

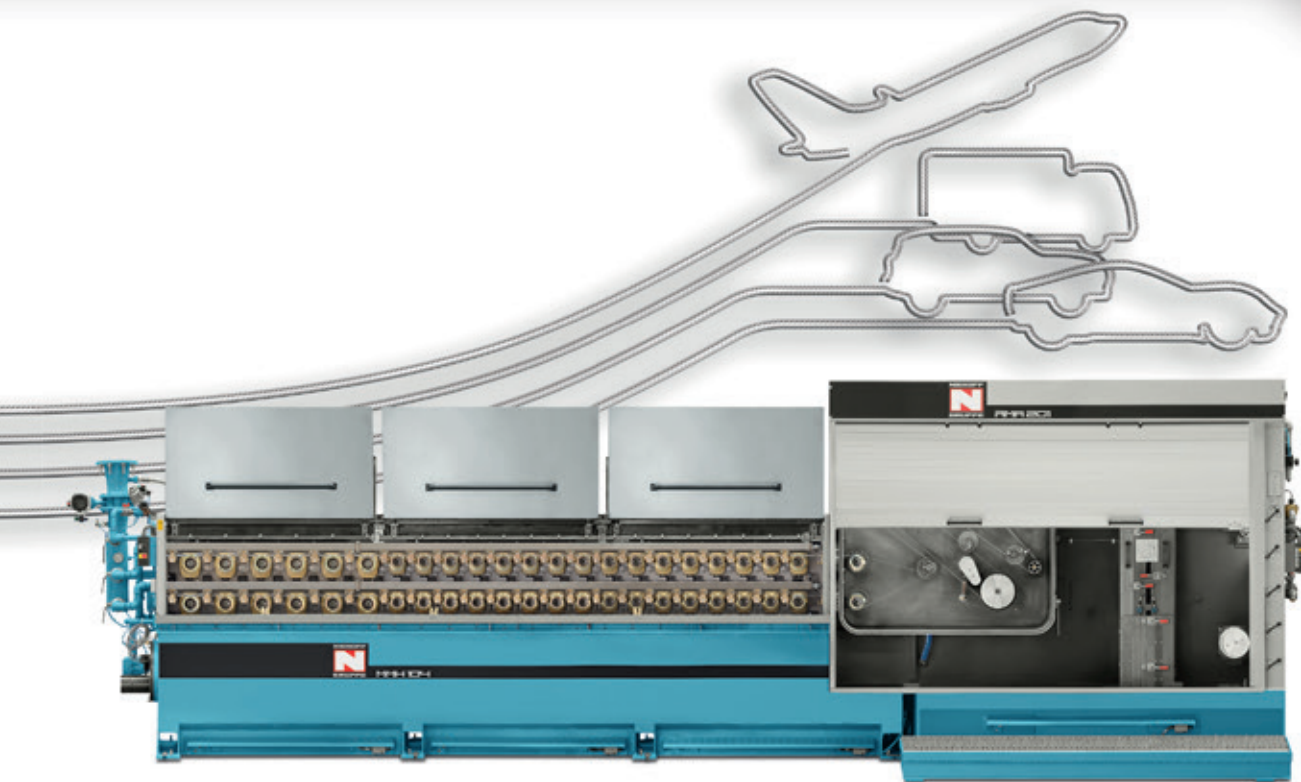


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The International Magazine for the Wire & Cable Industries



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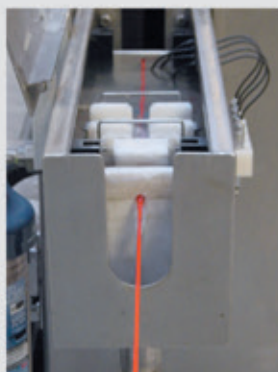
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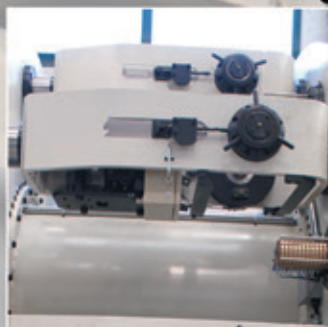
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ARMOURING CABLES
AERIAL CABLES
OPGW CABLES

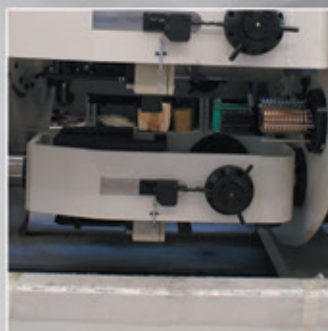
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Head of Procurement & Logistics at SIKORA AG



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US copies only:

EUROWIRE (ISSN No: 1463-2483, USPS No: 022-738) is published bi-monthly by Intras Ltd and distributed in the USA by SPP, 17B S Middlesex Ave, Monroe NJ 08831. Periodicals postage paid at New Brunswick, NJ. POSTMASTER: send address changes to Eurowire, 17B S Middlesex Ave, Monroe NJ 08831

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New year and a hectic year ahead for us all

A new year and a new calendar of events for companies in the wire and cable industry.

It may well only be the first month of 2013 but minds are already moving to what promises to be a busy year ahead in the exhibition schedule.

First up in April is Interwire, the largest of the US exhibitions, being staged in Atlanta, Georgia; then attention turns to Russia with wire Russia being staged in Moscow in June.

It's then further East as Thailand capital Bangkok stages wire SE Asia in September, rapidly followed by wire South America in São Paulo, Brazil, in October. Rest assured that we will be keeping you up-to-date with any developments for these exhibitions.

In this issue of *EuroWire* we focus on the opening of Bridon's new Neptune Quay plant, opened by UK Business Minister Michael Fallon, and capable of building the largest wire ropes in the world. You can find this story on page 9.

In technological advances, Germany's Uhing provides the lead story with the launch of the next generation of flange detecting systems for rolling ring drives. See page 26.

The finest equipment in the safest of operator's hands is called into action with our feature on testing and measuring for wire, cable and fibre optics on page 36.

And we explore countries from both Austria and Switzerland in our 'Focus On' feature, which this month starts on page 40.

For those of you who also make the best use of social networking sites, you can now also join up to the Wire and Cable News group on LinkedIn. Simply ask to follow and be updated daily with news and views from our industry.



David Bell
Editor

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- **Spark Tester:** Fault Detection
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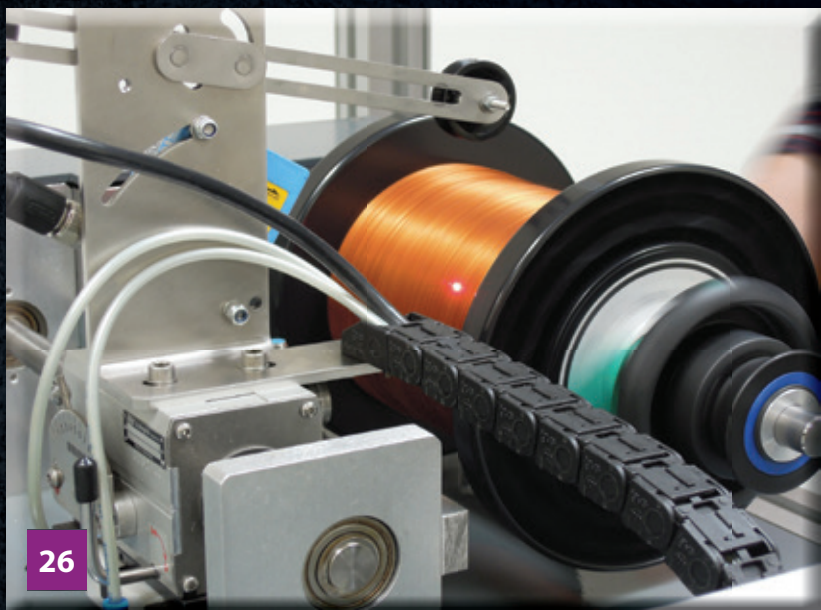
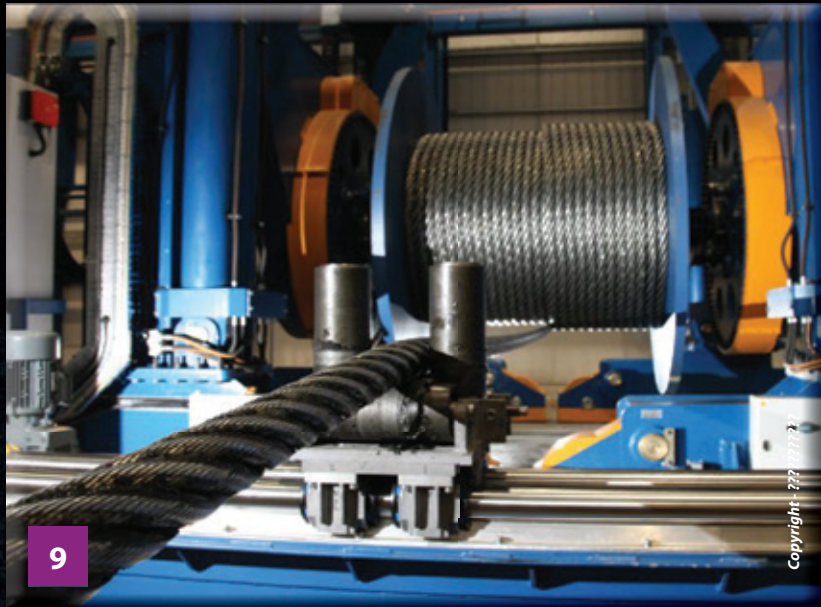
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Por Wayne Kachmar, ADC Telecommunications, EE.UU.

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Getting Technical

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dates for your diary ...

INTERWIRE

TRADE EXPOSITION

April 2013

23–25 Apr: **Interwire** – trade exhibition – Atlanta, Georgia, USA
Organisers: Wire Association International
Fax: +1 203 453 8384
Email: info@wirednet.org
Website: www.wirednet.org

June 2013

16–18 June: **Guangzhou Wire and Tube** – trade exhibition – Guangzhou, China
Organisers: Julang Exhibition Company Ltd
Fax: +86 203 862 0781
Email: meiwen@julang.com.cn
Website: www.julang.com.cn

25–28 June: **wire Russia** – trade exhibition – Moscow, Russia
Organisers: Messe Düsseldorf GmbH
Fax: +49 211 4560 7740
Email: info@wire-russia.com
Website: www.wire-russia.com

September 2013

17–19 Sept: **wire/Tube SE Asia** – trade exhibition – Bangkok, Thailand
Organisers: Messe Düsseldorf Asia Pte Ltd
Fax: +65 6332 9655
Email: wire@mda.com.sg
Website: www.wire-southeastasia.com

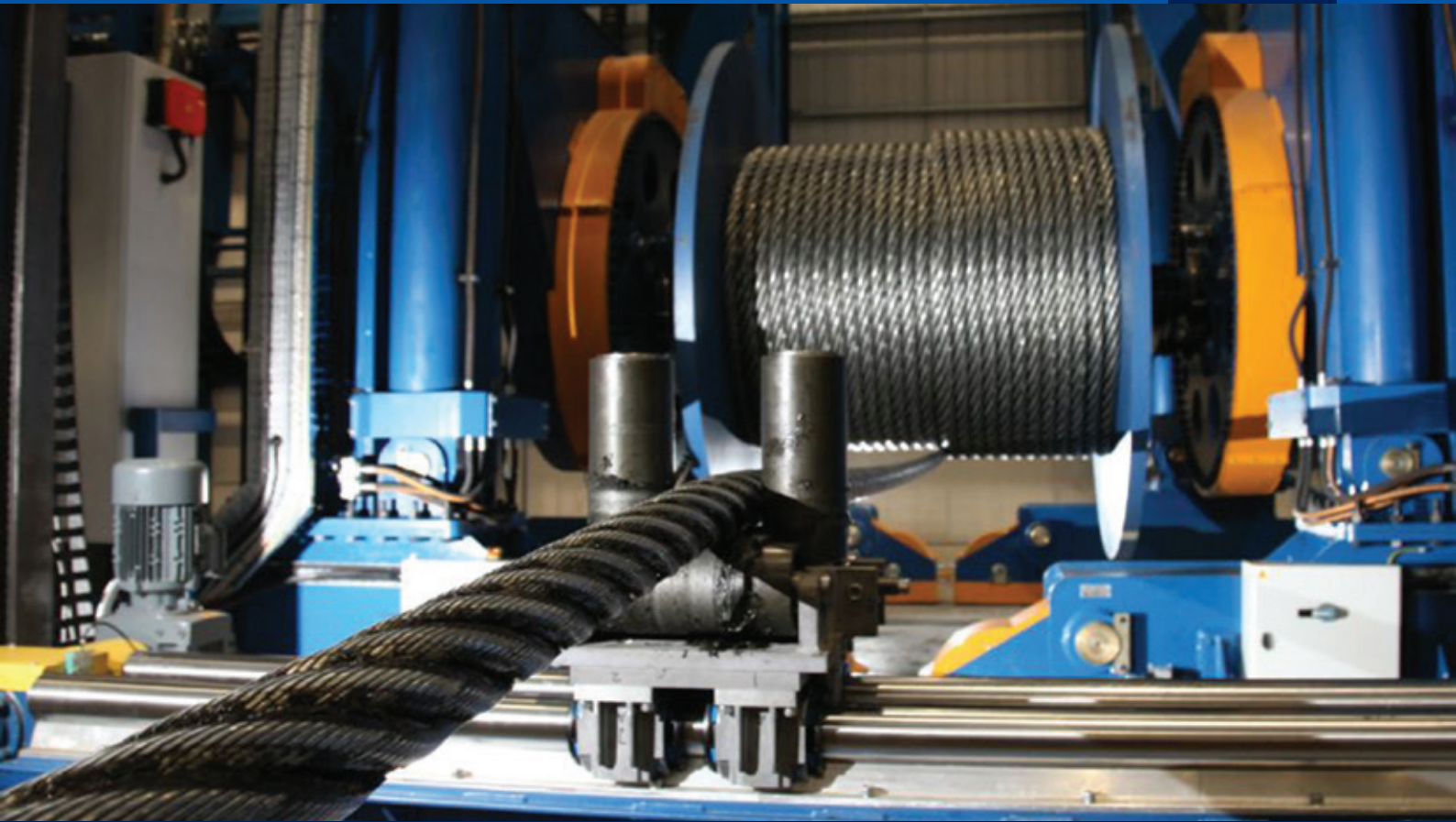
October 2013

1–3 Oct: **wire South America** – trade exhibition – Imigrantes Expositoes Exhibition Centre, São Paulo
Organisers: Messe Düsseldorf/Grupo Cipa
Fax: +49 211 456 0668
Email: infoservice@messe-duesseldorf.de
Website: www.wiresa.com.br



Above – "Interwire exhibition hall"
Courtesy of wirednet.org

Left – "The Flair"
bigstockphoto.com Photographer – Sean Pavone



▲ Wire rope heading onto the take-up stand at Neptune Quay, site of Bridon's new plant

New plant for the world's largest wire ropes

INDUSTRY leaders from companies including Heerema, NOV and Certex assembled in Northern England to watch UK business minister Michael Fallon open a facility that will manufacture the world's largest ropes.

