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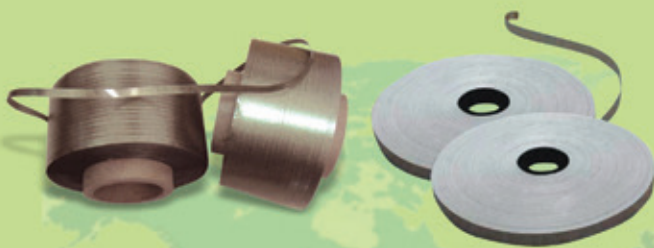
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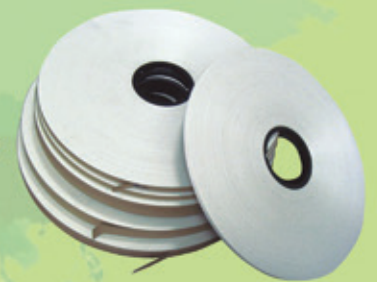
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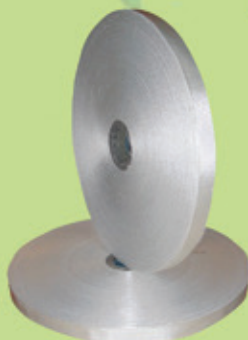
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See page 84 for further details

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Expansion, jobs and a congressman's visit

Expansion, it seems, is firmly on the mind of companies featuring in this issue of *EuroWire*.

Axjo America is investing \$11m and creating 14 new jobs by consolidating two facilities into one 143,000ft² factory in Conover, North Carolina, USA. The company has been working closely with Conover's mayor and at the Catawba County Economic Development Corporation for a number of months to make the move happen. Full details can be found on page 10.

Also opening up on new fronts is Kabelschlepp with the reopening of its enlarged facility in Slovakia.

The premises has been enlarged to about 19,000m² and the production facility, including storage capacity, has been increased by nearly 4,000m². Additional jobs will be added to the already 200-strong workforce as part of the expansion. The full story can be found on page 15.

An increase in production has seen Tulsa Power and Reel-O-Matic move into new larger premises in Oklahoma City, Oklahoma, USA.

Joining forces at the new 100,000ft² building will allow the new company increased manufacturing floor space, along with improved workflow and production capabilities. You can read all about it on page 16.

There's also a reason for Metro Wire to hold its head high in this issue, as the company celebrates its 40th anniversary in the wire and cable industry.

The multichannel wire and cable distributor's president, Donald D Ezop, said: "It is hard to believe that it has been 40 years when you work alongside great employees, customers and vendors, all the while having fun." Full details are on page 20.

Davis-Standard also had reason to lay out the red carpet with a factory visit for Joe Courtney, US congressman for Connecticut's Second District. Full story on page 21.

David Bell
Editor





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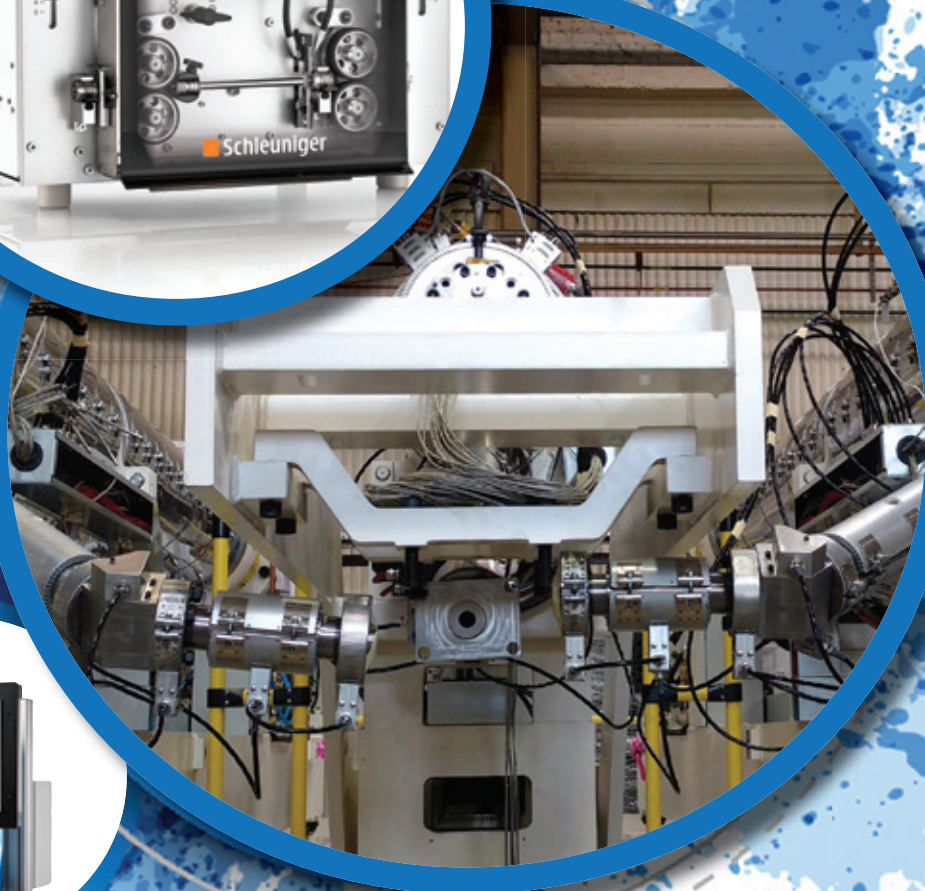
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micro-duct air-blown cables
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Wire cleaning, treatments
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AMI Cables

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AMI Cables – trade exhibition – Cologne, Germany

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dates for your diary ...

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23-25 March:

TEL – trade exhibition –
Istanbul, Turkey

Organisers:

Voli Fuar Hizmetleri AS

Fax: +90 212 604 5051

Email: info@voli.com.tr

Website: <http://tel-fair.com>

May

9-11 May:

Interwire –

trade exhibition –

Atlanta, Georgia, USA

Organisers:

Wire Association International

Fax: +1 203 453 8384

Email: sales@wirenet.org

Website: www.wirenet.org

June

5-8 June:

wire Russia –

trade exhibition –

Moscow, Russia

Organisers:

Messe Düsseldorf and VNIKP

Fax: +7 499 246 9277

Email: info@wire-russia.com

Website: www.wire-russia.com

September

19-21 September:

wire Southeast Asia –

trade exhibition –

Bangkok, Thailand

Organisers:

Messe Düsseldorf Asia Pte Ltd

Fax: +65 6337 4633

Email: wire@mda.com.sg

Website: www.wire-southeastasia.com

October

3-5 October:

wire South America –

trade exhibition –

São Paulo, Brazil

Organisers:

Messe Düsseldorf GmbH

Fax: +49 211 4560 668

Email: info@wire-south-america.com

Website: www.wire-south-america.com

8-11 October:

IWCS Technical Symposium –

conference and exhibition –

Orlando, Florida, USA

Organisers:

IWCS

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Email: phudak@iwcs.org

Website: www.iwcs.org



▲ The new QSE technology on display from Davis-Standard

QSE technology from Davis-Standard

A 3.5" (90mm) extruder exhibited by Davis-Standard during the K exhibition showcased engineering updates such as a new extruder frame, innovative feedscrew design and quick screw exchange (QSE) technology.

This specific extruder is designed for high temperature processes up to 300°C and those requiring speciality copolymer resins for film, coating, adhesion and moulding applications.

The standardised extruder frame is built with additional space to simplify maintenance and improve heater

access. Computer-designed stainless steel feedscrews provide reliable melt homogeneity for resins like acid copolymers, which improves bond performance to materials such as aluminium foil.

Other extruder advantages include electrical barrel heating with air-cooled blowers for each zone; temperature-controlled water cooling for gearbox oil cooler, water cooled screw and feed section; and fixed die support and thermal expansion capability.

The QSE adapter enables processors

to easily change the screw without dismantling the melt pipes, feed block and other components.

An extraction tool is included to manually change the breaker plate melt-filtering inserts.

The adapter is engineered with an electrical pressure gauge, manual or motorised pressure spindle, double thermocouple for every heating zone, and breaker plate with two-screen pack.

Davis-Standard – USA
Website: www.davis-standard.com

\$11 million investment and 14 new jobs

AXJO America plans to invest \$11.1 million and create 14 new jobs at a new manufacturing facility in Conover, North Carolina, USA, and consolidate two current facilities into the new location. Axjo America plans to purchase an existing 143,268ft² facility in Conover and add new machinery and equipment that will allow the company to grow in size and increase product offerings to the cable industry.

Axjo America has outgrown its facility in Hickory and, after exhausting a search for suitable buildings in Hickory and other locations and states, it selected the Conover facility as the best location for the expansion.

The company uses primarily recycled, environmentally friendly materials and the latest injection moulding technology to produce fibre-optic reels for spooling equipment.

The spools are low weight, UV-resistant and waterproof. Over the next five years it plans on expanding into the large spool sizes, adding new injection moulding machines each year.

"We are excited to become part of the Conover City community and to grow our business in Catawba County," said Dan Shelander, managing director, Axjo America.

"We are pleased to welcome Axjo America as a corporate partner," said Conover's mayor, Lee Moritz Jr. "Axjo is another example of our city's continued economic development strategy whereby our existing industries continue to grow, the industrial base is diversifying, and empty facilities are being filled."

"We are happy to see Axjo America grow and we congratulate them on establishing their new facility and creating jobs that will provide more opportunities for our citizens," said Randy Isenhower, chairman of the Catawba County Board of Commissioners. "The fibre optics and cable industry has been a mainstay of our economy for many years, and Axjo's success as a supplier to that industry is a testament to the continued strength of the sector in Catawba County."

"We have been working with Dan Shelander, the managing director of Axjo America for several months. When they couldn't find a suitable facility in Hickory, we worked diligently with them to keep them in Catawba County," said Julie Pruet, director of business recruitment with Catawba County Economic Development Corporation.

"It is exciting to see a company develop, evolve and thrive in our community. Plastics manufacturing is a cluster industry in Catawba County and one that we target for recruitment because of the growth and diversification within the industry."

Axjo America is a subsidiary of Axjo AB, a Swedish company in business since 1945 and a leading supplier of plastic spools in Europe.

Grants to encourage Axjo to expand were approved by the Catawba County Board of Commissioners and the Conover City Council.

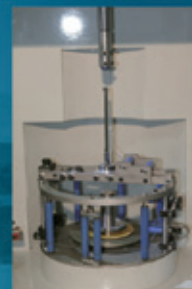
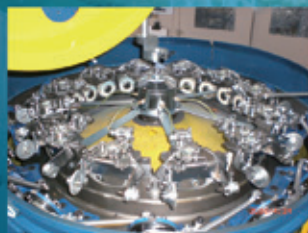
Axjo America – USA

Website: www.axjo.com

PTFE Coaxial taping machine

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- Pay-off and take-up*

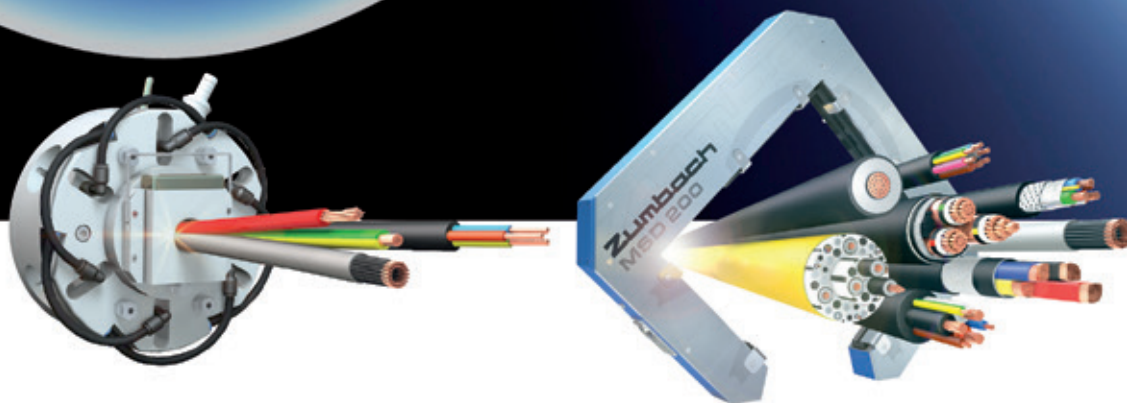


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Record-breaking Tenova!

TENOVA has developed a new furnace concept, the flexible modular furnace, for Jindal Steel and Power Limited (JSPL) Raigarh Steel Plant, in India – and set a new world record.

This innovative technology is designed for steelmakers that currently use a significant amount of hot metal in their charge mix yet are ready to move or return to scrap-based steelmaking.

In the JSPL steel plant, the steelmaker converted the existing electric arc furnace (EAF) into a Tenova FMF. Adopting the new Tenova technology, JSPL gained a saving on the production costs of around US\$15-18 per ton of steel, resulting in a year saving of approximately US\$15-20 million – achieving a ROI in less than four months.



▲ The new furnace at the Raigarh Steel Plant in India

The same new furnace can easily produce 32 heats with 89 per cent guaranteed yield, and has the potential of producing 36 heats with operation excellence. Moreover, it succeeded in producing 42 heats-through on 14th November last year – a world record! The project was commissioned on 31st August 2015 and successfully completed in a short span of six months from the effective start of the project. With efficient planning and collaborative teamwork, the project was accomplished in just ten days of furnace shutdown against 28 days as expected.

“This project shows the results of integrated cooperation between Tenova’s different centres of expertise: an international team of Indian, Chinese and Italian professionals perfectly synchronised brought an excellent result to the customer, who will benefit of our cutting edge technology. Furthermore, it represents a milestone for the launch of the FMF solution in the Asian market,” said Silvio Reali, Tenova senior vice president.

Thanks to the good performance – a mix of delivery, quality and price parameters – Tenova has been rated as “Grade A vendor” by the customer, and obtained the Final Acceptance Certificate in a record time.

The FMF solution is also suitable for those steelmakers that are looking for a transition from basic oxygen furnace (BOF) to an EAF-based steelmaking and for those EAF steel shops that aim to increase the hot metal percentage in their charge mix.

Tenova FMF is a modular concept of smelting furnace that can be developed from core equipment called base modules with specific add-ons, and has the flexibility of converting various charge mix of raw material (scrap, DRI, liquid hot metal, pig iron, etc). Each module is designed with specific features in order to fit the requirements of the charge mix.

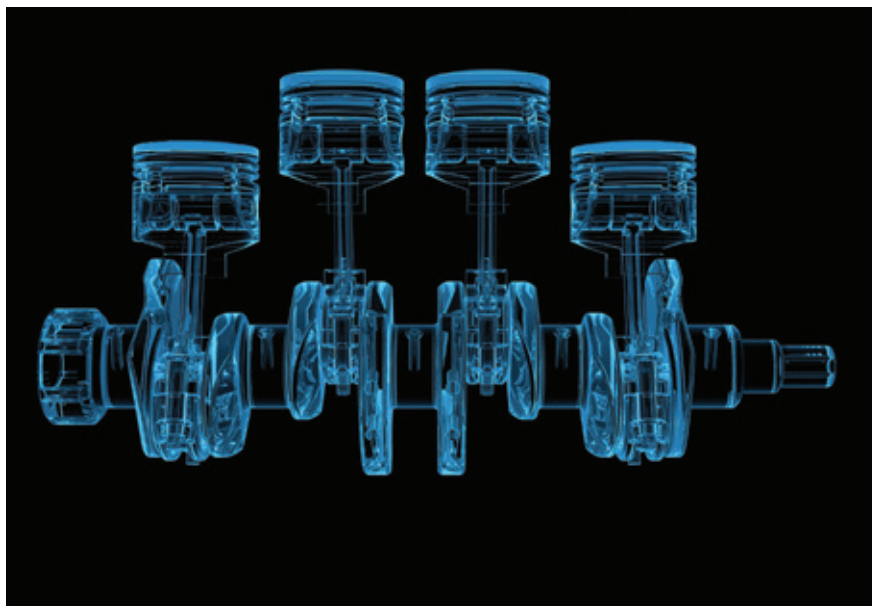
There are clear opportunities and applications for FMF. A full range of metallic charges can be smelted with capital costs reduced to the minimum level. Flexibility is clearly the greater advantage of this solution for all the markets that are developing toward lower footprint steelmaking operations, and FMF fits certain specific charge mixes, becoming even more convenient than classical solutions.

This project marks an important milestone in the launch of FMF in Asian markets. In India, high energy cost and inconsistent/poor availability of raw material has necessitated the industry to explore cost-effective steel making methods. Alternative methods to build flexibility in furnaces for charging different types of raw materials – such as the one offered by FMF – are the need of the hour, and very much essential to control the cost of steel. In China, FMF can be the first step for the modernisation of oxygen steel plants offering a smoother transition to the scrap era.

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▲ Strength and ductility providing an excellent steel for cold forming

New high-strength bainitic steel

A GERMAN steel producer has developed a unique steel with a high level of both strength and ductility. After appropriate processing, the steel is excellent for cold forming.

Steel prices are nowadays subject to significant fluctuations. This is mainly due to the variable alloy surcharge which is largely dependent on the nickel content of the steel. The new steel grade 20MnCrMo7, developed by ECM Edelstahlzieherei Mark GmbH, contains only very small amounts of nickel, which means that long-term price stability is guaranteed.

The bainitic steel 20MnCrMo7 not only offers price stability, but also provides important processing advantages.

Despite the steel's high strength, its fine granularity makes it remarkably ductile – it is not brittle but extremely hard and exceptionally robust. In rolled or forged form, its bainitic structure ensures a strength of 1,200-1,400 MPa and contraction at break of over 40 per cent. No heat treatment is necessary, saving time, energy and ultimately money. This new grade of steel is particularly economical.

The 20MnCrMo7 steel is also suitable for cold processing after suitable pre-treatment, and is highly versatile. In a tempered state, the steel is applicable wherever particularly high demands on the mechanical properties have to be met.

Values are reached which are rarely achieved by other steels. At low tempering temperatures, strengths of up to almost 1,600 MPa and a notched impact strength of more than 50 J are reached.

The response to this new development from customers in Germany and abroad has already been extremely positive.

Dr Kai Eck, managing director of EZM Edelstahlzieherei Mark, said: "More and more industries will benefit from the advantages of our bainitic steel. The price stability is, of course, a very welcome benefit – and this equally applies to the advantages of processing the steel in both an untempered and tempered state."

"The 20MnCrMo7 steel can replace considerably more expensive and price-sensitive case-hardening and heat-treatable steels, for example 18CrNi8, without any compromise regarding the technological properties."

ECM Edelstahlzieherei Mark GmbH – Germany
Website: www.ezm-mark.de

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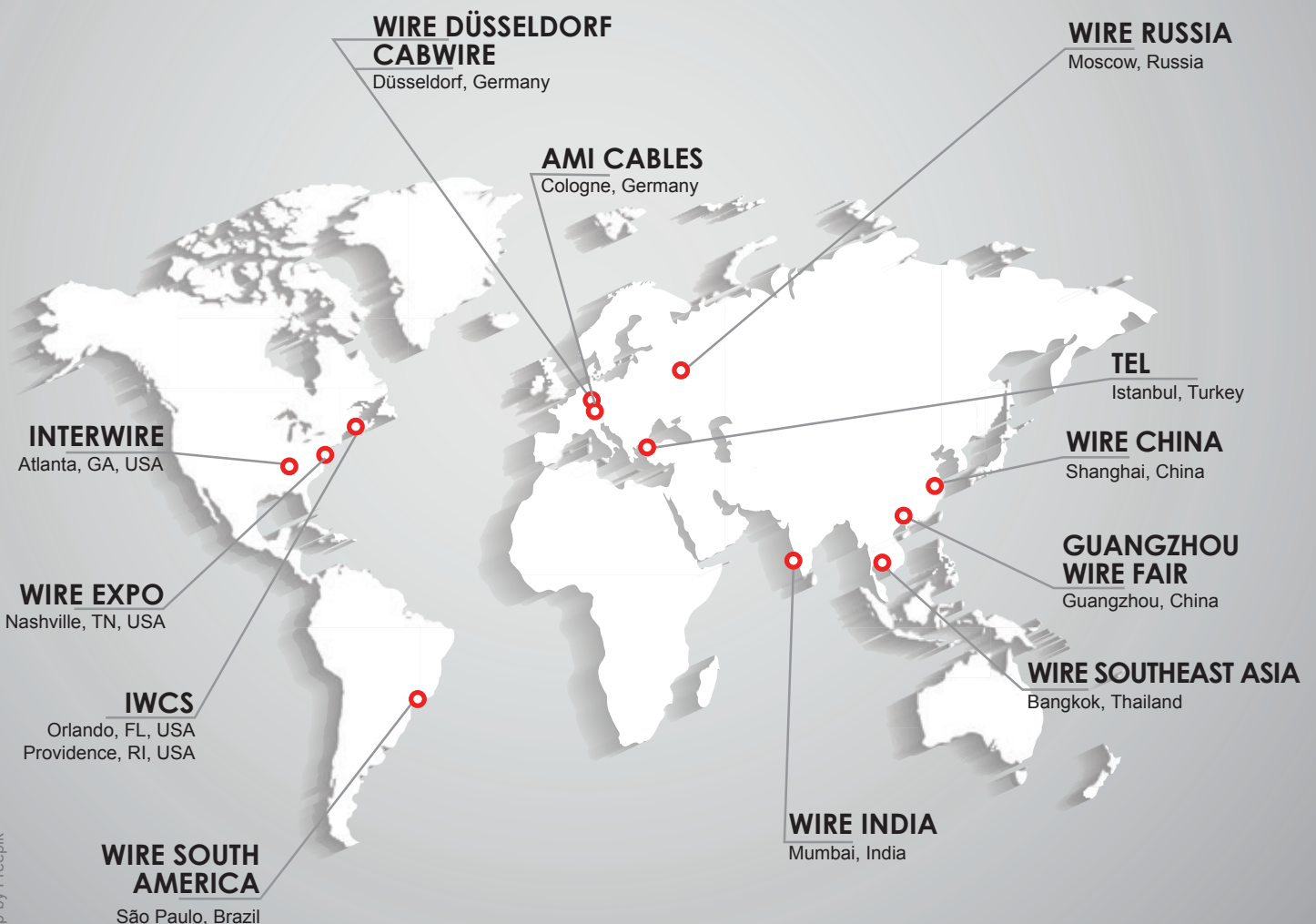


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Kabelschlepp expands production site in Slovakia

WITH a grand opening, Kabelschlepp celebrated the reopening of its enlarged facility in Nové Zámky, Slovakia. The plant premises have been enlarged to about 19,000m² and in just eight months of construction the production facility including storage capacities has been extended by nearly 4,000m².

This investment significantly benefits the economic future of this location. Not least, the expansion secures more than 200 existing jobs and creates additional ones.

"Slovakia is a reliable and stable partner within the EU," said Michael Diebel, vice president conveyor and protection systems at Kabelschlepp. "We have been investing here to deliver competitive and reliable high-quality products and intelligent solutions to our customers."

Since 1976, Kabelschlepp products have been manufactured in Slovakia, and as of 1990 under its own subsidiary.

Expanding the production capacity means that the company continues its strategy of consistently growing the Slovakian site, also within the Tsubaki Group.



▲ Guests await the opening of the expanded plant in Slovakia

Primarily conveyor and protection systems for the global machine tool industry are manufactured at the location in Nové Zámky. "The plant expansion substantially increases our production capacity and strengthens our position within the European strategy," said Dušan Strašík, managing director of

Kabelschlepp Systemtechnik spol sro. "Combined with our state-of-the-art machinery we are able to meet our customers' demands now even more appropriately."

The prelude of the festivities was a dinner in Bratislava, during which keynote speeches were heard from a board member of the German-Slovakian


Chamber of Commerce and Industry as well as from the Director General for Economy and Trade of the Slovakian Ministry of Economics. This was followed by the actual opening ceremony in Nové Zámky on the next day.

**Kabelschlepp Systemtechnik spol sro
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Move meets growing demand

TULSA Power and Reel-O-Matic have moved to a new, larger facility located in Oklahoma City, Oklahoma, USA. The new 100,000ft² building allows for increased manufacturing floor space along with improved workflow and production capabilities. The two companies will now operate under the name Reel Power Wire & Cable dba Reel-O-Matic and Tulsa Power. Reel Power Wire & Cable is owned and managed by Reel Power International Inc.

“By combining the expertise of the engineering teams, operations and sales group of these two companies, they can be more responsive, with a stronger focus on customer service and managing their substantial growth. These divisions were running out of room in their former locations so this investment made good sense,” said Don Moreau, senior vice president sales and marketing of Reel Power Wire & Cable.

“The new facility has been designed to provide a much improved work flow allowing us to increase production to meet growing demand.”



▲ The Reel Power Wire & Cable facility in Oklahoma City is the new home for Tulsa Power and Reel-O-Matic

Reel Power (Tulsa Power and Reel-O-Matic) serves the wire and cable industry, with a strong focus of continually providing new product innovations.

Reel Power designs and manufactures machinery for reeling, coiling and measuring of wire, cable, pipe, rubber, plastic, tubing, conduit, wire rope, fibre optic material, and any other flexible material. Expertise includes payoffs, take-ups, re-reevers, winches, spoolers, measurers, coilers, and warehouse solutions that include racking and design capabilities. Customers include cable and wire manufacturers and distributors, telecom companies, oil and gas

companies, automotive companies, crane and plastic pipe companies. The company manufactures and sells both standard and custom-engineered products.

Reel Power International Inc operates one other company, Reel Power Oil & Gas dba Radoil and Tulsa Power Oil & Gas, which services the oil and gas industries.

This division recently relocated its manufacturing facility into a brand new, state-of-the-art facility in Houston, Texas, USA.

Reel Power International Inc – USA
Website: www.reelpower.com

New dog, new tricks



Prysmian steps up to the mark

PRYSMIAN Group is ready to offer the market the widest range of energy and telecommunications cables compliant with the European Construction Products Regulation (CPR), continuing to support its customers through the supply of innovative and technologically advanced solutions.

CPR covers any cable product intended to be incorporated in construction works and subject to performance requirements on reaction and/or resistance to fire.

10th June 2016 was the Date of Applicability of this harmonised standard, with date of the end of the co-existence period set on 1st July 2017.

Prysmian is ready to support its customers during this delicate transition period, providing the required capabilities for fire testing, products positioning and materials development. The group has been investing in higher added-value products, and has developed a full range of high performance cables that are fully compliant with the requirements of CPR in the different European countries.

"CPR is a unique turning point to enhance the level of safety and quality in the European cable market," said Valerio Battista, CEO Prysmian Group. "This regulation will guarantee for any cable product intended to be used in construction works a certain level of performance in relation to their reaction to fire, resistance to fire and release of dangerous substances."

Consistency and reliability of information about a cable's performance are ensured by the Declaration of Performance and CE marking that will be associated with each cable.

To inform and help its customers in all steps of this important milestone in the industry, Prysmian has developed and launched a dedicated website and communications campaign addressed to decision makers, specifiers, professionals and its customers.

These tools will help deliver correct and complete information regarding safer cables and CPR, to ensure a smooth transition in all countries for all the supply chain, so to be informed about EU and local developments, and well positioned to cooperate with authorities and business partners.

Prysmian Group – Italy

Website: www.prysmian.com

New general manager

Thermcraft has appointed Bill Thomson as its new general manager. He will be responsible for day-to-day operations that foster an environment for positive growth and development within the Thermcraft organisation. The company has also appointed Scott Miller as its new North American sales manager.

Thermcraft Inc – USA

Website: www.thermcraftinc.com



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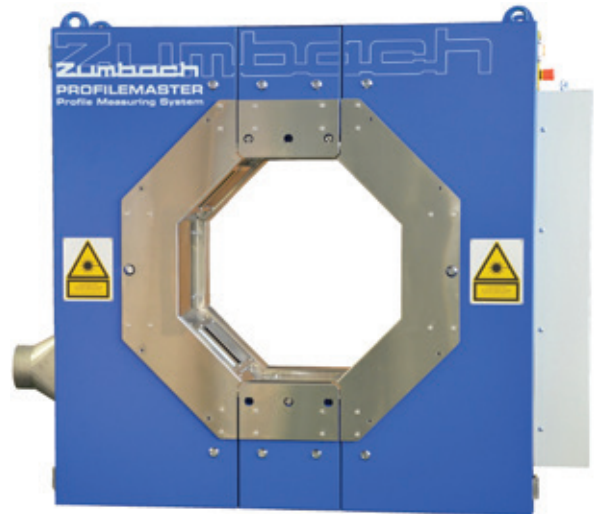


Profilemaster picked for in-line profile measuring system

ZUMBACH Electronic of Switzerland has won a contract from Štore Steel doo in Slovenia for a Profilemaster SPS 400-S4, an accurate in-line profile measuring system based on laser light section technique and machine vision.

The system will be integrated into a hot rolling mill, helping to increase the efficiency of the mill and to assure best product quality.

Štore Steel produces various round and flat steel products for the forging, spring and engineering industries. As a respected steel producer, Štore Steel is modernising its in-line measuring systems in order to gain better and faster control over its production process. A significant efficiency increase is expected by shortening start-up time and reducing downtime.



▲ The Profilemaster SPS 400-S4 measuring unit

The ordered Profilemaster SPS400-S4 is equipped with state-of-the-art technology for full profile measurement and surface fault detection. The system is equipped with four high-speed camera/laser modules capturing the full contour of the hot rolled profile.

Scanning the product with up to 500 full contours per second, the measuring system provides continuous dimensional measurements as well as surface fault detection. The sophisticated, engineered construction and the conditioning features of the Profilemaster SPS 400-S4 ensure highly stable and reliable measurements. The commissioning is planned before the end of 2016.

For measurement and control in the cold finishing process, Štore Steel has additionally ordered a non-contact measuring and control system from the Zumbach ODAC® – USYS product line.

Zumbach Electronic AG – Switzerland

Website: www.zumbach.com

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KetaSpire insulator of choice for Dacon

DACON Systems, a manufacturer of custom wire and cable, is increasingly specifying Solvay's KetaSpire® KT-851 NT polyetheretherketone (PEEK) as an insulator for challenging wire and cable designs targeting downhole oil well and nuclear energy applications.

"Downhole and nuclear environments present some of the harshest conditions in which our wire and cable products are installed, and these applications demand the highest performing materials," said Mark Daniels, president of Dacon Systems. "Our customers are increasingly finding that KetaSpire PEEK delivers unmatched durability and they are making it their material of choice for new applications within these industries."

Typical wireline applications used in oil and gas down-hole environments transmit data for the purposes of well intervention, data logging and reservoir evaluation, and they are often subjected to extreme temperatures and pressures. KetaSpire PEEK coatings are capable of meeting the performance demands of these applications and can enable cables to operate reliably in harsh environments. Specifically, KetaSpire KT-851 NT PEEK

offers reliable long-term insulation performance up to 240°C (464°F) with improved abrasion resistance compared to incumbent materials.

Solvay's KetaSpire PEEK also resists up to 1,000 kGy (100,000,000 rd) of gamma radiation, which can cause conventional fluoropolymers like polytetrafluoroethylene (PTFE) and fluorinated ethylene propylene (FEP) to become brittle. As a consequence, it is also becoming Dacon Systems' first choice for coating wires and cables that transmit power or sensor data in nuclear plants. Its polymers are inherently flame retardant and bromine- and chlorine-free. They also offer excellent low smoke properties. Cables insulated with KetaSpire PEEK are being developed to meet the nuclear industry's proposed 60-year lifetime rating, as well as the design criteria for cable function during Loss of Coolant Accident (LOCA) operations.

"Solvay offers an unmatched range of advanced polymers for wire and cable coating applications targeting electric power, data communication, rail transit, aircraft, shipbuilding and other industries," said Glenn Cupta, business development

manager for Industrial & Environment at Solvay Specialty Polymers.

"KetaSpire PEEK delivers the optimal mix of properties to meet the most difficult challenges when developing cable insulation for these very demanding oil well and nuclear environments. Our experience with wire and cable applications can further help identify the right product for specific applications, and provide the expertise and design support to minimise cost and increase yield."

Among the highest-performing materials in Solvay's selection of speciality polymers, KetaSpire PEEK imparts superior resistance to fatigue, stress cracking and abrasion along with excellent strength and toughness to wire and cable coating applications. It also has excellent melt strength and can be extruded into very thin 0.025mm (0.001") coatings. Dacon can custom manufacture KetaSpire PEEK wire in American wire gauge (AWG) diameters ranging from AWG 40 to 8 (0.08 to 3.3mm).

Solvay Specialty Polymers – Italy
Website: www.solvay.com

40-years celebration for Metro

For 40 years, Metro Wire and Cable has been dedicated to providing its customers with exceptional service, quality products and cost-saving alternatives. Today, Metro has grown from its humble beginnings in 1976, to being one of the USA's largest multichannel wire and cable distributors.

Founder, president and CEO Donald D Ezop proudly said: "It is hard to believe that it has been 40 years when you work alongside great employees, customers and vendors, all the while having fun. I am extremely thankful and appreciative of our customers' trust and loyalty, and look forward to the next 40 plus years of Metro Wire's growth."

With locations in Michigan, Georgia and Iowa, MWC specialises in working alongside public utilities, electrical contractors, wind-farm developers, commercial and industrial HVAC industries, traffic signal and airport lighting contractors, original equipment manufacturers (OEMs) and the security industry. Metro Wire & Cable provides value-added handling, warehousing, supply chain and delivery services of wire and cable products for this broad spectrum of markets.

Metro Wire & Cable – USA
Website: www.metrowire.net



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Congressman's visit to Davis-Standard site

DAVIS-STANDARD welcomed Joe Courtney, US Congressman for Connecticut's Second District, at its headquarters in Pawcatuck. Congressman Courtney and congressional staff member Tajah Anderson visited the site to learn more about Davis-Standard's technology, economic impact on the region, and the upcoming expansion of the Pawcatuck facility.

Company president and CEO Jim Murphy and other Davis-Standard leadership provided an overview and tour of Davis-Standard, offering an insight into the company's global growth, plant specifics and diverse equipment portfolio.

"Davis-Standard has an impressive operation and it was an honour to tour the facility in Pawcatuck," said Congressman Courtney. "The cleanliness of the machining floor, advanced manufacturing practices and employee engagement is really something to behold. We're very proud of Davis-Standard and the strong economic boost they continue to provide to southeastern Connecticut."

Mr Murphy added: "We enjoyed Congressman Courtney's visit and appreciate his support of the manufacturing industry. Last year, Congress enacted an R&D tax credit; this has been beneficial in helping us further our technological advancements. We also appreciate the congressman's support of the Pawcatuck expansion, which will house manufacturing capabilities for our growing blown film business."

Davis-Standard is adding 15,000 square feet of manufacturing space and over 30 jobs in the next two years to its Pawcatuck headquarters, which currently employs more than 400 people.

