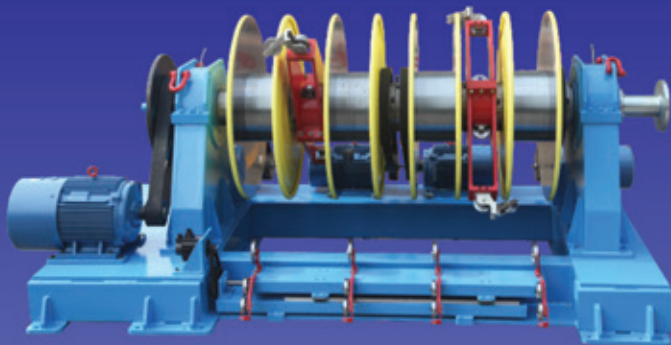


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TXJ01200 Concentric stranding machine



SJO1000-02500 Double twist bunching machine



JC090-0200 High efficiency extrusion line



JC035-080 High efficiency extrusion line



Auto coiling and stacking line



XB0500-02500 Cantilever type single twisting machine



DJ0630-02500A Single twisting machine



DJ01400-02500B Single twisting machine

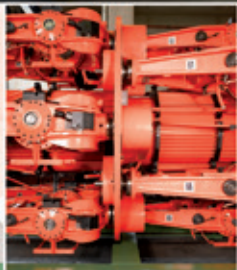
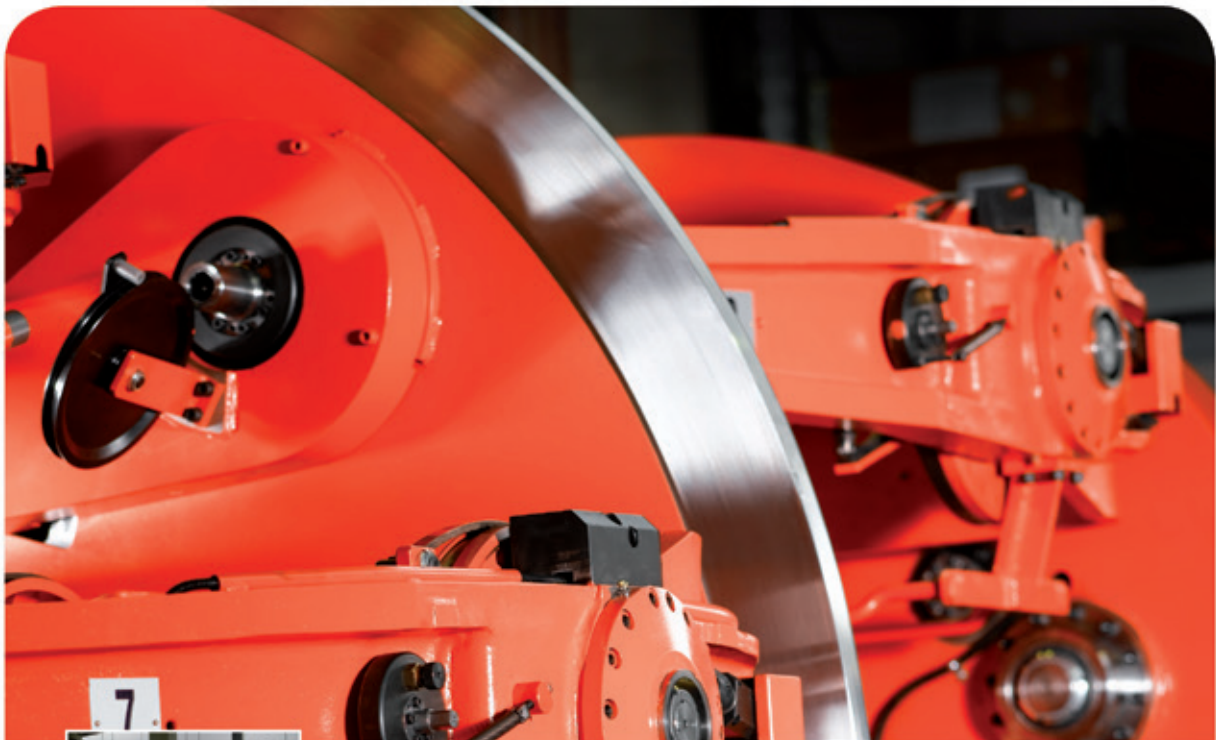


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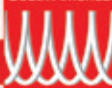


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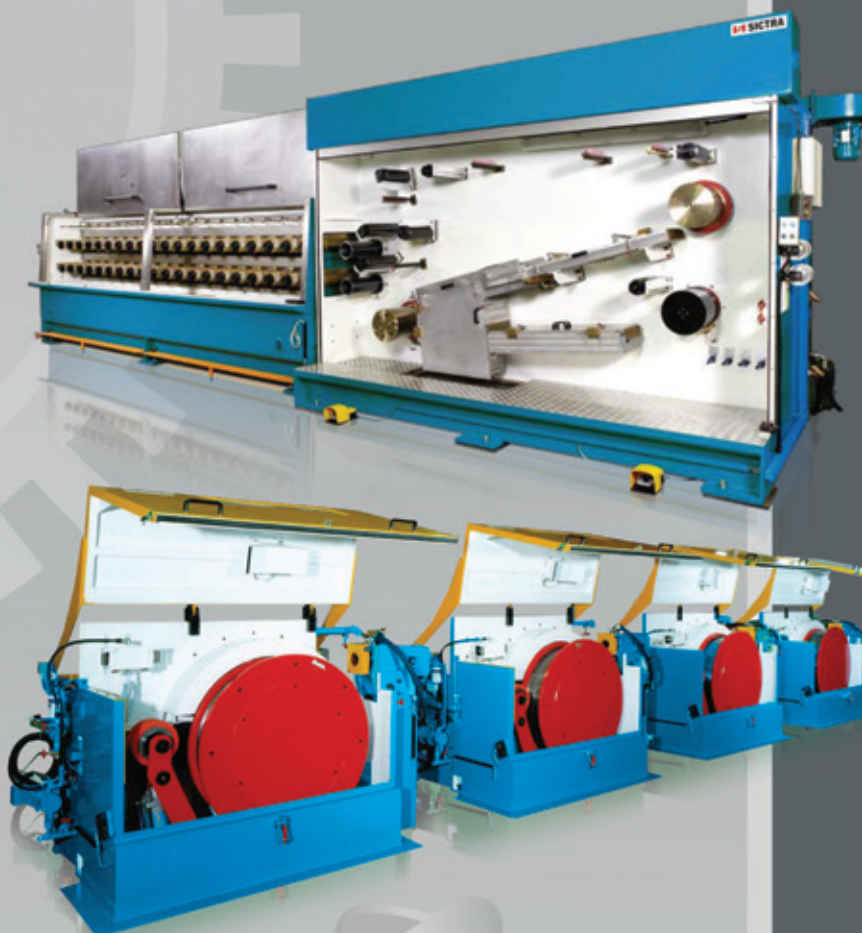
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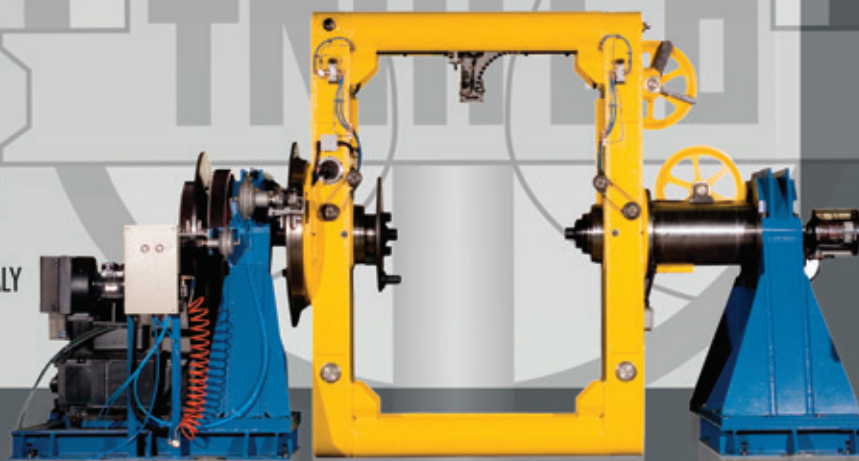


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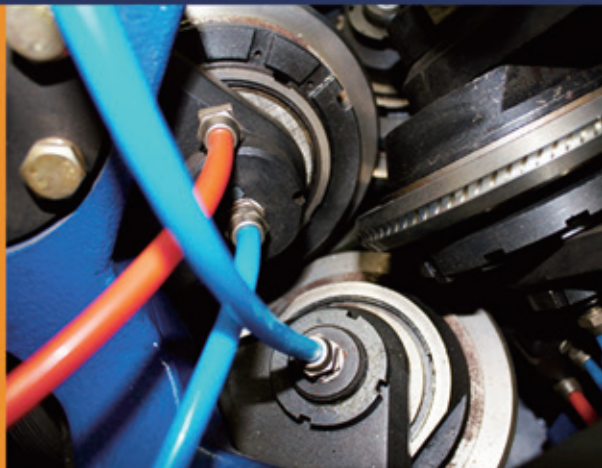


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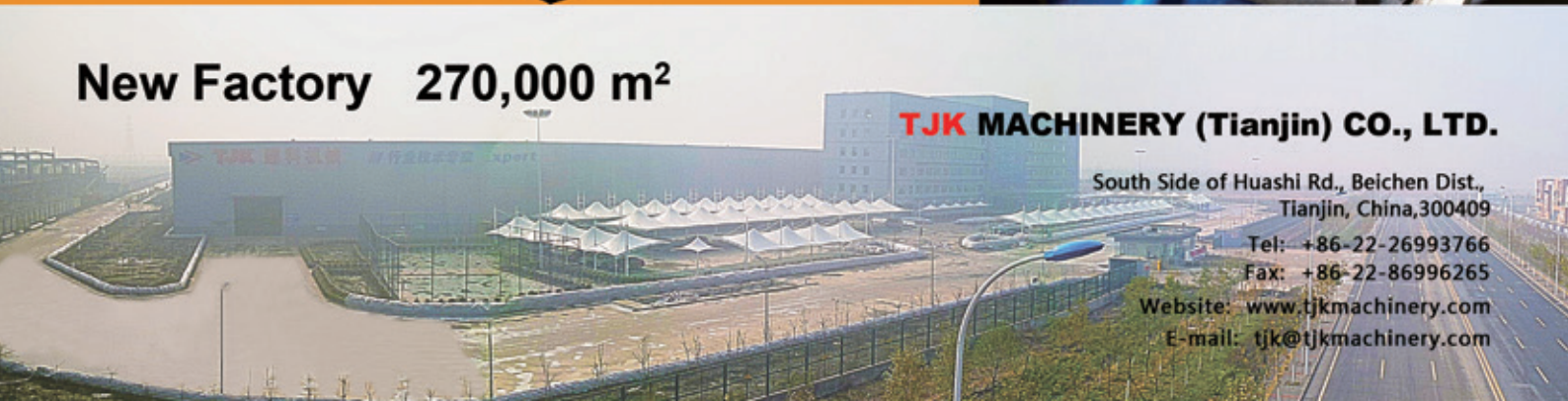


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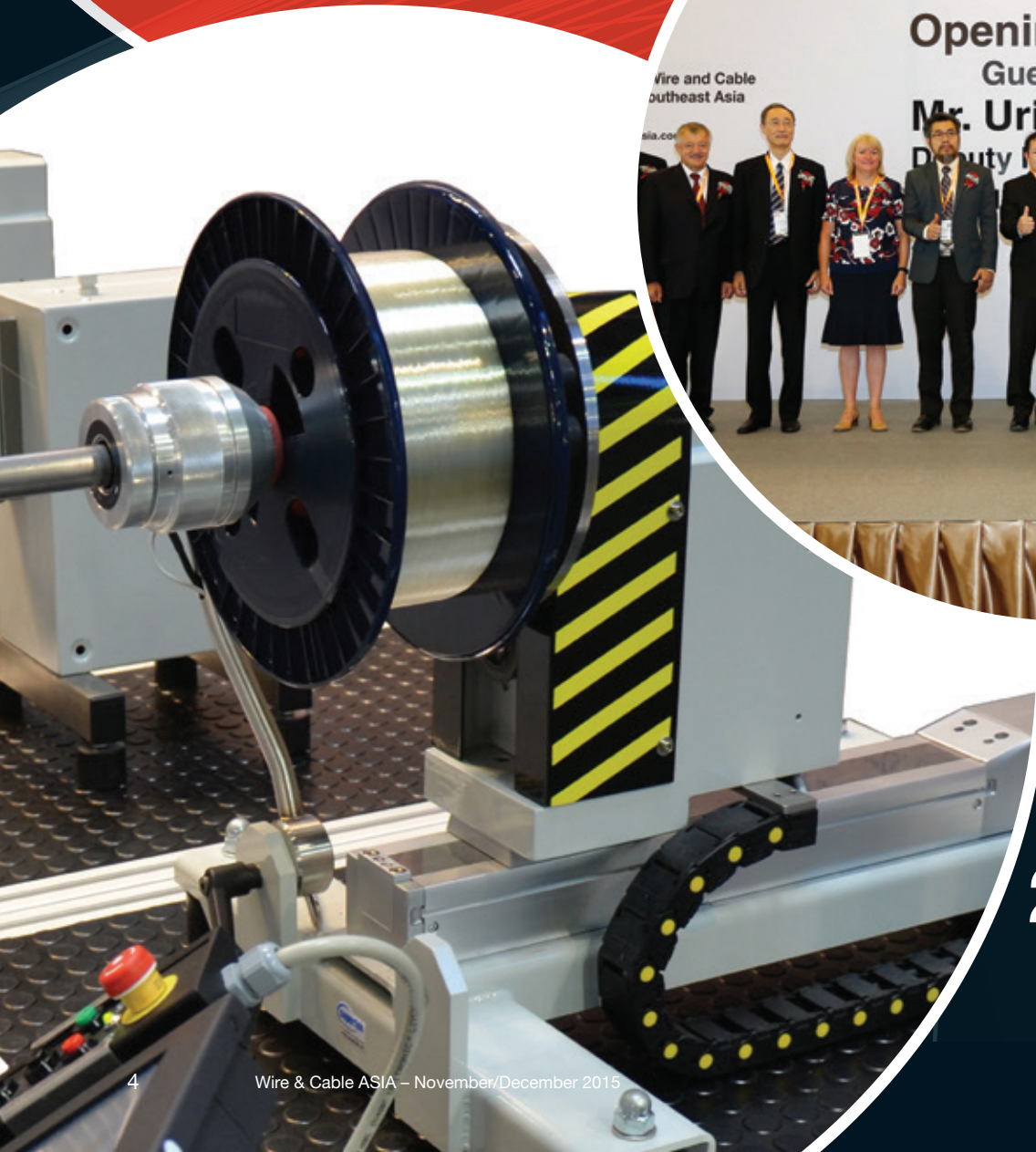


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Quality in Bangkok, numbers already high for Düsseldorf

IT'S very much a case of looking both backwards and forward in the final issue of Wire & Cable ASIA for this year. Asia's relentless thirst and enthusiasm for new technology can be measured, it seems, in numbers. In this case it's the numbers associated with the September staging of wire Southeast Asia.

Bangkok, Thailand, staged the three-day exhibition when 411 companies from 33 countries were on display to more than 7,000 eager visitors from 56 countries.

Visitor quality throughout was high, with one exhibitor saying, "The overall mood was very positive and we were very pleased with the number of existing and new customers who attended the show." See pages 8 and 13 for full details.

Looking ahead, we are now just five months from the most influential show in the wire and cable calendar – wire 2016 in Düsseldorf, Germany.

The countdown has well and truly begun with more than 900 exhibitors already reserving 630,800ft² of exhibit space for the week-long exhibition on the Rhine.

While companies from the European nations have strong exhibitor participation in Düsseldorf, a large number of registrations have also been received from the USA, South Korea, Taiwan, India, Japan and China.

See the latest story about build-up to the exhibition on page 18.

David Bell
Editor



When and where

2015

3 November:
Cabwire Conference –
conference –
Düsseldorf, Germany
Organisers:
IWMA, WAI, ACIMAF,
CET IWCEA
Fax: +44 121 781 7404
Email: info@iwma.org
Website:
www.cabwire.com

2016

4–8 April:
wire/Tube Düsseldorf
– trade exhibition –
Düsseldorf, Germany
Organisers:
Messe Düsseldorf GmbH
Fax: +49 211 45 60668
Email: wire@
messe-duesseldorf.de
Website:
www.wire.de

2016

11–14 May:
Lamiera –
trade exhibition –
Bologna, Italy
Organisers:
Ucimu-Systems
Fax: +39 0226 255 894
Email:
lamiera.esp@ucimu.it
Website:
www.lamiera.net

2016

8–9 June:
Wire Expo –
trade exhibition –
Uncasville,
Connecticut, USA
Organisers:
Wire Association
International
Fax: +1 203 453 8384
Email: sales@wirenet.org
Website: www.wirenet.org

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11th International Wire and Cable
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○ Officials and guests at the opening of wire Southeast Asia 2015

Show's Bangkok boom

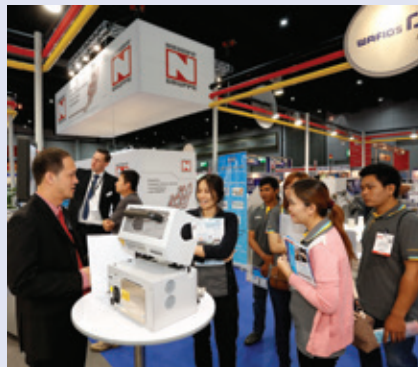
AFTER three days of floor activity, wire Southeast Asia – the 11th international wire and cable fair – closed its doors in Bangkok, Thailand.

A total of 411 companies from 33 countries, including seven national group exhibits from Austria, China, Germany, Italy, Taiwan, the UK and the USA showcased the latest technologies to 7,144 international trade visitors from 56 countries.

With almost 33 per cent of these visitors coming from outside Thailand – from countries such as Bangladesh, India, Malaysia, Singapore, Taiwan, Indonesia, Myanmar and Pakistan – as well as visiting delegations from China, Japan, Korea and Vietnam, wire Southeast Asia confirmed its status as the regional platform for the wire industry.

The formation of the single-economy ASEAN Economic Community (AEC), together with the start of Thailand's Infrastructure Development Plan – which includes massive transformation to the country's overall national infrastructure from 2015 to 2022 – will result in robust business opportunities for the wire industry in the coming years.

"The staging of the synergistic trade fairs comes at a timely juncture, presenting itself as a valuable platform to promote better understanding and business connections between Thailand, the region and the international community for mutual



○ Visitors at the Niehoff stand in Bangkok

benefit," stated Gernot Ringling, managing director of Messe Düsseldorf Asia.

Exhibitors at wire Southeast Asia were pleased with their participation. According to Christian Schalich, area sales manager for Sikora: "Our main objective for participating is to showcase our latest machinery to customers from the region. At the trade fair we were able to accomplish this and at the same time explain the advanced technologies of our machines while the customers test them. Having talked with more visitors than two years ago, I am pleased that we have met our objective fully and will surely be back in 2017."

For French exhibitor Numalliance, the successful sale of a machine to a Thai customer was the highlight of their participation.

Wang Fei, corporate programme manager at China Petroleum Technology & Development Corporation, agrees and mentioned that they met with clients from India, Bangladesh, Thailand and Indonesia.

"Through onsite discussions, we learned about the purchasing requirements and products that are of interest to our regional clientele and got a better grasp of the region's market trends, which will be helpful for the future planning of our business."

wire Southeast Asia was supported by international industry partners from the International Wire & Machinery Association (IWMA), the Italian Wire Machinery Manufacturers Association (ACIMAF), the International Wire & Cable Exhibitors Association (IWCEA), the Austrian Wire and Cable Machinery Manufacturers Association (VÖDKM-AWCMA) as well as the International Wire and Cable Exhibitors Association – France (IWCEA-France), the German Wire and Cable Machine Manufacturers Association (VDKM), and the Wire and Cable Industry Suppliers Association (WCISA).

The next staging of wire and Tube Southeast Asia will be held in 2017, with the exact dates to be announced at a later time.

Messe Düsseldorf Asia Pte Ltd – Singapore
Website: www.wire-southeastasia.com



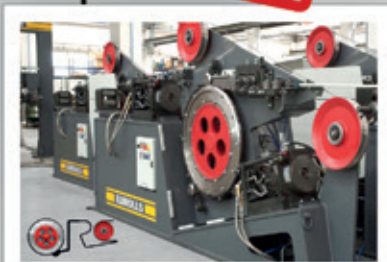
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New members for CCCA

REELEX Packaging Solutions Inc of Patterson, New York, USA, and Wonderful Hi-Tech of Taiwan are the latest corporations in the structured cabling industry to join the Communications Cable and Connectivity Association (CCCA).

As a non-profit association now comprising 28 prominent manufacturers, distributors and material suppliers, CCCA serves as a major resource for well-researched, science-based information on the technologies and issues vital to the industry.

CCCA has an on-going education campaign on one of those issues – the widespread proliferation of counterfeit, sub-standard and non-compliant communications cables, which pose a threat to safety, connectivity performance and installer liability.

“Many CCCA members are already licensees and users of Reellex packaging technology, while most

counterfeit cable manufacturers use an inferior pull box knockoff prone to tangling and kinking,” said Timothy Copp, vice president of business development at Reellex.

“As the inventor and licensor of the pull box package so many installers are familiar with, it’s important for us to educate installers on the role knockoff packaging plays in the counterfeit cable conversation.

“Our membership in CCCA will add value for us with support on these issues and we look forward to joining the education campaign.”

Wonderful Hi-Tech, established in 1978, is a publicly held corporation headquartered in Taiwan, with ten manufacturing sites across China, Thailand and Vietnam, and sales offices in Asia, Europe and North America.

About the company’s new membership, director Paul Chang said:

“Wonderful Hi-Tech is fully committed to the CCCA values and we look forward to contributing to the CCCA activities on the many important issues affecting the structured cabling market.”

CCCA – USA
Website: www.cccassoc.org

New marketing director

NDC Technologies has appointed Dr Ian B Benson as marketing director. He was previously global sales and marketing director for the company’s food and bulk business.

He will be responsible for the development and execution of the company’s marketing strategy for its measurement and control solutions serving the food, bulk, packaging, cable, metals and tubing industries.

NDC Technologies – USA
Website: www.ndc.com

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New chief executive

DR Christian Frank, a member of the board since 2013, took over as chief executive of Sikora in April.