The event marked the start of manufacturing at Bridon Neptune Quay (BNQ), a state-of-the-art factory constructed by Bridon International, which will produce the largest and most complex offshore ropes in the world.

The facility will have the capacity to produce highly engineered ropes in package weights of 650 tonnes, boasting enhanced breaking loads, optimised bend fatigue performance, effective lubrication, and minimal rotation under load.

The occasion was marked by the switching-on of the factory's rope-closing machine, which is the largest of its kind in existence. The machine, which was

constructed to a unique specification by German engineering company SKET, will allow the company to produce far more complex ropes than had ever previously been possible with such weights.

Pulling the lever to activate the machine was UK business minister Michael Fallon, who praised Bridon for establishing a global technology leadership position through its consistent investment in innovation.

Accompanying Bridon chief executive Jon Templeman at the event were a host of senior industry figures including Certex CEO Peter Keith and NOV Cranes division head Oddvar Hoydal, who noted how Bridon's highly engineered ropes could improve their companies' heavy lifting and deepwater deployment capabilities.

In addition to the switching-on of the facility's rope-closing machine,

the opening event offered a range of technical seminars for attending industry leaders, designed to demonstrate Bridon's unique services offering.

Focused on ensuring customers get the most out of Bridon's highly complex ropes, this package provides tailored support throughout a rope's development, installation and application.

Now operational, Bridon Neptune Quay is already taking on orders from major multinational operators, and its production schedule is designed to cater to the highest possible levels of demand.

The factory's portside location, along with its state-of-the-art take-up stand for lifting reels directly from dock to vessel, will help Bridon to significantly improve logistics.

Bridon International Ltd – UK
Website: www.bridon.com

Laying the foundations for future growth

LAST year, Rathbones relocated its London offices to Curzon Street in Mayfair.

The enlarged premises accommodate Rathbones' 300 London-based employees and offer improved facilities for a growing client-base.

The additional space also helped the company to meet the needs of the continued investment in technology and infrastructure, which is essential in providing operational efficiency. A new communications network from Datwyler is part of the improvements made.

Rathbone Brothers Plc is one of the UK's leading independent providers of high-quality, personalised investment and wealth management services for private investors, charities and trustees and the company has over 700 staff in 11 UK locations and Jersey, and has its headquarters in London.

some 44,200ft² split over two floors – a 10 per cent increase in floor space on the company's previous premises.

The enlarged premises offers improved facilities for a growing client-base, underlying a commitment to the highest levels of client service.

In autumn 2011, Datwyler was asked to supply a Category 6 U/UTP copper and an OM3/OS2 fibre optic solution for this

project. Datwyler provided a solution using CU 662 cables and Category 6 KU-T modules for the copper part of the new network. The backbone cabling was realised with high-grade Datwyler FO indoor fibre optic cable terminated onto LCD patch panels.

The consultant was PTS (Planned Telecom Systems) who specified Datwyler and worked closely with the UK Datwyler team during the installation. Able Data, one of Datwyler's global partners, carried out the work.



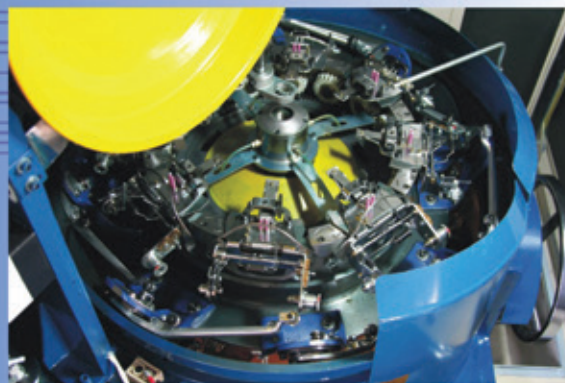
The new Mayfair offices cover ▲ *Rathbones new offices in Mayfair, London*

The project ran for several months and involved the installation and commissioning of more than 1,000 Category 6 cabinet links and 2,000 RJ45 telecommunication outlets. The fibre backbone links include OM3 multimode and OS2 single-mode cable, LCD panels and other FO components.

Datwyler – Germany
Website: www.datwyler.com

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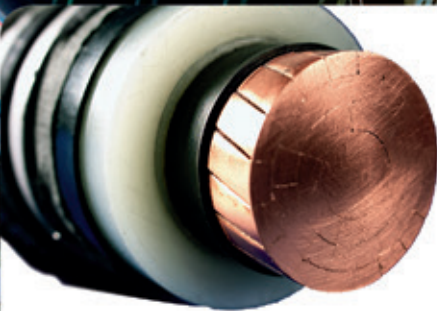
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www.borealisgroup.com
www.borouge.com



New sales chief

Daniel Zappa took over as head of sales at the Schlatter Group in September 2012, replacing Herbert Wenker. 40-year-old Mr Zappa has worked for Schlatter in various roles since 1995 and has been a member of the management board since 2003.

Ladle furnace

Tenova Melt Shops has been contracted by Arcelor Mittal to provide the turnkey supply of a 300-ton ladle furnace which will operate in integrated cycles in Arcelor Mittal's plant at Ghent, Belgium, and specialise in high quality steel for automotive sector. The technology will be operative in December 2013.

Technical director

Dave Henninger has been promoted to the position of technical director for Bridon American Corporation (BAC), taking over from David Sleightholm. Mr Henninger will lead Bridon American's efforts in product and process engineering, technical customer service and new product development.

New 30-tonne rebatch line for UK site



▲ Work underway on the rebatch line

PCT has recently supplied a 30t under-roller rebatch line to one of the world's major umbilical manufacturers located in the UK.

The under-roller rebatch line is able to rewind hose between two reels, allowing the user to either supply a specific length from one drum to another or to recoil a badly wound drum. The line consists of two take-up/pay off units facing each other where a single traverse unit controls the product lay on the take-up drum. The lines can also be run in either direction.

A clever feature of the

under-rollers is the ability to swap the traverse unit from one machine to the other so that either machine can be the take-up. The traverse unit also includes a dancer arm, which provides feedback to trim the speed of the pay-off unit. The units are designed to take drums up to 4m in diameter by 2.6m wide and a weight of up to 30,000kg.

The rebatch line is fully compliant with EU health and safety standards and has been fitted with a number of safety features. These include safety fencing which completely

encloses the line and sensors fitted to entrance points, which automatically reduces the speed of the winding to safely allow operators to work within the area.

PCT Ltd is a privately owned company based in Newcastle UK with subsidiaries in the USA and China. The company designs and supplies coiling, handling and packaging solutions for flexible products such as plastic pipe, sub-sea umbilical, power cables, flow-lines and steel wire rope.

PCT Ltd – UK
Website: www.pipeoil.co.uk

Full programme display at EuroBLECH

At the EuroBLECH Exhibition in Hanover, Roland Electronic showed its complete programme of automation products for the sheet metal processing industry.

The highlights at the show were:



▲ Both the UDK 20, top, and NS9N-AAD-SC were displayed by Roland

UDK20: Double sheet detection for all metals. UDK20 is especially in the focus of all automotive manufacturers which produce aluminium body parts.

Press shop managers prefer the easy Teach-In and the availability of all modern Fieldbus interfaces such as ProfiNet and Ethernet/IP.

NS9N-AAD-SC: Weld seam detection for narrow steel strips. This new sensor detects within milliseconds the arrival of a weld seam and thus protects the tools of fast-moving punching presses. A must-have for all makers of semi-finished products and metal fittings.

Exhibition innovation: A non-contacting double sheet detection system of new technology. Designed for operation in high-speed press lines with magnet conveyors. Sheets are checked at full conveyor speed and thus double sheet detection does not create any limitations to the press throughput.

Roland Electronic GmbH – Germany
Website: www.roland-electronic.com

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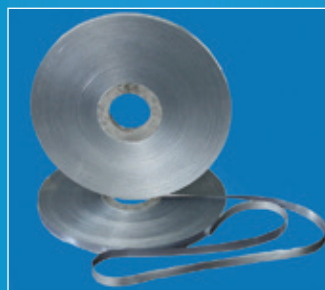
1. Semi-conductive Binding Tape Series

- Semi-conductive Nylon Tape
- Semi-conductive tetoron tape
- Semi-conductive nylon water-blocking binding tape
- Semi-conductive buffering water-blocking tape
- Semi-conductive water-blocking tape
- Semi-conductive non-woven tape
- Semi-conductive cotton tape



2. Water-blocking Tape Series

- Water-blocking tape
- Film laminated water-blocking tape



3. Insulation Binding Tape Series

- Polyester tape
- Non-woven tape
- Strengthened light non-woven fabric

4. Flame Retardant Tape Series

- Low smoke halogen-free flame retardant tape
- Thin flame retardant tape
- Fire resistant mica tape - Phlogopite mica tape
- Synthetic mica tape

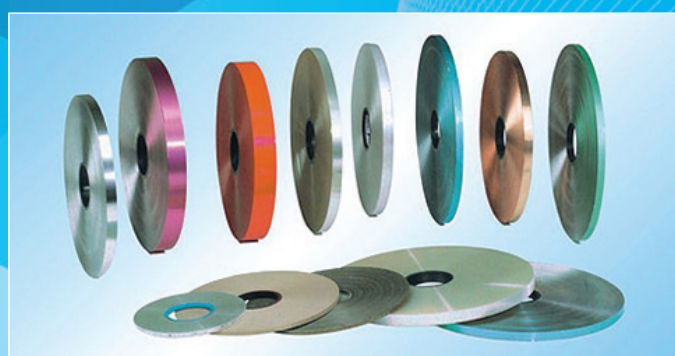


5. Metal Shielding Tape

- Aluminum polyester composite tape
- Electrodeposited copper foil (Cu+PET)

6. Filling Rope Series

- Water-blocking filling rope
- Semi-conductive water-blocking filling rope
- High temperature-resistant filling rope
- PP filling rope
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'Fibre Optics day'

A 'Fibre Optics Day' event took place – for the third time – at the Nextrom plant in Finland. Partners and customers from the optical fibre and fibre optic cable industry, bringing together over 100 guests from various companies from around the world, attended.

The event covered a range of topics of interest concerning the latest developments in technology and manufacturing methods.

The event ended with machine demonstrations at the Nextrom plant.

Sales up to €954m

Leoni increased its consolidated sales by nearly five per cent year on year in the third quarter of 2012, to €954.7m (previous year: €913.1m).

Consolidated EBIT amounted to €52.7m in the third quarter of 2012 (previous year: €54.6m). Overall in the first nine months EBIT increased to €197.2m (previous year: €183.6m); this includes a positive non-recurring item of €28.3 million from the sale of Leoni Studer Hard AG in March.

Cutting the wire on a new era

FORGET cutting the ribbon, cutting copper wire was the order of the day as SAMP Shanghai held a grand opening ceremony for its new plant in Malu Town.

The new plant, designed for manufacturing machinery and equipment for the wire and cable industry, covers an area of 4,500m² – doubling SAMP's presence in the region with the new state-of-the-art production unit.

The ribbon cutting ceremony was conducted in an unconventional way – with dignitaries declaring the building open by cutting copper wire, the final product of the machines manufactured in the Shanghai plant.

Several hundred guests from 20 different countries attended the evening, including Mr Wang Chun, Governor of Malu Town, Mr Vincenzo De Luca, Consul General of Italy in Shanghai, Mr Dominique Perroud, managing director of SAMP Shanghai, and Mr Antonio Maccaferri, president of the SAMP Group, who also made speeches to mark the occasion. Mr Perroud's remarks



▲ Dignitaries mark the opening the new SAMP plant

highlighted the focus of the SAMP Group on the Chinese and ASEAN market: "In recent years, SAMP has experienced an exceptional period of development in China, thanks to our customers' continuous trust and the hard work of our employees, their dedication and expertise.

"Today, a large and absolutely avant-garde production plant brings in a new phase of growth. We aim at giving our customers what they most need

and value, in a cost-effective and sustainable way. This new flexible plant will give us the capacity to realise our aggressive growth plans for the Asian market."

Following the ceremony, all guests took part in a gala dinner at the Marriott Hotel in Jiading, where traditional Chinese music shows and dances livened up the evening.

Sampsistemi SpA – Italy
Website: www.sampsistemi.com

Switching and testing whitepaper

Beta LaserMike has announced a new whitepaper – "10 Reasons Why You Should Use DCM Solid-State Switching for Testing LAN/Data Cables" – which is now available for download at www.betalasermike.com/dcm



▲ The new whitepaper from Beta LaserMike can be downloaded now

The whitepaper walks readers through the key decision-making process and highlights the primary reasons why cable producers should upgrade their existing legacy cable testing systems to the new DCM 3S-XLD platform – the latest generation in automated LAN/data cable testing.

LAN/data cable testing technology has come a long way since the early mechanical/electronic relay-type systems and upgrading to the latest DCM solid-state switching (3S) technology offers a successful path to increased testing performance, value and profits.

To maximise the return on investment, the whitepaper describes the ten key advantages of the DCM 3S-XLD system and touches on key points such

as: faster, more accurate cable testing; increased reliability and lower maintenance; fast, easy connection to UTP cables; testing alien crosstalk in minutes; flexibility to expand system capabilities; and the many benefits of intuitive, simple-to-use software, to name a few.

The white paper also summarises the easy upgrade path from a legacy DCM CMS-2XLD system to the latest DCM 3S technology.

With the continuing evolution of cable types and cable industry specs, this paper is a must-read for organisations that want to take their testing operations to the next level.