The addition will house the manufacturing and precision machining of advanced multi-layer blown film dies. It will also enable Davis-Standard to move all blown film manufacturing for its Gloucester Engineering product line from Gloucester,



▲ Congressman Joe Courtney, left, and Davis-Standard president and CEO Jim Murphy tour the site at Pawcatuck

Massachusetts, to Pawcatuck. Davis-Standard has operated in Southeast Connecticut since 1848 and is one of the oldest and largest employers in the Southeast Connecticut/Southwest Rhode Island region. The expansion of the Pawcatuck site reinforces the company's commitment to the local region. Through its long-standing position in the market, it is considered the "Centre for Excellence" for Connecticut's extrusion technology sector.

In addition to the Pawcatuck facility, Davis-Standard has manufacturing facilities and subsidiaries in the USA, Europe and Asia.

Davis-Standard – USA
Website: www.davis-standard.com

ROBI low-tension binder for single and dual-end yarns with up to 4,500 rpm

Rosendahl has developed the ROBI high-speed cross binder for SZ-stranded fibre optic cable elements. At 4,500 rpm, it is fast, but at the same time very gentle in its handling.

It has an adjustable binding tension to maintain the loose tube shape and the product's quality.

Beyond that, it is especially designed to maintain the very short reversal spots generated by the dynamic drive system of the Rosendahl SZ-strander.

A constant yarn tension under 2N can be achieved with the optionally available active yarn tension control system from Rosendahl.

This system keeps the tension constant at all operating

conditions even while the binder is ramping up or down and at high production speeds. This gives a constant and high-precision binding to maintain the product's properties.

Size-wise, ROBI allows large bobbin dimensions of up to 290mm for the outer diameter. This enables continuous production lengths. The integrated mini twist lock keeps strands perfectly formed and supports immediate binding at the stranding point.

Essential parameters, such as bobbin weight, bobbin diameter and brake curve, are stored in the database. These parameters are used during line operation to maintain a constant yarn tension at various production speeds.

RosendahlNextrom GmbH – Austria
Website: www.rosendahlnextrom.com

BASEC launches new CPR large-scale cable fire test facility

THE British Approvals Service for Cables (BASEC) has launched its large-scale vertical ladder fire test used for construction products regulation (CPR), EN 50399, and the full range of vertical ladder tests to the IEC 60332-3-21/25 series to the cable industry.

This coincides with the official launch of the European Union's CPR for cables used in construction, which was announced on 10th June 2016.

This substantial investment, which also includes completion of three new re-configurable fire test chambers for fire resistance and circuit integrity testing, expands BASEC's capability as the largest dedicated cable-testing facility in Europe and a world leading cable test and certification body.

The introduction of CPR for cables will have a significant impact on all construction cable manufacturers, importers and distributors supplying any type of cable that is intended to fit permanently into the structure of a building, including power distribution, final circuit wiring, control and instrumentation and data communications cables (copper and optical) to European markets.



▲ *The ladder rack being prepared before the test*

The new regulation demands new cable testing/certification as well as CE marking requirements for those supplying cables. With a strict deadline imposed, it is forcing the international cable industry to review its policies to

ensure compliance when the regulation becomes mandatory in July 2017. In light of this, cable manufacturers will in most cases need to engage with a Notified Laboratory and/or a Notified Product Certification Body.

Cable wholesalers and distributors supplying into European markets will also need to ensure the manufacturers they work with have done this.

Installers should also be aware of the new regulation as it lays down harmonised rules for the marketing of construction products in the EU.

It is likely there will be a challenging and uncertain environment for cable supply in Europe over the next few years.

The CPR training seminars cover the basics of the new requirements that manufacturers, importers and distributors of cable will need to adhere to, the new classification scheme, the choices available to manufacturers, and a summary of the technical requirements and procedures.

BASEC – UK

Website: www.basec.org.uk

Growing Turkish market fed by TEL

Due to the strong need for construction, infrastructure and energy, power and communication projects, the market size has grown in both value and volume in Turkey.

According to the statistics published by the Turkish Statistical Institute, the local wire and cable market has been growing steadily.

Turkey is an important supplier for the Middle East and North Africa countries and many other countries as well. Turkish contractors are prevalently operating in the MENA region and they supply the products they need from Turkey. This action also supports the increase of export figures of Turkey to the region.

Turkey is also an important player in the world cable market. Having world-class production technology has strengthened the market share of Turkish producers mainly in Turkey and in the MENA region and worldwide.

The second edition of TEL (Istanbul Wire Fair) will be held from 23rd to 25th March

2017. The fair venue, Istanbul Expo Centre, is next to International Istanbul Ataturk Airport and offers very convenient access to the fair.

The fair provides an excellent platform for both exhibitors and visitors to reach their target audience. Companies will have the opportunity to present their new products to the industry and connect with industry experts.

Major product groups that will be exhibited at the fair are:

- Wires made of ferrous or non-ferrous metal and alloys (steel, stainless steel, copper, brass, aluminium, nickel) for all applications
- Cables for all applications
- Materials for cable manufacturing
- Wire manufacturing and finishing machinery
- Cable manufacturing machinery
- Fastener manufacturing machinery
- Spring manufacturing machinery
- Welding machines
- Electrode manufacturing machines
- Wire rope machines

- Reinforcing mesh machines
- Wire fence machines
- Chain making machines
- Screw and nail machines
- Spare parts for wire and cable machines
- Dies, tools, lubricants and auxiliaries
- Testing, measuring, software, logistics and other services

Cables and cable manufacturing machinery have been added to the exhibitor profile in this second edition.

It will be an opportunity both for cable manufacturers and cable machinery suppliers to present their new technologies to the market.

This is a unique opportunity to present products to buyers, mostly from Turkey and the MENA region. Minimum space availability is 9m² at a cost of €2,017. Any stand furniture and extra materials needed will be extra. Further details are available via email to: info@voli.com.tr

TEL Istanbul Wire Fair – Turkey

Website: www.tube-wire-coil-fair.com

Ensuring no internally threaded fastener defects

IT is critical to inspect formed metal fasteners to ensure zero defects, whether for safety, mission critical performance, or to optimise the manufacturing process. Traditionally, it has been difficult to inspect internal threads for tiny defects such as chips, tears and weld splatter, as well as short or missing threads.

"Because many of our parts such as small fuel fittings and unions for the auto industry are safety parts, our customers will not accept anything but 100 per cent quality, so we carefully check key areas including internal threads," said Chuck Abbate, vice president of operations at H&L Tool. "We needed a way to make sure that all the internal features were perfect and within the print."

However, even typical cameras and laser-based equipment have difficulty detecting required features inside parts, and the deeper the hole or recess, the more challenging this becomes. "One of the problems that arises when looking at internal features on a machine is the different colour in the plating and

different lighting," added Mr Abbate. "It is very important to get a machine that determines what it is looking at, that it is truly looking at the part and not at glare or a shadow."

To help manufacturers ensure zero defects in their fasteners, a number of advanced high-speed sorting technologies are making slower, less reliable, traditional methods obsolete. In order to make certain that its couplers, tube nuts and internal female nuts contained zero defects, for instance, Mr Abbate turned to a high-speed vision-based measuring machine called the GI-100DT from General Inspection, a developer of high-speed measuring and sorting fastener inspection systems. The device uses a series of front and backlit cameras to calculate a part's height and profile as well as inner and outer diameters. As configured for H&L Tool, the device also has a number of advanced options. These include cameras to check for internal threads, an axial viewer that detects surface imperfections on multiple sides of a part at once, and eddy current

capability, which enables checking for metallurgical defects along with plating or hardness variations.

With 360° internal thread inspection capability, the General Inspection device incorporates hole inspection optics to specifically image and measure both the bottom of a hole and its vertical walls. This allows great detail of ID threads and the detection of very small defects like weld splatter, torn threads, reamed threads, chips in threads, and short or missing threads, as well as a single damaged thread.

According to Mr Abbate, an axial viewer also allows detection of any surface discontinuities on six sides of a part at once. With such a capability, the camera could, for instance, simultaneously "see" the top and sides of a fastener.

The device's eddy current capability also detects any metallurgical defects including plating or hardness variations.

General Inspection – USA
Website: www.generalinspection.com

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Three-in-one capability

AMETEK Land has developed an innovative new pyrometer that provides high accuracy and a three-in-one capability specifically for aluminium applications, including extrusion press exit, extrusion press quench zone, and aluminium strip mills.

The SPOT AL EQS (SPOT aluminium extrusion, quench and strip) pyrometer is an extremely flexible instrument with pre-configured algorithms that make it especially suitable for use at the extruder press exit and quench position as well as at mill entry and exit positions in hot rolling mills. In addition, the pyrometer's algorithms can be customised and tuned for

▼ *The SPOT AL EQS – an extremely flexible instrument with pre-configured algorithms*



bespoke applications and specific aluminium grades. This latest addition to the Land range of SPOT pyrometers was specifically designed to work in low emissivity environments where regular pyrometers might struggle to provide accurate and reliable readings. It has the ability to measure a wide temperature range from 200° to 700°C/392° to 1,292°F. Utilising the latest, cutting-edge temperature detector design in combination with the most-advanced data processing algorithms, Land has created an extremely accurate and repeatable pyrometer with a fast response time.

Incorporating the latest digital communication capabilities, the SPOT AL EQS can be configured remotely through a dedicated web server, and with Power over Ethernet (POE) capabilities is able to communicate data over Ethernet through a variety of different protocols (TCP-IP, Modbus TCP, DHCP, http, udp and ICMP). This further ensures that, along with the traditional 4-20mA/0-20mA output signal, the SPOT AL EQS can be easily integrated into any plant control infrastructure.

SPOT AL EQS works straight out of the box and can be installed by just a single person, offering greater convenience and ease of use. If the sensor is in an inaccessible location, SPOT AL EQS has a remote viewing capability to verify alignment and ensure a high level of accuracy. A built-in camera aids alignment, which, combined with a green LED, allows the user to position the measurement point in an optimal location to avoid ambient lighting reflections. Data from the SPOT AL EQS is available remotely as snapshots using free SPOT Viewer software or standard web browsers.

SPOT pyrometers are designed for high accuracy, high reliability, simple installation, configuration and flexible digital communications. They can be easily interchanged with other Ametek Land pyrometers and other manufacturers' equipment. All processing functions are integrated into a single pyrometer, making them suitable for use in all sized plants. Designed in close collaboration with industry-leading aluminium producers and plant control system engineers, the SPOT AL EQS pyrometer is helping lead the way in improving aluminium extrusion and strip plant throughput, quality and energy efficiency. This latest Ametek Land temperature measurement instrument already has demonstrated its ability to provide immediate data for process improvement.

Ametek Land – UK

Website: www.landinst.com

New area sales manager for South America

Alfredo Torres has been working for Niehoff Group as the new area sales manager for the South American countries.

Mr Torres holds an engineering degree in manufacturing processes and has gained vast experience in various industrial areas such as automotive and the wire and cable industry where he has worked among other fields in R&D, engineering and maintenance and in the development of all kinds of cables.

Working as a commercial area manager for Latin America focusing on machinery installation and commissioning, pre and aftersales technical assistance as well as wire and cable manufacturing process

development and integral development for wire and cable plants, he has gained an overall knowledge in the industry.

Together with the Niehoff agency in Chile, Rheintek Chile Limitada, Mr Torres will take care of customers in South America, in Bolivia, Chile, Colombia, Ecuador, Peru and Venezuela, marketing the machinery portfolio of Niehoff Germany.

His second field of activity will be the sales of all machinery built at Niehoff-Herborn Máquinas Ltda, Brazil, supporting them in their sales area.

Maschinenfabrik Niehoff & Co KG – Germany
Website: www.niehoff.de



▲ *Alfredo Torres – the new area sales manager for South America*

New management in Mexico



▲ Marco Trevisani



▲ Alan Tafoya

EUROLLS SpA has appointed a new general manager and production manager at its subsidiary in Monterrey, Mexico.

The new general manager for Eurolls De Mexico is Alan Tafoya, while the new production manager is Marco Trevisani, who has more than 25 years' experience working for Eurolls in Italy.

Eurolls De Mexico manufactures and regrinds rolls for customers in the tube, wire, hot mill and continuous casting sectors for both the ferrous and non-ferrous markets. The goal of the company has always been to provide the North and South American markets with a local service centre that can conveniently manufacture a range of customers' critical parts with Italian quality.

As the company is looking to expand its production capabilities in Monterrey, Eurolls De Mexico is investing in new equipment which includes new CNC lathes, grinders, CNC centres and others.

Eurolls SpA – Italy

Website: www.eurolls.com

20-year presence and experience

Engaged in the design and production of equipment for the cold working of wires, tubes, rods and metal profiles for more than 20 years, Violi Srl boasts an established presence in the main international markets thanks to a complete range of products that has allowed the company to gain the approval and trust of numerous customers.

▼ Wire straightening machine with fly cutting system VM/MRTV



Among the various lines offered by the company is one dedicated to the straightening process, which consists of equipment for the straightening of tubes or rods made of steel or other metals, having a circular or complex profile, ensuring excellent results and high productivity thanks to state-of-the-art solutions and high quality components.

- MRT series: hyperbolic straightening machine for tubes or rods in steel or other metals
- MRP/RPD series: for square and rectangular profiles in steel or other metals
- MRTSA/MRTV: for straightening through rotating group and fly cutting system of wires

Violi Srl – Italy

Website: www.violimacchine.it



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Tratos director to enhance global view of BCA

NEIL Ancell, non-executive director of Tratos UK, has been appointed vice president of the British Cables Association (BCA), the trade association for British manufacturers of insulated cables, wires and associated products.

Mr Ancell will take on this newly created post as the BCA plays an influential role in not just promoting the interest of UK cables and associated companies throughout the world, but also campaigns through the Approved Cables Initiative to improve the overall quality of cable on sale in the UK today. Mr Ancell's cabling career spans 49 years, joining Tratos UK in 2008 following the company's purchase of North West Cables. Tratos is an Italian-owned electrical, electronic and fibre optic cable manufacturer with its head office in London and UK manufacturing facilities in the north west of England. The company has been a member of the BCA for seven years.

Commenting upon his appointment Mr Ancell said: "Having been an active member of the BCA for the past 40 years, I relish this opportunity to have a greater involvement in helping to shape the association. It comes at a time when we are facing the possibility of very different trading environments for many of our members. My perspective has been broadened by working with an Italian-owned, family-run cable company – UK investment has served us well over the past eight years. Tratos is now the UK's second largest cable manufacturer with active markets such as power, telecommunications, rail, oil and gas and construction. Our UK and Italian manufacturing facilities and bases worldwide enable us to have a more



▲ Neil Ancell

global view of the market, something we can share with our membership."

As well as being a trade association, the BCA represents its members on relevant major policy issues across four product sectors – energy cables, supertension cables, communications cables and power accessories. Peter Smeeth, spokesperson for the BCA said: "BCA promotes the interest of UK cables and associated businesses world-wide and provides services which contribute to the commercial success of the industry, and is represented on more than 70 BSI committees. It also runs a forum for discussion on environment and health and safety matters.

"BCA examines what is being considered in fire safety, electric cars, umbilicals and rail infrastructure for example. We coordinate the efforts of our members, gather their comments and then promote agreed solutions to BSI."

Tratos UK – UK
Website: www.tratos.co.uk

Chinese show success for WTM

Visitors to wire China showed great competence and professionalism, with most focusing on advanced technologies, looking to WTM's solutions to enhance their products with up-to-date equipment. WTM can offer consolidated taping technology, also in combination with in-line sintering/curing process. A wide range of wrapping heads for any different taping materials and cable dimension can be combined in different machine configurations.

The technology that WTM makes available to any producer of special cables allows it to solve the most critical tape application problems, particularly orientated on production and shielding of high frequency coaxial cables, twin axial and high-rate data transmission cables, aeronautic/aircraft assembly, aerospace cables, military systems, wireless communications and cloud computing connections. Moreover, the new single twist stranding machine, shaft type, studied and created in detail for the production of very sophisticated LAN cables (Cat. 5/6/7/7a/8) particularly interested a great number of visitors. This equipment offers at the same time the possibility to produce other high-level cables, like those required for the robotic industry and overhead laying, basically characterised by high flexibility.

WTM Srl – Italy

Website: www.wtmachinery.com

Four management changes at Mount Joy

Mount Joy Wire Corporation has announced four management changes that will strengthen its ability to serve global customers and commitment to environmental, health and safety, and sustainability. The changes announced by president Ty Krieger include promotions for Ed Hollock to technical services manager and Matt Tipping to process control manager, and the appointment of Brandt Rosche to quality assurance specialist and Steve Weems to environmental services technician.

Mr Hollock will be responsible for working and collaborating with customers on quality, research and development and new product development. He will also work to further enhance Mount Joy Wire's new shop floor data collection system to improve in-house tracking of material, scheduling of orders, and on-time delivery. He joined the company in 1998 as quality manager and held that position for five years. He then worked for Nelson Steel Products as a plant engineer and Kalas Manufacturing as a process and quality engineer. He rejoined Mount Joy Wire in 2013 and since then has been responsible for the design, training and implementation of its custom shop floor data collection system.

Mr Tipping, who joined Mount Joy Wire in 2004, has been a customer service manager and assistant manager, a supervisor and specialist in various manufacturing departments and, lastly, an environmental technician.

He will be responsible for spearheading quality improvement initiatives, upgrading the safety and increasing the efficiency of production processes in all of the company's departments, managing laboratory technicians and supervising the wastewater treatment plant.

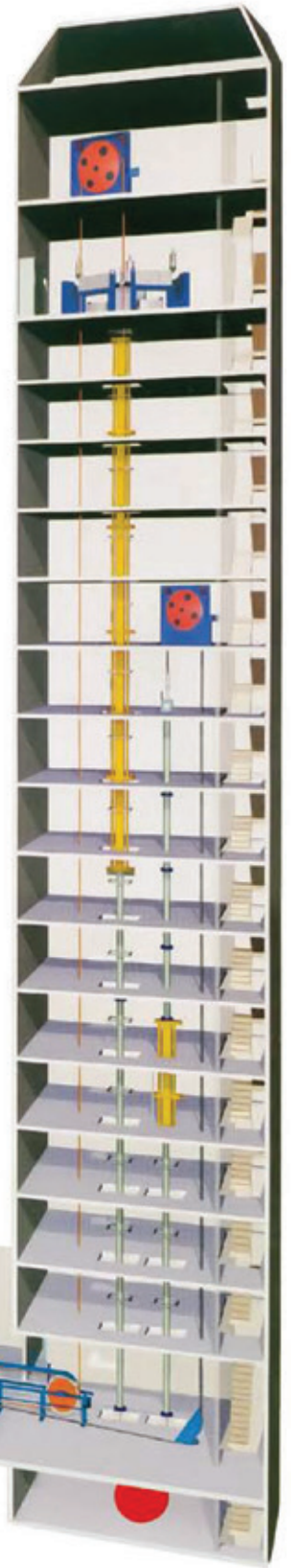
Mr Rosche, as quality assurance specialist, oversees the internal and external quality of the company's products. He previously worked for Auntie Anne's and American Axle & Manufacturing. He has a BS in Industrial Technology from Millersville University.

Mr Weems, who attended the College of Professional Studies, is responsible for Mount Joy Wire's environmental health and safety, continuous improvement, lean manufacturing and green initiatives, including sustainability. He previously worked as a project manager for ABM Industries, and as operations manager for ITW's Thielex Division.

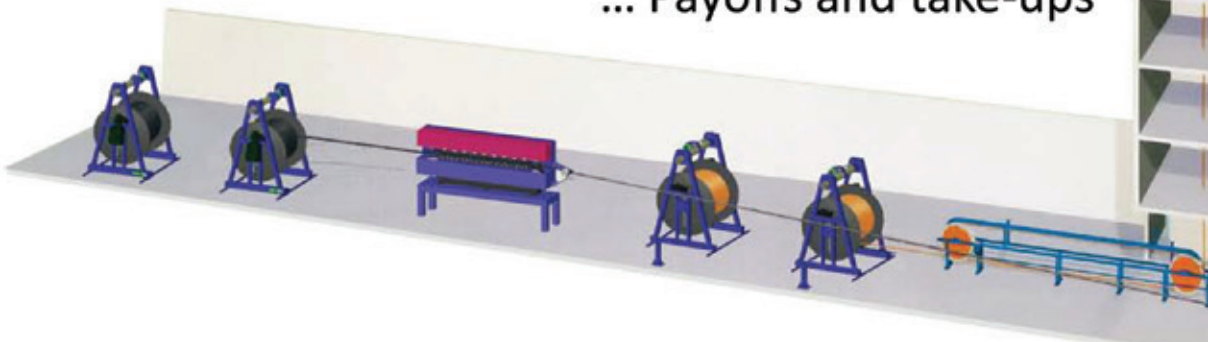
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Growth, development and expansion

IT has been a busy five years since Robert Brown, Chris Nettleship and Douglas Hunt took over the helm of high-performance lubricant specialist Metalube. This diligent trio has made huge strides into the wire and cable market and evolved into new market sectors, while the infectious ambition has firmly integrated itself across the whole company.

Not only has Metalube grown in size, it has also been awarded two of the UK's highest business accolades with a Queen's Award for Enterprise in International Trade 2013 and a Queen's Award for Enterprise for Innovation 2014. This year it was also awarded the ISO 14001 certification, the international standard for environmental management systems (EMS) and the most widely used in the world.

Managing director Robert Brown said: "Metalube was already in a great position when we bought the business back in 2011 and we are very lucky to have its founder, David Lee, still working with us today. David represents our interests in South East Asia and is a non-executive director. He adds enormous value to the company and we are grateful for his continued input and support."

One of the first priorities back in 2011 was to update Metalube's corporate identity with the launch of a streamlined logo, new barrels and brochures as well as a modern, well-designed website available in English, Chinese and Portuguese.

The company's 'Global Specialists in High-Performance Lubricants' promise was

▼ *The new premises at Metalube in Manchester, UK*



▲ *Directors, from left, Doug Hunt, Robert Brown and Chris Nettleship*

also unveiled. This new branding is now visible across all the company's literature as well as at the many trade shows it attends worldwide.

The company also invested in SAP ERP, software that is specifically designed for worldwide organisations. SAP now encompasses all areas of the business from accounts, sales and customer relationship management to material resource planning and quality control.

Principally an exporter, Metalube sends over 90 per cent of the lubricant it manufactures in Manchester, UK,

overseas. Over the past five years, the company strategy has been to expand via country investment. The existing Shanghai, China, office has grown significantly and there are now new offices in Dongguan and in Hong Kong.

Amit Gupte set up Metalube India in 2011, which has gone from strength to strength with India now being one of the company's biggest markets. A former development chemist in the Manchester laboratory, Mohd Shahrin Abu Bakar returned to his home in Malaysia in 2013 and has proved a valuable addition to the South East Asia team working as a technical sales engineer in the region. After a long and drawn out process in 2014, an ANP Licence to trade in Brazil was granted with a subsequent office opening in São Paulo led by general manager Ricardo Neves.

This year, Metalube Arabia was also launched with an office in Dubai headed by Nick Pomeroy, and a partnership was made between Metalube and Fusion Chemicals in the USA.

Douglas Hunt, commercial director, said: "We are really pleased by how well our strategy to invest in local people on the ground in our key markets has been. Our customers can now be assured that they are receiving a full service from individuals who understand our products, speak their language and understand their business cultures."

It is the Metalube team that is the backbone of the company and in the past five years the work force has nearly doubled from 21 to 40 staff.

...in five years

The company has a family culture and dedicates considerable time and investment to staff training and investment. It also hosts a variety of social events, which bring people from across the business together.

The company last year made a huge investment opening a brand new Manchester laboratory, which is now fully operational having doubled its capacity to 126m². The space provides a bright and airy workplace for solving tough everyday technical challenges.

It is purpose-built and fitted with specialist furniture and equipment. The facility meets all the requirements for a modern lubricant developer.

Alongside the laboratory the company invested £100,000 in new equipment to further enhance development capability. This new apparatus includes a Stanhope Seta 4-ball tester, Mettler differential scanning calorimeter and Liebisch Kesternich cabinet, which all cover the key functional properties of friction and wear, thermal stability and corrosion protection.

With success and growth comes the need for more manufacturing and warehouse space and fortunately this year the site adjacent to the Manchester plant became available. This increases the space accessible to the company by over 70 per cent and Metalube now occupies a one-hectare site, which includes a 3,000m² covered factory, warehousing and office space alongside its new laboratory.

▼ The company built a new laboratory and invested over £100,000 in new equipment



▲ One of the new blending tanks at the site

The company has also purchased four new Jungheinrich forklift trucks to service this new and improved operation. Two new blending tanks have also been purchased, which enhance manufacturing capability, enabling the company to keep up with increased demand.

Robert Brown added: "We are never complacent and are always looking at new ways to grow and improve. As a management team, we have made an on-going commitment to invest profits back into the business, improving the way we work and adding to our productivity.

"This strategy has proven wise, given the demand we now have for our range of superior quality lubricants."

Metalube Ltd – UK
Website: www.metalube.co.uk

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Transatlantic Cable

The USA economy

▶ With neither an impending slowdown nor a strong upturn in the cards, a raucous presidential campaign is in economic stasis

5th September – Labor Day, the traditional end of summer in the USA – marked as well the commencement of the final stretch of the presidential campaign. Writing a few days earlier in the *Wall Street Journal*, Nick Timiraos considered the most recent important economic report: in August, American employers added 151,000 jobs and the unemployment rate held steady at 4.9 per cent.

In his view, such news imparted no obvious benefit to either Hillary Clinton or Donald Trump as they entered the last phase of the race. The jobs report indicated neither an impending slowdown that might boost Mr Trump, the Republican nominee; nor the strong upturn that would free Mrs Clinton, the Democratic contender, to more tightly embrace the economic record of President Barack Obama. (“US Economic Data Not Seen Helping Either Candidate for President,” 2nd September)

To be sure, Mr Timiraos noted, the economy is generally sturdy and the worst-case economic fears for Democrats this year had not materialised. Hiring in May slowed sharply, but that proved an aberration. Growth over the next three months averaged 232,000 jobs, close to the highest level of the year.

On the campaign trail, Mrs Clinton conducted a careful balancing act, praising the administration’s policies while also acknowledging economic anxieties. In August, in Philadelphia, she reminded her audience that Mr Obama had saved the economy from the worst financial crisis since the 1930s, rescued the auto industry, and imposed tougher rules on Wall Street to prevent a rerun of the recession of 2008.

But at other events, in Iowa, Ohio and Michigan, her remarks on the economy omitted mention of Mr Obama and focused instead on stubborn problems like income inequality. Also in August, in Warren, Michigan, she said: “The tide is not rising fast enough, and it’s certainly not lifting all boats.”

For his part, Mr Trump declined to bother with fine distinctions. His economic adviser David Malpass said in a statement that immigration – both legal and illegal – has “destroyed upward mobility, consumer purchasing power, and the tax base of state, local and federal governments.”

▶ Providing context, the *Wall Street Journal* observed that the USA expansion, now in its eighth year, is the fourth-longest

in the post-war period. But, in late August, economists at J P Morgan Chase & Co said the probability that the country would enter a recession in the ensuing 12 months had climbed to 37 per cent, the highest for the current expansion cycle.

Mr Timiraos on 2nd September wrote that economists at Macroeconomic Advisers, a forecasting firm, reported USA third-quarter gross domestic product (GDP) running at a 3.4 per cent gain. Economists at Goldman Sachs were projecting a 2.8 per cent gain; J P Morgan economists, a 2 per cent increase.

▶ The voters who would be heading to the polls on Election Day (8th November) were roughly evenly divided in their attitude toward the economy.

Automotive

▶ Ford’s Dagenham Centre in Essex: redeeming the reputation of diesel, redefining what it means to be ‘green’

In the matter of fuel economy and tailpipe emissions, today’s diesel vehicles may be as eco-friendly as their gasoline-fuelled counterparts; but persuading car buyers of that is uphill work. Ford Motor Co, which launched its EcoBlue diesel engine in April, takes a two-pronged approach to the public relations effort.

The carmaker says it is prepared to demonstrate that its new engine is as efficient to manufacture as it is to run, with energy and water use at the company’s Dagenham Diesel Centre in Essex, UK, shaved by an impressive 50 per cent.

Writing in *New Atlas* (formerly *Gizmag*), the Liverpool-based tech writer Stu Roberts reviewed the high-technology engineering and manufacturing facility at Dagenham, operated by Ford of Britain.

The largest Ford diesel engine facility anywhere had been dedicated to the company’s TDCi diesel engine. Now, a newly installed production line is turning out 350,000 EcoBlue engines per year, with that total set to rise to 500,000 when a second phase of production begins in 2017.

Mr Roberts was told that water consumption per engine at the plant will be among the lowest at any Ford facility, for a savings of 3.9 million gallons per year as compared with usage in 2011. The ‘minimum quantity lubrication’ (MQL) machining tools in use on the new line will reportedly account for almost 3.6 million

Transatlantic cable

gallons of that savings. ("Ford's Efficient New Engine Is Being Built on an Efficient New Production Line," 4th August)

According to Ford, fine mists of oil lubricate, clean and cool the new machines throughout the metalworking process, using 99.8 per cent less water than the coolant required in high volumes. Three, smaller, coolant systems use about 70 per cent less energy than the single system they replaced.

Energy use per engine at the plant is said to be down from about 188 kilowatt hours (kWh) in 2011 to 92 kWh in 2016. A further reduction – of just shy of 750,000 kWh per year – is credited to the installation of LED lighting.

► "A number of other initiatives at the Dagenham plant are also helping to improve its green credentials," wrote Mr Roberts. Ford is now sending 'zero waste to landfill' there and at its other 11 European manufacturing plants. New technology means that engines can be tested without being started up first, for a savings of 11,000 gallons of diesel fuel a year. And advanced tooling is helping to reduce component rejection rates.

If Dagenham's reputation as a state-of-the-art facility should need any further burnishing, three wind turbines contribute to the plant's power requirements.

'Self-Driving Track Days' demonstrate Britain's intention to take the lead in autonomous car development

As reported this summer by David Curry of *ReadWrite*, in November a host of drivers will converge on Bruntingthorpe, an airfield and proving ground 40 miles east of Birmingham for Europe's first-ever track day for autonomous cars. The event, backed by the government's Innovate UK organisation, which funds emerging technology projects, will enable manufacturers, software developers and enthusiasts to come together for work on building the next generation of transport.

"Driverless vehicle technology is a young discipline which pools expertise from different areas of mechanical, electrical and software engineering skills," Self-Driving Track Days co-founder Alex Lawrence-Berkeley told *ReadWrite*. "We're keen to close the skills gaps between education and what industry is telling us is missing in the talent pool." ("Britain to Host Europe's First Track Day for Autonomous Cars," 11th August)

Innovate UK – which is sponsoring another such event at the Longcross Test Track, near Surrey – observed that most of the news on self-driving cars is generated by the manufacturers themselves. Its own emphasis is on universities and startups such as RDM Group, which may be bringing its new pods to Bruntingthorpe. One of the first firms to draw Innovate UK backing, RDM launched UK Autodrive, a \$24 million project to integrate driverless pods into urban environments.

Earlier in the year it was reported that this initiative has an important patron: Queen Elizabeth II. The Queen's Speech on the Opening of Parliament for the 2016-17 session (18th May) included an announcement of proposed reforms to insurance legislation that would legalise the testing and purchase of autonomous cars in the United Kingdom. When passed by Parliament, this will be the first legislation of its kind to apply to an entire country.

It will also serve notice on autonomous car manufacturers that the UK warrants consideration as a viable alternative to Europe and the USA for autonomous car development and

manufacturing. Volvo and Jaguar Land Rover are already testing autonomous cars in the UK, in controlled projects in cities like London and Milton Keynes, and may soon be able to test the cars nationwide. Volvo has chosen the UK as its headquarters for autonomous car operations. Nissan, a major automotive supplier in the UK, plans to add autonomous features to its Qashqai cars in 2017.

A German focus on electric cars

Weighing Britain's prospects of becoming "a self-driving hotspot," Mr Curry said he would expect its less restrictive rules on testing autonomous cars to attract European automotive companies. Audi, BMW and Mercedes-Benz have concentrated their public road testing of autonomous cars in Germany and the USA.

In France only one company, the PSA Group, is permitted to test its cars on open roads. Some testing is performed in Spain and Italy, but no important projects have been launched. No meaningful legislation on autonomous cars has been enacted anywhere on the continent.

ReadWrite considers Germany, the acknowledged leader in European automotive manufacturing, to be "behind the times" on autonomous cars, although Chancellor Angela Merkel has said she intends to address the issue.

However they see the future for autonomous cars, *Reuters* in early September noted that German carmakers are investing heavily in the development of electric cars, a segment once neglected by the industry as customers resisted their high cost and limited operating range. A growing backlash against diesel, together with recent advances in battery technology to increase the reach of an electric car by up to 50 per cent, has spurred major investments by Volkswagen, Daimler, and such suppliers as Bosch and Continental.

► In July the trade magazine *Automobilwoche* cited company sources as saying that Daimler, the maker of Mercedes-Benz, would bring to market several new electric car models between 2018 and 2024.

A source familiar with Daimler's plans told *Reuters* that the German company, which was to unveil a new electric car at the Paris motor show in October, was accelerating its development of premium electric cars, a segment currently dominated by USA-based rival Tesla. ("Daimler Plans at Least Six Electric Car Models – Source," 3rd September)

Steel

With simulation-based techniques promising economy and high accuracy, steel castings manufacturers see a rosy near-future

The London-based technology research company Technavio projects the global steel casting market to grow at a compound annual growth rate (CAGR) of more than six per cent over the period 2016-2020.

In a report on the present state of that market and its growth prospects, published 31st August, Technavio analysts identify valves and pumps, automobiles and transportation, construction and infrastructure, and mining as major segments.

Transatlantic cable

With a CAGR of close to 4 per cent for the forecast period, the market for valves and pumps is expected to grow at the fastest rate – the demand supported by hydraulic fracturing (“fracking”), chemical, nuclear, desalination and waste-disposal applications.

In terms of geography, Asia-Pacific (APAC) is the largest and fastest-growing steel casting market and China the dominant player. The market is driven by the automotive and construction sectors, with the Chinese construction market expected to grow at a CAGR of over 12 per cent (to \$2.5 trillion) during the forecast period.

According to Chandrakumar Badala Jaganathan, a lead analyst at Technavio for metals and minerals research, the primary demand driver for industrial castings in the APAC region is the rapid increase in industrialisation and development in China, India and South Korea.

Ongoing urbanisation in India is a notable factor, with the Indian government investing heavily in infrastructure and thus boosting demand for steel castings. As noted by Technavio, Indian steel companies “have been investing massively over the last seven years” to increase steel capacity. The growth rate of steel consumption in India is projected at seven to nine per cent to 2020.

Even as the steel castings market grows in size, the product grows in sophistication. By pinpointing the location of internal defects, Dr Jaganathan said simulation-based casting technique optimises casting design and method. In allowing visualisation of the casting processes (mould filling, cooling, solidification), it saves time for manufacturers while enabling them to more reliably satisfy critical dimension, size and weight requirements.

Elsewhere in steel . . .

➤ A news story from Minnesota may call into question the increasingly popular choice of stainless steel for residential gas lines. According to Christopher Dean, the fire chief of Muskegon Heights, the stainless steel gas line in a recently renovated house contributed to a fire on 29th August.

