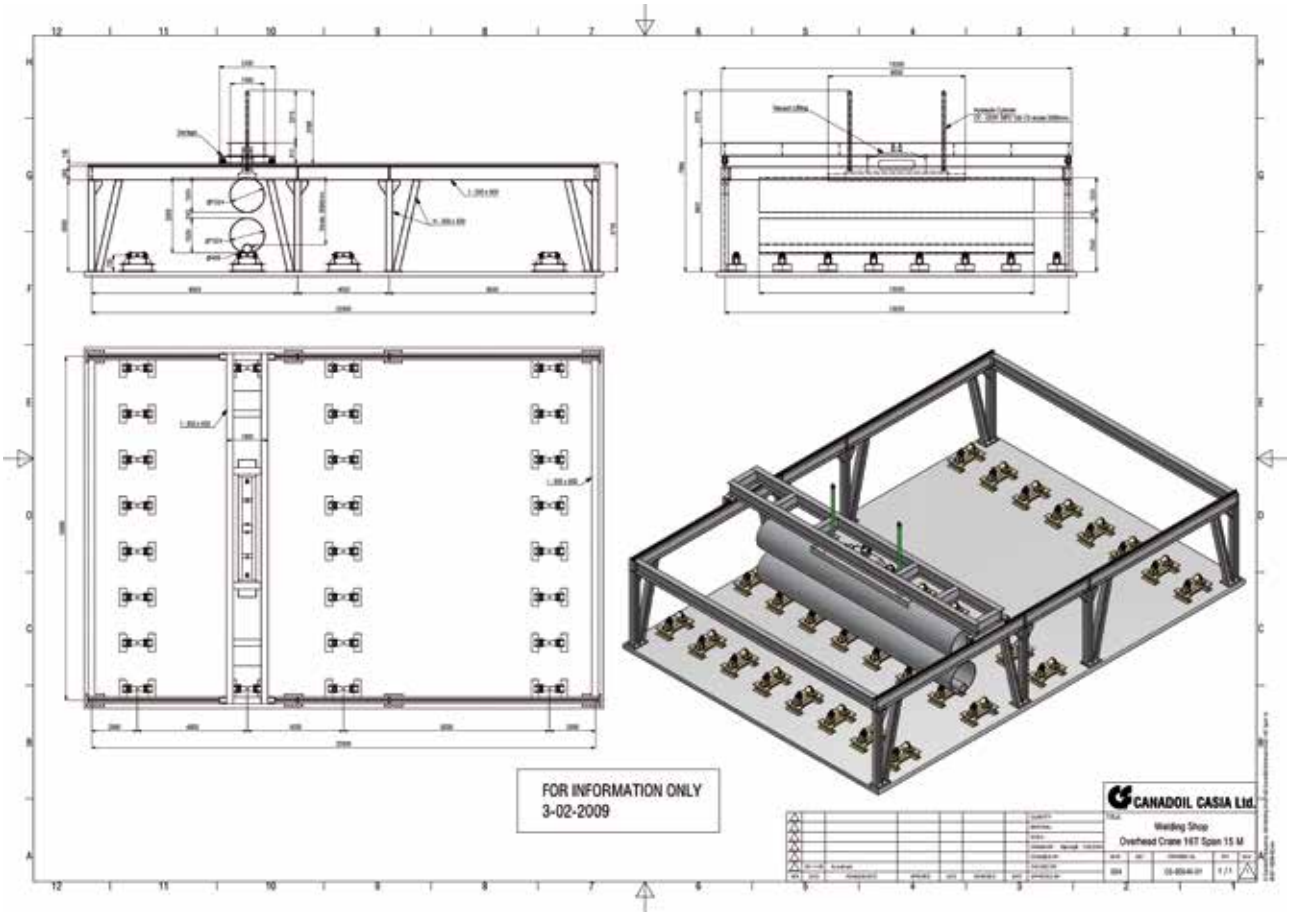
The finally recommended Lay-out has other Advantages worth to mention:

- Milling Machine follows Plate waviness and achieve a uninterrupted, constant weld-seam profile, resulting in much less welding defects (lower Repair-Rate); Average Pipe-Length increase significantly, lower numbers of Idle-Times and reduction of Idle Times between Diameter & Dimension changes in Production, since the Plate Storages are used as Storage of prepared Plates to compensate Tool changes at milling machine, last Plate of a final job, first plates of new job.
- Extended Plate Storage Areas and more uninterrupted Plate-Flow into main Production-Line.

3. THAILAND

This Plant was integrated in to 3 incoherent Factory-buildings, consequently a high number of Transport-Times added-up to 40% of the total Production-Time. Needless to say that Idle-Time are high, Out-Put-Rates are very low (Deliveries are always too late).

The Drawing below shows a Design-Idea how to improve Out-Put-Rates at two Outside- Welding-Machines. Essentially the Roller conveyor beside the Welding line has to be added-on and a Steel-Structure to take a new Pipe into welding area while final welded pipe moves out (secondary timely transport-operation parallel to main operation time = No waiting Time), a new pipe (overhead transported) vertically moves-down into the welding area.



An extraction from Time Studies shows that such Design Change increases Productivity by +25,63 %, from actual 4,8 Pipes/hour at each of 2 Outside Welding Machines, to 6,03 Pipes/hour/ Outside welding machine

Time & Motion Analyze at Outside Machine

36" x15.9 mm SMID

TIME-ANALYZE based on 15.9 mm	Actual (min.)		Time-Savings:	
1. Welding Finished	0:00:00			
2. Carrier moves Pipe out*	0:01:15		0:35	
3. Carrier moves to Loading Point	0:01:24		1:24	
4. Pipe Loading	0:00:34		0:34	
5. Carrier move to welding Point*	0:00:18	TOTAL:	2:33	
6. Turn pipe, Preparation for welding Start	0:01:59			
TOTAL:	0:05:30	(5:30 - 2:33)	2:57	
Welding Time:	0:07:00		7:00	
Cycle Time per Pipe:	***0:12:30***	***New Cycle-T.***	***9:57***	+ 20,4%

RESULTS:	***Productivity (P/h/O-W):***	***4.8***	***100%***		***6.03***	+ 25,63%
	Planned Productivity:	***3.8***	***80%***		***4.82***	+26,95%

J. Sordi 5/1/2009

**** The Measured Times under No's 2 & 5 don't include the improvement of increased speed by using variable speed motor at the Pipe-carriers.***

RESULT:

1. Yearly Out-Put increases at 80 % planned productivity to: 4, 82 Pipes – 3, 8 Pipes = 1, 02 x 2 x 20h/day x250 Days/Y = **10.200 more Pipes/Year**
2. Amortization-Time for Design: 6,5 Months
3. Design & Commissioning 6 Months

IV. How is Factory Improvement executed?
It happens in 3 Phases:

MODUL 1: FACT FINDING

FACT-FINDING: often called WEAK-POINT-ANALYZE, is based & executed as a Factory- Analyze, according to given Management Improvement-Topic's and can include/but not limited to:

- Machinery & Equipment (Idle-Time Analyze, Efficiency in Out-Put and Maintenance-Cost
- Base-material and Consumables
- Quality
- Down Time Analyze (overall Idle-Time of whole Factory
- Spare & Wear Parts (Cost-Efficiency-Ratio)
- Staff's Education & Training (Requirements & Up-dates for Production, QC & Maintenance)

MODUL 2: CATALOG of MEASURES (CoM)

The CoM is divided into 3 Categories:

Factory Improvements "without" Investment-Costs (Improvements comes out of existing Processes/Machinery/Equipment's)

Factory Improvements with "moderate" Investment-Costs (relatively low Investments)

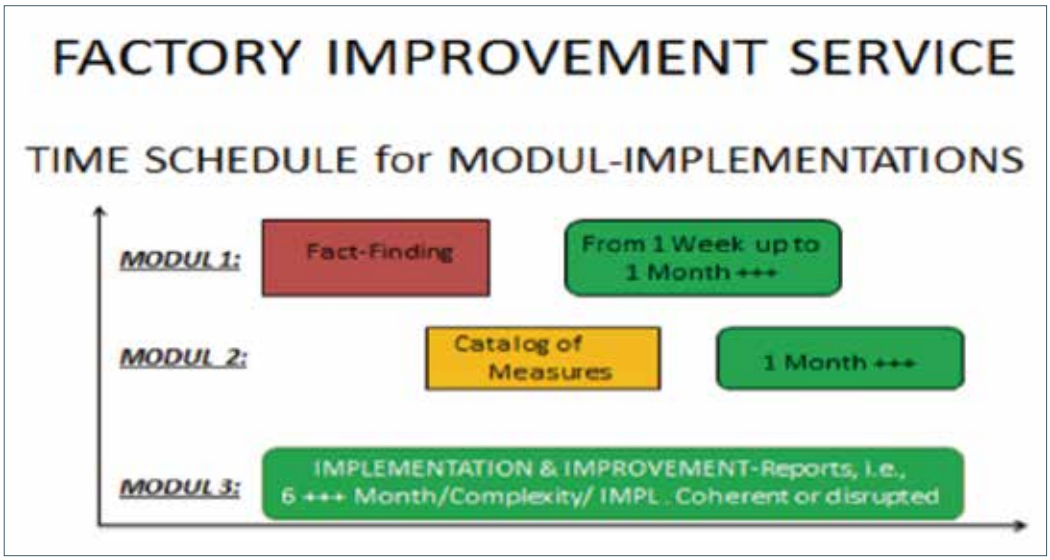
Factory Improvements with "high" Investment-Costs (New Machinery/ Technology)

MODUL 3: IMPLEMENTATION & TIME SCHEDULE

In M3 will be an IMPLEMENTATION-STRATEGY of different Measures and it's TIME SCHEDULE have to be organized.

Due to sometimes high Complexity, Implementation can't be coherent and, i.e., if Delivery Times of new Machine or Equipment takes too long. For such Period's Implementation are often sporadically interrupted; Interruption also occur if new commissioned Machinery doesn't comply to Performance-Tests, Improvement- Reporting can't be continued and live-up later, if a re-scheduled Performance Test takes place.

Example of a Factory Improvement Time Schedule



Factory Improvement is an individual tailored Service where Company Manager and Consultant have to agree to key aspects of Factory Improvements.

All shown examples are based on Companies set-up Priorities. Time Schedule varies very much due to Production-Process Complexity and Implementation-work and if Consultants are full or part-time involved.

V. IS FACTORY IMPROVEMENT WORTH THE MONEY to spend for CONSULTANT WORK ?

1. Yes, all Benefits Companies earned from implemented Improvement Projects are by fare much higher than paid Fee's for Consultant Services.
2. In some cases where new Technology is expected to be installed some Pipe-Plants want to have an independent (3rd Party)-Evaluation before Purchase Orders are placed. In such cases the Consultant, as an independent 3rd-Party, between Seller & Buyer, has to deliver a Cost-Benefit-Analyze determine that such Investments are feasible.
3. In all Factory Improvement Projects a hired Consultant has only one job – find Improvement Potentials - nothing else. She/he as an independent Institution isn't involved in any Company-Politics, favoritism of Supplier and/or Technologies. Its Integrity will be easily damaged for life-time if she/he can't stay "Neutral".

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A method for manufacturing bent profiles with open cross-section by die-push-bending

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INDRODUCTION

Bent profiles are increasingly used in the automotive, aerospace, logistics and other engineering sectors. They represent a cost-effective design element, which is characterized according to Berner [1] by a positive tare weight - inertia ratio. In particular, the use of profiles in vehicle constructions as scalable structural elements allows the realization of lighter and at the same time warp-resistant structures.

Furthermore, welding or punching operations can bring additional functional elements to the profile structure in order to integrate customer-specific requirements and functions in the component. Thus, the profile obtains a high priority as a structural and functional element in the vehicle.

In addition to extruded products, roll-profiled and welded open and closed profiles made of high-strength and ultrahigh-strength steels are used as semi-finished products. With regard to the geometry, both simple and complex profile structures are deployed with increasingly variable geometric features. Examples of this are the cross-sectional shape of the profile as well as a two- or three-dimensional shape of the centerline. Accordingly, manufacturing processes are required, which allow a high geometry and material flexibility.

For the production of these components, there is a variety of different bending processes. In order to ensure the highest design flexibility, free-form bending processes with kinematic shaping are preferred. These are characterized by the fact that the coordinated movement of individual tool elements relative to each other generates the bending contour. Concerning the opinion of Engel [2], they are often used in the production of small to medium lot sizes due to the high degree of design flexibility.

Roll-based bending processes, such as three-roll bending (DRB), are the most commonly used machine concepts in industry, according to Chatti [3]. The curvature is defined by the positioning of the forming roll in the plane. The DRB is suitable for profiles with open or closed as well as unsymmetrical cross-sections due to the variability in terms of the roller arrangement and the setting options of the individual rollers.

The development of bending processes with a kinematic shaping has been greatly improved in recent years, according to Becker [4] and Kersten [5]. For the manufacturing of spatially bent free-form curves, innovative free-form bending processes are used. Here, the bending process implemented by the delivery of a movable sleeve / die and / or pivoted rollers relative to a fixed guiding die/ roll.

Another roll-based method is the Torque Superposed Spatial (TSS) bending process according to Hermes [6]. In contrast, there are die-based tool concepts, such as MOS bending by Nissin presented by Murata [7] and Neu [8]. Flehmig [9] presents a similar process in a modified form.

Another variation of the method is the Hexabend concept according to Neugebauer [10]. Here, positioning and rotation of the bending die is achieved by parallel kinematics of six length variable hydraulic piston. The semi-finished product is pushed through the bending tools by a transport and rotation unit. Therefore, this bending process is also referred as die-push-bending.

Another method, which is close to being ready for series production, is the incremental swivel bending (ISB) according to Engel [11] developed at the Institute of Forming Technology (UTS) at the University of Siegen. The ISB is based on the principle of incremental forming, wherein the semi-finished product is clamped between tool elements and bent by their rotation to each other. The linking of several sequentially bent segments carries out the production of a bow element. The ISB bending process is intended e.g. for the production of structural car body parts for high-strength and ultrahigh-strength steels.

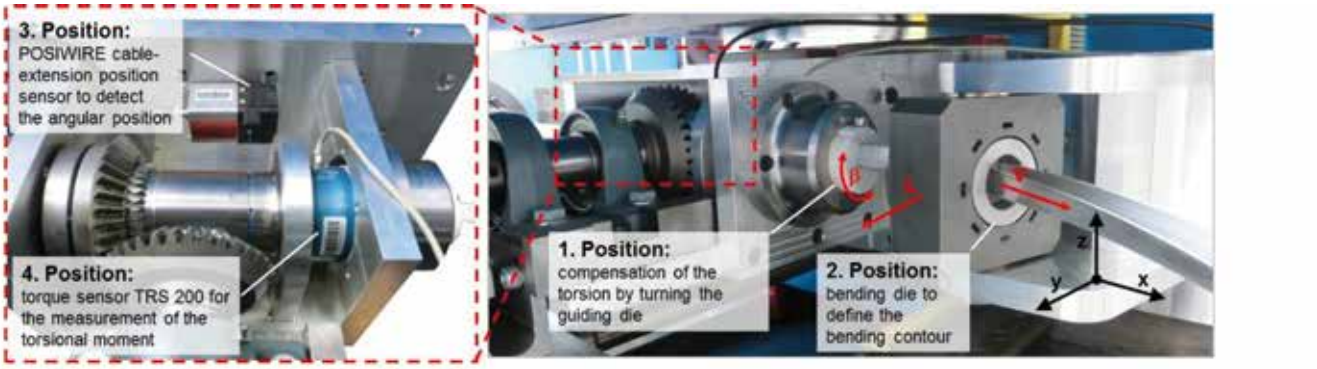

Figure 1: Tool setup for the die-push-bending process with integrated measurement technology

In spite of the different tool and drive systems, all free-form bending processes combine the high degree of flexibility in designing the bending geometry with little use of tools. However, the tool and system applications have so far been limited chiefly to the spatial bending of single- or double-symmetrical profiles with a closed cross-section. Therefore, an extension of the tooling technique is considered necessary to bend complex profiles with an open cross-section.

The bending of profiles with such a cross-sectional shape presents a particular challenge, since in addition to common manufacturing errors, such as a cross-sectional deformation or wrinkling, additionally an impermissible three-dimensional shape deviation can occur. The reason for this is the unfavorable introduction of the shear forces, which are necessary for the bending process. Due to the cross-sectional geometry, the shear force is not introduced at the shear center, which results in shear stress in the cross-section. The shear stress causes a torsional moment about the profile´s center of gravity. This results in a torsion of the profile´s cross-section about its center of gravity axis via a torsion angle. Due to an additional feeding of the profile, a contour deviation occurs. The torsion angle ψ is, according to VDI 3431 [11], the angle between the two cross-section, which are twisted to each other.

To prevent the torsion, it is necessary to initiate an external compensating moment in the cross-section via the bending tools. This compensating moment must be opposed the moment from the shear stress. In order to implement this in practice, only bending methods are suitable, which allow a process-related rotation of the bending tools about the center axis of the semi-finished product.

DEVELOPEMENT OF AN EXPERIMENTAL TOOL

In die-push-bending the bending tools support and enclose the cross section of the semi-finished product completely. Furthermore, a torsion moment for compensation can be actively applied by rotating the guiding die (Pos. 1, Fig. 1) relative to bending die (Pos. 2, Fig. 1). The die-push-bending process is applied at UTS on a conventional rotary-draw-bending machine. For this purpose, an experimental tool has been developed and produced by the support of Hans Berg GmbH & Co KG, Reichshof, Germany. The tool allows rotating the guiding die by the electromechanical drive of the wiper axis. Via the powertrain with a rack-and-pinion gear and a bevel gear, a drive torque of 700 Nm can applied at the guiding die around the x-axis.

For semi-finished products with differing cross-sections, the modular design of the tool allows simple replacement of tool elements in the bending die as well as in the guiding die. In order to minimize the friction between semifinish and guiding die, a plastic die of polytetrafluoroethylene (PTFE) is inserted into the guiding part.

The angular position of the guiding die is measured indirectly via a POSIWIRE cable-extension position sensor (Pos. 3, Fig. 1), which is a product by ASM GmbH, Moosinning, Germany. The torsional moment MtRE is identified by a static torque measurement. For this purpose, the torque sensor TRS 200 (Pos. 4, Fig. 1), by LIEDTKE Antriebstechnik GmbH & Co.KG, Hameln, Germany, is applied. The measurement data is gathered, processed and recorded with an external software for data acquisition, DIAdem 2011 by National Instruments Corporation, Austin, USA.

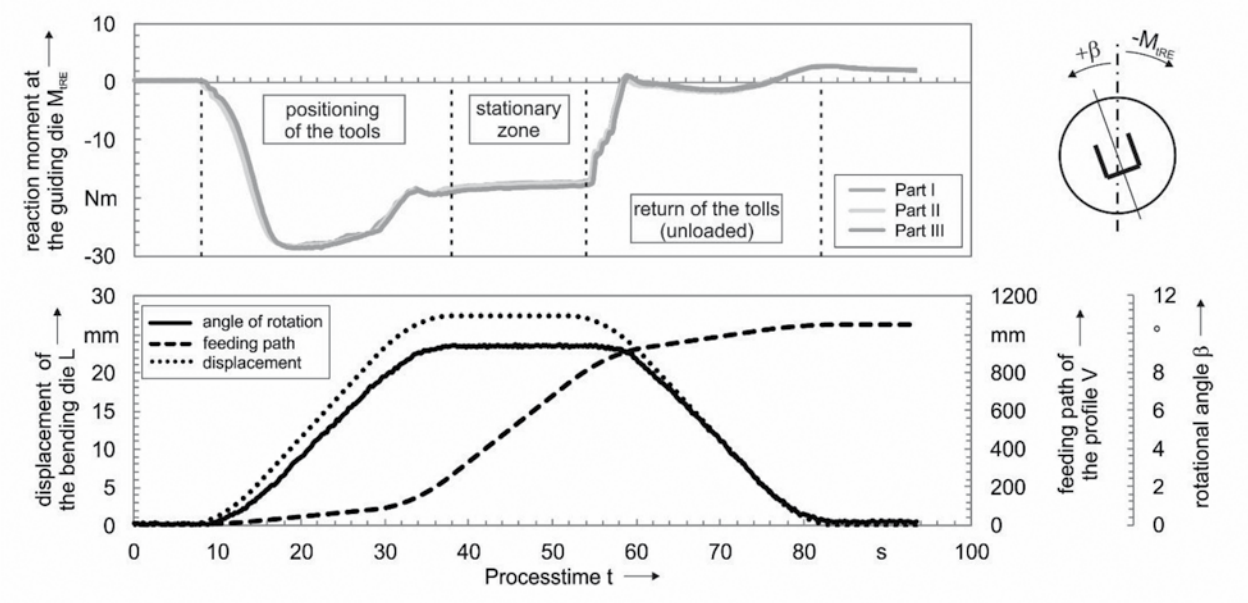

Figure 2: Plot of the resulting reaction moment at the guiding die over process time t (above) and the corresponding displacement of the bending die L and the feeding path of the profile V over process time t (below).

EXECUTION OF A PROCESS ANALYSIS

First, the influence of a superposed compensational moment on the torsional behavior of the bent profile has been investigated. The experiments have been carried out with an extruded u-profile of AlMgSi0,5 (3.3206), with a width and height of 20 mm, and a wall thickness of 1.5 mm.

At the beginning of the bending process, the bending die is shifted L = 30 mm in y-direction (see Fig. 1). By this, the position of the bending die and the bending radius after forming is determined. The position of the bending die remains unchanged in x-direction during the bending process. At the same time, the profile is feed in the direction of the x-axis and the guiding die is rotated around the x-axis. The rotational angle β is varied over the different series of experiments, since the angle has an influence on the compensation moment and the torsional behavior of the profile. After positioning the bending tools, the profile is pushed through a defined feeding path V through the tools.

Following the bending process, the bending die and the guiding die are returned to their initial position about a defined trajectory. The profile has to be moved simultaneously. Otherwise, an uncontrolled over-bending of the curved and twisted areas is possible.

In figure 2, the reaction moment MrRE applied to the guiding die, the feeding path V of the profile and the position of the bending tools, defined by L and β, are plotted over the process time. The bending process can be divided in three characteristic phases. In the first phase, the bending tools are positioned. The absolute moment initially increases up to a global minimum, before it subsequently drops to an approximately constant value.

This value remains unchanged in the second phase, in which only the profile is feed. In the shift to the third phase, which is initiated with the beginning of the return movement, the profile is suddenly relieved and the moment decreases to a value close to zero.

The torsion angle has been evaluated on a section of 100 mm for the rotation angles β = 0°, -5° and -10°. The displacement of the bending die L = 30 mm and the feeding path of the profile V are set constant. For all combinations of parameters, three specimens have been produced and measured.

EVALUATION OF SPECIMENS

In order to determine the torsion in the stationary area, the bent parts were aligned on the measuring table by means of two collets screwed into a magnetic stand. The tactile measurement of the U-profile was carried out along the outer and inner curve by a FARO-edge arm 2,7 of the company FARO Europe GmbH & Co. KG, Korntal-Münchingen. As measurement result, the respective arc is exported as a point sequence respectively polygon line and examined by a program sequence implemented in MATLAB R2014a. The examination of the arc is carried out exclusively on the almost constant curved arc area.

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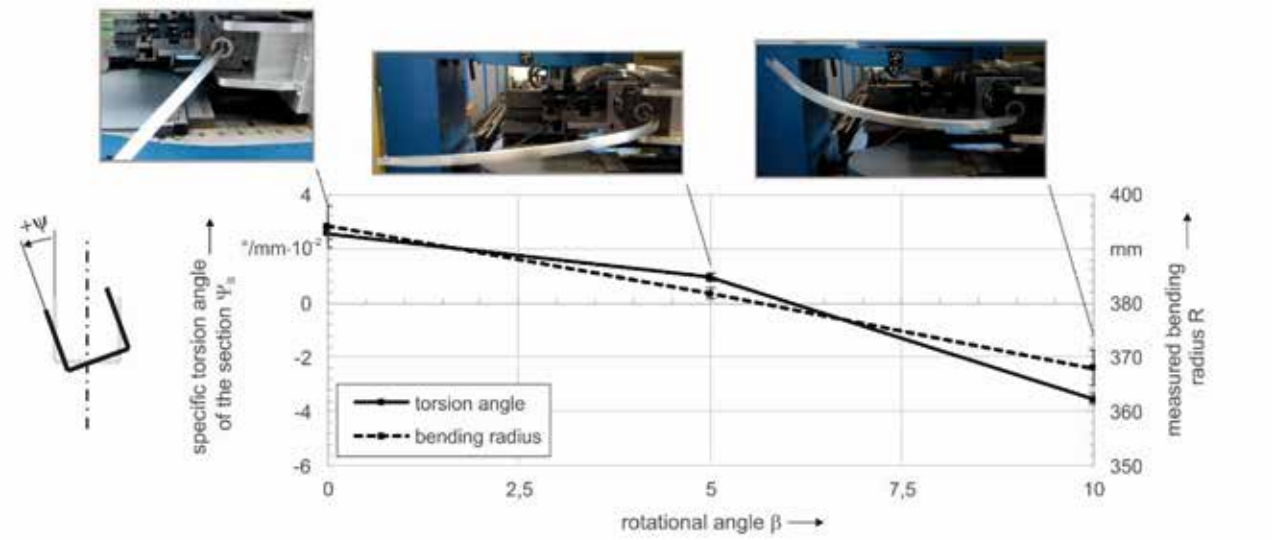

Figure 3: detection of the specific torsion angle ψs and the bending radius R for the different parameter combinations

Figure 3 shows that for an rotational angle of β = 0°, a specific torsion angle of ψ_S = 2,56 °/mm • 10^{-2} results on the bent profile. According to that, a three-dimensional contour deviation occurs in the negative direction of the z-axis. By adjusting the guiding die by 5°respectively 10°, the profile cross-section is specifically twisted between the bending and the guiding die. The moment applied around the x-axis in the profile's cross-section leads to a compensation of the torsion of the cross-section caused by the unfavor-able application of force. For a rotational angle of β = 10°, the specific torsion angle assumes a negative value, from which a contour deviation results in the positive direction of the z-axis. If the rotational angle is β = 5°, almost no torsion occurs. Considering three different parameter combinations, an approximate linear dependency between the specific torsion at the bent part and the rotational angle of the guiding die can be estimated.

Furthermore, it can be seen that there is a direct dependency between the torsion, present at the bent part, and the resulting bending radius. A transition from a positive specific torsion angle to a negative value causes a decrease in the bending radius. With regard to a future strategy for process design for the production of different individual radii as well as radii distributions, this interdependency has to be considered.

MANUFATURING OF PLANE BENT PARTS

Based on the linear correlation between the specific torsional angle at the bent part and the rotational angle, the required position of the guiding die was determined by means of regression analysis in order to bend a profile with an open cross-section in one plane. A comparison of the results for a bending process without and with specific compensation is shown in Figure 4. The part bent with compensation shows a specific torsion of ψ_S = -0,21 °/mm • 10^{-2} after the bending process in the constantly curved area.

POTENTIAL ASSESSMENT

Compared to shape related processes, kinematic bending processes offer the advantage that material-related springback can be compensated by the repositioning of tools. Furthermore, residual deviations in the process, due to material fluctuations between different batches, can be taken into account. By integrating an additional torsion-axis, three-dimensional contour deviations can be compensated or specifically adjusted on profiles with an open as well as closed cross-section structure.

Furthermore, it is possible to combine the die-push-bending process with existing manufacturing methods in a concatenate process technology. One possibility for the extension and realization is the roll forming bending, which includes a combination of the established production processes "roll forming" and "profile bending".

The knowledge from the field of roll forming and bending technology is combined in a continuous and successive roll forming and bending operation. By connecting the individual production processes

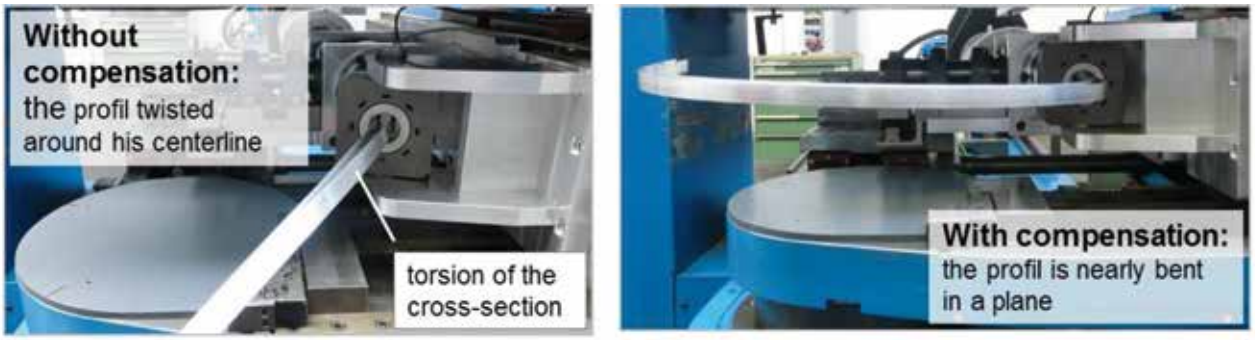

Figure 4: Bending of profiles with an open cross-section without (left) and with (right) torsion compensation

in series, a bent profile can be produced in a continuous way, starting from a wound strip material (coil). Additional logistical effort for the intermediate bearing of semi-finished profile products in buffer stores as well as for the internal material flow between the machines is thus eliminated.

SUMMARY AND OUTLOOK

For initial investigations, an experimental tool (see Figure 1) based on the principle of die-push-bending was developed at the Institute of Forming Technology and integrated on the existing CNC bending ma-chine. In the first series of experiments, it could be shown for an asymmetric U-profile made of an alumi-num alloy that the rotation of the guiding die can counteract a three-dimensional shape deviation by a specific superposition of torsional moment.

In the future, the process will be applied to further profile cross-sections and materials. Furthermore, an integrated strategy for the process design is developed. In addition, a combination of established manufacturing processes is to be used to build up in-line production and make ready-to-install individual components feasible.

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Innovative tube and pipe products made from steel and aluminium

Tubes and pipes are some of the most versatile products and design elements in general. Whether in the energy sector, mechanical, power or automotive engineering, in the chemical or petrochemical industry, in construction or in one of the many other areas, tubes and tube designs in different shapes, sizes and weights can be found everywhere. Steel tubes and pipes cover a particularly broad spectrum, as these products are conquering new applications, partly due to the innovative strength of manufacturers. However, thanks to new and further developments, they are also maintaining a good position in traditional applications.