Beta LaserMike – USA
Website: www.betalasermike.com

New €350,000 laboratory starts operation

AFTER nine months of construction, Dresden lubrication specialist Elaskon has put its new laboratory into operation.

With a footprint of around 400m², €350,000 has been invested in the structure alone. Taking into account the investment in laboratory technology the overall costs run to something like €1.2 million.

Ideal conditions for the further financial success of the company have been created through the modern laboratory.

Once the new production facilities started operation in 2003, and with the opening of the logistics centre in 2008, the construction of the laboratory is the third of a total of four large-scale investments on the company's premises. Later this year a new filling and storage hall will be built for the wide range of corrosion-protection and lubrication products and release agents.

Elaskon has sustained its position in the wire rope lubricant field for decades, now exporting to 56 countries. Five out of a total of 72 staff work in the lab, in both



▲ The newly opened laboratory

quality control and in the development of new products.

As a result of the broad demand for care products that go beyond corrosion protection Elaskon has greatly extended its range over the last few years.

Along with the established corrosion-

protection products, upholstery cleaning agents, paint-care merchandise and a multifunctional oil for every kind of mechanical application have been launched.

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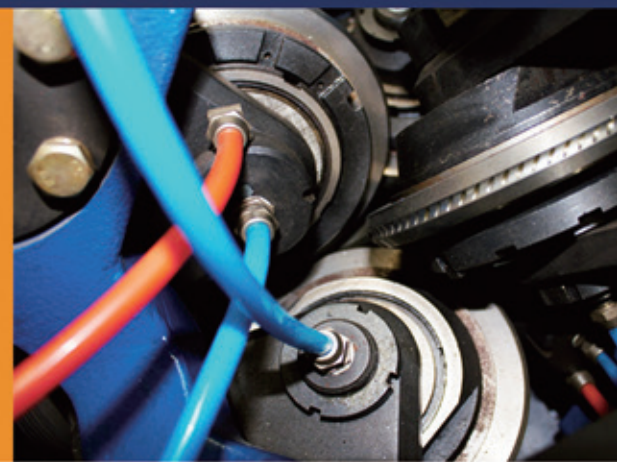
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Joining forces in a technology partnership

SIMUFACT Engineering GmbH, a global operating software and service company for process simulation in the manufacturing industry, and Schuler SMG GmbH & Co KG, Schuler Group's centre of excellence for hydraulic press systems and market leader in the manufacturing of hydraulic forming machines, have entered into a technology partnership.

The main purpose of the co-operation is the adaption of Simufact's simulation programs to the hydraulic machines of Schuler SMG.

Companies in the forging industry will benefit especially from the technology partnership, since they are now, based on this solution, able to simulate entire process chains on their Schuler SMG machines.

With the acquisition of a Schuler SMG forming machine customers can now purchase a process-specific, integrated software solution, with which they can map and optimise the holistic manufacturing process in their computer.

To do this, the Simufact simulation software will be adjusted to the Schuler



▲ Arnd Kulaczewski (right), managing director Schuler SMG GmbH & Co KG, and Dr Hendrik Schafstall, CTO Simufact Engineering GmbH, seal the co-operation with a handshake

SMG machines to simulate multi-stage forming processes within the process chain with a maximum accuracy.

The integration of additional functionalities enables the seamless communication between the machine control system, the overall production line control system, and process planning. The simulation of the manufacturing processes opens up new ways to

optimise forming strategies and tooling geometries. The required development time for new components will be notably shortened and the process safety will increase. This leads to an optimal use of resources and lower component costs.

"With Simufact we have a strong partner in the area of process simulation for complex forming processes," said Arnd Kulaczewski, managing director Schuler SMG GmbH & Co KG.

"The partnership with Schuler SMG opens a high innovation potential," says Michael Wohlmuth, CEO Simufact Engineering GmbH.

"To optimise advanced manufacturing processes it is important to integrate the entire process chain – the combination of multi-stage production lines and software based simulation is the best way to increase quality and efficiency."

**Simufact Engineering GmbH
Schuler SMG – Germany**

Website: www.simufact.com

Website: www.schulergroup.com

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Besides, we already have a no. of successful experience with customers using NPS take-up in Singcheer Extrusion Lines.

In the automotive wire industry, market leaders including Leoni, Delphi and Force have been Singcheer's major customers in China for more than 10 years already; while in the building wire industry, Singcheer has been always working closely with Far East, Baosheng, TBEA.



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Nexans' new anti-theft cable solution

NEXANS has launched its new anti-theft cable solutions at InnoTrans – which promises to help network operators reduce the high volume of copper cables theft along their railway networks.

The solution comprises two approaches to help combat the predominant theft of earthing cables. One focuses on cables that are harder to steal and less financially appealing to thieves, but which maintains full compatibility with the latest industry standards.

The other uses a sophisticated fire resistant copper-tape marking system that helps alert the supply chain to theft. Anti-theft grounding cable is protected by steel and copper mix. Most cables – earthing cables in particular – are constructed entirely from copper, making them extremely valuable and appealing to thieves (due to the high resale value of plain copper).

Nexans' first approach involves reducing the recycle value of the cable whilst maintaining the performance of the cable. The standard-sized copper core conductor is protected by an outer layer of alternating copper and galvanised steel wires, with a rugged PE (polyethylene) outer jacket.

The steel wires greatly complicate cable cutting with conventional tools, making it harder to steal, while the near impossibility of separating copper from steel reduces its value on the black



▲ A new solution from Nexans in the fight against cable theft

market to a fraction of pure copper.

These new patented anti-theft earthing cables are fully compatible in size with existing copper cables of equivalent performance, utilising the same tools and cable lugs and with excellent bending properties and form stability.

Typically, after cables have been stolen from railway tracks, thieves burn them to remove the insulation before selling the copper back into the supply chain. Normally, this will destroy all identification markings of the cables, making them impossible to trace.

To counter this problem, Nexans has developed a cable (patent pending) that incorporates a coded fire-resistant copper tape that is intertwined with the cable cores. The markings make it easy

to trace the origins of the stolen copper when it is brought to a scrap dealer. Since the tape is embedded along the length of the conductor, it is virtually impossible for the thief to remove it.

"Copper theft is a worldwide concern that creates serious safety and operational issues for railway networks across the globe, and Nexans is working closely with its customers to develop solutions that can significantly help to address this problem," said Jean Fehlbaum, vice president marketing infrastructure and industrial projects at Nexans.

Nexans' anti-theft cables are currently being piloted in Europe by a number of network operators.

Nexans – France
Website: www.nexans.com

New software for smoother running

High-performance lubricant specialist Metalube has gone live with SAP ERP – the globally renowned software solution that integrates all core business functions across the entire company.

SAP is specifically designed for worldwide organisations such as Metalube and will encompass all areas of the business from accounts, sales and customer relationship management to material resource planning and quality control.

Robert Brown, chairman, said: "This is a significant six figure investment for Metalube and is part of our overall ten-year growth plan, in which we aim to be industry leaders in technology. SAP will also incorporate our subsidiary companies in Brazil, China and India all under one software umbrella."

Live information will also give valuable benefits to customers with improved response times and up-to-the minute prices.

Metalube will have access to instant traceability of all raw materials and finished products and operatives will now be able to access and process information at any time from hand-held devices.

Mr Brown added: "The advantages are considerable – we can now trace batch numbers; who signed for what, when and where; what's in stock; what's being produced and what's available at a simple touch of a button. Ultimately, our supply chain will be seamless."

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

They're partners

The University of Sheffield has been named as one of Siemens' principal partner universities. This prestigious status is in recognition of the collaborative relationship between the global company and the university in the development of the award-winning School of Engineering.

Siemens Metal Technologies is already working with the university to engage in an engineering faculty-wide project called the Global Engineering Challenge, which will run over spring 2013. Three hundred second-year engineering undergraduates will spend a week on a 'Grand Challenge' project set by Siemens Industry as part of its drive to upskill the local graduate engineering community.

Aerospace contract

Cicor Group's Microelectronics unit in Radeberg, Germany, has signed a long-term agreement with HS Elektronik Systeme for wire production for aircraft power supplies and distribution equipment.

Now that's quality!

At the 3rd ETP Conference on "Underground Cables in Transmission Grids", Dow E&T highlighted the quality control measures it implements to deliver underground cable materials capable of operating at the highest voltages. The conference took place in October at the Hotel Palace Berlin, Germany.

Agent joins team

Senior personnel of Mount Joy Wire Corporation (MJW) were joined at the Spring World exhibition in Rosemont, Illinois, USA, for the first time by their international agent John Stanaway.

MJW manufactures wire for a wide variety of applications.

Brightly coloured

ASAP Srl offers stainless steel and zinc coated wire in annealed quality in very fine diameters from 0.1/0.2mm to 2/3mm.

This also includes a special new finishing of coloured stainless steel Aisi 304-304L or 316L wires in diameters from 0.2mm to 0.6mm.

US-Brazil submarine cable network

Seaborn Networks has signed a turnkey contract with Alcatel-Lucent to build Seabras-1, a 10,700km submarine cable system between New York and São Paulo in Brazil, with a branch to Fortaleza, Brazil.

Seaborn Networks and Alcatel-Lucent have already commenced the permit acquisition and marine survey work for the project.

The 100G Seabras-1 system will deliver new capacity on the primary route for the majority of Internet, data and voice traffic between South America and the rest of the world. In addition, this new system will support a wide variety of consumer and business broadband services between two of the world's most connected societies.

By providing low-latency communication via a 10,400km segment directly connecting São Paulo and New York, and route diversity via a 350km

branch to Fortaleza, Seabras-1 will also enhance traffic protection in the region.

"Seabras-1 will be the first direct route between New York and São Paulo and also the longest 100G transoceanic link to date. Once deployed, it will contribute with other ongoing initiatives to enhance trans-continental connectivity, for the benefit of the global consumer and business community," said Philippe Dumont, president of Alcatel-Lucent submarine networks.

Alcatel-Lucent will deploy an integrated 100G wet plant of cable and high bandwidth repeaters, power feed equipment and its 1620 Light Manager submarine line terminal equipped with advanced coherent technology.

Seaborn Networks – USA
Website: www.seabornnetworks.com

Upgrade to TratoSubmarine cable

TRATOS Cavi SpA has supplied 1,830m of TratoSubmarine medium voltage cable to energy company Edison for use in its Alba Marina floating storage and offloading vessel (FSO) and Rospo Mare B Platform, located in the Adriatic Sea.

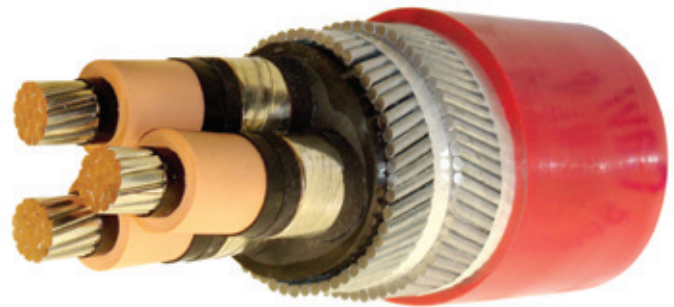
Manufactured in Tratos's Italian factory to IEC 60228 and IEC 60502-2, IEC 60840 to 26/45 KV, the TratoSubmarine cable is supplied with a copper or aluminium circular stranded conductor, extruded semi-conducting layer, HEPR insulation and a special hygroscopic PE innersheath and oversheath.

It features double galvanised steel armouring for durability, making TratoSubmarine suited to the oil and gas and utilities markets.

The TratoSubmarine power cable replaces the existing Tratos cable, which was fitted at the Alba Marina and Rospo Mare B Platform in 2004.

Tratos, whose primary market is the oil and gas industry, offers an extensive range of hydraulic, electro-hydraulic and electrical umbilical cabling for subsea oil and gas extraction and oil and gas BS6883 cables.

The Tratos subsea cable range allows for hydraulic and injection



▲ TratoSubmarine power cable

fluids to be transmitted, as well as power and data, depending on the cable type.

They are suited for installation at depths up to 2,000m, with select umbilicals qualified for depths of 3,000m.

All Tratos cables are produced using high grade component parts, and include recyclable materials where possible.

Tratos Ltd – UK
Tratos Cavi SpA – Italy
Website: www.tratos.co.uk

EFD Induction opens subsidiary in Brazil

EFD Induction's worldwide network has been expanded with the launch of a Brazilian subsidiary. The new company, with the formal name of EFD Induction Ltda, is based in the city of Sorocaba, about 60km from São Paulo.

The new subsidiary is headed by Evandro Nishimuni, a mechanical engineering graduate who has previously worked in France and in the Brazilian automotive industry. "EFD Induction and Brazil have so much to offer each other," said Mr Nishimuni.

"There is growing awareness throughout Brazil and the continent that sustained economic growth can only be maintained by investing in modern, efficient and proven technologies such as induction heating."

EFD Induction as – Norway
Website: www.efd-induction.com



▲ The outside of Flymca and Flyro's new site

New plant will raise production

FLYMCA and Flyro has opened its new plant.

The site includes new manufacturing facilities for the production of new rotating machinery as well as a stock of used equipment.

With a total ground area of 5,000m² and also new offices, the company will be able to reach a much higher production capacity of high quality machinery.

Deeply involved in submarine, umbilical and off-shore rotating cable machinery either for power cables and steel ropes, the company still also produces its standard range of stranders such as rigid, tubular, skip, planetary, drum twister, bow cabler and double twist bunchers.

Flymca and Flyro – Spain
Website: www.flymca.com

New credit facility for Componenta

Componenta has signed a new syndicated credit facility of €90m. The facility, valid until 30th June 2015, replaces the group's present credit facility. The new financing arrangement will clarify and stabilise Componenta's financing as is based on financing arrangement provided by three Nordic banks.

In the new credit facility Nordea Bank Finland Plc, Pohjola Bank Plc and Swedbank AB (publ.) are participating as lenders for €90mn and Finnvera Plc as guarantor for €15mn.