As reported by Lynn Moore on *mlive.com* (2nd September), Mr Dean said that the coating on electrical wires melted in an earlier, unrelated, fire in the structure. The wires grounded out on the stainless steel tubing, causing it to overheat and ignite floorboards and other building material. Both fires were extinguished quickly.

Milestones

▶ A historic first: a scheduled passenger jet flight from the USA to Cuba

Shortly after 10am on 31st August, JetBlue Flight 387 took off from Fort Lauderdale, Florida, en route to Cuba. As noted by Jen Kirby of *New York Magazine*, this was the first scheduled USA commercial flight to depart for Cuba since 1961, when airlines were still operating propeller planes.

The 150-strong payload of Flight 387 included US Department of Transportation Secretary Anthony Foxx and Frank Barreras, the JetBlue pilot and son of Cuban immigrants. CBS News reported that Mr Barreras’s father fled Cuba on one of the last USA-bound commercial flights before the rupture between the two Cold War foes ended that connection for a half-century and more.

The plane landed in Santa Clara – about 175 miles east of Havana, the Cuban capital – around 11am, the first flight under new USA rules that loosened travel restrictions after the resumption of diplomatic ties in December 2014. This May, a USA cruise ship docked in Havana for the first time since President Barack Obama launched an effort to normalise US relations with the island nation 90 miles offshore Florida.

According to the *New York Times*, six American carriers have been approved for commercial air service to nine Cuban cities. The commuter line Silver Airways was next up, after JetBlue, with its initial Cuban flight set for 1st September. American Airlines was to follow suit the following week. (“Scheduled Flights to Cuba From US Begin Again, Now With Jet Engines,” 31st August)

Earlier reports indicated that the USA cities of origination for Cuba flights would be Atlanta; Charlotte, North Carolina; Houston; Los Angeles; Newark, New Jersey; and New York; plus four in Florida – Miami, Fort Lauderdale, Orlando and Tampa. Of the 20 daily non-stop flights slated for Havana, 14 will leave from Florida, home to the largest population of Cuban-Americans.

➤ Together with hundreds of thousands of Cuban-Americans, who have been able to travel to Cuba without restriction since 2009, nearly 160,000 USA leisure travellers flew there last year. Previously, expensive and time-consuming charter flights provided their sole recourse.

But the *Times* reported that Americans who qualify for travel to Cuba under the approved 12 categories (eg family visits, official business, and educational or religious activities) can now book flights on an airline’s website, and many have paid fares as low as \$99 each way.

➤ Conservatives in Congress have been unwilling to lift the trade embargo of Cuba, which includes a travel ban. That means that most Americans still cannot legally visit Cuba. But, with the easing of the rules, enterprising travellers are free to design their own “people-to-people” cultural exchange tours with little oversight.

Carpe diem

▶ Massachusetts looks into an unusual suggestion for retaining its best and brightest: extend the hours of daylight

A 2013 Boston Federal Reserve study showed that New England had the lowest retention rate of college graduates of the entire USA, with only about 63 per cent of the class of 2008 still in Massachusetts a year after earning their diplomas. A Boston-area resident, Tom Emswiler, saw a direct connection between this statistic and the restiveness he had noted among young people in a city that goes dark about three hours after lunch.

As reported by Tom Moroney and Anne Mostue of *Bloomberg News*, of all the major cities on America’s eastern seaboard, none is as far north and east as Boston, where the sun sets really early in winter. On 9th December last year, sunset in Boston was at 4.11pm, only 22 minutes later than in the Yukon.

Mr Emswiler’s insight, developed at some length in a *Boston Globe* op-ed, found a receptive reader in Massachusetts Governor Charles Baker, who recently signed a bill ordering a feasibility study of moving his 10,555-square-mile state into a time zone that would brighten the end of the day in the months during which the Northern Hemisphere is tilted away from the sun.

Transatlantic cable

According to *Bloomberg*, the proposal under consideration is that Massachusetts join the Atlantic Time Zone, covering eastern Canada, the Caribbean and parts of South America.

No longer observing Daylight Saving Time (DST), residents would thus avoid the pesky chore of re-setting their clocks in spring and summer. From November to March, the sun would set an hour later than it does now. ("Massachusetts Could Swap Time Zones for Later Winter Sunsets," 29th August)

The sun would rise an hour later too, of course. But, wrote Mr Moroney and Ms Mostue, "The thinking is that darkness in the morning is less depressing than darkness at the end of the day."

Whether this might be enough to keep college graduates from fleeing Massachusetts should be clearer next year. As part of an economic development measure a legislative commission was established by Gov Baker to probe the matter. The commissioners must report their findings by July.

► The *Bloomberg* reporters provided some incidental information on Daylight Saving Time, customarily traced to a 1784 essay by Benjamin Franklin. To conserve on fuel by reducing evening use of lighting, Germany in 1916 became the first country to adopt DST.

The USA temporarily adopted it two years later, and most states later made it mandatory. Today, only Hawaii and most of Arizona – perhaps to be joined by Massachusetts – do not observe DST.

Telecom

▶ An American auction for the reallocation of UHF spectrum pits TV broadcasters against telecoms, producing no winner

"So what happened to the spectrum crisis?"

The question, posed by Guy Daniels of *TelecomTV*, is a legitimate one. For some time it had been generally understood that wireless operators in the USA, feeling themselves to be dangerously short of bandwidth, would give much for an additional slice of that critical asset.

On 30th August, the abrupt halt of the first stage of the Federal Communications Commission's 600MHz incentive auction proved otherwise. Forward bidding topped out at just \$23 billion, below the level needed to continue the proceedings and well short of the \$88bn target set by the FCC.

Mr Daniels, who in earlier coverage foresaw difficulties with "the world's most complex and mind-numbing spectrum auction," was ready with an explanation. In his view this was a complicated affair that pitted TV broadcasters against wireless operators.

The broadcaster-bidders had to voluntarily relinquish UHF spectrum rights in exchange for a portion of the proceeds from the forward auction: at which point the mobile broadband providers were expected to make their bids in the reverse auction for the released UHF spectrum, in the mobile-friendly 600MHz band.

The process involved "repacking" channels to the remaining broadcast television stations to create contiguous blocks of cleared spectrum suitable for flexible use.

The reverse and forward auctions would be integrated in a series of rounds, each consisting of a reverse-auction and a forward-auction bidding process, with additional stages to be run if necessary.

"Well, [that is] now proven necessary," wrote Mr Daniels. "But not for the reasons the FCC had hoped." ("US Wireless Operators Only Interested in New Spectrum if the Price Is Right [and It's Not]," 1st September)

The FCC announced that the incentive auction had closed, after 27 rounds, without meeting the conditions necessary to extend to a further round. The agency, left with no choice but to restart the entire process, announced Stage 2 with bidding to begin 13th September.

This would not be a new round of forward bids but a process *ab initio* – with a new reverse auction for broadcasters, followed by another series of forward bidding rounds for wireless operators. (Mr Daniels did say it was complex.)

To avoid a repetition of the failed first stage, the FCC set a lower target of 114MHz for Stage 2 (actually 90MHz of re-usable spectrum plus guard bands, compared with a 126MHz total in Stage 1). With less spectrum on offer – nine blocks of paired spectrum instead of ten – it was hoped that the relative scarcity would push up bids from the wireless operators.

"The TV industry also believes that this second stage means that its broadcast members will receive less money for their relinquished spectrum," wrote Mr Daniels on 1st September. "Spotting the winners here is nigh on impossible."

What do the experts say?

"NAB is surprised by the modest participation by wireless carriers in the first stage of the TV auction," said National Association of Broadcasters spokesman Dennis Wharton. "Perhaps the notion of a 'spectrum crisis' peddled in Washington for the last seven years is not as acute as policymakers were led to believe. We look forward to the second round of the auction where wireless carriers will be afforded another bidding opportunity."

To Dan Hays, principal of the strategy and consulting group at PricewaterhouseCoopers LLP, the outcome of the auction was unsurprising if disappointing to some. "The results demonstrate just how much pressure the mobile industry continues to face to limit its capital spending," he told *TelecomTV*. "The ball is now back in the court of TV broadcasters, who will need to decide whether to accept lower prices for their spectrum or bet on future opportunities to cash in on their airwaves."

Berge Ayvazian, senior analyst at *Wireless 20/20*, suggested to Dan Meyer of *rcrwireless.com* that it would take some extraordinary diplomacy on behalf of the FCC to bridge the gap between what it appears mobile telecom operators are willing to spend and what it appears TV broadcasters want for their spectrum holdings.

Mr Ayvazian also noted that telecom operators "might not be as gung-ho for low-band spectrum" in light of the future focus of 5G services on higher-band spectrum to support increased capacity needs – not broader coverage.

► Those monitoring the FCC auction could expect four weeks of reverse bidding followed by two weeks of forward bidding. By November, they should know if the second stage will be any more successful than the first.

Dorothy Fabian – USA Editor



▲ The new EcoStrip 9380 from Schleuniger

New for cut and strip range

SCHLEUNIGER has launched the new EcoStrip 9380, the company's latest innovation in its cut and strip product family.

"You don't need to wear a dinner suit every day," Schleuniger's head of marketing, Martin Engel, said. "Quite often jeans meet your needs."

The same is true of the cut and strip process: A wide range of applications do not require more than an entry-level solution.

One of the highlights of the EcoStrip 9380 is that it can be configured with rollers or belt feeding and the configuration can be quickly and easily changed by the operator. The unique three-position design of the optional belt feeding system further enhances the customer's capabilities. The belt feeding can be set for normal mode, roller mode or short mode processing – depending upon the

application. And thanks to the strip-boost control of the feeding units, additional stripping force can be added if required.

The EcoStrip 9380 is an economically priced machine with an excellent price-performance ratio. In terms of performance, it exceeds previous models by approximately 20 per cent. The EcoStrip 9380's low production costs are derived from features such as its state-of-the-art design and the ability to process two wires in parallel. The EcoStrip 9380 is also compatible with a full range of pre- and post-processing accessories for pre-feeding, marking (inkjet on-the-fly), stacking, coiling and tying, which turn the stand-alone machine into a fully automatic processing line. Owners of the original EcoStrip 9300 model can save additional money by using their current blades and guides with the new EcoStrip 9380.

The EcoStrip 9380 is a hard-working machine that is also user-friendly. It is

controlled via Schleuniger's standardised S.ON user interface with 5.7" colour touchscreen. With the release of the EcoStrip 9380, this interface is now the standard across the entire line of Schleuniger cut and strip products.

As business grows this standardisation makes it easier than ever for customers to expand capabilities and transition to new, higher level cut and strip machines without having to learn a new user interface. The EcoStrip 9380 is compatible with Schleuniger's wire processing software, Cayman, as well as the planning software S.WOP, for network integration of the machine.

In addition to these benefits, the EcoStrip 9380 is uncompromisingly precise. All driven axes are powered by Schleuniger's proven electronic platform, Bricks.

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Joining forces for a new drawing line

SCHMIDT Maschinenbau from Germany and Austrian company Plasmaid have integrated machinery to develop a new drawing line for fine stainless steel and nickel alloy wires with an inline annealer.

Annealing of stainless steel and nickel alloy wires has until recently been done almost exclusively in the traditional tube furnaces in a multi-line setup.

This is not the case any more. PlasmaAnnealer can now be installed in-line with fine wire drawing machines of Schmidt that produce fine stainless steel wires (diameter 1mm to 0.1mm) at a speed of up to 4-15m/s.

Such an integrated fine wire drawing line can avoid the need for 10-20 lines in a traditional tube furnace, ie abolishing the need for expensive multi-line take-ups and payoffs and associated material handling and manpower needs.

The installation in the layout drawing features a line with a horizontal annealer configuration and double-head take-up



▲ The integrated line on display in Düsseldorf, Germany, this year

with automatic spool changeover functionality.

The integrated line can also be offered in

a compact design with vertical annealer, which is suitable for smaller fine wire diameter ranges.

The new integrated drawing-annealing line has been initially offered in Europe and Asia, and will soon also be available in North America. PlasmaAnnealer can be used in combination with rolling mills or stranders.

The new integrated drawing-annealing line can be used in a wide range of applications and for different types of materials used in applications such as: fine wire for mesh and textile, filter wire, brush wires, EMS mesh wire, resistance wires, heating element wires, medical, jewellery, aerospace, automotive and similar applications.

Plasmaid GmbH – Austria
Website: www.plasmaid.com

Schmidt Maschinenbau GmbH – Germany
Website: www.schmidt-maschinenbau.com

Putting the charge into electric cars – super fast!

Huber+Suhner, a manufacturer of components and systems for optical and electrical connectivity, has developed a cooled cable and connector that enables high power charging of electric vehicles.

This development can multiply the power-throughput of a charging cable and keep charging times below 20 minutes (80 per cent state of charge) even with big battery packs of new electric vehicles and trucks.

With the release of the next generation of long range electric vehicles, fast-charging stations running with a power of 50kW and a current of 120A will lead to charging times up to one hour.

With the new cooled cable system by Huber+Suhner, currents of up to 500A or higher are possible while still providing a flexible, small-diameter and low-weight cable solution. This perfectly matches the high power charging stations currently under development that are said to provide 350kW with charging currents of 350A or more.

Huber+Suhner is convinced that the cooled cable and connector will support and accelerate the demand for environmentally friendly electric vehicles, as long charge times are a key factor in negatively influencing a person's decision to purchase one.

"Our cooled cables and connectors will make rapid charge times for all electric cars absolutely feasible," said Frank Rothe, head of the automotive market unit. "With environmentally conscious vehicles becoming more and more popular in the mainstream, this is the next step in making purchasing an electric vehicle the norm."

Huber+Suhner's cooled cables are highly flexible, lightweight and easy to handle – traits that traditional high-current cables lack. Thanks to an integrated cooling circuit, they also offer a much smaller cable cross section than the traditional option.

"We are excited to offer the cooled cable with Combined Charging System (CCS) type-1 and type-2 connectors and, since Huber+Suhner is committed to tailoring the best possible solution for each individual situation, we are always happy to discuss custom designs with our partners," added Mr Rothe.

Huber+Suhner – Germany
Website: www.hubersuhner.com



▲ A new addition to the fibre optic cable family from Datwyler

FTTx outdoor cable with 288 fibres from Datwyler

Datwyler Cabling Solutions has added a product with 288 fibres (G.652.D) in stranded loose tubes (12x24) to the "FO Outdoor wbKT S-Micro" fibre optic cable family. The diameter of this FTTx outdoor cable is only 10.4mm. This is an ideal size for blowing into microducts of 12mm or more internal diameter.

The compact, non-metallic cable with its dry interstices makes for a design which is easy to install and remove. Users also benefit from its attenuation figures – 0.21 dB/km at 1,550 nm, for example – and good mechanical properties, which are reflected in an increased tensile strength (2,900 N) and very long blowing distances.

Datwyler – Switzerland
Website: www.datwyler.com

Drawing more with less!



The latest addition to a long history of innovation is the new type MSM 86 rod breakdown machine designed for wires made of copper, copper alloys, aluminum, aluminum alloys, and other non-ferrous metals. State-of-the-art technological features and modular design result in dependably high quality wire surfaces and high production output. The real innovative power comes from unprecedented energy efficiency and an energy consumption which is 10% lower than that of its predecessor model MSM 85 and 20% lower than that of conventional rod breakdown machines.

The MSM 86 is designed to be combined with the new R 502 continuous resistance annealer. With an annealing power of 530 kW, the R 502 is the most powerful NIEHOFF annealer to date. Power consumption is reduced by 20% compared to state-of-the art DC annealers due to the newly developed voltage control system NAC (Niehoff Annealing Controller) and the AC annealing principle.

High efficiency: 2 wires Cu 2.60 mm with 24 m/s = 8,100 Kg/h

NIEHOFF combines outstanding expertise along your entire value chain with customer proximity and reliable service, for the entire lifecycle of your investment. It is just this combination that will make the difference, so you can concentrate on what is most important to you: your decisive competitive advantage.

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Advertorial on behalf of Decalub

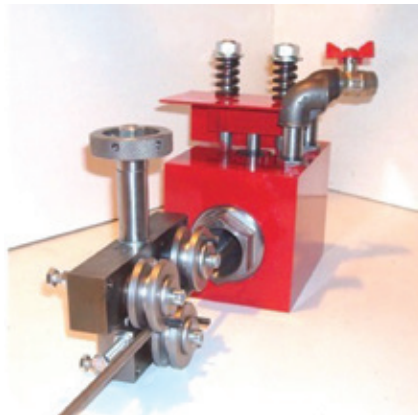
Rod phosphate-free conversion coating – green, at unlimited speed and frictionless

Today, replacement of conventional wire rod wet preparation by the PDH system phosphate-free conversion coating changes rapidly the current state of wire drawing, generating lower operating cost and benefitting from significant energy and maintenance savings, and complete environmentally friendly rod conversion coating and wire lubrication process.

Users have been attracted by the PDH coating technology, which is potentially less complex, much cheaper, simpler and more convenient to use.

The PDH system is used in-line in the most demanding drawing applications with all carbon steel rods and wires, including 0.90% C, mechanically descaled or acid cleaned, uncoated or pre-coated, in applications including spring wire, rope wire, PC strand wire, plating wire, cold heading wire, galvanised wire, CO₂ welding wire, etc.

The PDH system achieves a unique scenario in modern wire drawing



▲ Rod phosphate-free conversion coating by PDH system

operations, making the process green, dry, clean, instantaneous, self-controlled, repeatable, in-line, and operating at virtually zero energy consumption.

The major positive impact is immediate:

- Unlimited rod coating speed
- Frictionless drawing
- Output 2.2-4.9 tonnes per hour (from

- 5.5-13mm H/C uncoated rod)
- Minimal die wear (0.1-0.3 micron per tonne)
- Replacement of phosphate, borax and wet substitutes by a powder compound
- Hard and consistent fully controlled anti-friction coat that captures abrasive particles eliminating two-body abrasion wear (the most destructive lubricant contaminant)
- Elimination of moisture, which is the number one enemy in the wire drawing process (the second most destructive lubricant contaminant)
- Extremely compact unit, easy to incorporate into existing operation
- Providing very smooth wire finish not difficult to clean with water

More information can be found on the Decalub website, and particularly on the newsletter pages on the site.

Decalub – France

Email: info@decalub.com

Website: www.decalub.com

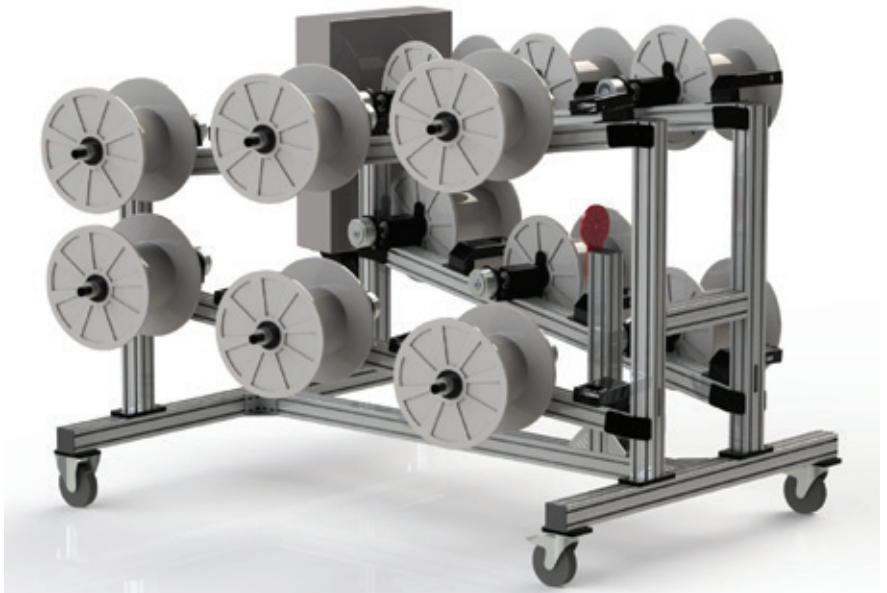
Infinitely adjustable brakes

MAGNETIC Technologies Ltd offers a variety of brakes for pay-offs and take-ups. Its brakes are infinitely adjustable to give extremely accurate tension control, and come in numerous sizes to fit customers' spools and reels.

Torque is developed magnetically and will remain the same year after year. The torque range is 0.11" ounces to 320" pounds. Advantages include adjustability, portability, and a minimum of floor space. Every brake or clutch is carefully engineered to give exceptional long life, for even the most demanding production standards.

They are designed to be easily mounted and serviced or modified, should the need arise. Magnetic Technologies stocks spare parts for all of its products and does any necessary repairs in-house at the company's facility in Oxford, Massachusetts, USA. Several models have tapered roller bearings to support heavy overhung loads.

Howard Schwerdlin, sales manager, said: "Based on our highly reliable electric hysteresis brakes, we have developed a constant current power supply controller that uses an internal computer to constantly adjust brake torque as the supply spool diameter decreases during pay-off using an ultrasonic probe to measure spool diameter."



▲ A new constant current power supply controller has been developed by Magnetic Technologies

"The controller incorporates the torque vs current curves for all ten sizes of brakes and logic to provide constant current to the brake over time. Multiple brakes can be controlled with one power supply.

"With direct touch panel control, the operator needs only to enter the desired tension in either imperial or metric units.

Both individual single station or multiple station designs are available.

"For applications that do not require constant tension a variety of single to multi-spool payoff stand types are also available."

Magnetic Technologies Ltd – USA

Website: www.magnetictech.com

mobac High Quality Products for Wire and Cable Applications

**Payoff with dancer accumulator
and double pivot to pre-load**



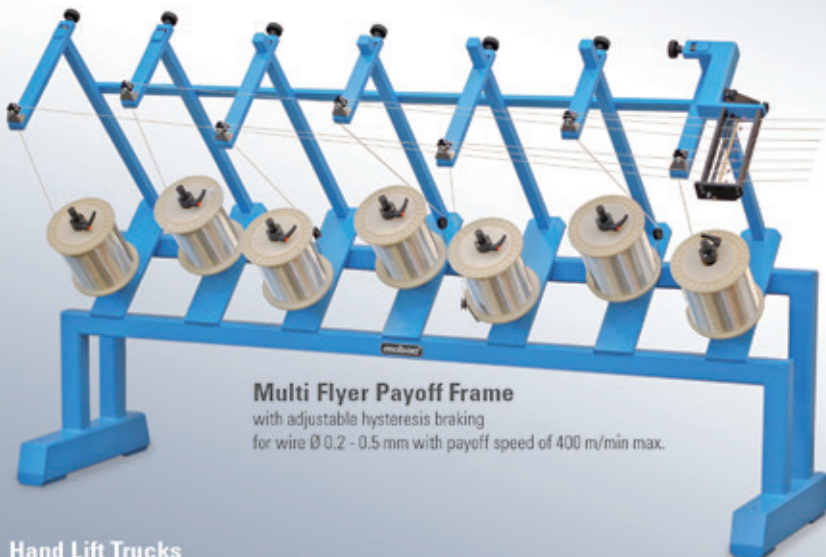
tension adjustment
by magnetic particle brake or hysteresis brake
for spools Ø 560 - 800 mm



**Flyer Payoff
with dancer accumulator**
for spools Ø 630 - 800 mm,
for single- and multiwire,
wire speed up to 400 m/min

Driven Tangential Payoff

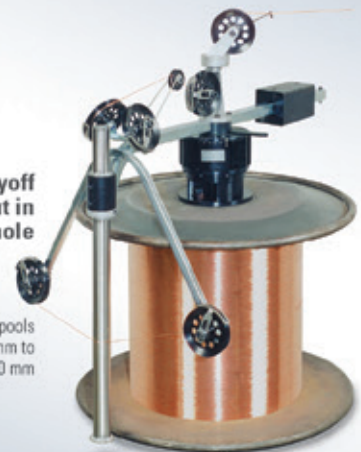
with tension and rpm control
for various spool
and coil diameters.
Max. dia 760 mm
for single wire,
multiwire, cable etc.
max. speed
up to 300 m/min



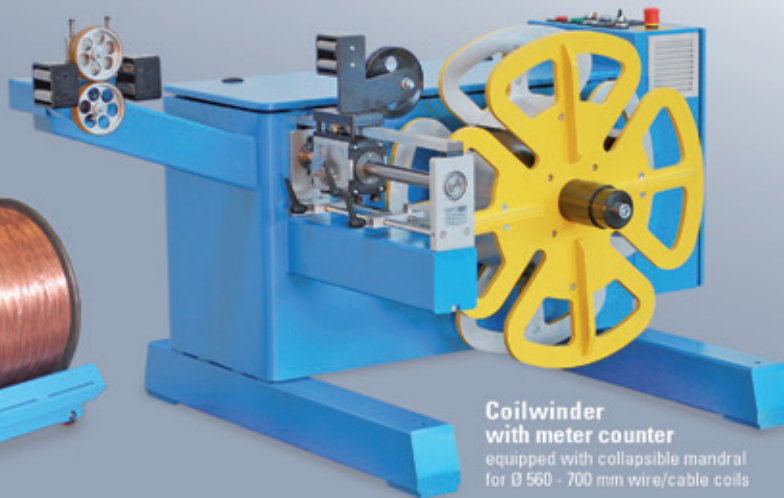
Multi Flyer Payoff Frame
with adjustable hysteresis braking
for wire Ø 0.2 - 0.5 mm with payoff speed of 400 m/min max.

**Flyer Payoff
to put in
bobbin hole**

for spools
Ø 500 mm to
Ø 1250 mm



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Ø 630 mm and 800 kg of weight,
different types available,
to lift up bobbins
directly from the floor



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equipped with collapsible mandral
for Ø 560 - 700 mm wire/cable coils



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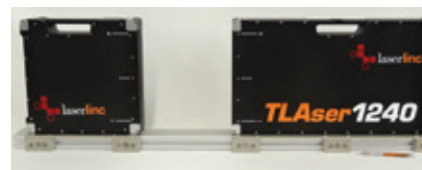
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wire, Spring steel wire, Baling wire.
Wire diameter: 0.15mm - 14mm
Zinc coating: up to 850g/m²

Quick and accurate TLAser1240

LASERLINC has introduced the TLAser1240™ scanning laser micrometer, a new single-axis diameter gauge for the inspection of large products, quickly and accurately without contact.



▲ The new TLAser1240

The TLAser1240 micrometer measures diameter, height or width up to 9.1" (231mm) and is designed for use in industries such as metal, glass, wire and cable, and plastics and rubber extrusion. For metals and glass, the transmitter and receiver components can be separated to keep away from moving product or equipment, as well as heat sources.

Features include:

- Measure any material, even if transparent
- Fast inspection – 1,600 measurements per second. At 50ft/minute, a measurement is made every 0.007" of product for virtual 100 per cent coverage
- Repeatability (two second) – $\pm 0.00008"$ [$\pm 2\mu\text{m}$]
- Separate transmitter, receiver and rigid mounting rail – mount in any orientation and out of the way of moving product and equipment

- Use two units together to get dual-axis (XY) inspection, or three for three-axis diameter and accurate ovality measurement
- Integrate with the Total Vu™ HMI using a standard Ethernet connection for complete product and process monitoring and control
- Integrate with line control PLCs using the SmartLinc™ processor and industrial communications such as EtherNet/IP
- Four-year warranty

"Prior to the TLAser1240, measuring large parts was a difficult task. This micrometer solves this problem with both speed and precision," said Jeff Kohler, vice president of LaserLinc.

LaserLinc Inc – USA
Website: www.laserlinc.com

New extrusion head features MAGS adjustment

Guill Tool has introduced the new 500 Series crosshead with MAGS gum space adjustment. The 500 Series is designed specifically for the flow characteristics and unique processing challenges of elastomeric compounds. One of the key features engineered by Guill on this new crosshead design is the mechanically assisted gum space (MAGS) adjustment system. This new method of gum space adjustment allows the operator to make an effortless adjustment from a single point using a common socket wrench. No more need to struggle with multiple nuts and bolts in order to adjust gum space, which leads to faster adjustments. The visual indicator on the core tube allows the operator to see how far the gum space has been moved, making those adjustments more accurate and repeatable.

The machine also features the latest centre-stage concentricity adjustment system that significantly reduces pressure on the tooling, allowing easier and more precise concentricity adjustments without loosening the face bolts.

Easy-out inserts for the adjusting bolts also allow simple replacement of locked or damaged adjusting bolts, which further saves on repair and downtime.

Another innovative feature of this rubber/silicone crosshead is a cast aluminium liquid-fed cooling sleeve that allows the user to switch out the cooling jacket in the event of a line obstruction, again reducing downtime compared to traditional integrated cooling systems.

The crosshead is a drop-in replacement on most existing NRM lines; however, this crosshead design can also be adapted to fit any extruder design or line layout.

The addition of a newly designed flow inlet channel reduces the shear and heat that is generated as the materials are being processed. This leads to lower head pressures, allowing the material to move through the head in a much more balanced and even flow.

The hardware-free and patented cam lock design of the 500 Series means no time is wasted unbolting and re-securing fasteners for disassembly and re-assembly. Only half of a rotation of the cam nut is required to loosen and automatically extract the deflector from the head body, which is another time saver. Also, with no undercuts on the deflector, there are no material hang-ups when extracting the deflector, allowing for faster and easier cleaning and changeover.

Guill Tool & Engineering – USA
Website: www.guill.com

High Temperature Textiles GmbH
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www.hightemperaturetextile.com

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www.hightemperaturetextile.de

Steel cord technology for the tyre industry

THE technological evolution of the automotive industry has obliged tyre manufacturers to develop products with improved performance, safety, grip and environmental impact.

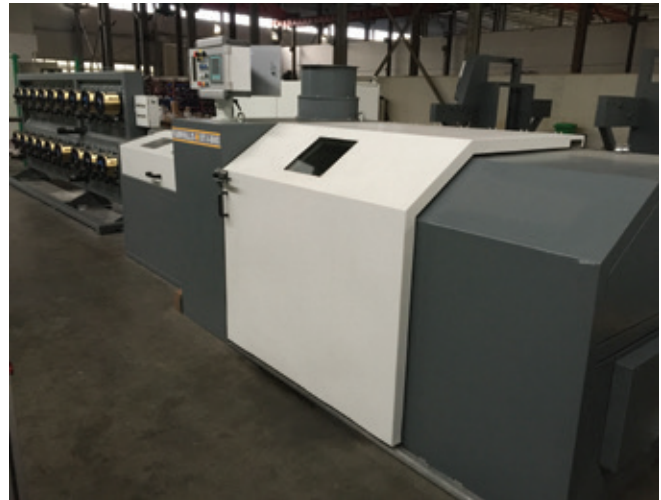
Both the rubber compounds used and the manufacturing process determine these characteristics.

In this process it is important to have the presence of a metallic belt composed of a fine steel cord netting formed from a series of high tensile wires (which can reach values up to 4,200MPa) with a brass surface to guarantee improved anchorage characteristics.

The numerous types of steel cord formations, chosen by the manufacturer in accordance with the desired dynamic and static performance/characteristics of the finished tyre, are based upon the concepts of quality and consistency in both individual components and design parameters.

The steel cord production process is a complex and sophisticated process based upon a combination of wire reduction sequences (using both dry and wet drawing equipment), heat and chemical (patenting, cleaning, brass plating) treatments terminating with bunching machines.

The new, technologically advanced Eurolls double twist bunching machine has been designed for high performance (rotation speeds up to 5,000rpm), ease of threading (new cable production) and operation/line control plus simplified maintenance interventions.



▲ *Eurolls' new double twist bunching machine*

The new concepts present in the machine not only guarantee stability, a constant final product quality, high operating flexibility for assembly of new wire formations and the use of latest quality entry material (increased carbon content and substantial presence of chromium) but also reduce the difficulties encountered by tyre manufacturers when producing a high quality final product.

Eurolls SpA – Italy
Website: www.eurolls.com

OCG™ – extending the life of your overhead line conductors



OCG™ is a world-beating range of cold-applied greases for the protection of overhead line conductors. Fully compliant with all international specifications, the range delivers unrivalled protection against fretting, multi-metal corrosion and high temperature oxidation.

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New flame-retardant halogen-free cable compound solutions

LARGE-SCALE production of flame-retardant XLPE insulated cables requires a cost-effective and reliable material solution. In addition to this there is an increase in demand for safe halogen-free cable solutions which are effective in preventing the spread of a fire as well as reduced levels of toxic smoke.

The major challenges for cable producers today are processing efficiency and short shelf life of existing solutions. Borealis and Borouge's new Visico™ FR compound solutions overcome these challenges and make the flame-retardant cable production much easier and simpler.

Based on Borealis' proven Visico technology, these silane cross-linkable compounds are produced without the grafting process of the silane additives. The silane needed for the cross-linking is incorporated in the high-pressure polymerisation phase, resulting in products with high quality consistency that are less prone to scorch during extrusion.

They also have a longer shelf life in comparison to grafted alternatives. When using this new solution, cable manufacturers can achieve better productivity and reduced scrap production, thereby lowering the total cost of production.

Visico™ FR4451 – supporting growth of solar energy: The expected global growth of solar energy is bringing increased demand for photovoltaic cables to connect the solar panels to the energy network. These cables need to be flame retardant, halogen-free and able to withstand significant heat and mechanical impact.

Visico FR4451, a new halogen-free crosslinked compound solution, meets these demanding requirements for this type of cable while enabling high productivity, quality consistency and cost-effective cable production. The combined solution of Visico FR4451 and catalyst masterbatch LE4439 is designed to meet photovoltaic cable standards TÜV 2Pfg 1169 and EN 50618.

Visico™ FR4450 – pioneering sustainable solution for UL style building and industrial wires: Conventional flame-retardant compounds for UL style building and industrial wires are typically halogenated using antimony and bromine flame retardant additives. In spite of their effectiveness as a flame retardant, there are major concerns about these types of additives regarding their impact on the environment and people.

Demanding requirements on wet electrical performance and mechanical impact make it very difficult to replace conventionally used solutions with halogen-free compounds based on mineral fillers. Visico FR4450, however, combines the benefits of Borealis' proven Visico and Caisco™ technologies with a natural catalyst masterbatch LE4439 or a black catalyst masterbatch LE4433.

The system is recognised by Underwriters Laboratories for UL 44 and UL 854 wires meeting the stringent requirements of a horizontal burn test.

Borealis AG – Austria
Website: www.borealisgroup.com



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**PROVIDING
RELIABLE
SOLUTIONS
FOR QUALITY
ASSURANCE.**

The small rotating system RS20 detects any longitudinal flaws – for the quality assurance of tubes, bars and wires with diameters up to 20 mm.

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INNOVATION MADE IN GERMANY.



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Measuring devices provide FFT analysis and SRL predictions

THE production of state-of-the-art cable products, eg data cables, requires constant monitoring of the cable diameter, concentricity and/or cable capacitance with regard to smallest, periodically occurring cable parameter fluctuations.

These fluctuations may occur from irregularities such as a 'pumping' of the extruder, imbalance of rotating parts, periodic fluctuations of the line speed, cyclic fluctuations of the foaming degree and/or periodic fluctuations of the conductor preheating.