In the energy sector pipes have become indispensable for the transportation of oil and gas, while also playing a major role as design elements. In fact, most structural foundations of offshore wind turbines consist of pipe elements. Pipes also fulfil important functions in the offshore production of oil and gas.

Special pipes for deep sea use

This application is one of the focal areas of Salzgitter Mannesmann Forschung GmbH (SZMF), the company that handles research and development for the Mannesmann Division at Salzgitter AG. According to this company, there is a demand not only for products but increasingly also for full-scale technical solutions. In tubes and pipes, for instance, their super duplex pipes have now been optimised for deep sea applications, so that a reliable media supply can also be ensured in deep water.

Such deep sea supply pipes (so-called umbilicals) are used on offshore platforms for the transportation of control signals, energy and chemicals from the surface of the water to the seabed. Special locations at great water depths down to 2,500 metres pose major demands on the rigidity, fatigue resistance and corrosion resistance of pipes. This is why trial procedures have been developed that make it possible to qualify super duplex pipes for deep sea applications. According to the company, close collaboration with initial customers has enabled them to identify the required pipe properties quickly and efficiently and to qualify their pipes accordingly.

Other growth areas that will be supported by research and development projects over the next few years will focus on the customised optimisation of pipe and tube properties. Take, for example, new developments for automotive engineering. Although the combustion engine has been written off by many, automotive manufacturers are not alone in believing that it will remain an important form of propulsion for many years to come. However, this makes it necessary to achieve further reductions in consumption and in harmful emissions – an area where precision tubes can help to achieve higher injection pressures that will warrant a more eco-friendly combustion process. In non-motor applications tubes with variable wall thicknesses can be used to support load-optimised lightweight construction.

Innovations for automotive tube solutions

Lightweight automotive construction is also at the focus of research and development at Benteler AG. Last year, for example, the company held its first Steel/Tube Lightweight Construction Convention in Bad Driburg. The latest innovations in automotive tube solutions included the prototype of a front axle carrier for electric vehicles. Thanks to a new innovative steel design, the weight has apparently been reduced by 35 per cent. Another innovation with lightweight potential that may be of interest to automotive manufacturers is the use of welded tubes made from a new steel with superior strength yet also above-average formability. The company says it has already created the first prototypes for some customers and is now awaiting validation.

Furthermore, the automotive industry should soon benefit from ultra high-strength tubes which can apparently be used as innovative automotive suspension systems. Compared with today's series production, such chassis solutions should save up to 30 per cent in weight. The first systems, says Benteler, were already being manufactured and validated on customers' premises in late 2016.

The first successes have also been reported in the segment of hot-

rolled axle tubes. Having received initial bookings from customers, serial deliveries are now running well. Moreover, Benteler has successfully provided customers with a range of innovative steel and tube solutions as well as prototypes for axles, track rods and axle guides for utility vehicles.

New solutions for industry and energy

But Benteler also offers innovative products outside the automotive sector. In industrial applications of seamless precision tubes this includes pre-tubes for the production of injection anchors (ground engineering). In a large-scale industrial project for tunnelling under a motorway in the Netherlands the company has successfully developed and implemented a modified steel product with, according to Benteler, offer an "excellent combination of strength and robustness" as well as special rolling and heat treatment technology.

Other recent Benteler products include welded and seamless ducts based on special surface technology (Zista Steel) that is intended to provide "excellent corrosion protection in combination with outstanding processing qualities".

Lightweight tube design for electric vehicle chassis

Although the combustion engine has by no means had its day in vehicle construction, it can be assumed that electromobility will increase and gain in importance. Tube component manufacturers will need to bear this in mind. After all, a purely electric vehicle no longer has any need for a complex exhaust system, just to mention one example of a tube component. Another area – lightweight construction – should also become increasingly important with the spreading of battery-driven electric vehicles. Rechargeable battery packs with a conventional reach of 300 to 500 km (180 to 300 km) still weigh many hundreds of kilograms, which is unlikely to change much – at least in the near future. Unless it becomes possible to do largely without batteries – fuel cells might be the answer – then it will be important to save weight in other areas.

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This will make it vital to reduce the weight of vehicle parts and thus to increase overall efficiency and save resources. Modern "exotic" materials, such as carbon, still have their limits in mass production, due to technical constraints in manufacturing and also economic limits, even though progress in the industrial processing of such materials is clearly in evidence. Here, the obvious alternative is lightweight construction based on steel as a proven material.

This is the purpose for which Thyssenkrupp Precision Steel in Hohenlimburg presented a new component for the chassis of electric vehicles some time ago. Specialising in medium-wide strips within the group, the company acted as a cooperation partner in developing a super-light tube made from high-strength steel (HBS 800). As less material is required, the optimised chassis component apparently allows the manufacturer to save over 34 per cent in weight. Being one third lighter, the component is also said to have benefits such as shorter production times and far less wastage. For series manufacturers it should be important that they can continue to use their conventional manufacturing processes for the production of this innovative steel design.

Another element in the new vehicle concept is tube stabilisers made from manganese-boron steel. This innovative solution is said to save 45 per cent in weight. Moreover, its homogeneous structure and extremely tight thickness tolerances allow high-frequency welding. And the concept also permits variable wall thicknesses and thus a further reduction in weight. These new lightweight steel construction solutions are made by a processing firm for the automotive industry. According to Thyssenkrupp Steel Europe AG, the ideas developed by the cooperation partners are to be used in a project for the Asian market where they will help to create a particularly long-life electric vehicle.

Internal high-pressure forming of hybrid aluminium/steel tubes

Aluminium is one of the most widely used materials in automotive engineering, alongside steel and various plastics. Bonding steel and aluminium components, however, can be a problem. A solution has now been found by the

Institut für Integrierte Produktion Hannover (IPH) gGmbH together with Laser Zentrum Hannover (LZH). The result is a tailored hybrid tube, made from aluminium and steel, which can even be given the relevant shape in an internal high-pressure forming process. First, steel and tube elements are soldered together in a laser process.

This makes it possible to apply internal high-pressure forming without breaking the bond. The developers are convinced that their technology will allow the production of particularly light components for vehicle bodies.

Internal high-pressure forming of hybrid tubes combines two lightweight approaches: Firstly, it saves weight through the geometry of the components, as tubes are generally suited for lightweight construction because of their excellent stiffness and robustness in relation to their weight. Secondly, the combination of steel and aluminium permits further savings in weight. Being both heavy and rigid, steel is only used for parts that will be exposed to high stress. Segments with less exposure to stress, on the other hand, can be made from aluminium. The company mentions especially light body parts such as connection points to the B-pillar where steel is used for critical areas that may need to be highly impact-resistant, e.g. in an accident.

The challenge in making such hybrid components is that steel is far more resistant to forming than aluminium. Also, tube sections must be combined in a way that avoids cracks in the joining area while forming is in progress. As welding leads to a brittle, non-formable seam, the steel and aluminium tubes are bonded together in a laser soldering process. The aluminium silicon batch is locally heated and melted, using a laser beam. The very low heat input prevents any brittleness in the components that might diminish the mechanical properties of the seam during the forming process.

According to the developers, the soldered joining area can withstand pressures up to 900 bars. In interior high-pressure forming such pressures are more than adequate for the forming of both aluminium and steel. To achieve maximum homogeneity in the forming process and to obtain the best possible results, the experts recommend combining steel (E235+C) and a higher-strength aluminium alloy (EN AW-6082).

Between now and the next issue of Tube 2018, the leading International Pipe & Tube Fair, researchers and developers in Germany and elsewhere will undoubtedly come up with further interesting innovations in tubes and pipes. As always, the leading trade fair will also include new developments in plants and machinery for the manufacturing and processing of pipes and tubes. As before, Tube 2018 will be held at the Düsseldorf Exhibition Centre, together with wire, the world's biggest wire and cable trade fair, from 16 to 20 April 2018

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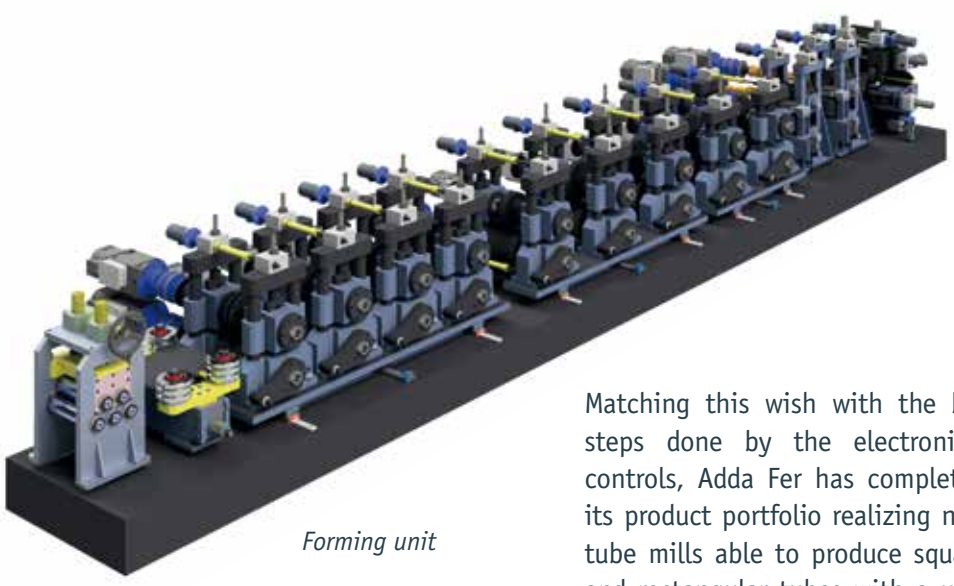
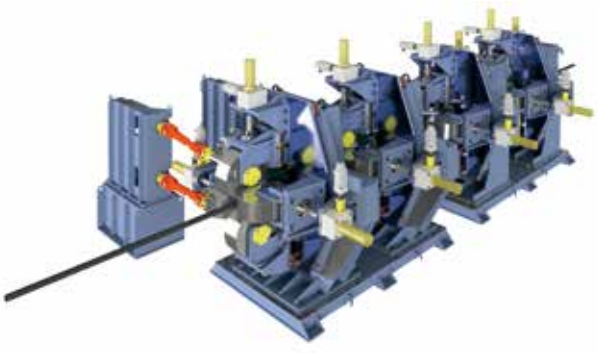


Forming unit

In the last years, the request of higher production flexibility has grown more and more, forcing the technology in finding new solutions that permits to have short time in size change and less tooling needed to cover all the production mix.

Fine pass stand and welding head



Turk heads stand

Matching this wish with the big steps done by the electronical controls, Adda Fer has completed its product portfolio realizing new tube mills able to produce square and rectangular tubes with a universal set of rolls and with an automatic adjustment system controlled by the PLC. This decreases dramatically the time needed to change size and permits to have the possibility to produce all the sizes needed without delivery time lost for rolls manufacturing. Moreover, the direct forming of the 90° edges of these tubes, without passing from the round mother tube, permits also to save raw material.

In fact, this particular deformation of the metal strip interests a smaller area than the traditional forming and the thickness on the edges decreases instead of increasing as in the traditional forming when the round tube is squared. For this reason, the starting width of the coil can be from 4% to 8% narrower saving tons of steel every year on the total production.

The standard configuration of the mill is with eleven stands before the welding head, two or three sizing stands depending from the range of thicknesses required and two turk heads.

The first five stands are used to form the lips from the flat strip. Then, four passaged complete the most of the forming using the internal rolls. Two fin-pass stands are then completing the forming creating the V channel with the correct shape to weld the tube correctly.

After the welding, scarfing and quenching, two or three sizing stands are calibrating the sides of the tube to the correct tolerance and two turk heads are straightening the tube before the cut-off. All the eleven stands before the welding and the sizing stands are driven with a dedicated motor for each stand and only the turk heads are idle.

The set up is made with hydraulic or electrical motors able to adjust the width of the forming stands, of the sizing stands and correcting the gap between the rolls for the correct thickness produced. The set of rolls is part of the machine and doesn't require to be changed accordingly with the size. All the adjustment are done in automatic by means of the supervisor system.

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New Tube and Wire Solution from Hexagon Manufacturing Intelligence

BendingStudio with Absolute Arm Brings the Speed of 3D Laser Scanning to the World of Tubes and Wires.

A new approach to tube and wire measurement was today announced by leading metrology and manufacturing solution specialist Hexagon Manufacturing Intelligence. An updated version of the popular AICON BendingStudio software platform now allows for the integration of a ROMER Absolute Arm with Integrated Scanner that can quickly determine complex tube and wire geometries using 3D laser scanning technology at almost any point in the production process.

From tube and wire inspection to manufacturing and reverse engineering applications, BendingStudio with Absolute Arm is a full-featured solution built on well-established technologies. The system will benefit from the ability to connect directly to a CNC bending machine, allowing for the simple and immediate correction of production errors.

"Speed and portability are both important to our customers in the tube and wire manufacturing industries," says Stephan Amann, Business Director for Portable Measuring Arms at Hexagon Manufacturing Intelligence. "While our previous tube and wire solutions focused on delivering one or the other, BendingStudio with Absolute Arm combines two established products into a new solution that is greater than the sum of its parts. We have in this new system the portability to measure geometries right on the shop floor in a quickly and easily repositionable and reproducible way, alongside the speed of being able to determine a tube's exact geometry with just a few fast sweeps of a 3D laser scanner."

With this new version, BendingStudio will retain all its previous capabilities, allowing users to combine use of the ROMER Absolute Arm with Integrated Scanner with a complementary AICON TubeInspect. With these two measurement hardware endpoints operating on the same software platform, users will benefit from increased efficiency within a toolkit covering every need in tube and wire design and manufacturing.

BendingStudio with Absolute Arm is available immediately from Hexagon sales offices and distributors, both as a standalone software package for current ROMER Absolute Arm with Integrated Scanner owners and as a full product package including both the BendingStudio software and a ROMER Absolute Arm with Integrated Scanner. Current owners of BendingStudio who wish to add a highly portable measuring solution to their existing toolkit will be able to simply upgrade their existing software package alongside the purchase of a ROMER Absolute Arm with Integrated Scanner.

About Hexagon Manufacturing Intelligence

Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, our expertise in sensing, thinking and acting – the collection, analysis and active use of measurement data – gives our customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

Through a network of local service centres, production facilities and commercial operations across five continents, we are shaping smart change in manufacturing to build a world where quality drives productivity. For more information, visit HexagonMI.com.

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Ajax TOCCO

Ajax TOCCO Sells New EMMEDI MosWeld SiC HFI Welder on Display at Fabtech – Chicago

Ajax TOCCO Magnethermic recently sold a new EMMEDI MosWeld SiC HFI welder which was displayed publicly for the first time at the FABTECH show in Chicago 2017. The welder will be installed in the Midwest, USA in early December.

This new SiC welder will forever change the face of HFI welding technology. Using high-current capable SiC (Silicon Carbide) transistor technology, the EMMEDI MosWeld SiC system delivers the same frequencies as former Mosfet units.

However, what sets this unit apart from other Mosfet units, is that the SiC Mosfet's only require four semiconductors versus 36 of the traditional Mosfet transistors, per 100 kW of power.

This particular 500 kW MosWeld SiC unit has 16 Mosfets versus 180 Mosfets required of traditional solid-state Mosfet HFI welders. The SiC Mosfet transistor frequency rating is 150 - 500 kHz, which is the ideal frequency for most HFI welding applications.

Previously, IGBT transistors were the only transistor with high-current capability. Their maximum frequency range of 150 kHz, as defined by the device manufacturers, is on the lower end of the ideal frequency range required for most HFI welding applications. The new Emmedi MosWeld SiC from AjaxTocco is the first HFI welder to operate at the optimum HFI welding frequency range for most HFI welding applications, with high-current capable SiC Mosfet transistors.

Ajax TOCCO Magnethermic®, a subsidiary of ParkOhio Holdings Corp.®, designs and manufactures world-class induction heating and melting equipment for various industries and applications throughout the world. In addition, the Company provides a range of services including laboratory process development, preventive maintenance, equipment repair, and parts, coil repair facilities and installation services through its locations in North America, South America, Europe and Asia. www.AjaxTocco.com

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Bossi S.r.l.

Customized in-line brushing machines for large tubes

40 years of activity in the manufacture of machines for metal z

BOSSI after having designed and manufactured a brushing machine with double rotary drum, to be installed in-line on a tube mill with laser welding system for stainless steel tubes with a maximum diameter of 12 inches, didn't settle but raised the difficulty level by realizing two machines for one of the world's largest tube manufacturers that, in addition to satisfying the qualitative performance of the result and the maximum diameter, are able to move orthogonally with respect to the working axis during the phase of brushing.

This manoeuvre allows the operator to correct possible shifts of the working axis and always ensure a uniform brushing. This translation may seem insignificant but it is not at all if we consider the 12.000 kgs of weight of the machine and the mass put in centrifugal rotation.

The machines are completely electronic, with automatic pressure control system and possibility of height adjustment in order to fit any type of tube mill, both with fixed tube bottom and fixed tube centre. Our systems are already in compliance with the requirements of Industry 4.0.

In this project, we invested heavily in research and development as we noticed that in recent years the big tube manufacturers are moving towards larger diameters and sections, produced with increasingly high-performance tube-mills at considerable speeds,

considering that only 10 years ago it was inconceivable to work these dimensions.

For these reasons, BOSSI developed a range of brushing machines, both for round and square tubes, able to brush diameters up to 12 inches and square or rectangular sections up to 300x300 mm.

Flexibility in responding to different requirements, a well-structured commercial network and a skilled technical service characterize our activity whose key component is represented by a "tailor-made" quality according to market needs.

The long experience combined with new technologies allow to reach the required performances thus assuring the customer a high-quality product which can respond to current requirements.

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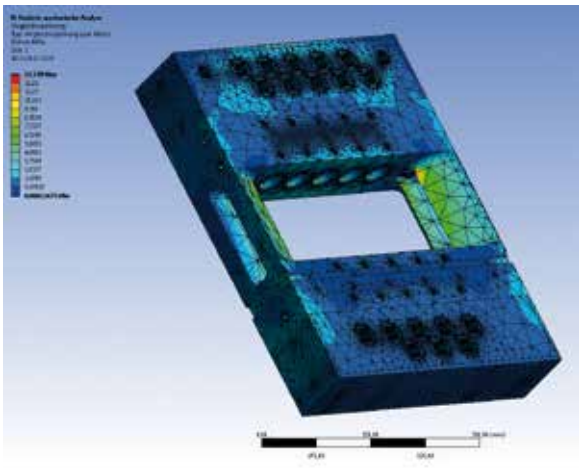
Bültmann GmbH

BÜLTMANN Heavy-Duty Ring Frame for Multi-Roll Straightening Machines



The sufficiently known BÜLTMANN rigidity concept for the design production machines has proven its worth until today. The positive feedback of our customers more than ever justifies this philosophy in this day and age. After all, the requirements with regard to strength and quality of tube and rod products have risen continuously in recent years. It can be assumed that this trend will continue.

All the more it was the right decision that BÜLTMANN has relied on the fully enclosed ringframe construction for the design of multi-roll straightening machines from the very beginning. Only this extremely rigid frame construction can meet current and future requirements.

The completely closed ring frame make BÜLTMANN made of solid forged steel blocks ensures a secure and torsion-resistant force absorption and distribution, a low-vibration running, most precise straightening results, a long-life cycle of the machine, a precise and safe clamping of roll holders during straightening, as well as a most sensitive adjustment when processing delicate tubes.

In addition to that is ensured free accessibility to the straightening area due to the not existing columns, so that it is possible to very easily and quickly change the straightening rolls by means of the quick roll changing device.

Each frame is individually designed by means of FE analysis in order to reliably cover the required applications.

Furthermore it can be stated, based on our experience and the feedback of our customers who were working with older straighteners with steel crown frame and columns, that this obsolete frame concept is not state of the art.

The downside of this concept is that the frame is not closed, that the upper and lower parts are connected just by columns. The frame is not able to securely take up and transfer the straightening forces in vertical and horizontal direction. The machine is not rigid and will be distorted during straightening. This has a negative effect on the tube quality, the reproducibility of product-related machine settings, the susceptibility to vibration as well as the lifetime of the machine. The accessibility of the straightening area is also considerably restricted.

If you want to meet the highest demands now and in the future, BÜLTMANN “State of the Art” tube and bar straightening machines are a must.

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Bureau Franke

Our control improves your result

"Engineering Bureau Franke International" Ltd. is an independent international inspection company which provides full and comprehensive range of services including control of technological processes during production, final quality and quantity acceptance at manufacturing site, loading and unloading operations during the process of dispatch of goods in all Black, Azov and Sea ports as well as the main Chinese and Baltic Sea ports.

Reputation of the company is based on more than 40-years history, high skills of management and employees.

Establishing of close and long-term partnership with clients is one of the main criteria of the company' policy.

In the field of ferrous and non-ferrous metallurgy Engineering Bureau Franke provides inspection of the following products:

- Seamless and welded tubes and pipes including:
  - OCTG pipes especially with Premium Connections;
  - Drill Pipes;
  - Line Pipes;
  - Construction pipes;
  - Pipes for machine-building;
  - Heat- and corrosion resistant tubes and pipes for boilers and refineries.
- Flat products including:
  - Hot- and Cold-rolled coils, sheets and strips especially for welded pipes manufacturing;
  - Galvanized and Coated sheets
  - Heavy plates.

- Long products including re-bars, hot-rolled and cold-drawn wire, I and T-beams, angles, rails.
- Steel billets, and Coast-Iron.

Thanks to developed network of branch offices and affiliated companies in Europe, CIS countries and China filled up with high level trained and motivated staff the company has opportunities to fulfill quality control of products as well as technical and QA audits in accordance with very severe requirements of the customers.

Among the clients of EBFI – the customers of such metallurgical and pipe producing companies as VOEST ALPINE, TPCO, Interpipe, Chelpipe, Metinvest, TMK, OMK.

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Controle Mesure Systemes

Inspection, measuring & testing

Eddy current rotating head RotoETscan for steel tubes inspection

Contrôle Mesure Systèmes will exhibit at TUBE Dusseldorf from 16th to 20th April 2018 – stand 6G18.

Specialist for nearly 30 years in nondestructive testing methods, we propose a large range of NDT equipments, especially for tubes and bars inspection, on or off line, in ferrous or nonferrous metal.

The 2 mains products of CMS are:

- Eddy current rotating heads RotoETscan: for tube inspection, diameter range 1 to 220mm, for surface, subsurface, punctual flaws detection.
- Ultrasonic rotating heads RotoUTscan for tube / bar inspection welded or not, in stainless steel, titanium, zirconium, but also in carbon steel (diameter range 6 to 250 mm) for longitudinal and transversal defect detection, thickness measurement as well as OD – ID and ovalization.

These rotating heads can be combined with other CMS equipments (magnetizing units, rotating systems, support coils…), and can be installed together in a strong control bench including centering devices. Supervision software allows displaying combined signals (UT / ET) and creating inspection reports that can be used as control evidences for quality services and customers. Data stored can be recall for analysis and quality treatment.

All the systems meet quality standards such as API, ASTM, DIN.

Through its products and its remote assistance, Contrôle Mesure Systèmes provides, all over the world, quality and productivity solutions for tubes applications.

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Ultrasonic rotating head RotoUTscan for steel alloys bars inspection

Going crazy when things go bent?

Let us straighten them out.

Rigatoni or steel piping? It makes no difference to us what you want to make. We see to it that your production process functions optimally and your final products fits the bill.

Our laser system measures straightness, diameters, ovality, shape and length all in one go and its totally non-contact. It has never been simpler to detect and avoid damaged or miscon-figured production equipment, to minimize the number of rejects and to achieve total perfection.

LIMAB gives you:
- Reduced set up time
- Improved safety
- Higher yield
- Immediate error detection
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LIMAB®
CONTROL BY MEASUREMENT

Copier Bevelmachines

NEW: Beaver CB series for pipe cut- and bevelling by Copier Bevelmachines

Beaver CB, Cnc pipe cutting and bevelling machine

We are happy to introduce our latest machine development for metal pipe cutting and bevelling in one production line: the Beaver CB series. Available in several sizes, overall from 1"up to 48".

Copier Bevelmachines is manufacturer of pipe end working machinery for many years now. The company offers stationary equipment for pipe shops, mainly pipe bevelling machines, pipe cut and bevelling machines, CNC pipe end working machines and pipe spool welding machines.

Since all our customers have to cut or saw the pipes before they start bevelling we developed a production line capable of cutting and bevelling metal pipes. This machine is called the Beaver CB. To have these features in one machine is very efficient and effective. The Beaver CB is modular built. You can have the basic cut- and bevelling machine, but you can expand with several types of roller benches, with manual or automatic pipe handling. Also length measuring is possible, it makes it very easy to cut a pipe to several different lengths. One operator could control the complete production line from the operator panel. You also can connect it to the overall shop control system and send the orders to the machine.

With the Beaver CB series your output will be higher because length measuring, cutting and bevelling is combined in one machine.

The Beaver CB is a completely CNC controlled machine with both radial and axial feeding, it cuts with up to three cutting bits from outside to inside of the pipe and during this process it performs a bevel shape with the required angles. All ASME code bevels are pre-set in the machine.

Pre-set bevel shapes

The operator could select one of the pre-set bevel shapes and dimensions that have been saved in the software of the CNC program. These bevel shapes are mostly based on the ASME or DIN bevel shapes and dimensions. The machine automatically changes tools according to the bevel shape and angles. The machine works with a single point CNC machining process and because of that could cut and bevel up to 60 mm thick walls. The Beaver CB will perform a bevel shape on both ends of the cutted pipe if required.

How does it work?

On the front infeed conveyor you put a metal pipe. The operator fills in the pipe parameters like pipe diameter, wall thickness, type of steel, bevel type and pipe length. The operator also enters all the lengths of the pipe parts that needs to be cut from the starting length. The push up infeed conveyor pushes the pipe into the Beaver CB and knows where to clamp it in order to make the cut on the required length as entered in the program. The machine starts cutting and during the cutting process it performs a bevel on both pipe ends. After that the

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pipe pieces are processed to the outfeed conveyor from where they can be dispatched.

User friendly

The Beaver CB is a user friendly machine mainly because everything is straight forward in the CNC programme that we designed together with the company FANUC. The machine operator works in an operator level and cannot change settings if not allowed. Only the administrator can change program settings. To work with this machine you do not have to be a trained CNC machining expert but you have to understand the basic process of course the CNC program.

Output

Obviously the output of the Beaver CB is much higher that when you would invest in a band saw in combination with bevelling machines. Another advantage is that you do not have the internal transport anymore from the saw to the bevelling machine. Another big advances of the Beaver CB series is the exact 90 degree cut it makes.

Flexibility

The Beaver CB is flexible and suitable for many pipe fabrication jobs because your most common bevel shapes and bevel angles are pre-set in the CNC software of the machine. Besides that the machine automatically performs these shapes by single point machining. You can do all different types of bevel shapes without changing tools. Also the full machining range can be done without adjusting the tool position.

Altogether it is a great machine to increase the output and the flexibility of your pipe shop!

Contact us if you are interested in a quotation or if you are interested in a demonstration on this Beaver CB in our factory in the Netherlands.

Condat Lubricants

Compliant lubes for copper tubes

Leader in the mechanical wire drawing market, Condat has earned an international reputation for supplying lubricants with added value to the industry. For the tube industry, CONDAT has recently developed drawing lubricants dedicated to copper tubes used in air conditioning and refrigeration service. New products to be discovered on Tube Düsseldorf.

Refrigeration tubes imply strong lubrication requirements

Copper tubes for air conditioning and refrigeration service must usually comply with various standards such as ASTM B280, EN 12735 and NBR 14665. In order to draw the tubes, an oil based product is often used for the lubrication between the tube and internal mandrel or plug. According to the fore-mentioned standards, the lubricant residues must be very low. Additionally, some systems' manufacturers request the residues to be compatible with refrigeration gas such as R134-a.

Reducing the drawing residues often means drawing with a thinner lubricant layer between the tube surface and the tooling. A high-performance lubricant is therefore required to avoid contact between the surfaces even at high speed. The various drawing steps impose a large range of viscosities to cover the different dimensions, deformation ratios and speeds.

Compatibility of the lubricant residues with R134-a gas leads to high technological constraints for which a reliable knowledge and control of the product's raw materials (oil, ester, additives...) is required.

CONDAT lubricant solutions

Condat R&D experts have developed lubricants dedicated to drawing copper tubes intended for air conditioning and refrigeration service. They have formulated these high-performance lubricants in order to reduce the amount of internal residues while offering the required lubrication level. They defined the formula, the raw materials and the production methods to ensure the lubricants are R134-a compatible.

These lubricants are already available under the larger CONDATUB TFH range and can be used for copper or aluminum tube drawing.

Different viscosity levels are available to respond to different deformation requirements, allowing optimal surface finish and cleaning ability (some formulations are designed to vanish during heat treatment operations).

To know more, contact the Condat team at tube@condat.fr or visit CONDAT at Tube Düsseldorf show, Hall 5 C10

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Danieli & C Officine Meccaniche S.p.A.

Developing effective solutions for demanding markets

The tube and pipe plants, forging and steel extrusion sessions of the Fourth Danieli Innovaction Meeting

Highly specialized engineering requirements in the tube and pipe market create the possibility for suppliers of tubular products, and extrusions to establish a unique market presence, and for this they must have timely insights, advanced production technologies, and new integrated plant concepts. Guests attending the tube and pipe plants, forging and steel extrusion session at the Fourth Danieli Innovaction Meeting took in all of these.

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Danieli & C Officine Meccaniche S.p.A.

Alfapipe Ghardaia HSAW welded pipe plant in full operation

This is the first of two lines ordered by the Algerian producer to Danieli

Alfapipe 80" line for spiral welded pipes installed in Ghardaia plant passed all performance tests in terms of productivity and quality and is now in full operation. The line has been specifically designed to process high wall thickness pipes up to 25.4 mm.

Data M Sheet Metal Solutions

data M Managing Director Albert Sedlmaier awarded China's highest honor to foreign experts

Vice Premier Minister Ma Kai (right) with data M managing director Albert Sedlmaier (left) at the friendship award ceremony.

Albert Sedlmaier, managing director of data M Sheet Metal Solutions GmbH from Germany, has been awarded with The People's Republic of China Friendship Award for his work as a technical adviser. On September 29th, the prize was given to 50 experts who contributed to the economic and social development of China. The Friendship Award is the highest Chinese honor granted to a foreigner.

In the market segment of design and simulation software for roll formers, the company data M is world leading with its COPRA product family. Besides his role as a businessman, managing director Albert Sedlmaier is acting as a technical adviser at the Jinan Foundry and Metalforming Machinery Research Institute that has also nominated him for the award. Albert Sedlmaier is delighted with the accolade: "This award is an honor for me, but also for every staff member at data M and our region."