Componenta Corporation – Finland
Website: www.componenta.com

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 - ARIEL BUNCH CABLE
 - AMBIENT CURING LV & ABC
 - FR GRADE FOR FIRE SURVIVAL CABLE
- PE SHEATHING GRADE - TELEPHONE CABLES
- HFFR

PRODUCT RANGE : MV CABLE COMPOUNDS

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CABLES



Transatlantic Cable

Telecom

▶ In bad odour in the US, Chinese suppliers Huawei and ZTE find Europe to be a much friendlier place to do business

"As a US congressional committee prepared to warn American telecommunications networks against buying from two Chinese suppliers, the founder of one of those companies was finding a warmer reception in London. There, he posed for photos with Prime Minister David Cameron in front of the fireplace at 10 Downing Street in London."

Eric Pfanner, the Paris-based media industry reporter of the *International Herald Tribune*, went on to note Mr Cameron's declaration that Britain was "open for business." Indeed, the British leader announced that his September guest, Ren Zhengfei, the chief executive of Huawei, had agreed to augment the company's already sizable operations in Britain with an investment of \$2 billion.

Mr Pfanner observed that, given the typically close cooperation between the US and Britain on security issues, the transatlantic divide over Huawei and another Chinese equipment provider, ZTE, was striking. On 8th October, the Intelligence Committee of the US House of Representatives branded both companies security threats. Chairman Mike Rogers warned American businesses to "find another vendor if you care about your intellectual property, if you care about your consumers' privacy, and you care about national security."

Huawei rejected the allegations as "little more than an exercise in China bashing and misguided protectionism." In contrast, said Roland Sladek, a spokesman for Huawei, "Europe is almost like a second home market" for us. ("Chinese Telecom Firm Finds Warmer Welcome in Europe," 10th October).

And for good reason, wrote Mr Pfanner. Huawei means jobs and investment for Britain and, more broadly, for Europe. The company has 800 employees in Britain, many at its research centre in Ipswich. The investment announced by Mr Ren is expected to create 700 jobs in five years and additional technical centres in the country. In all, Huawei has about 7,300 employees in Europe.

Mr Cameron's government has, however, taken a trust-but-verify approach to the relationship. Huawei has set up a Cyber Security Evaluation Centre in Banbury, England. There, its engineers work alongside officials of Government Communications Headquarters, a British spy agency, to vet Huawei equipment for use in Britain.

▶ Huawei customers include many of the biggest telecommunications companies in Europe, among them BT and Vodafone, of Britain; Telefónica, of Spain; and Everything Everywhere, a partnership of France Télécom and Deutsche Telekom in Britain. The company's equipment is in high demand, analysts told the *Herald Tribune*, as those companies strive to roll out next-generation wireless broadband networks.

ZTE's European telecommunications clients include KPN of the Netherlands. In Sweden, ZTE is working with Hutchison Whampoa of Hong Kong on a high-speed wireless network.

▶ The world's second-largest supplier of telecommunications network equipment, after Ericsson of Sweden, Huawei generated only four per cent of its \$32.4 billion in revenue in 2011 in the United States. In contrast, Europe accounted for nearly 12 per cent of its revenue in the year, during which sales in the region rose 26 per cent, more than twice the company's worldwide growth rate.

▶ The US healthcare industry has become a very big user of telecommunications services to manage patient care

According to Insight Research Corp (Mountain Lakes, New Jersey), spending on telecommunications services by the US healthcare industry increased by some 20 per cent over four years – from about \$7 billion in 2008 to \$8.3 in 2011. That is about half the rate projected for the next six years, and those numbers are expected to go even higher. Insight Research is looking for the US healthcare industry to boost its spending on telecommunications services by 9.7 per cent a year: from \$9.1 billion in 2012 to a projected \$14.4 billion in 2017.

Reviewing these projections in the Cisco Systems technology newsletter *Network* (7th October), Mary Ann Azevedo noted some factors that will drive the increased spending. These include continued growth in the healthcare industry as a whole, patients' increased use of mobile devices, and the motivation for health organisations to meet federal guidelines that will make them eligible for financial incentives while avoiding penalties.

In addition, an aging population and healthcare worker shortages are pushing the industry to find alternative approaches to current treatment practices. The report holds that the high costs in the current health care system are largely related to the "proximity of patient and provider," as well as to the "archaic administrative systems used to manage records and exchange information."

Transatlantic cable

According to Fran Caulfield, research director for Insight Research Corp, healthcare providers are avid consumers of telecommunications services and new technology. She told Ms Azevedo: "The combination of increased demand for wireless and broadband access, massive data storage demands, and the conversion to electronic health records (EHRs) and procedures is straining existing healthcare networks."

The Health Information Technology for Economic and Clinical Health Act, a part of the American Reinvestment and Recovery Act of 2009, says hospitals that can demonstrate "meaningful use" of electronic health records will receive money from the Centers for Medicare and Medicaid Services. Those that don't will face a reduction in Medicare patient reimbursement rates. "It's clear that the larger organisations are converting to electronic health records sooner and they are doing it more expensively," Ms Caulfield said.

➤ Even as more doctors in the US adopt electronic health records, and more patients have access to those records via Internet-based systems, Insight Research believes everything that is happening related to telemedicine is just the beginning. An example cited in Network supports that view.

Twenty years ago, the University of Texas Medical Branch at Galveston began using 600-pound videoconferencing equipment to connect patients and doctors. Today the institution's videoconferencing equipment has been reduced to a system that can sit on a desktop and weighs 15 to 20 pounds. Thanks to advancements in technology, wrote Ms Azevedo: "Sick or injured people in remote areas such as the South Pole and on cruise ships can get evaluated by specialists."

Automotive

▶ After a precipitous drop just three years ago, the US auto market has made a stunning turnaround

Bill Vlasic, the Detroit bureau chief of the *New York Times*, wrote in mid-October that the US auto market, growing "fast and furiously," was up 14 per cent for the year to that point and headed above 14 million in annual sales for the first time since 2007. He sees that market, after crashing to its lowest sales level in 25 years in 2009, as having regained its status as a safe haven for the world's automakers as well as their most reliable source of profits.

Jesse Toprak is similarly impressed. The chief market analyst for the auto research site TrueCar.com told the *Times*: "The industry was able to heal itself with natural remedies: new products, improved gas mileage, better technology, and providing good value to people who need to replace older models."

Over the course of the recent recession, the average age of vehicles on American roads stretched out to 11 years: the best stimulus the industry could have asked for, in Mr Vlasic's view. When consumers resumed shopping, they found the products offered by Detroit and its competitors to be more fuel-efficient than ever and replete with new technology and safety features.

"The key was that the industry could now sell new cars without resorting to huge incentives that destroyed profits," said Mr Toprak, the analyst. "They could spend more on improving their products." ("When a Crisis Comes With a Reset Button," 11th October).

➤ Mr Vlasic noted the "unique vantage point" commanded by Sergio Marchionne, the chief executive of Detroit's Chrysler and its parent company, the Italian carmaker Fiat. Successfully so far, Mr Marchionne has utilised Fiat-based technology and platforms to improve Chrysler's product lineup.

According to the philosophical Mr Marchionne, the travails endured by Chrysler prepared the way for its marriage to Fiat. Moreover, he believes that the broader American auto industry is better off for having suffered through the bankruptcies, bailouts, and dismal sales. "Surviving these events makes you into a different person because you end up realising you got really close to losing it all," the Chrysler-Fiat chief said. "[And] if we don't manage it properly, it could happen again."

Technology

▶ GM makes its choice of a lightweight material to help its cars go farther on a tank of fuel: magnesium

General Motors in late October announced that it had been testing a new forming technology. Steve Rousseau of Popular Mechanics wrote that magnesium sheet metal – roughly 75 per cent lighter than steel and 33 per cent lighter than aluminium – might seem an obvious choice for a producer gearing up to meet the ambitious fuel economy standards to be imposed in the US over the next decade or so. But, he noted, "Its high cost, complex forming processes, and vulnerability to corrosion have led auto makers to shy away."

According to GM body structure development engineer Paul Krajewski, the company has solved all three problems. In its new high-volume forming process, he told Mr Rousseau, magnesium sheets are quickly heated to 842°F, then placed in airtight dies that use air pressure to form the sheet into a panel. The method is based on high-temperature plastic vacuum forming.

"You don't form the magnesium with mechanical action – pushing it or drawing it or ironing – like you would typically do with sheet metal," Mr Krajewski explained. "Rather, you clamp it around the outside so it's sealed, and you apply gas pressure to form it into shape." ("GM Touts Weight-Saving Magnesium Sheet Metal," 24th October).

By taking advantage of its existing manufacturing infrastructure, GM believes it can efficiently produce magnesium parts at high volume, offsetting their high cost. The automaker also intends to use a corrosion-resistant coating to enhance the endurance of its magnesium sheet metal.

Traditionally, wrote Mr Rousseau, magnesium has been used in performance parts such as steering wheels, engine cradles, and the iconic mag wheels most famously found on the Shelby Cobra. But GM claims that the use of magnesium for structural components could shave up to 150 pounds from the weight of a vehicle, for fuel savings of between nine and 12 per cent. And the technology may be coming to the company's cars quite soon. Mr Krajewski disclosed that 50 vehicles were set to roll off GM assembly lines by the end of October equipped with magnesium inner panels on doors and trunks.

"This is another thing in our toolbox," said the GM engineer. "We're also working on aluminium, high-strength steel, and

Transatlantic cable

carbon fibre composites. Ultimately, when you're trying to make your vehicles lighter you're going to use some collection of all of these." To incrementally improve fuel economy over the next decade, Mr Rousseau wrote: "Auto makers will need to get creative." General Motors already has apparently got the message.

Steel

An owner of steel service centres in the American Northeast and Midwest will restart an Ohio steel plant

Esmark, a distributor and former operator of Wheeling-Pittsburgh Steel, has acquired at bankruptcy auction the defunct steelmaker's Yorkville, Ohio, plant and a 50 per cent stake in a related joint venture for steel processing. The \$6.3 million acquisitions were announced 11th October and the company set a re-launch of the mill – as Ohio Cold Rolling – for January.

The Yorkville plant produced light-gauge steel for the container and packaging markets. Now, much of its output will go to Ohio Coatings Co, also located in Yorkville. Esmark's partner in the 50-50 steel processing venture is TCC Steel, of South Korea.

In a period of low demand, with US steelmakers operating at around 70 per cent of capacity, the project represents a triumph of optimism. Esmark (Sewickley, Pennsylvania) estimates \$800 million in rebuilding costs, plus \$15 million or more for steel sheet and other supplies for the restart.

Len Boselovic of the *Pittsburgh Post-Gazette* (13th October) recapped the Yorkville history. That plant and a half-interest in Ohio Coatings Co were among the assets put on the auction block following the May 2012 bankruptcy of RG Steel, the fourth-largest US steel producer.

RG had been formed in March 2011 from a combination of Wheeling-Pitt's former operations; Bethlehem Steel's former Sparrows Point plant in Baltimore; and the former WCI Steel plant in Warren, Ohio. The bankruptcy idled all the plants.

Mr Boselovic also reported a resolution of the issue of remedying environmental hazards at Yorkville, which had delayed the October closing.

The US Environmental Protection Agency agreed to make Ohio regulators responsible for enforcing the clean-up, estimated to cost \$1.5 million to \$3.5 million.

Esmark chairman and CEO James P Bouchard said that the company has set aside \$2 million for the effort, with Ohio to provide \$1 million.

➤ Esmark owns steel service centres in the Northeast and Midwest that process steel for steel producers and their customers. It took control of Wheeling-Pitt after a 2006 proxy fight and sold the operations to Russian steel producer OAO Severstal in 2008 for \$1.25 billion, which included the assumption of debt. Severstal sold the mills to RG in 2011.

The other buyers of RG Steel's assets include a partnership led by Pennsylvania businessman Charles Better. The partners paid \$16 million for the Warren plant. Mr Better told the Post-Dispatch that he hopes to find an operator for the mill, which produced high-carbon steel used in the blades of farm equipment, knives, and other products.

Export/import

Slower growth in China, now the world's second-largest economy, poses risks to major industries in the United States

"As China's economy cools, American exporters are increasingly feeling the chill."

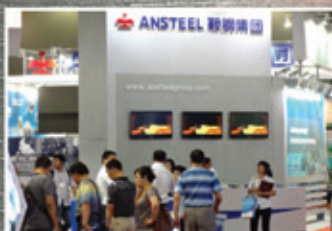
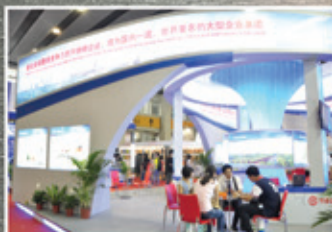
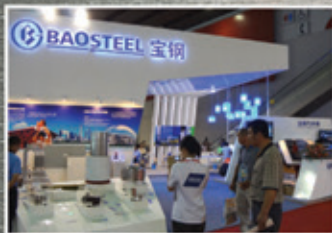
Nelson D Schwartz, who covers banking, finance and Wall Street for the *New York Times*, was calling attention to a remarkable aspect of the relationship between China and the United States: mutual dependence. Rivals in many spheres, the two big powers increasingly are finding that, when one economy meets with reverses, the other suffers sympathetic pains. ("China's Slowing Economy Puts Pressure on American Exporters," 22nd October).

Mr Schwartz offered some examples of contractions in American industries that prospered as China boomed. Cummins, the big Indiana engine maker, in October cited weak demand from China as a major reason for its elimination of 1,000 to 1,500 jobs by the end of the year. Schnitzer Steel Industries, the Oregon firm that is one of the nation's biggest metal recyclers, is cutting 300 jobs, or seven per cent of its work force, as scrap exports to China plunge. And Caterpillar, the Illinois manufacturer of earth moving equipment, reported lower sales in China and cut its global outlook for 2012. Even as the presidential candidates were striving to top each other's pledges to get tough on Chinese exports to protect American jobs, experts were saying that the more immediate threat to American workers might in fact be the slowing of sales to China, which has bid up the price of much of what the US sent overseas in recent years.

In the week before the *Times* article appeared, the Chinese government announced that gross domestic product (GDP) grew in China at an annual rate of 7.4 per cent in the third quarter, the slowest pace in more than three years. And China's full-year growth was expected to decelerate to 7.7 per cent from the breakneck 9.3 per cent pace of 2011. The resultant softening in Chinese demand has begun to clip American exports. This view was confirmed by Dean Maki, chief United States economist at Barclays Capital (New York), according to whose analysis the drop in exports to China alone is responsible for shaving 0.1 to 0.2 percentage points off the growth rate for the American economy, which expanded at an annualised rate of 1.3 per cent in second-quarter 2012. He told Mr Schwartz, "There's definitely been an effect from slowing exports to China on US exports."