○ *Dr Christian Frank, new chief executive*

He replaces Harry Prunk as chairman. However, Mr Prunk, who has successfully fulfilled the role of CEO since 2011, will continue as a member of the board.

In the course of reorganisation, Dr Frank is now responsible for human resources, controlling, research and development, business development/strategy and operations. Furthermore, he is in charge of the plastics sector for all departments. Mr Prunk is now managing sales, marketing and service and is interdepartmentally leading the divisions of wire and cable, hose and tube, and optical fibre.

Dr Frank brings his expertise for new markets to the lead position of the executive board. For the new CEO, the objectives of the company are clear.

“Our main focus is on finding solutions for our customers, to optimise the production processes and the end product itself, with innovations and the possibility of reducing costs at the same time,” said Dr Frank.

“We want to continue to expand, and therefore we want to use the vast technical potential of Sikora in order to develop new products for new markets but without losing sight of inherent markets.”

Sikora AG – Germany Website: www.sikora.net

Clean room in operation

The Purity Scanner laboratory and developing area at Sikora was extended by a new clean room in January this year. Due to the constantly filtered air and the slight overpressure in the room, plastic materials can be tested for impurities under clean room conditions.



Sikora provides good conditions for reliable detection and sorting results by the Purity Scanner.

○ *Klaus Bremer, project manager, Purity Scanner*

The new clean room was positively tested and perceived by many customers. Further material tests are also planned for the second half of the year in Bremen and can still be requested.

When purchasing the device, charges for material tests are refundable.

Sikora AG – Germany Website: www.sikora.net



○ The PWM team: from left, Steve Mepsted and Carole Cole of PWM, and June Goh and Jess Khoo of Cable Material and Equipment Supply Sdn Bhd Malaysia, PWM's distributor in Southeast Asia

PWM's stronger weld with the Southeast Asian market

UK company PWM was singing the praises of wire Southeast Asia in Bangkok, Thailand, in September, reporting a number of excellent sales leads from the three-day event.

Steve Mepsted, managing director, said: "The first day was rather quiet, but traffic to the booth improved after that.

"Visitor quality was good throughout, and we noted an increase in visitors from Indonesia, Malaysia and Vietnam.

Highest precision for medical engineering

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These products are manufactured according to customer specifications and are available in a range of dimensions and specific properties.

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"Our best-selling M101 cold welder for joining wire, strip and profile was the main attraction but our smaller hand-held machines also proved popular with manufacturers looking for a faster, easier alternative to electrical welding.

"The overall mood in Bangkok was very positive and we were pleased with the number of existing and new customers who attended the show."

PWM Ltd – UK
Website: www.pwmltd.co.uk

baskets, guidewires and flexible surgical instruments. The company was founded in 1993 and is a subsidiary of G.Rau GmbH & Co KG, which produces high-precision tubes, wires, sheet and components.

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The full supply scope covers a wide range of precision formed and welded metal tubes with optical fibres, like FIST, which are integrated into a number of different end products such as OPGW, OPFC and fibre optic submarine cables.

The company has recently received an order for a complete production plant to produce fibre optic submarine cables with a non-stop and error-free production length of up to 240km.

One line produces the inner FIST (Fibre in Steel Tube) and a second line applies a laser welded copper tube around the armouring including a start/stop welding system.

The precision micro tubes with optical fibres are specified in many different diameters, wall thicknesses and with many different numbers of fibres. The fibre excess length in the precision micro-tube is controlled and adjusted to suit the application.

The lines are equipped with tape feeding (pay-offs), laser cross welding and tape accumulator for full continuous and non-stop operation.

The lines are equipped with high precision tension controlled multi-fibre pay off stations. Down-stream operations complete the solution.

THE Machines – Switzerland
Website: www.the-machines.ch

African connections

AllAfrica reports that Tanzania has finalised the construction of its national ICT broadband backbone (NICTBB).

The 20,000km network covers all regions of Tanzania's mainland, and offers connectivity to three international submarine cables: Eastern Africa submarine system (EASSy); SEACOM; and Seychelles to East Africa system (SEAS). It also provides cross-border connectivity to Kenya, Uganda, Rwanda, Malawi, Burundi and Zambia.

TeleGeography notes that the network is managed and operated by the government through the incumbent telecoms operator Tanzania Telecommunications Company Ltd (TTCL). Liquid Telecom CEO Nic Rudnick said that following the deployment of the ICT broadband backbone, his company will begin routing capacity from Tanzania.

NICTBB – Tanzania

Website: www.nictbb.co.tz



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Long-term strengthening of partnership

WIEDENBACH Apparatebau, a supplier of continuous ink jet printers for industrial applications, and Komax Wire, a supplier of cable processing systems, are to continue their partnership with the signing of a new long-term supplier contract.

Wiedenbach develops and manufactures for Komax Wire marking solutions that are adapted to the requirements of Komax Wire systems.

The cooperation between the two companies started in 1997.

Two years later, after successful initial projects, the decision was taken to start a development partnership. The result was the ims 291 ink jet printer series, launched in 2003, which can be optimally integrated into the Komax Wire product range.

The constant further development of hardware and software led to the



○ Komax ims 295 BC ink jet printer from Wiedenbach

successor series ims 295, which was introduced in 2010.

After nearly 18 years of successful cooperation, both companies are said

to be proud to sign a further long-term supplier and cooperation contract.

Wiedenbach Apparatebau's continuous ink jet printers are used in the manufacture of many industrial products for marking. The portfolio also contains a wide range of inks, accessories and software solutions, which all are developed in-house.

Komax Wire offers a comprehensive range of automated, intelligent solutions for all applications of cable processing.

Standard and customer-specific lines are complemented by quality assurance modules and test devices as well as networking solutions for the safe and efficient production of cable harnesses.

Wiedenbach Apparatebau GmbH
– Germany
Website: www.wiedenbach.com

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Users are looking for the reel deal

REELEX Packaging Solutions has signed four new licensees.

According to Reelex's vice president of business development, Timothy Copp, the company has never welcomed so many new licensees in a six-month period.

Mr Copp attributes improvements in the global economy and a successful education effort, aimed at differentiating genuine Reelex from imitators, as catalysts.

"Our ongoing anti-counterfeit campaign is aimed at increasing recognition of knock-off packaging versus genuine Reelex," said Mr Copp.

"End-users are becoming more aware that products in genuine Reelex packaging are far less prone to tangles, knots and damage to the product, and are demanding that their suppliers provide them with products in stress-free packaging.

"This, in conjunction with our technology being protected by patents and trademarks, we believe is having a positive effect in expanding the use of Reelex versus knockoff alternatives."

Reelex technology is a proprietary method of coiling wire or cable into a precision-wound figure-eight pattern. The coil dispenses from the inside out, without twists, tangles or inertia, and is used to package low voltage cabling products.

Licensees sign an agreement to use the Reelex system via equipment designed and manufactured by Reelex Packaging Solutions.

Licensees are also obliged to use the Reelex trademark on their packages.

The four new licensees are Zhaolong (Zhejiang Zhaolong Cable), ZTC (Zhangjiagang Twentsche Cable), Sandmartin Electronic and The Siemon Company.

Reelex Packaging Solutions – USA
Website: www.reelex.com

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Countdown to wire 2016 is on

EXHIBITOR registrations for wire 2016 in Düsseldorf, Germany, next April are strong, with more than 900 exhibitors from 46 countries reserving 630,800ft² of exhibit space.

The 741 companies from 41 nations at Tube 2016 will occupy 516,700ft². Both events will be held concurrently from 4th to 8th April 2016 at the fairgrounds in Düsseldorf.

As in the past, countries with particularly strong exhibitor participation at wire 2016 are Italy, Belgium, France, Spain, Austria, the Netherlands, Switzerland, Turkey, the UK, Sweden and Germany.

A large number of registrations have also been received from USA, South Korea, Taiwan, India, Japan and China.

wire 2016 will feature machinery for the production and finishing of wire, tools and auxiliary materials in process engineering as well as materials, special wires and cables. It will also cover innovations in measurement, control and test engineering.

The trade fair will occupy halls 9-12, 16 and 17, featuring wire, cable and glass fibre machinery, wire and cable products as well as wire and cable trade. Innovations in metal forming will be shown in hall 15, and hall 16 will house mesh welding machinery and spring making technology.

Metal forming will occupy hall 5, while halls 6 and 7a will feature

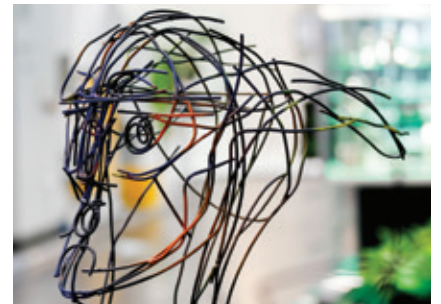


○ Exhibitors have already reserved 630,800ft² of exhibit space for wire 2016

tube-processing machinery. Mechanical engineering and construction will be presented in hall 7a. Halls 1 to 7.0 will also include profiles for a wide range of applications.

The special show PTF will be presented in Hall 7.1

Messe Düsseldorf GmbH – Germany
Website: www.wire.de



○ More than 900 companies have registered as exhibitors for the event

Cimteq CEO takes best presentation award

Ali Shehab, CEO of Cimteq, a cable design and manufacturing software company, was delighted to be recently bestowed the award for Best Presentation of the 63rd IWCS International Cable & Connectivity Symposium which took place in November 2014.

Mr Shehab's paper considered a practical analysis of the use and benefits of a manufacturing execution system (MES) in the cable industry.

Through use of a real-life scenario he effectively and concisely explained the different elements of MES. Focusing on its attributes and benefits he demonstrated how its application can transform a production environment.

He was ideally placed to speak on this topic based upon the nature of his business and the fact that Cimteq has

designed its own MES tailored specifically to the unique requirements of the cable industry: CableMES. "It was an honour to be asked to speak at the symposium, let alone to be selected as the most outstanding speaker is truly flattering," said Mr Shehab.

"I am extremely grateful and it is fantastic that my paper gained such attention. At Cimteq we are highly enthusiastic about sharing the benefits that CableMES offers to those manufacturing companies operating in the industry, and demonstrating how such a system can completely transform their productivity and efficiency."

He was presented with his award at this year's symposium on 6th October in Atlanta, Georgia, USA.

Cimteq Ltd – UK

Website: www.cimteq.com

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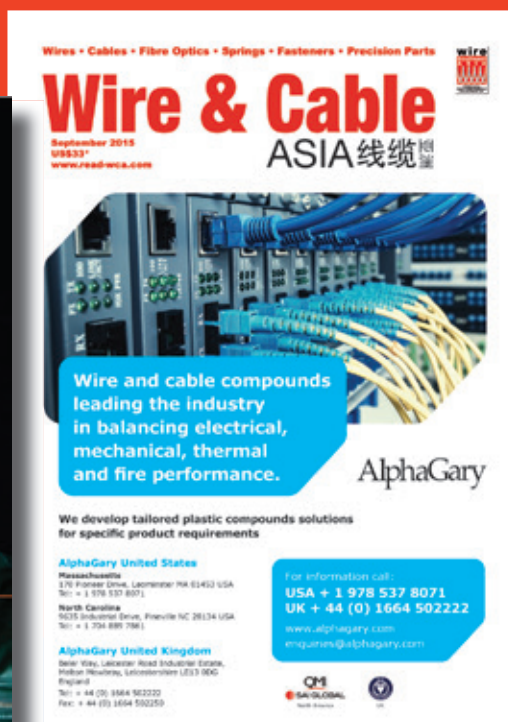
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Nexans sets sail as luxury liner goes to sea

ANTHEM of the Seas, a luxury cruise liner built at the Meyer Werft shipyard in Germany, set sail with Nexans cables on board. *Norwegian Escape*, another new luxury cruise ship currently under construction at Meyer Werft, will also be equipped with Nexans cables. Supplying Nexans' cable range for these two vessels is part of a multi-year contract which represents the continuation of a 25-year partnership between the two companies.

Nexans supplies low voltage power cables, instrumentation and control cables and medium voltage power cables, essential for the operation of the cruise liners. Around 3,000km of cables have been delivered for *Anthem of the Seas* and some 2,400km will be supplied for *Norwegian Escape*.

The cables are halogen-free and fire retardant, and exhibit special performances in respect of smoke emission and toxic gases under fire conditions. Nexans developed a new fire resistance standard to meet the demands of the project. The cables are designed to last for the lifetime of the ship, which is expected to be around 25 years. The cables will be manufactured at Nexans' plant in Monchengladbach, Germany, a dedicated global shipbuilding cable factory.

Royal Caribbean's *Anthem of the Seas* is the world's third largest cruise ship with a capacity of more than 4,000 passengers over 18 decks. Norwegian Cruise Line's *Norwegian Escape* has a capacity of 4,200 passengers and is expected to be delivered later this year.

Sven Smid, lead purchase manager for cables at Meyer Werft, said, "We have had a fruitful relationship with Nexans in the past and are looking forward to that continuing in the future. Nexans understands Meyer Werft and the needs of our projects."

"Nexans has a long-standing relationship with Meyer Werft to whom we have delivered thousands of kilometres of cables during the last 25 years we have worked together.

"This contract further connects Nexans and Meyer Werft and we are delighted of this successful collaboration," added Stephane Mortelette, shipbuilding segment manager at Nexans.

Nexans – France

Website: www.nexans.com

Mount Joy CFO tees up as a volunteer at LPGA Open golf event

Scott Badger, CFO at Mount Joy Wire, volunteered as a member of the Disability Services Committee for the 70th LPGA 2015 US Women's Open Tournament at the Lancaster Country Club in July.

Mr Badger, who is a golfer, was one of approximately 2,500 volunteers for the seven-day event. He worked in a special tent that provided electric powered scooters for visitors to use on their own during the tournament, or other transportation to take them to a particular location.

"People were amazed that there was no charge for the scooters or transportation," commented Mr Badger.

"For me, it was fun to interact with patrons and visitors during my shifts. The tent was open from 6am to 8pm for the three days of practice rounds and four days of the tournament. Everyone really appreciated the LPGA for doing this."

Mr Badger said he also enjoyed being a part of the committee, through which he met a number of new people. His other volunteer efforts include coaching youth sports and supporting Big Brothers/Big Sisters and the Challenger Little League.

The LPGA reported that 1,873 golfers



○ Scott Badger

were entered in this first major golf tournament held in Central Pennsylvania. Korean pro In Gee Chun won by a stroke after a thrilling playoff and received the top prize of \$810,000.

Company president Ty Krieger said everyone at Mount Joy Wire is proud of Scott.

"He certainly reflects the spirit of giving back among all of our people who

volunteer to make the Susquehanna Valley a better place to live and work."

For more than 20 years, Mount Joy Wire has been a manufacturer of spring wire, oil tempered wire and speciality wire for the agricultural, aerospace, architectural, automotive, building products, construction, household goods, manufacturing, marine, medical, oil and gas, and recreational industries.

The company manufactures all wire products in its Mount Joy, Pennsylvania, USA, facility and ships to customers around the world.

Mount Joy Wire Corp – USA

Website: www.mjwire.com

Tuning in on broadband

Prysmian Group organised a roundtable discussion in the European Parliament, where panellists shared views on the challenges and opportunities for the development of Europe's high speed broadband infrastructure, the path towards further digitisation in Europe, and the increased growth and competitiveness that results from investment in quality technologies.

Prysmian Group – Italy

Website: www.prysmiangroup.com

African communications get World Bank backing

The World Bank has agreed to fund the construction of a \$43 million fibre optic cable project to connect Kenya with Africa's newest nation, South Sudan.

Construction of the project, commissioned by Kenya and South Sudan, is expected to help ensure that South Sudan is not left behind in the development of East Africa's communication infrastructure. The project is expected to be completed in 2019 and will be South Sudan's first optic fibre cable since gaining independence from Sudan in 2011.

Under the memorandum of understanding signed between the two countries, the Kenyan government will be responsible for laying the cable to the border with South Sudan, while South Sudan will lay the cable around the country.

The World Bank, Africa's largest funder of ICT projects, expects the cable to improve communications in South Sudan. For Kenya, however, the project is part of the second phase of its inland nationwide network, the National Fiber Optic Backbone infrastructure plan, planned to cover 2,100km and provide a link between all of the country's county headquarters.

World Bank – USA

Website: www.worldbank.org

New deal in the Nordic states

MESSKO Nordic AB has taken over the representation of Highvolt Prüftechnik Dresden GmbH in Sweden, Norway, Finland and Denmark. The Swedish company is member of Reinhausen Group as well as Highvolt, and produces equipment for transformers and switchgear systems.



"With Roger Öhngren from Messko as representative we will continue our successful business activities in this region," said Highvolt's managing director, Ralf Bergmann. "We expect significant synergy effects for both companies to extend the cooperation with our customers in the fields of transformers, cables, switchgear and testing institutes, to name just a few."

○ Rolf Persson (right), long-term representative of Highvolt, handed over the business to Roger Öhngren (left). Highvolt engineer Tobias Mießler is a contact for customers in Northern Europe

products are used in the testing of a diversity of power transmission components, such as transformers, cables and switchgear.

Highvolt designs and manufactures high-voltage and high-current testing systems for the global market, and its

Highvolt Prüftechnik Dresden GmbH – Germany
Website: www.highvolt.de

Turkish rebar slump

The Turkish export rebar steel price fell steeply in mid-September when a major Turkish exporter took control of the month's sales to the UAE by dropping its price far below expected levels.

A UAE trader confirmed that a Turkish mill had sold 30,000mt of rebar at between \$350 and \$353/mt to several separate buyers, followed by a further 20,000mt the next day at \$350/mt. "No one else got bookings," he said.

This filled the anticipated demand in the UAE for Turkish material during September. The Eid festival at the end of the month, and a slower UAE economy, was predicted to cut demand in half from its recent average 100,000 to 120,000mt per month. Sources in the market are doubting that the prices would be repeatable. A Turkish exporter said the offer level was still \$370/mt.

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A new dimension of user-friendliness

For many years, continuous inkjet printers from Paul Leibinger have provided maximum quality and reliability in non-contact labelling of products of all kinds. In the JET3up, the company provides its customers with even higher performance, even better user guidance and greater added value through more than 800 functions integrated by default.

With its new JET3up continuous inkjet printer, the German marking specialist looks into the future with confidence. The upgrade to the previous JET3 model features state-of-the-art inkjet technology, many new functions and an even more user-friendly interface design.

Like all other Leibinger small-character inkjet printers, the new JET3up is equipped with the automated Sealtronic nozzle seal, which prevents the ink in the printhead from drying out, even during long downtimes. In combination with clean instant start and stop technology, the user is always capable of starting the printer within a few seconds, without the need for maintenance or rinse cycles.

The JET3up meets any customer requirements due to its 800 integrated standard functions and numerous model variants. The variants JET3up PI for pigmented inks, JET3up MI for microprints and JET3up PRO with industry standard IP65 for wet and dusty production environments make it fast and easy to find the suitable inkjet printer model for any industry and application. The drop position control technology also ensures a higher print quality through even more accurate placement of the ink drops.

The software interface of the JET3up series has been modernised comprehensively, making operation even more convenient for the user. New elements, such as individual buttons for direct access and illustrated operator instructions, help with orientation and ease of menu guidance. The operator also benefits from valuable additional information that is available at any time on the printer monitor. This includes the precise fill level of the solvent and ink tanks, pending prints remaining in the current print job, number of printed ink drops and the print speed (feet/min or products/min).



○ The new Leibinger JET3up inkjet printer is a good solution for any marking requirement. Photograph courtesy of Paul Leibinger GmbH & Co KG

During the development of the JET3up, great value was placed on the efficiency of the device. Minimum energy consumption, low heat development, low maintenance costs and special options such as the solvent recycling system EcoSolv assist in continuously keeping the operating costs at a low level. Additionally, solvent saving mode makes sure that zero per cent of the solvent is used during production breaks.

The easy integration of the JET3up

Nile Delta project

NEXANS will deliver 48km of static umbilicals for the West Nile Delta Taurus Libra project in Egypt. The Taurus Libra development is a subsea project tied in to existing BG Group operated Burullus facilities, and the umbilical delivery forms an important part of this subsea development.

The umbilicals will consist of electrical and fibre optic cables together with hydraulic and chemical lines.

They will be designed, engineered and manufactured at Nexans' specialised subsea cable and umbilical facilities in Halden and Rognan, Norway, with delivery scheduled for May 2016.

The West Nile Delta project involves the development of gas and condensate fields within the North Alexandria and West Mediterranean Deepwater concessions in the Mediterranean Sea, between 65km and 85km off the Alexandrian coast.

The Taurus Libra project is part of the first phase of the West Nile Delta fields development.