The most commonly used method for the quality control of data and high-frequency cables is the measurement of the return loss of a certain cable length as a function of the operation frequencies which are supposed to be transmitted on the cable.

The Structural Return Loss (SRL) represents the relation – expressed in dB – between a fed signal and the re-reflected signal fraction along the complete cable length towards the entry. While reflections caused by smaller randomly occurring fluctuations may be neglected, reflections caused by periodic re-occurring cable parameter fluctuations should be detected and eliminated.

It becomes clear with the following estimation: Caused by irregularities of the production process, periodic re-occurring 'dents' are pushed into the cable insulation with a gap of 10cm in between. If a reflection of 0.1 per cent of the fed signal is taken as a basis at each imperfection, a maximal total reflection of $1,000 \times 0.1$ per cent = 10 per cent can be estimated (neglecting the cable



▲ At the vertical, 22" wide-screen monitor of the Ecocontrol 6000, FFT analysis and production data are clearly displayed

attenuation at 1,000 impurities at a cable length of 100m). This complies with a return loss of 20dB. This value sums up when the signals of all single reflections at the cable entrance are added up in phase.

In order to optimise the cable quality as well as to reduce the scrap rate it is essential to search for the root cause of periodic fluctuations on the return loss of the finished cable at an early stage and to eliminate those by adjusting the production parameter. The online prediction of the return loss from short-term cable capacity data offers necessary information.

Sikora offers a variety of measuring systems for quality control of telephone wires, data cables and coax cables (eg Centerview 8000 for measuring diameter, ovality and concentricity, Capacitance 2000 for capacitance measurement). Regarding the measurement accuracy, the measurement resolution and the measuring rate, all of these devices meet the requirements for providing FFT analysis and SRL predictions.

Powerful digital signal processors are by default integrated in the gauge heads. On the basis of the computing power of the gauges, Sikora is able to realise a digital spectrum analyser as well as a prediction of the return loss directly in the gauge head.

This means, that the online calculation of the spectrum of cable parameter fluctuations as well as the online prediction of the return loss are executed at the same place where the input data (that is diameter, eccentricity or cable capacitance measuring values) is available with high chronological and amplitude resolution as well as high precision with minimal measuring value noise. A problematic (normally analogue) transmission of high-rate single measuring values is not necessary.

For the cable manufacturer the complex installation, configuration and cabling of several single devices is not required. Furthermore, the risk of a distortion of the analysis results caused by the coupling of electromagnetic disturbances is reduced to a minimum, as no broadband data transfer is necessary.

Sikora AG – Germany
Website: www.sikora.net

Premium quality for cable sheathing

Melos has developed new compounds for markets like shipbuilding and wind power in recent years, and has now introduced a thermoplastic, halogen-free compound offering easy processing at higher temperatures of up to 230°C.

Other features are high flexibility even at low temperatures, excellent oil- and fuel-resistance, superior fire behaviour and CPR results.

Thanks to a strong interaction with customers, Melos and its partners have developed a new flame-retardant, halogen-free, MDH-based sheathing compound. This low-smoke compound is suitable for a wide range of applications.

Mecoline S TP 1034 F can be processed easily and provides a wider processing window with greater flexibility. This will lead

to a stable and higher output of the extruder. Although this compound does not need any cross-linking, it will still meet the stringent requirements for cable applications in environments like wind turbines. These compounds complement the existing range of high grade Mecoline TP compounds.

Flexibility at low or high temperatures, oil and fuel resistance (Oil Res I & II according to UL 1277) and improved burning properties are the key properties of Mecoline TP S 1034 F. Flame spread tests according to DIN EN 50399 (CPR) resulted in the rating B2s1d0. The tested cable construction was H05Z1Z1-F (thermoplastic, flexible HFFR insulation acc. to TI6/TI7, medium LOI; no bedding compound).

Melos GmbH – Germany
Website: www.melos-gmbh.com

Latest evolution of the lubrication process with waterborne polymers

CONDORLUBE TF 22 has been designed as an environmentally friendly alternative to the current pre-treatment cycles which use heavy metals, such as zinc and nickel, and anions such as phosphates and nitrates.

Condorlube TF 22 has a dry-in-place formula and does not require any rinsing stages, reducing significantly the working cycle and reducing close to zero the water consumption and the need of the wastewater treatment unit.

The new product also offers significant advantages in terms of energy saving, better cleaning of the work place and less wear on equipment.

The components cold formed with the use of Condorlube TF 22 can easily be cleaned with a standard alkaline degreaser, eg Condorine 500 AL series.

Lubrication properties are guaranteed through a sophisticated production process where primary and secondary monomers, combined with special lubricant additives, form a compound of high molecular weight and structure to guarantee lubricity at extreme working conditions.

This polymeric compound, in synergy with primary inhibiting agents and secondary additives with buffer action to pH, guarantees bonding of the lubricant film and prevents oxidation of the material during the drying stage.

This lubricant mixture is a one-step chemical process. Once it dries and is transformed into a tough and sticking film, Condorlube TF 22 can provide a durable lubrication also when temperatures rise during drawing.

Characteristics of the polymeric lubricant system:

- Long life of the bath and significant reduction of management costs of the lubrication system
- Low consumption compared to traditional cold forming cycles with traditional lubricants
- Elimination of drawing residuals and strong reduction of the dust compared to soap-based lubricants

Condoroil Chemical Srl – Italy
Website: www.condoroil.it



▲ Condorlube TF22 – the environmentally friendly alternative



Kkalpana Industries (India) Limited

A leading polymer compound manufacturer in India with a global focus, providing solutions to all your needs.

PRODUCT RANGE FOR CABLES

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Kkalpana Products are RoHS & Reach Compliant



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Energising Lives Through Speciality Compounds

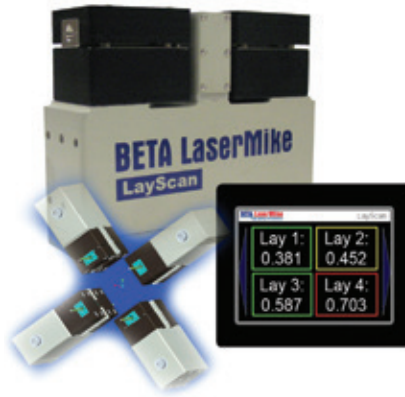
Accurately measure lay length at cabler and twinner

NDC Technologies' Beta LaserMike LayScan gauging system offers cable manufacturers an accurate and consistent method to measure the lay length of twisted pairs in data communication cables, such as Cat 5e/6/6a/7a/8 products.

LayScan solves scrap, costly rework and productivity loss problems due to manual, time-consuming lay length measurement methods and crosstalk performance issues from lay variations.

LayScan can be used to measure the four pairs at the cabler or to measure an individual pair at a twinner to confirm the accuracy of twisted-pair cable construction during production.

This non-contact system uses up to four individual pair lay sensors and the Beta LaserMike LaserSpeed® length and speed gauge to perform the high-speed lay length measurements. A data acquisition



▲ The LayScan gauging system offers accuracy and consistency

and control system effectively collects and processes each lay length in the cable and allows the full use of the customer's off-line analysis tools such as trend

charts, statistical analysis or FFT analysis to readily observe, measure and report systematic lay variations within each lay.

Data can be easily stored on a local PC. LayScan measures lay lengths up to 25.4mm at throughput speeds up to 152.4m/min with a measurement accuracy to within 0.025mm on the same twisted pair.

LayScan can be used in conjunction with the Beta LaserMike SRL Pro structural return loss measurement system for a total on-line cable performance quality solution.

SRL Pro can be used before and/or after the extruder to identify potential causes of structural return loss problems on data communication cables.

NDC Technologies – USA

Website: www.ndc.com/betalasermike

Innovation and progress from Ideal-Werk

Since 1923 Ideal has stood for innovation and progress in the production of welding machines and automation, including custom-made machine solutions according to customers' specific requirements.

The German company manufactures mesh welding machines, coil joining of wires and stranded conductors, as well as welders for grating, fencing and the production of wire articles such as cable trays, covers, frames, rings, etc.

The fence market is changing. Until a few years ago standard fences were produced in large numbers. Today, the lot size is much smaller and the focus is on the quick changeover of welding machines.

Adapting to the ever-growing competitive pressure and the flexible manufacture of superior products are now more than ever central issues. In the procurement of welding machines for the production of fences, high-quality welding, automation, resource-saving production, as well as flexibility and minimal set-up are at the top of the requirement profile.

In order to respond flexibly towards different requirements of manufacturers and markets, Ideal offers various manufacturing concepts and configurations:

- GA-Series wire mesh welding machines for the production of small



▲ FSD fence line welding portal

to large lot sizes, from simple to complex fencing mesh – for single and double wire fencing mesh and 3-5-8 security fencing mesh

- CSR Versaweld™ jig welding machines for the flexible production of small batches and special mats for a variety of fencing mesh and decorative fencing
- Accessories for the individual configuration of the machines
- Bending presses for automated V-shaped bends in 3D fencing mesh
- FSD production lines for the fully automated production process, available in different versions depending on the product portfolio; for the manufacturing of complex products and large quantities (eg, for single and double wire fencing mesh, 3-5-8 security fencing mesh, 3D fencing mesh, decorative fencing, as well as customised solutions)

One of the most important aspects of the modular design is the fact that modules in existing installations can be retrofitted.

This allows for the machines to grow with the demands of the markets and the requirements of the manufacturers.

An adaptation to the welding task is realised by way of complex welding cylinders, different transformer versions (AC alternate current, DC single-phase current, 1,000Hz medium frequency technology), as well as the possibility of direct and indirect welds and a variety of process-related options.

The classic cross wire weld is subject to much higher quality requirements. In a 'bad' weld with a burr that is too pronounced, moisture collects at the cross point.

A subsequent powder coating creates bubbles in which trapped moisture causes the cross point to rust. Subsequently, the hydrogen-induced cracking causes corrosion of the welds and consequences similar to those of material fatigue.

To rule out such errors and in order to meet the required quality standards, Ideal offers not only the appropriate hardware and software, but also the individual welding expertise based on almost 100 years of experience.

Ideal-Werk C+ E Jungblodt GmbH + Co KG – Germany

Website: www.ideal-werk.com

Tool maker brings flow simulation analysis technology to crosshead

B&H Tool Company, of California, USA, a designer and manufacturer of high quality, custom plastic extrusion tooling, has added Computational Fluid Dynamics (CFD) analysis to its portfolio of approaches for optimising and designing annular dies for plastic extrusion.

The flow simulation analysis software is completely integrated with its computer-aided design and manufacturing software to ensure high-quality tooling.

"Management's strategy is to bring the same approach to annular dies such as crosshead, in-line and co-extrusion dies, for single layer and co-extrusion applications. We want to bring the same technology that worked in film and sheet dies to annular die design," said Peter Neville, B&H's managing partner.

With CFD, B&H's team of experts design and manufacture annular dies that deliver uniform polymer flow to the exit of the die. The process starts with two required inputs: polymer rheology and a target output rate. With those inputs, designers can go to work to design a head assembly customised around a customer's application.

If a customer has multiple applications, B&H's engineering team can help them determine where they want their target output rate to be.

Analysing their output rates (as a function of pounds per hour) has been a big step forward for companies, Mr Neville reports. In many instances, across all industries, companies have not been looking at their tooling as an area of improvement.

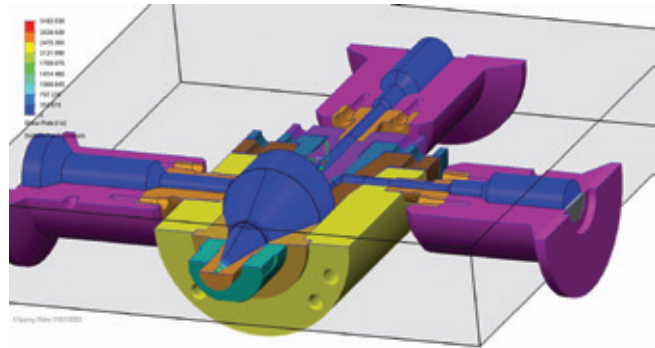
With the multitude of challenges faced in the manufacturing sector of both the USA and global economies, manufacturers have often been trying to use a 'one-size-fits-all' approach to their tooling capacity. CFD helps companies look at their tooling from a different perspective and help them straighten out their tooling. Often companies have developed 'bandaids' to compensate for uneven flow in their tooling.

With CFD, B&H's designers are able to simulate (before any metal is cut) polymer flow at a target out rate. With optimised tooling (as a function of pressure, velocity and shear), manufacturers can then focus on dialling in on the dimensions and quality of their products.

Companies report faster start-ups and can operate with less-skilled operators because they are not 'fighting' the tooling as much. With operations in lesser developed countries or competitive industries, these can be significant issues.

CFD is used for all types of annular dies – adjustable centre, fixed centre, co-extrusion, in-line and in-line spiderless dies. The approach is the same, as the goal is to deliver even flow to the exit of the die. Once the software inputs have been finalised and the tooling has been optimised using CFD, B&H's team reviews the final design with the customer and goes over the simulation. Once the customer has signed off on the final design, then the job is ready to be sent to production. Since they have been involved in the process, the customer is able to integrate the tooling more efficiently once it lands on their receiving docks.

CFD analysis is helpful in today's more sophisticated plastic extrusion applications or high volume, low margin applications.



▲ Simulation analysis to ensure tooling is optimised for the application

Whether it is low output micro-bore tubing, insulated fine wire, multi-layer automotive tubing or multi-layer irrigation tubing, CFD ensures that the tooling is optimised for the application.

For example, in irrigation tubing, post consumer polymers are used to bring down the cost of the tubing. Using CFD to make sure the rheology of 'regrind' is taken into consideration ensures that a major issue is addressed. In the case of low output applications, making sure the volume is optimised and the appropriate deflector is used is critical.

B&H Tool Company – USA Website: www.bhtool.com



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New Trendseal – a variable endseal system for CV lines

THE variable endseal Trendseal eliminates the requirement for seal changes during product changes in all types of CV lines and decreases tool-changing times.

Each CV tube is equipped with one or more endseals in order to keep the cooling medium in process while the cable proceeds. Depending on the cable diameter to be processed, it is required to change the applicable sealing and support ring sets per cable type. In order to avoid operator errors and to minimise product-changing times, Troester has developed the variable endseal system, Trendseal.

A concave shaped roller pair driven by AC motor can be easily adjusted to seal a wide range of different conductor and cable diameters. The rolls are coated with a highly resistant rubber compound to ensure a perfect sealing behaviour in abrasion-proof design. Vulkollan seals or silicone lamellas and corresponding pressure and support ring sets are not required any more.

Trendseal is used in all types of CV lines (CCV, VCV and rubber CV lines) for universal sealing applications during the production of medium and high voltage cables. One Trendseal replaces the conventional endseal system like single end seal, double end seal and lead wire seal.

"Trendseal minimises scrap at start-up and eliminates complex handling and costs by having only one universal endseal device," said Dirk Schmidt, sales director cable machinery division at Troester. "Having approved its capabilities in long-term operation for more than two years in several cable plants, it is now ready for supply in new CV lines with water and/or nitrogen cooling circuits and for upgrade of existing CV lines."

Troester GmbH & Co KG – Germany

Website: www.troester.de



▲ Troester's variable endseal, Trendseal



▲ The SV 402.D type double spooler from Niehoff

NPS with increased production speed

NIEHOFF manufactures machines which cover nearly all processes of wire and cable production and handling.

The Niehoff Package System (NPS) is a highly efficient, safe and economic handling system for automotive wires. It consists of the specially developed SV type spoolers and collapsible ABS plastic multi-way spools.

At the latest Niehoff in-house exhibition at the headquarters in Schwabach, Germany, held immediately after the wire 2016 trade fair, the latest version of the SV 402.D type double spooler was on display.

Niehoff engineers have achieved a 20 per cent increase in production speed, which now is up to 1,800m/min with original NPS spools.

One more advantage of the system is that original NPS spools provide highest production safety and a very safe operation.

The SV spoolers are foreseen to operate in line with extrusion lines. They spool the insulated wire with a particular conical wire laying technology onto the spools.

Changeover from full to empty spools is carried out at full production speed, allowing for non-stop production and enabling the highest cable pay-off speeds into the downstream processes.

The Niehoff standard range consists of six NPS spools in different sizes. Empty NPS multi-way spools can be fully dismantled and nested into each other.

Dismantled spools take up only a third of the space of comparable conventional spools and require much less return shipping space than traditional spools.

For applications where no regular spool exchange takes place, the NPS 400 one-way spool is offered.

The NPS concept has resulted in a worldwide pool of more than three million NPS multi-way spools, all compatible with each other.

No matter which spools are returned, their components always fit together. To protect the NPS spools from foreign spools which

are not compatible with the NPS and are a safety risk, Niehoff has protected the system for a long time.

One of the measures is an RFID transponder system with which all new original NPS multi-way spools are equipped. By this transponder NPS users can identify if a spool belongs to the system and is compatible with it or not.

The transponder also simplifies spool labelling: As the spool identification is stored in RFID no label is needed.

The NPS is the only packaging system for automotive wires made of copper, copper alloys and aluminium, which allows trouble-free and tangle-free paying-off at highest speeds.

Even signal cables made of copper alloys with a cross-section of 0.13mm² can be processed without any problems.

Maschinenfabrik Niehoff & Co KG – Germany
Website: www.niehoff.de

Responding to customer requests

Involved in the fields of tungsten carbide tools since 1870 and machinery for decades, the French company Agir Technologies provides solutions and advice to a variety of requests from customers.

The investments made in the company, such as a wire cutting EDM with two-wire spool of 0.03mm, a five-axis CNC machine to cut the electrodes, and new CAD/CAM software, allow Agir to widen its range of high precision and quality tools.

Agir is specialised in the production of tungsten carbide tools for wire and cable manufacturing and other wire transformation, including wire drawing dies (round, shaped, pressure), drawing dies and plugs, cable extrusion tools, straightening tools, wire-guides, tools for welding rods and plated wires.

The company is able, thanks to its range of software, to calculate any drawing station for round wire just like for any shape wire.

Agir Technologies – France
Website: www.agir-technologies.com



▲ *The new compound from Electric Cable Compounds*

UL/CSA rated moisture curable EPR compounds

ELECTRIC Cable Compounds has introduced its new AquaGraft line of moisture curable EPR compounds allowing cable manufacturers to produce flexible rubber cables on standard thermoplastic lines without the need of a CV line.

AquaGraft's design allows for superior storage shelf-life prior to use, while after extrusion cables quickly cure with exposure to environmental moisture at ambient temperature over time or at accelerated rates with exposure to sauna or hot water after extrusion.

AquaGraft compounds are designed for use in various low/medium voltage applications including building wire,

control cables, submersible pump cables, mining, power, and other specifications requiring superior thermal, mechanical, and electrical properties.

The AquaGraft products are composed of a multi-component system that will yield a finished compound to allow the cable to pass various industry-recognised flame tests and comply with numerous industry-recognised requirements.

Being able to offer a UL/CSA approved product allows AquaGraft to be differentiated in its ease of customer use qualification and speed to market.

Industry approvals have been obtained for AquaGraft 16-100 which is UL 44 listed

for cable types XHH, XHHW, XHHW-2, RHH, RHW, RHW-2 and SIS as well as CSA 22.2 No. 38-05 for RW-75, RWU-75, R-90 and RW-90.

Also available is AquaGraft 16-5150, which is designed for use in UL/CSA 150°C rated AWM and SAE J1127 cable applications.

Cables are able to pass FT-2 Flame Rating and UL Horizontal Flame tests, and trials are now underway on VW-1 rated materials. New systems are actively being developed and customer-specific requirements can be accommodated.

Electric Cable Compounds Inc – USA
Website: www.electricensecablecompounds.com

Precision flat wire for industrial applications

Cold-rolled flat wire nowadays plays an important role for industrial components such as closing and locking systems, safety devices, control elements, wiper blades and electrical connectors, thanks to its wide range of applications. Properly defined by material, dimensions and tolerances as well as mechanical properties, flat wire can be used in almost every industry sector.

Following the trend toward highly automated manufacturing processes, tight dimensional tolerances are often required, whether in the automotive sector, in precision engineering or medical technology, textile machinery or even for electrical connectors.

Flat wire from Studer-Biennaform is available in industrial quantities from widths of about 0.2mm (0.007") and thicknesses from about 0.05mm (0.002"). Tolerances in width of ± 0.005 mm (0.0002") and ± 0.001 mm (0.00004") in thickness are achievable considering width-thickness ratios of up to 70:1.

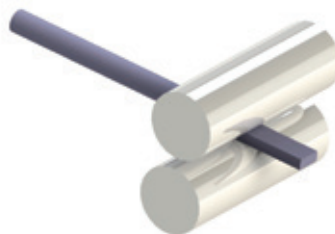
Compared to steel strip, cold-rolled flat wire has the advantage of very large core lengths without welds (up to 40km per spool and more), and a homogeneous distribution of the strength over the entire cross-section.

Depending on the required applications, such flat wire can be delivered with different edge shapes. Natural rolled edges represent an economical solution in mid-latitude thickness ratios. Rounded edges, ie edges that go through a peeling process after cold rolling, offer an even closer and more regular tolerance in width, especially for high quality products with very tight bending radii. Rolled edges are formed by a vertical pair of rollers, allowing similarly chased edges and narrower tolerances in width.

For such applications, stainless-steel flat wire is commonly used – both traditional materials, such as AISI 300 and 400 series, and special alloys. In general all cold-formable materials can be supplied as flat wire, for which procurement is possible.

Thanks to a stable supply-chain, supported by a broad set of machines for cold rolling, heat treatment and surface treatment, small quantities for validation purposes can be assured as well as large annual contracts with partial deliveries and accurately maintained tolerances.

Studer-Biennaform – Belgium
Website: www.precisionflatwire.com



▲ *Flat wire can be used in almost every industry sector*

Testing & measuring for wire, cable & fibre optics

A thick electrical wire can be expected to transmit more current than a thin one. But not many decisions on comparative capability are that straightforward, even when the composition, diameter, length and condition of the wire are reliably known.

Or when there is full visibility into fibre optic components, integrated optical devices and optical networks.

Hence the necessity for the products and services for testing and measurement reviewed here.

If the expression 'Better safe than sorry' was not coined in the wire and cable industry, wiremakers of long experience have made it their own.



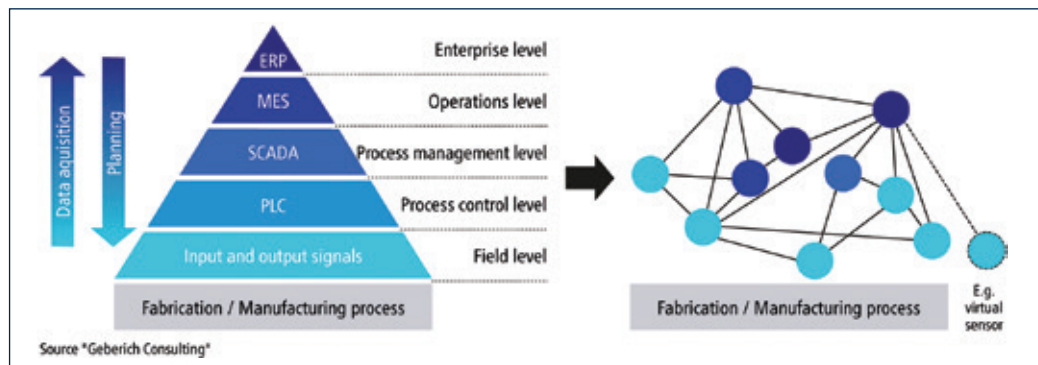
Photo courtesy of Focalspec

Zumbach measuring instruments now with OPC UA standard

Zumbach equips its powerful instruments with the recognised OPC UA standard. With this key technology, measurement solutions provide easy, scalable and secure information exchange with different systems in the production line – platform and manufacturer-independent data exchange. Prepare your dimension, profile and diameter measurement field data for new Industry 4.0 services. Instruments with the new OPC UA standard meet the technical requirements for intelligent data networking.

This means that the requirements for industry automation along with future semantic communication scenarios from Industry 4.0 and the Internet of Things (IoT) have already been met.

OPC has the broadest circulation in the field of automation, but is technologically industry-neutral and can be run on all operating systems. Communication between plant equipment takes place reliably, securely and independent of the manufacturer.



▲ Data output, diagnosis and reactive actions occur on one platform. The transparency generated shortens the reaction times in case of deviations and ultimately results in important quality gains

Zumbach has equipped its powerful measuring instruments with OPC UA which ensures a simple, scalable and secure information exchange between different production line systems – regardless of platform or manufacturer.

One software enables all M2M (machine to machine) or M2H (machine to human) measurement data obtained to be interconnected on one output platform, collected, displayed and analysed. The OPC UA standard facilitates horizontal and vertical integration across various levels of the automation pyramid.

As one of the first equipment manufacturers for inline measurement and monitoring, Zumbach integrated OPC UA into its PC-based stems with host communications protocol (eg in the Profilemaster® profile measuring systems series, in measurement systems for hot rolling mills and Steelmaster cold processes as well as in the USYS IPC series for universal data recording, processing and display systems and many more).

The OPC UA server is additionally available as external gateway software for measuring devices with microprocessor and host communications protocol (ODAC® laser diameter measuring instruments, MSD diameter and ovality measuring systems, spark testers, computer interface boxes, and more).

Zumbach Electronic AG – Switzerland
Website: www.zumbach.com

How to ascertain the conductivity/resistivity value of rods and drawn wires?

This measurement is the first step of electrical cable production monitoring, but maybe the most critical. AESA Cortaillod is introducing a new true, straightforward, three-step solution to experimentally measure the conductivity and resistivity of class 1 sample conductors. Measurement uncertainties due to imperfections in sample dimensional geometric shape (that brings significant errors) are eliminated, leading to an accurate determination of these physical parameters.

The resistivity (ρ), by definition, “is an intrinsic property that quantifies how strongly a given material opposes the flow of electric current”. For conductors of uniform cross-section such as wires, Pouillet’s Law gives the relation between the resistance R in $[\Omega]$ and the resistivity ρ in $[\Omega\text{m}]$ as follows:

$$R = \rho \frac{l}{S} \quad [\Omega]$$

where l is the length in $[\text{m}]$ and S the cross-section in $[\text{m}^2]$.

The conductivity (σ) in $[\text{siemens}/\text{metre}]$ is the reciprocal of resistivity ($\sigma=1/\rho$). Thus, the parameters to be measured for calculating the resistivity and the conductivity are the resistance (R) at a reference temperature, the length (l), and the section (S).

AESA Cortaillod has developed a new option to measure the conductivity/resistivity according to the norm IEC 60228. This option is user-friendly, fast and accurate and can be utilised with any of the AESA ResTest family equipment. The measured parameters are keyed-in via a user interface and the conductivity/resistivity are then automatically computed and displayed.

The resistance (R) at temperature (T) is measured with a linear resistance bridge. AESA Cortaillod offers a full range of high accuracy R -bridges (ResTest family).

All of them are fully integrated to accurately measure R (directly displayed

in $[\Omega/\text{m}$ at $20^\circ\text{C}]$). The length (l) is measured using a special ruler for long samples with all uncertain parameters taken into consideration. The section (S) is usually derived from the measurement of the conductor diameter.

However, this approach is very time consuming given that a mapping of the sample on the full conductor length is necessary to reduce uncertainties.

AESA proposes a novel approach based on volume measurement. The volume of the sample is determined in an inclined water bath through the weight measurement of a liquid whose density is known at a defined temperature. This new option fills a gap in the precise conductivity/resistivity measurement for all types of class 1 conductors (round, sectoral) with diameter of 8mm and larger.

AESA Cortaillod – Switzerland
Website: www.aesa-cortaillod.com

Spark tester with removable self-test module

According to European standards, openly operated measuring and testing equipment has to be checked regularly.

Therefore, spark testers are tested with regard to the accuracy of the supplied high-voltage, the short circuit current and function (sensitivity).

The Sikora Spark 6030 HF spark tester offers (optionally) a three-step self-test and calibration system including the Sikora App for mobile monitoring and analysis of the measuring results.

As each test probe has to be calibrated, the testing module has to be controlled regularly.

To support this process, the company has further developed the module of the Spark 6030 HF.

This includes the easy-to-change module that combines all testing functions and which can easily be exchanged from an additional opening in the housing of the Spark 6030 HF.

In order to meet the requirements of the ISO 9001 standards, Sikora recommends a yearly calibration of the spark tester by simply exchanging the test module.

Due to the fact that all functions are directly mounted at the module, the complete module is exchanged for calibration. Therefore, a submission of the complete device to Sikora as well as the assignment of a service engineer is not necessary.

As for the previous version of the module, the sensitivity and short circuit current tests are generated. For the sensitivity test, 20 discharges are simulated in 20 seconds.



▲ The Spark 6030 HF spark tester with removable self-test and calibration module

All of these discharges have to be completely detected by the spark tester.

For the short circuit current test, an error caused by the contact of a user and the bead chain electrode during the operation is simulated.

Here, a defined value must not be exceeded in order to guarantee the safety of the user. The calibration module measures continuously the accuracy of the testing voltage.

The standard for spark testers requests an accuracy of $\pm 5\%$. The test is successful if this criterion is met.

Sikora AG – Germany
Website: www.sikora.net

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IL5 high-speed camera

Fastec Imaging's IL5 high-speed 5MP camera enables the recording of any cable and wire manufacturing equipment moving or turning at high-speed, such as wire straightening, stranding, twisting and weaving equipment, as well as cutting machines.

Since this type of high-speed manufacturing is susceptible to vibration or alignment problems, slow motion replay allows analysing and troubleshooting what is not able to be seen with the naked eye or normal speed video.

With four models to choose from boasting crisp, clean video from 2,560 x 2,080 @ 230fps to 800 x 600 @ 1,650fps, there is an IL5 to fit many application needs. All models record over 3,200 fps at VGA resolution and more than 18,000 fps at smaller resolutions.

Able to save images to an SSD or SD card while recording high-speed bursts of hundreds or even thousands of images at a time, the IL5 is always ready for the next high-speed snapshot. With a base model starting below \$9,000, the IL5 is a cost-effective solution to record high-speed events for slow motion analysis.

Built for flexibility and ease of use, the Fastec IL5 camera can be controlled over Gigabit Ethernet via Fastec FasMotion software on PC/Mac or via the built-in web interface on PC, Mac, tablet, or even smartphone.



▲ The IL5 high-speed 5MP camera from Fastec

Using the (LR) FasCorder Mode, the camera can be operated as a regular camcorder to record and pause as needed and follow the action, stop recording and review, and then append additional footage at will, even after a power cycle.

Unlike traditional high-speed camera systems that only record for a few seconds and require careful triggering, the IL5's Long-Record (LR) option can record at high speed for many minutes at high resolutions, to many hours at reduced resolutions.

Fastec Imaging – USA
Website: www.fastecimaging.com

Continuous online roughness measurement

FocalSpec offers a plug-and-play system for continuous online surface roughness measurement for cable, wire and tube manufacturing.

The MicroProfiler MP900 system can measure surface roughness at line speeds up to 150m/min and provides information on Ra, Rz, Rsm, Cpk and Std.

The system has been thoroughly tested and put into use at some major cable manufacturers in Asia.

"Our system has fulfilled the most demanding acceptance criteria by one of the most prestigious mobile phone manufacturers and is currently being manufactured and shipped in volumes," said Sauli Törmälä, president of FocalSpec.

"The purchasing process has challenged our team and set an entire new standard for our internal processes. We definitely look forward to continuing the co-operation and, also, to expanding the concept into new application areas, such as medical cables and tubes."



▲ The MicroProfiler MP900 system

FocalSpec co-operates with Saxe Group in Europe. Saxe Group is a manufacturing line solution provider with a strong customer focus. The company operates throughout six European offices and has over 70 employees.

According to Mikkel Enevoldsen, CEO, Saxe Group: "We went together with FocalSpec to MEDTEC, a German exhibition targeted for medical industry, last year to verify the customer demand for the MicroProfiler MP900 among medical tube manufacturers. The outcome was very positive and we look forward to introducing a new level of product quality assurance to our customers. The MP900 can even be easily integrated into existing manufacturing lines."

Another point of contact for learning more about the MP900's capabilities in manufacturing conditions in Europe is Gimac, a globally operating company offering state-of-the-art solutions for extrusion and microextrusion. The company also works closely with Saxe Group.

Gimac decided to have an MP900 system at its premises in 2015. Simone Maccagnan, sales manager, Gimac Microextruders, said: "We have a common key customer with FocalSpec and want to have the same quality of manufacturing at our test line as our customer has."

"In addition, we believe the system could be highly useful for other accounts in electronics and medical industries for monitoring both the product quality and the process itself."

Focalspec – Finland

Website: www.focalspec.com

Highest accuracy to reduce manufacturing costs

The innovative Beta LaserMike LaserSpeed® non-contact laser gauge from NDC Technologies enables wire and cable manufacturers to accurately measure the length and speed of products during production to avoid costly product overages and shortages, as well as reduce product scrap and rework. Manufacturers of wire and cable have applications where they need to tightly control the length and speed of product during production. Applications include continuous length measurement, differential speed control, cut-to-length control, product positioning, and printing/marketing control, and other demands.



▲ The LS200 from NDC Technologies

Most manufacturers depend on the accuracy of their drive speeds or mechanical contact encoders. However mechanical encoders can lose contact on various product surfaces due to slippage or vibration, and require frequent calibration because of mechanical wear and tear. A contact encoder with inaccuracies as much as two per cent can cost a manufacturer a significant amount of money due to product give-away, waste, maintenance, and system downtime. To solve this problem, manufacturers have installed the LaserSpeed non-contact gauge on their production line to directly measure the length and speed of product.

The LaserSpeed gauge uses advanced, laser-based technology to precisely measure the length and speed of wire and cable during production without making contact with the product. This high-performance gauge projects a unique pattern on the surface of the product. As the product moves, light is scattered back to the LaserSpeed unit. This information is translated into product speed and pulses are produced to determine the product length. Length and speed measurements are captured with better than ± 0.03 per cent accuracy and ± 0.02 per cent repeatability.

NDC offers a complete line of LaserSpeed systems with measurement speeds up to 12,000m/min (39,400ft/min) and down to the true zero speed, standoff distances up to 1,000 mm (39.4"), and measurement depth of field up to 100mm (3"). NDC also offers a European certified length measurement system that meets MID (Measuring Instruments Directive) 2014/32/EU requirements.

NDC Technologies – USA

Website: www.ndc.com

Testing, measuring and quality control

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Manufacturing of compact conductors, highlighting the benefits and potential cost reductions in the whole stranding process

By Sean Harrington, Ceeco Bartell Machine Systems LLC

Introduction

Ultimately, every cable manufacturer aims to make a quality product using the least amount of resources in the fastest time. To do this, they must understand the critical parameters that affect the strand they wish to make.

Once this is accomplished, finding the hardware to provide them with the most flexible and effective process is relatively easy.

The aim of this paper is to present a technological solution in the process of the manufacture of compact conductors, which brings cost savings from the wire drawing process through the cabling and into the extrusion process.