➤ While the overall job market in the US has improved and the jobless rate has fallen, according to Mr Schwartz the slowdown in export growth has probably contributed to the loss of 38,000 jobs in the American manufacturing sector since July. He noted that the decline has been striking because exports, together with manufacturing, have provided a relative bright spot since the end of the recession. The United States still brings in from China far more than it sends in the other direction, importing nearly \$4 in goods for every \$1 it exports. Nevertheless, Mr Schwartz pointed out, the rapid growth rate there benefited many large American exporters and made China the third-largest buyer of American goods after Canada and Mexico. In 2011, China imported \$103.9 billion in products from the United States, or 7 per cent of American exports worldwide. And now, Chinese demand has obviously been cooling.

Dorothy Fabian – USA Editor



**THE 14th
GUANGZHOU INT'L
EXHIBITION ON PLATE METAL, BAR,
WIRE, METAL PROCESSING
AND SETTING EQUIPMENT**

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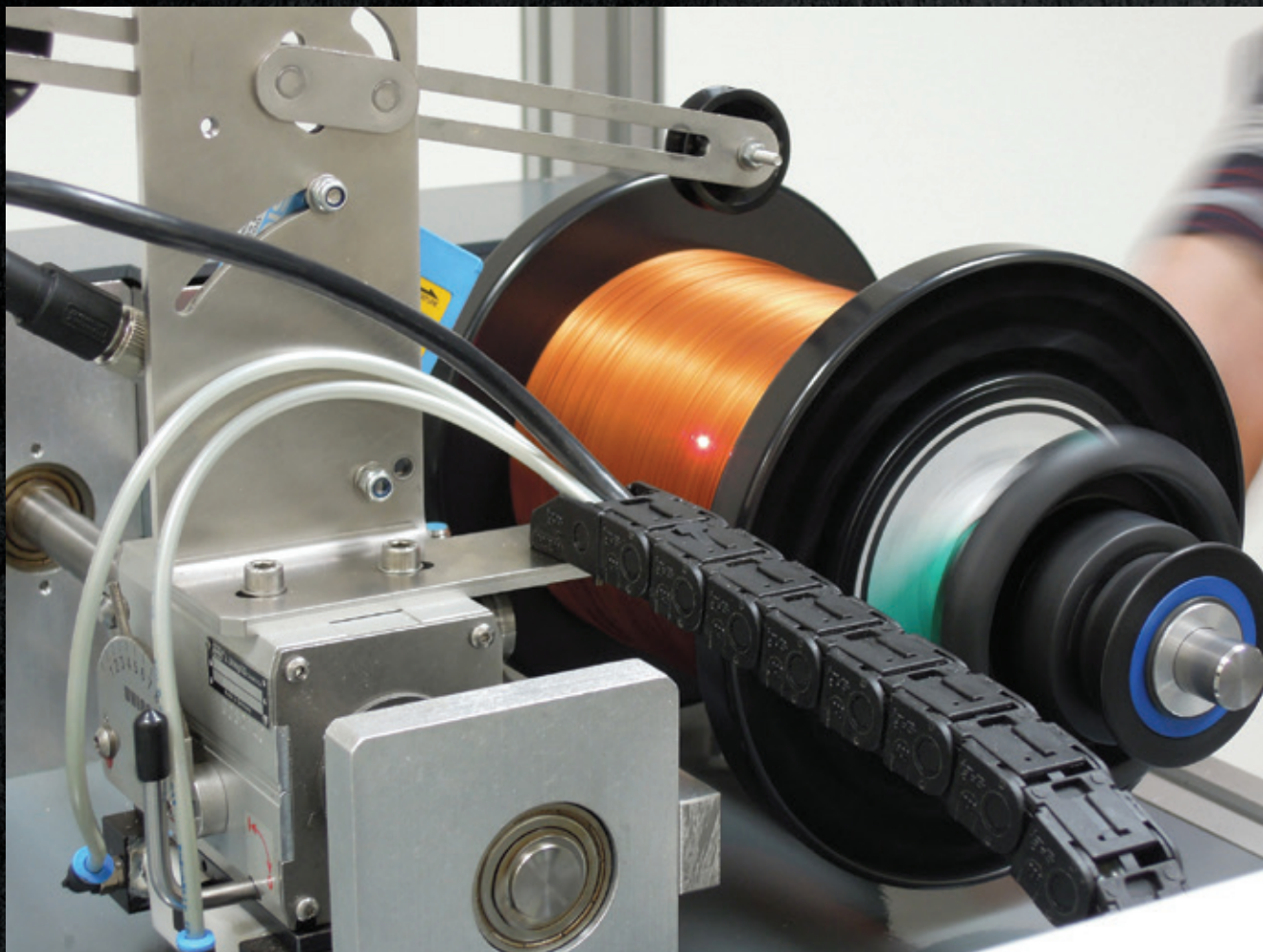
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THE 14th CHINA (GUANGZHOU) INT'L METAL & METALLURGY EXHIBITION



▲ Second generation from Uhing

Uhing launches next generation flange detecting system

IN 2004, Uhing added the non-contact FA flange detecting system for rolling ring drives to its product range.

This economically priced solution that automatically corrects the reversal points of rolling ring traversing gears relieves the employees in production companies of manual adjustment work and thus reduces time requirements and costs.

Uhing has now launched the second generation of this product – equipped with new sensor technology and expanded function range.

It often happens that a new spool is not in exactly the same position as the previous one although it has the same width, or that the spools have wide width tolerances.

The non-contact FA flange detecting

system corrects the reversal point of the traversing system automatically.

This function soon made the FA an indispensable device for companies whose products have to be wound – in particular wire or cable producing companies.

A new feature is the product's ability to automatically detect the width of spools and the flange type – straight or other than 90 degrees.

The flange detecting system adapts to the new position and width if a spool with a different width is used after spool change.

The most significant novelty of the FA II is the laser sensor. It replaces the previously applied light barrier detection system. The sensor detecting the flange is mounted on the traversing system.

Within a specified range, it captures the offset between the surface of the spool core and the maximum permissible height stored in the system software and saves this value as reference offset for each new layer.

During winding, the flange detecting system continuously measures the respective offset and compares it with the reference offset.

A reversal is triggered when the permissible height deviation also stored in the system is exceeded.

A display indicates the measured height or the permissible height deviation.

Joachim Uhing KG GmbH & Co – Germany
Website: www.uhing.com

Dual-spindle thread rollers from Israel

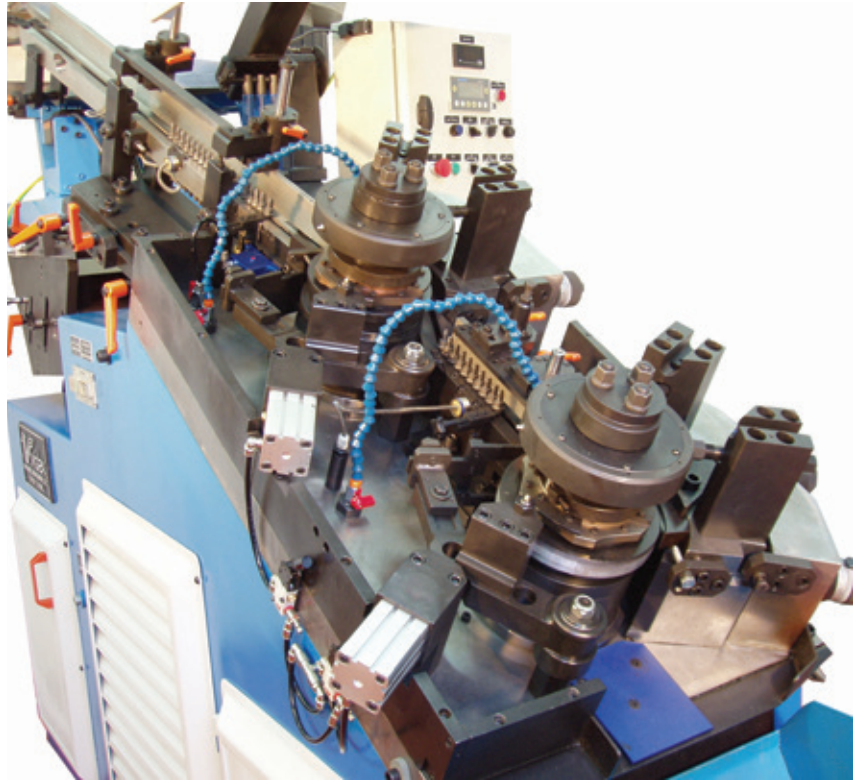
THE new Videx dual-spindle thread rollers are designed to roll threads above and below the shoulder. The threads can be either different or similar.

The two heads are independent, eliminating influence of one on the other, enabling use of simple and economical rolling dies.

Advantages include:

- Independent adjustments assure better quality of each thread
- Higher production speeds. The second operation does not slow down the machine
- Less handling, eliminating possibility of mixing parts
- Inexpensive tooling and full control of the quality of each rolling operation. Tools are replaced in minutes.

Both stations have controlled thread rolling start, hydraulic clamping, zero-taper mechanism for parallel threads and micrometric thread pressure screws as well as an AC speed controller, automatic air shut-off and two operator control panels.



▲ The Videx dual-spindle thread rollers

Videx Machine Engineering Ltd – Israel

Website: www.videx.co.il

Upgrade to software

General Inspection, LLC has released an update to its software for the Gi-360 sorting machine. This new 3600 Virtual Tilt virtually corrects for the cosine error as a result of the relationship of the head to the shank and length of the part as it slides down the V-Track.



▲ The upgraded Gi-360 sorting machine

This allows for more accurate images of the part to catch smaller defects and measure more features.

This is state-of-the-art software, and is not available on any other sorting machine. All new Gi-360s will have this new software feature as standard and current customers can call to schedule their upgrade.

General Inspection manufactures a complete line of gauging, sorting and inspection systems incorporating: laser, eddy current, vision, and acoustic technologies for dimensional measurement, determining metallurgical defects as a method for achieving zero defects.

General Inspection LLC – USA

Website: www.generalinspection.com

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Zhengzhou, Henan, China

CrimpCenter 36 S: Better than before

THE Schleuniger CrimpCenter 36 has brought new technologies to the high precision stripping and crimping market resulting in high performance and flexibility at a very competitive price.

The new CrimpCenter 36 S replaces the CrimpCenter 36 with improvements and a stylish new look. Systems throughout the machine have been upgraded to enhance precision and performance even more than before. The design has been refined for better appearance and functionality.

The CrimpCenter 36 S still accommodates up to six processing stations to give incredible application flexibility. Efficient motor programming and internal ethernet communication coupled with a maximum feed rate of 8m/sec results in some of the highest production rates on the market.

The machine features a touch screen monitor and the intuitive Easy operating software. The combination makes programming simple enough so that even novice operators quickly feel comfortable. New quick-change mechanisms, wire feed assist and integrated lighting make set-up times fast and simple. The CrimpCenter



▲ The new CrimpCenter 36 S from Schleuniger

36 S is compatible with Schleuniger's innovative ToolingShuttle system for incredibly fast change-overs of the applicator and terminals.

As with all CrimpCenter models, the CrimpCenter 36 S boasts standard TCP/IP protocol for easy machine networking. The optional Easy ProductionServer software can help optimise order processing and allows clients to monitor and gather production data from practically anywhere in the world.

Service is made simple with online documentation,

standard components, and an enhanced version of Schleuniger's Easy ErrorExpert. All product documents can be accessed from the touch screen monitor saving valuable time for service technicians. Standard components keep costs low and availability high. For easy troubleshooting, Easy ErrorExpert provides detailed pictures and helpful hints on how to resolve any issues. When necessary the world-class Schleuniger service team will be there to help.

Schleuniger Inc – USA
Website: www.schleuniger-na.com

Two new compounds on the market

Fainplast has launched two new products in the world of cables: the halogen free crosslinkable compound HFX 521 and the halogenated crosslinkable compound CTX 65.

HFX 521 is a halogen free crosslinkable compound (XLPO-HFFR), featuring long duration even at high temperatures, high fire resistance, low smoke emission and oil resistance.

This type of product – that can be processed using the SIOPLAS method (working with a normal extruder, and thus achieving a considerable reduction in costs) – is particularly suitable for applications on ships and railways, where high levels

of reliability and safety are required.

CTX 65 is a halogenated crosslinkable compound, with technical features similar to rubber, which is also resistant to high temperatures, atmospheric agents, mechanical and chemical stresses.

CTX 65 can be used with the SIOPLAS method, in order to produce cables with a normal extruder, with no need of specific plants. This product is particularly suitable for the realisation of power, signal and control cables.

These two new products are the result of the continuous research and development work of Fainplast and of its natural

tension towards innovation and implementation of new technologies.

HFX 521 and CTX 65 are now parts of the wide range of compounds that Fainplast puts on the market in order to satisfy all requirements.

Fainplast continues to stand out in the market of compounds, where it has been operating for over 15 years.

Research and development, on-going innovation and cutting-edge technology are the keys to success of the Italian company.

Fainplast – Italy
Website: www.fainplast.com

The safest cables

The newly developed Hradil SC 44 cables totally and safely prevent the zone entrainments within the cables, independently from the cable length as well as from the type and pressure of the gas.

The exhaustive compliance with the IEC 60079-14-9.3.1 brings far-reaching legal consequences with it. The first DEKRA test report of its kind certifies this technical breakthrough.

Hradil SC 44 cables are designed for users with extremely high explosion hazard requirements, for example, in the petrochemical industry. The new Hradil SC 44 cables are available in different configurations, for example 3x1.5mm².



▲ SC44 cables from Hradil

Lightweight and robust for all round protection

TSUBAKI Kabelschlepp offers the lightweight and low-noise all-round 1320 cable and hose carriers from the Uniflex Advanced series as a particularly robust version for rough application environments.

This cable and hose carrier with interior widths of 38mm and 50mm offers extra flexibility wherever extremely high torsion rigidity and stress-resistance is a must.