Nexans – France

Website: www.nexans.com

Paul Leibinger GmbH & Co KG – Germany
Website: www.leibinger-group.com

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○ 2015 东南亚国际线材展开幕式上的官员和嘉宾

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经过三天的展出活动，第11届东南亚国际电线电缆展在泰国曼谷闭幕。来自33个国家的411家公司，包括奥地利、中国、德国、意大利、台湾、英国和美国这七个国家的群展，向来自56个国家的7,144名国际专业参观者展出了最新的技术。

来自泰国以外的参观者约占33%——如来自孟加拉国、印度、马来西亚、新加坡、台湾、印尼、缅甸和巴基斯坦等国——以及来自中国、日本、韩国和越南的参观代表团，确定了东南亚国际线材展作为线材行业区域平台的地位。单一经济东盟经济共同体(AEC)的形成以及泰国基础设施建设计划的开始——包括从2015年到2022年的国家全国性基础设施的大规模转型——将在未来几年为线材行业带来大量的商业机会。

亚洲杜塞尔多夫董事总经理 Gernot Ringling 表示：“同期举办的展会非常及时，是促进泰国以及地区和国际共同体之间更好的理解和业务关系，实现互惠互利的有价值的平台。”。

在东南亚线材展上，参展商们对自己的参与感到非常满意。Sikora 公司区域销售经理 Christian Schlich 表示：“我们此次参展的主要目的是向各区域客户展示我们最新的机器。在展会上，我们能够做到这点，并在客户检测时介绍这些机器的先进技术。和我们交流的客户比两年前多，我们非常高兴完全完成了目标，而且非常肯定还会参加2017年的展出。”



○ 谷Niefhoff 展台上的参观者

对于法国参展商 Numalliance 来说，将一台机器成功销售给泰国的客户就是参加展会的最大亮点。中国石油技术开发公司企业项目经理 Wang Fei 也表示满意，她提到说会见了来自印度、孟加拉国、泰国和印度尼西亚的客户。

她说：“通过现场讨论，我们了解到区域客户的购买需求以及客户感兴趣的产品，并且掌握了该地区市场动向，这对我们未来的业务规划很有帮助。”

东南亚国际线材展得到来自国际线材和机械协会 (IWMA)，意大利线材机械制造商协会 (ACIMAF)，国际电线电缆参展商协会 (IWCEA)，奥地利电线电缆机械制造商协会 (VÖDKM-AWCMA) 以及国际电线电缆参展商协会——法国 (IWCEA-FRANCE)，德国电线电缆机械制造商协会 (VDKM)，以及电线电缆行业供应商协会 (WCISA) 得国际行业合作伙伴的大力支持。

下一届东南亚国际管材和线材展将于2017年举行，确切的日期稍后公布。

Messe Düsseldorf Asia Pte Ltd – 新加坡
网址: www.wire-southeastasia.com

Messko Nordic在北欧代表Highvolt

Messko Nordic AB 接手了 Highvolt Prüftechnik Dresden GmbH 在瑞典、挪威、芬兰和丹麦的代理权。这家瑞典公司是 Reinhausen Group 和 Highvolt 的成员，为变压器和开关系统生产设备。“Messko 公司 Roger Öhngren 作为代表，将帮助我们在该地区继续成功开展业务，” Highvolt 总经理 Ralf Bergmann 表示。“我们期待看到两家公司的协同效应，进一步拓展我们与该地区变压器、电缆、开关和测试设备等客户的合作。” Highvolt 为全球市场设计和制造高压高电流测试系统，其产品广泛用于测试各种动力传输部件，例如变压器、电缆和开关装置。

Highvolt Prüftechnik Dresden GmbH – 德国 网址: www.highvolt.de



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用户友好性的新境界

许多年来，Paul Leibinger公司出品的连续喷墨打印机在无接触打印各种产品过程中具有最高的品质和可靠性。公司新推JET3up产品，默认情况下，拥有800多个集成功能，能够为客户提供更高性能、更好的用户指导和更大的附加值。凭借其新的JET3up连续喷墨打印机，该德国标识专家对未来充满信心。老款JET3升级后，具有最先进的喷墨技术和许多新的功能，以及更加人性化的界面设计。

像所有其它Leibinger小型字喷墨打印机一样，新的JET3up配备有自动化Sealtronic喷嘴密封，以防止打印头里的墨变干，即使在长时间停机状态下也起到同样的作用。在与清洁瞬间启动和停止技术相结合的情况下，用户总能够在几秒内启动打印机，并且不需要维护或漂洗周期。JET3up因其800多个集成标准功能和众多的型号变量，因此能够满足客户的任何需求。比如，JET3up PI可应用于颜料墨水，JET3up MI用于

微打印，工业标准IP65 JET3up PRO可用于潮湿和多尘的生产环境，客户能够快速方便地选择适合工业和应用需求的机器。下降位置控制技术通过更加精确的墨滴放置位置，能够确保更高的打印质量。

JET3up系列的软件界面全面进行了现代化更新，这使得用户操作更加方便。新的元素，诸如直接访问和说明作业指导书的各个按钮，可帮助定位和方便菜单指导。操作人员也受益于有价值的附加信息，这些信息随时出现在打印机显示器上，包括溶剂和墨水盒的精确填充水平、残留在当前打印作业中的待打印任务、打印墨滴数和打印速度(英尺/分钟或产品/分)。

JET3up在开发过程中，效率受到特别重视。最小能量消耗、低热发展、低维护成本和一系列特殊选项，比如溶剂循环系统EcoSolv，有助于连续保持操作成本处于低位。此外，溶剂节省模式可以确保在生产中断期间没有任何溶剂被使用。JET3up易于集成，这是因为212毫米的缩短打印头和大量可供选择的打印头版本。打印机一旦开启，由VNC远程控制，这使得公司任意一台电脑都可方便控制打印机，或者通过生产控制台来控制打印机。命令可从平板电脑或智能手机，在WiFi. 环境下，发送到JET3up。

Paul Leibinger GmbH & Co KG – 德国
网址: www.leibinger-group.com



○ 新的Leibinger JET3up喷墨打印机是任何标识要求的最佳解决方案。
照片提供: Paul Leibinger GmbH & Co KG

新会员入驻CCCA

最近，结构化布线行业的两家公司美国纽约Reelex Packaging Solutions Inc of Patterson和台湾Wonderful Hi-Tech公司新加入了通信电缆和连接协会(CCCA)。协会是由28家杰出的制造商、分销商和材料供应商组成的非营利性组织。CCCA现已成为业界技术和问题精心研究和科学信息的主要来源。CCCA针对这些问题之一，举行持续的教育活动 - 假冒、不合格和不符合标准的通信电缆广泛扩散，威胁到安全、连接性能和安装责任。

“许多CCCA会员已经拥有授权，成为Reelex包装技术的用户，而大多数假冒电缆制造商使用劣质拉线盒贗品，易缠绕、打结，”业务开发副总裁Timothy Copp表示。“作为拉线盒包装的发明者和许可者，和众多的安装者都很熟悉，对我们来说重要的是要让安装者知道贗品包装在假冒电缆对话中所起的副作用。CCCA会员在这些问题上为我们提供支持，为我们带来价值，我们期待着参加先进性的教育活动。”

Wonderful Hi-Tech成立于1978年，是一家上市公司，总部设在台湾，十个生产基地分布在中国、泰国和越南，在亚洲、欧洲和北美设有销售办事处。关于公司新的会员资格，经理Paul Chang表示：“Wonderful Hi-Tech完全契合CCCA价值观，我们期待着为影响结构化布线市场的诸多重要问题而举行的CCCA活动贡献自己的力量。”

CCCA – 美国

网址: www.cccassoc.org

新任营销总监

NDC Technologies 已委任 Ian B Benson博士为营销总监。此前，Benson博士担任公司食品和大宗业务全球销售与营销总监，他将新的工作岗位带来丰富的国际营销和业务发展经验。Benson博士将负责开发和执行公司测量与控制解决方案的营销策略，这些解决方案专门服务于食品、散装、包装、电缆、金属和管道行业。他将领导公司的营销传播和产品管理团队，监管公司品牌和市场情报方案，并推动客户互动以提高NDC产品和服务需求。Benson博士毕业于英国布里斯托尔大学，拥有荣誉学位和化学博士学位，他将服务于NDC欧洲制造销售服务中心英国莫尔登。

NDC Technologies – 美国
网址: www.ndc.com

非洲连接

AllAfrica报道称，坦桑尼亚已完成了其国家信息和通信技术 (ICT) 宽带骨干网 (NICTBB) 的建设。

2万千米长的网络覆盖了坦桑尼亚大陆的所有地区，并提供到三个国际海缆的连接：东非海缆系统 (EASSy)；SEACOM；塞舌尔到东非的系统 (SEAS)。

另外，还将提供跨境连接到邻国肯尼亚、乌干达、卢旺达、马拉维、布隆迪和赞比亚。

TeleGeography指出，网络通过目前的电信运营商坦桑尼亚电讯有限公司 (TTCL)，政府具体运营管理。与此同时，Liquid Telecom首席执行官Nic Rudnick表示，继开发了ICT宽带骨干网后，公司将着手提高坦桑尼亚的路由容量。

“之前，我们从南非引入容量到赞比亚和津巴布韦，但从坦桑尼亚引进还是第一次，” Rudnick先生并补充说，Liquid将通过坦桑尼亚为肯尼亚、卢旺达和布隆恩提供冗余容量。

NICTBB - 坦桑尼亚
网址: www.nictbb.co.tz

洁净室投入运营

Sikora于今年一月份通过增加新的洁净室，扩展了纯净度扫描仪实验室和发展空间。由于不断地过滤空气和室内的轻微过压，塑料材料在洁净室条件下能够测试其杂质。

Sikora利用纯净度扫描仪为可靠的检测和分选结果提供良好的条件。

“由于使用了洁净室，我们能够降低外部污染的概率降至最低，并取得了最佳测试效果，” 纯净度扫描仪项目经理 Klaus Bremer表示。



许多客户积极测试和感知了新的洁净室。下半年在不莱梅进行进一步的材料测试也在规划之中，目前仍可申请。如果购买此设备，退还材料测试的收费。

○ 纯净度扫描仪项目经理 Klaus Bremer

Sikora AG - 德国
网址: www.sikora.net

PWM在东南亚市场更强大的焊接设备

英国公司PWM对9月份在泰国曼谷举行的东南亚线材展赞不绝口，公司称在为期三天的展会中得到了大量优秀的潜在销售顾客。

董事总经理 Steve Mepsted表示：“第一天比较清静，但之后展位客流量增加。参观者素质都很高，而且我们注意到来自印度尼西亚、马来西亚和越南的参观者人数增加。我们的畅销款M101线材、钢带以及型材冷焊机是最大的亮点，但较小一点的手持设备也非常受那些追求更快、更简单的电焊替代品的制造商们的欢迎。在曼谷的整个情绪都是非常好的，我们非常高兴有那么多新老客户参加展出。”

PWM Ltd - 英国
网址: www.pwmltd.co.uk



○ PWM团队，从左至右分别为，PWM的Steve Mepsted和Carole Cole，以及PWM在东南亚的经销商Cable Material and Equipment Supply Sdn Bhd Malaysia公司的June Goh和Jess Khoo

新的首席执行官

Christian Frank博士自2013年以来就是董事会的成员之一，四月份接任Sikora首席执行官。他的前任主席是Harry Prunk。Prunk先生自2011年以来成功胜任首席执行官这一要职，并将继续担任董事会成员。

在重组的过程中，Frank博士目前负责人力资源、控制、研发、业务发展/战略及运营。此外，他还管理各部门的塑料业务。Prunk先生目前管理销售、营销和服务，领导电线、电缆、管与管道以及光纤等部门间的业务。Frank博士为新市场、新岗位带来了丰富的行业知识。对于新的首席执行官职位，公司的目标是明确的。



○ 新的首席执行官 Christian Frank博士

“我们的主要目标是为客户寻找解决方案，以优化生产流程和最终产品本身，创新和降低成本的可能性齐头并进，两手都要抓，” Frank博士表示。“我们希望继续做大做强，因此，我要使用Sikora巨大的技术潜力，为新客户，但又不忽视固有市场的新产品。”

Sikora AG - 德国

网址: www.sikora.net

2016德国杜塞尔多夫国际线缆、线材展进入倒计时

2016德国杜塞尔多夫国际线缆、线材展将于明年4月举行，目前参展商注册正如火如荼。

来自46个国家的900多位参展商预留了63.08万平方英尺的展位位置。

2016德国杜塞尔多夫管材展吸引了来自41个国家的741家参展公司，场馆占地面积51.67万平方英尺。两大展览活动将同期举行，时间：2016年4月4日---8日，地点：德国杜塞尔多夫展览中心。

与以往一样，2016德国杜塞尔多夫线缆、线材展依然有强大的参展商团队助阵，他们来自意大利、比利时、法国、西班牙、奥地利、荷兰、瑞士、土耳其、英国、瑞典和德国。同时，也收到了大量来自美国、韩国、中国台湾、印度、日本和中国大陆的注册信息。

2016德国杜塞尔多夫国际线缆、线材展，参展内容涵盖线材制造与加工机械、工具、辅料、特种电线电缆等。此外，还包括测量、控制和测试工程领域内的创新。

该行业盛会将在此9 - 12, 16和17号展馆举行，包括电线电缆和玻璃纤维机械、线缆产品和线缆贸易。

金属成形领域内的创新将在15号展馆展出，16号馆将展示焊接机械和弹簧制造技术。



○ 2016年线材展630,800平方英尺已被参展商预定

2016德国杜塞尔多夫国际管材展覆盖完整系列的管与管道制造、加工、处理和贸易。1和2号馆重点展出管道附件，管道贸易和管道制造在展馆2、3、4、7.0和7.1。正如上次一样，中国馆安排在2号馆。

金属成形在5号馆展出，6和7a馆主要展示管道加工机械。机械工程和建筑在7a馆呈现。1到7.0号馆展览内容也包括广泛的应用。特别展览PTF将在7.1展馆呈现。

Messe Düsseldorf GmbH – 德国
网址: www.wire.de

THE Machines获得多宗订单

瑞士 THE Machines 公司为 OPGW 应用提供好几台自动化连续运行设备。供应范围包括广泛系列具有光纤的精密成形与焊接金属管，比如FIST，其被集成到许多不同的终端产品，包括OPGW、OPPC和海底光纤电缆。

该公司最近收到订单，提供一套完整的生产设备，用于不间断、无故障制造海底光纤电缆，长度达240千米。另外，一条生产线负责生产FIST(钢制管中纤维)，另一条生产线在铠装周围应用激光焊接铜管，包括启动/停止焊接系统。

具有光纤的精密微管在不同的直径和壁厚中都有规定，并且带有许多不同数量的光纤。在精密微管中光纤余长被控制和调节，以适应应用需求。

生产线配备了送带装置(放线机)、激光交叉焊接和储带器，用于连续、不间断运行。生产线还配备了高精度张力控制多纤维放线站。生产线的核心部分将纤维和金属带汇集在一起，具体特征如下：

- 需要时精密带导向和切边
- 高精度带成形平台
- 精确控制胶状物灌装（触变性凝胶混合物）

- 机器人控制的轨道焊接
- 专利焊接-焊缝跟踪和跟踪系统
- 实时视觉系统实现了完美和无故障焊接
- 在线焊缝控制ECC100，用于焊接的完全质量检测
- 趋势显示，记录和跟踪所有相关工艺参数
- 管道无故障焊接，公差达到±0.01毫米
- 大多数材料包括铜的加工

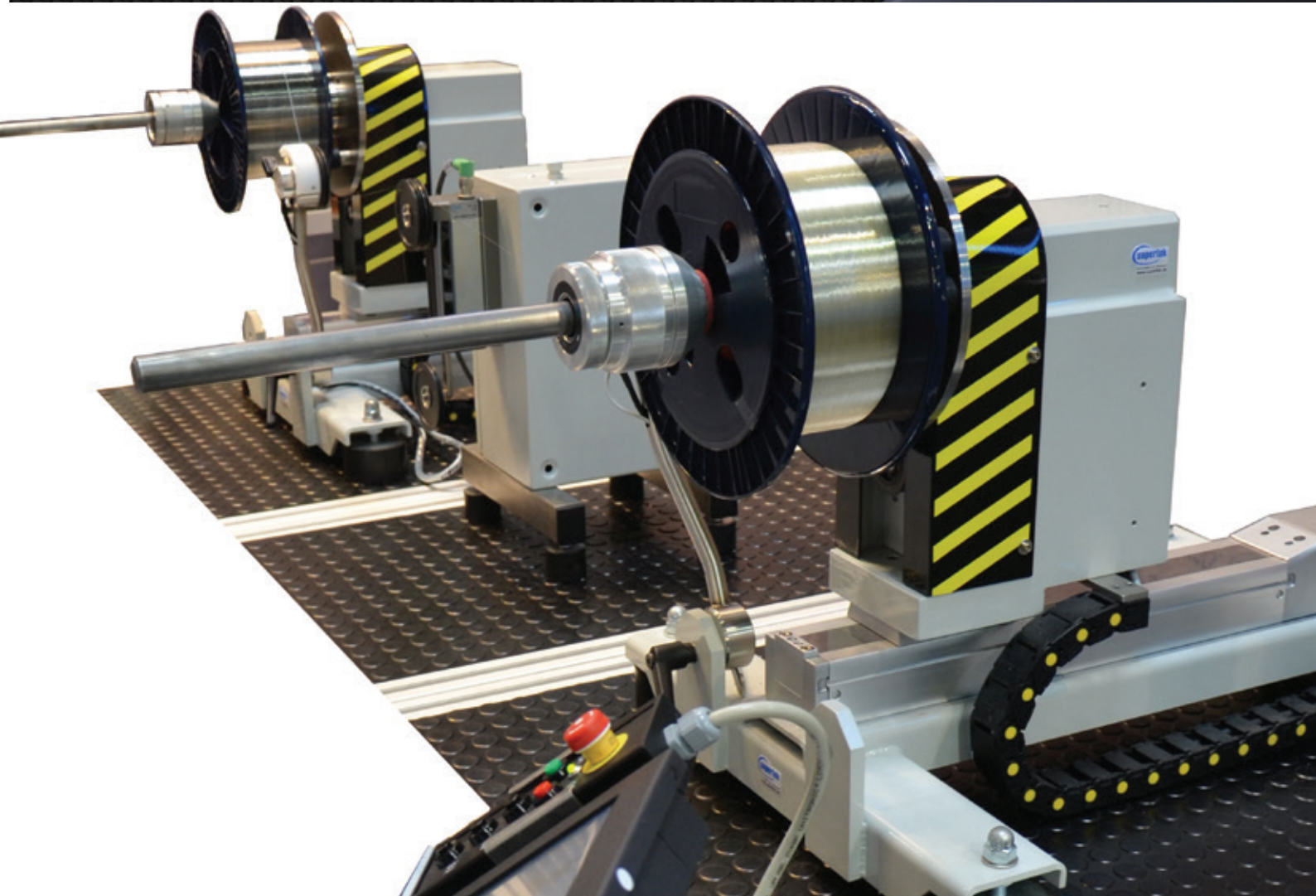
下游操作完善了该解决方案，特征如下：

- 收缩站用于确切的最终管尺寸
- 干燥、清洁和油分离装置
- 整个过程中，绞盘，能够精密控制线张力
- 光纤超长站 - 调节和纤维松弛长度控制
- 整个生产过程中都有记录
- 自动进给缠绕（收线）装置用于精密卷绕630到1,250毫米线轴

THE Machines – 瑞士
网址: www.the-machines.ch



○ THE Machines制造的焊接与成形机



○ The Supertek glass fibre rewinding station

Ever-increasing quality

UNAVOIDABLE optical glass fibre twisting caused by spooling processes can result in unacceptable EMR transmission quality degradation. However, increasing optical transmission and laser coherent beam requirements demand ever-increasing transmission quality.

Supertek has worked on this problem for some years and can now offer solutions providing very low twist values, in most cases well under 0.5 turns per 2m length, whilst still maintaining the highest standards in winding, laying and tension control.

The use of the Supertek Compact Multi-Winder (CMW) full- or semi-automatic system allows all optical fibre requirements to be handled simply and highly accurately

from drawing tower output to all other following processes. Precision tension control and laying geometry, fibre line handling at speeds up to > 3,500m/min, and all with the absolute minimum on supervision or operator intervention.

Optical fibres demand a highly accurate and consistent winding and process tension control. This is covered by the Supertek electromagnetic dancer system.

The CMW is also for use where highly accurate, consistent speed control and tension are paramount in re-winding systems or similar processes.

All the features apply not only to optical fibres. The digitally controlled traversing spool winder system is also suitable for materials such as

plastics, rubbers, carbon fibres, medical plastics, membranes, chemical fibres, precious metals and alloys as well as simple steels, coppers and other metals, textiles or chemical products.

This also includes a great variety of physical forms, from wires and threads of 5µ diameter or even less to foils, flat bands and profiles. The precision laying and winder servo rotation control allows highest positional accuracy of product handling, while the Supertek electromagnetic dancer control system allows a highly-accurate and consistent tension control claimed to be unbeatable in all other systems of this type.

Supertek GmbH – Germany
Website: www.supertek.de

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wire[®]
Düsseldorf



○ Cable take up from Davis-Standard

Addressing industry demand

Davis-Standard's new line of traversing and collapsible take-ups and pay-offs addresses industry demand for multiple wire and cable applications.

Advantages include a smaller overall footprint, enhanced operator ergonomics, simplified engineering and cost efficiency. The response has been positive with more than 25 of these machines selling since the start of the year.

Machine sizes range from 1,250mm to 5,000mm (48" to 195") with the greatest concentration within the 1,800mm to 2,500mm (70" to 98") size range. Each is available with a standard control platform, which includes a Yaskawa A-1000 AC drive and Allen-Bradley/Rockwell components encompassing servo drive, PLC (programmable logic controller) and HMI (human machine interface).

For international projects, machines are equipped with a Siemens AC drive, PLC and HMI with a Mitsubishi servo drive. Technology is available as 'stand-alone' (running in torque control) with a dancer or with an accumulator.

Davis-Standard's caterpillar capstan options and HPE extruder are also in demand. The company supplies multi-pass, linear and belt wrap capstans for the full range of wire and cable applications. The HPE offers a compact design and is one of the industry's most widely used extruders.

It is known for a fast delivery and rugged design that is energy efficient and easy to maintain. Advantages for wire and cable applications include increased torque capacity for high viscosity resins and custom options.

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

Modular in-line profile and shape measurement

ZUMBACH Electronic of Switzerland has introduced three new additions to its line of profile gauges for steel and metal profiles. The gauges are based on the laser light section technique and by camera vision, often also called “light cut” principle.

Up to eight line lasers “mark” the contour of the product and the respective cameras each capture a large number of pixels on the product contour. A highly developed software adds the four pictures to the true, orthogonal section of the profile.

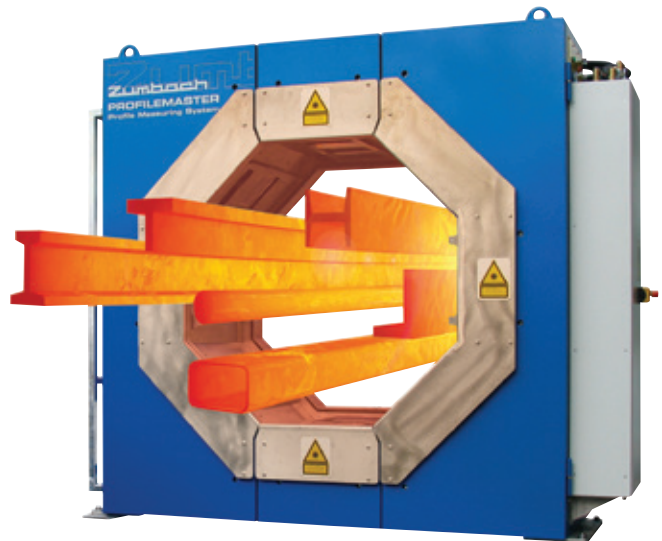
All critical dimensions, angles and radii can be programmed together with their tolerances. Operators and supervisors can not only monitor the true profile as a 1:1 section online, but can also see irregular faults such as seams, concave or convex shapes, etc.

All standard profiles such as H, I, U and L beams, hexagons, squares, flats and any special shape are measurable. Depending on the maximum product dimensions, the three new models cover measuring fields up to 200, 400 or 800mm.

Thanks to a unique concept, the Profilemaster® delivers highly accurate and stable readings (which is not “natural” by this principle, used in many gauges). A high reliability is guaranteed thanks to a sophisticated, multi-stage protection and purging/cooling system.