This is the use of the roll form technology, which allows the use of a single input diameter wire to be utilised throughout the stranding process, giving significant process savings and advantages.

Traditionally, a finished stranded conductor requires its own drawn wire diameter.

Each wire diameter typically requires a new string up in the wire drawing machine. Some conductor designs require more than one drawn wire size.

Similarly, multiple set-ups in the stranding process are necessary for each size of conductor. The set-up time taken on both the drawing and stranding machines, combined with inventory levels that are

necessary to manage the number of wire diameters, represent unnecessary activities that add to the conversion cost from rod to strand.

The SIW mentality effectively eliminates much of this unnecessary activity associated with the traditional set-up by using the same drawn wire diameter to finish a range of stranded conductors.

The result is:

- Increased wire drawing output
- Reduced wire drawing die inventory
- Reduced scrap
- Significantly lower work in process
- Minimum strander payoff changes
- Increased strander output
- Shorter lead times
- Enhanced JIT manufacturing mentality
- Streamlined overall stranding process

Probably more to the point is a significant reduction in the variables that the manufacturer needs to manipulate in the manufacture of any strand programme.

The change in philosophy that is required to effectively use single drawn wire diameter to produce the required range of finished strand conductors is to replace the flexibility of stranding the same number of wires using different diameters with stranding different numbers of wires using the same wire diameter.

In general, the benefits of the SIW mentality are independent of the strand manufacturing process used. It is only when the specific strand designs have been defined and the production

requirements of those designs are determined that the choice of the optimum manufacturing cell can be considered.

It should be noted that the concept of using a single input wire to manufacture a range of finished conductor sizes is not new; it is used within the confines of most manufacturing plants within the allowances of the current specifications.

It has been used extensively in Europe where strand programmes using the single input wire diameter to cover a range of finished conductor sizes has been in existence for decades.

The potential cost reductions using this process can be split into the following areas:

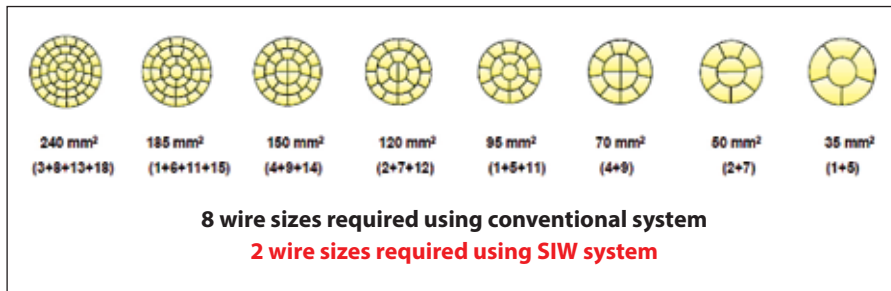
- Process savings
- Material savings

Process Savings

The obvious impact of the incorporation of roll forming into the stranding process is shown in *Figure 1*.

While still working within the constraints of the IEC and ASTM standards, the roll forming process allows the number of wires required to produce a range of conductors to be reduced dramatically.

In this case, to cover 35mm² to 240mm² the number of wires has been reduced from eight to two.



▲ Figure 1

In a similar way, 35mm² to 500mm² the number of wires can be reduced from 12 to three. This reduction in the required number of wire sizes brings about major cost savings in the wire drawing area:

- Creates a higher productivity in the wire drawing machine due to the elimination of multiple set-ups for the different wire diameters required for the traditional strand designs
- Reduces the amount drawn wire scrap through wire size changeover
- Creates a reduction in the wire drawing die inventory

Similarly the roll forming process has a cost saving impact in the stranding process:

- Lower volume of different wire sizes being produced to await the stranding process
- Ability to use larger package sizes and switch from a bobbin system to a stem pack system
- A reduction in down time due to loading, with the ability of automatic pay-off changeover while the machine is running
- Quicker set-ups for different strand sizes due to the elimination of the movement of different pay-off sizes
- Higher linear production speeds, when compared to conventional stranding methods
- Reduction in manning levels in the stranding process

Material Savings

The challenge for today's manufacturers is to determine what target is to be chosen within the scope of the specifications. If the criteria for determining the construction were based solely on the economics, the industry would gravitate to the unilay conductor schedule, and the smallest diameter that is allowed within that schedule. The roll form process allows unilay products produced up to 500mm².

Statistical analysis of strands compacted with methods (die or rollers) other than the roll form system has shown that a typical material variance of ±1% to ±1.5% must be expected. These results, therefore, lead to the need to oversize the

conductors by at least three per cent in order to ensure that product does not fall below specification. This excess material is, effectively, given to customers free of charge.

When utilising the Ceeco Bartell roll form system with its strand design software, the material variance is reduced dramatically.

Giving a real and very tangible material saving over conventional compacting methods, this is particularly important with the current cost of aluminium and copper.

This means that the minimum diameters specified in the IEC and ASTM standards can be achieved, while at the same time approaching but not exceeding the maximum resistance.

Due to the wide variety of strand that is used in the industry, Ceeco Bartell has developed a mathematical model to assist with the strand design.

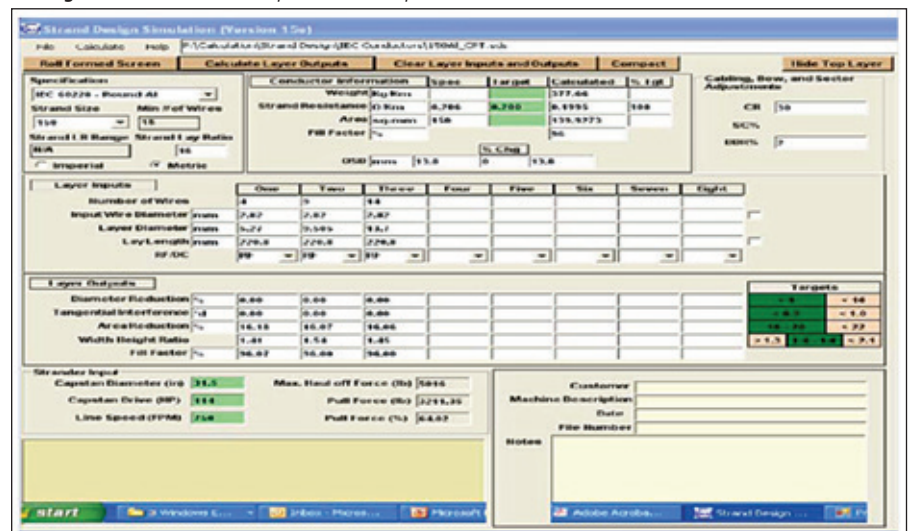
This model uses theoretical and quantitative data that allows prediction of the resistance of the strand. This program further analyses the geometry of the strand to optimise the performance of the machine. The result is an accurate prediction of the finished strand resistance.

Figure 2 shows a cross section of a 150mm² strand, showing how this program assists in the development of the optimum strand design.

This roll form programme provides the greatest potential as it has the smallest strand diameter schedule for a specific stand size. Consequently this also represents the greatest potential for insulation savings for a given insulation thickness.

This can be clearly seen in Figure 3, which shows savings in insulation while producing 95mm² XLPE product with fill factors ranging from 86 per cent to 96 per cent. As the conductor becomes smaller and the interstices disappear, the amount of insulation used will be reduced.

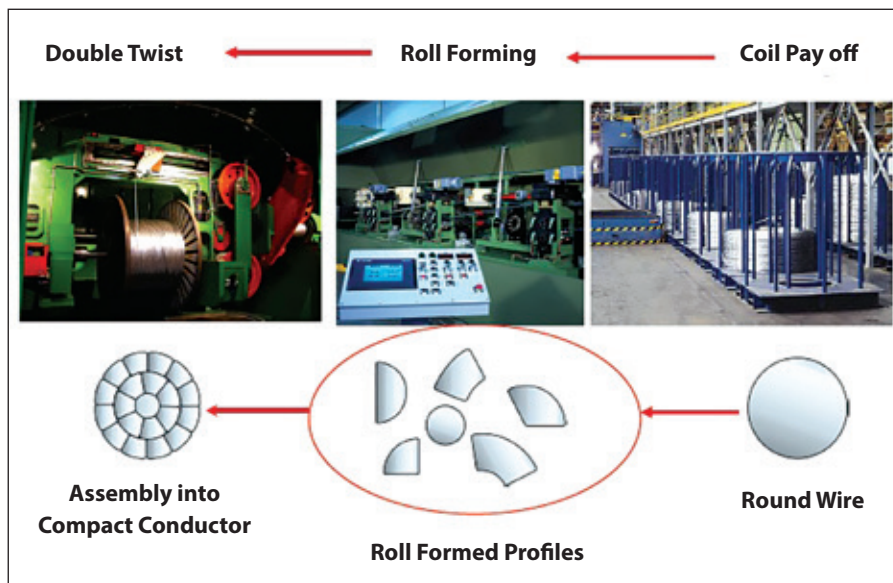
▼ Figure 2: Strand simulator output 150mm² compact strand



▼ Figure 3



Economic analysis of 95mm ² XLPE product			
Fill factor	86%	92%	96%
Configuration	1=6=13	1=6=11	2=6=9
Outer diameter (mm)	11.7	11.39	11.07
Outer gap area (mm ²)	15.88	0.710	0.663
Insulation cost (US\$/km)	131.35	109.55	106.83



▲ Figure 4

92 per cent fill factor is the best compaction that can be achieved using conventional methods. However, with the roll forming process 96 per cent fill factor can be achieved. This creates a potential saving of material of around two per cent.

The productivity of the extruder relies in part on the integrity of the strand construction. This applies equally to low, medium and high voltage extrusions.

Unstable strand construction not only compromises the speed of the stranding and extrusion processes, but can lead to considerable losses due to scrap and down times for both lines.

Birdcaging is often the result of unstable strand design. A tightly wound conductor is less likely to end up birdcaging. The tightness of the strand is greatly dependent on the geometry of the elements.

For this reason, the lay of the conductor is important. The elements of unilay/unidirectional lay conductors are nested and, therefore, inherently have a smaller outer diameter than reverse concentric lay and SZ conductors.

In addition, unilay/unidirectional lay conductors self-tighten under tension. As a consequence of this self-tightening feature, the extrusion of unilay/unidirectional lay conductors is statistically less prone to birdcaging.

The surface of the strand is also critical. A smooth outer layer such as one found with a roll formed layer presents a clean round profile to the extrusion process and, therefore, minimises the accumulation of conductor dust during the extrusion process.

The process is shown in *Figure 4*. Round wire is taken from large coil packs and passes through the roll form section where its shape is changed into various roll form profiles that are then assembled at high speeds by either a double twist machine or a single twist machine, depending on product size. This high-speed continuous process allows for linear speeds of 200m/min to be achieved while producing highly compact conductors. The roll form strander is capable of producing 40 tons of 150mm² compact aluminium conductor in a 24-hour cycle.

Conclusion

Savings in production costs depend on many factors such as existing manufacturing facilities; whether the strand is currently manufactured in-house or purchased; the care and control exercised over input copper and aluminium wire; general house-keeping; and the control of high-speed double twist stranding machines. Under the most advantageous conditions savings can provide quite astonishingly short pay-back periods, but should of course be calculated for each individual application.

The high performance of a roll form strander coupled with the Ceeco Bartell roll forming process will allow the cable manufacturer to reduce costs without compromising the finished conductor performance.

An awareness of this and other new technologies, combined with enlightened specifications, will further enhance the development of strand design and the potential to optimise further the manufacture of stranded conductors. ■

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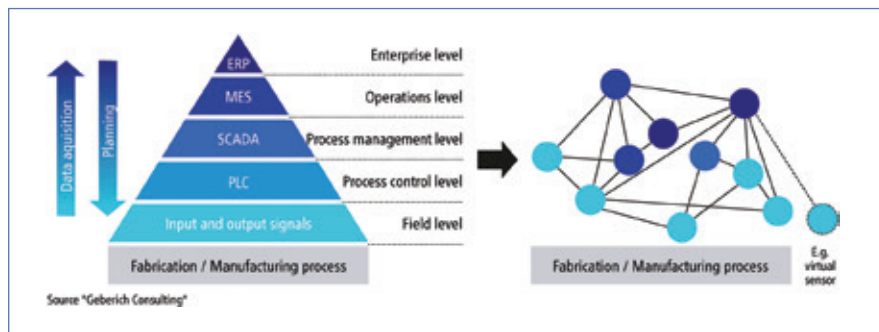
Zumbach Messwerkzeuge nun mit OPC UA Standard

Zumbach rüstet seine leistungsstarken Geräte mit dem anerkannten OPC-UA-Standard aus. Mit dieser Schlüsseltechnologie bieten Messlösungen einen einfachen, skalierbaren und sicheren Informationsaustausch mit verschiedenen Systemen in der Produktionslinie – ein von der Plattform oder vom Hersteller unabhängiger Datenaustausch.

Bereiten Sie Ihre Prüfdaten zur Dimensions-, Profil-, Durchmesser- und für neue Industrie 4.0 – Services vor, Geräte mit dem neuen OPC-UA Standard erfüllen die technischen Voraussetzungen für eine intelligente Datenvernetzung.

Zumbach hat seine leistungsstarken Messgeräte mit OPC-UA ausgerüstet. Diese gewährleisten einen einfachen, skalierbaren und sicheren Informationsaustausch mit verschiedenen Systemen in der Produktionslinie – unabhängig von Plattform oder Hersteller.

In Verbindung mit einer Software können alle M2M (machine to machine) oder M2H (machine to human) erhobenen Messdaten miteinander vernetzt auf einer Ausgabepattform gesammelt, visualisiert und ausgewertet werden. Der OPC-UA Standard verbindet die vorhandenen Schichten der Automatisierungspyramide



▲ Datenausgabe, Diagnose und reaktive Maßnahmen finden auf einer Plattform statt. Die geschaffene Transparenz verkürzt die Reaktionszeiten bei Abweichungen und resultiert schlussendlich in wichtigen Qualitätsgewinnen.

horizontal und vertikal. Damit sind die Anforderungen zur Industrieautomatisierung mit künftigen semantischen Kommunikationsszenarien der Industrie 4.0 und Internet der Dinge (IoT: Internet of Things) heute schon erfüllt.

OPC hat die größte Verbreitung im Bereich der Automatisierung, ist aber technologisch branchenneutral auf allen Betriebssystemen lauffähig. Die Kommunikation zwischen Anlagenteilen erfolgt herstellerunabhängig und sicher.

Als einer der ersten Gerätehersteller für Inline-Messung und Monitoring hat Zumbach OPC-UA in seine PC-basierten Systeme mit Host-Kommunikations-

Protokoll integriert (z.B. in den Baureihen Profitemaster® Profil-Messsysteme, in Messsystemen für Warmwalzstraßen und Steelmater Kaltverfahren sowie in den Baureihen USYS IPC für universelle Datenerfassung, Verarbeitungs- und Anzeigesysteme, u.a.m.).

Der OPC UA-Server steht außerdem als externe Gateway-Software für Messgeräte mit Mikroprozessor und Host-Kommunikations-Protokoll zur Verfügung (ODAC® Laser-Durchmesser-Messköpfe, MSD-Durchmesser und Ovalitätsmesssysteme, Sparktester, Computer Interface Boxes, u.a.m.).

Zumbach Electronic AG – Schweiz
Website: www.zumbach.com

Neuer Gebietsverkaufsleiter für Südamerika

Alfredo Torres arbeitet für die Niehoff-Gruppe als neuer Gebietsverkaufsleiter für die südamerikanischen Länder.

Torres hat nach einem fertigungstechnischen Ingenieurstudium umfangreiche Erfahrungen in verschiedenen Industriebranchen gewonnen, unter anderem im Automotive-Sektor und in der Draht- und Kabelindustrie. Dort arbeitete er unter anderem in den Bereichen F&E, Engineering und Wartung sowie Entwicklung von Kabeln aller Art.

Als kaufmännischer Gebietsleiter für Lateinamerika konzentrierte er sich auf die Installation und Inbetriebnahme von Maschinen, den technischen Pre- und After-Sales-Kundendienst, die Entwicklung von Draht- und Kabelfertigungsprozessen sowie gesamtheitliche Entwicklungen für Draht- und Kabelfabriken und gewann dabei ein umfassendes Branchenfachwissen.

Gemeinsam mit der Niehoff-Vertretung in Chile, Rheintek Chile Limitada, wird Torres Kunden in Südamerika, in Bolivien, Chile, Kolumbien, Ecuador, Peru und Venezuela betreuen und sich um die Vermarktung des Maschinenprogramms von Niehoff Deutschland kümmern.

Sein zweiter Tätigkeitsbereich liegt im Verkauf aller Maschinen, die bei der Firma Niehoff-Herborn Máquinas Ltda., Brasilien, gebaut wurden sowie in der Unterstützung dieses Verkaufsgebietes.

Maschinenfabrik Niehoff & Co KG – Deutschland

Website: www.niehoff.de



▲ Alfredo Torres – der neue Gebietsverkaufsleiter für Südamerika

Besuch eines Kongressabgeordneten im Werk von Davis-Standard

Davis-Standard heißt Joe Courtney, US-Kongressabgeordneter des zweiten Bezirks in Connecticut, in seinem Hauptsitz in Pawcatuck willkommen. Der Kongressabgeordnete Courtney und der Kongressbelegschaftsmitarbeiter Taijah Anderson besuchten den Sitz, um mehr über die Technologie von Davis-Standard, die wirtschaftlichen Auswirkungen auf die Region und die anstehende Erweiterung des Standorts in Pawcatuck zu erfahren.

Der Präsident und CEO des Unternehmens Jim Murphy und andere Führungskräfte von Davis-Standard boten eine Übersicht von und eine Besichtigung bei Davis-Standard, mit einem Einblick in das eindrucksvolle globale Wachstum des Unternehmens, die Besonderheiten des Werks und das vielfältige Ausrüstungsportfolio.

„Davis-Standard verfügt über einen eindrucksvollen Betrieb und es war eine Ehre das Werk in Pawcatuck zu besichtigen,“ so der Kongressabgeordnete Courtney. „Die Sauberkeit der Werkstatt, die fortgeschrittene Herstellungspraxis und das Engagement der Angestellten sind wirklich faszinierend. „Wir sind sehr stolz auf Davis-Standard und auf den starken wirtschaftlichen Impuls, den das Unternehmen weiterhin südöstlich Connecticut bietet.“



▲ Kongressabgeordneter Joe Courtney, links, und Präsident und CEO von Davis-Standard, Jim Murphy, zu Besuch im Werk in Pawcatuck

Murphy fügte hinzu: „Der Besuch des Kongressabgeordneten Courtney erfreute uns und wir schätzen seine der Herstellungsindustrie gebotene Unterstützung. Letztes Jahr, ordnete der Kongress eine Steuergutschrift für Forschung und Entwicklung an, die uns dabei unterstützte, unsere technologische Fortschritte zu entwickeln. Wir haben auch die Unterstützung des Kongressabgeordneten bei der Erweiterung in Pawcatuck geschätzt, wo die Produktionskapazitäten für unsere steigende Blasfolientätigkeit untergebracht werden.“

Davis-Standard erweitert in den nächsten zwei Jahren auf 15.000ft² (ca.

1.393m²) Produktionsfläche sowie um 30 Arbeitsplätze in seinem Hauptsitz in Pawcatuck, wo derzeit über 400 Mitarbeiter beschäftigt sind. Diese Erweiterung wird die Produktion und die Präzisionsbearbeitung fortschrittlicher mehrschichtiger Blasfolien-Ziehsteine aufnehmen. Darüber hinaus wird es Davis-Standard somit ermöglicht, die ganze Blasfolienproduktion für seine Gloucester Engineering Produktlinie von Gloucester, Massachusetts, nach Pawcatuck zu verlegen.

Davis-Standard ist seit 1848 in Südost-Connecticut tätig und ist eins der ältesten und wichtigsten Unternehmen in der Region von Südost-Connecticut/Südwest-Rhode Island. Die Erweiterung des Standorts in Pawcatuck verstärkt das Engagement des Unternehmens für die lokale Region.

Dank seiner langjährigen Stellung als Marktführer, gilt es als „Exzellenzzentrum“ für den Bereich Extrusionstechnologie in Connecticut. Neben dem Werk in Pawcatuck, verfügt Davis-Standard über Fertigungsanlagen und Tochterunternehmen in den USA, Europa und Asien.

Davis-Standard – USA
Website: www.davis-standard.com

Stufenlos verstellbare Bremsen

Magnetic Technologies Ltd bietet eine Auswahl an Bremsen für Ab- und Aufwickler. Diese Bremsen sind stufenlos verstellbar, um eine äußerst präzise Spannungsregelung zu liefern und stehen in zahlreichen Größen zur Verfügung, um sich den Spulen und Haspeln der Kunden anzupassen.

Der Drehmoment wird magnetisch entwickelt, bleibt Jahr für Jahr gleich und erstreckt sich von 0,11" Unzen auf 320" Pfund. Die Vorteile umfassen die Verstellbarkeit, die Tragbarkeit und einen minimalen Platzaufwand.

Jede Bremse oder Kupplung wird sorgfältig ausgelegt, um eine besonders hohe Lebensdauer zu gewährleisten, sogar für die anspruchsvollsten Produktionsstandards.

Deren Entwurf sichert, falls erforderlich, eine einfache Montage, Wartung oder Änderung. Gelagerte Ersatzteile für alle Produkte stehen zur Verfügung und jegliche erforderliche

Reparatur wird werksintern im Standort des Unternehmens in Oxford, Massachusetts, durchgeführt. Verschiedene Modelle sind mit konischen Rollenlagern ausgestattet, um schwere Radialbelastungen zu stützen.

Howard Schwerdlin, Verkaufsleiter, meinte dazu: „Basierend auf unsere hochzuverlässigen elektrischen Hysteresebremsen, haben wir einen Regler der Konstantstrom-Versorgung entwickelt, der einen internen Rechner einsetzt, um kontinuierlich den Bremsdrehmoment einzustellen, je nach dem wie der Versorgungsspulendurchmesser während des Ablaufs abnimmt, mit Einsatz einer Ultraschallprobe um den Spulendurchmesser zu messen.“

„Der Regler umfasst die Kurven Drehmoment gegen Strom für alle 10 Bremsgrößen sowie die Logik, um der Bremse Konstantstrom während der Laufzeit zu bieten. Mehrfachbremsen



▲ Neue Regler zur Konstantstrom-Stromversorgung wurde von Magnetic Technologies entwickelt

können mit einer einzigen Stromversorgung geprüft werden.“

„Mit einer direkten Touch-Panel-Steuerung, braucht der Bediener nur die gewünschte Spannung sowohl in metrischen wie in britischen Einheiten einzugeben. Zur Verfügung stehen Aufbauten als individuelle Einzelstation sowie als Mehrfachstation.“

„Für Anwendungen, die keine konstante Spannung erfordern, ist außerdem eine Vielzahl an Ablaufgestellen von Einzel- bis Mehrfachspulen verfügbar.“

Magnetic Technologies Ltd – USA
Website: www.magnetictech.com

Herstellung verdichteter Leiter, Hervorhebung der Vorteile und der potentiellen Kostensenkungen im gesamten Verseilverfahren

von Sean Harrington, Ceeco Bartell Machine Systems LLC

Einleitung

Jeder Kabelhersteller beabsichtigt unter dem Gesichtspunkt der Ressourcenschonung in kürzester Zeit ein Qualitätsprodukt zu produzieren. Dazu müssen sie die kritischen Parameter erkennen, die die zu fertigenden Litze beeinflussen. Ist dieses erfolgt, dann ist die Suche nach einer Hardware, die ihnen das flexibelste und effektivste Verfahren bietet, relativ einfach.

Ziel dieser Arbeit ist es, eine technologische Lösung für das Herstellungsverfahren verdichteter Leiter zu präsentieren, die Kosteneinsparungen vom Drahtziehverfahren zur Verkabelung bis hin zum Extrusionsverfahren bietet. Dabei handelt es sich um den Einsatz einer Walzprofilierertechnik, die die Verwendung eines Zufuhrdrahts mit einem einzelnen Durchmesser durch das ganze Verseilverfahren ermöglicht und wesentliche Verfahrenseinsparungen sowie -vorteile bietet.

Normalerweise erfordert ein fertiger mehrdrähtiger Leiter einen eigenen gezogenen Drahtdurchmesser. Jeder Durchmesser erfordert in der Regel ein neues Einfädeln in die Drahtziehmaschine. Einige Leiteraufbauten erfordern mehr als einen gezogenen Drahtquerschnitt.

Entsprechend sind im Ziehverfahren mehrfache Einstellungen je Leitergröße erforderlich. Die bei den Zieh- und Verseilmaschinen benötigte Einrichtezeit, kombiniert mit den Bestandsniveaus, die erforderlich sind um die verschiedenen Drahtdurchmesser zu leiten, stellen unnötige Arbeitsschritte dar, die die

Kosten der Umwandlung vom Walzdraht auf Litze erhöhen werden.

Die Technologie des SIW (*single input wire*) beseitigt effektiv viele dieser unnötigen Arbeitsschritte, die mit dem herkömmlichen Einrichten verknüpft sind, wobei derselbe gezogene Drahtdurchmesser benutzt wird um eine Auswahl an mehrdrähtigen Leitern zu vervollständigen. Das Ergebnis ist:

- Gesteigerte Drahtziehproduktion
- Reduzierter Ziehsteinbestand für das Drahtziehen
- Weniger Ausfall
- Wesentlich niedrigerer Umlaufbestand
- Minimale Wechsel des Ablaufs der Verseilmachine
- Höhere Verseilmaschinenleistung
- Kürzere Durchlaufzeiten
- Steigerungen der Methode der Just in time-Herstellung
- Rationalisierungen des gesamten Verseilverfahrens

Wahrscheinlich kommt es eher auf eine wesentliche Reduzierung der Variablen an, die der Hersteller bei der Fertigung eines jeglichen Verseilprogramms zu managen hat.

Die Veränderung der Methode - die erforderlich ist, um effektiv einen einzelnen Durchmesser des gezogenen Drahts zur Herstellung der geforderten Auswahl fertiger mehrdrähtiger Leiter zu benutzen - liegt im Ersetzen der Flexibilität des Verseilens der gleichen Anzahl an Drähten unter Verwendung unterschiedlicher Durchmesser, mit dem Verseilen einer variablen Anzahl von Drähten unter Verwendung desselben Drahtdurchmessers.

Im allgemeinen sind die Vorteile der Technologie SIW unabhängig vom eingesetzten Herstellungsverfahren von Litzen. Nur nach dem die spezifischen Litzenaufbauten definiert und die Produktionsanforderungen dieser Aufbauten bestimmt werden, kann die Auswahl der optimalen Fertigungszelle abgewogen werden.

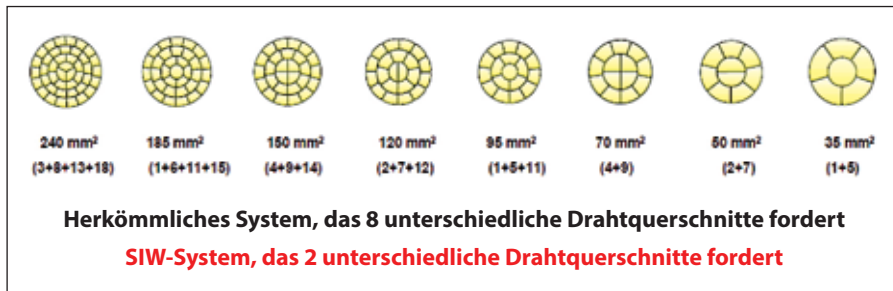
Hervorzuheben ist, dass das Einsatzkonzept eines einzelnen Zufuhrdrahts zur Fertigung von unterschiedlichen Abmessungen fertiger Leiter nicht neu ist; es wird in den meisten Herstellungsanlagen innerhalb der Toleranzen der aktuellen Spezifikationen eingesetzt. In Europa wurde dieses Konzept umfangreich eingesetzt, wo Verseilprogramme - die einen Zufuhrdraht mit einem einzelnen Durchmesser benutzen, um verschiedene Abmessungen fertiger Leiter abzudecken - seit Jahrzehnten bestehen.

Die potentiellen Kostensenkungen, die sich aus dem Einsatz dieses Verfahrens ergeben, können in nachfolgende Bereiche aufgeteilt werden:

- Verfahrenseinsparungen
- Materialeinsparungen

Verfahrenseinsparungen

Die offensichtliche Auswirkung der Aufnahme des Walzprofilierens im Verseilverfahren ist in der *Abb. 1* dargestellt. Obwohl es weiterhin innerhalb der Beschränkungen der IEC- und ASTM-Standards liegt, ermöglicht das Walzprofilierverfahren eine starke Reduzierung der Drahtanzahl, die erforderlich sind, um eine Leiter-Auswahl



▲ Abb. 1

herzustellen. In diesem Fall, um die Auswahl von 35mm² bis 240mm² zu decken, wurde die Drahtanzahl von 8 auf 2 gesenkt. In ähnlicher Weise kann bei der Auswahl von 35mm² bis 500mm² die Anzahl an Drähten von 12 auf 3 reduziert werden.

Diese Reduzierung der geforderten Anzahl an Drahtquerschnitten bewirkt hohe Kosteneinsparungen im Drahtziehbereich und dies:

- schafft eine höhere Produktivität der Drahtziehmaschine, da das mehrfache Einrichten für die unterschiedlichen Drahtquerschnitte wegfällt, die für traditionelle Litzenaufbauten erforderlich sind.
- reduziert den Schrottanteil an gezogenem Draht durch den Wechsel des Drahtquerschnitts
- schafft eine Reduzierung im Drahtziehsteinbestand

In gleicher Weise bewirkt das Walzprofilierverfahren eine Kosteneinsparung im Ziehverfahren:

- Reduzierung des Volumens verschiedener Drahtquerschnitte in Erwartung des Ziehverfahrens
- Die Möglichkeit, größere Drahtingrößen einzusetzen und von einem Spulensystem auf ein Coilabwickler zu wechseln
- Eine Reduzierung der Stillstandzeit, die beim Laden entsteht, mit der Möglichkeit des Wechsels des automatischen Abwicklers während die Maschine läuft
- Schnelleres Einrichten für verschiedene Litzenabmessungen durch die Beseitigung der Bewegung der Abwickler mit verschiedenen Abmessungen
- Höhere lineare Produktionsgeschwindigkeit, im Vergleich zu herkömmlichen Verseilmethoden
- Reduzierung der Personalstärke im Verseilverfahren

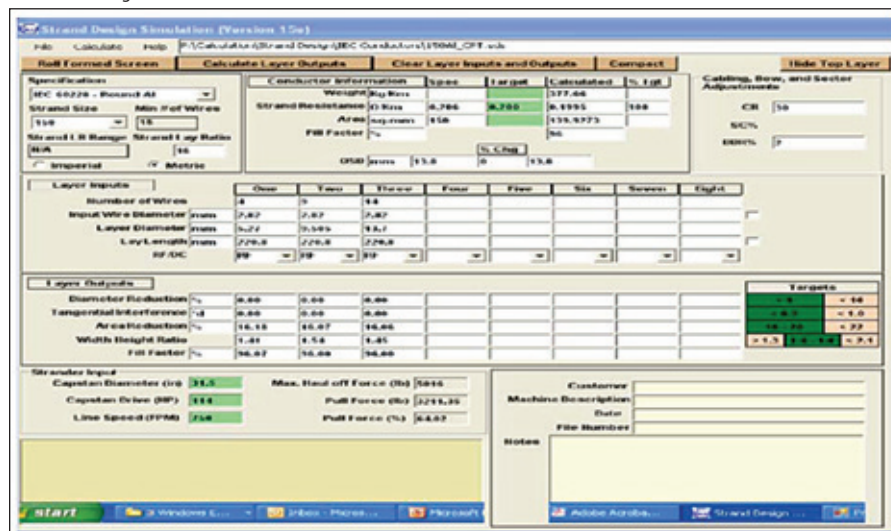
Materialeinsparungen

Die Herausforderung für heutige Hersteller liegt in der Bestimmung des Ziels im Rahmen der Spezifikationen.

Wenn das Kriterium zur Bestimmung des Litzenaufbaus lediglich auf der Ökonomie basiert, würde die Industrie das Modell des Unilay-Leiters bevorzugen sowie den kleinsten Durchmesser, der innerhalb diesem Modell zugelassen wird. Durch das Walzprofilierverfahren können Unilay-Produkte bis zu 500mm² hergestellt werden.

Die statistische Analyse der Litzen, die mit Methoden (Ziehstein oder Rollen) verdichtet werden, anders als das System des Walzprofilierens, hat gezeigt, dass mit einer typischen Materialabweichung von ±1% bis ±1,5% gerechnet werden muss. Demzufolge führen diese Ergebnisse dazu, die Leiter zumindest um 3% überzudimensionieren, um sicherzustellen, dass das Produkt die Spezifikation nicht unterschreitet.

▼ Abb. 2: Ergebnis des Litzen-Simulators 150mm² verdichtete Litze



▼ Abb. 3



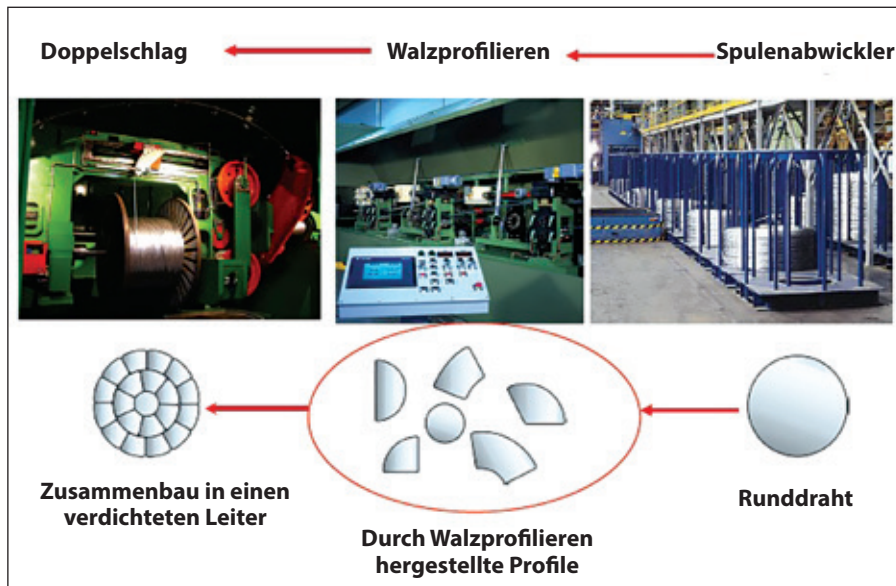
Wirtschaftliche Analyse des 95mm ² VPE-Produkts			
Füllfaktor	86%	92%	96%
Anordnung	1=6=13	1=6=11	2=6=9
Außendurchmesser (mm)	11.7	11.39	11.07
Außenbereich der Leerstellen (mm²)	15.88	0.710	0.663
Isolierungskosten (USD/km)	131.35	109.55	106.83

Dieses überschüssige Material wird an den Kunden tatsächlich kostenlos abgegeben.