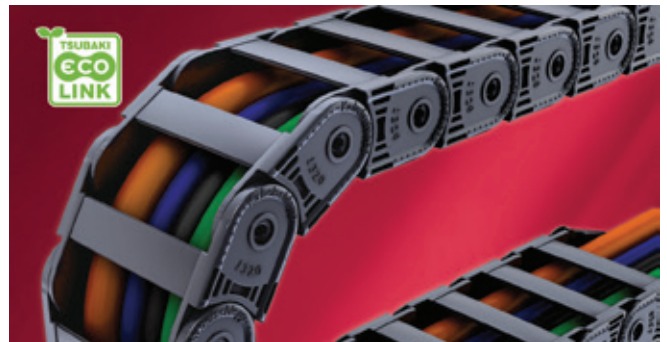
The plastic carrier, which was awarded the Eco-Link label, fulfils the most stringent of environmental-compatibility standards set out by Tsubaki Group.

The 1320 models of the Uniflex Advanced series were originally developed as a custom solution to safely route bend-proof hydraulic hoses through the extendible supports of a concrete transporter.

The limited construction space required a particularly compact cable carrier with small bend radii and a favourable ratio of interior to exterior width.

Due to the extreme application conditions with dirt, strong vibrations and high mechanical stresses, the torsion rigidity of the cable carrier was optimised with single-part links manufactured from plastic material.

A double stroke system for large unsupported sections and lateral wear surfaces make the Uniflex Advanced 1320 extremely robust.



▲ Fulfilling the most stringent of environmental-compatibility standards

The internal damping system ensures particularly low-vibration and low-noise running of the cable carrier.


The optimised chain geometry keeps the weight of the carriers of the Uniflex Advanced series extremely low.

The plastic cable and hose carrier Uniflex Advanced 1320 by Tsubaki Kabelschlepp with interior widths of 38mm and 50mm is available as a cost-effective standard solution for high-stress applications. The chain is supplied with bend-radii of 28, 38, 48, 75 and 100mm, and a pitch of 32mm.

The aluminium continuous height separators TS 0 or TS 1 are offered as matching divider systems.


The dividers can be moved along the cross-section, and can be fixed in place for laterally recumbent applications, or for applications with great transverse acceleration. The divider systems are mounted on every second chain link as standard.

Tsubaki Kabelschlepp – Germany
Website: www.kabelschlepp.com



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Double torsion springs



▲ The range of springs from William Hughes

A clean business: Development project for pellet inspection

THE cleanliness of PE material is gaining in importance at higher cable voltage classes. In particular, alternative wind energy generation in the off-shore area requires a cable network with the minimum number of joints. In order to achieve this goal, long production cycles should be run. Where production lines formerly ran from Monday to Saturday, now a continuous production run of 10 to 20 days is common.

Long production cycles are achieved, for example, by leaving out the screens before the crosshead in order to ensure a constant material flow. However, the manufacture without screens also results in contaminations passing directly into the cable insulation rather than being caught. Hence there is the need for other measures to detect possible contamination in the pellet and to remove them.

A special challenge is the contaminated pellet itself. Contaminations are most often not only on the pellet surface, but they are also melted down in the pellet. By means of optical testing systems these contaminations cannot be detected.

That is the reason why Sikora is currently developing a completely new system that differs in two ways from existing but flawed solutions: The Sikora system is based on X-ray technology and detects



▲ Sikora's development project "Pellet Inspection" ensures flawless pellets before starting production

also contaminations in the pellet. The smallest detectable particle size is 50µm, at a throughput of up to 500kg/h. Higher throughputs are possible by installing several units in parallel.

In addition, the pellet inspection is installed directly in the joint tube between the silo/octabin and the extruder. The system is consequently hermetically sealed and there is zero risk that dust particles get into the material flow.

The Sikora solution for pellet inspection is perfectly suitable for both manufacturers of energy cables and pellet manufacturers within the plastics industry.

Sikora AG – Germany
Website: www.sikora.net

While some spring manufacturers struggle with the complex shape of double torsion springs, William Hughes has invested in the latest CNC technology machines to fully automate the production process.

For many applications, double torsion springs perform better than single and as a result, they are widely used in the automotive industry. Typical applications include door handles, seat adjustment mechanisms and console lids.

When a manufacturer of seat and car interior parts needed a double torsion spring for the door handles of a popular small car, it approached William Hughes as one of its preferred suppliers. The application engineers at William Hughes used their knowledge and expertise to design the spring to meet the exacting specification of the car manufacturer, whilst ensuring that the spring would be easy to manufacture using its CNC machinery.

The spring is used inside the car to return the handle to its normal position and is specially designed to make assembly into the car mechanism easy. Despite the complex shape of the central section of the double torsion spring, very little tooling was required.

By making the spring in two fully automated stages, the difficult central section was easily formed to provide a spring that is compact, cost effective and which encompasses the right performance characteristics and durability. The final stage of the process is to finish and protect the springs using an organic and environmentally friendly anti-corrosion paint containing zinc flake.

William Hughes Ltd – UK

Website: www.wmhughes.co.uk

CAQ-system ProCable especially for producers

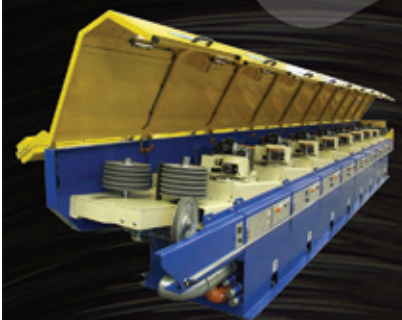
The iiM software ProCable is a compact CAQ system – especially developed for the requirements of cable producers.

With the CAQ system ProCable test plans can be developed, orders administrated and the received test results can be archived with corresponding additional information into the databases. ProCable generates a list of results from the measurements according to the applied test plans. Afterwards the test results are deposited, structured and accurate.

ProCable adapts test results with the test plans. Possible exceeding of tolerance limits will be shown to the user at once who can then repeat the measurement or be forced to comment the exceptional circumstances.

iiM AG – Germany
Website: www.iim.ag.de

Drawing machines beyond the ordinary



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Detection is made simple

Beta LaserMike's new three-axis LN3015 Lump and Neckdown Detector is designed to help wire and cable manufacturers precisely detect short-term faults in the diameter of cable.

The LN3015 offers a higher degree of coverage around the product's circumference to instantly detect sudden changes in the surface.

The LN Detector can measure products up to 15mm (0.59") in diameter at line speeds up to 3,000m/min (9,842 ft/min).

It can accept a range of inputs including length encoder, tachometer, line start/stop, and clear faults and can be connected to a host PC or PLC using Ethernet IP, Devicenet, Profibus and Profinet.

Data capture capabilities enable reporting of critical process information such as height, length, number and location of the flaw.

Beta LaserMike – USA

Website: www.betalasermike.com

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Manufacturing complex data and special cables

AS cables must meet ever more demanding tasks, cable design is continually becoming more and more complex.

Maschinenfabrik Niehoff produces a range of machines to meet exacting requirements, for example the DSI double twist stranding machines and the lever arm rotary braiding machines of the BMV series with their taping devices.

Niehoff developed both the data and special cable stranding machines of the DSI series with ancillary equipment and the BMV type braiding machines. The DSI stranding concept is based on the successful design of Niehoff's D series double-twist bunching machines, which represents a well-established experience in the design of wire bunching and cable stranding machines dating back to the early 1970s. Similarly the BMV type braiding system has been developed by specialists with a long-standing experience in building this type of machinery.

The field proven double twist stranding machines of the DSI series, DSI 631 and DSI 1001, are designed to manufacture insulated conductors into pairs or quads or to strand conductor pairs into special cables with or without foils. With diverse components the DSI machines can be configured into complete lines, perfectly adapted to the requirements of the users.

Depending on the configuration, a DSI stranding line can apply up to three foils inline on a cable under controlled foil tension in the multi taping process. One of the several DSI application examples is the manufacturing of instrumentation cables for the petrochemical industry. During the stranding process, the inner part of the cable has to be covered with three film layers.

All elements of the cable are assembled in one process on a stranding line which is composed by three tangential pay-offs type ATP 630, three longitudinal tape pay-offs type ALB 600, a pre-twister type VVD 180, and a DSI 631 type double twist stranding machine.

The 12, 16 and 24-carrier lever arm rotary braiding machines of the BMV series are mainly designed to apply an EMC shielding onto cables. With an integrated central taping device, the braiding and the subsequent taping processes are completed in one step under constant and uniform haul-off tension. In this case,



▲ *BMV 16 type lever arm rotary braiding machine*

considerable cost savings result from eliminating intermediate rewinding and WIP storage, from requiring less shop floor space and from a higher product quality. The applications of the BMV machines include the manufacture of data, control and coaxial cables, hollow braids for battery cables, stranded braids, and mechanical reinforcements for pressure hoses and medical catheters.

The BMV braiders and the DSI machines with their ancillary equipment are part of the modular Niehoff machinery programme which covers all operational steps from rod wire drawing to fine wire drawing and to data and special cables manufacturing.

By means of several quality control systems BMV braiders can work for a long time unattended and without operator intervention. With DSI lines all types of the above-mentioned cables – and even cables of future categories – can be manufactured with high speeds and the utmost precision and quality. Another advantage for the users of Niehoff systems is that Niehoff supports customers with comprehensive process knowledge, reliable technical assistance and a worldwide customer service, which is always ready for action. The users of Niehoff technology therefore have the ideal tools at hand to benefit from the further development in the cable sector.

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

New technology achieves high-energy savings

ENERGY savings, reduction of emissions and cost savings are important selling points in all sectors of the steel and non-ferrous industry. The hydraulic system also offers great potential here. A new technical solution from SMS Meer provides considerable advantages.

The variable speed pump, VSP for short, enables an efficient hydraulic system with pressures of more than 450 bar.

The two major Russian pipe producers, Vyksa Steelworks (OMK) and Izhorsky Trubny Zavod (Severstal), will soon be using the VSP technology on two pipe closure presses (each with 25 MN pressing force and four pressing cylinders).

The general principle is that the oil pressure is generated only on the system level – meaning only when it is actually required.

Commercially available axial piston pumps are used, and regulation follows through the speed of the servomotors. With energy efficiency and environmental compatibility, this technology fulfils the guidelines of the SMS Meer 'Ecoplants' systems.

Set-up is performed using proportional valve technology, during which the complete throttling of the hydraulic power by significantly heating up of the oil is completely eliminated.

As a result, an extremely energy-saving and low-loss hydraulic system is built up with the 'small' systems, but also with high pressing forces as well as with several hydraulic axles.

Only the oil pressure and volumetric flow that are actually required by the system are generated.

In this respect, the motors only run during the main machine function (eg pressing process), but are idle in the non-productive time.

This means less power consumption and lower noise burden. The structure also enables feedback into the power network, something like that from the compression energy of the oil.

Hydraulic systems with VSP require neither a cooling system nor a central hydraulic station with a large tank.

The costs of housings or hydraulic pits as well as long pipelines are eliminated. All hydraulic components are mounted directly in an easy-to-maintain way or on top of the machine.

Longer lifetime of the oil also make a contribution towards the low repair costs as do the low number of wearing parts and the modular, easily exchangeable components.

The integrated control of the pump parameters even allows preventive repair and maintenance. This means that it can be seen if a component should be replaced in the near future.

SMS Meer GmbH – Germany
Website: www.sms-meer.com

New lubricants India launch

Metalube launched a semi-synthetic oil, Inoxol™ 5108, at Wire & Cable India 2012. This latest addition to its lubricant range is specifically designed for the wet drawing of stainless steel wire and significantly outperforms rival products.

Inoxol™ 5108 contains the very latest synthetic additives, improving film strength and providing outstanding extreme-pressure and anti-wear properties.

Technical director Chris Nettleship said: "Our test results for this product are exceptional. We are witnessing excellent drawing performance that will considerably extend the life of dies, and as the cost of dies is noticeably higher than that of a lubricant, the results speak for themselves. Inoxol™ 5108 will radically reduce customer overheads."

Inoxol™ 5108 also contains special additives to minimise thermal and oxidative degradation of the oil, extending the service life of the oil, reducing both the quantity of oil consumed as well as the cost of waste oil disposal. The improved lubricity benefits provided by these additives also produce an exceptionally bright surface finish.



▲ *Albert Malloy, general manager Metalube; Joseph Ellingworth, Metalube India and Amit Gupte, general manager Metalube India pictured at Wire and Cable India*

Laboratory wear tests have shown that Inoxol 598 reduces wear by more than 20% compared to its nearest rival.

Metalube specialises in wire and tube drawing lubricants, working with wire, cabling and tubing manufacturers across the world. The headquarters are in Manchester, UK, where the site incorporates offices with warehousing, laboratories and manufacturing facilities.

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

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Acid-free rod dry cleaning, coating and drawing

THE new version of acid-free rod Dry Cleaning, Coating and Drawing (DCCD) process is rapidly changing the current state of rod preparation and wire drawing, replacing conventional rod wet preparation, including acid cleaning/rinsing/wet pre-coating and drying, by the new totally dry and completely "green" technology.

The DCCD process offers substantial cost savings in the most demanding drawing applications from mechanically descaled uncoated rod, drawn directly without wet pre-coating chemicals, including spring wire, PC strand wire, cold heading wire, plating wire, etc.

The process operates at 'zero' maintenance cost as there is no acid, no hot liquid tanks for rod pre-coating, no hot air blowers to dry wet rod, and it operates at virtually 'zero' energy consumption.

An added benefit is the automatic control of lubrication parameters, including lubricant pressure, temperature and viscosity, enabling the use of standard high melting lubricants (melting at +220°C/428°F for H/C applications) which are converted from solid into liquefied state and instantaneously deposited on uncoated rod to form a high-performance lubricant film resisting at high load and temperature, generating exceptional thermal stability in all drafts at the highest drawing speed, eliminating the need for phosphate, borax and their wet substitutes.

Insulating and sheathing lines

Supermac Industries (India) Limited has since 1974 manufactured different kinds of insulating and sheathing lines for various cable sectors (power cables, optical fibre cables, house wiring, control cable, etc).

Supermac specialises in providing customised solutions, taking care of customer requirements, and has maintained a leading edge in technology.

The company has in-house automation, software developments, panel making and testing facilities for extrusion of cable sheathing.

Its qualified engineers are fully equipped in installation and commissioning of plants.