With innovative CAE technologies, the software specialist data M is a pioneer in the field of roll forming and has been targeting the world market from the start. As early as 1991 Sedlmaier established a business and academic collaboration with Dr. Liu, professor at North China University of Technology at the time. For the past 26 years, the two experts built up a nationwide network, trained specialists and introduced new technologies to the Chinese market.

However, the collaboration extends far beyond the field of software. At present, the company from Bavaria is working together with a Chinese machine builder in flexible roll forming based on a patent license. The data M machine allows the production of profiles with discontinuous cross sections for the first time. The company also developed another 3D roll forming machine for prototypes that can produce profiles from batch size 1, which makes it particularly useful for research institutes and automotive suppliers.

Data M Sheet Metal Solutions

data M Sheet Metal Solutions honored with Bavarian Foreign Trade Award

The German company data M Sheet Metal Solutions has been awarded with the Foreign Trade Award by the Bavarian Ministery of Economic Affairs and Media, Energy and Technology in the category Services. The accolade is an award for small companies from Bavaria with not more than 50 staff members and a high export ratio. State Minister Ilse Aigner presented the honor on Wednesday night during an award ceremony at Joseph-Wild-Hall in Munich.

From left to right: Stefan Tavares Bollow, State Minister Ilse Aigner, Albert Sedlmaier, Maximilian Sedlmaier, Stefan Freitag, Managing Director data M Sheet Metal Solutions GmbH Copyright: sl-pictures.de/Bayern International

data M is a world-leading special software developer for roll formers and has been working together with numerous international partners on business and academic matters. Managing director Albert Sedlmaier is delighted with the award: "This prize is terrific for our company. Despite our international focus with an export ratio of 85 Percent and subsidiaries abroad, we have a strong link to our home base in Bavaria." data M also received a company portrait video that was shown at the ceremony for the first time.

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data M Sheet Metal Solutions presents training packages for simulation software COPRA® FEA RF

The Bavarian company data M Sheet Metal Solutions is presenting its extensive service- and training-packages for the software solution COPRA® FEA RF at the TUBE fair 2018. The packages contain for instance complete example models including video-tutorials for the integration of pre- and post-processing operations with a focus on embossing and tube bending.

The industry demands precisely fitting and complex products with small bending radius to wall thickness ratios. This makes manufacturing ever more demanding. The leading software solution COPRA® FEA RF visualizes and verifies the production process within a virtual environment and thus prevents deviations during production. By taking into account previous roll forming procedures, pre- and post-processing steps can be optimally calculated thus improving the forming process as a whole.

Tube bending of a roll formed tube in COPRA® FEA RF

With the training packages for the software, roll formers will be able to integrate additional processing steps into the forming process. The designers learn among other things how to utilize the advanced functionalities of COPRA® FEA RF. An applicable package contains a ready-to-use simulation model as well as 3D models for any necessary tools. These can be used immediately with the 3D import functions of COPRA® FEA RF 2017. Furthermore, a manual for the creation of example models including a video tutorial is also added to the portfolio. Finally, the detailed instructions for the application of COPRA® FEA RF 2017 enables roll formers to create better models for future projects. Special trainings can also be conducted upon request.

data M Sheet Metal Solution keeps working on training and service products for existing and new customers. The company is thereby also reacting to the rising demands of the industry. The packages are aimed predominantly at roll formers and tube makers planning to expand their product portfolio with additional processing steps without losing control over the entire manufacturing process.

Dhatec BV

Optimizing pipeline transport with Sytem88

Last September, Jan De Nul Group won the IADC Safety Award 2017, during the Annual General Meeting of the International Association of Dredging Companies (IADC) in Marseille, France. Jan De Nul Group designed and tested their optimized working process by colleagues in the field. The team combined new ideas with various techniques available on the market which resulted in an overall safer process to handle and transport pipelines. This company was honoured for its 'transport of pipeline optimization' initiative on its logistic hubs in Zelzate (Belgium) and worldwide. They optimized and enhanced the handling and transport of dredging pipes by means of three techniques, including the use of DHATEC 'cradles' known as System88 – a safe and flexible transport system for transporting pipes by train or truck. Jan De Nul commented on this product: "System88 is perfectly equipped for transporting pipes. Not only are we able to stow two high on trucks, but we can use different types of trucks as well. For a project in Italy, for instance, we drove more than 280,000 kilometres with this system. Without any damage and without having to replace a single block". System88 is easy adjustable for different pipe diameters, with an application range from 219,1 mm - 3.657,6 mm (8" - 144"). This system is safe, reliable and tested by TÜV Nord Mobilität.

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Dhatec BV

Australian standard for DHATEC Pipe Hooks

All DHATEC Pipe Hooks comply with the highest European quality standards and NEN-EN-13155. 'Crane-Safety-Non-fixed load lifting attachments'.

We are proud to announce that DHATEC Pipe Hooks also comply with the latest Australian standard AS;4991;2004 'Lifting devices'. And can now also be sold in Australia, ensuring a safe, reliable and consistent product.

This compliance for DHATEC's handling equipment was requested by an Australian customer. At DHATEC, our clients' needs come first and if required, we can apply this for other countries as well.

Looking for a special compliance request? Please send an email to info@dhatec.nl or contact +31 497 542 527.

Elmed Dr. Ing Mense GmbH

70th company anniversary – a success story from Heiligenhaus

On January 8th 2018, ELMED Dr. Ing. Mense GmbH in Heiligenhaus celebrated its 70th company anniversary.

Since its foundation in 1948, the family business in its second generation has developed over the last few decades into an internationally renowned and sought-after supplier of special products for industrial measurement and testing technology. “70 years, a long time in which we have initiated and mastered many changes and developments. In the future, we will face new tasks and challenges with suitable products and solutions”, says Managing Director Claudia Mense.

Quality is a top priority at the company site in Heiligenhaus. After moving out from Essen 48 years ago, the products “Made in Germany” are being sold from Heiligenhaus to customers all over the world. “Only in this way and with many experienced, long-standing employees and innovative developments are we able to compete and develop our position on the world market”, confirms Claudia Mense.

Both the progressing globalization and the constantly growing demand for energy in industrialized and emerging countries could be used for ELMED’s dynamic expansion.

After the early beginnings in medical technology, to which the company’s name still refers, the focus is now on high-voltage testing of coatings and linings as well as industrial high-performance stroboscopes.

The ISOTEST® brand, which is particularly used in the passive corrosion protection, is in demand worldwide. For many years now, ELMED has been providing an important contribution to the longevity, safety and environmental compatibility of existing and future pipelines.

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EPI Co Ltd

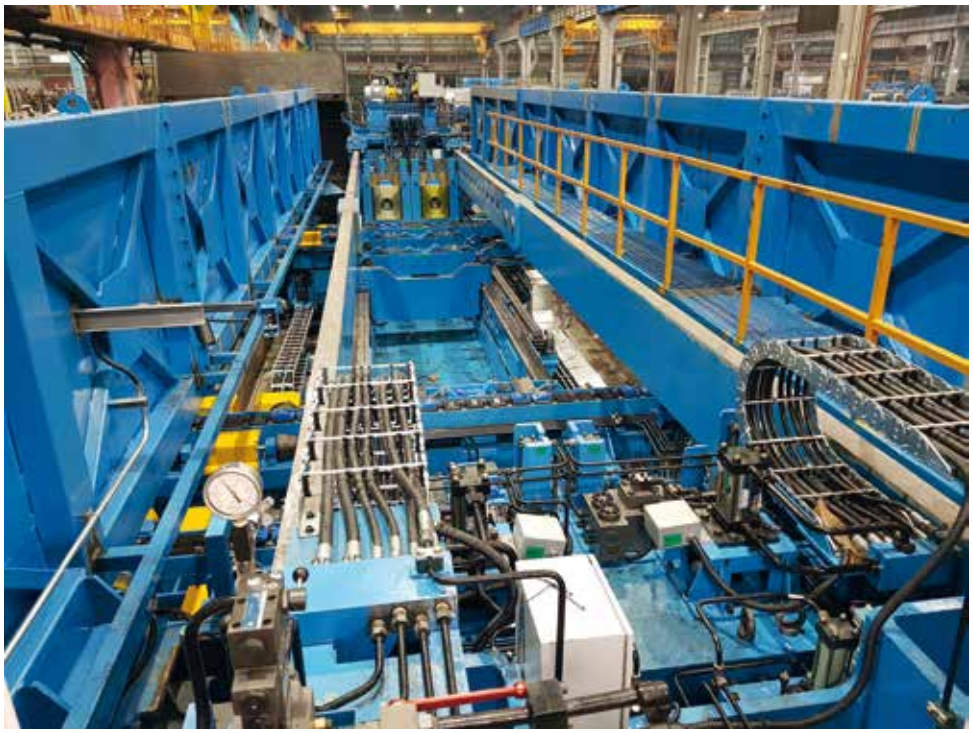
Dual head 12”O.D, max 600bar Hydrostatic Tester

Hyundai Steel in Korea who is a major pipe producer has awarded an order 12inch dual head hydrostatic tester to EPi who is developing state of the art technology for ERW API pipe mill line continuously.

Patent for non-contact packing seal, cramping and easy tool head changing system which were developed by NAKATA’s technical support are applied to 12” dual head hydrostatic tester.

NAKATA who is leading Forming technology called FFX and ODF always support and give opportunities to his J.V.C, EPi Co., Ltd in Korea, to develop the most advanced technology. 17” Coupling pipe end Hydrostatic Tester & Bead Remover by milling after butt welding were already developed by NAKATA and EPi together.

Replacing existing single head, Hyundai steel have more than two (2) times productivity with dual head and reduce cycle time by rigid walking handling equipment. Dual head can be tested separately. Non-contact packing seal prolong their life time. New tool head changing system also easy



tool change and protect packing seal damage. It is much helpful to operator. Three (3) intensifiers are applied and can reach max pressure 600 bar stably.

Hyundai steel assist EPi can have enough testing time to complete hydrostatic testing for future high productivity. It will be a good model for the new technology development by producer and supplier together.

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EWM AG

Exchange with the German metalworking trades on current trends

Robert Stöckl, EWM Sales Management held the laudatory speech for the Deutscher Metallbaupreis.

Robert Stöckl (centre) presents the Deutscher Metallbaupreis in the category "Windows, Façade, Conservatory" to the company Metallgestaltung Pohl.

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Metalwork without welding? This is hard to imagine as these two sectors of industry are still inextricably linked to this very day. This is one of the reasons why EWM AG has been offering its expertise and innovative welding technology to actively support the metalworking industry for years. Therefore, at this year's Metallbaukongress in Künzelsau, the Mündersbach-based company presented itself as a competent partner on all issues relating to welding.

EWM has been part of this industry gathering since 2012. The Metallbaukongress has evolved into a permanent fixture in the German metalworking calendar. The rising number of participants is evidence of this: despite full order books, around 300 industry experts attended the two-day event in Künzelsau this year. It was a varied programme, including the latest industry news, exciting expert presentations and numerous networking opportunities. "With our dense network of branches, we have always consciously sought proximity to small and medium-sized skilled craft businesses," EWM Sales Management Robert Stöckl explains. "The Metallbaukongress also offers the perfect opportunity to talk directly with the German metal workers. As a partner to the skilled craft trade, we are therefore extremely happy to support the event – both financially and with our welding expertise."

Ingenuity and craftsmanship

One of the highlights of the trade fair was the annual award ceremony for the "Deutscher Metallbaupreis". Robert Stöckl did not miss the chance to personally present the award in the category "Window, Façade, Conservatory". In his laudatory speech for the winners, he paid tribute to the courage, ingenuity and craftsmanship of the company Metallgestaltung Pohl, who realised a high-quality skylight for the Historisches Museum Frankfurt. As Germany's largest manufacturer of arc welding technology, EWM also provided attendees at the Metallbaukongress with information on the latest developments in arc welding at its own booth. This was a great opportunity for interested visitors from the metalworking trade to hold technical discussions in the newly opened Carmen Würth Forum in Künzelsau. EWM is always looking to engage in dialogue with the skilled trade industry beyond specialist events such as the Metallbaukongress. For instance, this was one of the reasons why the welding technology manufacturer opened a branch in Koblenz in the immediate vicinity of the metal and technology centre of the local Chamber of Trade.

FASPAR Spa.

Robot for slitting line – automatized the process of preparing the tools for longitudinal shear with the use of the ROBOT

In the process of the transforming the mother coil in strips it is crucial the set-up of the circular blades of the longitudinal shear.

In fact, the preparation of the tool kit requires a good percentage of the total setup time of the line and at the same time requires accurate execution. However even the operator of the line can make the setup in blanked time, it remains an operation which entails considerable physical fatigue.

It is also a repeating and monotonous task with a high risk of errors. Furthermore, the manipulation of tools of considerable size and weight leads to potential risks to the operator's health and to damage to the utensils themselves.With the aim to analyse the above mentioned consideration and find a solution the main topic that have to be considered are the following

Operator safety

Manual set-up of cutters and spacers for slitting lines is a labor-intensive process.

The work is a heavy and monotone and often gives industrial injuries as a result since the operator handles several tons of slitting tools during a working day.

Line setup time and flexibility in change of production

The current longitudinal cutting lines are becoming more and more powerful and reach remarkable work speeds, in this context, the possibility to reduce as much as possible the time of stop for the setup is of considerable importance to ensure flexibility in execution and a fast return of the investment.

Cutting tool life

The handling of cutting tools, especially if heavy and bulky by man, is an operation with a high risk of damage to the cutting edge of the blade with a considerable increase of the grinding operation and finally the life of the blades.

Setup errors

The setup of a longitudinal cutting head is an operation that requires the arrangement of a big numbers tools (blades, separators, rubbers) which need to be chosen from the storage and positioned uniquely in the machine. Is therefore an operation with a significant margin of error, which if not noticed at the time of the cutting operations, involves considerable damage.

Based on those evaluations, the possible real and effective answer is to fully automate the entire tools preparation process. Namely a Robot, with a dedicated software that using the basic information of the production to realize, must be able to calculate the proper set of tools and physical prepare in automatic the tools themselves for the new setup.

Main characteristic requested for the automatic Robot

From a survey conducted at several companies that work in the coils production, analysing the modality on which the production work and evaluating the needs stated

Robot Tunnel type installed on a slitting line

by its customers, the following features emerged:

- Friendly and customized software

The automation must be programmed with a software customized and friendly because it is no possible for the companies that works in this field to dedicated a special skilled operator to manage this Robot. The Robot has to be used by the same operator that is already managing the line.

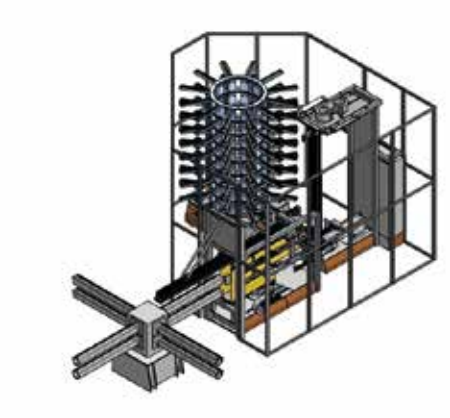
- The Robot must have minimal and easy maintenance.

In this sense, a robust and simple construction is required at the same time with the sensible parts based on standard component. The maintenance personnel present in the company, who are already in charge of the maintenance of other plants must also be able to make ordinary maintenance and basic intervention.

- Security of fitting

The Robot must warranty a security control system in order to avoid incorrect fitting of the tools

Tunnel type



Tower type

in particular for all the opeartions that involve the manual intervention as for example the loading the tools into the system

- Short setup times.

The cycle time of the Robot as to be good enough to allow having several set up in the same shift. Easy installation on existing lines Robot has to be designed in order to be easily installed on existing lines having the least impact in layout.

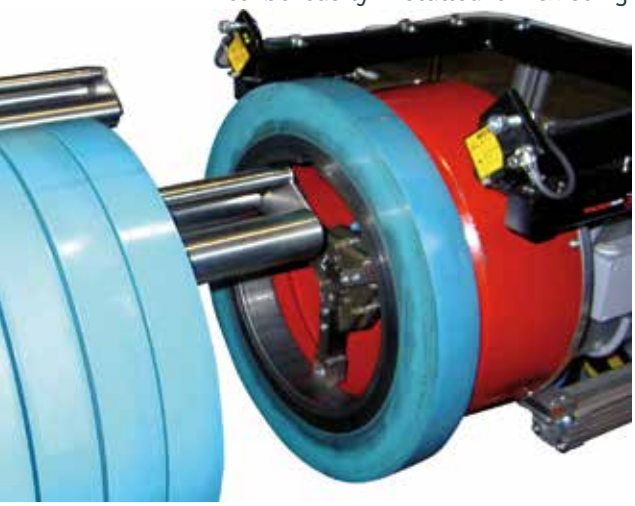


fig. 1

The project is based on the analysis to meet the above-mentioned needs, already realized in several exemplars installed at companies in the industry is characterized by:

Two different structure, Tunnel that guarantee faster cycle time and Tower that allow compact footprint.

Composition and main characteristics

- Design on modules

The design on modules allow realizing custom layout according to the existing floor space availability.

- A fully enclosed main frame, with the air dehumidifying system

The robot and the magazine are fully integrated. The integrated storage magazine ensures a dust-free, corrosion-inhibiting storage environment for cutters/spacers.

- Tool storage stock

Custom designed considering current and future needs allow to stock. The system must fully satisfy the actual request but also be designed and prepared for the increase in productivity that a fully automatic system generates.

- A 4 axis Robot (3 linear and 1one rotating) for the tool handling

The robot has an unsophisticated and efficient structure, composed by the minimum necessary number of moving parts that warranty long life and require an easy service (can be performed by own personnel).

- Magnetic Gripper Head, for tool's pick and place.

Equipped with "piece presence sensor", separator of double tool (in the case of tools attached to each other) and camera code reader for tool recognition.

- Interim station.

Designed and realized with the same characteristics of the existing "carousel blades support" of the line, for holding the tools during the robot job.

Customized software

The software has been designed following the indications and requests of the operators of the slitting lines.

Is intuitive because it is created with a structure similar to that used for tool-making.

Can be customized with the same set up approach already in use, replicating the same compositions already tested in house.

The setup calculated by a Robot can be used as it is but can be also easily modified by the operator according to particular features.

The control system consists of an industrial PC running Windows.

Support for the computer system can be obtained via Internet.

It is also available for special requirement

- Washing machine for blade.
- Sharpness control of the cutters.
- Station to blow-off the tools after every slitting.

Picture of main component of the Robot (fig. 1)

The gripping tool can handle spacers from 1 mm and picks one ring at a time eliminating the risk of manual handling damages. The cutters/spacers are automatically be demagnetized. The gripping tool leaves the cutters and spacers into the storage magazine with a space between to avoid corrosion

and reduce the risk that two tools are put together. If more than one tool has been taken the gripping tool automatically separates them

Unique identification system ensures that the system is proof for incorrect fittings (fig. 2)

The system checks that the correct sides of the cutters have been fitted through optical recognition of a matrix code on the cutter. All slitting tools in the system have a unique identity. The system also ensures that the tools are placed back into the magazine correctly after regrinding.

Interim station (fig. 3)

Housed inside the robot replicates the arms of the existing turnstile of the line. It is designed and built to fully interface the existing turnstile avoiding to make modifications on the existing line and It also offers the advantage of preparing the full set of tools without engaging the turnstile (that can be used for other jobs).

The time to transfer all the tools from interim station to turnstile is very short.

Software (fig. 4)

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In/Out station for manual Load Unload the tools on the system

Example of the typical use of the I/O station is the management of the cutters, that can automatically be taken out of the robot (for inspection or regrinding). After inspection/ regrinding the cutters are placed back in the robot cell again via the service station (robot type SR) or via reserved places in the storage magazine (robot type SRC). As the robot knows (by the identification system) which storing place that is used for the actual cutter it will always re placed correctly.

Washing machine

The robot can be integrated with a washing machine for washing of cutters or spacers. The operator can choose to wash all used cutters and distances during the night. As the tools are dried after the washing they can immediately be placed again in the robot's storage magazine.

Sharpness control

A sharpness control of the cutters can also be provided as extra equipment

- Fully integrated in the robot.
- The limits for damages allowed are stipulated of the customer, and can be modified.
- The customer can also stipulate the control interval after every slitting or after a certain slitting length.
- If there are damages on one of the edges the identification system ensures that only the undamaged edge will be used. When both edges are damaged the robot will place the cutter in the service station for regrinding.

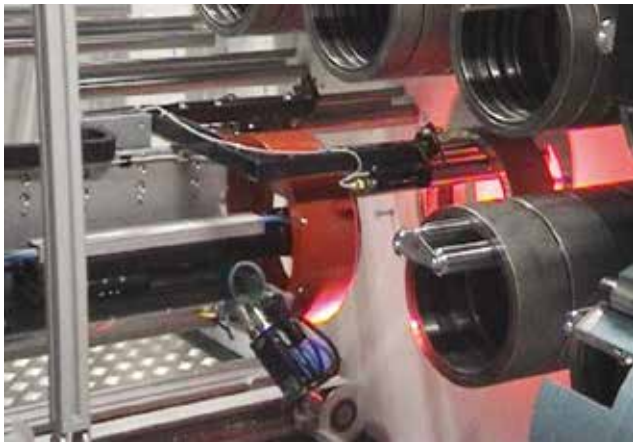

fig. 2

fig. 3

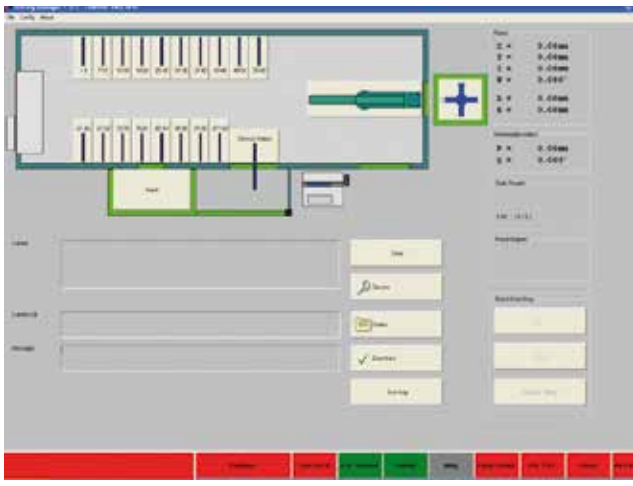

fig. 4

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Fives OTO S.p.A.

Fives expands its offer in tube and pipe machinery

Fives, a global industrial engineering group, has acquired the intellectual property (IP) and know-how of Italy's Imec Engineering's Tube and Pipe division.

The acquired portfolio covers the technological expertise in four segments of Imec Engineering: polishing, finishing, packaging and handling in the steel and energy sectors. It will highly complement the Fives' offer which covers engineering, manufacturing, supply and installation of custom engineered machines under the historical names of Abbey, Bronx, OTO and Taylor-Wilson to process seamless and welded tube and pipe products. The purchase of the IP and know-how is a key step in enlarging Fives' offer in stainless steel machinery and strengthening its global offer for the mechanical, structural and automotive tubing markets.

Stefano Olcese, Head of Tube and Pipe business line of Fives, said, "The acquisition will enable us to provide complete customized solutions to tube manufacturers worldwide and cement our position as a supplier of choice from start to finishing."

Fives OTO S.p.A.

Fives OTO: Best Italian Client Award 2017

Fives OTO S.p.A. (Italy), a market leader in welded tube mill lines, received Lloyd's best Italian client award in the quality, safety and environment management nomination.

Lloyd's Register Foundation have selected 20 companies in Italy to award the title of Best Italian Clients for fiscal year 2016/2017 in three nominations: energy, offshore and business improvement services. The ceremony gathered more than 200 people in the Villa Wolkonsky, residence of the British Ambassador in Rome, Italy on December 4, 2017.

Fives OTO was rewarded for commitment to achieve the highest quality and environmental protection standards, having incorporated those principals into development and production of high-tech products worldwide. The company received three certifications over the short time period: the OHSAS 18001:2007 health and safety management system and ISO 14001:2015 environmental management system in March 2017, as well as the ISO 9001:2015 quality management in June 2016.

"We are very proud and honored being recognized as one of the best Italian companies for quality, safety and environment management," says Elisabetta Spiller, Health, Safety & Quality Manager of Fives OTO S.p.A.

Fives OTO S.p.A.

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Fives OTO S.p.A.

Fives' solutions for a major tube production project in Russia

Fives, a global industrial engineering group, has been contracted to provide cutting-edge solutions for a large-scale investment project in Russia.

Fives, having expertise in both welded tube production lines and finishing solutions, was entrusted by a leading Russian tube maker to design and manufacture process and finishing equipment for a tube production facility.

The scope of supply includes three Bronx straighteners, two OTO accumulators for tube mills, and five Taylor-Wilson finishing products (a three head hydrotester, a set of end facers, a dual drifting machine, and two coupling leak testers for a pipe threading line).

The Taylor-Wilson three headed hydrotester features a robust yet efficient design that maximizes plant production.

The Bronx straightener is a rigidly constructed machine, enabling tube manufacturers to meet criteria for reliability and accuracy. The OTO accumulator is a durable machine, allowing for high production capacity.

Fives has been very active in the Russian tube and pipe market for

more than 40 years, having supplied straighteners, hydrotesters, leak testers, end facing machines, as well as welded tube mill lines and cut-off systems.

Graebener Maschinentechnik GmbH & Co KG

Graebener's 4in1 solution sets new benchmark in flexibility of pipe production

Graebener's new 4in1 technology is a trendsetting and future oriented solution for an economic and flexible pipe production.

Ever increasing requirements for pipe tolerances set virtually impossible tasks for more and more pipe manufacturers making them face serious economic risks. Especially special pipes for the gas and oil industry with a wall thickness above one inch, to an increasing extent clad pipes as well, today are subject to such sophisticated tolerance requirements that only few pipe manufacturers are able to live up to these challenges. Reason for this: many of them are missing suitable production machines which can meet these requirements efficiently, reliably and economically.

Therefore, the German special machine builder Graebener has been specializing for years on the task of preparing pipe manufacturers worldwide for exactly these challenges. The latest response to the current trends of the pipe production is a combination of well proven machine concepts which is unique in the world. The highlight: a combined calibration, straightening, bending and crimping press. The design: Four in one. Crimp plates, calibrate pipes, straighten pipes and bend pipes using only one single machine.

Especially for thick-walled materials and clad pipes with small and rapidly changing lot sizes, the newly developed 4in1 technology offers comprehensive advantages evident by looking at the crimping process alone. In this area, the conventional post-bending presses and roll pre-bending machines quickly come up against their technological limits. While numerous pipe manufacturers have to deal with rolling flaws, pinch points and severe welding problems when pre-bending with rolls, the combined Graebener crimping technology ensures a minimum of straight pipe ends for a perfect joining result even with the most demanding materials. Both plate edges are pre-bent simultaneously throughout the entire plate length in a step-by-step process – without any pinch points which pose serious problems for the operators of roll pre-bending machines when it comes to the final acceptance with their customers. Thanks to specially arranged cylinder systems increased tolerance requirements are no longer a problem.

A movable tool table later on allows users of the new 4in1 technology a quick change between the crimping tool and the calibration, straightening and bending tool. "Future oriented pipe production lines must cover multiple work steps reliably. Only this way we can ensure highest flexibility for our customers as well as a quick return on invest", says Dieter Kapp, Managing Director of Graebener.

Graebener Maschinentechnik will present more information and technical details on the new production line at the exhibition TUBE in Duesseldorf from April 16 to 20, 2018, at booth 6C01 in hall 6. This year, the special machine builder will put the spotlight on pioneering production concepts for economic and flexible pipe production such as customized crimping concepts for large production rates, intelligent seam preparation concepts and economic retrofit solutions. Beyond that, pipe manufacturers interested in a promising solution for intelligent process data analysis and machine condition monitoring can visit the booth for a non-binding consultation.

Booth at Tube:
Hall 6 | Booth C01

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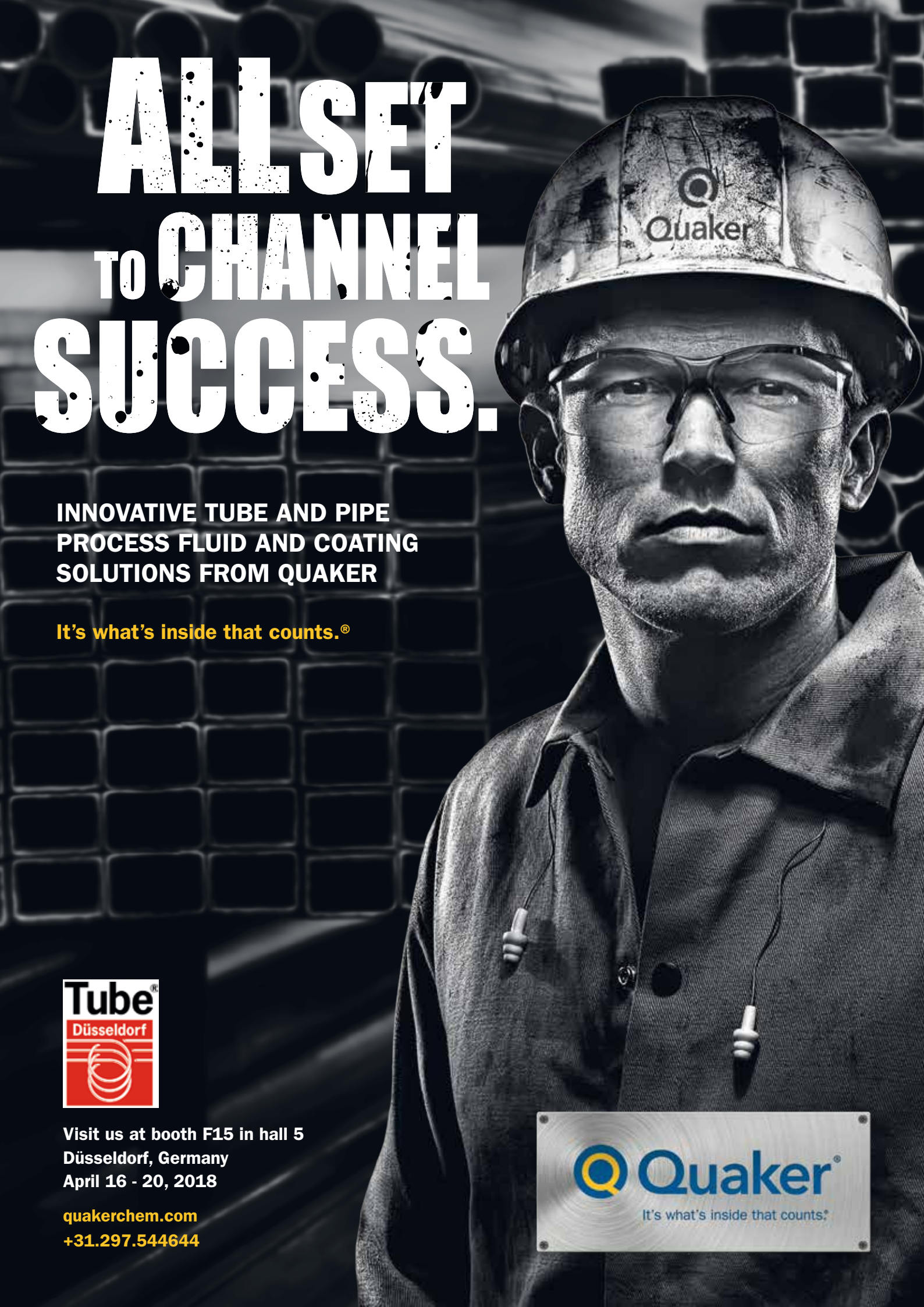
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Huntingdon Fusion Techniques HFT®

Double Freezing technique for large diameter Valve replacement

Qwik Freezer PQF PHO 01C Pipe Jacket Ice Kit

Qwik Freezer PQF PHO 05C Man Pipe Jacket Installing

Replacing valves in a pipeline can be a challenge, especially when the pipelines have liquids running through them. One option is to completely drain the system to make the repairs, which can prove costly with respect to loss of expensive fluid, heating or cooling costs, security matters, time that system is down plus labour costs.