Beim Einsatz des Walzprofiliersystems von Ceeco Bartell mit der entsprechenden Software des Litzenaufbaus, wird die Materialabweichung stark reduziert.

Indem eine reale und sehr spürbare Materialeinsparung gegenüber herkömmlichen Verdichtungsmethoden erreicht wird, ist dies in Hinblick auf die derzeit bestehenden Aluminium- und Kupferkosten besonders wichtig. Das bedeutet, dass die in den IEC- und ASTM-Standards spezifizierten Minstdurchmesser erreicht werden können, während man sich gleichzeitig dem maximalen Widerstand nähert, jedoch nicht überschreitet.

Dank der großen Auswahl an Litzen, die in der Industrie eingesetzt werden, hat Ceeco Bartell ein mathematisches Modell entwickelt, das beim Litzenaufbau unterstützt. Dieses Modell setzt theoretische und quantitative Angaben ein, die eine Vorhersage des Litzenwiderstands ermöglichen. Darüber hinaus analysiert dieses Programm die Geometrie der Litze, um die Leistung der Maschine zu optimieren. Das Ergebnis ist eine genaue Vorhersage des Widerstands der fertigen Litze.



▲ Abb. 4

Abb. 2 stellt einen Querschnitt einer 150mm² Litze dar und zeigt, wie dieses Programm bei der Entwicklung des optimalen Litzenaufbaus unterstützt.

Das vorgestellte Walzprofilierprogramm bietet das größte Potential, da es über das kleinste Litzendurchmesser-Modell für einen spezifischen Litzenquerschnitt verfügt. Demzufolge stellt dies auch das größte Potential für Isolierungseinsparungen für eine bestimmte Isolierungsdicke dar.

Das ist deutlich in der Abb. 3 dargestellt, die Einsparungen beim Isolierstoff zeigt, während ein 95mm² VPE-Produkt mit Füllfaktoren von 86% bis 96% gefertigt wird. Während der Leiter kleiner wird und die Zwischenräume verschwinden, wird der Anteil der eingesetzten Isolierung reduziert.

92% Füllfaktor ist die beste Verdichtung, die mit der Anwendung herkömmlicher Methoden erreicht werden kann. Allerdings kann mit dem Walzprofilierverfahren ein Füllfaktor von 96% erzielt werden. Das schafft eine potentielle Materialeinsparung von zirka 2%.

Die Produktivität des Extruders setzt teilweise auf die Unversehrtheit des Litzenaufbaus. Das trifft gleichermaßen bei Nieder-, Mittel- und Hochspannungs-Extrusionen zu. Ein instabiler Litzenaufbau beeinträchtigt nicht nur die Geschwindigkeit der Verseil- und Extrusionsverfahren, sondern kann auch zu beträchtlichen Verlusten führen wegen des Schrotts und der Ausfallzeiten für beide Anlagen.

Die Korbbildung ist oft das Ergebnis eines instabilen Litzenaufbaus.

Ein dicht gewickelter Leiter endet weniger wahrscheinlich mit der Korbbildung. Die Dichtheit der Litze hängt sehr von der Geometrie der Elemente ab. Aus diesem Grund ist der Schlag des Leiters von Bedeutung. Die Elemente der Unilay-Leiter/der Leiter mit unidirektionalem Schlag sind verschachtelt und haben demzufolge inhärent einen kleineren Außendurchmesser als Leiter mit gewendetem konzentrischen Schlag und SZ-Leiter.

Darüber hinaus ziehen sich Unilay-Leiter/Leiter mit unidirektionalem Schlag selbst unter Spannung fest. Als Folge dieser selbst festziehender Eigenschaft, neigt die Extrusion von Unilay-Leiter/Leiter mit unidirektionalem Schlag statistisch weniger zur Korbbildung.

Die Oberfläche der Litze ist ebenfalls kritisch. Eine glatte Außenlage, wie jene die in einer walzprofilierten Lage vorhanden ist, zeigt ein reines, rundes Profil beim Extrusionsverfahren und minimiert, demzufolge, das Ansammeln von Staub im Leiter während des Extrusionsverfahrens.

Das Verfahren ist in der Abb. 4 dargestellt. Runddraht wird aus großen Coilpaketen entnommen und läuft durch den Abschnitt des Walzprofilierens, wo seine Form in verschiedenen Profilen des Walzprofilierens geändert wird, die dann bei hohen Geschwindigkeiten zusammengesetzt werden, entweder durch eine Doppelschlag- oder durch eine Einzelschlagmaschine, abhängig von den Produktabmessungen.

Durch den kontinuierlichen Prozess mit hoher Geschwindigkeit können Lineargeschwindigkeiten von 200m/min

erzielt werden, während hochverdichtete Leiter hergestellt werden.

Die Walzenprofilier-Verseilmaschine kann 40 Tonnen 150mm² verdichtete Aluminiumleiter in einem 24-Stunden-Zyklus fertigen.

Schlussfolgerung

Die Einsparungen der Produktionskosten hängen von vielen Faktoren ab, wie z. B. den bestehenden Fertigungsanlagen, ob die Litze derzeit betriebsintern hergestellt wird oder erworben wird, die Aufmerksamkeit und die Prüfung, die dem Zufuhrdraht aus Kupfer und aus Aluminium geschenkt wird, allgemeine Hauswirtschaft und die Prüfung der Doppelschlagverseilmaschine mit Hochgeschwindigkeit.

Unter den vorteilhaftesten Bedingungen, können die Kosteneinsparungen zu sehr erstaunlich kurzen Amortisierungszeiten führen, jedoch müssen die Berechnungen natürlich für jede einzelne Anwendung durchgeführt werden.

Durch die hohe Leistung der Walzprofilierverseilmaschine, zusammen mit dem vom Ceeco Bartell patentierten Walzprofilierverfahren, wird den Kabelherstellern eine Kostensenkung ohne Leistungsbeeinträchtigung der fertigen Leiter ermöglicht.

Das Bewusstsein dieser und anderer neuen Techniken, zusammen mit aufschlussreichen Spezifikationen, werden die Entwicklung des Litzenaufbaus weiter forcieren um das Potential für die mehrdrähtige Leiterherstellung weiter zu optimieren. ■

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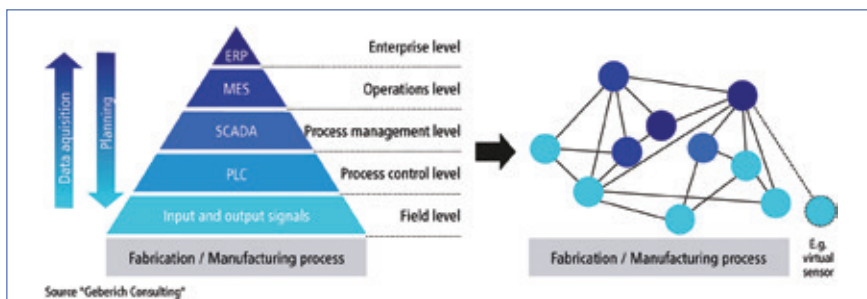
Website: www.bartellmachinery.com

КИП Zumbach теперь со стандартом OPC UA

Zumbach оснащает свои надежные КИП по спецификации стандарта OPC UA. С данной ключевой технологией решения для измерения предусматривают простой, настраиваемый и надежный обмен информации различными системами в линейке продукции – обмен данными, не зависящий от платформы и производителя.

Подготовьте область измерений размеров, профиля и диаметра к новым сервисам Industry 4.0. КИП с новым стандартом OPC UA отвечают техническим требованиям для интеллектуальной организации сетей передачи данных.

Компания Zumbach оборудовала свои мощные КИП измерения OPC UA, что обеспечивает простой, настраиваемый и надежный обмен информации между различными системами линейки продукции – независимо от платформы или производителя. Одна программа позволяет получать данные измерения M2M (взаимодействие машины и механизма) или M2H (взаимодействие машины и человека), получаемые для взаимосвязи на одной платформе вывода, собираемые, отображаемые и анализируемые. Стандарт OPC UA поддерживает горизонтальную и вертикальную интеграцию на различных уровнях пирамиды автоматизации. Это означает, что он уже соответствует требованиям



▲ Вывод данных, диагностика и ответные меры осуществляются на одной платформе. Созданная открытость увеличивает скорость реакции в случае отклонений и конечные результаты в важном достижении качества

к отрасли автоматизации вместе с будущими сценариями семантической коммуникации с Industry 4.0 и системой контроля промышленного оборудования через Интернет.

OPC имеет самое широкое распространение в сфере автоматизации, однако с технологической точки зрения, не относится к какой-то определенной сфере и может использоваться на всех операционных системах. Коммуникация между оборудованием предприятия является надежной, безопасной и не зависит от производителя.

Как один из первых производителей оборудования для встроенного измерения и контроля, компания Zumbach интегрировала OPC UA в свои устройства на компьютерной

основе с протоколом связи с главным компьютером для станов горячей прокатки и низкотемпературной технологии Steelmater, а также для серии USYS IPC, предназначенной для глобальной записи данных, обработки и систем отображения, а также для многих других целей).

OPC UA сервер дополнительно доступен в качестве программы внешнего шлюза для устройств измерения с микропроцессором и протоколом связи (ODAC® лазерные КИП для измерения диаметра, системы измерения диаметра и овальности MSD, искровые контрольные приборы, компьютерные блоки интерфейса и прочее).

Zumbach Electronic AG – Швейцария
Вебсайт: www.zumbach.com

Новый региональный директор по продажам в Южной Америке

Альфредо Торрес занимает должность нового регионального директора по продажам в южноамериканских странах в Niehoff Group. Господин Торрес имеет диплом инженера в производственных процессах и богатый опыт в различных промышленных отраслях, таких как автомобильная и отрасль кабеля и проволоки, в которой он работал в том числе в научно-исследовательском секторе, инжиниринге и техническом обслуживании всех видов кабелей. Торрес получил богатый опыт и обширные знания в отрасли, занимая позиции коммерческого регионального директора в Латинской Америке, занимаясь в основном установкой оборудования и пуско-наладкой, техподдержкой до и после продаж, а также развитием технологии производства кабеля и проволоки и комплексным развитием заводов кабеля и проволоки.

Вместе с агентством Niehoff В Чили, Rheintek Chile Limitada, господин Торрес будет сотрудничать с заказчиками в Южной Америке, Боливии, Чили, Колумбии, Эквадоре, Перу и Венесуэле, реализуя линейку оборудования Niehoff Germany. Его второй сферой деятельности будет продажа всего оборудования, произведенного в Niehoff-Herborn Máquinas Ltda, в Бразилии, оказывая поддержку в сфере продаж.

Maschinenfabrik Niehoff & Co KG – Германия

Вебсайт: www.niehoff.de



▲ Альфредо Торрес – новый региональный директор по продажам в Южной Америке

Посещение площадки Davis-Standard членом Конгресса

Компания Davis-Standard поприветствовала Джо Кортни, члена Конгресса США второго округа Коннектикута в своем головном офисе в Покатаке. Член конгресса Кортни и член персонала Конгресса Тайджа Андерсон посетили площадку, чтобы узнать о технологии Davis-Standard, экономическом влиянии, оказываемом на регион и предстоящем расширении предприятия в Покатаке.



▲ Член Конгресса Джо Кортни слева и президент Davis-Standard и Генеральный директор Джим Мерфи на экскурсии по площадке в Покатаке

Президент компании и Генеральный директор Джим Мерфи, а также другие руководители Davis-Standard провели экскурсию и рассказали о Davis-Standard, представив информацию по впечатляющему глобальному росту компании, особенностям предприятия и широкой линейке оборудования.

«Davis-Standard поражают производственным процессом, и для нас было честью посетить предприятие в Покатаке», - заявил член Конгресса Кортни. «Чистота пола механического цеха, передовые производственные практики и вовлечение персонала действительно стоит увидеть. Мы очень гордимся значительной поддержкой экономики, которую компания продолжает оказывать юго-восточному Коннектикуту». Господин Мерфи добавил: «Мы были рады посещению

члена Конгресса Кортни и благодарны за поддержку производственной отрасли. В прошлом году Конгресс произвел налоговый вычет, который оказал нам дополнительную помощь в нашем технологическом развитии. Мы также благодарны за поддержку расширения членом Конгресса в Покатаке, где будут размещены производственные мощности для нашего растущего бизнеса по производству пленки».

У Davis-Standard появилось 15 000 квадратных футов производственной площади и более 30 рабочих мест в течение следующих двух лет в головном офисе в Покатаке, в котором работают

более 400 сотрудников в настоящее время. На дополнительной площади будет размещаться производство и высокоточная механическая обработка современных многослойных пленочных фильер. Это также дает возможность Davis-Standard перенести все производство пленки, получаемой экструзией с раздувом с линии продукции Gloucester Engineering из Глостера, Массачусетса в Покатаке.

Davis-Standard занимается коммерческой деятельностью в юго-восточном Коннектикуте с 1848 и являются одним из самых старых и крупных работодателей в регионе юго-восточного Коннектикута/Под Айленда. Расширение производственных площадей в Покатаке укрепляет присутствие компании в местном регионе.

В своей долговременной позиции лидера рынка компания считается «Центром выдающихся достижений» в технологическом секторе экструзии Коннектикута. Кроме предприятия в Покатаке у Davis-Standard есть производственные предприятия и филиалы в США, Европе и Азии.

Davis-Standard – США
Вебсайт: www.davis-standard.com

Устройства фиксации с безграничными возможностями настройки

Magnetic Technologies Ltd предлагает большое разнообразие ограничителей для отдачи и наматывания. Данные устройства ограничения имеют безграничные возможности настройки для обеспечения максимально точного контроля натяжения, и они выпускаются в большом количестве размеров для соответствия катушкам и бобинам заказчиков.

Крутящий момент разрабатывается путем магнитного воздействия и останется одинаковым на протяжении многих лет. Диапазон кручения – 0,11 унций-сил-дюйм на 320 дюйм-фунтов. Преимущества включают легкость настройки, портативность, минимальную занимаемую площадь. Каждое устройство фиксации или рычаг аккуратно рассчитаны для обеспечения исключительно долгого срока службы даже при самых строгих стандартах производительности. Они разработаны для легкой установки

и обслуживания или модификации, при необходимости таковой. Для всей нашей продукции на складе имеются запасные части, а также возможно проведение ремонтных работ в офисе компании в Оксфорде, Массачусетсе. Некоторые модели оборудованы коническим подшипником качения для поддержания большой внешней радиальной нагрузки.

Ховард Швердлин, директор по продажам, заявил: «На основе наших высоконадежных гистерезисных устройств фиксации мы разработали устройство контроля со стабилизированным источником тока, которое использует внутренний компьютер для постоянной настройки крутящего момента по мере того, как уменьшается диаметр подающей катушки во время отдачи при использовании ультразвукового датчика для измерения диаметра катушки».



▲ Компания Magnetic Technologies разработала новые устройства контроля стабилизированного источника тока

«Устройство контроля включает кривые измерения крутящего момента и тока для всех 10 размеров устройств фиксации и логическое устройство для непрерывной подачи постоянного тока в фиксирующее устройство».

Несколько устройств фиксации могут контролироваться одним источником подачи тока.

Magnetic Technologies Ltd – США
Вебсайт: www.magnetictech.com

Изготовление компактных проводников, выделение преимуществ и потенциального сокращения расходов на всем процессе скрутки

Шон Харрингтон, Ceeco Bartell Machine Systems LLC

Введение

В основном, каждый производитель кабеля стремится изготовить качественную продукцию при использовании минимального количества ресурсов за наиболее короткий срок. Для этого необходимо понимать критические параметры, которые отрицательно влияют на кабель, который они хотят изготовить. При выполнении данных условий, подбор оборудования, обеспечивающего самый гибкий и эффективный технологический процесс, не представляет сложности.

Целью данной работы является презентация технологического решения для процесса изготовления компактных проводников, которое предусматривает сокращение расходов в процессе волочения проволоки от изготовления кабеля и до процесса экструзии. Это использование технологии вальцевания, которая позволяет использовать проволоку одного диаметра на протяжении всего процесса скрутки стренги, что в результате упрощает технологический процесс и имеет преимущества.

Обычно для изготовленного витого провода необходим собственный диаметр тянутой проволоки. Для каждого диаметра проволоки обычно необходим новый станок волочильного стана. Для некоторых профилей проводника необходим более, чем один размер тянутой проволоки.

Схожим образом, в процессе скрутки стренги необходимы многочисленные установки для каждого размера проводника. Время настройки как волочильного, так и крутильного

станов, в сочетании с количеством материальным средств, необходимых при производстве большого числа диаметров проволоки, представляют ненужные действия, которые приводят к затратам, связанным на обработку от заготовки до кабеля.

Концепция кабеля с одним параметром эффективно устраняет необходимость данной ненужной деятельности, связанной с традиционными настройками при одинаковом диаметре проволоки для обработки ряда многожильных кабелей. В результате:

- Увеличивается производительность волочения проволоки
- Сокращаются материальные запасы фильер
- Сокращается количество отходов
- Значительно уменьшается объем работ в технологическом процессе
- Изменение отдающей катушки крутильного стана сокращается до минимума
- Увеличивается производительность крутильного стана
- Уменьшается производственный цикл
- Совершенствуется принцип изготовления «точно в срок»
- Оптимизируется общий процесс скрутки

Вероятно, наиболее важным является факт значительного сокращения переменных параметров, которыми должен управлять производитель в производственной программе любой стренги. Изменением принципа, которое необходимо для эффективного использования одного диаметра тянутой проволоки для изготовления необходимого ряда обработанных витых проводников, является замена пластичности скручивания тем же числом кабелей, использующих

различные диаметры со скручиванием различного числа проволоки, используя одинаковый диаметр. В основном, преимущества принципа кабеля с одним параметром не зависят от используемого технологического процесса изготовления скрутки. Только при определении отдельного профиля стренги и определении производственных требований данных профилей, может быть учтен выбор гибкого производственного модуля.

Следует отметить, что концепция использования кабеля с одним параметром для изготовления ряда размеров обработанных проводников не новая; она используется в рамках большинства производственных предприятий в пределах допусков настоящих технических условий. Это широко используется в Европе, где в программах стренги используется один диаметр проволоки для ряда размеров обработанных проводников, что существует на протяжении десятилетий.

Потенциальное уменьшение стоимости при применении данной технологии может быть разделено на следующие части:

- Экономия на технологии
- Экономия материала

Экономия на технологии

Очевидное влияние включения вальцевания в технологии скрутки показан на рисунке 1.

При учете ограничений стандартов IEC и ASTM технология вальцевания предусматривает значительное



▲ Рисунок 1

снижение необходимого количества проволоки для производства ряда проводников. В данной случае для изготовления 35 мм² и до 240 мм² количество проволоки было сокращено с восьми до двух. В похожем случае для изготовления 35 мм² и до 500 мм² количество проволоки было сокращено с 12 до трех.

Данное уменьшение необходимого количества размеров проволоки приводит к значительному сокращению затрат при волочении проволоки:

- Возникает большая производительность у волочильного стана в связи с устранением многочисленных настроек для различного диаметра проволоки, необходимого для традиционных профилей стренги
- Уменьшается количество отходов при волочении посредством смены размера проволоки
- Уменьшается материальный запас фильер

Как и с технологией вальцевания, сокращаются затраты в процессе скрутки:

- Меньший объем различных размеров проволоки для изготовления на очереди для скрутки
- Возможность использовать большие размеры блоков и переключаться с системы катушек на систему контейнерного типа
- Сокращение времени простоя на загрузку с возможность автоматической смены отдачи при функционировании стана
- Более быстрые настройки для различных размеров скрутки благодаря отсутствию движения различных размеров отдачи
- Более высокая скорость линейного производства при сравнении с традиционными методами скрутки
- Сокращение количества обслуживающего персонала в процессе скрутки

Экономия материала

Сложной задачей для современных производителей является определить, какая цель должна быть достигнута в

рамках технических условий. Если критерии определения изготовления были основаны только на основании экономического фактора, отрасль опустится до сортамента однопровитных проводников, а самым маленьким допустимым диаметром будет диаметр в пределах сортамента. Технология вальцевания позволяет изготавливать однопровитную продукцию до 500 мм².

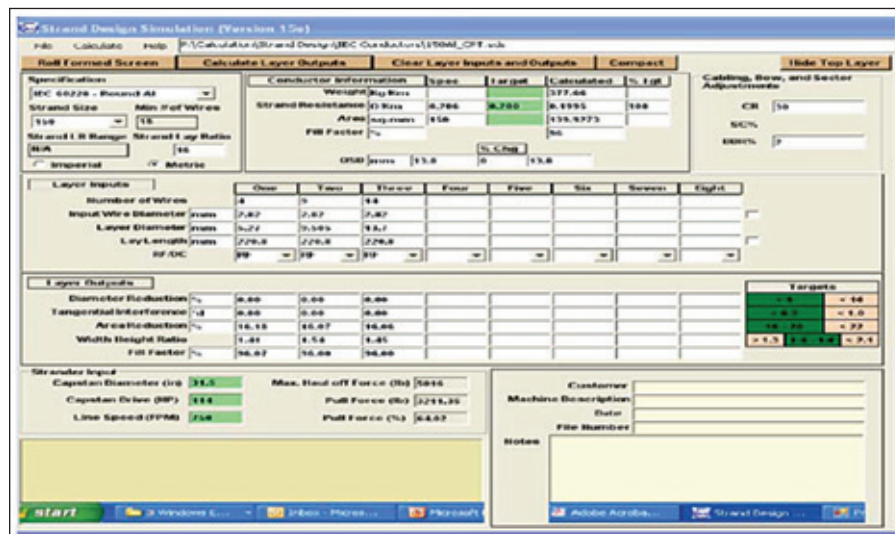
Статистический анализ скрутки, изготовленной методами (фильеры или роликов), отличными от системы вальцевания, показывает, что в таком случае следует ожидать стандартную

вариацию материала от ±1% до ±1.5%. Данные результаты, таким образом, приводят к необходимости увеличения размера проводников минимум на три процента для соответствия продукции техническим требованиям. Данные излишки материала предоставляются заказчиком бесплатно.

При использовании системы вальцевания Seeco Bartell с ее ПО по расчету скрутки разнообразие материала значительно уменьшается. С учетом реальной и очень ощутимой экономии материала по сравнению со стандартными методами изготовления, это особенно важно с текущими ценами алюминия и меди. Это означает, что минимальные диаметры, указанные в стандартах IEC и ASTM, могут быть достигнуты, при приближении, но не превышении максимальной сопротивляемости.

Из-за большого разнообразия стренги, используемой в отрасли, Seeco Bartell разработали математическую модель для содействия расчету стренги. В данной модели используются теоретические

▼ Рисунок 2: Модулятор скрутки с производительностью компактной скрутки 150 мм²



▼ Рисунок 3



Анализ экономического фактора продукции из сшитого полиэтилена 95 мм ²			
Фактор заполнения	86%	92%	96%
Конфигурация	1=6=13	1=6=11	2=6=9
Внешний диаметр (мм)	11.7	11.39	11.07
Участок внешнего зазора (мм²)	15.88	0.710	0.663
Стоимость изоляции (Доллары США/км)	131.35	109.55	106.83



▲ Рисунок 4

и количественные данные, которые позволяют предсказать упругость стренги. Далее данная программа анализирует геометрию стренги для оптимизации функционирования стана. Результатом является точный прогноз упругости обработанной стренги.

На рисунке 2 показано сечение 150 мм² стренги, где продемонстрировано, как данная программа помогает в разработке оптимального дизайна стренги.

Данная программа вальцевания обеспечивает огромный потенциал, так как она применяет самый маленький сортамент диаметра стренги для определенного размера стренги. Впоследствии это также представляет огромный потенциал для экономии затрат на изоляцию для определенной толщины изоляции.

Это хорошо видно на рисунке 3, где показано уменьшение затрат на изоляцию при изготовлении 95 мм² продукции из сшитого полиэтилена с факторами заполнения от 86% до 96%. При уменьшении проводника и исчезновении промежутков, количество используемой изоляции будет сокращено.

Фактор заполнения 92% - это самое лучшее уплотнение, которое можно получить при использовании стандартных методов. Однако, при технологии вальцевания, может быть получен фактор заполнения 96%. Это создает потенциальную экономию материала около двух процентов.

Производительность стана экструзии основана частично на целостности

изготовления стренги. Это применимо для низковольтной, средневольтной и высоковольтной экструзии. Нестабильное производство стренги не только ставит под вопрос процессы скрутки и экструзии, но и может привести к значительным потерям из-за отходов и простоев обеих линий.

Деформация кабеля часто является результатом нестабильного профиля стренги. Плотность скрученный проводник менее подвержен деформации. Плотность стренги зависит во многом от геометрии элементов. По данной причине, скрутка проводника важна. Элементы одноповивки/однонаправленности скрутки проводников взаимосвязаны и, следовательно, безусловно имеют меньший внешний диаметр, чем обратные концентрически скрученные и разнонаправленные проводники.

Кроме того, одноповивные/однонаправленные скрутки проводников самоуплотняются при напряжении. Следствием данного самоуплотнения является уменьшение склонности к деформации скрученных проводников.

Поверхность стренги также важна. Плавный внешний слой, такой как слой, полученный вальцеванием, представляет чистый круглый профиль для процесса экструзии, что, в свою очередь, уменьшает накопление пыли в проводнике в течение процесса экструзии.

Процесс показан на рисунке 4. Круглая проволока берется из крупных упаковок рулонов через секцию вальцевания, где ее форма меняется в различные профили

вальцевания, затем собирающиеся при различных скоростях либо при помощи стана двойной крутки, либо стана одинарной крутки, в зависимости от размера продукции.

Высокоскоростной постоянный процесс предусматривает линейные скорости 200 м/мин, которые достигаются при производстве высоко компактных проводников. Стан скрутки может производить от 40 тонн 150 мм² компактного алюминиевого проводника за 24-часовой цикл.

Заключение

Экономия затрат на производство зависит от многих факторов, таких как существующее производственное оборудование; производится ли стренга самостоятельно, или закупается, аккуратность и контроль при подаче медной и алюминиевой проволоки; общее ведение процесса и высокоскоростные станы двойной скрутки. При самых выгодных условиях экономия может предусматривать довольно поразительные периоды быстрой окупаемости, но, конечно, это должно рассчитываться для каждого отдельного применения.

Высокая производительность станов вальцевания с технологией вальцевания Ceeco Bartell позволит производителям кабеля сократить расходы без ущерба качеству обработанного проводника. Осознание этого и новых технологий в сочетании с предусмотрительными спецификациями в дальнейшем усовершенствует разработку дизайна стренги и потенциально оптимизирует производство витых проводников. ■

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Instruments de mesure Zumbach avec la plate-forme de communication universelle OPC UA

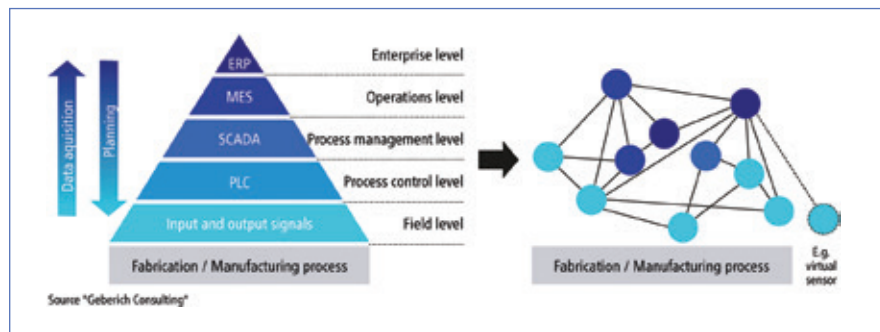
Zumbach est en train d'équiper ses puissants instruments avec la plate-forme de communication universelle reconnue OPC UA. Grâce à cette technologie-clé, les solutions de mesure peuvent fournir un échange d'informations facile, évolutif et sûr avec différents systèmes de la ligne de production, un échange de données indépendant des plates-formes et du fabricant.

Il sera ainsi possible de configurer les données du champ de mesure des dimensions, du profil et du diamètre pour les nouveaux services de Industrie 4.0.

Grâce à la nouvelle plate-forme de communication universelle OPC UA, les instruments répondent aux exigences techniques pour la mise en réseau de données intelligentes.

Zumbach a équipé ses puissants instruments de mesure avec le protocole OPC UA qui assure un échange d'informations simple, évolutif et sûr entre les différents systèmes de la ligne de production, quelle que soit la plate-forme ou le fabricant.

Un logiciel permet d'effectuer l'interconnexion à une plate-forme de sortie, la collecte, l'affichage et l'analyse de la totalité des données de mesure M2M (entre machine et machine) ou M2H (entre machine et homme) obtenues. La plate-forme de communication universelle OPC UA facilite l'intégration horizontale et verticale entre les



▲ La génération des données, le diagnostic et les actions réactives ont lieu sur une plate-forme unique. La transparence générée raccourcit les temps de réaction en cas d'écarts et aboutit finalement à des gains de qualité importants

différents niveaux de la pyramide de l'automatisation. Cela signifie que les exigences pour l'automatisation industrielle ainsi que les futurs scénarios de communication sémantique de l'Industrie 4.0 et de l'IdO (Internet des objets) ont déjà été satisfaits.

L'OPC est le protocole de communication le plus diffusé dans le domaine de l'automatisation, mais il est technologiquement neutre pour l'industrie et peut être exécuté sur tout système d'exploitation. La communication entre les équipements de l'usine se déroule de manière fiable, sûre et indépendante du fabricant.

En tant que l'un des premiers fabricants d'équipements de mesure et de surveillance en ligne, Zumbach a intégré le protocole de communication OPC UA dans ses systèmes informatisés avec le

protocole de communication hôte (par exemple dans la série de systèmes de mesure du profil Profilemaster®, dans les systèmes de mesure pour les laminoirs à chaud et dans les processus à froid Steelmater ainsi que dans la série USYS IPC pour l'enregistrement des données universelles, pour les systèmes de traitement et d'affichage etc.).

Le serveur OPC UA est en outre disponible en tant que passerelle de logiciel externe pour les équipements de mesure avec microprocesseur et protocole de communications Hôte (instruments de mesure de diamètre laser ODAC®, systèmes de mesure de l'ovalité et du diamètre MSD, les dispositifs d'essai à étincelle, les boîtes d'interface d'ordinateur, et d'autres éléments encore).

Zumbach Electronic AG – Suisse
Website: www.zumbach.com

Nouveau directeur régional des ventes pour l'Amérique du Sud

Alfredo Torres est le nouveau directeur régional des ventes pour les pays d'Amérique du Sud du Groupe Niehoff. M. Torres est titulaire d'un diplôme d'ingénieur en procédés de fabrication et a acquis une vaste expérience dans plusieurs domaines industriels tels que le secteur automobile et l'industrie du fil et du câble où il a travaillé, entre autres, dans les domaines de la Recherche et du Développement, de l'ingénierie et de la maintenance et du développement de toutes sortes de câbles.

M. Torres a également acquis une connaissance globale du secteur en travaillant en tant que directeur régional des ventes pour l'Amérique latine notamment en ce qui concerne l'installation et la mise en service de machines, l'assistance technique prévente et après-vente ainsi que le développement des processus de fabrication des fils et des câbles et le développement intégral d'installations pour fils et câbles.

En collaboration avec l'agence Niehoff au Chili, Rheintek Chile Limitada, M. Torres s'occupera des clients en Amérique du Sud, en Bolivie, au Chili, en Colombie, en Équateur, au Pérou et au Venezuela avec la commercialisation du portefeuille de machines de Niehoff Allemagne. Son deuxième domaine d'activité concernera la vente de machines construites par Niehoff-Herborn Máquinas Ltda au Brésil, et consistera à offrir un support à la filiale brésilienne dans sa zone de vente.

Maschinenfabrik Niehoff & Co KG – Allemagne
Website: www.niehoff.de



▲ Alfredo Torres, nouveau directeur régional des ventes pour l'Amérique du Sud

Visite d'un membre du Congrès dans les établissements de Davis-Standard

Davis-Standard a accueilli Joe Courtney, Membre du Congrès américain pour le deuxième district du Connecticut, à son siège de Pawcatuck. Le Membre du Congrès Courtney et le membre du personnel du Congrès Taijah Anderson ont visité le site pour en savoir plus sur la technologie de Davis-Standard, sur l'impact économique sur la région, et sur la prochaine extension de l'installation de Pawcatuck.

Le président et PDG de l'entreprise Jim Murphy et d'autres dirigeants de Davis-Standard ont pourvu un aperçu et une visite des établissements de Davis-Standard, en offrant un aperçu de l'impressionnante croissance globale de la société, des caractéristiques de l'établissement et du portefeuille diversifié des leurs équipements.

"L'activité de Davis-Standard est extrêmement intense et il a été un honneur de visiter l'installation de Pawcatuck", a déclaré le Membre du Congrès Courtney. "La propreté de l'atelier d'usinage, les pratiques de fabrication de pointe et l'engagement des employés sont vraiment impressionnantes. Nous sommes très fiers de Davis-Standard et du vigoureux essor économique que la société continue à fournir au sud-est du Connecticut."



▲ Le membre du Congrès Joe Courtney, à gauche, et le président et PDG de Davis-Standard Jim Murphy visitent l'établissement de Pawcatuck

Murphy a ajouté: "Nous avons apprécié la visite du Membre du Congrès Courtney et nous apprécions son soutien à l'industrie manufacturière". L'an dernier, le Congrès a adopté un plan d'allègement fiscal pour la recherche et le développement, ce qui a été bénéfique pour nous aider davantage à développer nos progrès technologiques. Nous apprécions également le soutien du Congrès pour l'expansion de Pawcatuck, qui offrira de l'espace supplémentaire pour notre activité de fabrication de pellicules soufflées en expansion».

Davis-Standard va augmenter de 15000ft² (environ 1 393m²) l'espace de fabrication et va ajouter plus de 30 emplois dans les deux prochaines années

à son siège de Pawcatuck, qui emploie actuellement plus de 400 personnes. L'extension hébergera le département de fabrication et de l'usinage de précision de moules pour pellicules soufflées multi-couches avancé. Elle permettra également à Davis-Standard de déplacer la totalité de la production de pellicules soufflées pour sa gamme de produits de Gloucester Engineering de Gloucester, Massachusetts, à Pawcatuck.

La société Davis-Standard est active dans le Sud-Est du Connecticut depuis 1848 et est l'un des employeurs les plus anciens et les plus importants de la région du Sud-Est du Connecticut/Sud-Ouest de Rhode Island. L'expansion de l'établissement de Pawcatuck renforce l'engagement de la société à l'égard de la région locale.

Grâce à sa position de longue date en tant que leader du marché, la société est considérée comme le «Centre d'excellence» du secteur de la technologie d'extrusion du Connecticut. En plus de l'établissement de Pawcatuck, Davis-Standard possède des installations de production et des filiales aux États-Unis, en Europe et en Asie.

Davis-Standard – États-Unis
Website: www.davis-standard.com

Freins à réglage continu

Magnetic Technologies Ltd offre une variété de freins pour dérouleurs et enrouleurs. Ses freins sont à réglage continu pour fournir un contrôle de tension extrêmement précis et ils sont disponibles dans de nombreuses tailles pour s'adapter aux bobines et aux dévidoirs des clients.