The state-of-the art facilities are equipped with international and indigenous

Advertorial on behalf of Decalub



▲ Rod cleaning and wire drawing by DCCD process

In operation, all lubrication parameters 'communicate' together in a sensitive and automatic multi-way interaction to form a hard and strongly adherent full-film anti-wear lubricant coat, weight-adjustable, enabling frictionless drawing by physical separation of wire-die contact in all drafts, eliminating friction heat, providing superior surface quality, increasing die life and improving wire ductility.

Typical applications with DCCD processed rod: Output of 2.2 tonne/hour with 5.5mm 0.83/0.88%C rod.

Spring wire is drawn at 18m/s (3,600ft/min); 5.5mm 0.72%C rod drawn to 2.35mm at 16m/s (3,200ft/min); 10.5mm 0.85/0.88%C rod drawn to 4.22mm at 8-9m/s (1,800 ft/min).

Decalub - France
Fax: +33 1 60 20 20 21
Email: info@decalub.com
Website: www.decalub.com

machinery to carry out the process of manufacturing. It has implemented a customised ERP system to achieve increased productivity, lower costs, and satisfied customers.

Recently Supermac has got its products approved for the CE Mark, enabling it to export to the European market.

The product range includes: Insulation line for house wiring and control cables; insulation line and sheathing line for power cables; triple extrusion line for SIOPLAS (XLPE) cable; CCV line for LV/MV power cables up to 132 KVA; HCV line for rubber/EPDM/silicon cables; extruders from 30mm to 175mm; cross-head; haul-off caterpillar; capstan; take-up and pay-off from 630mm to 4,500mm.

Supermac Industries (India) Ltd - India
Website: www.supermacindia.com

Materials savings from Zumbach

TO compete in today's markets, it is necessary to reduce operating costs. But, cutting costs cannot mean sacrificing a high quality standard, and an in-line measurement and control system incorporated on an extrusion line can reduce material usage.

In-line measurements are a requirement for many extrusion lines. The objectives of such measurement systems vary from a simple quality control tool to a completely integrated closed-loop control system. There are different measurement technologies that can be used in the wire and cable industry, and the implementation of such systems can result in significant material and scrap savings.

These technologies include:

- Laser and infrared technologies suitable for all applications
- Ultrasonics for jacketing lines (cable, fibre, etc), insulating lines and multi-layer applications
- Inductance for primary lines and insulating lines
- X-ray for CV lines

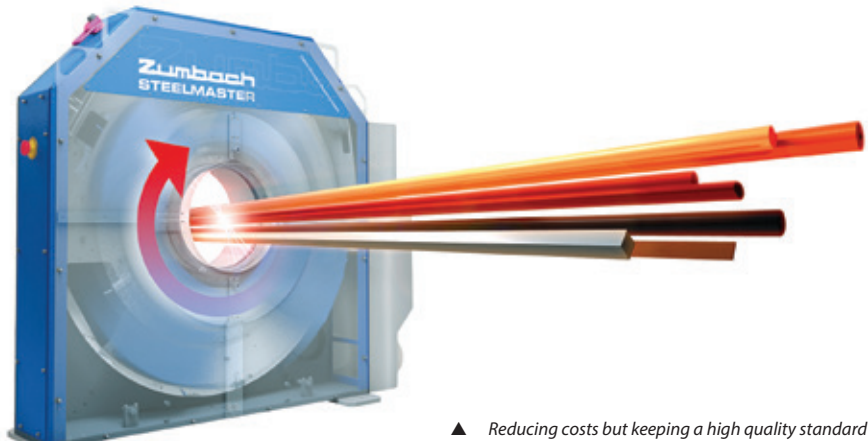
Once the method of measurement is established, the system's processor can be configured to perform closed-loop control. Using the example of a line running 75m/min and a measurement point location of 2ft from the cross head. In this case, the delay time is dramatically improved (2ft divided by 75m/min equals 0.5 seconds).

Although the short-term variation has been significantly improved, the issue of shrinkage must still be considered. An offset can be effectively used, but changes due to such variables as material, cooling, tension, etc, have to be considered. In most applications, these variables are enough to warrant a second loop to the controller. This is called a dual loop system.

In a dual loop system, both the "hot end" measurement point and "cold end" measurement point are used. The system takes the readings from the hot end and constantly compares them to the readings at the cold end to establish an accurate offset. These values are shifted to ensure "same spot" comparison.

This dual loop (DLP) control strategy can be taken a step further for jacketing applications. To realise the highest potential savings, the desired controlled parameter is the minimum wall. This minimum wall value can be established using a combination of ultrasonics and laser.

Zumbach's "DIACAL" technology is used to calibrate the ultrasonics based on the



cold values in the same way the dual loop controller does.

With any controller, not only is establishing the correct control strategy important, but setting up the controller properly can make all the difference. A controller can be set up to be as aggressive as the process can tolerate. The more the process is statistically "in control", the better a controller can perform.

To account for unexpected events in a process, a controller can utilise statistics to tune it. Once accurate measurement has been established, and the controller strategy has been optimised, yet another function can be utilised to improve material savings.

Since a product's key characteristic has a tolerance and a nominal, the typical controller would be set to tolerate the nominal as the controller's set point. Most likely, these nominal and tolerance values were established based on the line's performance with the lower tolerance in mind. At one point, someone established the set point with the logic that this is where the operator needs to target to play it safe to ensure the lower tolerance is not violated.

It is assumed these parameters were established with a statistical study of some sort. In the real world, these nominals are rarely adjusted. The results are parameters that are padded unnecessarily.

By enabling statistics to determine the correct nominal, all factors can be taken into consideration in real time. Zumbach Electronic uses a CPK Pilot lot to perform this function. By entering the desired CPK level, the controller can determine the capabilities of the line. Once this is known, the controller will adjust the nominal value as low as possible, maintaining the desired CPK level.

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

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Testing & measuring for wire, cable & fibre optics

“These are not pushbutton testers!”

The caution, from a primer on fibre optic testing, refers to OTDRs – optical time-domain reflectometers that measure and integrate optical pulses as functions of time and fibre length. It notes that OTDR tests are generally not appropriate for short cables and always require a knowledgeable operator to interpret the findings.

In fact, the testing and measurement of any wire and cable – fibre optic or otherwise – call for only the finest equipment in the hands of well-trained and painstaking practitioners.

That “pushbutton testers” have no place in these specialities is an understanding shared by the professionals whose products and services are reviewed in this section of EuroWire.

Be in control!

STATISTICAL Process Control is the ideal way to prevent problems in manufacturing, not only enhancing quality level, but also decreasing costs, through reduction in scrap, tool damage and machine stops.

Without using the best of the available technology, however, SPC is time consuming and subject to human mistakes. It requires suitable software support and the proper system to collect measurements in an efficient and intrinsically error free mode.

The first advantages in this sense were performed using quality control programmes with data input tools to achieve measurements from conventional instruments.

Nowadays improvements in optical technology allow reduction in time and improved result reliability. Commonly available optical stations are well used for pre-production and final tests, but during manufacturing process face at least two drawbacks.

If the station is organised to measure only the profiles, such as the ones adopting the side view on a V in glass, the operator has to handle the part to measure recess and axial holes: it works like a "semi-manual" station. If the optical station is organised to measure recesses and axial holes, in addition to the profile, it needs to place the parts with specific bits, necessarily different from those needed for other parts: the changeover and correct calibration requires time.

Eldes' new optical station Themis 2K makes use of pre-assembled frames specialised with suitable bits before starting the production. Each frame houses up to five parts, allowing measurement of five samples at the same time automatically, including pits and holes.

Parts can rotate to detect concentricity, straightness and misalignments in complex structures, threading integrity, hex across corners/flats and wrench height.

The basic model is used for parts with maximum length 36mm, maximum diameter 25mm, with 0.001mm resolution. A second model extends the measurement capability, using the same camera to 150mm length and 36mm diameter, thanks to the vertical movement of the frame facing the camera.

The quality management software is born "before the station", resulting from Eldes' 20 years' experience in this field, ensuring that the Themis station is not a standalone product requiring an interface with data storage software to be fully used within a production process.

Optical measurements are managed by a module, integrated to the software suite in which control plans, job order launches and SPC analysis are managed. Starting from a "general purpose" plan, it takes a few minutes to set up a complete part template.

An intuitive graphic software interface assists in this. Once the part template is complete, it can be saved in memory and recalled later. A copy of a template from a parent article is also possible.

The main features of the Themis software Module for Automatic Dimensional Acquisition and SPC Analysis are:

- user friendly touch screen interface
- choice of the job order from a list. Selection possible using bar code reader
- frequency of control in time or number of pieces, with colour alarms for the operators (red – green); integration with production data collection and dedicated alarm lamps

- state of job order (start, stop, suspended) can be managed separately or in connection with existing ERP or data collection system
- declaration of defects and notes guided by catalogues, but also free if required
- visualisation of technical drawing of the article, procedures, instructions, any notes useful to the operator for controlling the production or setting the machines
- statistical analysis of all the acquired values (Xm/R, Xm/s, Cp, Cpk) and configurable alarms (out of limits, run, trend, middle third, out of time)
- immediate operator visualisation of the new point acquired on the SPC chart, following quality rules
- calibration through dot grid target with NIST certification of accuracy
- possibility of association lot code or raw material identification for traceability
- complete traceability of all measurements
- management of production approval, supervisor control, machine capability
- interface to the new optical system as well to commercial instruments, already existing optical stations and profile projectors. External stations are considered as an instrument that sends a package of measurements which is integrated in the database with all the other measurements for further analysis
- control panel to see all the active processes trend, out of control and alarms

Eldes snc di Bellotto Paolo & C – Italy
Website: www.eldes.net

▼ Themis 2K from Eldes



Patented off-line system



▲ The CAPRIS® CMS2 from Spectrum Technologies

The CAPRIS® CMS2 ('Contrast Measurement System 2') is a patented system, specifically designed for off-line contrast measurement of laser generated marks on electrical wiring and fibre optic cabling employed in aerospace and other critical industries. It provides a convenient quality assurance tool that can be employed simply and quickly to monitor and measure the average contrast of user applied and/or manufacturer markings on wire and cable.

The CMS2 uses optical technology to calculate the contrast by measuring the variation in luminance on the surface of a sample over an area encompassing the mark and the unmarked insulation.

This type of measurement is a key requirement for a number of aerospace customers and end users such as Boeing, Airbus, Sikorsky and the US Navy, to ensure the quality and legibility of marks on their wire.

Generally anything giving less than a 40 per cent contrast is unacceptable. Spectrum Technologies brought the first CMS system to market in 1996 and since then many modifications have been made to make the technology faster, smaller, cheaper and more accurate. In particular, following a two-year US Navy-funded project, the US National Institute of Standards & Technology (NIST) verified the operation and performance of the CAPRIS CMS2.

As part of the project, the measurement algorithm was enhanced to improve performance on coloured wires, lower contrast values and smaller marks, as well as confirming the accuracy on white wires of $\pm 2\%$ and the repeatability of the system of $\pm 1\%$. The CAPRIS CMS2 has since been qualified to Boeing and Sikorsky specifications BAC 5152 and SS7333, respectively, as well as complying with other international aerospace standards.

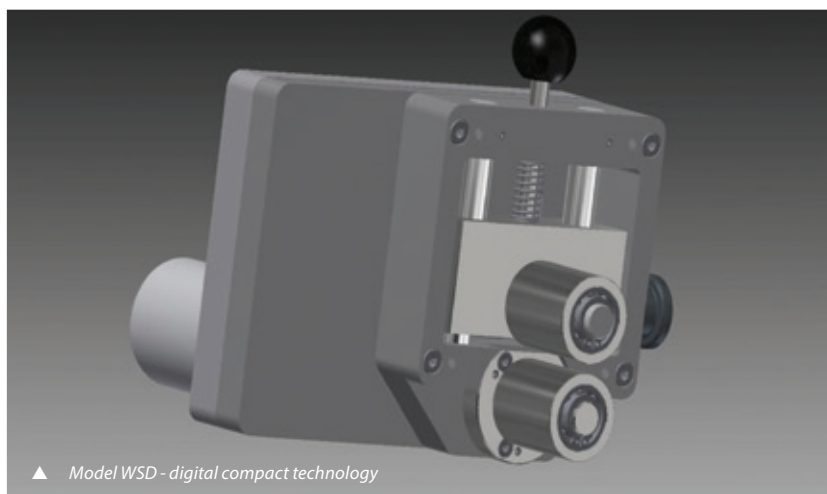
Spectrum Technologies Plc – UK

Website: www.spectrumtech.com

Wire surface detector

Italy-based Rigon Instruments has launched a compact in-line rectangular or round enamelled wire surface detector tester, model WSD, capable of detecting blisters and lumps, in compliance with the most stringent international standard.

The company claims that the digital contact technology used for the measurement, compared to the analogue technology already present in the market, ensures long-term stability, repeatability and electrical noise immunity, suitable for working in harsh environments requiring at the same time low maintenance. Its design allows an easy threading in very small area, avoiding bend and stress of enamelled wire. The device can be positioned in different ways without measuring problems.



▲ Model WSD - digital compact technology

The blister detector is a modular system that can be assembled to control two or all four surfaces of strip wire, with the possibility to install a soft conductive electrode to perform high voltage continuity of covering test up to 3,000 Vdc, under the supervision of dedicated software, which allows the setting of minimum detectable blister, test voltage and current, pre-alarm and alarm for each test length, with a final customisable report for each reel produced.

Rigon Instruments – Italy

Website: www.rigon.it

Solving answers to twisted pair wires

Twisted pair wires are used in signal-/control-/network- and fieldbus cables. The degree of twisting is defined by the length of lay, or the twisting angle. The lay length (Snom) of the paired wires influences the electrical and mechanical characteristics. If the lay length deviates from the nominal value, various quality relevant defects appear. If those defects are noticed by the customer, expensive callback activities will result and controlling the lay length within the production line or rewinding station helps to avoid such actions.

For controlling the lay length, Roland Electronic offers a method independent from the kind of cable jacket, suitable for unshielded cables, performable within the production line or the rewinding station: Detection of defects with eddy current encircling coil. For detecting defects a special eddy current encircling coil is used, through which the cable is led. The eddy current signals from the material are processed and evaluated in the control unit SND40. In case of deviation of twisting, the control unit reports this directly to the machine controls. The inspection is not influenced by running high voltage inspection. Detection monitoring: Speed – 0.2...6m/s, detection threshold – deviations > 0.5 Snom*, basic condition, length of defect > 0.5 Snom*
* lay length



▲ Detection of defects with eddy current encircling coil

Further possible applications are: Monitoring of the homogeneity of the shielding meshwork, inspection for homogeneity of strands, detection of weldings and cable joints and detection of material changes (eg of heating cables).