Pipe Freezing Experts Huntingdon Fusion Techniques HFT® recently introduced the Qwik-Freezer™ Systems to their Pipestoppers® Division. These systems create ice plugs or freeze seals in the pipes, avoiding the requirement to drain systems.

Qwik-Freezer™ is the industry standard portable CO2 Pipe Freezing System, in use around the World, covering pipe diameters from 3/8" – 8" (9 – 200 mm).

The quick and easy to use system requires very little set-up time and is the only CO2 Pipe Freezing System capable of freezing larger pipe diameters.

Georgia Gascoyne, CEO for Huntingdon Fusion Techniques HFT® said: "Qwik-Freezer™ has become the preferred solution for a wide range of water-carrying pipework, where valves need to be changed, in industry sectors such as petrochemical, building and maintenance services, food and beverage, hospitals, water treatment, shipping and aerospace."

Once liquids have been brought to a standstill, a specially designed flexible jacket is wrapped around the pipe at the point where the freeze is required. A nozzle in the jacket is then coupled to a cylinder of liquid carbon dioxide by means of a high-pressure hose. For valve replacement, a second jacket is installed on the other side, creating a double freeze, blocking flow on both sides of the valve.

When the CO_2 is injected into the space between the jacket and the pipe, at a temperature of -78oC, the pipe contents freeze and a secure 'ice plug' is formed, which seals the pipe. The 'ice plug' forms only in the section of the pipe covered by the jacket, so the resulting rise in pressure is very small and there is no damage to the pipe itself. The technique can be used safely on iron, steel, lead, stainless steel, copper, brass and plastic pipe.

Huntingdon Fusion Techniques HFT® have an Exclusive Distributor network, which can be found at: www.huntingdonfusion.com.

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Huntingdon Fusion Techniques HFT®

New Tungsten Electrode Grinder

Ensuring your Tungsten Electrode is sharpened correctly can help to improve weld quality. Tungsten Electrode Grinders are a convenient, safer and more accurate way than other methods of grinding Tungsten Electrodes.

Back by popular demand, Huntingdon Fusion Techniques HFT® have re-initiated the manufacturing of the TEG-2 Tungsten Electrode Grinder, which was retired from their product range a number of years ago.

It has an updated design with a number of improvements and the model name is now the TEG-1000.

Georgia Gascoyne, CEO said: "Since we stopped manufacturing the TEG-2 Tungsten Electrode Grinder, we've had many requests to bring it back into our product range. We are excited to announce that it's back, with a new modern look and attractive price."

The use of the TEG-1000 Grinder will give repeatable Tungsten Electrode points every time, enabling consistent repeatable arc performance and welding results. Diameters 1.0 to 3.2 mm can be ground as standard, with other sizes catered for with standard accessories available as extras.

Savings can be achieved because of the increased life of properly ground Tungsten Electrodes. With the special collet accessory, shorter Tungsten Electrodes can be held, significantly increasing the length of life of each Tungsten Electrode before it is discarded.

TIG welding requires Tungsten Electrodes to have perfectly ground and polished tips. HFT®'s TEG-1000 provides these, time after time, to exactly the same size and shape. The diamond wheel grinds the Tungsten Electrodes longitudinally, preventing arc flicker or wander caused by circumferential lines or ridges found on electrodes, which have been ground incorrectly.

With Tungsten Electrodes ground and polished, mechanised welding can produce identical, repeatable results every time. With manual welding, the shape of the Tungsten Electrode is just as important. With a correctly shaped tip, the arc can be precisely positioned with none of the preferential arcing experienced when using poorly shaped manually ground tips.

Tungsten Grinder TEG1000 PHO 01C Angled 110V UK Connection Arrow

Tungsten Grinder TEG1000 PHO 33C Grinding MST

Huntingdon Fusion Techniques HFT®

Low Cost Weld Purge Monitor® for Stainless Steel Welding

PurgEye API100 PHO

Measuring the oxygen level before, during and after welding stainless steel is crucial to achieve oxide free, zero colour welds. During stainless steel welding, the oxygen content must be purged down to a level as low as 100 ppm.

The low cost, hand held, battery operated PurgEye® 100, designed and developed by Huntingdon Fusion Techniques HFT® is perfect for welding stainless steel, reading accurately from atmospheric oxygen level (20.94%), right down to 100 ppm (0.01%).

A customer recently said: "The PurgEye® 100 is one of the best, if not the best residual oxygen detector instruments on the market today. With its digital residual oxygen level LCD screen readouts measuring as low as 100 ppm and its large user friendly viewing screen making it easier for me to read. The PurgEye® 100 also has a great accuracy of oxygen, with speedy measurement's being displayed within seconds."

The PurgEye® 100 is IP65 rated and comes with leak-tight push buttons, auto calibration features, vacuum-sealed leak-tight probe assembly, wrist/neck strap and tripod mount.

The extra long life sensor provides approximately 18 months life before it requires changing. A low sensor indicator will appear on the screen, warning that a new sensor is required. Once that icon appears, it provides the user with adequate time to obtain a new sensor, which can be fitted like changing a battery and the monitor can be re-calibrated easily by the user.

With a clear, easy to read LCD screen, the PurgEye® 100 boasts a 24 mm high display with features such as a low battery icon as well as the low sensor icon. When the monitor is not in use, an automatic sleep mode activates to conserve battery life.

The Weld Purge Monitor® was invented by HFT® in the 1970's and with over 40 years of innovation, design and manufacturing experience, the company now has a Family of PurgEye® Weld Purge Monitors® to measure oxygen levels from atmospheric content (20.94%) down to 1 ppm (accurate to 10 ppm).

Ron Sewell, Chairman for HFT® said: "All of Huntingdon Fusion Techniques HFT®'s Weld Purge Monitors® and Inflatable Tube, Pipe and Pipeline Weld Purging Systems are manufactured in the UK. We do not sacrifice on quality. We guarantee to help you achieve zero colour welds, time and time again."

It is important not to use oxygen analyzers or other oxygen safety monitors, they are calibrated for accuracy at ambient conditions and therefore not suitable for measuring purge levels at 0.01% as the PurgEye® 100 does.

PurgEye® 100 video can be viewed at: https://youtu.be/quw_xtSZDAw.

Inductotherm Heating & Welding Ltd

inmet

Inmet focus on their strengths and strategic initiatives in order to encourage long-term profitability and to secure our company's continued independence. The portfolio is covering a big range of profiles, from 20 to 1500mm slit strip with 0,5 to 15mm wall and of course high quality HF welded tubes.

With ambition, courage and respect we achieve business success since many years while promoting social commitment, a staff-oriented culture, civil responsibility and ecological awareness.

Mr. Jürgen Hoffmann from Inmet Stahl: "As a reliable partner who thinks ahead and takes a proactive approach, Inmet develop the solutions that make their customers more successful in the future. We are making a decisive contribution to finding environmentally-friendly and energy-efficient solutions for our own production but also for customers with our products. Therefore we need to work with high-technology and high knowledge partners like Thermatool.

Thermatool is for our HF welders the excellent partner that supports us always with our requirements and service."

Mr. Hasan Simsek from Thermatool added:" High quality equipment and also service are the keys to work with good customers like Inmet Stahl. We can clearly see Inmet Stahl are happy with Thermatool's products and support. We look forward to our continued relationship and our ambition is to always strive in supplying the highest calibre welding solutions on the world market."

Thermatool, has a long and respected history for innovation, technical ability and it continues to innovate and lead in the HF Welded tube market. Thermatool will participate in the ITA Conference Dusseldorf (November 2017) and are well into their planning and look forward to meeting friends, colleagues, associates, customers, and prospects in Tube Dusseldorf April 2018 - Hall 6 C40.

Thermatool specialises in the design and manufacture of high technology tube and pipe production equipment, offering the most comprehensive range of HF welders, seam annealers and high-speed flying shears to the tube and pipe sector worldwide.

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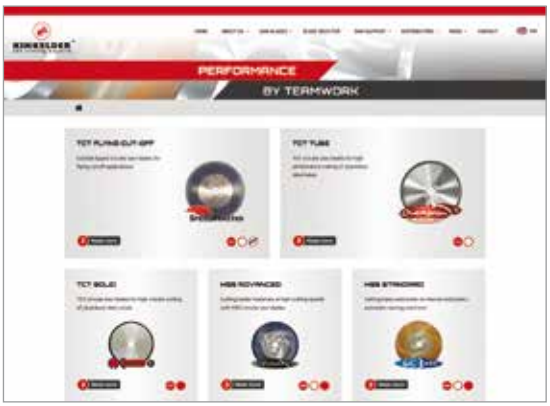
Kinkelder BV

Kinkelder BV launches new website



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Industrial saw blades manufacturer Kinkelder BV has recently launched a brand new website, suitable for all desktop and mobile devices.

Besides clear navigation through all Kinkelder saw blade series, our new website also offers a variety of digital cutting tools. By filling out material specifications, expected blade life, annual machine capacity in cuts and blade price, the Kinkelder Cutting Calculator provides you interesting efficiency values. Furthermore, our Blade selector allows you to find the most suitable saw blade for your specific application in 3 simple steps.

Access to our global distribution network on each webpage enables you to easily find your local Kinkelder reseller. The Saw Support area provides a wide range of free technical information on saw blades and (stainless) steel cutting applications. The Kinkelder website is available in multiple languages, new languages will be added on a regular basis. For your convenience, there's also a Kinkelder app with all relevant information available in your app store.

Meet us at Tube 2018 in Düsseldorf, booth 6/C32.

Kloeckner Metals UK

Kloeckner cuts through with a new LT14 "Jumbo" laser

Kloeckner Metals UK, one of the leading tube laser processing providers in the UK, is set to grow its capacity with the addition of new Adige LT14 "Jumbo" laser to its already extensive laser cutting portfolio.

This new equipment is the latest generation of these type of machines with the cutting edge technological features amongst large diameter tube lasers. Having this machine available will mean that Kloeckner Metals UK will be one of the few business in this country capable of processing parts up to 355mm in diameter and weight up to 100kg/m. In addition to processing Hollow section tubes, it can also process large beams, columns, split tees, angles and channels.

Some of the advantages of Kloeckner's new LT14 "Jumbo" laser cutting machine are:

- LT14 has a 4.5 KW Rofin CO2 laser source with the ability to laser cut 20mm thick mild steel and weld prep 16mm thick mild steel material up to 45 degrees.
- Shorter lead times – machine's latest touch screen interface uses an operating system that is up to 30 % faster than previous versions.

- It is also programmed using the latest generation of Artube 3 CAD software which can now import full 3D models / assemblies including IFC files (Tekla), step, iges and X_T.
- Loading and unloading are 15.5 m infeed and 15.5 m outfeed – first for an LT14 in the UK.

Clint Jones Kloeckner Metals UK Group Commercial Director: "We are delighted with this new edition to our processing portfolio. The advantages and versatility of the new LT14 "Jumbo" laser processing machine will significantly increase Kloeckner's production capabilities and enable us to better service various sectors such as construction, transport and energy markets which require larger processed parts. Having these extensive processing capabilities under one roof allows us to offer our customers high quality parts at shorter lead times to the specifications required."

Kloeckner Metals UK is the first ever company to achieve NHSS3B certification

Kloeckner Metals UK are pleased to announce they have become the first company in the UK to achieve the National Highways Sector Scheme 3B (NHSS3B) certification, awarded by the accreditation body the Steel Construction Certification Scheme (SCCS (021)).

For Kloeckner Metals UK to receive this certification demonstrates that they have in place robust quality management processes to supply multi metal products specifically for suppliers and contractors of Highways England.

Following a robust UKAS assessment, the SCCS recently became the first Certification Body to be accredited to audit the National Highways Sector Scheme 3B – Stocking and distribution activities for structural steel products.

John Topham Deputy SCCS Manager said: "For SCCS to achieve this accreditation is a significant milestone and we are pleased to announce that Kloeckner Metals UK is the first company to achieve certification to this National Highways Sector Scheme."

This new certification follows in the footstep of Kloeckner Metals UK recently awarded certificates for both ISO 9001:2015 and ISO 14001:2015.

Barrie Salter, Business Development & Marketing Director at Kloeckner Metals UK, said: "We are extremely excited to be the first stockholder and distributor in the UK to be awarded with this NHSS 3B certification. By gaining this approval demonstrates we have satisfied all mandatory requirements including transition to the new ISO 9001:2015 to supply structural steel products specifically for all Highways England projects.

SCCS Scheme Manager, Stephen Blackman presenting NHSS3B certificate to Barrie Salter Director at Kloeckner Metals UK.
From left John Topham SCCS Deputy Manager, Stephen Blackman, Barrie Salter and Kevin Maddison Group Quality Manager at Kloeckner Metals UK

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Linsinger Maschinenbau GmbH

Mr. Günter Holleis takes over the management of LINSINGER Maschinenbau GmbH

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www.linsinger.com

The supervisory board of AFW Holding GmbH has appointed Mr. Günter Holleis as LINSINGER's new chief executive officer, effective November 30th, 2017.

As a member of the shareholder's family, Mr. Holleis acquired management expertise at Weingärtner Maschinenbau GmbH, and since 2013 as CEO of LINMAG, has gained international recognition as a leading rail service provider.

Mr. Holleis will now develop LINSINGER's outstanding potential to further expand market and technology leadership.

Magnetic Analysis Corp

MAC's ultrasonic weld line tester

Ultrasonic Weldline Tester with Test Head

Magnetic Analysis Corp. will be highlighting information on the Echomac® WLD ultrasonic weld line test system at its Booth in Hall 6 I -12 at Tube 2018 Dusseldorf. Featuring operating conveniences for inspecting tube weld zones on-line during continuous production, the system is designed to test for longitudinally oriented defects that are typical of the ERW welding process. These systems are typically four channels, using both CW and CCW sound modes for detection of ID and OD longitudinal defects between 5 % and 10 % of wall thickness. Additional channels can be added, depending on the application.

The WLD system includes MAC's well regarded Echomac® instrumentation, and a test head incorporating transducer assemblies with irrigated shoes for constant coupling with the tube being tested. Individual adjustment of each transducer to easily achieve optimal position for CW and CCW direction is available. In addition a coupling alarm alerts the operator to any loss of coupling between a transducer and the tube, because of loss of water or improper alignment, and remote weld following is included in the system. Another convenience during operation is that individual irrigated transducer shoes can be easily exchanged to accommodate tube size changes in 5 seconds using MAC's new quick disconnect mechanisms.

The WLD test head is supported by a strong gantry that allows for operating on the weld line for mill testing, or off line for easy calibration for a new tube size. A precision roller assembly is located in the off-line position to allow for easy calibration of the transducers. Once the calibration is achieved, the test head is simply moved back to the on-line position for production line testing.

The remote operator station contains essential controls including the video monitor. The instrument system is programmed with the transducer locations and a spray marker located downstream is automatically instructed to spray paint onto the actual defect location to enable sorting of the cut tubes. Separate colors can be selected for OD and ID condition. Chart recordings are also generated that represent the tube condition of each cut tube. These are stored in digital format and are archived for future retrieval.

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Messe Düsseldorf

Magnetic Analysis Corp

MAC to Feature NDT Instruments & Systems at Tube 2018 Dusseldorf

MAC's Echomac FD-6A ultrasonic instrument, part of a "spin the tube" immersion tank system to test titanium tube for nuclear applications.

Magnetic Analysis Corp., celebrating 90 years of serving the metals industry, will be featuring NDT instruments and systems for testing tube, pipe, bar and wire at Stand # 6 I - 12 at Tube 2018 Dusseldorf. MAC's latest developments in Eddy Current, Ultrasonic and Flux leakage test technology will be highlighted at the show, including the new Echomac® FD6/6A for testing high performance tube and bar, the Echomac® WLD Ultrasonic Weld Zone test system, and DC and AC Rotoflux® instruments and systems.

The Echomac® FD6/6A, ultrasonic inspection instrument is designed for on or off-line flaw detection, thickness, weld inspection, and dimensional measurement in tube and pipe. It achieves a high signal to noise ratio, includes a wide range of selectable band pass filter settings, precise thickness resolution, and excellent repeatability and reliability. The Model 6A also holds GE Qualification for P3TF31 and P29TF82 Class A and B, typically required to meet high level quality standards for aerospace and other critical applications.

Features of the FD6/6A include Echohunter® software which provides a versatile, intuitive operation with convenient set up and control of all key test parameters on one screen, the ability to move thresholds by selecting and dragging on screen, and a global key to adjust or copy a group of test parameters from one channel to another. The instrument is compatible with rotary, immersion, bubbler or squirter and "spin the tube" type applications. The Echomac® series is being used for a variety of applications ranging from full body testing of spinning tube and weld zone inspection during production, to 500 mm Ultrasonic/Flux Leakage multi test systems for large diameter OCTG pipe.

MAC's experienced Engineers will be present at the booth to discuss the full range of MAC test systems, including innovative MultiMac® eddy current weld and full body inspection of large diameter tube ranging up to 1300 mm, as well as the compact, affordable Minimac® 55 eddy current tester. Information on the Echomac®, ultrasonic phased array system for testing bar, and ultrasonic/flux leakage multi-test systems ranging up to 500mm for OCTG pipe, as well as other nondestructive test solutions for tube producers, will be available.

MAC's 90 years developing and supplying nondestructive test equipment and systems to tube, bar, and wire manufacturers ensures a thorough understanding of customer inspection needs.

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MAIR RESEARCH S.P.A.

Mair Research has supplied an integrated finishing line suitable to process cold drawn tubes to an important US customer

Mair Research has supplied an integrated finishing line suitable to process cold drawn tubes to an important US customer.

The line is designed to manage 12.7 to 63.5mm diameters of 20m lengths at a maximum speed of 180m/min and the work flow and equipment layout have been developed in conjunction with the customer'srequirements.

Scope includes:

- Automatic loader
- RMT10/60 Ten roll straightener
- NDT station
- Sample cutting for testing purposes
- MC100 Multicut to achieve final lengths
- Deburring
- Visual inspection
- Oiling and automatic bundling

The entire line is fully automatic and interfaced with the customer's MES system. All work data is tracked along the entire process to the final bundle.

The 10 roll straightening machine Model RMT10/60, is a key component of the line: it is based on a ring frame structure made of steel elements welded together, annealed and machined to achieve one monolithic unit having the benefit of being free of any vibrations during the work process.

A quick replacement system allows a rapid replacement of the rollers. Moreover the rollers are equipped

with load cells in order to control and monitor in real time through a dedicated software.

The line is completely automatic and operates free of operators, except in particular cases of running very small and long tubes.

Multihead cutting machine Model MC100/6 allowing to cut the single tubes in the desired lengths.

The cutting length is obtained by automatically positioning the heads longitudinally, by means of a fully automatic management system.

The packaging machine Model HEX100/D/6/SL allows to pack automatically the tubes into hexagonal bundles, with fully automatic.

Meet us at Tube 2018 Düsseldorf, Germany. Hall 06 - Booth 6E12

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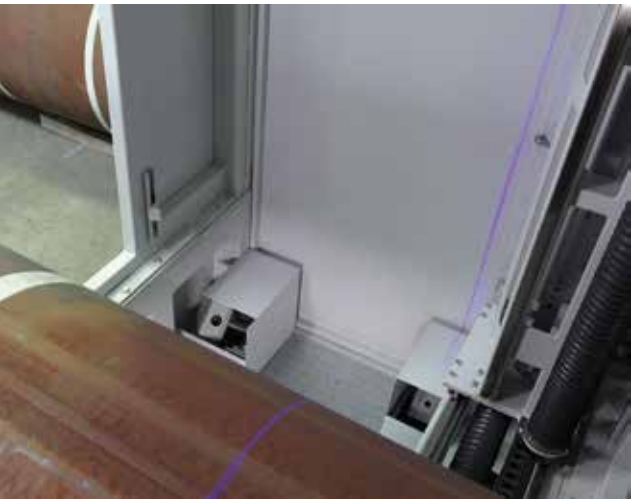
MSG Maschinenbau GmbH

Optical geometry measurement of large tubes in production



A combination of the GCS-family (Geometry Control System) outer contour measurement and the GCS straightness measurement enables MSG Maschinenbau to determine the outer geometry of large workpieces in space.

Recording of the cross-sections during passage on the one hand and subsequently of the longitudinal workpiece axis in space on the other hand permits highly precise determination of the outer sleeve.

The tried and tested GCS outer contour measurement is expanded by the component of straightness measurement by this. The difference from straightness measurement for small cross-section is in compensation for gravity. Due to the very high intrinsic stiffness of the workpieces, this is not necessary. Evaluation takes place, as in all measuring facilities from MSG, using a dedicated software.

Beyond this, the customer may use the in-house engineering by MSG Maschinenbau when expert know-how from a special machine manufacturer is required. The great advantage of MSG Maschinenbau is in processing turnkey solutions, with the entire know-how from mechanical engineering, electrical systems and programming available in house. Two of these systems have already been successfully integrated in different production areas.

The manufacturer generally offers a pioneering option for meeting the continually increasing market requirements to all quality officers, test technicians and system operators with the optical straightness measurement.

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MÜLLER OPLADEN GmbH

Shorter production time and lower costs = better quality

Comprehensive software support for process-oriented production

MUELLER OPLADENs software solutions for machines and processes make customers' production workflows more efficient. The MO-machines for the thermal cutting of 3D contours are not therefore isolated elements, but part of an integrated process chain. With CAM modules MO-machines can be linked to upstream and downstream workflows to significantly reduce production time, material costs and errors.

The software PypeServer and/or the macro-based Corobs software are the basis for the MO Compact, Watts, MO Classic and MO Heavy-Duty machine series. The AlmaRobo software is the basis for the MO Robo series.

PypeServer is a comprehensive CAD/CAM system for the purpose of modeling cutting geometries, for nesting numerous parts to be cut on a single pipe, for assigning cutting functions to one or several machines while taking into account their respective capacity, for keeping track of current working process stages at the machines and for calculating and recording cutting times and costs.

PypeServer also provides extensive reporting functions for calculation or documentation purposes. Furthermore, PypeServer provides comprehensive reporting for downstream costing and documentation purposes. PypeServer can be fully integrated in a company's workflow as an autonomous software system for the modeling of pipes or by importing drawings from a multitude of CAD software systems.

PypeServer offers rich data in SQL views that can be pulled into Excel and other tools for reporting, and into ERP systems or other databases. PypeServer is typically run at both the machine and in offices. In offices, CAD designers and detailers import jobs, design parts, and plan work. At the machine, machine operators nest parts on pipes and cut jobs.

PypeServer modeling module

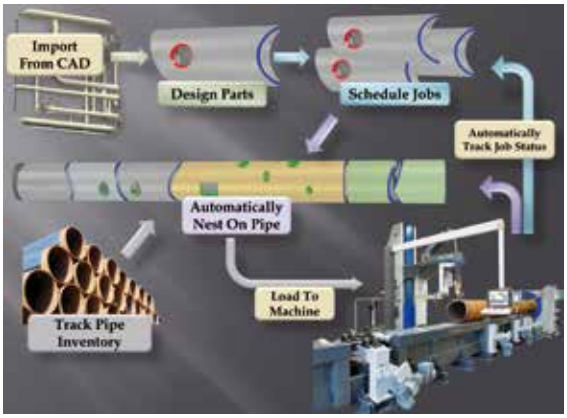
The PypeServer modeling module permits independent production of pipe cutting con-tours represented in 3D with dimension contours. To begin with, a cutting contour such as a saddle cut is selected. Then, only a few parameters need be entered into a preset mask to allow the cutting contour to develop automatically. Repetitive contours can simply be duplicated.

PypeServer CAD import module

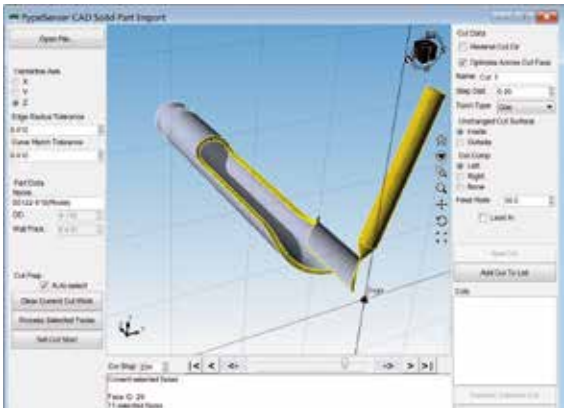
PypeServer can import parts and complete design spools of most well-known software CAD systems such as Acorn, AutoDesk, Aveva, BoCAD, COMPRESS, Intergraph, Pro CAD, Pro Engineer, Ship Constructor, Solid Works or Tekla Structures. Custom importers for special CAD systems can be developed in cooperation with customers.

PypeServer nesting module

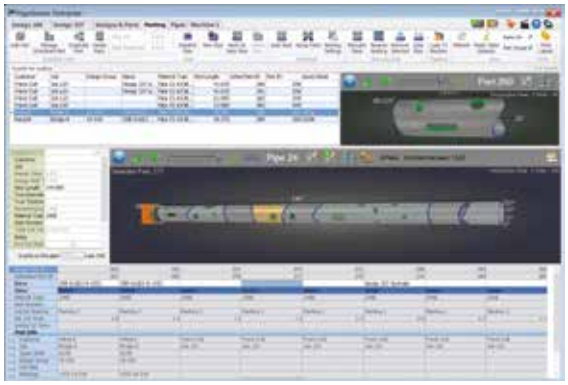
Once all the parts have either been modeled or alternatively imported, PypeServer, with a single command, automatically



PypeServer modeling module

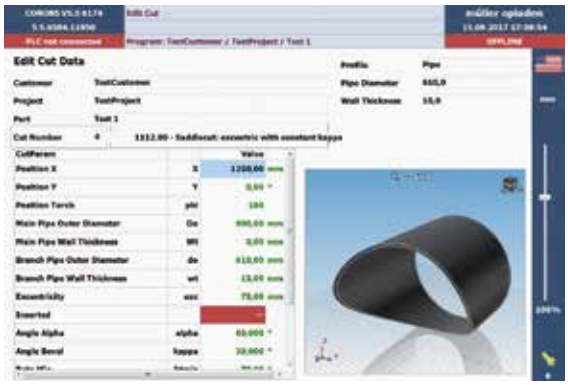


PypeServer CAD import module

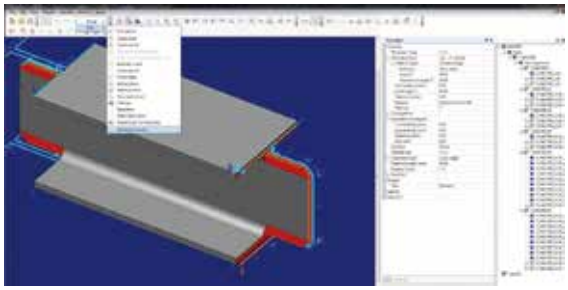


PypeServer nesting module

PypeServer and SQL databases



Corobs macro-based programming for the MO-machine series



AlmaRobo CAD/CAM system for the MO Robo machine series

nests the parts on a pipe. This algorithm for such optimal nesting can save up to 10 percent in materials. The pipe segments to be cut are then shown in 3D on the monitor.

During the cutting process, both the machine operator and those using PypeServer in offices can remotely see the machines' cutting progress. PypeServer integrates also software that can automatically print unique labels for each part.

PypeServer and SQL databases

PypeServer runs on top of SQL databases. These databases expose a rich set of data views for use in ERP, process management, inventory control, and custom reporting.

Our customers often integrate PypeServer data with their ERP system, and also with Microsoft Excel to create custom live reports for job costing, scheduling and tracking, inventory control, and post-job analyses.

Corobs macro-based programming for the MO-machine series

Besides PypeServer, the machine computer also uses our Corobs software. Through selection of a wide range of cutting macros, this allows quick preparation at the workstation of the various cuts which are then directly performed on the pipe.

In addition to this, Corobs offers various setting options with regard to cutting parameters and other sequential parameters with a view to optimizing the individual steps in each case and also depending on the properties and quality of the pipe. These functions are also provided by Corobs when PypeServer is being used since the two software systems are interconnected and adapted to each other.

AlmaRobo CAD/CAM system for the MO Robo machine series

AlmaRobo is a comprehensive CAD/CAM system running on top of Alma software. This latter ranks as the comprehensive and leading CAD/CAM software for companies in the structural steel sector. The cutting contours are generated with the aid of freely programmable software architecture. In AlmaRobo, data import from a CAD system, preferably from Tekla Structures, is followed by the automatic definition of the cutting curves and the associated creation of a cutting file. AlmaRobo then sets the start and end points for the cutting task. After this, the overall cutting process of a cutting file is simulated with the depiction of the machine and the workpiece before the start of cutting proper. The CAM tools in AlmaRobo have a design similar to those in PypeServer.

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Olimpia80

Olimpia 80 has installed different tube mills

During this year, Olimpia 80 has installed different tube mills all over the world and in particular:

- Two tube mills out of three, ordered by the Indian company APL APOLLO and destined to improve the production capacity of carbon steel tubes, have already been installed:
  - Cage forming tube mill for square and rectangular tubes from 20x20 up to 60x60 mm and max thickness 4 mm
  - Cage forming tube mill for square and rectangular tubes from 30x30 up to 80x80 mm and max thickness 6 mm
  - Cage forming tube mill for square and rectangular tubes from 80x80 up to 200x200 mm and max thickness 10 mm
- In Myanmar, we have installed a tube mill for carbon steel material, to cover a wide range of OD from 20 up to 114 mm and max thickness 3 mm, engineered according to the special local market request: "big OD and thin wall". The tube mill can run up to 120 m/min and is completed with the fully automatic packaging line
- Two completely new tube mills have installed in China, to the same customer, to produce stainless steel tubes, one with LASER and one with High Frequency welding technologies.