Le couple développé magnétiquement reste constant au fil du temps et présente une plage de 0,11" onces à 320" livres (de 7,8×10⁻⁴Nm à 36,16Nm). Les avantages incluent le réglage, la portabilité et un encombrement minimum.

Chaque frein ou embrayage est conçu de façon précise pour obtenir un cycle de vie d'une longueur exceptionnelle, même dans le cas des standards de production les plus exigeants.

Ils ont été conçus de façon à garantir une installation aisée, un entretien ou des modifications faciles à réaliser, en cas de nécessité.

Des stocks de pièces de rechange sont disponibles pour la totalité des produits et toute réparation nécessaire est effectuée dans l'usine de la société d'Oxford, Massachusetts. Plusieurs modèles sont équipés de paliers à roulements coniques pour supporter des charges radiales lourdes.

Howard Schwerdlin, directeur des ventes, a déclaré: "En nous basant sur la haute fiabilité de nos freins à hystérésis électriques, nous avons développé un contrôleur d'alimentation à courant constant qui utilise un ordinateur interne pour régler en continu le couple de freinage au fur et à mesure que le diamètre de la bobine d'alimentation diminue pendant le déroulement en utilisant une sonde à ultrasons pour mesurer le diamètre de la bobine."

"Le contrôleur intègre des courbes couple-courant pour la totalité des 10 tailles de freins et la logique pour fournir au frein du courant constant au fil du temps. Il est possible d'effectuer



▲ Nouveau contrôleur d'alimentation à courant constant développé par Magnetic Technologies

le contrôle de plusieurs freins au moyen d'un seul alimentateur.

"Grâce au contrôle direct par écran tactile, l'opérateur doit fournir uniquement la tension souhaitée en unités impériales ou métriques. Il existe des modèles à station individuelle ainsi que des modèles à station multiple.

"Pour les applications n'exigeant pas une tension constante, il existe également une série des dérouleurs à une bobine ou à plusieurs bobines."

Magnetic Technologies Ltd – États-Unis
Website: www.magnetictech.com

Fabrication de conducteurs compacts, en particulier eu égard aux avantages et aux réductions potentielles des coûts dans l'ensemble du processus de toronnage

Par Sean Harrington, Ceeco Bartell Machine Systems LLC

Introduction

En définitive, les fabricants de câble ont pour but de fabriquer un produit de qualité en utilisant un minimum de ressources dans un laps de temps le plus court possible. Pour ce faire, ils doivent comprendre quels sont les paramètres critiques qui affectent le toron qu'ils souhaitent réaliser. Une fois que cette opération est accomplie, trouver le matériel pour leur fournir le processus le plus souple et efficace est relativement simple.

Le but de cet article est de présenter une solution technologique dans le processus de fabrication de conducteurs compacts, permettant de déterminer des économies en termes de coûts à partir du processus de tréfilage du fil au toronnage jusqu'au processus d'extrusion. Il s'agit de l'utilisation de la technologie de profilage qui permet d'utiliser un fil d'alimentation d'un seul diamètre pendant la totalité du processus de toronnage d'où des économies de processus et des avantages significatifs.

Traditionnellement, un conducteur toronné fini exige un diamètre spécifique de fil tréfilé. En général, chaque diamètre de fil requiert un nouvel enfilage dans la tréfileuse. Certains modèles de conducteurs exigent plus d'une section de fil tréfilé.

De même, le processus de toronnage exige plusieurs réglages pour chaque

dimension du conducteur. Le temps de mise en place exigé par les tréfileuses et par les toronneuses, associé à des niveaux de stocks qui sont nécessaires pour gérer les différents diamètres de fil, relève des activités inutiles qui augmentent le coût de conversion du fil machine au toron.

La technologie SIW (*single input wire*) permet d'éliminer efficacement une grande partie de ces activités inutiles associées à la mise en place traditionnelle en utilisant le même diamètre de fil tréfilé pour compléter une gamme de conducteurs toronnés avec les résultats suivants:

- Augmentation de la production de fil tréfilé
- Réduction des stocks de filières pour tréfilage de fil
- Réduction des chutes
- Réduction considérable du matériau en cours de traitement
- Réduction au minimum des changements du dérouleur de la toronneuse
- Augmentation du rendement de la toronneuse
- Réduction des temps d'exécution
- Amélioration de la méthodologie de production *juste-à-temps*
- Rationalisation de la totalité du processus de toronnage

Toutefois, probablement, le point le plus important est représenté par la réduction significative des variables que le fabricant doit gérer pour la fabrication dans tout programme de toronnage.

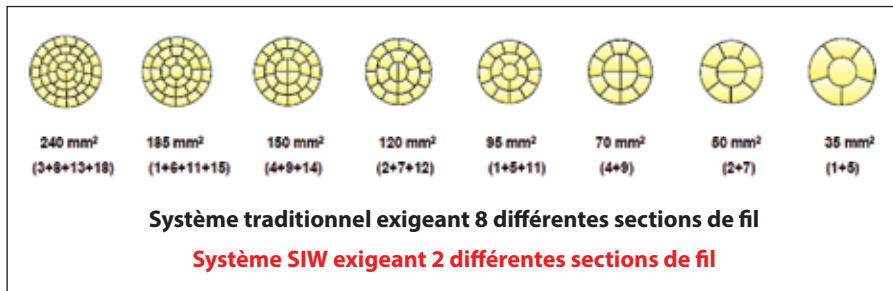
Le changement de méthodologie demandé pour utiliser efficacement un seul diamètre de fil tréfilé pour produire la gamme requise des conducteurs toronnés finis consiste à remplacer la flexibilité de toronnage du même nombre de fils en utilisant des diamètres différents avec le toronnage d'un nombre variable de fils en utilisant le même diamètre de fil.

En général, les avantages de la technologie SIW sont indépendants du processus de fabrication de torons utilisés. Ce n'est qu'après avoir défini les structures spécifiques du toron et avoir déterminé les exigences de production de ces structures, qu'il est possible de considérer le choix de la cellule de fabrication optimale.

Il faut remarquer que le concept de l'utilisation d'un fil d'alimentation unique pour la fabrication d'une gamme de dimensions de conducteurs finis n'est pas nouveau. En fait, il est utilisé dans la majorité des usines de fabrication dans les tolérances admises par les spécifications actuelles. Ce concept a été largement utilisé en Europe, où les programmes de toronnage, utilisant un seul diamètre de fil d'alimentation pour couvrir une gamme de dimensions de conducteurs finis, sont en vigueur depuis des décennies.

Les réductions de coûts potentielles résultant de l'emploi de ce processus peuvent être réparties dans les domaines suivants:

- Économies en termes de processus
- Économies en termes de matériaux



▲ Figure 1

Économies en termes de processus

L'impact évident de l'intégration de la technique de profilage dans le processus de toronnage est représenté à la Figure 1. Bien qu'encore limité par les normes IEC et ASTM, le processus de profilage permet une réduction drastique du nombre de fils nécessaires pour produire une gamme de conducteurs. Dans ce cas, pour couvrir la gamme de 35mm² à 240mm², le nombre de fils a été réduit de 8 à 2. D'une manière similaire, pour la gamme de 35mm² à 500mm² il est possible de réduire le nombre de fils de 12 à 3.

Cette réduction du nombre requis de sections de fil entraîne d'importantes économies des coûts dans le secteur du tréfilage et notamment:

- Elle crée une productivité supérieure de la tréfileuse grâce à l'élimination des multiples mises en place pour les différents diamètres de fil nécessaires aux structures de toron traditionnels
- Elle réduit la quantité de déchet de fil tréfilé grâce au changement de section du fil
- Elle entraîne une réduction des stocks de filières de tréfilage

De même, le processus de profilage a un impact de réduction des coûts dans le processus de toronnage comme suit:

- Réduction du volume des différentes sections de fil produit dans l'attente du processus de toronnage
- Possibilité d'utiliser des écheveaux de dimensions supérieures et de passer d'un système à bobine à un système avec dérouleur pour écheveaux
- Réduction des temps d'arrêt dus à la charge, avec la possibilité de commutation du dérouleur automatique pendant le fonctionnement de la machine
- Mises en place plus rapides pour différentes tailles de toron grâce à de l'élimination du mouvement des dérouleurs de dimensions différentes
- Des vitesses de production linéaires supérieures par rapport aux méthodes de toronnage classiques
- Réduction des niveaux d'effectifs dans le processus de toronnage

Économies en termes de matériaux

Le défi pour les fabricants d'aujourd'hui consiste à déterminer quelle cible doit être choisie dans le cadre du cahier des charges. Si les critères de détermination de la construction du conducteur étaient uniquement fondés sur des critères économiques, l'industrie graviterait autour du modèle de conducteur du type *unilay* et du diamètre le plus petit admis pour ce modèle. Le processus de profilage permet de réaliser des produits du type *unilay* jusqu'à 500mm².

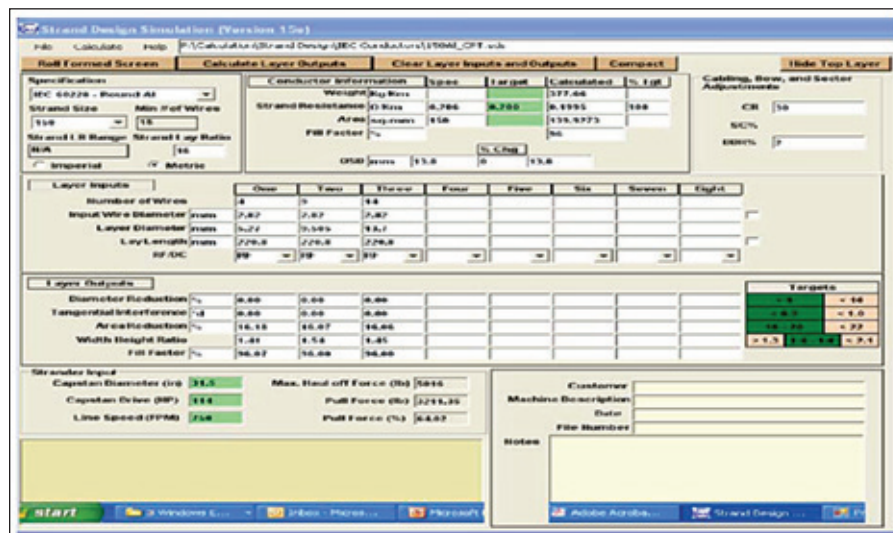
L'analyse statistique des torons compacts avec des méthodes (filières ou rouleaux)

autres que le système de profilage, a montré qu'un écart typique de matériau allant de ± 1% à ± 1,5% doit être prévu. Par conséquent, ces résultats entraînent la nécessité de surdimensionner les conducteurs d'au moins 3% afin d'assurer que le produit ne descende pas en dessous de la valeur de spécification. Cet excès de matériau est effectivement donné aux clients gratuitement.

Lors de l'utilisation du système de profilage de Ceeco Bartell avec son logiciel de conception de torons, la variance du matériau est réduite radicalement. Offrir une économie de matériau réelle et très concrète par rapport aux méthodes de compactage classiques, est particulièrement important compte tenu du coût actuel de l'aluminium et du cuivre. Cela signifie que l'on peut réaliser les diamètres minimaux spécifiés dans les normes IEC et ASTM tout en s'approchant de la résistance maximale sans toutefois la dépasser.

En raison de la grande variété de torons utilisés dans l'industrie, Ceeco Bartell a développé un modèle mathématique pour permettre la conception assistée de torons. Ce modèle utilise des données théoriques et quantitatives qui permettent de prévoir la résistance du

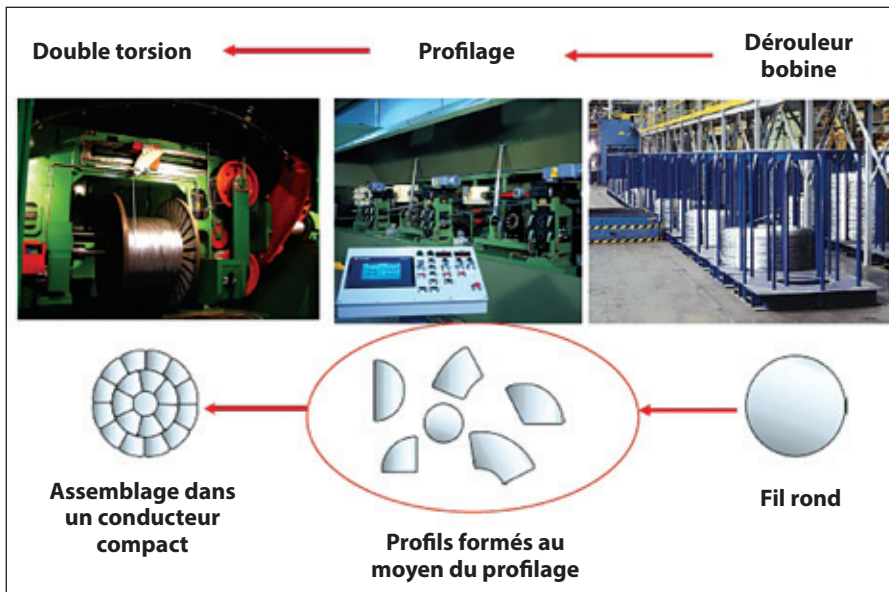
▼ Figure 2: Résultat simulateur toron pour toron compact de 150mm²



▼ Figure 3



Analyse économique du produit XLPE de 95mm ²			
Facteur de remplissage	86%	92%	96%
Configuration	1=6=13	1=6=11	2=6=9
Diamètre extérieur (mm)	11.7	11.39	11.07
Zone externe des espaces (mm²)	15.88	0.710	0.663
Coût de l'isolement (US\$/km)	131.35	109.55	106.83



▲ Figure 4

toron. Ce programme analyse plus à fond la géométrie du toron pour optimiser les performances de la machine. Le résultat est une anticipation précise de la résistance du toron fini.

La Figure 2 illustre une section transversale d'un toron de 150mm², en montrant comment ce programme assiste le développement de la conception de toron optimale.

Ce programme de profilage fournit le majeur potentiel car il dispose du modèle pour le diamètre de torons le plus petit pour une section de toron spécifique. Par conséquent, cela représente également le plus grand potentiel en termes d'économies d'isolation pour une épaisseur d'isolation donnée.

Cela peut être clairement remarqué à la Figure 3 qui met en évidence l'isolant économisé pendant la réalisation de produits en XLPE de 95mm² avec des facteurs de remplissage allant de 86% à 96%. Au fur et à mesure que le conducteur devient plus petit et que les interstices disparaissent, les utilisations de l'isolation seront également réduites.

Un facteur de remplissage de 92% représente le meilleur compactage pouvant être obtenu en utilisant des procédés classiques. Cependant, avec le processus de profilage, 96% du facteur de remplissage peut être réalisé avec pour résultat une économie potentielle d'environ 2%.

La productivité de l'extrudeuse repose en partie sur l'intégrité de la structure du toron. Cela étant également valable pour les extrusions à faible, moyenne et haute tension. Une structure instable du toron compromet non seulement la

vitesse des processus de toronnage et d'extrusion, mais peut conduire à des pertes considérables dues à la ferraille et aux temps d'arrêt pour les deux lignes.

La déformation en panier est souvent le résultat de la conception d'un toron instable. Un conducteur étroitement enroulé risque moins de présenter une déformation en panier. La compacité du toron dépend fortement de la géométrie des éléments, raison pour laquelle le pas du conducteur est important. Les composants de conducteurs du type unilay/à pas unidirectionnel sont emboîtés et, par conséquent, ont intrinsèquement un diamètre extérieur inférieur à celui des conducteurs à torsion concentrique inverse et des conducteurs SZ.

En outre, les conducteurs du type unilay/à torsion unidirectionnelle sont autoserrants sous tension. En conséquence de cette fonctionnalité d'auto-serrage, l'extrusion des conducteurs du type unilay/à torsion unidirectionnelle est statistiquement moins sujette à la déformation en panier.

La surface du toron est également critique. Une couche extérieure lisse telle que celle formée avec une couche profilée présente un profil net et rond dans le processus d'extrusion et, par conséquent, réduit au maximum l'accumulation de poussière dans le conducteur au cours du processus d'extrusion.

Le processus est illustré à la Figure 4. Le fil rond est tiré de bobines de grandes dimensions et passe à travers la section profilée où sa forme est transformée en différents profils de profilage qui sont ensuite assemblés à haute vitesse soit par une machine à double torsion ou par une machine à simple torsion, en fonction des dimensions du produit.

Ce processus continu à haute vitesse permet d'atteindre des vitesses linéaires de 200m/min, tout en produisant des conducteurs extrêmement compacts. La toronneuse de profilage est en mesure de produire 40 tonnes de conducteurs compacts en aluminium de 150mm² pendant un cycle de 24 heures.

Conclusions

La réduction des coûts de production dépend de nombreux facteurs tels que: les installations de fabrication existant déjà, le fait que le toron soit habituellement fabriqué dans l'entreprise ou bien acheté, le soin apporté ainsi que le contrôle effectué sur le fil d'alimentation en cuivre ou en aluminium, la gestion générale et le contrôle des toronneuses à double torsion à haute vitesse.

Dans les conditions les plus avantageuses, les économies réalisées peuvent entraîner des délais de retour sur investissement extrêmement courts, mais il est évident que les calculs doivent être effectués pour chaque application.

Les hautes performances des toronneuses avec profilage associées au processus de profilage breveté par Ceeco Bartell permettront aux fabricants de câbles de réduire les coûts sans compromettre les performances des conducteurs finis.

Prendre conscience de cette technologie ainsi que des autres avancées technologiques associées à des spécifications spéciales permettra de renforcer davantage le développement de la conception du toron et de continuer à optimiser la fabrication de conducteurs toronnés. ■

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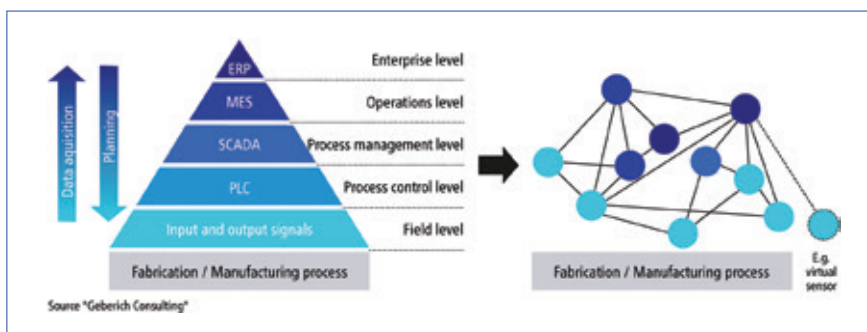
Strumenti di misura Zumbach ora con piattaforma di comunicazione universale OPC UA

Zumbach sta dotando i propri potenti strumenti con la piattaforma di comunicazione universale riconosciuta OPC UA. Mediante questa tecnologia chiave, le soluzioni di misura possono fornire uno scambio di informazioni facile, scalabile e sicuro con diversi sistemi della linea di produzione (uno scambio di dati indipendente dalle piattaforme e dal costruttore).

Sarà così possibile impostare i dati del campo di misura delle dimensioni, del profilo e del diametro per i nuovi servizi Industry 4.0. Grazie alla nuova piattaforma di comunicazione universale OPC UA, gli strumenti soddisfano i requisiti tecnici per la messa in rete intelligente dei dati.

Zumbach ha dotato i suoi potenti strumenti di misura con il protocollo OPC UA che assicura uno scambio di informazioni semplice, scalabile e sicuro tra diversi sistemi di linea di produzione, indipendentemente dalla piattaforma o dal produttore.

Mediante un software è possibile effettuare l'interconnessione ad una piattaforma di uscita, la raccolta, la visualizzazione e l'analisi di tutti i dati di misura M2M (tra macchina a macchina) o M2H (tra macchina e uomo) ottenuti. La piattaforma di comunicazione universale OPC UA facilita l'integrazione orizzontale e verticale tra i vari livelli della piramide di



▲ Generazione dati, diagnosi e azioni reattive avvengono su un'unica piattaforma. La trasparenza generata riduce i tempi di reazione in caso di deviazioni e, alla fine, si traduce in un notevole miglioramento della qualità

automazione. Ciò significa che i requisiti per l'automazione industriale e i futuri scenari di comunicazione semantica di Industry 4.0 e IoT (Internet degli oggetti) sono già stati soddisfatti.

OPC è il protocollo di comunicazione più diffuso nel campo dell'automazione, ma è tecnologicamente neutrale per l'industria e può funzionare su qualsiasi sistema operativo.

La comunicazione tra gli equipaggiamenti dell'impianto avviene in modo affidabile, sicuro ed è indipendente dal costruttore.

Essendo uno dei primi produttori di apparecchiature per la misurazione e il monitoraggio in linea, Zumbach ha integrato il protocollo di comunicazione OPC UA nei propri sistemi computerizzati

con protocollo di comunicazione Host (ad esempio nella serie di sistemi di misurazione del profilo Profilemaster®, nei sistemi di misurazione per laminatoi a caldo e nei processi a freddo Steelmater nonché la serie USYS IPC per la registrazione di dati universali, sistemi di elaborazione e di visualizzazione e altro ancora).

Il server OPC UA è inoltre disponibile come software gateway esterno per dispositivi di misura con microprocessore e protocollo di comunicazione Host (strumenti di misura del diametro a laser ODAC®, sistemi di misura dell'ovalità e del diametro MSD, spark tester, scatole di interfaccia computerizzate, ecc.).

Zumbach Electronic AG – Svizzera
Website: www.zumbach.com

Nuovo responsabile commerciale di zona per il Sud America

Alfredo Torres è il nuovo responsabile commerciale di zona per i paesi del Sud America del gruppo Niehoff.

Torres possiede una laurea in ingegneria dei processi di produzione e ha maturato una vasta esperienza in diversi settori industriali come il settore automobilistico e l'industria del filo e del cavo, dove ha lavorato tra l'altro nell'ambito della ricerca e dello sviluppo, dell'ingegneria e della manutenzione e dello sviluppo di tutti i tipi di cavi.

Torres ha inoltre acquisito una conoscenza generale del settore lavorando come responsabile commerciale di zona per l'America Latina con particolare riguardo all'installazione e alla messa in servizio di macchinari, all'assistenza tecnica preventiva e post vendita, nonché allo sviluppo dei processi di fabbricazione di fili e cavi e allo sviluppo integrale di impianti per fili e cavi.

In collaborazione con l'agente cileno di Niehoff, Rheintek Chile Limitada, Torres si occuperà dei clienti del Sud America, Bolivia, Cile, Colombia, Ecuador, Perù e Venezuela commercializzando la gamma di macchinari di Niehoff Germania. Il suo secondo campo di attività consisterà nella vendita di tutti i macchinari realizzati presso Niehoff-Herborn Máquinas Ltda in Brasile, supportando la filiale brasiliana nella propria area di vendita.

Maschinenfabrik Niehoff & Co KG – Germania
Website: www.niehoff.de



▲ Alfredo Torre, nuovo responsabile commerciale di zona per il Sud America

Un Deputato visita lo stabilimento di Davis-Standard

Davis-Standard ha accolto Joe Courtney, Deputato degli Stati Uniti del secondo distretto del Connecticut, presso la propria sede di Pawcatuck.

Il Deputato Courtney e l'agente del Congresso Tajjah Anderson hanno visitato il sito per conoscere meglio la tecnologia di Davis-Standard, l'impatto economico sulla regione e sapere di più sulla prossima espansione dello stabilimento di Pawcatuck.

Il presidente e CEO della società Jim Murphy e altri dirigenti di Davis-Standard hanno offerto una panoramica e una visita agli impianti di Davis-Standard per avere un'idea della straordinaria crescita globale della società, illustrando le caratteristiche dello stabilimento e il portafoglio diversificato dei propri equipaggiamenti.

"L'attività dello stabilimento di Davis-Standard è straordinaria ed è stato un onore visitare l'impianto di Pawcatuck", ha dichiarato il Deputato Courtney. "La pulizia dell'officina, le avanzate pratiche di produzione e l'impegno dei dipendenti sono davvero ammirevoli. "Siamo molto orgogliosi di Davis-Standard e del forte impulso economico che la società continua a fornire al sud-est del Connecticut."



▲ Il Deputato Joe Courtney a sinistra e il presidente e CEO di Davis-Standard Jim Murphy in visita nello stabilimento di Pawcatuck

Murphy ha aggiunto: "Abbiamo apprezzato la visita del Deputato Courtney e apprezziamo il suo sostegno all'industria manifatturiera. Lo scorso anno, il Congresso ha approvato un piano di sgravio fiscale per la ricerca e lo sviluppo che è stato utile per aiutarci a dare impulso alle nostre innovazioni tecnologiche. Apprezziamo anche il supporto del Deputato per l'espansione di Pawcatuck, che offrirà dello spazio supplementare per fabbricare pellicole soffiato, nostra attività in espansione."

Davis-Standard amplierà di 15.000ft² (ca. 1.393m²) l'area di produzione e creerà oltre 30 posti di lavoro nei prossimi due anni nella sua sede centrale di Pawcatuck, che

attualmente impiega oltre 400 persone. L'ampliamento ospiterà il reparto di fabbricazione e di lavorazione meccanica di precisione di matrici per pellicole soffiato multistrato all'avanguardia.

Inoltre, Davis-Standard potrà trasferire tutta la produzione di pellicole soffiato per la propria linea di prodotti di Gloucester Engineering da Gloucester, Massachusetts, a Pawcatuck.

Davis-Standard opera nell'area sud orientale del Connecticut dal 1848 ed è una delle aziende più antiche e più importanti della regione sudorientale del Connecticut e della regione sudoccidentale di Rhode Island.

L'espansione dello stabilimento di Pawcatuck rafforza l'impegno della società nei confronti della regione locale.

Grazie alla sua posizione consolidata come leader di mercato, la società è considerata il "Centro di Eccellenza" del settore della tecnologia di estrusione del Connecticut. Oltre all'impianto di Pawcatuck, Davis-Standard possiede impianti di produzione e filiali negli Stati Uniti, in Europa e in Asia.

Davis-Standard – Stati Uniti
Website: www.davis-standard.com

Freni a regolazione continua

Magnetic Technologies Ltd offre una varietà di freni per avvolgitori e avvolgitori.

I suoi freni a regolazione continua forniscono un controllo della tensione estremamente preciso e sono disponibili in diverse dimensioni per adattarsi alle bobine e ai rocchetti dei clienti.

La coppia motrice sviluppata magneticamente, resta costante nel tempo e presenta un intervallo da 0,11" once a 320" libbre (da 7,8x10⁻⁴Nm a 36,16Nm).

Fra i vantaggi possiamo citare la regolabilità, la portabilità, e un ingombro minimo. Ciascun freno o frizione è accuratamente progettato per ottenere una durata eccezionale, anche nel caso degli standard di produzione più esigenti.

La loro progettazione garantisce una facile installazione, manutenzione o modifica in caso di necessità.

La società dispone di scorte di pezzi di ricambio per tutti i prodotti ed effettua qualsiasi riparazione necessaria internamente presso lo stabilimento dell'azienda di Oxford, Massachusetts. Diversi modelli sono dotati di cuscinetti a rulli conici per sostenere carichi radiali pesanti.

Howard Schwerdlin, direttore commerciale, ha dichiarato: "Basandoci sull'elevata affidabilità dei nostri freni elettrici ad isteresi, abbiamo sviluppato un regolatore di alimentazione a corrente costante che utilizza un computer interno per regolare in continuo la coppia frenante a mano a mano che diminuisce il diametro della bobina di alimentazione durante lo svolgimento, utilizzando una sonda ultrasonica per misurare il diametro della bobina."

"Il regolatore prevede curve coppia motore-corrente per tutte le 10 misure di freni e la logica per fornire al freno corrente costante nel tempo. È possibile effettuare il controllo di più freni



▲ Nuovo regolatore di alimentazione a corrente costante sviluppato da Magnetic Technologies

mediante un unico alimentatore.

"Grazie al controllo mediante pannello a sfioramento diretto, l'operatore deve solamente inserire la tensione desiderata in unità imperiali o metriche. I modelli sono disponibili a stazione singola o a più stazioni.

"Per le applicazioni che non richiedono una tensione costante, è inoltre disponibile una serie di avvolgitori a bobina singola o multipla."

Magnetic Technologies Ltd – Stati Uniti
Website: www.magnetictech.com

Produzione di conduttori compatti, con particolare riguardo ai vantaggi e alle potenziali riduzioni di costo nell'intero processo di trefolatura

A cura di Sean Harrington, Ceeco Bartell Machine Systems LLC

Introduzione

In definitiva, tutti i produttori di cavi puntano a realizzare un prodotto di qualità utilizzando la minor quantità di risorse nel minor tempo possibile.

A tal fine, devono capire quali sono i parametri critici che influenzano il trefolo che desiderano realizzare. Una volta fatto questo, trovare l'hardware per fornire loro il processo più flessibile ed efficace è relativamente facile.

L'obiettivo del presente articolo è di presentare una soluzione tecnologica per il processo di fabbricazione di conduttori compatti, che offra una riduzione dei costi, dal processo di trafilatura al cablaggio e fino al processo di estrusione. Si tratta dell'utilizzo di una tecnologia di profilatura che consente di impiegare un filo di alimentazione di un unico diametro per l'intero processo di trefolatura con conseguenti risparmi e vantaggi significativi.

Normalmente, un conduttore a più fili finito richiede uno specifico diametro di filo trafilato. In genere, ciascun diametro di filo richiede un nuovo inflaggio nella trafilatrice. Alcune strutture di conduttori richiedono più di una sezione di filo trafilato.

Analogamente, il processo di trefolatura richiede varie regolazioni per ogni dimensione di conduttore.

Il tempo di allestimento richiesto dalle trafilatrici e dalle trefolatrici, associato ai livelli delle scorte necessarie per gestire i vari diametri di filo, rientra fra le attività superflue che aumentano il costo di conversione dalla vergella al trefolo.

La tecnologia SIW (*single input wire*) consente di eliminare efficacemente molte di queste attività inutili associate all'allestimento tradizionale mediante l'utilizzo dello stesso diametro di filo trafilato per completare una serie di conduttori a più fili con i seguenti risultati:

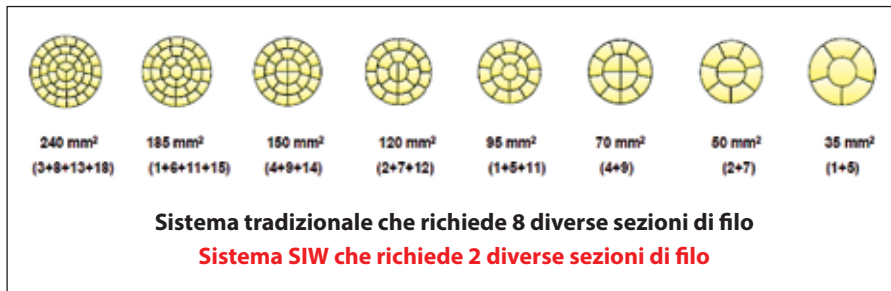
- Aumento della produzione di filo trafilato
- Riduzione delle scorte di filiere per trafilatura di filo
- Riduzione degli scarti
- Considerevole riduzione del materiale in corso di lavorazione
- Riduzione al minimo dei cambi di aspo della trefolatrice
- Aumento del rendimento della trefolatrice
- Riduzione dei tempi di esecuzione
- Miglioramento della metodologia di produzione *just in time*
- Razionalizzazione dell'intero processo di trefolatura

Tuttavia, probabilmente, il punto più importante è rappresentato dalla significativa riduzione delle variabili che il costruttore deve gestire nella fabbricazione in qualsiasi programma di trefolatura.

Il cambiamento di metodologia richiesto per utilizzare efficacemente un singolo diametro di filo trafilato nella produzione della gamma richiesta di conduttori a più fili finiti, consiste nel sostituire la flessibilità di trefolatura dello stesso numero di fili utilizzando diametri diversi con la trefolatura di un numero variabile di fili utilizzando lo stesso diametro di filo.

In generale, i benefici della tecnologia SIW sono indipendenti dal processo di fabbricazione di trefoli utilizzato. Solamente dopo aver definito le strutture specifiche del trefolo e una volta determinati i requisiti di produzione di tali strutture, è possibile considerare la scelta della cella di produzione ottimale.

Va notato che il concetto di utilizzare un unico filo d'ingresso per produrre una gamma di dimensioni di conduttori finiti non è nuovo. Infatti, viene utilizzato nella maggior parte degli impianti di produzione entro le tolleranze ammesse dalle specifiche correnti. Questo concetto è stato ampiamente utilizzato in Europa,



▲ **Figura 1**

dove i programmi di trefolatura, che utilizzano un solo diametro di filo in ingresso per coprire una gamma di dimensioni di conduttori finiti, sono in vigore da decenni.

Le potenziali riduzioni di costo risultanti dall'utilizzo di questo processo possono essere suddivise nelle seguenti aree:

- Risparmi nei processi
- Risparmi di materiale

Risparmi nei processi

L'impatto evidente dell'integrazione della tecnica di profilatura nel processo di trefolatura è illustrato nella *Figura 1*.

Sebbene ancora vincolato nell'ambito delle norme IEC e ASTM, il processo di profilatura consente una drastica riduzione del numero di fili richiesti per produrre una serie di conduttori. In questo caso, per coprire la gamma da 35mm² a 240mm² il numero di fili è stato ridotto da 8 a 2.

Analogamente, per la gamma da 35mm² a 500mm² è possibile ridurre il numero di fili da 12 a 3.

La riduzione del numero necessario di sezioni di filo comporta notevoli risparmi sui costi nel settore della trafilatura e più in particolare:

- Genera una maggiore produttività della macchina di trafilatura grazie all'eliminazione di allestimenti molteplici per i vari diametri di filo necessari per le strutture di trefolo tradizionali
- Riduce la quantità di scarto di filo trafilato mediante il cambio di sezione del filo
- Determina una riduzione delle giacenze di filiere per trafilatura

Analogamente, il processo di profilatura ha un impatto sul risparmio dei costi nel processo di trefolatura come segue:

- Riduzione del volume delle diverse sezioni di filo prodotto in attesa del processo di trefolatura
- Possibilità di utilizzare matasse di dimensioni maggiori e di passare da un sistema a bobina a un sistema con avvolgitore di matasse

- Riduzione dei tempi morti dovuti al carico, con la possibilità di cambio dello svolgitore automatico mentre la macchina è in funzione
- Allestimenti più rapidi per diverse dimensioni di trefolo grazie all'eliminazione del movimento di svolgitori di diverse dimensioni
- Velocità di produzione lineari più elevate, rispetto ai metodi convenzionali di trefolatura
- Riduzione dei livelli di manodopera nel processo di trefolatura

Risparmi di materiale

La sfida per i produttori di oggi consiste nel determinare quale obiettivo scegliere nell'ambito delle specifiche.