Key advantages include:

- With up to eight cameras, modular camera setting, any shape can be captured
- Up to 16,000 points/contour (2,048/camera) = 5,734,400



○ The Profilemaster SPS 800-8K gauge

- points/second (with eight cameras)
- High sampling rate of 350 to 500/second (full profiles/second)
- Four different colours of laser with an eight-camera system with no interference
- Shape fault detection (SFD)
- Compilation of a 3D model thanks to high sampling rate
- Trouble-free maintenance with quick and easy access to the maintenance points

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

UniCrimp 100 bench crimping press from Schleuniger

The new UniCrimp 100 delivers power and precision at a very competitive price.

It is a simple and cost effective crimping press that provides high quality performance. With 20kN (2.2 tons) of crimping force, the UniCrimp 100 can process wires up to 6mm² (10 AWG).

The press accepts most industry-standard, mini-style applicators for crimping side- and rear-feed terminals.

The optional pneumatic feed unit accommodates pneumatic feed applicators.

Excellent applicator access makes adjustments and exchanges quick and simple and the optional quick-change applicator base is available for even greater efficiency.

The power and robust design of the UniCrimp 100 make it suitable for a wide range of applications and the simplicity combined with accuracy makes it ideal for a variety of production environments.

Schleuniger Inc – USA

Website: www.schleuniger-na.com



○ The new UniCrimp 100

Boosting coiling possibilities

SINGLE, double, fixed, expandable, vertical, horizontal, manual, automatic... Italian company DEM likes to offer more possibilities.

The main distinction is in the coil axis. Wire can be wound up in horizontal or vertical coils, according to the material production flow.

Horizontal coilers could have a fixed mandrel (BOM) or an expandable mandrel (BOH). The latter features an automatic opening/closing front door and automatic coil height pre-set adjustment to make all operations fast and easy and to increase uptime. It is provided with precision laying software that controls the sideways positioning movements with the rotation, to obtain a perfect traverse oscillated coiling of the wire.

The BOH coiler can also be equipped with additional modules for coil ejection, and a tilting unit for fast coil removal.

The family of vertical coilers includes the single-reel (BVS), double-reel (BVD) and double-reel with fully automatic coil change (VSA). The latter has a maximum capacity of five tons and a maximum working speed of 18m/sec. In its full configuration it includes the automatic strapping machine, aerial spool manipulator, weighing unit, and roller conveyors to load up to four spools and unload the empty spools (in case of collapsible spools).



○ DEM: Expanding coiling possibilities

All type of machine can coil flats, squares or round wires with speed synchronised with that of the line.

Coilers are designed to have a heavy-duty structure. Rational design and the use of high quality components ensure reduced, fast and easy maintenance and long machine life.

DEM Wire Rolling Technology has been a reliable partner in cold rolling lines for flat, profile and round wire since 1996.

Excluding cold rolling cassettes and microcassettes, more than 290 machines have been delivered since then.

The company is moving on a solid basis and has lately attained a new goal. It has straightened its management and financial constitution, becoming a joint-stock company (Italian SpA).

**DEM Wire Rolling Technology SpA
- Italy**

Website: www.demgroup.com

New addition from Haefely

Haefely Hipotronics has introduced the latest addition to its 800 series DC Hipots with the digital 880PL-DC, ensuring simplistic operation, accurate results, and operator safety when testing insulation strength of electrical apparatus.

This new design is claimed to have the highest output-to-weight ratio of any single-piece DC hipot on the market.

The 880PL-DC is controlled by an intuitive, user-friendly interface displayed on a large 7" colour touchscreen. 880PL-DC users can now program hipot test sequences in automatic mode or simply control the test voltage using manual mode.

The 880PL-DC is also equipped with



○ The new digital 880PL-DC tester

data acquisition software for exporting test results via USB. The 880PL-DC is outfitted with extensive safety features

including external interlocks, built-in safety checks, visible and audible warning indicators, and an easily accessible emergency stop button to ensure safe operation under all circumstances.

Key features include:

- Programmable output voltage, ramp rate, current limit and dwell timer
- IP67-rated case with wheels and adjustable handle
- 7" colour touchscreen with intuitive user interface
- Digital metering with analogue or digital scales
- Auto-ranging current meter

Haefely Hipotronics – Switzerland

Website: www.hipotronics.com

Retrofit and upgrade solutions

ECONOMICS play a big role. Is your line equipped with technology and electrical components which are not 'state-of-the-art' or are even outdated?

With a relatively small investment it may be possible to upgrade your equipment to meet today's demands.

The right retrofit application often imparts the same benefits as new equipment. Rosendahl's automated control system technology expertise and especially its process knowledge is the key to your retrofit success. You will measure your return on investment within months, according to the company.

Most importantly, more than thousands of installed systems and Rosendahl's long-term customer care give the company an in depth perspective which makes Rosendahl a cost-effective partner in the cable industry.

Rosendahl offers a wide range of customised upgrades, from single components, to line control systems and entire electrical cabinets including latest PLC and AC-drive technology.

It makes sure you are getting the most out of your equipment for many years to come.

Retrofit benefits include:

- Increased equipment reliability and future-proof investment
- 'State-of-the-art' line control system
- Reduced maintenance costs and increased spare part availability
- Minimum downtime required for complete retrofit
- Uniform line control system for all lines

Performance upgrades often go in hand with retrofitting your existing production line. Increase the machine performance for higher output through electrical, mechanical or process upgrades. Upgrade your existing line control unit to state-of-the-art technology.

Performance upgrades offer:

- Increased overall equipment effectiveness
- Higher production flexibility
- Optimised production process
- Short return on investment (ROI)
- Expanded capabilities due to greater line control functionality and usability

RosendahlNextrom GmbH – Austria
Website: www.rosendahlnextrom.com



○ Upgrades from Rosendahl

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Developed for rapid processing

SPECIALITY chemicals company Lanxess is launching a new family of pre-crosslinked EVM rubbers, in the form of the ethylene-vinyl acetate copolymers of the Levapren PXL series.

These have been developed specifically for rapid processing in particularly cost-effective, continuous mixing processes – using Buss co-kneaders, for instance, or twin-screw extruders.

Among other things, the free-flowing

granules are suitable for reducing mixing times when producing particularly high-quality hoses or cable sheathings.

Samples of the new ethylene vinyl acetate rubbers have already been made available to the first customers.

The first grades to be available are 500 PXL, 600 PXL, 700 PXL and 800 PXL, with vinyl acetate contents of between 50 and 80 per cent. The properties of vulcanisates produced using Levapren PXL are similar to those made using

conventional EVM rubbers from Lanxess.

“Standard Levapren grades have a much lower Mooney viscosity than many other synthetic rubbers,” said EVM specialist Jörg Stumbaum from the high performance elastomers business unit at Lanxess.

“This brings several advantages, eg fewer plasticisers or even none at all are needed for EVM processing. However, some users require EVM rubbers with somewhat higher viscosity.

“For some time now, we have been able to offer these customers our pre-crosslinked Levapren XL grades.”

However, the technical conditions of the radiation crosslinking process used in the production of these grades mean they have to be mixed very well if the surface of the extrudates has to meet particularly high quality standards.

“We have therefore long been looking for an alternative crosslinking technology, and have now found the solution in reactive extrusion,” added Mr Stumbaum.

In this process, the polymer is pre-crosslinked with very small amounts of peroxide – although it is ensured that the product does not contain any traces of the crosslinking agent at a later stage.

The process ensures that all Levapren PXL granules have the same crosslinking density.

The result is free-flowing EVM granules that are quick and easy to process in an internal mixer or in continuous mixing processes and deliver exceptional flow properties. This is reflected, for example, in the particularly high surface quality of the extrudates.

The rubbers in the Levapren PXL series also provide much higher green strength than standard and XL grades.

The new Levapren PXL grades from Lanxess are much less susceptible to blocking even after long-term storage, which keeps the material free flowing.

Lanxess AG – Germany
Website: www.lanxess.com

Intuitive operation and stable processes

SIKORA'S display and control units of the Ecocontrol series enable precise regulation of production lines, resulting in a high repeatability and stability of processes. The units can be combined with all Sikora measuring systems and offer relevant data for the regulation of processes quickly and clearly.

In order to facilitate production work for machine operators, Sikora has enhanced the Ecocontrol 600 and Ecocontrol 1000 devices with some practical features. Both devices were equipped with intuitive control elements at the front and a USB port for the optional storage of production data on an external storage medium.

In addition, the operating system of the

Ecocontrol devices was updated to Windows® Embedded, enabling a modern and structured display of measuring as well as trend and statistical data. On an 8" or 15" TFT display, the Ecocontrol 600 and Ecocontrol 1000 offer the operator time and length related values, graphical visualisation, comprehensive statistics at minimal, maximal and nominal values, and information on the standard deviation as well as Cp and Cpk values.

All these functions and features can also be found on the 22" TFT colour monitor of the Ecocontrol 6000.

Sikora AG – Germany
Website: www.sikora.net



○ The Ecocontrol1000 and Ecocontrol 600 were upgraded with practical features

Radiation-resistant multimode fibres for computer tomography



○ Radiation-resistant multimode fibres from Leoni

RADIATION-resistant multimode fibres by Leoni's centre of expertise in fibre, Business Unit Fibre Optics, stand out with their mechanical stability and consistent functional integrity. Even when exposed to increased radiation in computer tomography (CT) scanners, the attenuation of the fibres remains virtually constant.

Leoni supplies its radiation-resistant multimode fibres singly, but also in any desired cable variant such as hybrid cable, breakout versions and in assembled form.

High data rates are generally no problem for glass fibres, but unwanted radiation-induced attenuation (RIA) occurs in the fibre core during transfer in a CT scanner due to the existing X-rays. Although the fibres recover after the CT scan has finished, their transfer performance is compromised during the process.

Radiation-resistant multimode fibres by Leoni's Business Unit Fibre Optics register lower radiation-induced attenuation readings than other multimode fibres. They boast not only a high bandwidth, easy handling and good spliceability, but also an exceptionally small increase in attenuation while exposed to radiation.

The fibres conform to the standard IEC telecommunication specifications, and the Fraunhofer Institute INT in Euskirchen verified their radiation resistance pursuant to TIA/EIA 455-64, the common method to determine to RIA on optical fibres.

This test involves measuring the attenuation increase during pulsed and

continuous radiation. The finding is that, during pulsed exposure to X-rays, Leoni's glass fibres register radiation-induced attenuation of about 20 dB/km at 1,310nm after one second, while one minute after the impulse the induced attenuation increase is one of <0.5 dB/km.

At continuous exposure with g_r radiation (Co-60) to a total dose of up to 1·10⁶ rad/1·10⁴ Gy, the radiation-induced fibre attenuation of the tested multimode fibres comes to less than 40 dB/km at 1,310nm.

In the fibre optics segment, Leoni has a portfolio ranging from fused quartz to preforms and the fibres drawn from this through to fibre optic cables and complete fibre optic systems, thus serving all value creation stages. The Business Unit Fibre Optics is able, at all production stages, to lay out its radiation-resistant glass fibres for their later use and to supply them in different configurations.

The options include, for example, larger coatings of 500µm or various fibre core diameters of 50, 62.5 or 100µm. Integrated in every possible cable design Leoni can, by adjusting the structure and mix of materials, give the radiation-resistant cable tension or crush resistance up to 600 N or make it either extremely flexible or flame-retardant in compliance with IEC 60332-1-2 and IEC 60332-3-22 Cat A. UL-recognised types pursuant to UL 1651 OFNR (UL 1666) are also available, as are assembled solutions.

Leoni Special Cables GmbH – Germany
Website: www.leoni.com



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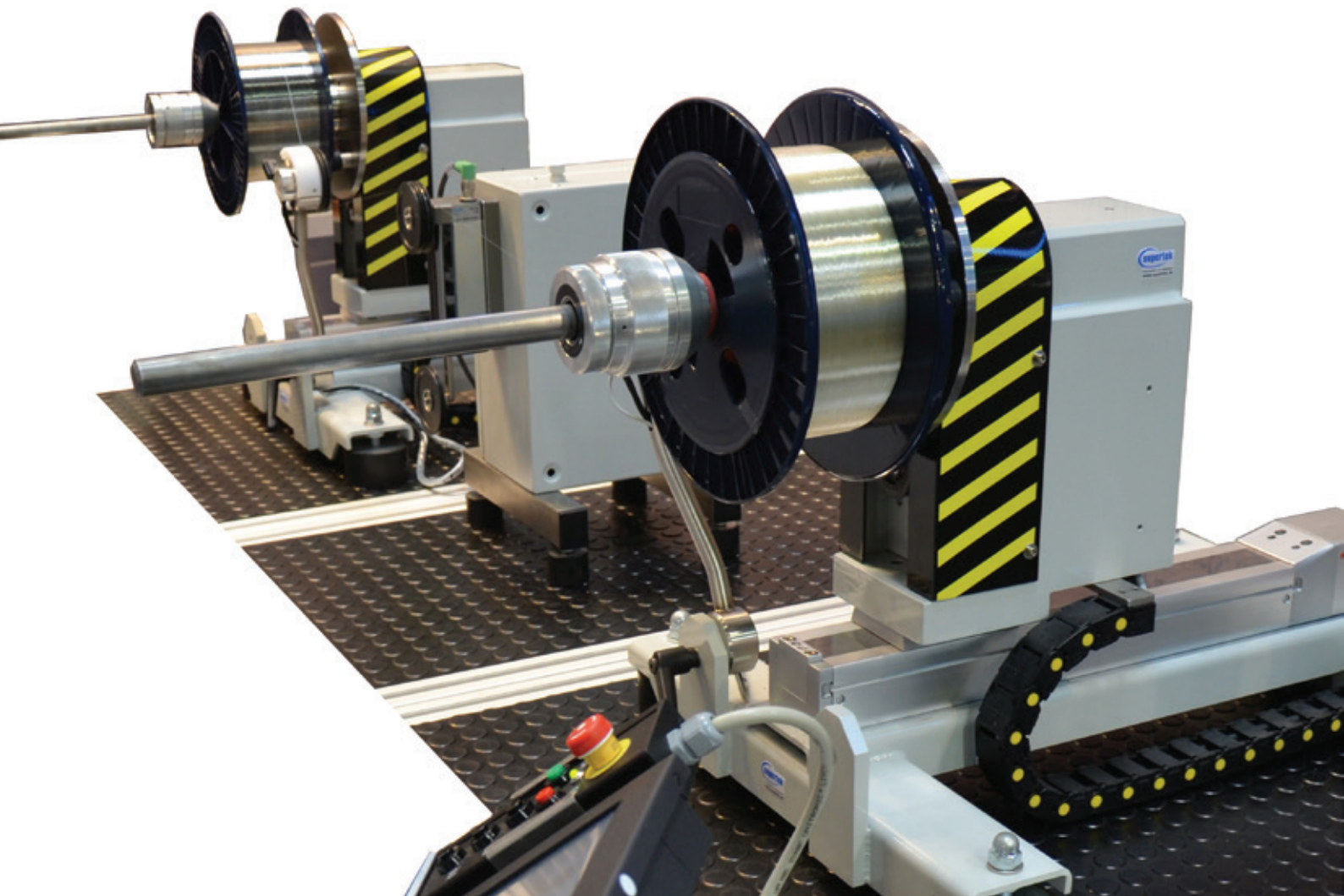
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○ Supertek提供的玻璃纤维复绕站

低扭曲缠绕光学玻璃纤维

缠绕工艺会导致不可避免的光学玻璃纤维扭曲打结，结果影响EMR传输质量。但是，增加光学传输和激光相干光束需要不断提升传输品质。德国公司Supertek钻研这一难题已经数年了，现可提供低扭曲值解决方案，在大多数情况下每2米长度低于0.5圈，同时还保持最高缠绕、绞合和张力控制标准。

使用Supertek Compact Multi-Winder (CMW) 全自动或半自动系统可以轻松高精度解决所有的光纤问题，从拉伸塔输出到所有紧随其后的工艺。精确的张力控制和绞合的几何形状，光纤线处理速度高于3,500米/分，保证最小化监控或操作员干预。除了简洁性之外，专门开发的Supertek电子控制系统允许软件控制所有系统参数，“数据高速传输”(on the fly)上许多是可调节的。光纤要求高度精确、一致的缠绕和过程张力控制。Supertek电磁调节系统对此也是完全胜任的。该创新系统在最高速度下能够

保持最高质量的张力，范围从小于10mN到高于4N。根据材料和类型，准确度优于 $\pm 1\text{mN}$ 。

当高精度、一致的速度控制和张力在复绕系统和类似工艺中至关重要，在这样的情况下，CMW也同样适用。由于每个缠绕机都可被用作放线机或收线机，作为主机或从机，触摸一个按钮，过程完全程序控制，这种复合型机器几乎适合于所有需要的配置中，可单独使用也可嵌入。

所有功能不仅适用于光纤。该数字控制横向卷轴卷绕系统适合于多种材料，诸如塑料、橡胶、碳纤维、医用塑料、膜、化纤、贵金属、合金以及普通钢、铜和其它金属、纺织或化学品。

物理形态也是多种多样，从5 μ 直径的线材和线到更小的箔、扁条带和型材。精度绞合与缠绕机伺服旋转控制允许产品加工的最高定位精度，而Supertek电磁调节控制

系统允许最高精确和一致的张力控制，这是其他类似系统无法媲美的。举例来说，绞合系统提供优于10 μm 的定位分辨率，并且伺服旋转位置设定的精确度控制在0.002°范围内。因此，这不但允许标准的卷轴缠绕，而且针对线圈和变压器绕组，启动、开关和停止的位置都能够准确定位。

对于较大的产品和线圈尺寸，Supertek还提供标准MultiWinder系统，类似于CMW，但是CMW能够承受重达35kg的线轴，法兰直径大于50厘米，同时还提供高度精确的绞合与张力控制。

操作元素，例如“触屏”控制面板装置提供完全标准或客户定制的卷绕机控制，或者客户自己的控制装置也易于整合。软件可打包供应或根据客户具体需求。

Supertek GmbH – 德国
网址: www.supertek.de

模块化在线轮廓和形状测量

Zumbach Electronic of Switzerland公司推出三款新型钢材和金属型材轮廓测量仪。这些新型测量仪以激光横断面技术为基础，采用摄像头视觉，通常也称为“光切”原理。

多达8条线的激光器“标出”产品轮廓范围，每个对应的摄像头捕获产品轮廓大量像素点。然后由高度发达的软件将四张图片添加到轮廓真实的正交剖面上。

所有临界尺寸、角度和半径连同它们的公差都可以编程。操作者和监控人员不仅可以在线监控1:1的真实的轮廓，还可以看到一些不规则缺陷，如接缝、凹凸形状等。

所有标准型材，如H型钢、I型、U型和L型钢，六角钢、方钢、扁钢以及任何特殊形状都可以测量。根据最大的产品尺寸，这三种测量仪测量面积为200、400或800毫米。

凭借独特的概念，PROFILEMASTER®能提供精确、稳定的读数（这不是许多测量仪使用的在这一原理的“固有特点”）。而且还有成熟的多级保护以及清洗/冷却系统确保极高的可靠度。

主要优点包括：

- 多达八个摄像头，模块化相机设置，可以捕捉所有形状；
- 高达16000点/轮廓（2048/摄像头）=5,734,400点/秒（用八个摄像头）
- 采样率高达350-500/秒（完整的轮廓/秒）
- 四种不同颜色的激光器有8个摄像系统，实现完全无干扰
- 形状缺陷检测（SFD）



○ Profilemaster SPS 800-8K测量仪

- 凭借高采样率可以编辑一个3 d模型
- 可以快速方便地接近维修点，实现无障碍维修。

Zumbach Electronic AG – 瑞士
网址: www.zumbach.com

适用于计算机断层扫描的抗辐射多模光

Leoni光纤事业部光纤技术中心生产的抗辐射多模光纤因其稳定的机械性能和一贯的功能完整性而出类拔萃。即使置于高辐射计算机断层（CT）扫描仪中，光纤几乎没有衰减。Leoni不仅可供应抗辐射多模光纤，而且还可以生产其他类型光缆，例如混合光缆、分支光缆和组装光缆。

采用玻璃纤维可轻松实现高传输速率，但是由于x射线的存在，光纤在CT扫描仪中传输时会出现辐射致衰减（RIA）。虽然CT扫描完成后光纤会恢复，但是在扫描过程中光纤的传输性能受到了影响。相较于其他多模光纤而言，Leoni光纤事业部所生产的抗辐射多模光纤具有更低的辐射致衰减。Leoni光纤不仅具有高带宽、便于处理、容易熔接等优点，而且当置于辐射环境时，光纤的衰减极低。

Leoni光纤符合IEC通信标准，位于德国Euskirchen的Fraunhofer Institute INT研究所依据检验光纤RIA的TIA/EIA 455-64标准验证了其抗辐射性。该测试检测了脉冲辐射和连续辐射下的光纤衰减增量。检测结果是在x射线脉冲发生1秒后1310 nm波段处，Leoni玻璃光纤的辐射致衰减度为20 dB/km，x射线脉冲发生1分钟后，辐射致衰减增量为小于0.5 dB/km。

在带辐射（Co-60）的连续辐射中，当总辐射剂量达到 $1 \cdot 10^6 \text{ rad/1} \cdot 10^4 \text{ Gy}$ 时，受测多模光纤在1310 nm波段处的辐射致衰减低于40 dB/km。

在光纤方面，从熔融石英到预制棒、从光纤拉丝到光缆以及完整的光纤系统，Leoni在价值链的每个阶段都具备独特的产品组合。在任何生产阶段，光纤事业部都能够生产抗辐射玻璃光纤以供后期之用，并生产不同规格的光纤。

○ Leoni生产的抗辐射多模光纤



例如，Leoni可生产涂层厚度为500μm的光纤，或纤芯直径为50、62.5或100μm。通过调整结构以及采用不同的材料组合，Leoni可进行任何集成式电缆设计，使抗辐射电缆的张力或抗压力达到600 N，或使其柔软性或阻燃性达到IEC 60332-1-2和IEC 60332-3-22 Cat A标准。Leoni还可提供UL认证的符合UL 1651 OFNR（UL 1666）标准的组装电缆。

Leoni Special Cables GmbH – 德国
网址: www.leoni.com

解决行业需求

Davis-Standard公司新的穿越和折叠收卷放卷机满足了多种电线电缆应用的行业需求。优势包括整体尺寸更小、提高了操作员的人体工程学设计、简化了设计和提高了成本效益。产品反馈非常好，目前已经售出25台机器。