- Two tube mills for carbon steel material, one up to OD 63.5 and one up to OD 127 mm have successfully installed in Uzbekistan, to one of our first customers in these regions.
- In North America (USA) we have finalized the commissioning of the second complete tube mill for automotive stainless steel tubes application. The first one in Mexico for the same HF stainless tubes productions.
- In Bangladesh, we putted in operation a complete HF tube mill, for stainless steel tubes for decorative applications.

According to our commercial and technical politics, we study all the potential markets, and offer our conventional or fully automatic solutions, for carbon and for stainless steel materials, always following the customer needs and always making a customized tube mill.

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Protem SAS

Improve productivity through on-site maintenance

In nuclear power plants, oil and gas facilities, refineries, shipyards, etc., piping and fittings are subjected to severe conditions and tests. High pressure, continuous flow and hazardous products are just a few factors that result in equipment wear in these types of sensitive environments.

Energy-related companies are always susceptible to a variety of risks in their facilities. Of the many potential problems that can occur, leaks are certainly the most difficult to detect, locate and repair quickly. The proper functioning of flanges and valves is essential to production. When a leak appears, it is imperative to fix it quickly in order to not aggravate the situation.

For some time we have heard talk of explosions, fires and leaks of dangerous products in refineries, offshore stations or even nuclear power plants. The human and material consequences are often very serious and disastrous. Often these tragedies could have been prevented through maintenance performed on time and with the right equipment.

SERCO machines can repair sealing surfaces directly on-site, without removing a welded valve or cutting a defective weld flange to replace it with a new one. On-site repair, therefore, saves time in disassembly, transport to a workshop, reassembly of equipment and performance of weld control functions. Depending on the size of the equipment, a standard replacement operation may take two or three days and generate excessive administrative management due to performance of many required operations. A SERCO portable machine can solve these problems in a few hours at most, thus saving large increments of time, which allows for a faster restart of the installation, and a large reduction in non-production related costs.

Maintenance and repairs performed directly on the installation can eliminate hidden time during the shutdown period dedicated to maintenance, thereby drastically shortening it. Even before an explosion becomes imminent, some leakage may cause a drop in pressure in the network causing a decline in production. Quick intervention on-site allows this type of problem to be resolved much more rapidly and plant operations to be resumed much faster.

Warning, it is mandatory to perform a high quality repair that is durable over time. The key to a high quality, durable repair is the importance of using appropriate equipment. The machine must be able to reach all the seal surfaces (valve seats, raised surfaces, grooves, etc.) and repair them to their original condition. SERCO machines were designed by our engineers specifically for these types of on-site uses. For over 40 years, SERCO has been using these machines for on-site maintenance and repair services. SERCO is continuously striving to improve its equipment in order to obtain the most suitable response to the issues of in-situ utilization; small size, light weight, accuracy and durability.

SERCO machines are actively used in the following industries:

- Oil & Gas
- Nuclear and fossil power plants
- Shipbuilding
- Large engine repair (diesel or gas motors)
- Hydro-electric power plants
- Defense
- Etc.

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Pickling tank with a length of over 20 m are produced in one piece by KVK KOERNER and delivered to the customer

KVK-Pickling Plants

Customised, ready to use and with the highest level of environmental protection.

KVK pickling plants for pickling iron, high-grade steel and non-ferrous metals.

- Planning and construction of complete pickling plants
- Particularly solid design for pipe pickling
- For hydrochloric, sulphuric and nitric/hydrofluoric acid pickling media
- Pickling tanks with integrated fume-extraction channels and scrubber systems
- KVK enclosure panels totally separate the pickling plant from other production areas, thus avoiding corrosion of steel construction, cranes etc.
- KVK pickling plants meet all environmental conditions and work to the cycle principle.

Fire resistant

Scientific test reports from official test institutes have confirmed the significantly higher fire resistance of the kvk-panel, in comparison to PP and PE panels.

KOERNER kvk®

partner of: Tube Innovation Network
www.tube-innovation-days.com

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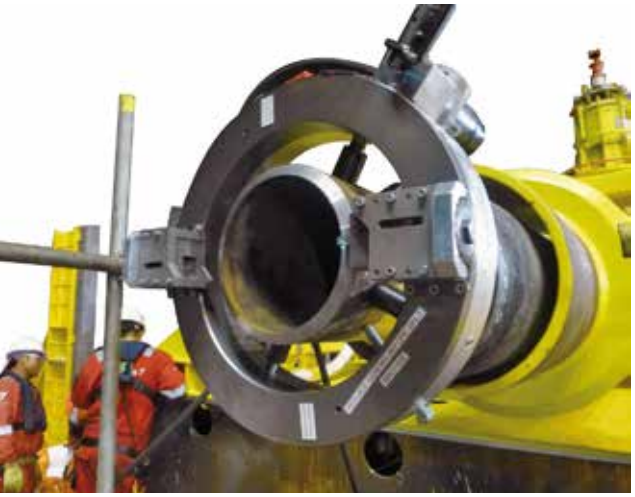
Protem SAS

Orbital pipe cutting and beveling machine



Sliptframe design for a use on existing tubular beam

TT-NG SERIES:
Through decades of proven reliable technology and continuous development, the TTNG-machines are the premium tools for perfect welding preparations. Designed for standard, and especially for heavy walled tubes and pipes, for virtually all kind of materials, the TTNG series of machines meets the demand for the high accuracy and precision required in today's welding applications.

Their design is characterized by power, rigidity, dependability, versatility, reliability and light weight.

SLIP FRAME DESIGN
The split frame design allows the machine to split in half at the frame and mount around the OD of the in-line pipe or fittings for strong, stable clamping.

The two half shells are connected with a hinge, which is opened to mount the machine on the tube. The alignment of centricity is done by seperately adjustable clamping jaws. The perpendicularity will be adjusted at the same time. Additional clamping screws bear the axial forces. Tool carriages with covered spindles ensure protection against chips.

The clamshells have been adapted for use on demanding construction, maintenance and dismantling projects.

ADVANTAGES:

- Light weight
- Rugged construction
- Fast and easy mounting on tubes and pipes
- Cold cutting process : no heat affected zone
- Suited for in-line piping systems
- Safe operation
- Modular design
- Ideal for tight spaces
- Dependable orbital cutting and beveling
- Adapted for virtually all environments :
- irradiated areas,
- subsea,
- very high or very low temperatures.

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Plymouth Tube Company

Drew van Pelt appointed president and CEO of Plymouth Tube Co.

Effective January 1, 2018 Plymouth Tube Co. has named Drew Van Pelt its new president and chief executive officer.

Drew joins Plymouth as Donald Van Pelt, Jr., 'Van' – who served as president and CEO for 18 cumulative years and as Chairman of the Board since 2013 – makes plans to return to retirement. During Van's tenure he transformed the business, increasing both revenue and shareholder equity one-third each by executing growth strategies in new markets and developing a service package to maximize customer satisfaction.

Drew and Van will work together closely during a transition period to ensure maximum continuity for the business. In a statement to employees, Van remarked, "Drew has been a valuable contributor to the Plymouth Board, and I'm very excited about the implications of this path for the Company and for me. This move will allow me to invest more time in mentoring key leaders in our business and focusing on the significance of larger economic and industry trends."

Preceding this appointment at Plymouth, Drew Van Pelt worked with Warren Buffet as CEO of a Berkshire Hathaway subsidiary, Larson-Juhl. The Company manufactures and distributes custom picture framing products in 16 countries and has the leading market share in most of the locations in which it operates. "Plymouth has been important to me for a long time as I've watched first my grandfather and then my father lead the Company," said Drew Van Pelt. "I look forward to supporting the Plymouth Experience that has been the bedrock of our partnership with customers for years, to living the four pillars of our mission statement and to learning how we can support our customers in new and innovative ways."

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PROYECTO ILIMITADO CMAV

PROYECTO ILIMITADO – project: unlimited – celebrates first full calendar year with good order book

Active in many fields of equipment and services for semifinished and finished metal products like sheet, tube, profile, bar, rebar, wire and automotive components using these, PROYECTO ILIMITADO CMAV (refered to also as "P.I." or "UNLIMITED") has celebrated its second year with groth both in terms of actual volume of business and enquiries. Total orders involved in have multiplied the humble start in 2015 to now over € 5.5 million, two thirds of it corresponding to equipment equivalent to new investments of 10 million €.

European ITA board member and PI partner José B. Berenguer-Fröhner points out, "the best pay-back to the efforts is the lasting customer confidence; we seek honest business respecting all parties' interests, customer's and also of qualified partners".

In the long product area (mainly tube and profile), wether for standard tubes, hollow sections, oil and gas or mechanical tube, PROYECTO ILIMITADO offers used and eventually new or refurbished machines from first brands and services related.

A refurbishment of a tube mill is under way to increase its availability and output after this Middle East customer just signed the final acceptance test for a palletized Cut-to-Length.

In Spain PROYECTO ILIMITADO has now got an order for a stabilized high-speed crane with electromagnets for tube bundles, and a special tooling set for special closed profiles as well as a completely machined precision roll pair for paperboard processing.

Example for the coordination of various ressources throughout several countries is a project for a complete general galvanizing plant –with hollow sections for construction as a main target- in the Middle East, involving the dismantling of existing equipment, refurbishment and upgrading, transport, hall engineering, service cranes, installation and set-up, ash management and chemical bath control with partner companies and consultants.

New prospects are:

- Another tube bundle transport system
- Standard used tube mills in the range ½ to 12" are being offered and eventually negotiated in various countries.

- A project for a special automotive development in a workpiece which combines tubular parts, stamped parts and rivets, all in aluminum, is being discussed with an Italian partner.
- Reg. OCTG, PROYECTO ILIMITADO is offering equipment together with a Canadian supplier to renowned Spanish customers for an innovative wall thickness/excentricity control during hot processing using laser ultrasound. This

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technology was presented by during the ITA "Added Value in Difficult Times" conference in Düsseldorf.

- A cooperation for sales of tube laser cutting machines, completely revamped, has been signed.
- A project for titanium tubes, including five machines in line, offering also finanzing options.

PROYECTO ILIMITADO's range of technologies (machines) and services covers: cold forming (tube mills, spiral mills, profiling lines, four roll benders, integrated punching and bending lines, cold drawing benches, levelers, straightening machines, riveting machines; cutting (slitting lines and CTLs), warm cutting (plasma, laser), warm forming (forging and extrusion), machining (beveling and edge preparation), thermal treatment (annealing, tempering and quenching), welding, quality control (NDT in terms of Eddy Current, laser, US and laser UT), surface treatment (hot dip galvanizing equipment), packaging (plastic foil wrapping equipment), handling and flexibel palletized transport (avoiding OT containers and limiting waiting time in loading mixed product lots). Most of the enquiries received related to tube manufacturing and processing. Besides steel and stainless steel, also in non ferrous materials.

As agents for Spain and (in some cases) Latin America PROYECTO ILIMITADO CMAV represents companies from Germany, Italy, Netherlands, Switzerland, Spain, Portugal, Canada, and United Arab Emirates.

Partners and agents cover so far (or cooperate in) Germany, Italy, Finland, Latin America, Northern Africa, the Middle East and the GUS states.

Quaker Chemical Corporation

Extensive Range of Process Fluid Solutions for Tube & Pipe Applications

Quaker Chemical Reinforces the "Front-to-Back" Approach at Tube Dusseldorf 2018

Throughout the production process for seamless and welded tube and pipe, industrial fluids are crucial in machining, cleaning, and protecting the metal to ensure high quality results. Quaker Chemical Corporation (NYSE: KWR, "Quaker"), a leading global supplier of process fluids, provides a comprehensive "Front-to-Back" product range that offers metalworking fluids for the front end of the tube and pipe manufacturing process as well as corrosion preventives and protective coatings to finish at the back end.

Quaker will be exhibiting at Hall 5 – Stand F15 at Tube Dusseldorf (https://www.quakerchem.com/events/tube-dusseldorf), the premier trade fair for the tube processing industry, from April 16-20 in Germany.

QUAKERDRAW® 4470 EXPANDER, a new expansion fluid for thick walled large diameter pipes, will be introduced with the benefits of:

- Water based chemistry resulting in easy cleaning and no sticky residues
- Compatibility with seals
- Excellent lubrication properties

Responding to the on-going industry demands of addressing environmental concerns, improving operational costs, and boosting product aesthetics, Quaker will feature a range of cost effective and performance enhancing tube and pipe products:

QUAKERCOOL® forming and threading coolant fluids for electric resistance welded (ERW) manufacturing

- Boron-free, formaldehyde-free, and mineral oil-free variations
- Cost effective options
- Available in synthetic, neo-synthetic, semi-synthetic, or microemulsion compositions
- For use in forming, sizing, thread cutting, and hydro-tester

FERROCOTE® Corrosion Preventives

- Low odor
- Solvent based or VOC free options
- Provides up to 12 months corrosion protection

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QUAKERCLEAN® Cleaners

- General purpose maintenance and floor cleaner
- Formaldehyde free systems cleaner and sterilizer for extending coolant life

QUAKERCOAT® Coatings

- QUAKERCOAT® 710 Black: Water based black coating for premium quality OCTG pipes
- QUAKERCOAT® 151: Water based acrylic clear coating (available in EMEA only)
- QUAKERCOAT® 025: Ultraviolet (UV) cured coating

To complement its product line, Quaker's global team of process experts provides application expertise to deliver customized solutions for specific customer needs in the tube and pipe industry.

For the full product line offerings for tube and pipe applications, visit: https://www.quakerchem.com/industry/tube-and-pipe/

ROLL-KRAFT

Outstanding attendance once again at ROLL-KRAFT's anual regional seminars

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Roll-Kraft, an internationally known supplier of roll tooling to tube and pipe and roll forming manufacturers, recently held its annual regional tube and pipe and roll form training seminars in Mentor, Ohio. Attendees were invited to tour Roll-Kraft's state-of-the-art corporate headquarters before and after the seminars.

Over 125 attendees from more than 54 widely diversified companies attended the two-day event at the LaMalfa Holiday Inn Conference Center in Mentor. According to organizer and speaker, Robert A. Sladky, Vice President of Tube Mill Engineering for Roll-Kraft, the seminar attracted a broad mix of attendees, from basic/experienced mill operators to maintenance and quality personnel, supervisors, and management. In addition to Sladky, other notable speakers during the two-day event included Bret Molnar and Dave Rostocil, Senior Technical Performance Specialists.

The seminar presentations were designed to allow interaction with the attendees. Sladky added that the audience participation in regard to questions, as well as interaction with the live tube and pipe and roll form displays, was exceptional.

The addition this year of interactive videos from the vast resources of Roll-Kraft's website was extremely popular among attendees. Combined with a dynamic PowerPoint presentation,

follow-along seminar guide books, and real live "show and tell" mill equipment, these programs offer one of the most comprehensive and effective training programs in the industry. This detailed training is geared toward developing a standard, proven, and clear-cut method for all to follow, rather than the arbitrary "day shift way," "night shift way," "this guy's way," or "that guy's way."

All presentation materials and procedures demonstrate tested practices that have been documented as successful over the years and are currently used throughout the industry. The seminar is not a theory-only event; rather, it features tangible, reliable information that can be utilized immediately. Sladky states that this is one of the major reasons these "regional" and "in-house on-site" programs are so popular and rank high in demand and attendance.

Comments from seminar evaluations taken at the end of the program outlined many positive comments, further supporting the interest and continuation of these regional seminars.

Roll-Kraft conducts regional training seminars and events periodically throughout the year, and also offers tube and pipe training and roll forming training programs at customer's locations. Conducting a training program on-site allows the instructors to focus on the mills as they currently operate, with tooling and staff, and allows interaction with their everyday issues and experiences. According to Sladky, demand for this service during 2017, along with on-site mill line training, has outpaced all other years in which these services have been offered.

Roll-Kraft has its headquarters in Mentor, Ohio, and maintains other facilities in Lombard, Illinois (Chicago Roll Company); Ontario, Canada (Roll-Kraft Ltd.); and Houston, Texas (Roll-Kraft Texas). Calls to the company's main line, (888) 953-9400 or (440) 205-3100, are greeted by a live operator who can assist callers in quickly reaching a technician, engineer, or sales staff, who can provide immediate assistance. The company's fax number is (440) 205-3110.

Learn more about Roll-Kraft products and services by visiting roll-kraft.com. For easy and immediate contact with Roll-Kraft that transcends time zones and working hours, the website features an easy-to-use contact form.

ROLL-KRAFT

ROLL-KRAFT adds cnc machine to Chicago Roll Company

New Samsung SL-65MC/1000 Turning Center installed at Chicago Roll Company

Roll-Kraft, a worldwide supplier of custom roll tooling to the tube and pipe and roll forming industry,

has installed a new CNC (Computer Numerical Control) Turning Center, with live tooling, on the factory floor of Chicago Roll Company, located in Lombard, Illinois. The new machine is a Samsung SL-65MC/1000 Turning Center, and it features the latest CNC controls.

This machine will allow the company to produce rolls with a maximum diameter of 35" and maximum length of 39.4". Along with up-to-date technology and many state-of-the-art upgrades, the new machine is very user-friendly, featuring a digital touch display.

The machine will provide the necessary accuracy and precision that is essential in producing new rolls and reworking existing rolls.

Roll-Kraft's continued commitment to "industry-leading" on-time delivery and first-time performance, along with its 55-year history, assures customers of the company's stability and experience necessary to design and produce rolls with the most detailed specifications.

Reika GmbH & Co KG

Success is guaranteed with RingSaw® Technology by Reika

New production cell for processing of premium coupling blanks and cutting of tempered tubes is taking customers on the fast lane.

Facts and figures are crucial in a decision making process. For the final assessment, however, a personal presentation can be the contributing factor.

When Braun, CEO of Reika, introduced the advanced RingSaw® to a large audience of international decision makers of the tube industry during the ITA conference back in November 2017, he had little to hardly any expectations of what will be the follow up.

For sure every company maintains to deliver the highest quality ever, but Braun has proven it. The RingSaw® concept is based on a special saw head rotating around the fixed workpiece and is, above all, convincing due to the high-precision cutting quality in terms of squareness, length tolerance and even cutting surface. Thanks to the RingSaw®, the cut is right-angled and almost burr-free within a pipe diameter range of 100-610 mm. Therefore, facing on the lathes is no longer necessary, the coupling blanks will be machined externally and, if necessary, also internally on heavy duty turning machines. The positioning of the blanks is perpendicular to the center line of the lathe chuck and therefore the

machining depth can be reduced.

Thus the RingSaw® Technology delivered by German based equipment manufacturer Reika offers a high efficient production cell for premium coupling blanks. This completely flexible and powerful production cell consisting of RingSaw®, lathes and robots has been developed in recent years with the focus on using low cost standard turning machines for the premium couplings. The fully automated production cell, its modular design giving it a high level of adaptability, performs outside and inside turning and potentially also thread cutting. Marking units, measuring stations and material tracking are also provided in the automatic process. Minimum workforce for multi-machine operation increases the profits of production. Automatic palletizing with an integrated automatic pallet changer is also provided.

This unique technology has meanwhile captured a widespread high-profile awareness across Europe and leading nations of the pipe industry. A leading Russian steel pipe manufacturer, a well-known global player, has ordered last year a fully automatic RingSaw® production line with robots and turning machines. Meanwhile the facility approval has been completed successfully. Now the Russian manufacturer is able to produce up to 300 coupling blanks per hour according to API Standards on an single machine. Based on his satisfaction with the new RingSaw® technology the Russian manufacturer has now ordered again two production lines for his premium coupling production.

Success is and has always been the best promotion. Following the lead of the Russian company another large international pipe manufacturer ordered the new RingSaw® technology. And this is just the beginning of the story.

Since the personal presentation of the RingSaw® technology during the ITA conference in November 2017, manufacturers from all over the world are interested in taking advantage of the latest developments at Reika and order constantly. „They are beating a path to our door“, tells Hans-Jörg Braun and he delivers another reason for the success of the RingSaw®. „Customers feedback from the past six years consistently prove that tool cost savings of up to 80 percent with a 40 to 60 percent increase in productivity can be achieved with the RingSaw® compared to conventional carbide saws. Long tool life and short changing times also ensure high availability for our customers. The return on investment is therefore secured within a very short time.“

Good to know: Each RingSaw® is an individual solution, tailormade to the requirements of the customer. „We are looking forward to delivering the perfect solution for every client“, underlines Hans-Jörg Braun, „with all our passion for highest individual and industrial requests, we all make it happen.“

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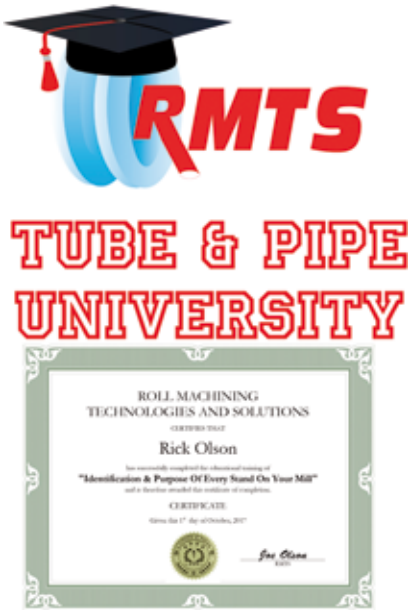
Roll Machining Technologies & Solutions (RMTS)

Continuous Training and Improvement



Roll Machining Technologies and Solutions continues to deliver firsthand knowledge from our more than 100 years of experience with actual tube mill trade skills with our customized interactive training. RMTS heads into the year's fourth quarter continuing to educate operators in their own plants with their new tooling and demonstrating how and why things are happening on a tube mill. RMTS president Rick Olson said, "We are teaching productive and repeatable work habits, safety, organization and set ups to operators. We help educate all levels- from the first time tuber to the plant managers. Some for the first time, some for the 20th time. Everyone can take something away from these valuable discussions and be able to make improvements on their mills." Rick went on to say, "Better education gives operators the knowledge to make better tube. When we rescue a company's dollars from the scrap bin, we feel accomplished helping everyone become successful."

RMTS maintains a continuous expanding library of technical papers in their 'RMTS University' organized from over the past 100 years of hands on experience. These offerings include information on straighteners, slitting, welding, edge trimming, galvanizing, finishing and much more. RMTS offers their training on site and with a packaged collection of DVDs.

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Schuler AG

Launch of spiral pipe plant in Canada

Part of the pipe storage area with transport equipment for the final welding stands.

Schuler helps steel and mining company EVRAZ to commission a line and to train the maintenance staff

In less than five months, Schuler and its customer EVRAZ have launched a spiral pipe plant in Regina, Canada. In addition, the forming technology specialist has spent three weeks training maintenance staff for software and hardware about the line and its components. EVRAZ had bought and relocated a line to Canada which was already installed in the USA.

For the modernization process, Schuler also supplied the coil cart and decoiler as well as all roller beams of the forming station with sophisticated technology. At the heart of the decoiler are two coil stands, each with two servo motors and proportional valves. The line will be used to produce spiral pipes measuring 12.0 to 24.3 meters in length with diameters of 608 to 1,625 millimeters.

The pipes will have wall thicknesses of 6 to 25.4 millimeters and weigh up to 24 metric tons.

EVRAZ North America is a wholly-owned subsidiary of EVRAZ plc, one of the world's largest steel and mining companies. It is a leading North American producer of steel products for rail, energy and industrial end markets.

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Schuler AG

First spiral pipe produced on a Schuler plant

Experts predict that in North America alone, over 10,000 kilometers of new pipeline will be laid per year by 2020. And most of that will be spiral pipes. Tuberías Procarsa, one of the leading manufacturers of steel pipe in Latin America, is equipped for this trend: the company with headquarters in Monclova (Mexico) has put a spiral pipe plant from Schuler into operation and used it to produce large-diameter pipes.

The offline spiral pipe plant can produce large-diameter pipes with a diameter of 508 to 2,235 millimeters (20 to 88 inches) and a length of 12 to 24.4 meters. The raw material up to 25.4 millimeter-thick sheet metal band made of high-quality steel (up to X100) comes on a hot rolled coil (HRC). The spiral mill forms the diameter and welds the spiral pipe within the first step by tack welding. In a further process, the final pipes will be weld by several final welding stands with a submerged arc welding process.

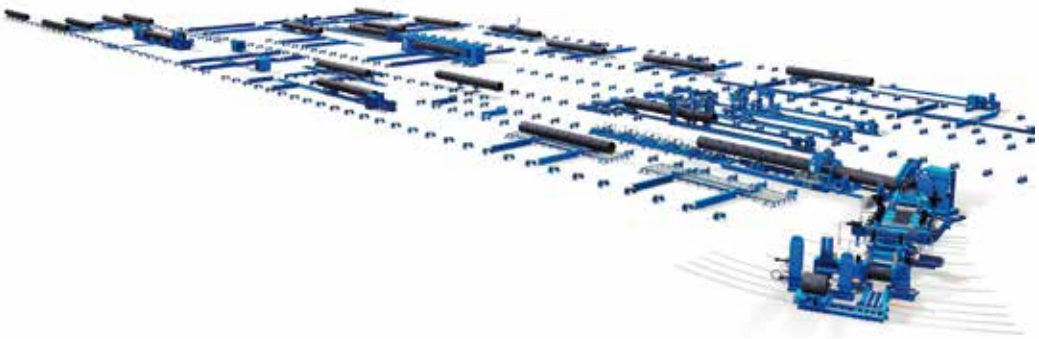
An innovation from Schuler is the integrated coil preparation stand. It ensures short changeover times, high occupational safety and an exact 90-degree cut of the beginning of the band. A crane transfer is no longer necessary. All relevant work steps on the spiral mill are automated: settings are no longer made manually; instead, setting is done directly on the well-organized control panel and implemented by servo motors. This results in an energy savings of up to 30 percent and short changeover times.

At a length of 285 meters, the pipe plant also includes various equipment for inspecting the large-diameter pipes in accordance with the API 5L standard. Ultrasonics, X-rays and water pressure stands are used here. The production capacity of Tuberías Procarsa will be increased by 200,000 tons a year thanks to the Schuler system.

Tuberías Procarsa has put a spiral pipe welding system from Schuler into operation and used it to produce the first large-diameter pipe.

Schuler AG

Pipe ID 4.0: Monitoring Plants in Real Time



It features track and trace, overall equipment efficiency (OEE), condition as well as power monitoring and smart diagnostics.

Up to 50 terminals give an overview of the workflow process (2 and 3) or the individual working stations (4).

Schuler introduces comprehensive process control system for the manufacturing of large pipes including product data acquisition

For its spiral pipe plants, Schuler continuously develops optimizations aiming at similar objectives: creating a stable and safe process flow which offers high quality large pipes, low costs of operation and a high degree of automation. This is also true for the company's latest innovation, Pipe ID 4.0 – a comprehensive process control system for the manufacturing of large pipes in real time featuring a track and trace system, overall equipment efficiency (OEE) monitoring, condition monitoring, smart diagnostics and power monitoring.

Schuler has already implemented machine monitoring in other production lines, e.g. for the manufacturing of railway wheels. The production data acquired includes all planned and unplanned downtimes including their causes, fault messages, target/actual production and the quality of the parts. In this way, the system operators gain a basis for calculating the OEE. Permanent logging of parameters also enables a cycle-accurate response in real time, where necessary; condition monitoring allows checking the system at regular intervals for damage and wear, and thanks to smart diagnostics, fault analysis is accelerated significantly.

With large pipes, product data acquisition is of particular importance when it comes to inspecting the high grade steel pipes (X100) in accordance with the API 5L standard by means of dimension quality, welding quality, ultrasonics, hydrostatic testing and X-rays. Schuler upgraded the analog X-Ray system to a digital version, so it can be easily integrated into Pipe ID 4.0. Schuler's Pipe Monitoring System. It includes a server station that stores the results of these tests as well as all of the other machine parameters.

With network label printers or paint marking and barcode scanners, all of the pipes in the plant can be traced and tracked, and their quality e.g. regarding close tolerances ensured. Even the coil storage area is managed in the database, which means that the coil data is assigned to the produced pipe. Mobile devices like tablets or smartphones can also be used for monitoring and evaluation.

Fiber optical network with ERP interface

The server station also forms the backbone for the fiber optical network every machine is connected to by managed industrial switches. This enables an overview of the workflow process including a quick status of the single machines and big pictures of the stations under work and

with fault, the production time of single pipes and a fault report. An interface to the customer ERP network is integrated.

Up to 50 operator terminals all over the plant grant access to information about the actual working time, the number of pipes per time unit, the production rates, the status of the plant and error messages of the working stations – like the offline welding station, the hydrostatic testing machine, the cross seam welding and repair stand, the inspection stand or the pipe end beveling machine. This reduces operation effort as well as costs for maintenance and repair.

Additionally, with its new robots for tab plate welding and cutting, final pipe measuring, grinding and pipe stenciling, Schuler developed a fully automatic system which can be used for both pipe ends. The minimum cycle time for diameters ranging from 20 to 88 inches is approximately five minutes. Short coil and diameter changing times, a high flexibility and low downtimes further increase the degree of automation that Schuler's spiral pipe plants dispose of.

Schwarze-Robitec GmbH

High-performance solutions for the serial production of complex tube and pipe geometries

High-performance tube and pipe bending solutions "Made in Germany" – in keeping with this slogan Schwarze-Robitec presented its extensive product range of tube and pipe bending machines and fully automatic bending cells at Fabtech. At the booth in the north hall of the trade fair in Chicago, interested visitors were able to experience a state-of-the-art CNC 100 E TB MR tube bending machine live and in action. Together with the experts from the American branch office, the long-established Cologne-based company answered all questions interested trade visitors had concerning tube and pipe bending processes.

Faster, more flexible and more efficient – the serial production of complex tube geometries presents numerous challenges for companies. This is why the tube and pipe bending specialist Schwarze-Robitec has placed its comprehensive solution competence at the center of the booth at Fabtech. The company presented the operation of a CNC 100 E TB MR tube and pipe bending machine from the high-performance series live. Whether for the production of different radii or bend-in-bend systems, such as manifolds and exhaust pipes, with the full-electric and multi-stack CNC tube bending machines, a particularly wide range of different tube and profile dimensions can be bent. Users benefit from the shortest cycle times, the highest speed, and maximum accuracy. In combination with individually adjustable tools, the multi-level technology used ensures the problem-free and accurate shaping of tubes with very short lengths between the individual bends. This can be

Schwarze-Robitec used Fabtech 2017 to emphasize its high-performance tube and pipe bending solutions "Made in Germany". This includes the CNC 100 E TB MR.