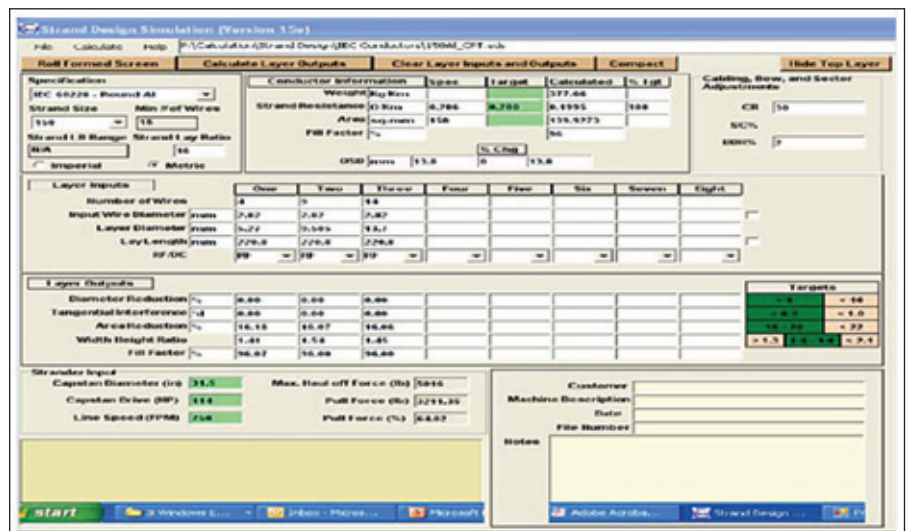
Se i criteri per determinare la costruzione del conduttore fossero basati esclusivamente su aspetti economici, l'industria graviterebbe intorno al modello del conduttore del tipo unilay e del diametro più piccolo consentito nell'ambito di tale modello. Il processo di profilatura consente la realizzazione di prodotti del tipo unilay fino a 500mm².

L'analisi statistica dei trefoli compattati con metodi (trafile o rulli) diversi dal sistema di profilatura, ha dimostrato che deve essere prevista una tipica varianza del materiale da ±1% a ±1,5%.

Pertanto, questi risultati implicano la necessità di sovradimensionare i conduttori di almeno il 3% per assicurare che il prodotto non scenda sotto il valore di specifica. Questo materiale in eccesso viene, di fatto, dato ai clienti gratuitamente.

Quando si utilizza il sistema di profilatura Ceeco Bartell con il relativo software di progettazione per trefoli, la varianza del materiale si riduce drasticamente. Offrire un risparmio di materiale reale e molto tangibile rispetto ai metodi di compattazione convenzionali, è particolarmente importante con il costo attuale dell'alluminio e del rame.

▼ **Figura 2: Risultato simulatore trefolo per trefolo compatto da 150mm²**



▼ **Figura 3**



Analisi economica del prodotto XLPE da 95mm ²			
Fattore di riempimento	86%	92%	96%
Configurazione	1=6=13	1=6=11	2=6=9
Diametro esterno (mm)	11.7	11.39	11.07
Area esterna degli spazi (mm²)	15.88	0.710	0.663
Costo dell'isolamento (US\$/km)	131.35	109.55	106.83



▲ Figura 4

Ciò significa che si possono realizzare i diametri minimi specificati nelle norme IEC e ASTM, e contemporaneamente avvicinarsi ma non superare la resistenza massima.

A causa della grande varietà di trefoli utilizzati nel settore, Ceeco Bartell ha sviluppato un modello matematico per consentire la progettazione assistita dei trefoli. Questo modello utilizza dati teorici e quantitativi che permettono di effettuare la previsione della resistenza del trefolo. Questo programma analizza ulteriormente la geometria del trefolo per ottimizzare le prestazioni della macchina. Il risultato è una previsione accurata della resistenza del trefolo finito.

La Figura 2 illustra una sezione trasversale di un trefolo da 150mm², mostrando come questo programma assiste lo sviluppo della progettazione ottimale del trefolo. Il programma di profilatura presentato offre il maggiore potenziale in quanto dispone del modello per il diametro di trefolo più piccolo per una sezione di trefolo specifica. Di conseguenza, ciò rappresenta anche il maggiore potenziale di risparmio nell'isolamento per un dato spessore di isolamento.

Ciò può essere visto chiaramente nella Figura 3, che mostra il risparmio nell'isolante durante la realizzazione di un prodotto in XLPE da 95mm² con fattori di riempimento che vanno dal 86% al 96%. A mano a mano che il conduttore si riduce di dimensione e gli interstizi scompaiono, si riducono anche gli utilizzi dell'isolamento.

Un fattore di riempimento pari al 92% è la miglior compattazione che si possa ottenere con i metodi convenzionali. Tuttavia, con il processo di profilatura è possibile ottenere un fattore di

riempimento del 96% con un potenziale risparmio di materiale di circa il 2%.

La produttività dell'estrusore si basa in parte sull'integrità della struttura del trefolo. Ciò vale anche per le estrusioni a bassa, media e alta tensione. Una struttura instabile del trefolo non solo pregiudica la velocità dei processi di trefolatura ed estrusione, ma può provocare notevoli perdite a causa dei rottami e dei tempi passivi per entrambe le linee.

La distorsione a canestro è spesso il risultato della progettazione di un trefolo instabile. Un conduttore strettamente avvolto ha minore probabilità di presentare una distorsione a canestro. La compattezza del trefolo dipende notevolmente dalla geometria dei componenti, ragione per la quale il passo del conduttore è importante. I componenti dei conduttori del tipo unilay/con torsione unidirezionale sono annidati e quindi, hanno intrinsecamente un diametro esterno inferiore a quello dei conduttori con torsione concentrica inversa e dei conduttori SZ.

Inoltre, i conduttori del tipo unilay/con torsione unidirezionale si serrano autonomamente sotto tensione. Grazie a questa caratteristica di auto-serraggio, l'estrusione di conduttori del tipo unilay/con torsione unidirezionale è statisticamente meno soggetta alla distorsione a canestro.

Anche la superficie del trefolo è critica. Uno strato esterno liscio come quello fornito con uno strato profilato, presenta un profilo rotondo netto al processo di estrusione e, di conseguenza, riduce al minimo l'accumulo di polvere nel conduttore durante il processo di estrusione.

Il processo è illustrato nella Figura 4. Il filo tondo viene prelevato da pacchetti di matasse di grandi dimensioni e passa attraverso la sezione profilata in cui la sua forma viene trasformata in vari profili di profilatura che vengono poi assemblati ad alte velocità da una macchina a doppia torsione o da una macchina a singola torsione, in funzione delle dimensioni del prodotto.

Questo processo continuo ad alta velocità consente di raggiungere velocità lineari di 200m/min e di produrre allo stesso tempo conduttori estremamente compatti. La trefolatrice di profilatura è in grado di produrre 40 tonnellate di conduttori di alluminio compatti da 150mm² in un ciclo di 24 ore.

Conclusioni

La riduzione dei costi di produzione dipende da numerosi fattori quali gli stabilimenti di produzione già esistenti, dal fatto che il trefolo sia correntemente prodotto all'interno dell'azienda o acquistato, dalla cura e dal controllo effettuati sul filo di alimentazione di rame e di alluminio, dalla gestione generale e dal controllo delle trefolatrici a doppia torsione ad alta velocità.

Nelle condizioni più favorevoli, i risparmi possono comportare dei tempi di ammortizzazione estremamente brevi, ma i calcoli dovrebbero essere ovviamente effettuati per ciascuna applicazione.

Le elevate prestazioni delle trefolatrici con profilatura, associate al processo di profilatura brevettato da Ceeco Bartell, permetteranno ai fabbricanti di cavi di ridurre i costi senza compromettere le prestazioni dei conduttori finiti.

La consapevolezza di questa e di altre nuove tecnologie, associata a specifiche mirate contribuirà a sviluppare ulteriormente la progettazione del trefolo e la possibilità di continuare a ottimizzare la fabbricazione di conduttori a più fili. ■

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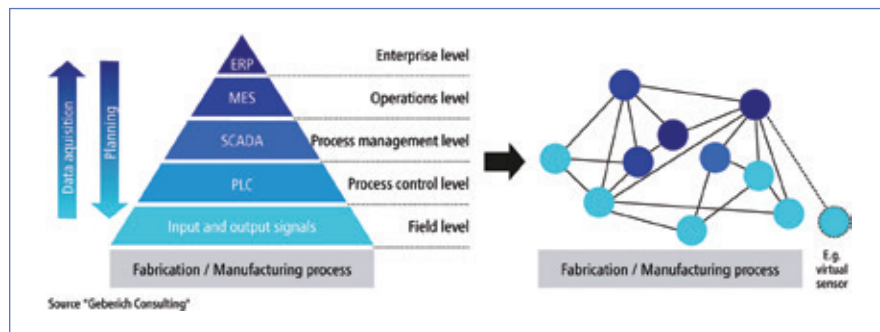
Instrumentos de medida Zumbach ahora con arquitectura unificada OPC

Zumbach está equipando sus potentes instrumentos con el reconocido estándar de arquitectura unificada OPC. Con esta tecnología clave las soluciones de medida ofrecen un intercambio de información fácil, escalable y seguro con distintos sistemas en la línea de producción (intercambio de datos independiente de la plataforma y del fabricante).

Será posible preparar los datos de campo de medida de dimensión, perfil y diámetro para los servicios de la nueva Industria 4.0. Los instrumentos que disponen del nuevo estándar de arquitectura unificada OPC cumplen los requisitos técnicos para las redes de datos inteligentes.

Zumbach ha equipado sus potentes instrumentos de medida con arquitectura unificada OPC, la cual garantiza un intercambio de información simple, escalable y seguro entre distintos sistemas de la línea de producción, cualquiera que sea la plataforma o el fabricante.

Mediante un software es posible interconectar a una plataforma de salida, recoger, mostrar en pantalla y analizar todas las medidas M2M (máquina a máquina) o M2H (máquina a humano) obtenidas. El estándar de arquitectura unificada OPC facilita la integración horizontal y vertical a varios niveles de la pirámide de automatización. Esto significa



▲ Salida de datos, diagnóstico y acciones reactivas en una sola plataforma. La transparencia generada acorta los tiempos de reacción en caso de desvíos y, además, genera un importante aumento de la calidad.

que los requisitos para la automatización industrial y los futuros escenarios de comunicación semántica de Industria 4.0 e IoT (Internet of Things) ya se han cumplido.

OPC es el protocolo de comunicación más difundido en el campo de la automatización, pero desde el punto de vista tecnológico es neutral para la industria y puede funcionar en cualquier sistema operativo. La comunicación entre los equipos de la planta se realiza de manera fiable, segura e independiente del fabricante.

Siendo uno de los primeros fabricantes de equipos para medidas en línea y monitorización, Zumbach ha incorporado el estándar de arquitectura unificada OPC en sus sistemas basados en pc con protocolo de comunicaciones con *hosts*

(ej. en la serie de sistemas de medida de perfiles Profilemaster®, en los sistemas de medida para trenes de laminación en caliente y procesos en frío Steelmater, además de la serie IPC USYS para registro de datos universales, sistemas de procesamiento y visualización y muchos otros).

El servidor de arquitectura unificada OPC está disponible además como software de pasarela externa para los dispositivos de medida con microprocesador y protocolo de comunicaciones con *hosts* (instrumentos de medida de diámetro con láser ODAC®, sistemas de medida de ovalidad y diámetro MSD, probadores de chispa, cajas de interfaz con los ordenadores, y más).

Zumbach Electronic AG – Suiza
Website: www.zumbach.com

Nuevo gerente de ventas para Sudamérica

Alfredo Torres está trabajando en el grupo Niehoff como nuevo gerentes de ventas para los países de Sudamérica.

El Sr. Torres tiene el título de ingeniero en procesos de fabricación y ha adquirido amplia experiencia en distintos sectores industriales como el automotriz y el del cable y alambre donde ha trabajado en campos como el de I&D, ingeniería y mantenimiento y en el desarrollo de todo tipo de cables.

Trabajando como gerente de zona para Latinoamérica donde se dedicaba a la instalación y puesta en marcha de maquinaria, asistencia técnica pre y post venta, además de al desarrollo de procesos de fabricación de cable y alambre y al desarrollo integral de plantas de cable y alambre, ha adquirido un conocimiento general del sector.

En colaboración con la agencia chilena de Niehoff, Rheintek Chile Limitada, el Sr. Torres se ocupará de los clientes de Sudamérica, en Bolivia, Chile, Colombia, Ecuador, Perú y Venezuela comercializando la gama de maquinaria de Niehoff Germany. Asimismo, se encargará de las ventas de toda la maquinaria fabricada en Niehoff-Herborn Máquinas Ltda, de Brasil, sirviéndoles de apoyo en su zona de ventas.

Maschinenfabrik Niehoff & Co KG – Alemania
Website: www.niehoff.de



▲ Alfredo Torres, nuevo gerente de ventas para Sudamérica

Diputado visita la planta de Davis-Standard

Davis-Standard recibió a Joe Courtney, diputado americano del segundo distrito de Connecticut, en su oficina central de Pawcatuck.

El diputado Courtney y la agente del Congreso Tajah Anderson visitaron la planta para conocer la tecnología de Davis-Standard, el impacto económico en la zona y saber más sobre la próxima expansión de la planta de Pawcatuck.

Jim Murphy, presidente y CEO de la empresa, y otros dirigentes de Davis-Standard ofrecieron una visión general y una visita a la planta de Davis-Standard con la que hacerse una idea del impresionante crecimiento global de la empresa, ilustrando detalles sobre la planta y la variedad de sus equipos.

«El funcionamiento de la planta de Davis-Standard es asombroso. Fue un honor visitar la planta de Pawcatuck,» comentó el diputado Courtney. «La pulcritud del piso de mecanizado, las prácticas de fabricación avanzadas y el compromiso de los empleados es algo realmente digno de contemplar. «Nos sentimos muy orgullosos de Davis-Standard y del fuerte impulso económico que siguen dándole al sureste de Connecticut.»



▲ El diputado Joe Courtney, a la izquierda, y Jim Murphy, presidente y CEO de Davis-Standard, durante su visita a la fábrica de Pawcatuck

El Sr. Murphy añadió: «Hemos disfrutado con la visita del diputado Courtney y apreciamos su apoyo a la industria manufacturera. El año pasado el Congreso aprobó un plan de desgravación fiscal para I&D que nos ha ayudado a impulsar nuestros avances tecnológicos. Asimismo, apreciamos el apoyo del diputado a la expansión de Pawcatuck, que ofrecerá espacio adicional para fabricar películas de soplado, nuestro creciente negocio.»

Davis-Standard va a añadir unos 15.000ft² (aprox. 1.393m²) de espacio útil para la producción y a crear más de 30 puestos de trabajo en los próximos dos años en su sede central de Pawcatuck, donde

ya cuenta con más de 400 empleados. El nuevo espacio disponible estará dedicado a la producción y mecanizado de precisión de hileras para películas de soplado de varias capas.

Además, Davis-Standard podrá desplazar toda la producción de películas de soplado para su línea de producción de Gloucester Engineering de Gloucester, en el estado de Massachussets, a Pawcatuck.

Davis-Standard lleva fabricando en el sureste de Connecticut desde 1848 y es una de las empresas más antiguas y grandes del sureste de Connecticut y suroeste de Rhode Island.

La expansión de la sede de Pawcatuck fortalece el compromiso contraído por la empresa con la zona.

Gracias a su posición de líder del mercado durante muchos años, es considerada «centro de excelencia» del sector de tecnología de extrusión de Connecticut. Además de la planta de Pawcatuck, Davis-Standard tiene fábricas y subsidiarias en Estados Unidos, Europa y Asia.

Davis-Standard – Estados Unidos
Website: www.davis-standard.com

Frenos de ajuste continuo

Magnetic Technologies Ltd comercializa una gama de frenos para desenrolladores y enrolladores. Sus frenos son de ajuste continuo, lo que ofrece un control de tensión de máxima precisión, y están disponibles en varios tamaños para adaptarse a las bobinas y carretes de los clientes.

El par motor se genera magnéticamente y permanece invariado año tras año. El par motor va desde 0,11" onzas hasta 320" libras (desde $7,8 \times 10^{-4}$ Nm hasta 36,16 Nm). Entre las ventajas se pueden citar ajustabilidad, portabilidad y espacio mínimo.

Cada freno o embrague es diseñado atentamente para conseguir una duración excepcional, incluso para los niveles de producción más exigentes.

Son diseñados para ser montados y asistidos mecánicamente o modificados fácilmente, en caso de necesidad. La empresa almacena piezas de repuesto de todos sus productos y efectúa

todas las reparaciones necesarias internamente en la fábrica de la empresa en Oxford, Massachusetts. Varios modelos tienen rodamientos de rodillos cónicos para soportar las cargas radiales pesadas.

Howard Schwerdlin, director de ventas, declaró: «Basándonos en la alta fiabilidad de nuestros frenos eléctricos de histéresis, hemos desarrollado un controlador de suministro de corriente constante que usa un ordenador interno para ajustar constantemente el par del freno a medida que disminuye el diámetro de la bobina de alimentación durante el desenrollado utilizando una sonda ultrasónica para medir el diámetro de la bobina.»

«El controlador incorpora las curvas par motor-corriente para todos los 10 tamaños de frenos y a la lógica para suministrarle al freno una corriente constante en el tiempo. Se pueden controlar varios frenos con una sola fuente de alimentación.»



▲ Controlador de suministro de corriente constante desarrollado por Magnetic Technologies

«Gracias al control directo a través de panel táctil, el operador solo tiene que introducir la tensión deseada en unidades imperiales o métricas. Los diseños están disponibles en distintas versiones, de una estación o de varias estaciones.»

«Para aplicaciones que no requieren tensión constante, también hay una serie de caballetes desenrolladores de una a varias bobinas.»

Magnetic Technologies Ltd – Estados Unidos
Website: www.magnetictech.com

Fabricación de conductores compactos, destacando los beneficios y las reducciones potenciales de costes en todo el proceso de trenzado

Por Sean Harrington, Ceeco Bartell Machine Systems LLC

Introducción

Por lo general, todos los fabricantes de cables desean obtener un producto de calidad usando la menor cantidad posible de recursos en el menor tiempo posible. Para ello, deben comprender cuáles son los parámetros críticos que afectan a la trenza que desean producir. Una vez entendido esto, encontrar un hardware que les permita llevar a cabo el proceso de la manera más flexible y eficaz es relativamente fácil.

El objetivo de este artículo es presentar una solución tecnológica para el proceso de fabricación de conductores compactos, que permita ahorrar en el proceso de trefilado de alambre hasta el trenzado y el proceso de extrusión. La solución consiste en el uso de la tecnología de conformado con rodillos que permite utilizar un solo diámetro de alambre para todo el proceso de trenzado con significativos ahorros y ventajas para el proceso.

Normalmente, un conductor trenzado acabado requiere un determinado diámetro de alambre trefilado. Por lo general, cada diámetro de alambre requiere un enhebrado diferente de la trefiladora. Algunos diseños de conductores requieren varios diámetros de alambre trefilado.

Además, el proceso de trenzado requiere varias regulaciones para cada tamaño de conductor. El tiempo de preparación de las máquinas de trefilado y trenzado, junto con los niveles de inventario requeridos para gestionar los distintos diámetros de alambre, representan operaciones

innecesarias que se añaden al coste de transformación de alambres a trenza.

La tecnología SIW (*single input wire*), utilizando el mismo diámetro de alambre de alimentación para obtener una gama de conductores trenzados, elimina muchas de las operaciones innecesarias típicas del método de producción tradicional. El resultado es:

- Aumento de la producción de alambre trefilado
- Menor cantidad de hileras de trefilado requerida
- Menor cantidad de chatarra
- Significativa reducción del trabajo en proceso
- Cambios de desenrollador de la cableadora reducidos al mínimo
- Mayor rendimiento productivo de la cableadora
- Tiempos más cortos desde el comienzo del proceso hasta su finalización
- Mejora de la metodología de fabricación *just in time*
- Optimización general del proceso de trenzado

Probablemente, se pueda hablar, más en concreto, de una significativa reducción de las variables que el fabricante debe manejar durante la fabricación en cualquier programa de trenzado.

El cambio de metodología que se necesita para usar eficazmente un solo diámetro de alambre trefilado para producir la gama requerida de conductores trenzados acabados es la de reemplazar la flexibilidad de trenzar el mismo número de alambres usando diámetros distintos

con la de trenzar un número variable de alambres usando el mismo diámetro de alambre.

Por lo general, los beneficios de la tecnología SIW son independientes del proceso usado para la fabricación de la trenza. Solamente cuando ya se han definido los diseños específicos de las trenzas y los requisitos de producción de dichos diseños, se puede decidir qué celda de fabricación usar.

Nótese que el uso de un solo alambre de alimentación para fabricar conductores acabados de varios tamaños no es un concepto nuevo. Se usa en la mayoría de las plantas de producción dentro de las tolerancias admitidas por las especificaciones corrientes.

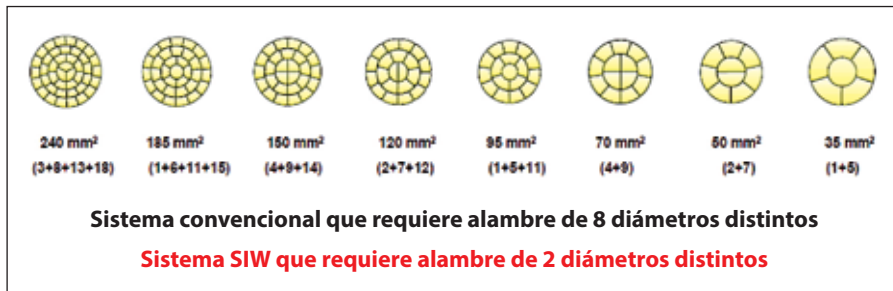
Este concepto ha sido usado extensamente en Europa, donde los programas de trenzado que utilizan un solo diámetro de alambre de alimentación para cubrir una gama de dimensiones de conductores acabados existen desde hace décadas.

Las potenciales reducciones de costes usando este proceso se pueden dividir en las áreas siguientes:

- Ahorros en los procesos
- Ahorros de materiales

Ahorros en los procesos

El lógico impacto de la incorporación del conformado con rodillos en el proceso de trenzado está ilustrado en la *Figura 1*.



▲ Figura 1

Aunque vinculado a las restricciones de los estándares IEC y ASTM, el proceso de conformado con rodillos permite reducir drásticamente el número de alambres requerido para producir una gama de conductores. En este caso se ha reducido de 8 a 2 el número de alambres necesarios para cubrir secciones de 35mm² a 240mm². Del mismo modo, se puede reducir de 12 a 3 el número de alambres para secciones de 35mm² a 500mm².

Esta reducción del número requerido de secciones de alambres ofrece los mayores ahorros en el área de trefilado:

- Genera mayor productividad en la trefiladora de alambre gracias a la eliminación de regulaciones múltiples para los distintos diámetros de alambre requeridos para los diseños de trenza convencionales
- Reduce la cantidad de chatarra de alambre trefilado debida al cambio de sección del alambre
- Permite reducir la cantidad de hileras de trefilado requeridas

Igualmente, el proceso de conformado con rodillos afecta al ahorro de costes en el proceso de trenzado:

- Reducción del volumen de alambres de varias dimensiones producidos en espera del proceso de trenzado
- Posibilidad de usar rollos de alambre más grandes y pasar de un sistema de bobina a un sistema de devanado de rollos
- Reducción de los tiempos muertos de carga, gracias al cambio automático de desenrollador mientras la máquina está funcionando
- Regulaciones más rápidas para diferentes secciones de trenza gracias a la eliminación del movimiento de desenrolladores de diferentes secciones
- Velocidades de producción lineales más altas comparadas con las de los métodos de trenzado convencionales
- Reducción del número de operadores en el proceso de trenzado

Ahorros de materiales

El reto para los fabricantes de hoy es determinar qué objetivo escoger

dentro del campo de aplicación de las especificaciones. Si los criterios para determinar la construcción del conductor se basasen solamente en el ahorro económico, la industria giraría en torno al diseño del conductor unilay y al diámetro más pequeño admitido por dicho diseño. El proceso de conformado con rodillos permite producir productos unilay de hasta 500mm².

El análisis estadístico de las trenzas compactadas con métodos (hileras o rodillos) diferentes del sistema de conformado con rodillos ha mostrado que se puede prever una variación del material típica de ±1% a ±1,5%. Estos resultados, por lo tanto, llevan a la necesidad de aumentar la sección de los conductores en por lo menos un 3% para asegurar que el

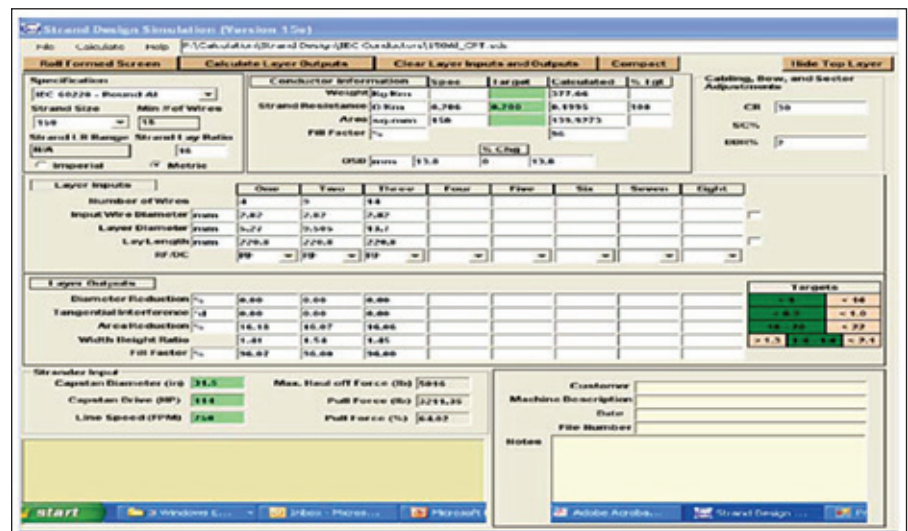
producto no esté por debajo del valor de la especificación. Este material en exceso es, efectivamente, dado gratuitamente a los clientes.

Cuando se usa el sistema de conformado con rodillos de Ceeco Bartell con su software de diseño para trenzas, la variación de material se reduce drásticamente. Ofrecer un ahorro de material real y muy tangible respecto a los métodos de compactación convencionales es muy importante considerando el coste actual del aluminio y del cobre. Esto significa que se pueden realizar los diámetros mínimos especificados en los estándares IEC y ASTM y, al mismo tiempo, se puede aproximar, sin exceder, la resistencia máxima.

Debido a la gran variedad de trenzas que se usan en la industria, Ceeco Bartell ha desarrollado un modelo matemático para ayudar en el diseño de las trenzas. Este modelo usa datos teóricos y cuantitativos que permiten predecir la resistencia de la trenza.

Este programa analiza, además, la geometría de la trenza para optimizar el rendimiento de la máquina. El resultado es un pronóstico exacto de la resistencia de la trenza acabada.

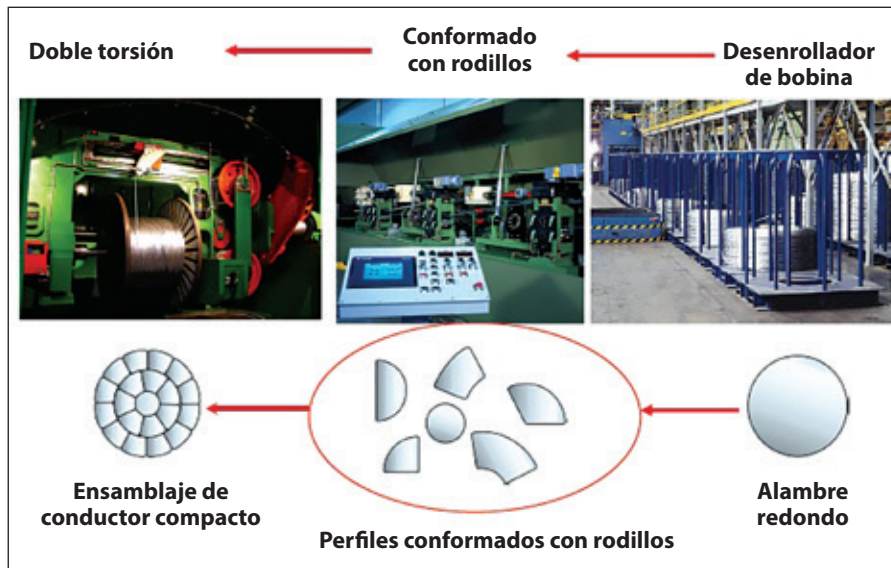
▼ Figura 2: Resultado del simulador de trenza Trenza compacta de 150mm²



▼ Figura 3



Análisis económico de un producto XLPE de 95mm ²			
Factor de relleno	86%	92%	96%
Configuración	1=6=13	1=6=11	2=6=9
Diámetro externo (mm)	11.7	11.39	11.07
Área de espacios externa (mm ²)	15.88	0.710	0.663
Coste del aislamiento (US\$/km)	131.35	109.55	106.83



▲ Figura 4

La Figura 2 muestra la sección de una trenza de 150mm² ilustrando cómo asiste el programa en el desarrollo del diseño de trenza ideal.

Este programa de conformado con rodillos es el que mayor potencial ofrece, porque tiene el diseño para el menor diámetro de trenza para una sección de trenza específica. Por consiguiente, también es el que mayor potencial ofrece en términos de ahorro de aislamiento para un determinado espesor de aislamiento.

Esto se puede ver claramente en la Figura 3 que muestra los ahorros de aislamiento cuando se produce un producto XLPE de 95mm² con factores de relleno de un 86% a un 96%. A medida que el conductor se hace más pequeño y los intersticios desaparecen, la cantidad de material de aislamiento se reduce.

Un 92% de relleno es el mejor factor de compactación que se puede alcanzar usando los métodos convencionales. Sin embargo, con el proceso de conformado con rodillos se puede obtener un 96%. Esto permite un ahorro potencial de material de aproximadamente un 2%.

La productividad de la extrusora se basa en parte en la integridad de la construcción de la trenza. Esto se aplica de la misma manera a extrusiones de baja, media y alta tensión. Una construcción de trenza inestable no solo compromete la velocidad de los procesos de trenzado y extrusión, sino que también genera pérdidas considerables en forma de chatarra y por tiempos muertos en las dos líneas.

El arqueamiento es a menudo el resultado de un diseño de trenza inestable. Un conductor enrollado bien apretado está menos sujeto a arqueamiento.

El apretamiento de la trenza depende mucho de la geometría de sus elementos. Por esta razón, el paso del conductor es importante.

Los elementos de los conductores tipo unilay/unidireccional están encajados y, por lo tanto, tienen de por sí un diámetro externo más pequeño que los conductores con paso de cableado concéntrico contrario y los SZ.

Además, los conductores de paso unilay/unidireccional se tensan por sí solos bajo tensión. Debido a este auto tensado, la extrusión de conductores de paso unilay/unidireccional es menos propensa al arqueamiento estadísticamente.

La superficie de la trenza también es crítica. Una capa externa lisa como la que se tiene con el conformado con rodillos presenta un perfil redondo limpio para el proceso de extrusión y, por lo tanto, reduce al mínimo la acumulación de polvo del conductor durante el proceso de extrusión.

El proceso está ilustrado en la Figura 4. El alambre redondo es tomado de grandes paquetes de rollos y pasa por la sección de conformado con rodillos, donde su forma es cambiada en varios perfiles de conformado con rodillos que, seguidamente, son ensamblados a altas velocidades por una máquina de doble torsión o una máquina de simple torsión, según la sección del producto.

Este proceso continuo a alta velocidad permite alcanzar velocidades lineales de 100m/min produciendo conductores altamente compactos. La cableadora de conformado con rodillos puede producir 40 toneladas de conductor de aluminio compacto de 150mm² en un ciclo de 24 horas.

Conclusión

Los ahorros en los costes de producción dependen de muchos factores como los equipos de fabricación existentes, si se fabrica la trenza en la planta o si es comprada, el cuidado y control efectuados en el alambre de cobre y aluminio de alimentación, la gestión general de la planta y el control de las cableadoras de doble torsión de alta velocidad.

En las condiciones más ventajosas los ahorros pueden proveer tiempos de restitución extremadamente cortos, pero los cálculos deben ser personalizados para cada aplicación.

El alto rendimiento de la cableadora de conformado con rodillos, junto con el proceso de conformado de Ceeco Bartell, permitirá a los fabricantes de cable reducir los costes sin afectar a las prestaciones de los conductores acabados. El conocimiento de ésta y otras nuevas tecnologías, junto con especificaciones inteligentes, mejorarán aún más el desarrollo del diseño de trenzas y el potencial para optimizar más la fabricación de los conductores trenzados. ■

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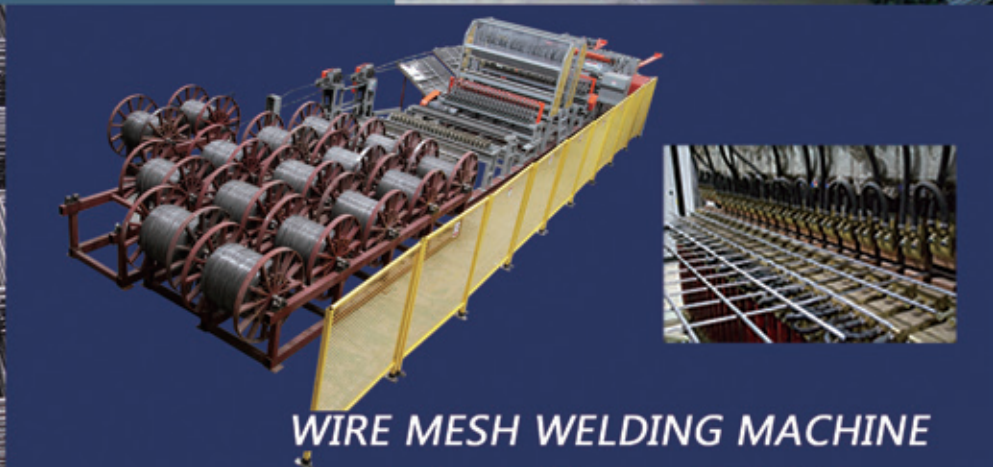
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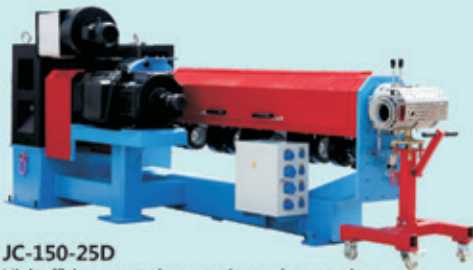
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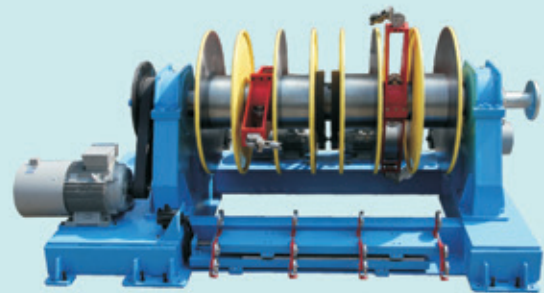
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