○ Davis-Standard 制造的电缆收线装置



机器尺寸范围从1,250毫米到5,000毫米 (48" - 195")，最集中的尺寸范围在1,800毫米到2,500毫米 (70" - 98")。每台机器都具有标准的控制平台，包括Yaskawa A-1000交流驱动和Allen-Bradley/Rockwell组件包含伺服驱动，PLC(可编程逻辑控制器)和HMI (人机界面)。

对于国际项目，机器都配备了西门子交流传动、PLC和三菱伺服驱动器HMI。技术可以“独立”(转矩控制运行)，带有调节装置或累加器。

Davis-Standard履带式绞盘和HPE挤出机需求也旺盛。Davis-Standard提供多通道、线性和皮带缠绕绞盘，适合于完整系列的电线电缆应用。HPE提供紧凑式设计，是业界最广为使用的挤压机之一。

公司设备因交付快速和设计坚固而著名，而且高效节能和易于维护。电线电缆应用优势包括：为高粘度树脂增加了扭矩能力和客户选项。

就性能和成本效益而言，应对市场需求的能力是Davis-Standard公司服务于电线电缆行业Global Advantage产品的一个方面而已。

此外，Davis-Standard拥有超过70年供应挤压机和相关电线电缆设备的经验。应用包括架空电缆、建筑线、同轴电缆、复合电缆、视频双绞线电缆、电缆盘、CATV、THHM和THWN电线等。

Davis-Standard LLC - 美国
网址: www.davis-standard.com

直观的操作和稳定的工艺

Sikora公司提供的Ecocontrol系列显示控制装置能够精确调节生产线，从而产生高重复性和稳定性的工艺。

这些装置能够与所有Sikora测量系统相结合，为加工过程控制提供快速清晰的相关数据。

为了方便机器操作者的生产工作，Sikora通过一些实用功能进一步强化了Ecocontrol 600和Ecocontrol 1000设备。

这两种设备的前部均配备了直观控制元件，以及一个USB接口用于外部存储介质上选择储存生产数据。

此外，Ecocontrol设备的操作系统被更新为Windows®嵌入式，实现了现代化和结构化显示测量以及趋势和统计数据。

在8"或15" TFT显示器上，Ecocontrol 600和Ecocontrol 1000提供操作者时间和长度相关值，图形可视化，最大、最小和标称值的综合统计，以及标准偏差信息和Cp、Cpk值。所有这些功能和特征都能够

在Ecocontrol 6000 22" TFT 彩色监视器上找到。

Sikora AG - 德国
网址: www.sikora.net

○ Ecocontrol1000 和 Ecocontrol 600 利用实用功能进行了升级



持续推进卷取可能性

单、双、固定、可扩展、垂直、水平、手动、自动...意大利公司DEM倾向于提供更多的可能性。

主要区别在于线圈轴。根据材料的生产流程,线材可卷绕在水平或垂直线圈上。

水平卷取机可以有一个固定心轴(BOM)或可膨胀心轴(BOH)。后者具有自动开/关前门、自动线圈高度预设调节,使得所有操作快速简便和提高正常运行时间。

卷取机配有精密绞合软件,能够控制侧向定位运动与旋转,以获得完美的线材横向振荡卷绕。

BOH卷取机还可以配备用于线圈弹射的额外模块和快速线圈拆除的倾斜装置。

立式卷取机系列包括单卷轴(BVS)、双卷筒(BVD)和全自动线圈更换双卷轴(VSA)。后者具有5吨的最大容量,最高工作速度18米/秒。在其完整配置中,包含自动捆包机、空中线轴操纵器、称重装置和滚筒输送机,滚筒输送机能够装置多达四个卷轴和卸载空卷轴(如果是可折叠线轴)。

所有类型的机器都能够卷绕扁、方或圆型线材,与生产线速度同步。卷取机设计具有一个重型结构。合理设计和使用高品质的组件保证减少维护,即使需要维护也方便快速,并且延长了机器使用寿命。



○ DEM...开拓了卷绕可能性

DEM Wire Rolling Technology自1996年以来,一直是扁平、型材和圆型线材的可靠合作伙伴。不包括冷轧模具和微型模具,公司已经交付了290多台机器。公司正继续前进,奠定坚实的基础,最近实现了新的目标。

管理和财务结构也渐趋完善,成为一家股份制公司(Italian SpA)。

DEM Wire Rolling Technology SpA
- 意大利
网址: www.demgroup.com

改造与升级解决方案

经济在这方面发挥了很大的作用。您的生产线技术已经不那么先进了吗?电气部件已经过时了吗?相对较少的投资都有可能升级您的装备,以满足当今的需求。正确的改造应用收益不亚于新设备带来的好处。Rosendahl自动控制系统技术经验,尤其是他们的工艺知识是您改造成功的关键所在。您可以在数月内衡量投资回报。最重要的是,上千个安装系统和Rosendahl的长期客户的关切给予他们一个深入的视角,这使得Rosendahl成为电缆界成本经济的合作伙伴。

Rosendahl提供广泛系列的定制升级,从单个部件到整个线控制系统和整个电气柜,包括最新的PLC和交流驱动技术。Rosendahl确保您的设备多年都不会过时。改造的好处包括:

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- 降低维护成本和提高备件可用性
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性能升级往往和改造现有生产线是相连的。通过升级电气、机械或工艺提高机器性能,以获得更高的产出。升级现有的线控制装置,使之具有最先进的技术。性能升级提供:

- 提高整体设备效率
- 更高的生产灵活性
- 优化生产工艺
- 投资短期回报率 (ROI)
- 由于较大的线控制功能和易用性而扩展了各项功能

RosendahlNextrom GmbH - 奥地利

网址: www.rosendahlnextrom.com

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优良的敷抹器使得调节和交换既快速又方便,可选的快速更换敷抹器可以效率更高。UniCrimp 100因其动力和坚固的设计,能够适合广泛系列的应用,其简洁性与高精度的完美结合,使之成为各种生产环境的理想选择。

Schleuniger Inc - 美国
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India Insight

Companies join forces to provide power

STERLITE Power Grid Ventures Ltd and Burns & McDonnell International Inc have signed an agreement to apply engineering and construction methodologies on transmission projects in India.

Sterlite is the largest private developer of independent power transmission systems, while Burns & McDonnell is a global transmission and distribution engineering company.

The companies will be working on the Northern Region System Strengthening 29 (NRSS 29) project, which will carry 2,000 megawatts of power to Kashmir Valley from Punjab.

Sterlite Grid will invest close to Rs 3,000 crore towards this critical asset comprising 900 circuit kilometres (Ckm) of transmission lines and 400kV gas-insulated substation (GIS) at Amargarh.

Sterlite Grid has said it will implement this 50-month project in less than 40 months.

“We, at Sterlite Grid, are committed to a cause that not a single unit of electricity should remain unused due to the lack of transmission infrastructure.

“To achieve this, we would like to eliminate transmission line delays by delivering these projects in half the benchmark time.

“Our partnership with Burns and McDonnell will help us achieve this goal by bringing cutting-edge technologies to India,” said Pratik Agarwal, vice chairman.

“Burns & McDonnell is excited about the opportunity to work with Sterlite Grid on this challenging project in Kashmir Valley,” said Jim Hogan, senior vice president, Burns & McDonnell’s transmission and distribution division.

Sterlite Power Grid Ventures Ltd – India
Website: www.sterlitetechnologies.com

Burns & McDonnell – USA
Website: www.burnsmcd.com

Shedding light in security

From November, ONGC Tripura Power Company will export power to Tamu in Myanmar (Burma), where insurgent groups are believed to be hiding.

“This is going to be a very important power export, and [the] Indian government readily agreed,” confirmed ONGC Tripura’s managing director, Satyajit Ganguly, adding that the power will be transported via Manipur from the 726MW Palatana project in Tripura.

“The Tamu town, which is just 3km from Moreh, currently does not have any grid connection and people there use diesel generator sets for power. We will export 3MW of power and this will be sufficient to light up the town. This will help the security agencies in tracking the terrorist movement,” Mr Ganguly said.

Regarding power export to Bangladesh, the necessary transmission lines are currently being laid and Mr Ganguly said it is likely to begin in January or February 2016.

Tripura Power Company – India

Website: www.otpcindia.com

Superfast 4G rollout begins

The country’s largest telecom group by sales has started rolling out superfast 4G mobile data packages in 296 towns – and also plans to sell low-cost smartphones.

Bharti Airtel launched the high-speed data offering ahead of rival Reliance Jio, expected to launch by the end of the year.

Airtel is also offering 4G handsets following a deal with Samsung and Flipkart, and partnership deals with other players could be announced later.

Gopal Vittal, Bharti Airtel’s chief executive, said: “We have now built India’s first commercial 4G network that will make high-speed mobile broadband a reality.”

He added that the company had increased the number of 4G mobile sites three times in the last 60 days to provide better services to customers.

The 4G service has been rolled out to towns and cities since its launch in Calcutta in 2012. Competitor Reliance Jio is currently testing its 4G network before its commercial launch.

Bharti Airtel Ltd – India

Website: www.airtel.in

Highest-ever quarterly profits

Reliance Industries has reported its highest-ever quarterly net profit of Rs 6,720 crore for the July to September period.

That equates to the company earning US\$10.6 for turning every barrel of crude oil into fuel.

RIL’s gross refining margins will continue to improve as it completes margin-enhancing projects – the petcoke gasification project and refinery off gas cracker, which will enhance the recovery of petrochemicals from the refinery off gases that are currently being used as fuels.

“We expect RIL’s margins will improve by at least US\$2 per barrel on completion of these projects,” Moody’s Investors Service said.

Reliance Industries Ltd – India

Website: www.ril.com

Grid growth

Sterlite Power Grid Ventures Ltd (Sterlite Grid) has commissioned its Jabalpur transmission project. The 379km long, 765kV double circuit Dharamjaygarh to Jabalpur line is the longest 765kV line in the country.

The 236km Jabalpur to Bina element was commissioned in June, and with the commissioning of the second element, Sterlite Grid has become the first private developer to complete a 765kV double circuit transmission system.

The Dharamjaygarh to Jabalpur line will transmit power from generating plants in Chhattisgarh and Odisha to key load centres in the western and northern regions.

Sterlite Grid has already commissioned ENICL (East North Interconnection Co Ltd) and BDTCL (Bhopal Dhule Transmission Co Ltd). The company now operates over 2,800km of EHV transmission lines and 6,000MVA of transformation capacity across seven states, integrated with the national grid.

“Besides eliminating bottlenecks in connecting power producers and distribution entities, the project will ensure stability and reliability of the grid.

“By commissioning JTCL project, Sterlite Grid has showcased that private developers have come a long way to play a pivotal role in the government’s mission to provide uninterrupted power to all by 2022,” said Sterlite Grid’s chairman, Pravin Agarwal.

Sterlite Power Grid Ventures Ltd – India

Website: www.sterlitetechnologies.com

Standard & Poor's sees 'pockets of revenue growth' ahead for telecoms in the United Kingdom, Germany, and Scandinavia

The approach of autumn brought some good news to European telecoms from the ratings firm Standard & Poor's. According to an S&P Industry Report Card (4th September), after years of declining revenues Europe's telecom market is expected to halt this trend in 2015-16, with some countries set to reverse it altogether.

Among several trends supporting stronger revenues across the region are these, cited by S&P credit analyst Mark Habib:

- sharp rises in data traffic and increasing monetisation of 4G investments
- the beneficial impact of tiered pricing in most markets
- fewer price wars as mergers and acquisitions continue to consolidate and converge markets.

Consistent cost control by operators also influenced the forecast, noted Nick Wood of London-based *Total Telecom* (4th September). Accordingly, S&P expects Europe as a whole to see a break-even revenue trend in 2015-16, with pockets of growth in the United Kingdom, Germany, and the Nordic countries. Mr Wood also detected a "tone of renewed optimism running through the recent financial reports" of Europe's big telecoms, offering these examples:

- Spain's Telefónica raised its full-year revenue guidance after reporting strong second-quarter growth in sales and profit, while revenue and adjusted EBITDA of French incumbent Orange beat estimates for the second quarter.
- Deutsche Telekom saw second-quarter revenue in Germany edge up 2.1 per cent, while strong domestic performances by Swisscom and Norway's Telenor boosted both their top lines.
- Vodafone CEO Vittorio Colao said in the British telecom's first-quarter report that more of its European businesses had returned to revenue growth. His opposite numbers at Telecom Italia and Sweden's TeliaSonera made similarly upbeat comments about recent performance by their companies.
- S&P expects long-term stability in Europe's telecom and cable sectors. In its view, mergers and acquisitions are the single most important factor in the recent improvement because they have relieved the competitive pressure that was eroding revenues. In particular, mergers among fixed and mobile operators have defused competition as customers signed up to bundled services.

Short-term regulatory headwinds are also receding, S&P said, as the last round of mobile termination rate (MTR) cuts will have been accounted for by the end of fiscal 2015. Noted Mr Wood of *Total Telecom*: "That leaves the phase-out of roaming charges as the main regulatory headwind when it comes to pricing."

The economic embargo of Cuba crumbling, US telecoms see a place for themselves in the \$68 billion Cuban economy

When, in December 2014, the United States and Cuba announced moves to re-establish diplomatic relations broken off in 1961, the

USA declared connectivity to be a priority in its new relationship with the island nation 92 miles offshore Florida. And President Barack Obama made plain his intention to follow through. Telecommunications equipment, technology and services were among the first exemptions to the US economic embargo of Cuba that had been in place for 54 years. Now, at another watershed point, the No 1 US wireless carrier proved itself

equally swift off the mark. Becoming the first US company to do so, Verizon Communications Inc said on 17th September it would begin to offer roaming wireless service in Cuba the following week. The announcement came on the same day that new Cuban ambassador José Cabañas presented his credentials to Mr Obama at a White House ceremony.

Verizon will charge \$2.99 per minute for voice calls and \$2.05 per mega-byte for data. This is an expensive option but one likely to be welcomed by Americans requiring cellular service while on a visit to Cuba. Previously they had to purchase a pay-as-you-go cell phone through state telephone company Empresa de Telecomunicaciones de Cuba SA (ETECSA); or else have a cell phone account in a third country. ETECSA does not offer data transmission.

Whether the Verizon initiative will produce an early effect on Cuban subscribers is less certain. Of a population of 11 million, barely two million have cell phones. Cuban officials, who cite the USA embargo for the poor wireless development, say they hope that 60 per cent of the island's people will have mobile phone access by 2020. Two important factors will help advance that hope: US mobile and broadband service providers can now enter into agreements with Cuban partners; and American companies can now outsource work to Cuban software developers.

At the time of the Verizon announcement, US corporations had been working behind the scenes with the Obama administration for months to bring about the normalisation promised by the president, which began with the initial set of regulatory changes in January. The new rules – which allow US telecommunications and Internet companies to locate in Cuba and market their services there, as well as to import mobile applications made in Cuba for development in the United States – have exceeded the expectations of some business leaders.

- "They've gone farther [and faster] than most anyone expected," said John S Kavulich, president of the New York-based US-Cuba Trade and Economic Council. "It's in keeping with President Obama's strategy, agree or disagree, which

is, 'I'm throwing the proverbial ball into the Cuban court.'"

On 18th September, he reached for another example from the world of competitive sports. The occasion was the release, by the US Treasury and Commerce departments, of 27 more pages of new regulations authorising American entrepreneurs to engage with Cuban government-owned companies as well as the more than 200 categories of independently licensed businesses on the island. "This isn't end-run around the embargo," said Mr Kavulich. "It's a full frontal assault."

- Other US telecoms trying for a Cuban toehold include IDT Corp, which in March reached an agreement with ETECSA to provide direct international long-distance service. Previously phone communication between the two countries had to pass through third countries. And Boost Mobile, a unit of Sprint Corp, in April launched a prepaid plan for American consumers calling and texting Cuba.

Elsewhere in telecom . . .

- Telecom service to tens of thousands of people in a brush-fire-threatened area of California was interrupted on 3rd September by vandalism to a fibre optic line. An AT&T repair worker told the *Ukiah Daily Journal* that a rock slide had exposed the line and that those who cut the cable likely mistook it for saleable copper wiring. On realising their mistake they dropped it and fled. Full restoration of service took 24 hours. AT&T offered a \$10,000 reward for information leading to the arrest and conviction of those responsible for the phone and Internet outages, which spread across several counties. Tampering with telecom networks in the USA is a violation of federal law.
- CEO Marco Patuano of Telecom Italia SpA told reporters in Rome on 20th September that the company would review its strategy in Brazil in light of the economic recession in a country that generates almost 30 per cent of the firm's revenue. Telecom Italia owns about two-thirds of Rio De

Janeiro-based TIM Participações SA, the second-largest Brazilian wireless carrier, with a market value of about \$5.1 billion. In February, Telecom Italia said it planned to invest \$3.6 billion in Brazil over three years to extend fourth-generation mobile coverage to more than 15,000 sites, and 3G coverage to over 14,000 sites by 2017.

- IHS in September reiterated its projection that spending on macro LTE infrastructure would peak in 2015 at \$23.3 billion as operators approach the end of their network deployments. The Englewood, Colorado-based research firm found that spending on macro network equipment reached \$11.4 billion in the three months through to 30th June, up two per cent year-on-year. The growth was driven by 3G deployments in EMEA and unabated LTE rollouts in China. Ericsson and Huawei were tied in the mobile infrastructure race at the end of the second quarter, with each vendor claiming a market share of just over 20 per cent.
- BT has pledged to be answering more than 80 per cent of its customers' calls in the UK, rather than from overseas contact centres, by the end of 2016. To meet this commitment the communications company said it has created over 1,000 new call-centre jobs in the UK and plans to go further. BT will continue to outsource back office functions and work.
- These submarine fibre optic cable developments were announced in September:
- Hibernia Networks said that its 2,858-mile Hibernia Express route connecting Halifax in Nova Scotia, Canada, to the Irish port of Cork is ready for service. As reported by *TeleGeography*, the first trans-Atlantic submarine cable to be built in over 12 years comprises six fibre pairs, with a portion of the fibre optimised for the lowest latency and a portion optimised for 100Gbpsx100Gbps capacity. Total cross-sectional design capacity of the cable is more than 53Tbps. Leveraging a DWDM platform, Hibernia Express is engineered to potentially scale up to 400Gbps

per circuit and beyond. Hibernia Networks also announced that it had launched an Ultra Low Latency service between New York and London which improves the lowest latency route between the two cities by five milliseconds.

- Russian operator Rostelecom said it had completed the first phase of a new cable designed to connect the Kamchatka, Sakhalin and Magadan regions by way of the Okhotsk Sea. The cable will stretch 1,242 miles and have a total capacity of 400Gbps, with optional future expansion to 8Tbps. The first stage of the construction work – handled by Chinese equipment vendor Huawei – involved the deployment of 577 miles of fibre optic cable between Magadan and Okha (Sakhalin). The operator was then to commence work on the Okha-Ust-Bolsheretsk stretch, set for completion by December this year. The full system is scheduled to enter commercial operation in June 2016.
- TeliaSonera has announced plans to withdraw from its seven Eurasian markets to concentrate its resources on operations in Sweden and Europe. The Swedish telecom attributed the shift in focus to difficulties across the Eurasian region, where it has struggled to find partners. Covering Azerbaijan, Georgia, Kazakhstan, Moldova, Nepal, Tajikistan and Uzbekistan, TeliaSonera has recently also been hit by currency volatility as well as the entry into those markets of aggressive new competitors.

Iain Morris of *Light Reading* reported (17th September) that the operator is one of several in Europe alert to the potential of new IP technologies and opportunities in areas, including the Internet of Things, seen as complementary to their core businesses. TeliaSonera's plans to withdraw westward were disclosed only days after the company said it had abandoned efforts to merge its Danish business with that of Norway's Telenor in the face of opposition from European Union regulatory authorities. TeliaSonera's European operations cover the markets of Spain, Estonia, Latvia, Norway and Finland, as well as Sweden and Denmark.