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used to bend exhaust pipes with a bending radius of 1 × D, using the smallest straight intermediate lengths between two bends. The integrated rapid clamping system "Quick Tool Unlock" allows changing the bending tools fast and requires almost no tools at all. Set-up times are therefore significantly optimized, and machine downtimes are substantially minimized. The NxG control system also contributes to the fast cycle speeds of the high-performance series: Users can reduce the production time by up to 35%, depending on the tube system to be bent.

Expansion of the range of services in North America

Fabtech is the meeting place for the metal-processing industry in North America. Schwarze-Robitec took the opportunity to get in touch with numerous customers and interested parties and to inform them about the latest company news. This also includes the fact that the US branch office moved to new offices warehouse facilities in Grand Rapids (Michigan) in April. On 2000 square feet Schwarze-Robitec stores there, among other things, the most important spare parts for the custom-made tube and pipe bending machines. This means, the company with a long tradition, headquartered in Cologne (Germany) and first-class support, can respond to service requests in North America even more quickly. The goal is to further expand the market in North America

Sikora AG

SIKORA at TUBE 2018 (6J32) – Premiere of innovative measuring technologies for online quality control of steel tubes

SIKORA AG, with its headquarters in Bremen, Germany, is a manufacturer and supplier of advanced measuring, control, inspection and sorting technologies for the hose and tube, wire and cable, optical fiber and plastics industries. At Tube in Düsseldorf, from April 16 to 20, 2018, the company presents for the first time a broad portfolio of innovative systems for non-destructive quality control and process optimization during production of steel tubes at its booth 6J32.

S-WAVE 6000: Diameter and ovality measurement of steel tubes by means of millimeter waves based radar technology

For more than ten years SIKORA has been successfully active in the plastics market. The applied technologies for quality control measure and control online product parameter such as diameter, ovality, wall thickness as well as eccentricity for the highest quality of the end product and optimal process efficiency during the production. The operator's advantages that result from using SIKORA measuring systems, suggested the proven technologies to be transferred to the steel market. The SIKORA S-WAVE 6000 is based on progressive, high resolution radar technology and represents an innovative alternative to the

optical triangulation technology. The advantage of radar technology is that reliable measuring values are generated even under difficult environmental conditions. Therefore, the automotive industry uses in the area of autonomous driving radar technology guaranteeing reliable measuring values under all weather conditions. The S-WAVE 6000 measures online and contactless, simultaneously from several directions the diameter and ovality of steel tubes. In addition, in this way fast rotating steel tubes can be precisely measured. The system requires neither coupling media nor a calibration. The temperature of the tube has no influence on the measurement. Due to the slim design the S-WAVE 6000 can easily be integrated in the production process in arbitrarily large distance to the tube. The S-WAVE 6000 is even able to provide reliable measuring values when the tube moves outside the center of the measuring head. The technology is suitable for blank, rough as well as cold or warm surfaces.

Thickness measurement of steel plates by means of millimeter waves technology

Radar technology based on millimeter waves additionally convinces with the measurement of the thickness of steel plates. Similar to the optical triangulation method the distances to the steel plates are measured at the top respectively at the bottom. The advantage is that the radar waves are directed over a reflector on the product to be measured, thus the radar transceivers carry out the measurement from a protected position. Dust, steam and even dripping water do not influence the measuring result. For this application as well, surface quality is no issue with the result that blank, rough, cold and warm surfaces are precisely measured.

Wall thickness measurement of plastic coated steel tubes by means of X-ray technology

Wall thickness measurement of plastic coated steel tubes by means of X-ray and millimeter waves technologies

At the Tube SIKORA also showcases systems for the measurement of plastic coated tubes on the basis of X-ray and millimeter waves technologies. A plastic coating is among others applied at freely installed, underground and under water laid steel tubes for corrosion protection. For the joining of produced tubes compliance with specified dimensions for example for the wall thickness is essential. Therefore, for the measurement of the wall thickness of the plastic coating, SIKORA's X-ray based X-RAY 6000 PRO for tubes with a diameter up to 200 mm is used. For larger dimensions the previously described S-WAVE 6000 is used. Both methods are independent from the material of the product to be measured and the temperature, they do not require coupling media and no calibration. Immediately with the online measurement precise measuring values are accessible. These are visualized at the monitor of the processor system ECOCONTROL 6000 and allow the operator, if required, to intervene in the process for optimization. Thus, SIKORA systems are essential components to ensure the highest quality and an efficient process during the manufacturing of plastic coated steel tubes.

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SMS group GmbH

Global Pipe Co. invests in SMS group key equipment

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Mr. Johannes Heinlein, Commercial Sales Manager, SMS group
Mr. Frank Kaiser, Technical Sales Manager, SMS group
Mr. Ahmed Hamad Al-Khonaini, Shareholder and Managing Director, Global Pipe Company

Global Pipe Company (GPC), based in Jubail, Saudi Arabia, has placed an order with SMS group for the supply of a mechanical expander an a hydrostatic pipe tester for its new manufacturing line that will double the company's annual production capacity from 200,000 tons to 400,000 tons.

"Our target is to equip our new manufacturing line with the most advanced technology available on the market, from reliable machine suppliers with lengthy experience in the supply of equipment for pipe mills," says Ahmed Hamad Al-Khonaini, Shareholder and Managing Director of GPC. "Thus SMS group has been selected as the supplier for the expander and the hydrotester. They have presented us strong references in pipe mills with similar scope of business." continues Mr. Al-Kohanaini.

The new 10MN mechanical expander will be installed in the final control area of the new line. In addition to the stress relief on welded pipes, the expander will give the final shape for GPC's products, making sure that the final dimensions are within the required range according to the applicable specifications. The machine will initially cover the diameter range between 24" and 56", and optimize GPC's output in big diameter pipes. The new hydrostatic pipe tester covering pipe diameters from 16" to 62" is also one of the major equipment additions to the new line. It will have a testing capacity of 650 bar allowing the hydro-inspection of small-diameter pipes with heavy wall thickness pipes as per applicable specifications.

The new line will be implemented as a completely independent line from the existing one. This will allow GPC to run two different manufacturing orders simultaneously and avoid interruption for orders in case of priority changes.

"By doubling our nominal capacity to 400,000 MT, we will be in the position of allocating production slots for neighboring markets in the GCC and MENA region without neglecting our home market," says Ahmed Hamad Al-Khonaini.

The new line should be ready for production in the third quarter in 2018.

SMS group GmbH

voestalpine Tubulars commissions new heat treatment line and hot tube straightener from SMS group

voestalpine Tubulars GmbH & Co KG based in Kindberg-Aumühl, Styria, Austria, has successfully commissioned a new heat treatment line and a hot tube straightening machine supplied by SMS group (www.sms-group.com). The line is designed for seamless tubes with outside diameters between 60.3 and 273.0 millimeters. It can process steel grades with alloying contents of up to approx. 20 percent.

The line has a maximum capacity of 25 tons per hour. With this new line, voestalpine is strengthening its market position as a supplier of seamless tubes for oil and gas exploration.

The heat treatment line supplied by SMS group consists of a walking beam type austenitizing furnace, an SMS Quenching Head, a cooling table for normalizing, a tempering furnace, also of walking beam design, a cooling bed and two sawing stations for sample cutting. This equipment allows voestalpine Tubulars to perform various different heat treatments such as quenching, tempering, and normalizing in one single line.

Today the heat treatment line can handle tubes with wall thicknesses of up to 25 millimeters. The line is designed to be expanded by an additional quenching unit at a later stage in order to process tubes with wall thicknesses greater than 30 millimeters.

The cross-roll straightener with ten individually controlled rolls has a very sturdy design and allows rapid roll changing for minimum standstill times. The line is controlled fully automatically.

Thanks to the high product flexibility of the line, also small batches and a great number of different product groups can be processed highly cost-efficiently.

The use of eco-friendly, extremely low-NOx recuperator burners in the furnaces saves up to five percent of fuel compared to conventional burners. The water treatment plant cools and filters up to 1,800 cubic meters of water per hour, reducing fresh water requirements to less than three percent.

SMS group received the Final Acceptance Certificate after only two months of intensive testing in close cooperation with the engineers of voestalpine Tubulars. During these tests, all performance parameters (specific fuel consumption, temperature uniformity, production rate and final tube quality) were successfully reached.

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www.sms-group.com

The cross-roll straightener with ten individually controlled rolls has a very sturdy design and allows rapid roll changing for minimum standstill times.

The use of eco-friendly, extremely low-NOx recuperator burners in the furnaces saves up to five percent of fuel compared to conventional burners.

SMS group puts digitalization in the spotlight at Tube & wire 2018

Sensors generate data. When manufacturing tubes, wire and steel bars, laser light section sensors measure up to 5,000 contours per second and convert them into a high-resolution 3D model during the production process.

We see digitalization and Industry 4.0 as key challenges that are set to profoundly change the tube and wire industry in the years to come. SMS group (www.sms-group.com) is turning the spotlight on these topics at the Tube & wire trade fair, which will take place in Düsseldorf from April 16th to 20th, 2018. Hall 7a, booth B03/B04, is where SMS group will be looking at how digitalization is changing the whole value-added chain and enabling greater efficiency, higher quality, and more flexibility from a number of different angles.

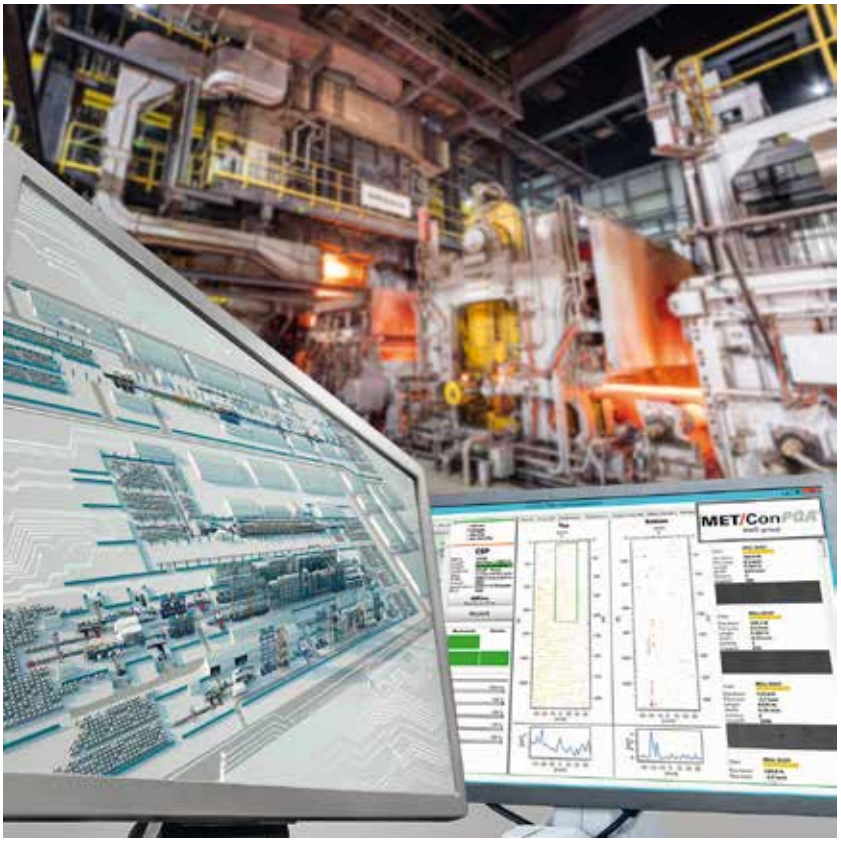
The first impetus arising from digitalization and Industry 4.0 concerns the design and manufacture of machines and components for the production of tube and wire itself. At the fair, SMS group will be demonstrating this using the example of a mill stand for a cold pilger mill, which is made with the aid of additive manufacturing processes. The component geometry of a mill stand, which up to now has been made by machining techniques, was optimized in terms of the stresses generated so that the number of strokes and thus the productivity were enhanced significantly. Further examples of SMS group's activities in the additive manufacturing growth market, which are to be shown at the fair, are the competence center for 3D printing, which is being built in Mönchengladbach, as well as 3D printed components. They show an enhanced functionality, they weigh less and have shorter delivery periods.

The second topic shows the possibilities that digitalization offers for the production process. The aim of the "smart mill" is to use data and the corresponding parameters as a basis for business and process control related decisions. A realistic map of the process with precise measurements is required for the collection of reliable process data. This type of measuring system for tube, pipe, bar, and section mills is to be displayed by SMS group at Tube & wire in cooperation with TBK Automatisierung und Messtechnik GmbH, an SMS group company. The system measures up to 5,000 contours per second with laser light section sensors during the rolling process. Local atypical anomalies on the surface can be detected on the basis of the 3D models, generated

by high resolution cross-sectional measure¬ments. The direct transfer of the measurement readings to the mill stand control system allows roll setting adjustments to be made during the rolling process and thus saves time and money by directly monitoring the production process.

Digitalization is also creating new opportunities for plant service. "Smart Maintenance Solutions" are aimed at enhancing the availability of the plant and the quality of the end products on a long-term basis by combining software solutions. The creation of a digital plant structure will offer maintenance teams centralized access to all the relevant parameters in future. The information required will be provided, for example, by the eDoc electronic parts catalog, the IMMS® (Integrated Maintenance Management System), or the Genius CM® system (Condition Monitoring). What's more, the link to "smart" training courses will also be presented at the fair using augmented reality.

Digital products and platforms round off the range of presentations at Tube & wire 2018. They form the basis for intelligent, digital services, and implement the secure, digital exchange of information between SMS group and its customers. One example is the platform for PQSC® piercer plugs for seamless tube rolling mills, through which you can process orders and check the status of each order 24 hours a day. Not only that, a comment function ensures easy communi¬cation, as notes referencing the relevant customer order and SMS group employee can be entered. The option of order-based communication means the whole process is more transparent, change requests are easier to follow, and orders can be split if different delivery times for partial deliveries are required.



The quality management system PQA® (Product Quality Analyzer) is another digital product that will be presented at Tube & wire 2018.

However it is not just technological boundaries that will be redefined by digitalization. The way we work with customers and other partners will change, with cooperation becoming even closer in future. As the "Leading Partner in the World of Metals" SMS group is getting together with customers to present projects at this fair that highlight this successful cooperation in the areas of new plant construction, revamps, and service. More information on the program will be published on our microsite www.sms-group.com/tw2018 at the start of April.

Vallourec Deutschland GmbH

Vallourec reports third quarter results and results for the first nine months of 2017

Vallourec announces its results for the third quarter and the first nine months of 2017.

Vallourec today announces its results for the third quarter and first nine months of 2017. The consolidated financial information was presented by Vallourec's Management Board to its Supervisory Board on 9 November 2017.

Improved 9M 2017 results

Positive EBITDA in Q3 2017: +€9 million compared with -€52 million in Q3 2016

Strong improvement in EBITDA for first nine months: -€9 million compared with -€156 million in 9M 2016

Mainly driven by higher Oil & Gas revenue in the US and the realized benefits from the Transformation Plan

Liquidity strengthened: €800 million refinancing through bond and convertible bond issuance

Range for EBITDA target for 2017 revised upwards to -€30 million and -€10 million.

Commenting on these results, Philippe Crouzet, Chairman of the Management Board, said:

"Over the first nine months of 2017, Vallourec's financial performance has improved in each of the three quarters leading to significant progress compared to the same period in 2016. In the third quarter, the full effect of announced price increases in the US became evident. In EAMEA, NOCs continued to issue tenders for Oil & Gas products, and while IOCs' are starting to sanction new projects in the region, market prices are still challenging.

Vallourec remains focused on the sustained implementation of its Transformation Plan.

In October, the Group both strengthened and diversified its liquidity position by raising €800 million on the bond and convertible bond markets.

The EBITDA target for the full year 2017 has been raised to a range between -€30 million and -€10 million."

Vallourec strengthens its commitment to the climate

89 French companies co-signed a new version of the French Business Climate Pledge, in order to contribute to a low carbon economy.

Initially, this agreement was signed in 2015 before the COP 21, by 39 companies who wanted to increase their ecological investment during the 2015-2020 period. They had committed to investing:

- 45 billion euros in industrial and R&D projets
- 80 billion euros in bank and bond financing for projects contributing to the fight against climate change

On December 11th, 2017, the day before the One Planet Summit initiated by French President Emmanuel Macron, 89 companies met either to renew the agreement for the 3 remaining years, or to join the initiative. Each one of them highlighted its actions and publically identified itself as a player committed to fighting climate change.

The above commitments were respectively raised to 60 and 220 billion euro.

A company has many ways to curb its carbon footprint, for example by using energy from renewable sources, such as wind or solar, reducing greenhouse gases or developing new materials and low carbon technologies.

Vallourec is among the signatory companies, along with others such as Air Liquide, Arcelor Mittal, Saint-Gobain, Technip and Total.

Vallourec's industrial activity requires significant electricity, gas and charcoal consumption, but nearly 40% of the energy consumed by Vallourec in its manufacturing process is renewable. The Group is engaged in an ambitious project of energy efficiency. Moreover, the Group has lead an

in-depth study of the operating conditions in its forest in Brazil. At the end of this scientific study, it can clearly be seen that, thanks to the role of the roots and the earth, the forest-steelworks system captures carbon instead of emitting it, thereby considerably lowering the Group's total carbon emissions.

Finally, the premium products manufactured by Vallourec have always been eco-solutions which allow its customers to reduce their carbon emissions. For instance, the tightness and mechanical resistance of VAM® connections are equivalen to those of the tubes and avoid the risk of cracking and breaking and therefore leakage of liquid or gaseous hydrocarbons. Another example is CLEANWELL®, a non-polluting coating applied to threaded and coupled connections aims to replace storage and running compounds, and ensure perfect sealing of the connections while protecting them effectively against galling and corrosion. The result? Productivity gains, but above all minimal repercussions on the environment.

Vallourec is considering divesting its "Drilling Products" business

Vallourec announces that, after negotiations run with the US oil services company NOV, it has received a binding offer for the purchase of Vallourec Drilling Products business, for a total cash amount of US$63 million.

Boulogne-Billancourt, December 11, 2017 – Vallourec today announces that, after negotiations run with the US oil services company National Oilwell Varco (NOV), it has received a binding offer for the purchase of Vallourec Drilling Products business, for a total cash amount of US$63 million.

This offer covers all of Vallourec's industrial activities related to Vallourec Drilling Products in North America, in the Middle East, in the Netherlands, and in France (one plant in Aulnoye-Aymeries, Hauts de France).

The French "Drilling Products" sites in Cosne sur Loire (Bourgogne-Franche Comté) and in Tarbes (Occitanie) would undergo an independent divestment process at the same time.

Vallourec Drilling Products, with an overall workforce of around 600 employees, offers a wide range of products including drill pipes, drilling accessories and other tubular products.

NOV is a US company and leading provider of oil services with a global presence, offering the technology, equipment and services needed for drilling, oil and gas well completion, and hydrocarbon production.

This project further supports Vallourec's Transformation Plan aiming at strengthening its competitiveness on its strategic markets. In accordance with the applicable regulations, this project is conditional upon the approval of governance structures and consultation with the relevant staff representative bodies.

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voestalpine Tubulars GmbH Co. KG

voestalpine and its partners get the green light to build the world's largest industrial hydrogen pilot plant in Linz

voestalpine has long been regarded as an environmental and efficiency benchmark in ist industry, as well as a driver of innovation. Now the technology and capital goods group can complete another step towards realizing the H2FUTURE research project funded by the EU: the government of Upper Austria as the responsible EIA authority has recently authorized construction oft he world's largest pilot plant of ist type for CO2-free production of hydrogen at the site in Linz. Together with five project partners, voestalpine is laying the foundations for further pioneering research into decarbonizing the steel manufacturing process.

Gaining official approval is the starting signal for building the new hydrogen electrolysis plant at the voestalpine premises in Linz. This will be the largest and most advanced plant of ist type for generating "green", i.e. CO2-free, hydrogen. With EUR 18 million in EU funding, the project will conduct research which explores, amongst others, the potential use of hydrogen in the individual stages of steel production.

Research breakthrough technologies

"In view oft he EU'S 2030 climate and energy goals, both industry and utilities face enormous ernergy-related challenges which demand fundamental technological changes. For years voestalpine has been taking steps towards gradually de-carbonizing the steel production process. This hydrogen pilot plant is finally paving the way for research into true breakthrough technologies," says Wolfgang Eder, Chairman on the Management Board of voestalpine AG. The long-term goal ist o move away from coal and coke, via bridging technology based on natural gas (e.g. in the direct redeuction plant in Texas), to use "green" hydrogen in the production process. Realistically, it will take aroung a couple of decades before theses processes can be used on an industrial scale. "Furthermore, a technological transformation can only take place when renewable energy is sufficiently available and at competitive prices," explains Eder.

Construction to start in the coming weeks

The pilot plant will be erected in a new building immediately adjacent to the voestalpine power plant at the site in Linz. "Now that official approval has been given, we can begin with actual implementation and start the preparatory construction work. Establishing this research facility is a technological flagship project not only for voestalpine, but also for linz, and represents an important investment in the future of the region,", says Herbert Eibensteiner, Member oft he Management Board of voestalpine AG and Head of the Group's Steel Division, based in Linz. The individual plant components are scheduled for delivery as early as this summer, and testing should commence before the year is over. The centerpiece of the new research facility will be the world's largest PEM (proton exchange membrane) electrolyser, with a capacity of six megawatts and able to produce 1,200 m³ of hydrogen an hour. The electrolysis system developed by project partner Siemens will achieve a higher output efficiency than comparable systems to date. In a PEM electrolyser electrical energy - in this case electricity generated from renewable sources by project partner Verbund - is used to break down water into its constituent parts, hdrogen and oxygen. The aim of H2FUTURE is to test this next development step in PEM technology on an industrial scale, as well as to trial ist use in the electricity balancing market.

About H2FUTURE

The H2FUTURE project consortium sonsists of voestalpine, VERBUND, and Siemens as well as the Austrian Power Grid (APG), together with scientific partners K1-MET (Metallurgical Competence Center) and ECN (Energy research Centre of the Netherlands). The Project is funded a spart oft he European Commission's Horizon 2020 program (Joint Undertaking Fuel Cells and Hydrogen) through to 2021.

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ITA – International Tube Association

The ITA Conference 2017

CONFERENCE
ITA
International Tube Association

DÜSSELDORF 7 - 8 NOV. 2017
CCD EAST Messe Düsseldorf

The best way to drive an industry forward is to share: progress, experiences, successes and new developments. In early November 2017 – and after months of preparation on our part – professionals from the tube and pipe sector came together in Düsseldorf for the ITA Conference 2017.

The theme for the two-day Conference, from 7-8 November 2017, was How To Stay Competitive In Difficult Times. Participants gathered at the exhibition grounds of Messe Düsseldorf, the trade fair organizers in Düsseldorf, and with 16 exhibitors in the tube sector and a number of companies exhibiting in the concurrent wire event, the two days saw an exciting buzz of activity and networking.

Our members were given the opportunity to showcase their company and their work with a foyer exhibition, which also provided a marvelous forum for networking and discussion. Others shared their expertise with a presentation; the first day's agenda included an amazing 16 papers on such topics as Spiral Pipe Plants In New Dimensions, Reliable Ultrasonic Tube Testing and the Russian Steel Pipe and Tube Market in 2017-2018.

There was also a panel discussion on the main topic: namely, how to sustain a competitive edge in difficult markets. Participants stressed the importance of market knowledge and of constant innovation.

As a counterweight to the professional orientation of the daytime agenda, the evening offered the chance to do a little sightseeing; a Rhine riverboat tour with a dinner and drinks onboard provided further networking opportunities with colleagues and experts from across the sector. We'd like to think that the many conversations around the dinner table led to several profitable and mutually

beneficial connections and partnerships.

The second day of the conference was given over, for those who wished it, to two highly informative plant tours, one at the site of Vallourec in Düsseldorf and the other on the premises of Europipe in Mülheim in the nearby Ruhrgebiet.

And we enjoyed it so much we would like to do it again. Feedback has encouraged us to reach out to still wider segments of the industry, and we're envisaging a further invitation to colleagues and stakeholders to once again come together at our world-class venue.

Dates and themes have yet to be decided, but we are certain that developments within the sector will provide plenty of exciting topics to discuss, from new markets to materials and technologies that are still on the drawing-board.

In order to be kept in the loop, members and colleagues can sign up for our newsletter – via Contact Us, http://www.conference.itatube.org/#footer – or just drop us a line at info@itatube.org

You can also follow us on social media for updates; links to our Twitter, Facebook, LinkedIn and Google+ pages can be found on the website.

International Tube Association e.V.

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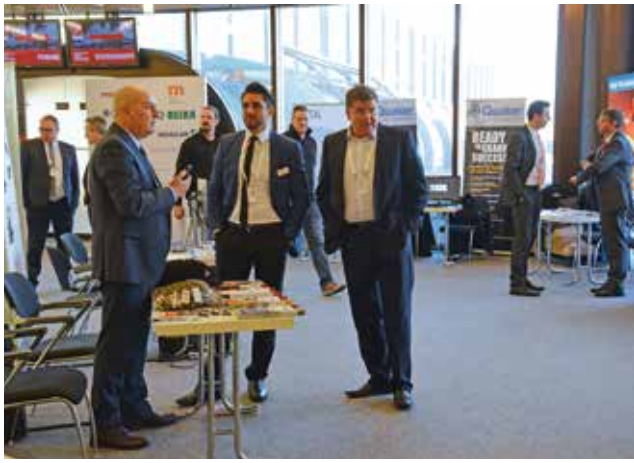

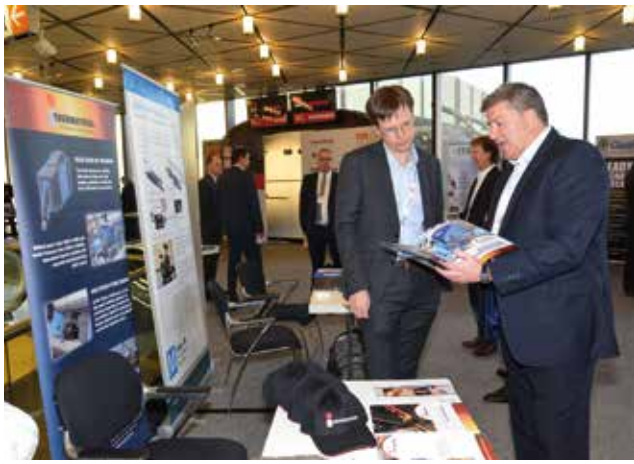

ITA-India Chapter

ITA-India Chapter held a one day Conclave

CONFERENCE
ITA
International Tube Association
NEW DEHLI - 15 NOV. 2017

ITA-India Chapter held a one day Conclave on Emerging Trends in Tubes and Pipes for Oil and Gas in New Delhi on November 15, 2017. The Conclave was inaugurated by the Hon Union Minister for Steel, Shri Vishnu Deo Sai, who drew upon the significant linkage between the Steel Industry and the Oil and Gas Industry, and the need for continuous investments in research and development in the interdependent areas of new products, durability, reliability and cost effectiveness. The speakers at the inaugural session included Mr. Anand K Tiwari, Executive Director, Indian Oil, Mr. Chintamani Tandi, Executive Director, ONGC and Mr. Bhagwat Negi, Consultant. The programme was divided into 3 sessions, broadly, one on Exploration and Extraction, second on Refining and the third on Conveyance post refining. While the session on Conveyance and Line Pipes attracted many speakers, the one on refining did not have many speakers. All the speakers talked about improvements and new insights being gained in their respective fields and felt that it is necessary to go beyond the API standards to gain significant value to the system. One session presented detailed research on Corrosion and corrosion resistance in down hole pipes and measures to improve the working life. Another suggestion came from use of non standard thicknesses for pipes used as Line Pipes, different from thicknesses prescribed by API standards, by designing the pipes from basic engineering fundamentals, to reduce material content, and thereby reducing the initial investment costs. Other presentations covered Methods to improve pipeline safety, challenges to pipe coating, Steel solutions for Pipelines, Material selection to improve Corrosion Resistance and so on. There were also two panel discussions, one was on Competitive Advantage between India and China in manufacturing Steel, led by Mr. Syedain Abbasi, former Deputy Secretary, Ministry of Steel, Government of India, and the second, Technological Challenges in Manufacture of Line Pipes for Oil and Gas led by Mr. TS Kathayat of Welspun Corp, Mumbai and an ITA member. The session on competitiveness pointed out the cost differential between China and India arising only from the cost of coking coal used, in which China has a major advantage. Suggestions for India to compete in this would be in terms of scale, improved productivity and better infrastructure.About 120 delegates from diverse fields attended the Conclave, including Manufacturers of Tube and Pipe, Suppliers of Steel Plates and Coils, Coating materials suppliers, Weld element suppliers, Independent Assessors, Third Party Inspectors, Consultants on Design and Safety, Project Executioners etc. There was good participation from the Oil and Gas Industry professionals from organisations like ONGC, OIL India, EIL, Indian Oil, GAIL and so on.

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SteelFab 2018

Sharjah fair sets the course for regional fabrication industry

The projected doubling of UAE's growth rate and rising crude oil prices are set to underscore the growth of the region's steel fabrication and metal working industry.

The green shoots of these new growth factors were visible at the just-concluded SteelFab 2018 held at Expo Centre Sharjah from January 15 to 18, 2018.

"SteelFab 2018 once again went to show why it is considered the best event in the region for the metal working, metal manufacturing and steel fabrication industry. By hosting close to 291 exhibitors from 23 countries and attracting 7,123 trade visitors from scores of countries, the show has reinforced its position as the largest and most attended event of its kind in the region," said H.E. Abdalla Sultan Mohamed Al Owais, Chairman of the Sharjah Chamber of Commerce and Industry & Expo Centre Sharjah.

The upturn in industry turnout was aided by promising macro-economic conditions, apart from a vibrant construction and infrastructure sector that is the lifeline of the fabrication industry.

For the first time in almost two years, the price of oil has climbed to its highest level of close to US$69 per barrel. With analysts expecting the prices to rise, the UAE and the other oil-producing regional countries are expected to benefit in a big way.

Besides, after years of sluggish growth, the UAE economy is expected to grow at 3.4% this year; and the introduction of value-added tax is set to further strengthen the economy, setting the stage for a rise in orders for regional steel fabricators.

With less than 1,000 days to go for the Expo 2020, and mega projects like the Dhs 2.4 billion Maryam Island getting launched, a multitude of opportunities are awaiting the regional fabrication sector, added H.E. Al Owais.

"SteelFab has always been a gathering point of the regional industry. Now, we have gone a step ahead and become the voice of the industry by launching the Fabricators Forum, which aims to encourage dialogue, discuss issues, explore opportunities and find ways to tap them," said H.E. Saif Mohammed Al Midfa, CEO, Expo Centre Sharjah.

SteelFab 2018 also witnessed the launch of the Middle East Fabricators Awards 2019, which will recognise organisations that demonstrate leadership and innovation from both the private and public sectors.

In a first, SteelFab 2018 played host to the launch of the Essen Welding & Cutting Pavilion, an offshoot of a tie-up between Expo Centre Sharjah and Messe Essen, organiser of Europe's Schweissen & Schneiden fair.

Besides, pipes and tubes machinery & tools were in focus this time too, thanks to the support of the International Tube Association from Germany for the second consecutive year.

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Apart from Germany, visitors also took benefit of the enhanced foreign participation from countries such as Italy, Taiwan, Turkey, India and China. Display and sale of machinery were also aided by special focus areas such as Wear Resistant, Welding & Cutting and Machine Tools.

Other attractions at the show included seminars & technical presentations, live displays and the 3rd Fasteners World Middle East that showcased a wide range of industrial fasteners and fixings, assembly and installation systems, fastener manufacturing technology as well as storage and logistics services.

About the show

SteelFab 2018 was organized and hosted by Expo Centre Sharjah with the support of the Sharjah Chamber of Commerce and Industry from January 15 to 18, 2018. It showcased machinery and equipment in metal forming, surface preparation & finishing, grinding & cutting, machining & other allied engineering disciplines. It also featured Italian, German and Taiwan pavilions, and enjoyed support from leading industry associations from Italy, Germany, Taiwan, the UK and the UAE.

TUBOTECH 2017

Brazil: Regional Trade Fairs for Wire, Cable and Pipes with a Positive Summary after the Three-Day Events

3 to 5 October 2017 saw the regional trade fairs for the wire, cable and pipe industries – wire South America and TUBOTECH – held jointly at the Sao Paulo Expo Exhibition & Convention Center in Brazil for the third time now.

The rather reticent approach to investment over the past years seems to be over – interest in investing in Brazil and the rest of South American market is rising and boosting prospects for good follow-up business.

Nevertheless, some companies felt insecure and did not come to Brazil this year, a fact reflected by exhibitor numbers.

In the run-up to the economic upswing to be expected 116 companies from 22 countries presented their technological innovations at wire South America. 67 exhibitors from 10 countries travelled to TUBOTECH in Sao Paulo.

For the second time now a national pavilion with 15 German companies presenting their products on the South American market was organised in the wire and cable segment. In addition to this, wire South America featured pavilions of Italian and Austrian exhibitors.

TUBTOTECH focused on trends and technologies from the areas of pipe manufacturing, pipe finishing, pipe processing, pipe accessories and pipe trade.

Visitor interest has increased: a total of 12,000 trade visitors attended both trade fairs and gathered information on the latest technologies and current products from the areas of wire, cable and pipes over the three days of the fair.

95% of trade visitors came from Brazil, 5% from South and Central American countries such as Argentina, Bolivia, Chile, Columbia, Paraguay, Mexico, Peru and Uruguay as well as from Canada, China and India.

The visitors travelling from Europe to Sao Paulo came from Germany, Spain, Italy, Sweden and Turkey.

Visitors came primarily from the oil and gas industries, the automotive industry, the construction industry, metal construction and mining. After all, wire, cable and pipes are indispensable for upcoming investment in the South American construction industry, the automotive and energy industry.

Messe Düsseldorf has already cooperated with its international partners for many years. Together with CIPA Fiera Milano Brazil they continuously work towards the success of both trade fairs.

wire South America was again supported by the international associations IWMA – International Wire & Machinery Association, IWCEA – International Wire & Cable Exhibitors Association, WCISA – Wire and Cable Industry Suppliers Association (USA) and ACIMAF – Italian Wire Machinery Manufacturers Association.

TUBOTECH received conceptual and expert support by ITA – International Tube Association – and the Brazilian professional association ABITAM – Associação Brasileira da Indústria de Tubos e Accesórios de Metal.

The metal trade fair duo will be held again from 1 to 3 October 2019 at the Sao Paulo Expo Exhibition & Convention Center – this time in the new exhibition hall 1, which is located right at the entrance to the fairgrounds and therefore even faster and more convenient to access.

For current information on both trade fairs go to the Internet portals www.wire-south-america.com and www.tubotech-online.com.

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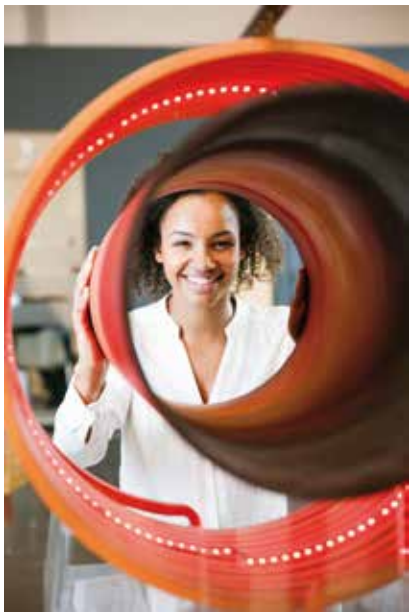
wire 2018 and Tube 2018 – bigger than ever! Record results for the two famous metal trade fairs in Düsseldorf



Nearly four months before the start of the metal trade fair summit in Düsseldorf the exhibition centre has received better bookings than ever before in the successful history of wire and Tube Düsseldorf, a history of over 30 years.

Never before have so many square metres been reserved by exhibitors. Taken together, wire and Tube already have a net floor space occupancy of 120,000 sqm, which is about 10,000 sqm more than the final figure for the two trade fairs in 2016 – a result that was already outstanding.

The number of exhibitors who have so far registered for wire 2018 is currently 1,180, representing 50 countries. Over 65,000 sqm are occupied in Halls 9 to 18. The occupancy level for Tube in Halls 3 to 7.0, 7a and 16 to 18 is over 52,000 sqm, with 965 exhibitors from 53 countries.

As before, the two Düsseldorf events have impressively demonstrated their number one positions as the world's leading trade fairs in their industries. Innovative technologies, new machinery and equipment as well as products and services from the wire, cable and tube industries will be presented on five days.

wire 2018 will be held in Halls 9 to 16 and partly also in the temporary Hall 18. It will feature machines for the manufacturing and finishing of wire, tools and auxiliary materials for process engineering as well as materials, special wires and cables. The trade fair will also cover innovations in measurement and control engineering, test engineering and a range of specialist areas.

2018 will have an even greater focus than previously on the potential of glass fibre technology. Glass fibre is more efficient, faster and often more reliable than conventional materials. In this way Messe Düsseldorf is responding to the increasing use of glass fibre technologies in the energy sector

as well in the construction and communication industries.

The segments of wire and cable machines, wire and cable production, the retail trade and glass fibre technologies will be presented in Halls 9 to 14 and 16, while connection and fastener technologies can be viewed in Hall 15. Mash welding machines and spring making can be found in Hall 13.

Tube 2018 will present itself in Halls 3 to 7.0, 7a, 16 and 17 and also partly in the temporary Hall 18. The range of showcased products will cover machinery and equipment for tube production, treatment and processing as well as raw materials, tubes and accessories, pre-owned machinery, process technology tools, auxiliary resources and measuring, control and test equipment.

Furthermore, the line-up will include pipelines, OCTG technology, profiles and plastic tubes.

Halls 16 and 17 will feature tube accessories, while the tube trade and tube manufacturing can be found in Halls 3, 4, 7 and 16, and tube forming technology in Hall 5. Machinery and equipment as well as tube processing machines will be presented in Halls 6 and 7a. Profiles and plastic tubes will be shown in Halls 3 to 7.0, 7a, 16 and 17.

Ongoing demand from China has made it possible to set up a Chinese Pavilion again. Chinese companies from the wire, cable and tube industries will be jointly represented in Hall 16 under the slogan “Meet China’s Expertise”.

Up-to-date details of the two trade fairs can be found on their respective websites: www.wire.de and www.Tube.de

Interview with Friedrich-Georg Kehrer

Interview with Friedrich-Georg Kehrer, Global Portfolio Director Metals and Flow Technologies, in the run-up to the international trade fairs wire and Tube, which will be held at the Düsseldorf Exhibition Centre again from 16 to 20 April 2018

Question:
What’s new at the world’s leading trade fairs for wire, cables and tubes in 2018?

Kehrer:
As before, the two number one trade fairs in their industries will occupy 16 exhibition halls, mapping the entire spectrum. They will cover wire manufacturing and finishing, process automation, measurement and control engineering, cable technologies, tube manufacturing and processing, raw materials, the raw material trade, pipelines, OCTG technology, profiles, pre-used machinery and plastic tubes.

But there will also be enough space for further specifications and applied technologies, and of course Industry 4.0 will definitely continue to determine the course of the two leading trade fairs in 2018. We’ll be welcoming over 70,000 trade visitors on those five days, and we’re expecting to see the entire professional world coming to Düsseldorf again.

What’s new is the hall layout. The southern section of our exhibition centre will be extended towards the Rhine, comprising the future Hall 1 and thus a new, light-flooded southern entrance area as the dominant feature, looking towards the city centre. This is why wire 2018 will be held in Halls 9 to 16 and parts of the temporary Hall 18, while Tube will cover Halls 3 to 7.0 and Halls 16, 17 and also parts of the temporary Hall 18.

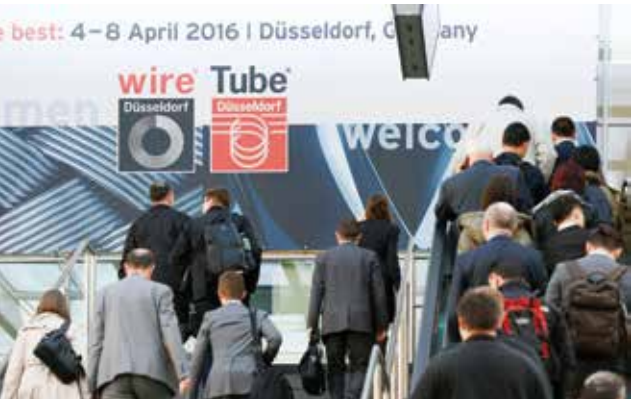
It means that Hall 16 will form a transitional area and interface between wire 2018 and Tube 2018.

In addition to the southern, eastern and northern entrances, there will be a temporary entrance in Hall 17. The shuttle buses will be serving all four entrances.

Question:
What will be the main emphasis in the various halls?

Kehrer:
wire: Halls 9 to 14 and part of Hall 16 will focus on wire and cable machines, wire and cable production and trade and glass fibre technologies.

Hall 13 will put the emphasis on mesh welding machines and spring making technology. Hall 15 will feature connection and fastening



technologies, and the adjacent Hall 16 will have a section entitled "Meet China's Expertise".

This has proved its worth in the past and has again been requested by our Chinese exhibitors who want to present their innovative products in a compact and manageable area, within one hall.

Tube: Tube manufacturing, profiles and the tube trade will feature in Halls 3, 4, 7 and 16. Tube metal forming will be presented in Hall 5, and tube processing machines in Halls 6 and 7a. Plants and machinery will be showcased in Hall 7a, whereas Halls 16 and 17 will be about tube accessories. Profiles will be presented in Halls 3 to 7a and Halls 16 and 17. China's Tube exhibitors will occupy Hall 16 together with their wire colleagues from the same country, inviting visitors to "Meet China's Expertise". But although the two Chinese groups will share the same hall, they will occupy different sections within it.

Question:
How are the two events being effected by the global economy?

Kehrer:
Despite various global crises in recent years, the entire industry is currently experiencing a global boom. It's an economic climate that encourages investment, not just in Europe.

Considerable sums of money are being invested in infrastructural projects, construction and the automotive industry in South-East Asia, in some South American countries and in parts of Africa.

The German economy, too, has been booming for a number of years now. Private households are increasing their consumption, and the building industry is benefiting from the trend among many Germans to build their own houses. Rising exports have led to a higher gross national product.

The wire, cable, pipe and tube industries are playing major roles in all this. We are therefore optimistic about spring 2018, and we have already recorded a good number of registrations – over six months before the trade fairs.

Even at this stage, therefore, the registration figures are persuasive. wire 2018 currently has a net occupancy of around 65,000 square metres. So far 1,120 exhibitors have registered, coming from 50 countries (November 2017).

Tube has so far attracted 794 exhibitors from 46 countries, with a net space of about 48,000 square metres (November 2017).

Question:
Can you explain the term Global Portfolio?

Kehrer:
wire and Tube have grown steadily in Düsseldorf since the mid-1980s. Every two years Düsseldorf becomes the meeting place for key players of these industries.

The demand for plants, machinery and products from the cable, wire and tube industries is also growing in other countries, and so we now have wire and Tube satellite trade fairs in Russia, India, China, Thailand and Brazil. wire and tube are going global – and in fact at a time of global transformations. After all, no industry could function without wire, cables or tubes.

The success of these events has shown that we were right not to limit our focus to our domestic and European markets, but to pursue a worldwide focus and to develop more and more new markets. This

is what gives our brands so much strength: wire and Tube – join the best.

It's also been our first year of active involvement in Iran. 2017 was the first time that Messe Düsseldorf acted as an overseas associate at Iran Wire. We've been targeting and supporting all international companies (except US companies) that would like to present themselves as exhibitors at the trade fair in Tehran.

So it'll be exciting to see how things go at the EXHIBIRAN INTERNATIONAL Fairground from 6 to 9 December 2017. The Aria Group, the owners and organisers of Iran Wire, will be holding this high-profile technology trade fair for the first time at the new exhibition centre.

Question:
Has there been a shift in the countries where exhibitors and visitors come from?

Kehrer:
Our strongest exhibitors' and visitors' countries in 2018 will continue to be our European neighbours, although there are also many overseas companies.

The most strongly represented exhibitors at wire and Tube are from Italy, the UK, France, Turkey, the Netherlands, Belgium, Spain, Switzerland, Sweden, Austria, Poland and Germany. Many of the overseas exhibitors come from

the United States, India, Taiwan, South Korea and China. We are expecting around 70,000 trade visitors on the five days.

Most trade fair visitors will be coming from major production and consumer countries, such as Italy, Belgium, the UK, France, the Netherlands, Spain, Switzerland, Austria, Russia, Turkey and Germany. But we're also expecting an increasing number of expert visitors from overseas, i.e. the United States, Brazil, India and China.

Brief profile:

Friedrich-Georg Kehrer is Global Portfolio Director for Metals and Flow Technologies at Messe Düsseldorf GmbH. Working with a large team, he is responsible for the international plant and machinery portfolio in the growing area of metal trade fairs. At the moment, this means over 30 events worldwide.

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Trade fairs are breaking all records: wire 2018 and Tube 2018 – bigger and more international than ever

The global economy is flourishing, and with it also leading trade fairs in the wire, cable and tube industries – wire and Tube Düsseldorf. From 16 to 20 April 2018 the two industry heavyweights will open their gates at the Düsseldorf Exhibition Centre while also celebrating an anniversary.

For 30 years the two trade fairs have been impacting developments in their industries, both nationally and internationally. Both are held jointly every two years at the Düsseldorf Exhibition Centre, and their product areas – wire, cables and tubes – have now led to worldwide satellites in Russia, Brazil, China, Southeast Asia, the United States and India, as well as a joint venture in Iran.

Moreover, the two leading Düsseldorf trade fairs have announced record figures – just in time for their 30th anniversary. Occupying a total exhibition space of 118,000 sqm, around 2,600 companies will be presenting everything that these industries have to offer in terms of technology and service.

Featuring 1,419 exhibitors from 51 countries and a space of over 65,000 sqm (net), wire has grown by around 6,000 sqm (nearly 10%) and has almost 100 more exhibitors than in 2016.

The logistics and engineering departments are being challenged in Hall 13, in particular by the big mesh welding machines, as they require the installation and connection of thick cables in the service ducts. This is because the machines need focused voltage, rather than a voltage build-up.

Tube, too, has grown rapidly and is now 2,000 sqm (3.8%) bigger than before. In total, 1,216 exhibitors from 57 countries will be present, filling a net space of 53,000 sqm. International diversity of exhibitors is continuing to grow, so that Tube 2018 will have six more exhibitors' countries than the last event in 2016 (which had 51 countries).

These results confirm impressively that wire and Tube both have number one positions as the world's leading trade fairs.

wire 2018 will be held in Halls 9 to 16. On display there will be plants and machinery for the production and processing of wire, tools and auxiliary materials for process engineering, materials, fibre-optic technologies and special wires and cables. There will also be innovations in measurement, control and test engineering.

Tube 2018 will take place in Halls 3 to 7.0, and also in Halls 16, 17 and 18. The range of showcased products will cover machinery and equipment for tube production, treatment and processing as well as raw materials, tubes and accessories. There will also be pre-owned machinery, process technology tools, auxiliary resources and measuring, control and test equipment. Furthermore, the line-up will include pipelines, OCTG technology, profiles and plastic tubes.

This year, once again, 70,000 visitors are expected from around 130 countries. The latest information on the two trade fairs can be found on the relevant websites, at www.wire.de and www.Tube.de.

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ITA – International Tube Association

Student Day at Tube 2018

It's the world's biggest and most important trade fair for the tube and tube processing industry. Tube 2018 kicks off at the Düsseldorf exhibition grounds on April 16, 2018, and as the website says, anyone who has made a mark on the industry, or intends to, will be there.

With this in mind, the International Tube Association has decided to specifically address the entrepreneurs, experts and innovators of tomorrow and to get them on the same stage with the employers and enablers of today. This year for the first time, the ITA have issued an invitation to machining and forming technology students and faculty members from around the country.

The students are invited to attend the exhibition on April 20, 2018, for a day, beginning at 10 a.m., which will include a guided tour of the halls and a chance to meet some of the exhibitors.

We would like to encourage exhibiting companies to join with us in giving the students some insight into promising developments in the industry. Company owners, executives and engineers can come together with the young people who have the potential to be the next movers and shakers in the sector.

The students profit from the experience and knowledge of well-established names; the hosts have the opportunity to collaborate on research that could point the way to the next breakthrough in the sector. Ideas find resources, infrastructure meets initiative. This is truly networking with the future.

Tube® Düsseldorf

ITA International Tube Association

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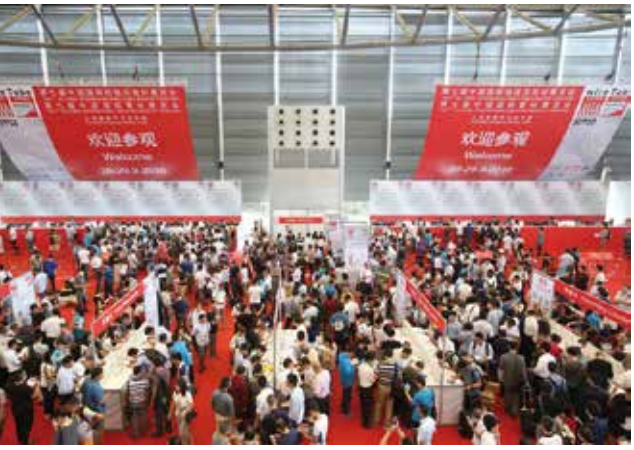
Tube China

Autumn 2018 reunion sparks on-going booth reservations for the next wire & Tube China ...



As one of the pivotal international wire, cable, tube and pipe industry trade platforms in Asia, the upcoming wire China and Tube China will once again be held in Shanghai, the "Pearl of the Orient", ushering in their 16th year since the debut. After its upgrade in 2016, the Shanghai Fastener & Tech Show confirmed its collocation with wire & Tube China – resulting in three major exhibitions in the industry helping to connect the dots and create a truly 'one-stop business platform' that links upstream and downstream players in the industry!

The organizers estimate more than 1,700 established brands to gather at the four-day exhibition (September 26-29, 2018). In addition to local Chinese exhibitors, those from Germany, Italy, North America, Austria, France, South Korea, Japan and Taiwan Region will be highlighted during wire & Tube China 2018 at the International Pavilions, with the concept of 'global integration and development'.

10 exhibition halls covering the entire product spectrum

In response to increasing demand for a larger exhibition area and better exposure, the overall scale of the exhibition will be expanded to 104,500 square meters in 2018, covering nine major halls (Hall W1-W5, Hall E1-E4), and one outdoor exhibition hall.

Products to be showcased at this high-quality platform will mainly focus on the following categories:

wire China – wire manufacturing / processing machinery; cable manufacturing machinery; fastener manufacturing machinery; spring manufacturing machinery; second-hand tools; process technology tools; auxiliary process technology materials; materials / special wires cables; measuring / control technology; test engineering; specialist areas, etc.

Tube China – raw materials / tubes / accessories; tube manufacturing machinery; rebuilt / reconditioned machinery; process technology tools / auxiliaries; measuring / control technology; testing engineering; specialist areas; trading / stockists of tubes; pipeline / OCTG technology; profiles / machinery, etc.

In addition to the regular 'Material Zone' and 'Spring Zone' at wire China, Tube China 2018 will introduced an 'Innovation Park' – an independent space where technical seminars are held and products are showcased. Prominent industry leaders will be gathered to discussed the latest technologies – from new materials, process control, pipe production and processing technology, to the plant energy efficiency solutions. Seize this opportunity and stay up to date with the 'global re-industrial revolution' trend.

Highly praised by former exhibitors, the booth reservations are selling out quickly

Among the 1,700+ exhibitors participating in the 2018 edition are many loyal supporters who have been growing with wire & Tube

China for over a decade. Some of the main reasons cited by the supporters for their patronization are: "highly effective", "high quality buyers", "intensive orders from the exhibition".

"The biennial wire & Tube China gathers high-quality buyers from China and many neighboring countries," said Dr. Christoph Müller-Mederer, CFO of Wafios, Germany, at the 2016 exhibition, "Some clients have already placed orders during the event. This exhibition has become an important step for Wafios to tap the Asian market potential, and it is believed that the industry will get better with the advancement of industry 4.0."

Mr. Xia Jianjie, Director of Sheet Metal Equipment Division, Han's Laser Technology Industry Group, also mentioned: "Through this exhibition, we met a lot of professional buyers looking for precision pipe cutting technology, which helps Han's Laser to increase their market share. I am very satisfied with the outcome of attending this exhibition. We look forward to meeting more friends and upstream & downstream players of the pipe processing industry."

It is by virtue of the 'visible and tangible' effect, as well as word of mouth among exhibiting brands that the organizers received many renewal request once the booth reservations for the 2018 edition opened up. To date, a number of established companies confirmed their participation, the most well-known being Zumbach, Suzuki-Sumiden, Nexteck, Haicheng Greatx, Pan-Pioneer, Cheng I, Unistrong, Xiaoxuan, Proton, Esteve, Markem-Imaje, Dainichiseika, Xintai, Yeswin, WTL, Thermatool, Kinkelder, Euro-me, WIKUS, Formdrill, KANEFUSA, MAASS Global, etc.

Join China's first-class exhibition with 46,000 professional buyers

Statistics show that the last event attracted a total of 42,199 professional visitors from 94 countries and regions. It's estimated that this number will exceed 46,000 this year. In addition to a large number of domestic professional participants are an increasing number of overseas buyers who recognize the significance of the "Made in China" tag. In 2016, the top ten overseas visitors by quantity were from South Korea, India, Taiwan Region, Japan, Russia, Malaysia, Iran, Thailand, USA, Indonesia, and Vietnam.

Join the best: wire China 2018 - International Wire & Cable Industry Trade Fair, Tube China 2018 - International Tube & Pipe Industry Trade Fair, Fastener Shanghai 2018 - Shanghai Fastener & Tech Show. See you in Shanghai next September!

Follow wire & Tube China's Facebook to get the latest news of the industries and exhibitions.

Messe Düsseldorf (Shanghai) Co. Ltd.

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Tube CHINA

Tube China

Tube & Pipe Industry Development Seminar 2018 "How to stay competitive in difficult times – innovations & latest technical solutions"

27 - 28 September 2018 in connection with Tube China

The world's economy is in a period of major adjustment after the international financial crisis. The growth rate may pick up, but the overall weak trend is likely to continue. Additionally, due to reduced demand in the downstream industries, competition will become more intense.

In such a tough economic environment, how do enterprises grasp downstream market trends? How do exporters deal with international trade frictions? How do we achieve win-win and level the playing field? A platform is needed to discuss these issues. To this end we are holding a Tube & Pipe Industry Development Seminar during the Tube China 2018 exhibition in Shanghai. In preparation for the event, we are now open for abstract submissions and invite you to be a speaker at our seminar.

The call for submissions is free of charge for exhibitors at Tube China. Companies and individuals who are not exhibiting at the trade fair can participate on payment of a fee of 2,000 Euros. The fee includes a free trade fair ticket for the day of the conference as well as a marketing opportunity for your company:

A roller banner and brochures, if you want to provide them, will be put on display outside the conference venue.

The theme of Tube & Pipe Industry Development Seminar 2018 is:

HOW TO STAY COMPETITIVE IN DIFFICULT TIMES – Innovations & Latest Technical Solutions

Interested speakers are invited to submit an abstract (max. 300 words) describing the main ideas of their papers together with the presenter's CV (max. 200 words). Abstracts should focus on technical/economical classifications, new technologies, modernization, R&D or recent case studies rather than company presentations. Joint presentations between pipeline operators and technology providers are welcome. All proposals received will be considered by our Technical Committee.

Each speaker gets a presentation time of 20 minutes plus a Q+A session. The presented papers will be published in the conference proceedings and distributed to the conference attendees. All abstracts and papers will also be made available free of charge for ITA members six months after the conference.

Deadlines

Deadline for abstract submission: 31 May 2018

Notification of abstract acceptance: 29 June 2018

Final conference paper due: 31 August 2018

Conference language: English/Chinese

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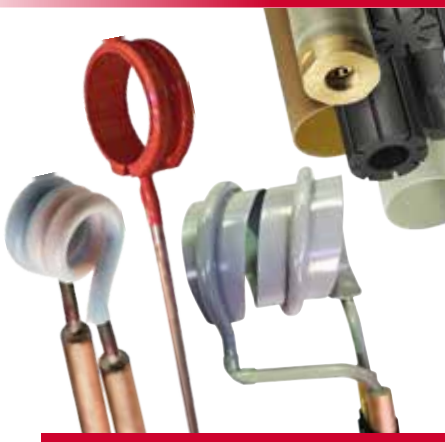

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Topics and purpose

The 7th Dortmund Colloquium on Tube and Profile Forming (DORP) will be held on September 11th – 12 th, 2018. The Institute of Forming Technology and Lightweight Components will host the conference on September 12 th, 2018. The conference topics cover innovative reports by users, machine manufacturers and scientists. This comprehensive transfer of information has made DORP a popular platform for the exchange of experiences and ideas between industry and science. DORP 2018 offers participants once more interesting lectures and intensive discussions between experts from both areas.

We cordially invite you to participate in DORP 2018 and will be happy to welcome you in Dortmund.

The conference language is German.

For further information, please visit: https://www.iul.eu/veranstaltungen/dorp18/

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ITA-India Chapter

ITA India Chapter plans to hold a one day conference

ITA India Chapter plans to hold a one day conference with the theme **TRANSFORMATION OF TUBE AND PIPE MANUFACTURING ADOPTING DIGITAL TECHNOLOGY** on November 28, 2018. The Conference will focus on topics like Automation 4.0, Industrial Robotics, Data Collection and Monitoring Systems in Manufacturing, CAD/CAM, 3 D Printing, Cloud Computing, Virtual Reality, Artificial Intelligence, Predictive Maintenance, Vision Systems and similar, as applied to Tube and Pipe Manufacture. Progressive depletion of natural resources and Competition will demand a more Efficient and Robust processes in Manufacturing. Digitisation is the focus of Manufacturing Management today and how it is transforming Tube and Pipe Manufacturing will be discussed at this Conference.

The organizers wish to invite Researchers, Equipment Manufacturers, Consultants, Advisors, and Practitioners of Digital Technology, to share the body of knowledge that they have gathered in this area,. The Conference will also feature live case studies of adoption of Digital Technology in Tube and Pipe Manufacture that has helped the user to derive multiple benefits of their application. The delegates will mainly be from the Tube and Pipe Industry, as well as from users of Tubes and Pipes. The organisers are keen to encourage New Ideas and New Product launches at the Conference.

The Conference will be held alongside Messe Dusseldorf India's Exhibition on Tube, Wire and Metallurgy, between 27th and 29th November 2018, in Mumbai. Speakers at this Conference will be addressing a large audience who will attend the Conference and the Exhibition together. The speakers will also be able to get a flavour of the progress being made in India, in manufacturing, in these areas.

Please send in your Expression of Interest, indicating the Title of the Paper, and the name/designation of the speaker, with a synopsis of not more than 200 words, by e-mail, not later than 31st May 2018.

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June 12-14, 2018
Toronto Congress Centre

Atlanta, GA USA
November 6-8, 2018
Georgia World Congress Center

AWS FMA sme PMA

Ambrell, a leading manufacturer of induction heating solutions ranging from 1 kW to 500 kW, will be in Düsseldorf in Hall 11, booth H31

At the trade fair, members of THE LAB at Ambrell will be on-hand to discuss client heating applications. Attendees are encouraged to bring their parts and/or drawings for discussion with expert application engineers.
Tube and pipe heating applications such as hot bending, weld stress relieving, coating curing, heat treating, and brazing are commonly tested in THE LAB at Ambrell. Clients receive a complimentary application review and system recommendation after testing. Ambrell has sold more than 12,000 systems into 50 countries. Visit www.ambrell.com for more information.

BOSSI S.r.l. – Macchine Finitura Metalli, a leading manufacturer of machines for metal surface finishing will be in Hall 05, booth 5J31

The BOSSI brand has been present since more than 40 years on the world-wide market, in the field of metal surface finishing.
We design, manufacture and install customized machines that can solve any problem of grinding, satin-finishing, polishing, deburring, etc. of any kind of ferrous and non-ferrous materials, both in-line and off-line. Please check our website www.bossi-srl.com for more information.
Our customers include the world's most important tube manufacturers with whom we collaborate for supplying high-quality products able to achieve the required finishing results.
Flexibility in responding to different demands, a well-structured commercial network and a skilled technical service characterize our activity whose key component is represented by a "tailor-made" quality according to market needs, including the requirements of Industry 4.0.
We look forward to seeing you in our booth 5J31: our sales team will be at your complete disposal to provide all technical and commercial information and to show you our well-known bead grinder STP 3000/150/170 COAXIAL, with more than 500 units sold all over the world, and our new planetary brushing machine PL 350/118-600 for laser lines, a high performance equipment enclosed in a small space.