标准普尔(S&P)认为英国、德国、斯堪的纳维亚电信行业存在少量利润增长潜力

随着秋天来临,国际评级机构标准普尔(S&P)也给欧洲电信带来了一些好消息。根据标准普尔(S&P)9月4日的一项行业报告卡显示:欧洲电信市场有望在2015-16年度终结多年的利润下滑势头,其中一些国家已经开始颠覆这一趋势。

标准普尔(S&P)的信贷分析师马克·哈比(Mark Habib)在几大趋势中,引用了以下几项作为更强劲的利润增长的证据:

- 数据通信的急剧增加以及4G投资货币化的逐步增长
- 大部分市场中分层定价的有利影响;以及
- 兼并收购继续促进市场整合与集聚,导致价格战减少

9月4日,来自Total Telecom(电信行业分析杂志,总部位于伦敦)的尼克·伍德(Nick Wood)指出,经营者们持续的成本控制也对预测产生了影响。因此,标准普尔预期在2015-16年度整个欧洲电信有望获得保本收益,而英国、德国以及北欧国家可能取得少量增长。

伍德先生(Mr Wood)还发现,近期欧洲电信巨头的财务报告中的语调洋溢着重燃的乐观情绪,并列出了如下事例:

- 西班牙电信(Spain's Telefónica)报告称二季度销售和利润大幅增长,并调高了全年收入预期;同时,法国当前运营商橙(Orange)的收益和未计利息、税项、折旧及摊销前的利润(EBITDA)高于预期。
- 德国电信(Deutsche Telekom)二季度收入微升2.1%;瑞士电信、挪威电信(Norway's Telenor)国内表现不俗,推高了他们的总收入。
- 英国沃达丰集团(Vodafone)首席执行官维托里奥·科劳(Vittorio Colao)在英国电信(British Telecom)一季度报告中说,公司有更多的欧洲业务的收入开始恢复增长。他在意大利电信以及瑞典的TeliaSonera电信公司的“对手们”也对他们公司近期的表现发表了类似的乐观评论。
- 标准普尔(S&P)预期欧洲电信和电缆行业将保持长期稳定。他们认为合并收购是近期增长的唯一最重要原因,因其缓解了蚕食收益的竞争压力。尤其是通过合并固定和移动通信经营者,使消费者注册捆绑服务,从而缓和了竞争。

标准普尔称,由于2015年财年结束时也将考虑上一轮移动终端率,短期监管阻力也在减弱。Total电信的伍德先生说:“在定价方面,这将使得逐步淘汰漫游计费成为主要的监管阻力。”

对古巴的经济封锁瓦解,美国电信在价值680亿美金的古巴经济中看到了他们的一席之地

2014年12月,美国与古巴声明采取行动重建自1961年中断的外交关系,美方宣称,在其与这一距离佛罗里达海岸线92英里的岛国的新关系中首先看重的是通讯。巴拉克·奥巴马总统坦言他的意图也与此一致。通讯设备、技术和服务是美国对古巴54年经济封锁中第一批被解禁的行业。

现在,美国排名第一的无线设备商也随机应变,成为另外一个分水岭。作为第一家“吃螃蟹”的美国公司,威讯通信公司(Verizon)于9月17日称,接下来的一周开始他们将为古巴提供无线漫游服务。同日,古巴新任外交官约瑟·卡巴那(José Cabañas)在白宫的庆典上将国书交给奥巴马总统。

威讯公司(Verizon)将收取2.99美金每分钟的语音呼叫费以及2.05美金每兆节的数据流量费。这一出价虽然昂贵,但却

很可能受到那些在古巴旅游时需要使用漫游服务的美国人的欢迎。在此之前,他们必须得购买古巴国有电信运营商(ETECSA)提供的预付费电话,或者购买第三国账户电话。古巴国有电信运营商(ETECSA)并不提供数据传输。

近期威讯公司(Verizon)的这项创举是否会对古巴用户产生影响还是未知。1,100万人口中仅有200万人持有移动电话,古巴官方将无线发展缓慢归因于美国的禁运,他们希望到2020年,60%的岛上人口可以使用移动电话。两项重要的因素将会加快这一愿望的实现:美国移动和宽带服务商现能与古巴合伙人达成协议;以及美国企业现在可向古巴软件开发商外包服务。

与威讯公司(Verizon)发表声明的同时,美国公司与奥巴马政府在幕后花费数月兑现总统承诺的“正常化”,并将于1月份开始实施初步的监管调整。新规则将允许美国通讯以及互联网公司在古巴设点并开拓市场服务,同时也允许在美国发展古巴生产的移动应用程序,这一措施甚至超出了很多商业大鳄的预期。

➤ “他们的发展势头和速度超出大部分人的预期”,驻纽约的美国-古巴贸易和经济委员会主席约翰·S·卡乌里奇(John S Kavulich)说道。“这与奥巴马总统的战略不谋而合,不管别人同意不同意,‘我都将把话语权交给古巴裁决’”。

➤ 9月18日,他又从竞技体育世界引出了另外一个事例,起因是美国财政部出台了一份超过27页的新规章,允许美国企业家与古巴国有公司和超过200多个不同行业的、持有独立营业执照的岛国企业合作。“这不是绕开禁运的迂回战术”,卡乌里奇(Kavulich)先生说道:“这是正面攻击。”

➤ 其他试图排除古巴障碍的美国电信公司还包括美国国际数据集团(IDP Corp),该公司于三月份与古巴国有电信公司(ETECSA)达成协议,向古巴直接提供国际长途服务。在此之前,两国之间的电信通讯必须通过第三国进行。美国斯普林特公司(Sprint Corp)旗下的运营商布斯特移动(Boost Mobile)也在四月份发布了一项针对与古巴进行通信和发送短信的美国用户的预付费计划。

电信行业的其他新闻.....

➤ 9月3日,加利福尼亚州一处受森林火灾威胁地区的成千上万用户的电信服务由于蓄意破坏光纤电缆而被迫中断。一名美国电话电报公司(AT&T)的维修人员告诉尤凯亚日报的记者,岩滑暴露了线缆,那些切割电缆的人以为这些是可以变卖的铜导线。当意识到自己的错误时他们就扔掉电缆溜掉了。

全面抢修计划持续了24个小时。本次通讯和网络中断波及周围若干郡县,美国电话电报公司(AT&T)将向协助逮捕破坏通讯和网络服务人员并助其认罪的消息提供者奖赏一万美金。在美国,破坏电信网络是触犯联邦法律的行为。

➤ 9月20日,意大利电信(Telecom Italia SpA)首席执行官帕吐纳诺(Marco Patuano)在罗马告诉记者,考虑到巴西经济衰退,而公司来自巴西的收入占总收入的百分之三十,公司准备重估在巴西的发展战略。意大利电信(Telecom Italia)拥有TIM Participações SA公司(总部位于里约热内卢,市场价值约51亿美金,是巴西第二大无线运营商)三分之二的股份。2月份,意大利电信(Telecom Italia)称其将在2017前的三年时间内,在巴西投资36亿美金,用于将4G网络覆盖拓展至超过15,000个站点,3G网络覆盖超过14,000个站点。

The US economy

The key to grasping why a sharp decline in stock prices poses no significant threat: 'The stock market is not the economy'

At a recent pace of about 200,000 per month, the US economy is adding jobs at a rate of 2.4 million a year. The private sector has gained more than seven million workers since the end of 2012. In August, the most recent month for which results are available, the unemployment rate stood at 5.1 per cent.

That rate is at its lowest since April 2008, and broader measures of underemployment are likewise improving. The rest of the monthly report from the Bureau of Labor Statistics was similarly positive. The jobs picture brightens all the time.

Despite the steady reassurance of this bellwether economic marker, going into the autumn the American media focused on a sudden and sharp decline in stock prices. To judge from such headlines as "Bloodbath in Global Markets," many of the nation's news sources seemed barely able to control their agitation.

A notable exception is James Surowiecki, the financial page writer of the *New Yorker*, whose sober assessment of the market gyrations served as a timely corrective. Ignoring warnings about "a real threat to the American economy" and "a leaner era ahead," he began with a useful reminder of a simple financial truth: the stock market is not the economy. Investor anxieties, he wrote, "have surprisingly little to do with the current state of the American economy." ("Drop in the Bucket," 7th September)

A virtually unaffected GDP

Here, abridged and lightly edited, are the principal points made by Mr Surowiecki:

☛ The market sell-off in the USA was driven mainly by turmoil in China, which is dealing with the deflation of a stock-market bubble and is striving to maintain economic growth. But these problems will have little impact on the USA. Total American exports to China are just \$165 billion, less than one per cent of gross domestic product (GDP).

Even a significant economic downturn in China would squeeze most American companies barely at all, at least short-term. Goldman Sachs estimates that a one per cent drop in China's growth rate translates into a mere 0.06 per cent drop in the GDP of the United States. And the flow of goods imported into the USA from China is unlikely to be affected by a Chinese downturn.

☛ Globally, China's slowing pace of growth has certainly had spillover effects. The price of commodities (eg iron ore, copper, oil) has fallen, and the price of oil has been pushed down further by a production glut.

This has been very hard on developing economies like those in Latin America, which rely on commodity exports to China. But cheaper commodities favour the USA economy, lowering production costs for American firms and keeping more money in consumers' pockets.

☛ Some financial commentators worry that the recent market turmoil foreshadows something like the meltdown of 2007-09 or the Asian financial crisis of 1997-98. But these were insolvency crises, involving debt that was not going to be repaid, companies and countries going under, and economies deep in recession.

The situation today is not analogous. Unlike the Asian countries that got into trouble in the late 1990s, China is a creditor-nation, not a debtor. And the emerging market economies are in much better shape than they were. Today, these countries typically have sizable dollar reserves and, instead of running big current-account deficits, mainly run surpluses with the rest of the world.

☛ Stock-market crises can, of course, become "contagious" – dampening what John Maynard Keynes called the "animal spirits" of managers and consumers and leading to cutbacks in investment and spending. And stock prices do certainly have some impact on consumer spending.

Still, market moves need to be severe and long-lasting to make a real difference. The 1987 crash saw stock values drop more than 22 per cent in a single day. Yet it had no measurable impact on corporate investment and only a short-lived effect on consumer spending.

In the far less precipitous drop of 2015, wrote the *New Yorker's* Mr Surowiecki in September, Americans' retirement accounts became a bit lighter than they were two weeks earlier.

He noted further: "America's economy looks pretty much the same."

Telecom

An all-electric satellite launch is noteworthy on other counts, as well – not least its 'unheard of' low price-tag

Bermuda-based satellite fleet operator ABS said on 10th September that its ABS-3A satellite, the world's first all-electric commercial telecommunications spacecraft, had reached final geostationary position and begun operations six months after its launch.

Reporting in *SpaceNews* on the entry into service, Peter B de Selding cited as the advantage of all-electric satellites their low launch mass, allowing the purchase of less-expensive launch services; or, as here, enabling satellite operators to launch two satellites at once, depending on the rocket selected. The disadvantage, wrote Mr Selding, "is that they take months to reach geostationary position, rather than a couple of weeks

From the Americas

for satellites with chemical propellant.” This perhaps explains the emphasis on ABS-3A’s achievement of full functionality about a month ahead of schedule. (“ABS All-Electric Satellite Arrives Early at Operating Orbit,” 10th September)

ABS-3A was launched in March aboard a Falcon 9 two-stage rocket operated by SpaceX of Hawthorne, California. The 4,299lb satellite was paired with the slightly heavier Eutelsat 115 West B, weighing 4,850lb, for a launch that, as noted by Mr Selding, “became a showcase for how even smaller fleet operators can trim capital expenditures with smart buying practices.”

ABS and fleet operator Satmex, of Mexico – since purchased by Paris-based Eutelsat – secured favourable contract terms from Boeing Space and Intelligence Systems and with SpaceX, both as inaugural customers for the all-new Boeing 702SP design, and because of the purchase commitment. The contract, finalised in March 2012, stipulated four firm satellite orders and options, with the first four – two for ABS, two for Satmex – paired on Falcon 9 launches.

According to Mr Selding, industry sources at the time said ABS and Satmex paid about \$90 million for each satellite, with the two evenly splitting the cost of a \$60 million Falcon 9 launch. To build and launch satellites carrying 40-plus transponders for around \$120 million apiece “was unheard of” at the time of the contract signing, he noted.

Since then, other satellite builders, including Airbus Defence and Space of Europe, have ploughed resources into their own all-electric designs and have won commercial orders.

☛ Eutelsat 115 West B was scheduled to arrive at its operating station, 115 degrees west longitude, by late September and to commence service in October, with the heavier mass accounting for the one-month difference in arrival times between the paired satellites.

ABS-3A carries 24 C-band and 24 Ku-band transponders and is expected to provide telecommunications to the Americas, Africa, Europe and the Middle East for at least 15 years.

A water conservation effort by wireless provider AT&T in drought-stricken California targets household leaks

According to the US Environmental Protection Agency, residential water leaks can waste more than a trillion gallons of water annually – equal to the water usage of 11 million American homes. Average household leakage can account for more than 10,000 gallons of wasted water every year.

These statistics are especially pertinent in California, now in the fourth year of its worst drought in a millennium. On 11th September, the National Weather Service released an update on the anomalous periodic (once in seven years) weather phenomenon known as El Niño, which seemed to promise a wet winter on the Pacific Coast. But, as noted by science editor Nick Stockton of *Wired* (10th September), “That forecast comes laden with caveats.”

For one, it matters where and when the precipitation falls – even if, as predicted, El Niño 2015 is a soaking weather system. California’s wettest El Niño, in 1983, dropped nine times the annual average rainfall, and at least that much would be needed now to bring reservoirs back up to normal. Wrote Mr Stockton: “No matter how much water El Niño brings, it’s unlikely it will be enough to sate the Golden State’s deficit.”

In these conditions water conservation is of the first importance. In *FierceWater*, a newsletter of the *FierceMarkets Energy Group*, Barbara L Vergetis Lundin reported on a new programme designed by AT&T to help its California customers counter the major source of water waste: household leaks. (“Wireless Provider Gets in on Water Conservation Game,” 25th August)

This summer, the company – which in 2013 set a goal of reducing its own global water use by 150 million gallons annually – offered new customers a bill credit of \$5 a month for six months when they sign up for a digital water detection service that sends alerts to mobile devices when a sensor detects water leakage in the home.

Alternatively, new customers could opt for a credit of \$10 a month over six months on signing up for a digital water control service. This not only detects and reports leaks but also allows users to shut off the water source remotely from a mobile phone or tablet. Existing customers were also eligible to receive a bill credit of \$5 a month for six months upon adding a water detection feature to their current service.

Additionally, for each purchase of either service made at participating California retail locations, AT&T pledged to donate \$10 to the Nature Conservancy for projects like Save the Sierra Nevada: Save our Water.

☛ Every such effort is to the good. According to a paper published on 14th September in the journal *Nature Climate Change*, last winter’s snow in the Sierra Nevada Mountains, an essential source of fresh water for California, was at its lowest in 500 years. The new study used tree-ring data from centuries-old oaks to provide historical context for the diminished snowfall in the mountain range. As of 1st April, the snowpack levels were at just five per cent of their 50-year historical average.

Elsewhere in telecom . . .

☛ After reviewing records of cable faults worldwide, the International Cable Protection Committee (ICPC) concluded that concern about shark attacks on undersea fibre optic cables is unfounded. The danger was addressed in a graphic video of a shark frenzy shown during Shark Week 2014 on the Maryland-based Discovery Channel, since viewed widely on YouTube. But, as reported on *Smartgridnews.com* (7th July), ICPC studies have discerned a marked decline in faults caused by fish including sharks.

From 1901 to 1957 – a period dominated by subsea telegraphic cables – at least 28 such cables were damaged by fish. From 1959 to 2006 – a span that

encompasses coaxial cables, replaced by fibre optic systems in 1988 – some 11 cables needed repair, and fish bites accounted for 0.5 per cent of all cable faults. The most recent analysis – covering 2007 to 2014 – recorded no cable faults attributable to sharks.

The reduction in faults is seen as consistent with improved design, protective sheathings, and other measures to protect subsea technology. According to *Smartgridnews.com*, more problematic faults derive from natural phenomena like subsea landslides and ocean currents (less than ten per cent) and component failure (five per cent).

Energy

Having put European antitrust concerns to rest, GE is approved for acquisition of the power business of Alstom of France

General Electric Co of the USA, has gained the go-ahead from European antitrust regulators to buy most of Alstom SA's energy business, advancing chairman and CEO Jeffrey Immelt's goal of returning GE to its industrial roots after a diversification into finance by his predecessor.

GE's pledge to sell gas-turbine assets to an Italian rival, Ansaldo Energia SpA, helped allay concerns over the \$9.5 billion plan, the European Commission said. Minutes later on 8th September, the US Justice Department chimed in with its approval.

"We got a deal that's good for our customers and good for GE and good for our investors," Mr Immelt said in a phone interview with *BloombergBusiness*. ("GE Wins EU-US Approval for Alstom Deal With Asset-Sale Vow," 8th September)

The *Bloomberg* reporters Gaspard Sebag and Rick Clough noted that, in 2001, European regulators blocked GE's projected takeover of the American engineering conglomerate Honeywell International – a failure that shadowed the review of the Alstom deal.

With the Alstom assets it is buying, GE means to extend its global leadership in providing electrical utilities with generating equipment and power-grid distribution systems. Like rivals such as Siemens, of Germany, GE sees opportunity in that business as the world moves away from coal and toward cleaner natural gas, solar and wind energy.

☎ Deane Dray, an analyst with RBC Capital Markets LLC, told Messrs Sebag and Clough that GE has its work cut out to integrate the large operation and achieve promised synergies of \$3 billion in five years.

But for now GE has the green light for its Alstom acquisition – an outcome which was far from inevitable. In February, when the European Union opened its investigation into the deal, EU antitrust chief Margrethe Vestager expressed concern that the combined company's dominance might lead to higher prices and fewer options for customers.

In September, Ms Vestager pronounced herself satisfied that this would not happen. At the news conference in Strasbourg, France, at which the GE-Alstom deal was announced, she said that the divestitures to Ansaldo would avoid "a great risk of choice going down and prices going up."

☎ In other news of General Electric, CEO Jeffrey Immelt told the business news TV channel *CNBC* that the company expects to decide on a new location for its headquarters before the end of this year. GE had been mulling a move out of Fairfield, Connecticut, since June, when state lawmakers passed a budget that includes \$1.2 billion in tax increases despite protests from some of the state's biggest corporations.

Reuters observed that the loss of GE is likely to be a huge blow to Connecticut, which bled thousands of jobs after the financial crisis and has been one of the slowest states to recover from the recession. Its gross domestic product (GDP) grew less than one per cent in 2014, compared with 2.4 per cent growth for the USA as a whole.

Transportation

With a Boston railway car contract in hand, a Chinese builder of high-speed rail systems broadens its US ambitions

"As you know, about 100 years ago USA infrastructure was leading the way. But after 100 years it still has a lot of room to grow and create opportunities."

This tactful view was expressed to the *New York Times* by a man who knows something of opportunity: Yu Weiping, the vice president for international business of the China Railway Rolling Stock Corporation. State-owned CRRC broke ground in September for a \$60 million plant in Springfield, Massachusetts, that will provide new cars for the Boston transit system.

The plant, which will hire 150 people, is part of a \$566 million contract awarded last year under which CRRC is to provide 284 cars for Boston's Orange and Red Lines. It is the first Chinese railway car manufacturing company to win a major transit contract in the United States.

"The company sees the plant as a potential beachhead to win more contracts in the United States," wrote the *Times's* Jad Mouawad. He sees the deal, China's biggest push in the American railroad market, as an example of Beijing's policy of encouraging its technology and infrastructure companies to export their skills and seek foreign markets. ("Chinese Rail Firm Makes Inroads with US Factory and Boston Transit Deal," 3rd September)

CRRC, which beat out Canada's Bombardier, among other competitors, included in its bid a provision to assemble the rail cars in Massachusetts. The new plant, on a 40-acre industrial lot in a former Westinghouse manufacturing centre, will begin operations in 2016, with deliveries to commence in 2018.

The new rail cars will replace Orange Line cars in service for 32 years and Red Line cars that have been operating for 44 years.

Mr Mouawad suggested that the presence of a new rail car manufacturer in the USA might provide impetus for cities and states that are considering modernisation of their transit systems or are looking into high-speed rail.

Such a development would apparently suit CRRC very well. In his previous job as chairman of Tangshan Railway Vehicle, which is owned by CRRC, Mr Yu oversaw the design and manufacture of one of the fastest high-speed trains in the world, with an average speed of 218 miles an hour.

He told the *Times* that his company was eager to apply the lessons learned in China. Speaking through a translator he said, "With our expertise in this field, we would like to partner with whichever [USA] states see the need and continue to be a good partner and help create local jobs."

Automotive

Ten 'radical' automakers will offer standard robotic braking in a bid to curb US deaths, injuries, repairs and insurance premiums

One-third of all car crashes on American roads are rear-end collisions, with a driver hit from behind every 17 seconds. Now, in what automotive reporter Jerry Hirsh of the *Los Angeles Times* terms "a radical move," ten of the world's largest automakers will begin making automatic emergency braking a standard feature in future models sold in the USA.

Joined by federal safety regulators and an insurance industry trade group, the automakers announced in September that they will adopt systems that use on-vehicle sensors such as radar, cameras or lasers to detect an imminent crash; warn the driver; and, if the driver takes no action, engage the brakes. ("Automakers Vow to Put the Brakes on Rear-End Collisions," 11th September)

The automakers – Audi, BMW, Ford, General Motors, Mazda, Mercedes-Benz, Tesla, Toyota, Volkswagen and Volvo – all agreed to work with the National Highway Traffic Safety Administration (NHTSA) to develop a timeline for installing automatic braking as a standard feature in all vehicles they sell in the USA. Taken together, the ten companies accounted for 57 per cent of US auto sales in 2014.

"The announcement brings the rapidly changing auto industry one step closer to self-driving vehicles," wrote Mr Hirsh, who noted that many cars sold in the US are already available with automated safety features. These include cruise control that speeds and slows with traffic, lane departure alerts with steering assistance, and high beams that switch on in the absence of oncoming cars. Additionally, many cars are equipped with automatic braking.

Mercedes-Benz offers a standard front-crash-prevention system in its 2015 C-Class, CLA and E-Class sedans. Volvo in 2014 made low-speed automatic emergency braking standard on all its vehicles.

The Insurance Institute for Highway Safety (IIHS), an industry trade group, said 52 per cent of the 784 models available in the USA this year come with technology that alerts a driver to a pending crash as either a standard or an optional feature. Among those models, 27 per cent also offer robotic braking. That is more than twice as many as in the 2012 model year. But often the feature is an expensive option.

Mr Hirsh reported that Honda charges an extra \$1,000 for a safety package that includes automatic braking for its Accord sedan and Pilot sport-utility vehicle. Subaru groups robotic braking with such amenities as a moon roof in a package that adds \$2,595 to the sticker price of its popular Impreza. (Neither company joined the ten "taking the pledge" in September. Another absentee – Nissan – said in a statement that it was not asked to be included but planned to discuss the proposal with NHTSA.)

Near-unanimity on robotic braking

There is compelling incentive for making robotic braking mandatory. According to NHTSA, it helps prevent or reduce the impact of the rear-end collisions implicated in 33 per cent of all crashes on the road. The IIHS said its research found that automatic braking systems can reduce insurance injury claims by as much as 35 per cent.

Automatic emergency braking "is up there with electronic stability control and front and side air bags," said Clarence Ditlow, executive director at the Center for Auto Safety, who would welcome consumer-group input. He told Mr Hirsh: "We would ask, if you are going to test the braking to make sure it stops a car going at 25 miles per hour, then why not at 50 – which is closer to highway speeds?"

Consumer Reports is already on the job. Automotive test director Jake Fisher said that, as automatic braking finds its way into more vehicles, the independent product testing and review publication will stop recommending cars that lack it.

NHTSA, with help from the insurance institute, will work with automakers on the details of the rollout, including performance criteria and a time-frame, NHTSA spokesman Gordon Trowbridge told the *Los Angeles Times*. "This is not an enforcement or a recall issue," said Mr Trowbridge. "The companies are making this commitment in the absence of a federal mandate."

That is not to say that a mandate would not be forthcoming if the initiative shows signs of slowing. NHTSA, with its mission to "save lives, prevent injuries, and reduce vehicle-related crashes," happens to be an agency of the Executive Branch of the USA government. Thus, supporters of automatic braking systems have an influential friend in Washington: President Barack Obama.

Dorothy Fabian – Features Editor

美国经济

把握为何股价大幅下跌并非致命威胁的关键：“股市并非经济”

美国经济近期以每月大约增加200,000个工作岗位的节奏，全年240万的速度增加就业岗位。民营企业自2012年年末以来已经获得了超过七百万工人。8月，该调查最新可用月度结果，失业率站在5.1%。

该比率是自2008年4月以来的最低值，而日益扩大的就业不足尺度可能正得到改善。源自劳工统计局月度报告的其他部分也同样积极。就业前景始终明朗。

尽管有领先经济指标的稳定保证，进入秋季以来美国媒体聚集于股票价格的突然大幅下跌。从类似“全球市场遭血洗”这样的标题判断，诸多国家的新闻媒体几乎不能控制他们的躁动。

一个值得注意的例外是《纽约客》杂志 (New Yorker) 的财经版作家，詹姆斯·索罗维基 (James Surowiecki)，他对市场回应的冷静评估起到了及时纠正的作用。撇开关于“一个对美国经济的真正威胁”及“一个更精简时代就在前方”的警告。

他以简单的金融真理为开头，有效的提醒称：股市并非经济。他写道：投资者的担忧“令人惊讶的与当前美国经济没有多少关系。”（“杯水车薪，”9月7日）。

GDP几乎未受影响

以下是索罗维基先生主要观点，仅作略微调整和删节：

① 美国证券市场的抛售行为主要是由中国经济动荡引起的，中国正在处理证券市场泡沫的紧缩并努力保持经济增长。但是这些问题对美国的影响微乎其微。美国对中国的出口总额仅为1,650亿美元，不到国内生产总值 (GDP) 的1%。

即便中国发生了巨大的衰退，至少在短期内对美国公司的挤出效应也微不足道。高盛评估称中国增长率下降1%仅导致美国GDP下降0.06%。且从中国进口至美国的物流将不太可能受中国衰退的影响。

② 全球范围内，中国放缓增长的步伐势必导致溢出效应。大宗商品的价格（例如，铁、铜、原油）下降，且原油价格已经因产能过剩进一步的下滑。这使得身处拉美依赖对中国商品出口的发展中国家面临困境。但是更廉价的商品对美国经济有益，使得美国公司能降低生产成本还能让消费者省下更多的钱。

③ 一些财经评论员担心最近的市场动荡于是这诸如2007-2009年的危机和1997-1998年的亚洲金融危机的前兆。但那些是无力偿还的危机，涉及不能偿还的债务，公司和国家深陷其中，经济陷入衰退。

今天的情况并不相似。与上世纪90年代末陷入困境的亚洲国家不同，中国是债权国而非债务国。而且新兴市场经济比当年要好许多。今天，这些国家通常拥有相当规模的美元储备，且与世界其他地区主要为顺差不再是通过大规模经常项目赤字来运营。

④ 当然，股市危机有“蔓延性”的可能——抑制管理人员和消费者的，如约翰·梅纳德·凯恩斯 (John Maynard Keynes) 所称的“动物精神”，并导致投资和消费削减。因此股价的确会对消费支出产生影响。

不过，严重和长期市场波动才能制造真正的不同。1987年的崩盘单日下跌22%。然而这对企业投资行为没有可测的影响，对消费者支出只有短期影响。

索罗维基先生在9月的《纽约客》中写道，2015年的下滑远不如前。美国人的退休账户与两周前相比只是稍微少了一点。

他进一步指出：“美国经济看起来非常的相似。”

电信行业新闻

全电能的卫星发射在其它各方面也值得关注，尤其是“闻所未闻”的低标价

位于百慕大的卫星舰队运营商ABS称9月10日，其ABS-3A卫星，世界首颗全电能商业电信航天器，已经到达了最终的静态位置并在发射六个月后开始运营。

在《空间新闻》(SpaceNews) 中从进入服务开始报道，彼得·B·迪·斯尔汀 (Peter B de Selding) 称全电能卫星其优点是发射重量低，允许购买较低花费的发射服务，或，由此使得卫星运营商根据其选择的火箭类型一次发射两颗卫星。

其缺点是，斯尔汀先生写道，“是其要花费数月到达静态位置，而使用化学燃料推进的卫星只需花费两至三周，”这也许能解释强调ABS-3A大约提前计划一个月实现了全部功能的原因。(ABS全电能卫星提前到达运行轨道，9月10日)

ABS-3A在三月发射，搭乘位于加利福尼亚州霍桑市 (Hawthorne) 的太空探索科技公司 (Space X) 的猎鹰 (Falcon) 9号双节火箭。该4,299磅重的卫星与稍微重一些的Eutelsat 115 West B相伴，后者重达4,850磅，斯尔汀先生评论称：发射它们，“成为小的卫星舰队运营商能通过明智的采购举措削减资本开支的范例。”

ABS和卫星舰队运营商墨西哥的墨西哥卫星公司 (Satmex) ——由于被巴黎的欧洲通信卫星组织 (EUTELSAT) 收购——确保了来自波音航天和智能系统部门及太空探索公司的有利合同条款，两家都是全新的波音702SP设计的首批客户，也是因为购买承诺。该合同，2012年3月敲定，规定四颗公司卫星次序和选项，第一批四颗——ABS两颗，墨西哥卫星公司两颗——在猎鹰9号上配对发射。

根据斯尔汀先生的观点，业内人士称ABS和墨西哥卫星公司为每颗卫星支付了大约9,000万美元，同时双方均摊猎鹰9号6,000万美元的发射成本。他评论称，签署合同的当时，建造并携带40多个转发器的卫星，每颗只需大约1.2亿美元“是闻所未闻”。自那以后，包括空客防务 (Airbus Defence) 和欧洲空间 (Space of Europe) 在内其他卫星制造商，开始开发自主全电能设计产品并已获得商业订单。

⑤ Eutelsat 115 West B 计划9月底之前达到其运行站点，西经115度，并在10月开始服务，因较重导致与相配对的卫星的到达时间差为一个月。ABS-3A携带24 C-波段和24 Ku波段转发器且预期为美洲、非洲、欧洲及中东提供电信服务至少15年。

无线运营商美国电话电报公司 (AT&T) 在遭受旱灾的加州致力于针对家庭漏水的节水措施

根据美国环境保护署的报告，每年住宅漏水浪费超过1万亿加仑的水量——相当于1,100万个美国家庭的用水量。每年户均漏水造成10,000加仑的水被浪费。

这些统计数据在加利福尼亚尤为重要，现在已经是该州进入千年难遇的旱灾的第四个年头了。9月11日，国家气象局发布一个被称为厄尔尼诺天气现象异常周期（曾经是七年）的更新，似乎保证太平洋海岸会有一个湿冷的冬天。

但是如《连线》杂志（Wired）（9月10日）的科技编辑尼克·斯托克顿（Nick Stockton）评论，“这个预告充满了警示。”

首先，其问题是何处及何时降水——即便如预测的那样厄尔尼诺2015是一个潮湿的天气系统。加利福尼亚最潮湿的厄尔尼诺年份，1983年降雨量是平均年降雨量的9倍，现在至少需要那么多才能让水库回复到正常水平。斯托克顿先生写道：“无论厄尔尼诺带来多少水，它都不能满足黄金州的赤字。”

在这种条件下，节约用水是第一要务。菲娅斯马凯斯能源集团（Fiercemarkets Energy Group）的实时通讯在《激流》（Fiercewater），中，芭芭拉·L·瓦格提斯·伦丁（Barbara L Vergetis Lundin）报道一个由AT&T设计的新程序帮助其加利福尼亚客户应对最主要的水资源浪费：家庭漏水。（“无线供应商加入节水游戏，”8月25日）

今年夏天，该公司——其在2013年设定一个目标：每年减少其全球用水量达1.5亿加仑——提供新客户一个长达六个月，每月5美元信用额度的账单，只要他们签署一份数字水探测服务，当传感器侦测到家中有漏水时会发送警告至移动设备上。

另外，新客户在六个月结束后通过签约参加一份数字水控制服务可选择每月10美元信用。该服务不光侦测和报告漏水还同时允许用户通过手机或平板电脑远程关闭水源。

现有客户也有权获得长达六月每月5美元信用的账单，只要在其目前的服务上增加水侦测特征即可。

此外，每次在参与活动的加州零售地区购买上述两种服务的任何一种，AT&T均承诺捐款10美元给大自然保护协会，诸如保护内华达山脉：保护我们的水项目。

☛ 每一个类似的努力都是行善。根据9月14日出版的杂志《自然天气变化》（Nature Climate Change），去年冬天在内华达山脉的雪，即加州淡水的主要来源，为500年来最低。该新研究使用来源于百年老橡树的年轮数据提供该山脉降雪减少的历史环境。截至4月1日，积雪量仅为50年历史平均值的5%。

电信行业其他新闻.....

☛ 在回顾了全球范围内的电缆故障之后，国际电缆保护协会（ICPC）总结称对鲨鱼袭击海底电缆的担忧是没有根据的。这种危险是在2014年马里兰州的发现频道（Discovery）的鲨鱼周中关于鲨鱼狂怒的图像视频中被定义，之后在视频网站YouTube上被广泛浏览。

但是，如Smartgridnews.com（7月7日）所报道，ICPC研究已经发现包括鲨鱼在内由于类引起的故障已经明显的下滑。

从1901年到1957年——海底电报电缆主导的时期——至少28根类似电缆被鱼类损坏。从1959年到2006年——在此期间包括于1988年被光纤系统所取代的同轴电缆在内——大约11根电缆需要维修，同时鱼类破坏占有所有电缆故障的0.5%。根据最近的分析——涵盖2007年至2014年——并无归因于鲨鱼的电缆故障记录。

故障降低被视为与设计、保护层及其他保护海底技术方法的改进相一致。根据Smartgridnews.com，问题故障更多源自于诸如海底滑坡和洋流（低于10%）等自然现象及元件故障（5%）。

能源行业新闻

平息欧洲对反垄断的担忧，通用电气（GE）被批准收购法国阿尔斯通（ALSTOM）的电力业务

美国的通用电气公司，已获得欧洲反垄断监管部门对购买法国阿尔斯通公司的大部分能源业务的许可，推进了主席和首席执行官杰弗里·伊梅尔特（Jeffrey Immelt），在其前任带领通用电气投身于多元化金融之后，将GE带回工业根基的目标。

通用电气承诺将其燃气涡轮资产出售给意大利竞争对手，安萨尔多能源公司（Ansaldo Energia SpA），帮助为超过950亿美元计划的减负，欧洲委员会称。9月8日的几分钟内，美国对其批准也做出响应。

“我们得到了对我们的客户及通用电器还有我们的投资者都有好处的交易。”伊梅尔特先生在彭博商业的电话采访中说道。（通用电气通过资产销售的承诺赢得欧洲-美国对阿尔斯通交易的批准，9月8日）

彭博（Bloomberg）的记者加斯帕德·塞巴格（Gaspard Sebag）和瑞克·克劳馥（Rick Clough）评论称，2001年欧洲监管者阻止了通用电气收购美国能源集团霍尼韦尔国际的计划——这一失败给阿尔斯通交易的审查带来阴影。

通过购入阿尔斯通资产，通用电气想要延伸其在发电设备和电网供应系统提供电力公用事业的全球领导地位。

和竞争对手诸如德国西门子（Siemens）一样，当全球从煤炭能源转向为更清洁的天然气，太阳能和风能时，通用电气看到商业机会。

☛ 加拿大皇家银行资本市场（RBC Capital LLC）的分析师迪恩·德雷（Deane Dray），告诉塞巴格和克劳馥两位先生，通用电气削减其工作而致力于整合大规模的行动并达到其在5年内综合效应300亿美元的承诺。

但是现在通用电气对阿尔斯通的收购获得了通过——一个绝非不可避免的结果。今年2月，当欧盟对该交易开始调查是，欧盟反垄断领导玛格丽特·维斯塔格（Margrethe Vestager）表达了她的担忧，该联合企业的统治地位对消费者而言可能导致更高的价格和更少的客户选择权。

今年9月，维斯塔格女士宣布其本人对担忧事项没有发生感到满意。在法国斯特拉斯堡（Strasbourg）的新闻发布会上宣布了通用-阿尔斯通交易事项。她说资产剥离到安萨尔多将会避免“选择减少而价格上涨的巨大风险。”

☛ 有关通用电气的其他新闻中，首席执行官杰弗里·伊梅尔特（Jeffrey Immelt）告诉商业新闻电视频道美国全国广播公司财经频道（CNBC）通用电气可能在本年末为其总部找到一个新地址。

自六月起GE酝酿离开康奈迪克州的费尔菲尔德（Fairfield），该州的立法者通过一项预算，置该州部分最大企业的反对于不顾增加12亿美元的税收。

路透社观察指出，对康奈迪克州而言失去通用电气将可能是一个巨大的打击，该州在经济危机中损失数以千计的工作岗位且已成为从衰退中复苏最缓慢的州之一。

其2014年国内生产总值（GDP）增长为1%，相较而言，全美平均增长率为2.4%。

交通行业新闻

随着波士顿铁路购车合同在手，中国高铁系统建造商在美国的雄心更大了

“如你所知，大约100年前，美国基建引领着时代。但是100年后，其仍然有很大的发展空间并创造机遇。”

向《纽约时报》(New York Times)表达这个委婉观点的是一个对机遇有所了解的人：中国铁道车辆股份有限公司的国际业务副总裁余卫平。9月，国有企业中车集团在马萨诸塞州(Massachusetts)的斯普林菲尔德(Springfield)价值6000万美元的工厂破土动工，其将为波士顿交通系统提供新的车辆。

该工厂将会雇佣150名员工，是去年达成价值5.66亿美元合同的一部分，该合同中中车集团为波士顿的橙线和红线提供284辆车。这是中国铁路车辆制造商首次在美国获得重大交通合同。

“该公司将工厂视为在美国赢得更多合同的潜在抢滩阵地，”时报的加德·穆阿瓦德(Jad Mouawad)写道。他看出该交易，是中国在美国铁道市场上的最大推进，作为北京鼓励其技术和基建公司出口技术和寻找海外市场的政策样板。(“中国铁路机构通过与美国工厂和波士顿交通的交易打入市场，9月3日)

中车集团(CRRC)，该公司打败了加拿大的庞巴迪(Bombardier)及其他竞争对手，在其竞价中包括一项在马萨诸塞州组装铁道车辆的条款。新的工厂，在之前的威斯汀豪斯(Westinghouse)制造中心内占地40英亩的土地上，将于2016年投入运营，2018年开始交货。新的轨道车辆将取代已经服务长达32年的橙线车辆及已经运营44年的红线车辆。

穆阿瓦德先生认为一个在美国的新轨道车辆制造商可能为那些考虑将交通系统现代化或对高铁进行调查城市和州提供助力。

这样的发展显然非常适合中车集团。余先生之前的工作是唐山铁路汽车的主席，该公司归中车集团所属。他监督了世界上最快的高铁列车之一的设计和制造，该列车平均速度为218英里每小时。

他告诉《时报》，他的公司渴望应用在中国所学的经验教训。通过翻译他说，“通过我们在该领域的专长，我们愿意与任何了解需求的[美国]州合作，成为长期的合作伙伴并帮助创造本地工作机会。”

汽车行业新闻

十家“激进”的汽车制造商将会提供标准的自动刹车以抑制美国的死亡、伤残、修理、保险费率

在美国所有公路撞车事故中，三分之一是追尾碰撞，每17秒就有一个司机被后车撞上。现在，《洛杉矶时报》(Los Angeles Times)的汽车记者杰瑞·赫什(Jerry Hirsh)所说的“一个激进的举措”，十家世界最大的汽车制造商将开始促使自动紧急刹车成为未来在美国销售车型的标准特征。

联邦安全监管和保险行业贸易集团也加入，该汽车制造商在9月宣布他们将采用一种诸如雷达、相机、或镭射的车用传感系统来检测即将发生的碰撞并警告司机，如司机不采取行动将咬合刹车。(“汽车制造商发誓为追尾事故踩刹车，9月11日)

汽车制造商——奥迪、宝马、福特、通用汽车、马自达、梅赛德斯-奔驰、特斯拉、丰田、大众及沃尔沃——都同意与全国高速公路交通安全委员会(NHTSA)合作以开发一个安装自动刹车作为在美国销售全部汽车的标准特征的时间表。综合来看，这十家公司占了2014年美国汽车销售的57%。

“该消息为汽车行业带来迅速的变化，进一步的接近了自动驾驶汽车，”赫什先生写道，其评论称很多在美国销售的汽车已经具备自动化安全特征。包括巡航控制，在行驶中加速或减速，车道偏离警告及转向帮助，以及在对面来车时远光灯的开启。

此外，很多汽车装备了自动刹车。梅赛德斯-奔驰在其2015年C级CLA和E级四门车中提供一个标准的前车碰撞预防系统。沃尔沃于2014年在其所有的车辆上制订了低速自动紧急刹车标准。

IIHS称今年美国可获得的784款车型中52%拥有提醒驾驶员前方可能撞车的技术，无论是作为标准还是可选特征。在那些车型中，27%同样还提供自动刹车。这比2012年度多了2倍。但是通常这些特色是较昂贵的选项。

赫什先生报道称本田对安全包额外征收1,000美元的费用，该安全包包括正对其雅阁四门和Pilot运动功能车的自动刹车系统。

斯巴鲁(Subaru)集团在其广受欢迎的翼豹(Impreza)自动刹车并伴有车顶窗组合，在标价上增加2,595美元。(两家公司都不在九月加入10家“下保证”。另一家缺席的公司——尼桑——称该公司未被要求参与但计划与NHTSA讨论该建议。)

与机器人制动几乎一致

有一个对强制安装自动刹车有引人注目的激励。根据NHTSA观点，其帮助预防或减少所有公路撞车事故中有关33%的追尾事故的冲击。高速安全保险公司(IIHS)，一个产业贸易集团在其研究发现中称自动刹车系统可以降低高达35%的保险索赔。

“自动紧急刹车”即将与电子稳定控制和前排及侧面安全气囊在一起。汽车安全中心的执行总裁克拉伦斯·迪特劳(Clarence Ditlow)说，其同样欢迎客户群体的意见。

他告诉赫什先生：“我们将会询问，如果你要测试刹车以确保其能在25英里每小时的速度停下，那为什么不到50英里呢，哪个更接近高速公路的速度？”

《消费者报告》(Consumer Reports)早已投入工作。汽车测试总裁，杰克·费雪(Jake Fisher)说到，由于自动刹车在越来越多的汽车中找到出路，独立产品车市和审查出版物将停止推荐未安装自动刹车的汽车。

NHTSA，在来自保险公司的帮助下，将在上线阶段的细节上与制造商展开合作，包括性能标准和时间框架。NHTSA发言人高登·特罗布里奇(Gordon Trowbridge)告诉《洛杉矶时报》。

“这不是一个执法或召回问题，”特罗布里奇先生说，“这些公司在没有联邦授权的情况下行使这一承诺。”

那并不意味着如果主动安装有放缓的迹象授权将不会来临。NHTSA，其使命是“拯救生命，防止受伤并减少汽车事故。”恰好是美国行政管理部门的一个机构。因此，自动刹车系统的支持者们在华盛顿有一个有影响力的朋友：总统奥巴马。

专栏编辑: Dorothy Fabian

Standardisation of PV wires and cables 2001-2014

By Faruk Yeginsoy, Leoni Struder AG

Abstract

This paper will show the evolution from the first German TUV Rheinland document 2Pfg1169/2001 to 2Pfg1990/2012 and the influence of this document to national standards in the USA, Japan and Europe as well as to the development of the standards Cenelec EN50618 and IEC62930.

Furthermore it will give an insight to the necessary design, material combinations and production processes to comply with the above stated standards.

In particular the challenge was to comply with multiple standards, as for example the combination of UL and TUV.

An additional aspect will give an understanding to specific testing procedures of essential compound properties which have an impact on the expected very long operation time of PV wires.

1 Introduction

Starting at the end of the last century the worldwide interest in renewable energy was encouraging the PV industry to grow significantly and this growth around the world was irresistible.

At that time the construction of PV systems was an expensive and long-term investment. The investors did not know how to estimate the quality of modules, and customers were asking for the expected lifetime of PV modules and PV installations. There was a strong need for a third-party assessment of safety and quality.

At this time the German TUV Rheinland started reviewing the safety and quality of photovoltaic modules with their own requirements.

Very soon it was clear that the module quality and module safety was dependent on the components, but there was a lack of standards for components considering the requirements of PV application. This was the beginning of the standardisation of PV wires.

2 The beginning

In 2001 the TUV Rheinland in Germany started testing PV modules and noticed many problems because of the cables.

Since no dedicated standard tests for these cables existed, the TUV Rheinland created their own standard. This was the birth of 2Pfg1169:2004.

This first standard was based on IEC60245-4:1994 (Rubber insulated cables - rated voltages up to and including 450/750 V - Part 4: Cords and flexible cables). At that time H07RN-F was the most used cable (rubber 60°C–90°C). In this early stage of PV installations, nobody realised that the requirements on PV cables were much higher.

2.1 First wiring failures after a few years



○ **Figure 1:** Wiring failures caused by ozone and high temperatures

3 New requirements

After numerous wiring failures the PV experts recognised that the requirements of the first Pfg 1169 /2004 had been too low.

In 2006 a new experts group (German National Committee Working Group 411.2.3) started to work on a new version of the “Requirements for photovoltaic cables”.

In the first part of the work, it was a joined group of module and cable experts. The focus was now on the period of use of PV wires. The working group was principally involved in following questions:

- How can we predict the lifetime of a cable?
- How many years does the lifetime of a cable have to be?
- How is ageing of cables to be understood?
- How can we test the ageing process?

3.1 Material ageing is the new focus

3.1.1 Thermo-oxidation of polyolefins

One of the elementary chemical laws is the Arrhenius law. This law describes the correlation of temperature and process speed.

The thermal ageing of polymer is nothing else than a chemical process, and every chemical process is dependent on the process temperature.

Increasing the temperature by 10°C accelerates the process by a factor of two. This also works backwards. Decreasing the temperature slows down the ageing process by a factor of 0.5.

The specified temperature rating of a cable should be in combination to a specified time period.

Without a time indication, the temperature rating is useless. The standard temperature rating in the European cable industry is xxx°C at 20,000h.

The PV industry standard period of use for PV modules is 25 years. These are roughly 150,000h. The assumed ambient temperature is 90°C, ie the minimum temperature rating shall be 90°C/150,000h. Normalised to the industrial standard time of 20,000h, the new temperature rating shall be 120°C/20,000h.

3.1.2 Photo-oxidation

Sunlight contains a high amount of ultraviolet radiation. The ultraviolet radiation that is absorbed by a polymer material will result in its degradation. The energy may be sufficient to cause the breakdown of the unstable polymer and, after a period of time, changes its components.

Polymer materials which are to be exposed to UV for long periods of time should be made from polymer compounds that are appropriately stabilised for such environmental conditions.

The basic polyolefin polymers have limited outdoor life. However, most polyolefin, coloured (non-black) solar cables manufactured today contain an ultraviolet stabilisation package which is satisfactory for limited time of 5–10 years. But for prolonged outdoor service life, polyolefins should be formulated with a minimum of 2.5 per cent finely dispersed carbon black.