Brandt Engineered Products – Comprehensive Tube & Pipe Equipment Solutions Hall 05, booth G15

Visit Brandt in Hall 5, Booth G15 to see how our complete life-cycle approach has delivered consistent results for the Tube & Pipe industry for over 80 years, from simple quick-turnaround repairs to complex custom Brandt-designed-and-built machines.
Producers around the world trust Brandt because we are a true one-stop shop. Whether your need is testing, material handling, threading, bundling or a unique custom solution, our multidisciplinary in-house team does it all. And, it starts right here in our own facility – from scoping and design to manufacturing, installation and final testing.
As a result, we can maintain strict quality control requirements through every process and ensure that nothing leaves our facility until it's

perfect. Our onsite design and engineering team has decades of experience configuring equipment to maximize space usage and meet targeted production rates.
Whether it's new equipment or old, successful Tube & Pipe producers look to Brandt to help them gain a competitive edge, because they know that we'll be there for them when it matters most.
To learn more about Brandt or to set up an appointment during the show, contact Jason Schoff (412) 215-5824 or visit our website at www.brandt.ca

Bültmann – Your Partner in know-how
Hall 06, booth E14

In the course of the ever-increasing demands of the international markets, BÜLTMANN, as one of the leading machine building companies in the areas of peeling, drawing and straightening of tubes, bars and profiles, has even more than before defined as a main aim to serve its customers in an even more individual and flexible manner.
No two applications are the same and it is therefore important for us to meet the individual requirements of our customers with our tailor-made solutions. This is accompanied by an extended after-sales service support. This full-service package ensures maximum productivity and efficiency for our customers.
Our sales and technical staff is looking forward to welcoming you at our booth E14 in hall 6 and giving you individual advice. More information on www.bueltmann.com.

Century, Inc. – Quality Tooling for the Tube and Wire Industry
Hall 06, booth C08-01

Visit Century in Hall 6, Booth C08-01 to discuss our capabilities to produce the highest quality tools including dies and mandrels for the tube and rolls for the wire industry. ISO 9001 and AS9100 quality certified, Century is vertically integrated to provide both machining and heat treating at one location. This allows us to control quality throughout the process, shorten lead times and provide competitive pricing. Century has provided dies and mandrels to the tube industry for almost 50 years and is making investments in the latest technology as part of our continuous improvement efforts.
To learn more or set up an appointment during the show, contact Rocky Trowbridge at rtrowbridge@centinc.com, visit our website at www.centinc.com or visit us at Tube Dusseldorf in Hall 6, Stand C08-01

CONDAT – Compliant lubes for copper tubes
Hall 05, booth C10

Discover new lubricants dedicated for the tube industry such as drawing lubricants dedicated to copper tubes used in air conditioning and refrigeration service. These high-performance lubricants are formulated in order to reduce the amount of internal residues while offering the required lubrication level. The formula, the raw materials and the production methods ensure the lubricants are R134-a compatible.
CONDATUB lubricants range also include hot forming graphite & ceramics dispersions, non-reactive and reactive drawing soaps, pilger rolling and forming soluble lubricants, neat drawing oils and corrosion inhibitors. To know more, contact the Condat team at tube@condat.fr or visit CONDAT at Tube Düsseldorf show, Hall 5 C10. www.condat-lubricants.com

data M Sheet Metal Solutions GmbH
Hall 04, booth F19

ITA offers excellent opportunities for networking with colleagues from tube and pipe industry from all over the world and is a great platform for demonstrating our latest COPRA® developments in a professional environment.
data M Sheet Metal Solutions is presenting its extensive service- and training-packages for the software solution COPRA® FEA RF at the TUBE fair 2018.
The packages contain for instance complete example models including video-tutorials for the integration of pre- and post-processing operations with a focus on embossing and tube bending. The packages are aimed predominantly at roll formers and tube makers planning to expand their product portfolio with additional processing steps without losing control over the entire manufacturing process.
At the data M booth visitors learn also how to efficiently implement complex forming projects with different COPRA® solutions – for example during an onsite demonstrations of data M's renowned design- and simulation software COPRA® RF and COPRA® FEA RF and a live demonstration of our COPRA® ProfileScan Desktop.
data M is looking forward to your visit at booth 4F19 (opposite the ITA booth) and on our website www.datam.de

Tubos de Precisión Delmàs S.L.
Hall 03, booth B17

Delmas, cited in Barcelona. We are the European specialist producer of very small diameter welded precision steel tubes.
Mainly focused on the small diameter range of 3 to 12 mm outside diameter. We provide you winner solutions adjusting our tubes to your specific needs offering you 3 types of tubes 100% produced with reweable energy:

- PREMIUM DELMAS TUBES: BRIGHT AND EXTERNALLY PRECISE WELDED STEEL TUBE

- OPTIM DELMAS TUBES: TAILORED TUBES TO SUIT THE CUSTOMER'S SPECIFIC NEEDS.
  Precision calibrated welded steel tubes, excellent bright surface finish, minimized welding bead height, inner working diameter guaranteed.
- PRECISE DELMAS TUBES: Cold drawn welded precision tubes for the highest demanding requests.

We offer you versality, flexibility, quality and competitiveness. We want to work with you on research, innovation and new developments. Reach us at stand Hall 3 B17 and in www.delmas-tubes.com, we will be glad to assist you.

EMMEDI – Complete induction solution for the tube and pipe industry Hall 06, booth A17

For over five decades, EMMEDI has earned an outstanding reputation in the tube industry for reliability through superior technology and quality of design. The EMMEDI line of products is recognized worldwide as an industry leader with over 1000 global installations.
EMMEDI welders are installed throughout the world since the early 1960's. Our welders have earned a reputation for their reliable design and advanced engineering.
From vacuum to solid-state tube welders, EMMEDI is now leading technological advancements in the market with the MOSWELD the ultimate solid state power supply using SiC transistors.
EMMEDI supplies a full line of products to the tube, pipe and wire industries. With our affiliation within the Ajax TOCCO family of global companies, we now offer expanded global solutions with local parts and service capability.
For more information contact info@saetemmedi.com or visit www.saetemmedi.com/products/

EUROLLS, leader in the production of rolls for the Tube & Wire Industry, launches a great investment plan – Hall 06, booth E05

After celebrating the 30th anniversary in 2017, EUROLLS has started over the past few months a process of renewal and expansion of its machinery stock with numerous investments in different divisions.
For what concerns special steels processing, the company has acquired several new CNC machines. Some have already been delivered, others will be soon. The new plants will partly replace the existing installations but above all they will allow EUROLLS to expand the offer of big dimensions products, such as shafts, spindles etc.
Within the year a new surface coating equipment will be introduced in one of the company production facilities. The new installation, developed together with an Italian nuclear physics center, will bring great added value to a company which has always made innovation its strong point.
At the same time the hard metal production unit has been strengthened with the addition of new machines. Eventually the internal sintering

unit, which was already at the forefront, has been further strengthened and will allow EUROLLS to offer dedicated carbide grades to each single application.
EUROLLS will showcase all its novelties and its vast portfolio of consumable products for both Tube and Wire industries and high quality machinery for the Wire industry at Wire & Tube Düsseldorf 2018. The company will be glad to meet you at booths n. 6E05 (tube) and n. 11D34 (wire) from 16th to 20th April 2018.

HandyTube Corporation – A leading manufacturer of seamless stainless-steel & nickel alloys for coil and straight-length tube will be in Hall 04, booth C04.

Discover our seamless tubing that is available in both coils and straights in numerous high-performing, corrosion-resistant stainless steel and nickel alloys including many 300 Series alloys, 904L, Alloy C276, Alloy 22, Alloy 400, MP35N, Alloy 825, Alloy 600, Alloy 625, including 6Mo (UNS S31254) meeting NORSOK M650 (Edition 4 for MDS R18) featuring wall thicknesses up to 3.8 mm. All tubing can be coated with PVC or TPU providing additional protection against the elements and line identification.
Coil tubes featuring outer diameters as small as 0.020" (0.508 mm) and inner diameters as small as 0.005" (0.127 mm) up to 1" outside diameter and 0.150" wall. Our coil tubing is utilized in applications ranging from safety valves for sub-sea oil wells, the transmission of highly-flammable hydrocarbon gases, and CNG/LNG refueling stations. Coil product is also utilized in firefighting systems, remote hydraulic control lines, and pressure sensing lines by ship-builders.
Our straight-length tubes are manufactured according to ASTM, MIL-T, Semi-Conductor Manufacturer's, and AMS specifications, making them ideal for general instrumentation, aerospace and defense service, and Ultra High Purity (UHP) systems. Our straight-length tubing is available in different sizes ranging from outer diameters as small as 0.020" (0.508 mm) and inner diameters as small as 0.005" (0.127 mm) up to 0.750" outside diameter.
We also manufacture seamless capillary tubes, which play a vital role in many sophisticated measurement and sensing devices. From pressure sensors to flow meters, our capillary tubes are used in many critical applications where accuracy and reliability are paramount. In addition, our Ultra-Small Diameter (USD™) capillary tubing for Chromatography applications features outside diameters less than 0.0625" (1.59 mm). To minimize the risk of cross-contamination and save our customers time, we developed our proprietary Chroma Clean ID™ cleaning process, which removes manufacturing lubricants and other contaminants from the tubing interior. In addition, our Chromat ID™ drawing process provides ID support during the manufacturing process, creating smoother, consistently uniform ID surface characteristics.
For more information please visit www.handytube.com

Hart b.v., Leading stockholder in Nickel Alloy Piping Products
Hall 03, booth C13

Hart b.v. is a specialised stockholder in Nickel Alloy piping products and acts as a master distributor for the suppliers to the Oil & Gas and (Petro-) Chemical Industries.
We can assist in all your requests to complete your piping packages - Total Project Management -.
Projects requiring Nickel Alloy products can be supplied directly from our extensive stock.
Seamless pipe & fittings in stock: Alloy 200/201, 400, 600, 625, 825, *C276 (*seamless & welded).
Sizes ½"upto and including 8"/ Sch10s upto and including XXS
www.hartbv.nl

Hauhinco Water Hydraulics: Press Drives and Controls, Descaling Systems, Hydroforming and Tube Inspection Systems – Hall 07A, booth E14

Hauhinco is the Expert in Water Hydraulic Solutions: We design and manufacture customized Drives and Controls for Presses, Descaling Systems, Hydroforming and Tube Inspection Systems for the tube and pipe industry. Hauhinco high pressure plunger pumps and valves are high quality products specifically designed for water hydraulic applications. The entire engineering and manufacturing is made in Germany. Visit us in Hall 7A, Stand E14 at Tube 2018, Düsseldorf to learn more on our solutions for your application or visit our website www.hauhinco.de.

IMS tube measuring systems offer you a maximum in precision and continuity
Hall 07A, booth F14

In order to exploit the technical potential for maximum material and energy usage to the full, the different tube manufacturing processes – regardless of the underlying forming method – require automated measuring systems. IMS has faced the challenge of this demanding requirement successfully for more than 25 years – with a succession of measurement concepts adapted to the respective rolling units and their specific needs.
Whether you need to monitor eccentricity after piercing, know the local distribution of wall thickness around the circumference of the hollow blank or determine the formation of thickened ends on the finished tube, IMS has a suitable measuring system for all these and many other measurement tasks. On top of this, it is possible to build a customized compact measuring system by grouping various measurement tasks at one measuring point.
For more information visit : www.ims-gmbh.de.

Kinkelder BV – The cutting experts – Circular saw blades
Hall 06, booth C32

Circular saw blade manufacturer Kinkelder tailors sawing solutions to the demands of professional cutting specialists. By means of our unique range of high quality HSS, TCT & segmental circular saw blades, the latest developments in coating technology, metallurgy, precision grinding and technical support, we enable our customers to achieve their cutting objectives.
Our Tube 2018 theme "Performance by Teamwork" emphasizes our general focus and added value the route to greater production efficiency and transferring our knowledge and experience. A network of subsidiaries and distributors in nearly 80 countries, supported by our application engineers, enables Kinkelder to be close to local markets whilst maintaining the benefits of the centrally provided technical expertise and best practice.
In addition, Kinkelder offers you a wealth of free information on steel cutting applications via the Kinkelder Saw Blades app (available for IOS & Android) and our new website www.kinkelder.com. Here you will also find a range of online cutting tools to help you find the most suitable saw blade for your specific cutting application and discover interesting efficiency values.
Visit us at Tube 2018 in hall 6/C32 or check our website for more information: www.kinkelder.com.

KVK-Pickling Plants – Customised, ready to use and with the highest level of environmental protection – Hall 06, booth E22

KOERNER KVK®

Koerner specializes in planning and erection of complete metal pickling plants for the pipe and tube industry. Pickling tanks produced by Koerner are exported to over 50 different countries and are in use on every continent.
The KVK-pickling system, a completely encapsulated pickling plant, guarantees highly efficient pickling operation and meets all environmental requirements.
Our worldwide customers include manufacturers of carbon steel tubes as well as stainless steel tubes and non ferrous tubes. Special concepts and individual solutions are required for each sector and we hope to find new clients and partners at the Tube Düsseldorf, April 16-20, 2018.

Indcrease your productivity with LINSINGER Machines
Hall 07a, booth C04

LINSINGER

It is a great pleasure to present the latest Linsinger Sawing and Milling Technology at the TUBE Düsseldorf. We are looking forward to present the tailor-made solution for your requirements, for more reliable and successful future productions using the latest well-proven technology.
You are warmly invited to visit our stand 7a, booth C04.
Meet our team for detailed information.

MAGNETIC ANALYSIS CORP. – NDT Systems for tube, pipe, bar, wire
Hall 06, booth I12

Magnetic Analysis Corp. , celebrating 90 years of serving the metals industry, is your answer to finding the best NDT instruments and systems for testing tube, pipe, bar and wire. Visit our Stand # 6 I -12 to learn about MAC's latest developments in Eddy Current, Ultrasonic and Flux Leakage test technology and systems. Tell us your application and our experienced Engineers will help you select the best NDT solution. Echomac® Ultrasonic Weld Zone Test Systems for ERW tube, the new Echomac® FD6/6A Ultrasonic instrument for testing high performance tube or bar for aerospace and nuclear applications, an Ultrasonic Full Body Tube test system, MultiMac Eddy Current tester for small diameter tube or rod, or Rotoflux® Flux Leakage systems for large OCTG heavy wall tube are just some of the broad range of systems MAC can supply. With 90 years, MAC meets the "Test of Time". Visit mac-ndt.com for more.

Visit us at MFL Stand
Hall 07, booth F17,

The experts of MFL Sawing and Milling Technology will be very pleased to welcome you.
MFL offers a broad range of innovative and newly developed machines and plants for the tube industry that are, based on decades of know-how and expertise, tailor-made for your challenging and specific demands. Our high-quality products Made in Austria clearly stand out from other products in the market because they are extremely sturdy and long living.
MFL's team will be pleased to inform you in detail at the stand.
MFL product portfolio for the tube industry:

- Mobile and stationary tube end machining centres
- Cold circular sawing machines
- Plate edge milling plants
- Welding seam machining plants

NAKATA sincerely would like you to visit us
Hall 05, booth F19

NAKATA Mfg. Co., Ltd., Japan, founded in 1908, is a world-wide known welded pipe plant and machine supplier who's capable for entire equipment of mill line from entry to finishing machine. With full utilizing of its unique high speed and accurate FEM Simulator developed by NAKATA with support of Kiuchi Laboratory, NAKATA has innovated and introduced many advanced technologies into the market like "FFX Mill" and "Roll Box", all of those are successfully in operation to produce various sizes by one set of common-use roll with keeping high quality performance. Recently, the new generation mill system next to FFX has been launched into the market, named "Orbital Die Forming" (ODF) system. This new system is also able to produce wide range OD sizes without changing the tools with more variant materials, and further, as its own

unique feature, this new system is capable to make the pipe from both of coil strip and steel plate as raw input material, which is evaluated as a pioneer of "hybrid mill" leading towards next generation.
For further information, NAKATA sincerely would like you to visit us in Hall 05, Booth F19 at Tube 2018, Düsseldorf or find our website www.nakata-mfg.com.

SARA – manufacturer of butt – welding carbon and alloy steel fittings from 21.3mm (½") to 1422mm (56") will be in Düsseldorf in Hall 17, booth A09.

SARA is a major European manufacturer of butt-welding steel fittings used in oil and gas industry, power plant construction, shipyards all over Europe and not only. The company was founded as a family owned business in 1991 and since then knew a continuous growth.
The production range of SARA diversified from one year to another considering clients and market demands and, at this moment, is including the following products: elbows – mandrel formed with diameter within 21,3mm and 1422 mm, equal and reduced tees – mould formed with diameter within 21,3mm and 1 219 mm, concentric and eccentric reducers – mould formed with diameters up to 610 mm, caps with diameters up to 1 219 mm, equal and reduced saddles with dimensions of maximum 406 mm as well as induction bends with diameters within 48,3mm and 1422 mm and maximum bending radius of 12000 mm. SARA usually manufactures fittings according to standards such as EN 10253-2, DIN 2609, ASME B16.9, EN 14870-1, EN 14870-2. Based on client's request, the company may also manufacture fittings according to other standards or client's technical specification.
The production capacity and the professional team allow to meet clients requirements in terms of delivery time, quantity and quality.
The company implemented an integrated management system, certified of ISO 9001:2015, ISO 14001:2015, ISO 50001:2011, OHSAS 18001:2007 and applied for the manufacture of materials in accordance with the Pressure Equipment Directive 2014/68/EN and AD2000-Merkblatt W 0. SARA's laboratory for destructive and non destructive tests is accredited according to SR EN ISO/CEI 17025:2005.
SARA is the perfect business partner in terms of reliability, quality, flexibility, best delivery time, competitiveness.
Visiting SARA's stand at TUBE DUSSELDORF 2018, you may discuss and establish with a professional team all technical and commercial details of your present and future projects.

UT rotary systems from Slickers Technology GmbH & Co. KG
Hall 06, booth D04

At Slickers our focus is as precise as our systems, we do one thing and do it well, build end to end UT rotary systems. Our rotary UT systems yield the world's fastest material throughput, detecting defects to the world's toughest specifications, frankly we do the jobs nobody else can do or wants to pursue. We are at the heart of the majority of the world's nuclear fuel rod testing and have been qualified Nadcap for Avionics production for companies such as Pratt Whitney, Boeing, Airbus and SpaceX just drop a few names. We make systems ranging from 6mm to 450mm OD capability testing but our specialty is making the fastest tube handling, driving and test mechanics and matching UT instruments for precision applications below 90mm OD. Come by our booth (Hall 6 booth D04) to discuss how you can get more test capacity without increasing headcount or enter new markets and see our flagship 6mm-24mm Rotary UT tester in operation.

New impetus for the tube and wire industry
Hall 07a, booth B03/B04

SMS group is looking forward to this year's Tube & wire, a key event for our industry. SMS group sees digitalization and Industry 4.0 as key challenges that are set to profoundly change the tube and wire industry in the years to come. SMS group is turning the spotlight on these topics at the Tube & wire trade fair.

The SMS group unites global players in plant and machinery construction for processing steel and NF metals, operating under the roof of SMS Holding GmbH. SMS group has more than 130 years of experience in the production of tubes and pipes and it is the only provider able to offer the full line of products and services for steel tube production, from design and manufacturing of the key machines up to the training of the operator's personnel, including technological support. Its roots go back as far as 1885, when brothers Reinhard and Max Mannesmann obtained the first patent for the manufacture of seamless tubes – a pioneering invention. Today innovative solutions such as the PQF® seamless pipe making technology and the JCOE® large-diameter pipe forming technology as well as the 2-step spiral pipe plants from PWS are well-known worldwide.

Hall 7a, booth B03/B04, is where SMS group will be looking at how digitalization is changing the whole value-added chain and enabling greater efficiency, higher quality, and more flexibility from a number of different angles. We cordially invite you to visit us for a personal exchange of ideas and information with our experts.

Thermatool™ Solid State High Frequency Welders
Hall 06, booth C21

Thermatool™ Solid State High Frequency Welders consistently produce the best welds in the industry on any tube or pipe mill. Our innovative HAZControl™ Technology — Thermatool's advanced power supply design and exclusive software and control capability — enables tube and pipe producers to access stored process recipes applicable to all types and sizes of tube and pipe materials. That's your assurance for achieving the best welds you've ever made, every run, every day, every time. For proven HF Welders backed by decades-long industry leadership, put your trust in Thermatool — and gain a competitive edge for your company.
Visit http://thermatool.com/products/haz-control-technology-welders/ for more information!

Orbital tube cutting saw blades for longer cutting life
Hall 06, booth C08-02

Tru-Cut Saw Inc. has redesigned its Orbital tube cutting saw blades makes it easier for customers to achieve longer cutting life, the newest development has shown an improvement increase of life to over 30 meter sq., this is an increase of over 8 meter sq. from the previous saw blades.
Richard Otter, Vice President, "We are really excited about the newest development and looking forward to showing it to our customers this year in Dusseldorf, Germany at TUBE 2018."
Our sales team will start offering the latest Orbital cutting saw blades to our current customers Worldwide once the TUBE 2018 Show is completed, Tru-Cut Saw expects that by the end of this year all of our current customers will have access to this latest technology and will start seeing the increased blade life before the end of 2018.
Tru-Cut Saw has the latest carbide grades available and has their own R&D team to development the latest PVD coatings and grind angles.
Tru-Cut Saw is the only privately held saw blade manufacturer in the USA to have the two in-house PVD coating chambers with a capacity to coat saw blade up to 1250 mm in diameter. This allows Tru-Cut to tightly control coating quality and uniformity, and permits adjustments for individual customer applications.
Through its ICO Surface Coating Division, the company offers PVD coating services for cutting tool and other saw blade manufacturers and distributors. For more information, visit www.trucutsaw.com

UPCAST® SGTube – small grain, bigger gain.
Welcome to visit us!
Hall 06, booth A02.

Video Systems, leader in solutions for quality and process control
Hall 06, booth D18

In its 25th year from foundation, Video Systems is looking forward to this year's Tube & Wire, which represents a key event for one of our Company's field of activity.
This year we are presenting our solutions for quality and process control, focusing on Industry 4.0. We aim at providing more and improved real-time information on manufacturing plants.
Video Systems is specialized in quality and process control based on artificial vision and artificial intelligence.
Taking part in a important European project (www.amblifire.com) in co-operation with European enterprises and research institutes, such as Fraunhofer IPT, enabled us to improve significantly our know-how in Big-data and Data mining management based on artificial intelligence.
Therefore we can provide predictive systems for the process and quality control of products.
This year we are presenting several projects/solutions designed to ensure higher quality and more efficiency on manufacturing plants, based on artificial intelligence and vision including:

- Welding control systems
- Advanced product surface checking
- Inspection on cutting and reworking processing of products

We are glad to welcome you at Stand Hall 6 Booth D18 to present you our products and technologies and to meet your needs.
For more information please visit www.videosystems.it

Xiris Automation Inc. – Optical equipment used for process and quality control
Hall 06, booth J02

At Tube Düsseldorf, Xiris will be demonstrating its WI post weld inspection system designed to detect various flaws that could occur during the forming and welding of a longitudinally welded tube or pipe. The WI2000/WI3000 uses laser-camera triangulation to measure the 3D profile of the formed tube and weld geometry, automatically monitoring a variety of different geometrical features around the weld area of the tube to provide early warning of defects during production. Defects inspected include mismatch, undercut, sunken welds, bead height, deflection, freeze line and scarfing defects.
Xiris will also be introducing the SeamMonitor™ System combining a spectacular 140+ dB High Dynamic Range camera with adjustable optics and advanced image processing software to provide the ability to monitor the Seam to Torch alignment in real time while displaying unprecedented image quality of a TIG, Plasma or Laser welding process. The SeamMonitor™ System is suitable for use in seam tracking of straight, long run welds, such as those found in tube and pipe manufacturing, roll forming, blank or panel welding, orbital welding, etc.
Xiris Automation Inc. specializes in developing optical equipment used for process and quality control across a number of specialty industries. With an extensive product line, Xiris provides some of the world's most dynamic manufacturers with the ability to detect, recognize, and interpret quality defects in their manufactured goods.

Events for Business, Technology, Education and Networking

Diary of world class tube events

April 2018

16 – 20 April 2018	**Tube 2018** Ehibition, Düsseldorf, Germany	Messe Düsseldorf GmbH Fax: +49 211 4560 8540 AhrensG@messe-duesseldorf.de www.tube.de	
19 April 2018, 15:00 hours	**ITA Annual General Meeting** (for members only) Location: International Lounge, Messe Düsseldorf, Germany	International Tube Association e.V. Jennifer Kranz Tel.: +49 211 947-5650 Fax: +49 211 947-3938 jennifer.kranz@itatube.org www.itatube.org	
19 April 2018, 16:30 hours	**ITA Networking event** Networking event will be held at our booth F17 in Hall 4.		
20 April 2018	**Students Day at Tube Düsseldorf**		

September 2018

26 – 29 September 2018	EXHIBITION: **Tube China** Shanghai, P. R. China.	Messe Düsseldorf GmbH Fax: +49 211 4560 8540 MuellersM@messe-duesseldorf.de www.tubechina.net	
27 – 28 September 2018	**SEMINAR: Tube & Pipe Industry Development Seminar 2018** „How to stay competitive in difficult times – innovations & latest technical solutions“ Organised by International Tube Association e. V. in connection with Tube China 2018	International Tube Association e.V. Jennifer Kranz Tel.: +49 211 947-5650 Fax: +49 211 947-3938 jennifer.kranz@itatube.org www.itatube.org	

November 2018

6 – 8 November 2018	EXHIBITION: **Fabtech** Atlanta, USA.	www.fabtechexpo.com	
27 – 29 November 2018	EXHIBITION: **Tube India** Mumbai, India	Messe Düsseldorf GmbH Fax: +49 211 4560 8540 AhrensG@messe-duesseldorf.de www.tube-india.com	
28 November 2018	**ITA CONCLAVE at Tube India** Topic: Transformation of Tube and Pipe Manufacturing Adopting Digital Technology	International Tube Association – India Chapter 5, Brindavan Street, Mylapore CHENNAI 600 004 Tel.: +91-44-400 0217 ita.lakshmi@yahoo.com	

January 2019

14 – 17 January 2019	EXHIBITION: **SteelFab** Sharjah, UAE	Expo Centre Sharjah Fax : +971-6-5770111 steel@expo-centre.ae www.steelfabme.com	

May 2019

14 – 17 May 2019	EXHIBITION: **Tube Russia** Moscow, Russia	EXPOCENTRE in Moscow Fax: +49 211 4560 8540 AhrensG@messe-duesseldorf.de www.tube-russia.com	

June 2019

25 – 29 June 2019	EXHIBITION: **METEC** Düsseldorf, Germany	Messe Düsseldorf GmbH Fax: +49 211 4560 8540 MuellersM@messe-duesseldorf.de www.metec-tradefair.com	

September 2019

18 – 20 September 2019

EXHIBITION: **Tube Southeast Asia**
Bangkok, Thailand

Messe Duesseldorf Asia Pte. Ltd.
beattrice@mda.com.sg
www.tube-southeastasia.com

October 2019

1 – 3 October 2019

EXHIBITION: **Tubotech** Sao Paulo, Brasil

Messe Düsseldorf GmbH
Fax: +49 211 4560 8540
MuellersM@messe-duesseldorf.de
www.tubotech-online.com

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Front page	€ 2,400.00	€ 2,280.00	€ 2,190.00
Outside back cover	€ 2,000.00	€ 1,900.00	€ 1,800.00

New members

The ITA is pleased to welcome the following new members who truly reflect the global status of our Association.

Howard Lloyd	GBC Industrial Tools Ltd.	UK
Peter Boczkariw	GBC Industrial Tools Ltd.	UK
Michael Twist	GBC Industrial Tools Ltd.	UK
Laura Pettefer	GBC Industrial Tools Ltd.	UK
Radomyr Korol	State Enterprise Ya.Ye.Osada Scientific Research Tube Institute	Ukraine
Thomas Schulte	MSG Maschinenbau GmbH	Germany
Jens Hegener	MSG Maschinenbau GmbH	Germany
Matthias Kramer	MSG Maschinenbau GmbH	Germany
Wolfram Volk	Chair of Metal Forming and Casting, Tech. University of Munich	Germany
Simon Vitzthum	Chair of Metal Forming and Casting, Tech. University of Munich	Germany
Andy Semple	Brandt Engineering Products	Canada
Neil Marcotte	Brandt Engineering Products	Canada
Jason Schodd	Brandt Engineering Products	Canada
Terry Best	Brandt Engineering Products	Canada
Joseph Rizk	Brandt Engineering Products	Canada
John Hillis	T & H Lemont	USA
Walter Heller	T & H Lemont	USA
Michael Strand	T & H Lemont	USA
Tim Gaughan	T & H Lemont	USA
Jeremiah Cleary	T & H Lemont	USA
Nick Lally	Kurt Orban Partners Ltd.	UK
Richard Calveley	Kurt Orban Partners Ltd.	UK
Peter Mertz	Kurt Orban Partners Ltd.	UK
Paul Herbert	Kurt Orban Partners Ltd.	UK
Alison Leitelmayer	Kurt Orban Partners Ltd.	UK
Rick Fang	Hangzhou Wagen Precision Tooling Co., Ltd.	China
Young Dong Kim	EPI Co., Ltd.	Rep. of Korea
Jennifer Korkovich	Century, Inc.	USA
Gretchen Maike	Century, Inc.	USA
Summers Kevin	Century, Inc.	USA
Rocky Trowbridge	Century, Inc.	USA
Gibson Wayne	Century, Inc.	USA
Ajay Sambrani	Tubacex Service Solutions India Pvt. Ltd.	India
Vipul Sutaria	Tubacex Service Solutions India Pvt. Ltd.	India
Shabareesh Nair	Tubacex Service Solutions India Pvt. Ltd.	India
P.V. Anand	Tubacex Service Solutions India Pvt. Ltd.	India
Kunal Singh	Tubacex Service Solutions India Pvt. Ltd.	India
Rahul Gupta	Metallurgical Services Pvt. Ltd.	India
Sachin Daptardar	Metallurgical Services Pvt. Ltd.	India
Nagendra Hebaar	Metallurgical Services Pvt. Ltd.	India
Neel Thakar	Metallurgical Services Pvt. Ltd.	India
Zubin Rizwan	Metallurgical Services Pvt. Ltd.	India
Richard Otter	Tru-Cut Saw Inc.	USA
Yahui Shen	Kaiyuan Autowelding System Co., Ltd.	China

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