Implementing carbon black in polyolefins greatly increases the UV resistance. Carbon black acts as a UV absorbent and screens the polyolefin from damaging ultraviolet radiation.

Until now there has been no known physical or chemical interrelationship applicable to extrapolate an accelerated weathering test up to the lifetime of cables.

The conducted test durations in standards UL and TUV are 720h whose results cannot be extrapolated based on a mathematical formula. These tests provide only comparable results, but no real statement about the real lifetime.

As has been demonstrated through over four decades of outdoor experience with polyethylene jacketed communication cables, the addition of 2.5 per cent finely dispersed carbon black results in more than 25 years of protection against UV.

The dispersion of carbon black is an integrated part of the extrusion process of the jacket, which has a high impact on the UV resistance. The proper management of the machine parameters is the critical key factor for best results.

Carbon black is in EN50290 (“Communication cables. Common design rules and construction”) a mandatory requirement for communication cables for exposed outdoor use.

3.2 Basic points of the new requirements in 2007

The main basic point of the new version of the Pfg1169/2007.8 is the thermal endurance test according to IEC60216 “Electric insulating materials – Thermal endurance properties” (120°C/20,000h).

In the application of this standard, it is assumed that an almost linear relationship exists between the logarithm of the time required to cause defined property change (less than 50 per cent elongation at break) and the reciprocal value of the corresponding absolute temperature.

This test is to conduct at least three different temperatures. The highest temperature shall be selected to result an endpoint not less than 100h and the lowest temperature is to be selected for the expected result not before 5,000h.

A straight line is drawn to connect the various recorded points. By extending the line until it intersects the 20,000h on the ordinate – axis (logarithm of time) it is possible to determine the temperature rating on the abscissa – axis (the reciprocal absolute temperature).

Additional essential points are:

- The used materials shall be halogen-free
- The used conductors shall comply with IEC 60228 class 5
- The cables and wires have to comply with IEC60332-1-2 (vertical flame test)

The result of this work was published by VDE as:

- VDE-AR-E 2283-4 “Requirements for cables for PV systems”

And by TUV as:

- TUV 2Pfg1169/2007.8 “Requirements for cables for use in photovoltaic systems”

3.3 The specification of PV wires by UL

In 2005 UL published the first edition of Outline 4703. The UL type ‘PV’ was created. This outline was based on UL854 (Service Entrance Cables). But in 2005, the NEC2005 (Article 690) was requiring USE, USE-2, UF and SE.

As recently as 2008, the PV type was mentioned for the first time in the NEC2008. The required wires were in this edition USE-2 or PV.

Mentionable is the acceptance of metric sizes of conductors in the UL outline 4703.

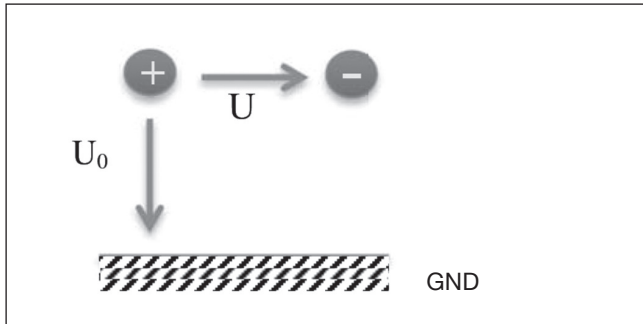
In 2010 UL published the fourth edition of UL outline 4703, which is the relevant version until today.

In this edition is the reference standard UL 44 “Thermoset-insulated wires and cables”.

3.3.1 The differences to TUV 1169/2007.8

The significant differences between UL and TUV are:

- Halogenated compounds are permitted in UL4703
- The required flaming test UL1581-1060 is more demanding than IEC60332-1
- No differentiation between DC and AC in UL4703
- 1,000V (or 2,000V) is permitted, which is more future-orientated
- Aluminium wires are permitted in UL4703
- No differentiation U₀/U in UL4703



○ Figure 2: Definition of U_0/U

4 New challenge for the cable industry

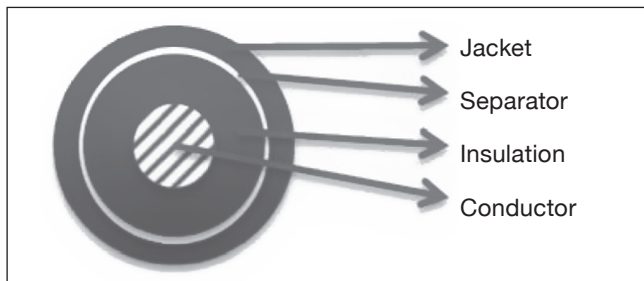
4.1 TUV and UL approved cables 2006–2013

In 2006 the module manufacturers started to think globally. The new marketing requirement was to manufacture one type of photovoltaic module with all relevant approvals to sell them on all markets.

The challenge was to create a cable which could combine the opposed specifications of UL (PV / USE-2) and TUV 1169. Particularly the following discrepancies had to be overcome.

- Halogen-free compounds are highly filled with flame retardant minerals. The physical properties required by UL are a challenge for this kind of compound
- Passing the flame test required by UL is easy for halogenated compounds but difficult for halogen-free compounds
- The long-term stability test of UL is a real challenge for filled compounds because the flame-retardant additives are hygroscopic

However, it was possible to comply with all these requirements.



○ Figure 3: Optimised design of a UL4703 and TUV1169 or TUV1169 wire

4.1.1 The first solution

The outstanding characteristics of this design are:

- Three-layer extrusion in one pass (implied by increasing pricing pressure in the PV industry)

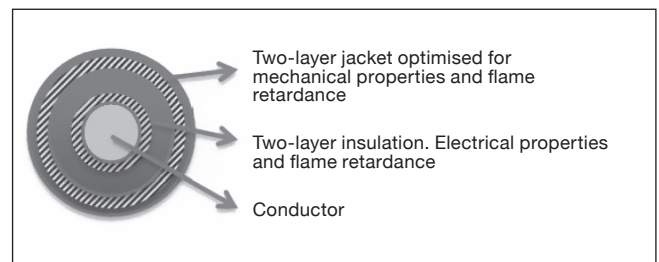
- Special developed polymer as separator
- Separable layers which have been required by many customers (UL definition: “Thermoset insulation having a jacket”)
- The difference of these two cable families are different layers thicknesses because the UL has a higher requirement for the insulation thickness
- All compounds are thermoset (electron beam crosslinking)

5 The next step

5.1 New requirements

In 2013 the new requirement of the PV industry was to increase the system voltage to save cable cost and to increase the efficiency of the PV systems. The voltage rating of the first generation of PV wires according to TUV1169 was based on generic industrial cable standards. The standard voltage rating of low voltage cables in the CENELEC and IEC is $U_0/U = 600/1,000V$ AC or $900/1,500V$ DC.

The nominal voltage rating of the new generation photovoltaic wire is $U_0/U = 1,000/1,000V$ AC or $1,500/1,500V$ DC. In the meantime TUV Rheinland developed 2Pfg1990/2012, which considers the new requirements.



○ Figure 4: New design

5.2 New generation of UL4703 1,000V/TUV 1,500V DC cables

The outstanding characteristics of this design are:

- Four-layer extrusion in one pass (implied by further increasing pricing pressure in the PV industry)
- All compounds are thermoset (electron beam crosslinked)
- Layers not separable (UL definition: “Composite insulation without a jacket”)
- Approvals: UL (1,000V)/TUV (2Pfg1990)/CSA 22.2 No 271-11

6 The way to CENELEC and IEC

6.1 CENELEC

In 2011 the German National Committee for PV wires and cables started to work out a revision of VDE-AR-E 2283-4 “Requirements for cables for PV systems”.

The target was now to apply this draft as a new work item to CENELEC TC20. The main topics were:

- Increasing the system voltage
- Adapting test procedures to the new voltage level

The result of this work is EN50618, which was published as a final draft in August 2014.

6.2 IEC

In 2013 IEC adopted the draft EN50618 on request of IEC TC82 as a basic paper to start to work out an IEC standard for photovoltaic wires.

This is now published as a committee draft IEC62930. The IEC draft is 95 per cent identical to EN50618.

6.2.1 The difference to EN50618

The main difference between EN 50618 and IEC 62930 is that in the IEC standard class two conductors are permitted for use for fixed installations.

7 What is new in EN50618 and IEC 62930

7.1 Design

There are no great differences in the design requirements of these new standards. Notice, however, the definition of black as preferred jacket colour.

Minor changes are in the required layer thicknesses, which are slightly increased.

7.2 Test requirements

Note that the material testing procedures have been widely changed by adapting IEC60811 "Electric and optical fibre cables – Test methods for non-metallic materials".

- All test samples now have to be taken from finished cables
- It is not permitted to conduct material tests on extruded tapes or moulded plates

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2001年至2014年太阳能光伏电线电缆的标准化进程

作者：莱尼公司鲁克·耶井索伊

摘要

本文展现了自2001年首篇德国莱茵公司(TUV Rheinland)文档2Pfg1169/2001发布以来，直到2012年发布2Pfg1990/2012文档之间的革新进程，包括该文档对于美国、日本和欧洲采用的国家标准的影响，以及欧洲电工标准化委员会(Cenelec)制定的标准EN50618和IEC62930的发展过程。

另外，本文也将深入分析符合上述标准所必须实行的设计、材料组合和加工流程。特别是解决“符合多种标准”的难题，例如需同时符合美国保险商实验室(UL)和德国技术监督协会(TUV)的双重标准。

附加板块则会对基本化合物性能的特定试验流程进行分析，这些基本化合物性能将影响到太阳能光伏电缆的长期使用寿命。

1 简介

自上世纪末起，全球范围内对于可再生能源的关注促使太阳能光伏产业飞速发展，其在全球的发展势头迅猛，势不可挡。

在当时，建设太阳能光伏系统是一项昂贵的长期投资项目，而且投资者们根本不知道如何估计组件的数量，与此同时，客户则更关心太阳能光伏组件和装置的预计使用寿命。当时急需第三方评估其质量和安全性。

于是，当时德国莱茵公司开始根据其自身的要求对光伏组件的质量和安全性进行了评估。

莱茵公司很快就调查清楚，组件的质量和安全性依赖于部件成分，但是当时缺少适用于太阳能光伏应用要求的部件标准。这就是太阳能光伏电线标准化的开端。

2 开端

2001年，德国莱茵公司开始检测太阳能光伏组件，就采用的电缆发现了诸多问题。

由于当时没有对这些现有电缆的指定标准检测，于是莱茵公司创建了他们自己的标准。这就是2Pfg1169:2004的诞生。

这个首创标准建立在IEC60245-4:1994的基础之上(橡皮绝缘电缆-额定电压高达并包括450/750伏-第四章：内芯线和软电缆)。

当时H07RN-F是最常使用的电缆(橡皮材质，适用温度：60°C-90°C)。

在太阳能光伏装置的初期阶段，没有人意识到光伏电缆实际所需的要求更高。

2.1 数年后首批采用的电线发生故障



图一：因臭氧和高温导致电线故障

3 新要求

在发生数起电线故障之后，太阳能光伏专家意识到第一版Pfg1169/2004的规格太低了。2006年，一个新成立的专家组(德国国家委员会工作小组411.2.3)开始研究新版的“光伏电缆规格”。

在这项研究工程的初始阶段，组员包含了组件和电缆业的专家。工作组的重心是太阳能光伏电缆的使用寿命，研究项目还主要包含以下问题：

- 我们如何预测电缆的使用寿命？
- 电缆必需的使用寿命应该多长？
- 如何查明电缆是否已经老化？
- 如何检测电缆的老化程度？

3.1 材料老化是新的研究重点

3.1.1 聚烯烃的热氧化

阿雷尼斯定律(Arrhenius law)是最基本的化学法则之一。该定律表明了温度和作用速度的关联性。聚合物的热老化也不过是一个化学作用，而所有的化学作用都依赖于作用温度。每升高10°C温度，则化学作用的速度将加快两倍。

反之亦然。下降温度可以将老化速度降低0.5倍。电缆的特定温度额定值需与特定的时长相符。

在未指定时长的情况下，温度额定值毫无意义。欧洲电缆业的标准温度额定值为20,000小时时长下多少摄氏度。

太阳能光伏产业标准规定光伏组件的使用寿命为25年。大约为150,000个小时。假定环境温度为90°C，即最低温度额定值为90°C每150,000小时。当产业标准化时长为20,000小时的情况下，相应的温度额定值为120°C每20,000小时。

3.1.2 光氧化

日光中含有大量紫外线辐射。经过高分子材料的吸收之后，紫外线辐射的强度就会降低。这一能量足以将不稳定的聚合物分解，经过一段时间后，还可改变聚合物的成分。长期暴露在紫外线中的高分子材料必须采用能在如上自然环境中相对稳定的聚合物复合物。基本的聚烯烃聚合物在户外的使用寿命有限。但是如今制造的多数聚烯烃有色（非黑色）太阳能电缆都具有可在紫外线中保持稳定的外皮，使其使用寿命可达五至十年。但是如果延长电缆的户外使用寿命，那么聚烯烃内需含有至少2.5%的精细炭黑粉。

在聚烯烃内添加炭黑粉可显著增强抗紫外线的的能力。炭黑粉可用于吸收紫外线，并为聚烯烃材料抵挡有害的紫外线辐射。

直到今天，还未有可知的物理或化学关联性可适用于推断电缆使用寿命的加速老化试验。依据标准（美国保险商实验室（UL）和德国技术监督协会（TUV）），进行试验的持续时间为720个小时，试验结果无法通过数学公式进行推断。这些试验仅能提供参考结果，而无法提供准确的使用寿命时长。

经过四十多年聚乙烯外皮通信电缆的户外安置经验表明，添加的2.5%炭黑精细粉末可防护紫外线达25年以上。散布的炭黑粉通过挤压工艺成为电缆外皮的一部分，可对抗紫外线能力产生巨大的影响。而对机械参数的合理管理也是产生最佳结果的关键性因素。

EN50290（“通信电缆。通用设计规则和制造”）中含有炭黑粉，是对于户外露天使用的通信电缆的强制性要求。

3.2 2007年度新要求的基础要点

2007年发布的新版Pfg1169/2007.8中的主要基础要点是依据IEC60216“电气绝缘材料-耐热性能”（120°C每20,000小时）进行的热稳定性试验。

在该标准的应用中，假定用于引发界定性质变化（断裂延伸率小于50%）所需的时间对数和相应绝对温度的逆值间近乎存在线性关系。该项试验至少在三种不同的温度下进行。

选择的最高温度的试验节点应不少于100个小时，而选择的最低温度的试验节点应不少于5,000个小时。

可用一条直线连接不同的记录点标。延长这条直线直到穿过纵轴上的20,000小时点标（时间对数），则可在横轴上确定温度额定值（温度绝对值的逆值）。

其他要点：

- 采用的材料为无卤素材料
- 采用的导体需符合IEC60228类别五的标准
- 电线电缆需符合IEC60332-1-2（垂直燃烧试验）的标准

德国电气工程师协会（VDE）所发布的研究结果为：

- VDE-AR-E 2283-4 “太阳能光伏系统的电缆规格要求”

德国技术监督协会（TUV）所发布的研究结果为：

- TUV 2Pfg1169/2007.8 “光伏系统内采用的光缆规格要求”

3.3 美国保险商试验所 (UL) 关于太阳能光伏电缆的说明

2005年，美国保险商试验所发布了首版纲要4703。保险商试验所创建了自己的“太阳能光伏”类型。这份纲要建

立在了UL854（进户线电缆）的基础之上。但是到了2005年，NEC2005标准（第690章）则要求USE、USE-2、UF和SE。

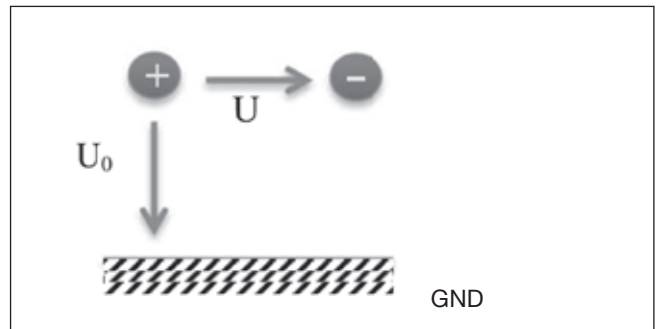
直到2008年，太阳能光伏的类型才首次在NEC2008中被提到。在该版本中符合要求的电缆为USE-2或太阳能光伏。值得注意的是，保险商试验所的4703纲要中采纳了导体的米制尺寸。

2010年，保险商试验所发布了第四版的4703纲要并沿用至今。在这个版本中，参考标准UL44为“热绝缘电线和电缆”。

3.3.1 TUV1169/2007.8的不同点

保险商试验所和德国技术监督委员会之间最显著的差别如下：

- UL4703允许采用卤代化合物
- UL1581-1060中对于燃烧试验的要求高于IEC60332-1。
- 在 UL4703中未对直流电和交流电做出区分
- 根据未来的需求，电压允许1,000伏（或2,000伏）
- UL4703允许采用铝制电线
- 在UL4703中未有 U_0/U 差异



○ 图二: U_0/U 的定义

4 电缆产业的新挑战

4.1 2006年至2013年德国技术监督协会和美国保险商试验所批准采用的电缆

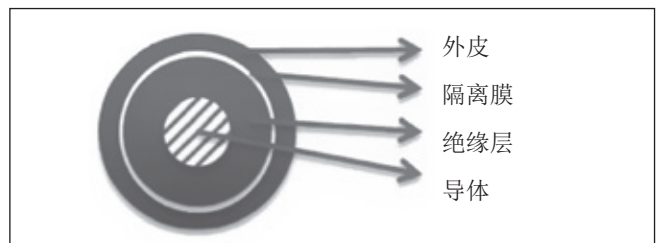
2006年，组件的制造商们开始将目光放眼于全球。新的市场需求是生产一类可满足所有标准的光伏组件，可在任一市场进行销售。而新的挑战在于能设计出一类电缆用于综合保险商试验所（UL）（PV/USE-2）和TUV1169的对置要求。

尤其是要克服以下差异：

- 无卤素化合物中充满了阻燃矿物质。保险商试验所要求的物理性质对于这类化合物来说是个挑战。
- 卤代化合物可轻易通过保险商试验所的燃烧试验，而卤代化合物就很难通过这一试验。
- 由于阻燃添加剂容易受潮，因此保险商试验所的长期稳定性试验对于填充化合物是一个难题。

但是还是有可能满足这些要求的。

4.1.1 第一个解决方案



○ 图三: UL4704和TUV1169或TUV1169电线的优化设计

该设计的主要特性如下：

- 一次加工处理中进行三层压缩（在太阳能光伏产业中也受到价格上升压力的影响）
- 隔离膜采用特别开发的聚合物
- 很多客户要求采用隔离膜（保险商试验所的说明：“热固性绝缘体需有外皮”）
- 由于保险商试验所对于绝缘厚度有更高的要求，因此这两类电缆的区别在于不同的层面厚度。
- 所有的化合物都具有热固性（电子束交联）

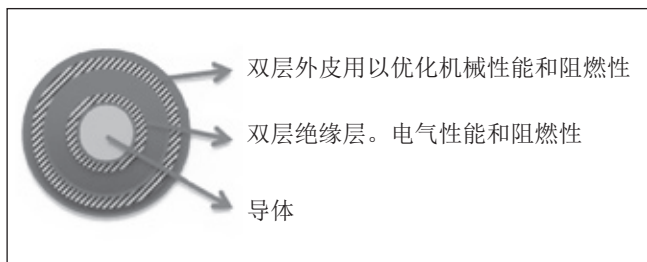
5 下一步计划

5.1 新的要求

2013年，对于太阳能光伏产业新的要求在于提升系统电压，用以节省电缆成本并提高太阳能光伏系统的效率。依据TUV1169，初代太阳能光伏电缆的额定电压建立在通用工业电缆的标准之上。欧洲电工标准化委员会（CENELEC）和国际电工技术委员会（IEC）规定的低压电缆标准额定电压为 $U_0/U = 600/1000V$ 交流电（AC）或 $900/1500 V$ 直流电（DC）。

新一代光伏电缆的标称电压为 $U_0/U = 1,000/1,000V$ 交流电（AC）或 $1,500/1,500 V$ 直流电（DC）。同时，莱茵公司考虑到新的规格要求开发了2Pfg1990/2012。

5.2 新一代UL4703 1,000V和TUV 1,500V 直流电电缆



图四：新设计

该设计的主要特性如下：

- 一次加工处理中进行四层压缩（未来在太阳能光伏产业中也受到价格上升压力的影响）
- 所有的化合物都具有热固性（电子束交联）
- 层面不可分离（保险商试验所的说明：“复合隔离层无需外皮”）
- 批准：UL (1,000V) /TUV (2Pfg1990)/CSA 22.2 No. 271-11

6 欧洲电工标准化委员会和国际电工技术委员会的要求

6.1 欧洲电工标准化委员会

2011年，德国太阳能光伏电线电缆国家委员会开始着手制定VDE-AR-E 2283-4版本“太阳能光伏系统的电缆规格”。委员会目前的目标在于将上述版本的拟稿应用到欧洲电工标准化委员会TC20的项目中。主题如下：

- 升高系统电压
- 将试验程序应用到新电压等级中

该项目结果为EN50618并作为终稿于2014年8月发布。

6.2 国际电工技术委员会

2013年，国际电工技术委员会依据IEC TC82的要求起草了EN50618，用以作为国际电工技术委员会光伏电缆标准的基础版本。现在该文档已作为委员会的拟稿IEC62930出版发布。国际电工技术委员会的拟稿有95%的内容与EN50618相同。

6.2.1 与EN50618的不同之处

EN 50618和IEC 62930之间最主要的区别在于在国际电工技术委员会的标准中，允许在固定装置中采用类别二的导体。

7 EN50618和IEC 62930中的新内容

7.1 设计

这些新标准中对于设计要求未做明显变更。然而，需要注意的是，黑色仍为优先选择的外皮颜色。小的变化在于略微增加了层面厚度。

7.2 试验要求

值得注意的是，由于采用了IEC 60811“电缆和光缆-非金属材料试验方法”，因此材料检测程序有了很大的变化。

- 所有的试验样本需从成品电缆中采集
- 不可在压制带或模板上进行材料试验

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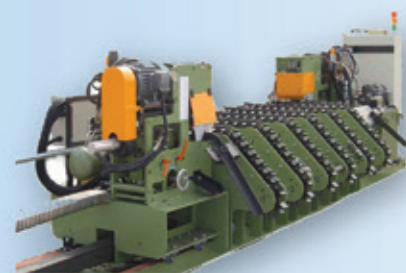
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