Roland Electronic GmbH – Germany Website: www.roland-electronic.com

Digital inline profile projector Geokon

KJM GmbH in Germany has developed a new high-precision 2-D profile inline measurement system named Geokon. Four sensors acquire four images of the object and the data is then analysed on computer by image processing software.



▲ Geokon from KJM GmbH

Rectangular and complex profiles can be measured. The profile types can be entered as CAD-data in the DXF file format using the "Teach-In" program.

With the "Teach-In" program, new products can be defined very simply. The technical drawing must be saved in DXF-format and entered into the "Teach-In" program. Then the measurement parameters are defined, as in CAD programs, by entering dimensions, creating a name (eg R15), defining tolerance or intervention levels and saving the parameters. For a new measurement, only the article to be measured must be selected.

The results are displayed numerically as well as graphically. An exclusively numerical display of important dimensions in large numbers can be selected. Values outside of tolerance are highlighted in colour.

Measurement results are saved, printed or transferred to computer-aided production data acquisition PDA- or QM-systems, according to customer requirements.

KJM GmbH – Germany
Website: www.kjm-ag.de

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Construction:
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6-form with 12 strands
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Diameter: 6 to 38mm

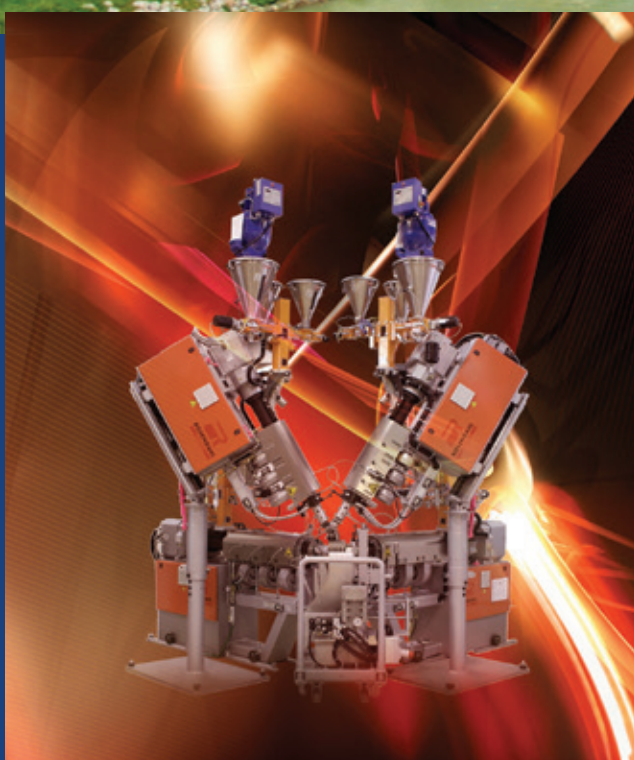
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email: jackychen8325@gmail.com

Focus on Austria & Switzerland

The 'hills are alive' to
precision and efficiency
in the Alpine region



Rosendahl's customised manufacturing solutions

As a member of the Knill Group, which recently celebrated its 300th anniversary, Rosendahl continuously sets new standards with its customised manufacturing solutions for the global cable and wire market.

Working together with its sister company Nextrom, a supplier of manufacturing systems for fibre and fibre optic cable, Rosendahl operates in over 100 countries and employs around 500 people.

Rosendahl's expertise ranges from extrusion, corrugation and optical fibre to SZ-stranding. Out of these competences the company developed the product segments power cable, automotive wire, LAN cable, coaxial cable and fibre optic cables.

◀ *Rosendahl extruder technology*



Forming machines and tools for precise metal parts

Hatebur develops and markets high-quality forming machines and tools that are used to manufacture precision metal parts in large quantities.

Founded in 1930 as a family enterprise, the company has produced a number of groundbreaking products, which in turn have led to milestones being set in the history of modern massive forming.

Through a combination of pioneering spirit, decades of experience and modern technological processes, Hatebur has worked to produce innovative solutions with an established tradition, setting new standards in terms of quality.

Preferred by demanding customers who supply mainly to the automotive, roller bearing and fastener industries, Hatebur is a leading source of fully automatic horizontal part formers.

The Swiss company has subsidiaries and agencies around the world, enabling it to be close to its customers.

Hatebur offers a full range of products for customised forming, hot or cold. HateburColdmatic coldformers produce precision and complex parts formed directly from wire.

The parts produced this way are characterised by precision tolerances, quality surface finish and overall strength. Net-shape manufacturing becomes a reality.

HateburHotmatic hotformers are suitable for forging parts such as wheel spindles, gear blanks, bearing rings and nuts, which are produced from steel bars in a fully automated process.

Hatebur machines offer not only precision and flexibility, but also efficiency, because of their ability to produce large volumes of parts at a high production rate.

Hatebur Metalforming Equipment Ltd – Switzerland
Website: www.hatebur.com

Photo: bigstockphoto.com – 'Panorama of Salzburg, Austria', by Fedory Natalia

The extrusion technology, under unceasing development over the years, forms one of Rosendahl's key areas of expertise and strengths.

The ROEX extruder generation and the enlarged crosshead series are important results enabling the company to serve the market with constant technological advancements.

Technical knowledge is reflected in a wide range of cable manufacturing systems, and covers R&D, manufacturing, control and software systems, installation and commissioning, as well as staff training and maintenance. Continuous high investment in R&D is one of the key factors to Rosendahl's success.

A focus on discovering new knowledge and the reconsideration of present methods enables it to apply newly discovered and upgraded methods to its products, processes and services.

Rosendahl Maschinen GmbH – Austria
Website: www.rosendahlaustria.com



▲ Hatebur manufactures equipment for hot and cold forming

Austria & Switzerland

Focus on

Caliper with plug-and-play connectivity

Hexagon Metrology has launched its Tesa Twin-Cal IP67 caliper, a user-friendly digital hand tool with an innovative built-in output connection. The electronic measuring tool is IP67 compliant, with its main components encapsulated and protected from shop floor contaminants such as dust, oil and coolants.

The adaptable and upgradable calipers

can be used wirelessly or with a cable using the new plug-and-play TLC (Tesa Link Connector). The TLC allows the user to send measured data from the instrument to the computer via USB, TWIN (Tesa Wireless Interface, available Q1, 2013) or Digimatic option. The USB cable connection allows the caliper to be directly connected to a computer.

The wireless module is integrated in the battery cap and enables the operator to retrieve data for optimal SPC monitoring. Digimatic output is a cabled connection

that allows Tesa instruments to work with any competitor's interface.

Suitable for applications in the metrology laboratory or on the production floor, the caliper can be used in combination with mechanical instruments or stationary machines.

Established in 1941, Tesa SA manufactures and markets more than 5,000 dimensional metrology products, ranging from high-precision handheld tools to sophisticated measuring systems. CMM products and vision systems for non-contact measurement are also included. Most of the range is produced under the "Swiss Made" label.

A worldwide direct sales and distribution network is a major asset of the Swiss company whose primary sectors are the automotive, aerospace, watch-making, medical and metal processing industries. Tesa is part of Hexagon Metrology, which offers a comprehensive range of products and services for all industrial metrology applications in sectors such as automotive, aerospace, energy and medical.

Tesa sa –Switzerland
Website: www.tesabs.ch



▲ Tesa Twin-Cal IP67 caliper





Photo: bigstockphoto.com – 'Belvedere Palace, Vienna, Austria' by Digital Press

Technology platform for wire and cable industry

Borealis and Borouge have launched Borlink™, a technology platform offering a complete global package of power materials, experience, knowledge and support.

Borlink is a wire and cable industry-wide platform cross-linking technology, products and expertise to connect networks and grids as well as people and their access to energy.

Borealis is a provider of chemical and innovative plastics solutions that create value for society.

With sales of €7.1bn in 2011, customers in over 120 countries, and around 5,300 employees worldwide, Borealis is owned 64 per cent by the International Petroleum Investment Company (IPIC) of Abu Dhabi and 36 per cent by OMV, a leading energy group in the European growth belt.

Borealis is headquartered in Vienna,

Austria, and has production locations, innovation centres and customer service centres across Europe and the Americas. Through Borouge, a joint venture between Borealis and the Abu Dhabi National Oil Company (ADNOC), one of the world's major oil and gas companies, the company's footprint reaches out to the Middle East, Asia Pacific, the Indian sub-continent and Africa.

Building on Borealis's Borstar and Borlink technologies, and more than 50 years' experience in polyolefins, Borealis and Borouge provide innovative, value-creating plastics solutions for infrastructure (pipe systems and power and communication cables), automotive and advanced packaging markets. In addition, Borealis offers a wide range of base chemicals from melamine and fertiliser to phenol and acetone.

Borealis AG – Austria
Website: www.borealisgroup.com

Wire rope technologies

Teufelberger is a specialist manufacturer of ropes and strapping, headquartered in Austria.

Its wire rope division focuses on the research and development, manufacturing, marketing and sales of high-performance special steel wire ropes.



▲ Evolution TK18 by Teufelberger

Two manufacturing sites and 220 staff generate an annual sales volume of about 6mn metres of premium quality steel wire rope. Key customers include original equipment manufacturers, distributors, and end-users of ropeways, crane applications used for transportation, building and construction, and offshore, as well as of forestry equipment.

The requirements that special steel



Photo: bigstockphoto.com - 'Zurich' by Alexander Chaikin

wire ropes are expected to meet are increasingly tough, especially when it comes to cranes.

Whether aboard offshore drilling rigs, of in harbours or in the building and construction industry, the performance capacities of cranes are being constantly upgraded to higher levels. At the same time, users demand stronger and more durable ropes.

Teufelberger has accepted these challenges in each of its product development projects. The company has launched various cutting edge steel wire ropes, such as the Evolution TK18 and the Evolution Q8, that stand out with their exceptional breaking strength and durability.

Teufelberger combines highest quality raw materials with some of its tested and tried technologies, such as Superfill® compaction and Plastfill™ plasticised cores.

The Superfill compaction method was developed in cooperation with universities and independent research institutes.

Each strand of the rope is compacted in a special process, translating into a significant improvement of the rope's properties. This increases the rope's breaking strength by up to 30 per

cent and prolongs its service life. As a consequence, it is possible to use smaller diameter ropes offering the same breaking strength.

With Plastfill technology, the lubricated steel core is enveloped in a compact plastic cover. During stranding, the outer strands are embedded in this plastic cover. This ensures the accurate positioning and equidistant spacing of the strands, resulting in lower internal wear and an even load distribution.

The longer service life achieved by permanent lubrication and the higher breaking strength accomplished by reducing laminar pressures within the rope constitute distinct advantages, as do the reduction of friction between the core and the outer strands and a high resistance to compression and lateral pressures.

Teufelberger GesmbH – Austria
Website: www.teufelberger.com

In-line profile and shape measurement and monitoring

The new Profilemaster® PMM 30, 50 and 80 profile and shape measurement

systems are the latest models available in Zumbach's Profilemaster® family, enabling measurement systems using light section principle and machine vision.



▲ The latest addition to the Profilemaster family

The design is focused to achieve the best price/performance ratio for all profiles, tubes, cables made of plastic, rubber, metal, steel and other materials. Additionally, the Profilemaster® PMM 30/50/80 fulfils the demands of the market for compact, industrial-proof and cost-effective systems.

As a pioneer of on-line measurement committed to extensive research and development activities, Zumbach Electronic has continuously grown as a worldwide manufacturer of on-line measuring and control systems.



The top priority at Zumbach Electronic remains customer relationships through local presence combined with proven high quality products, services, personal consultations and support.

Customer benefits include:

- Increased accuracy of end product
- Improved process control
- Scrap reduction
- Savings on raw material and post processing costs
- Increased product quality = higher customer satisfaction
- Quick and easy installation on existing production lines
- Seamless integration of the PC-based system with user's network

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

Steel wire industry technology

CPA is focused on the supply of machinery and equipment for the benefit of the global steel wire industry.

The product range includes furnaces for austenitisation, diffusion, stress relieving and tempering of steel wires and sheets, galvanic coating lines for brass, zinc

and copper coating, as well as payoff and take-up systems and wet drawing machines.

Representing a new heat treatment technology for high carbon steel wire production, AEOX pure recirculation furnaces are characterised by improved heat transfer.

The furnace pressure is not generated by the burners, but by a forced air circulation of the hot furnace gases created by a special blower.

In this way air velocities of up to 30m/s are reached on the wire surface.

AEOX preheats the combustion air

delivered to the burners by using the high temperature flue gas-heat content and utilises the flue gas heat remaining after the recuperation for further process applications such as bath heating.

Due to the interaction between the cutting-edge burner technology and the recovery of the remaining heat of the flue gas and the dragged-out energy, energy consumption reduction is claimed to be up to 40 per cent.

CPA's latest innovation is Linnox, a wet drawing machine for drawing high-strength and high quality demanding steel wires, beginning from a final diameter of 0.06mm.



▲ CPA's AEOX heat treatment technology

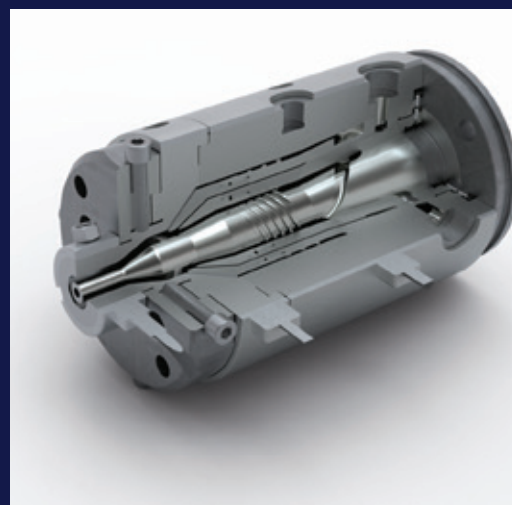


State-of-the-art components and a user-friendly operating system enable automated and error-free production. Advantages include a unique drive concept, low installation and maintenance effort, low energy consumption, inline-wire straightening and testing unit, straight wire behaviour and the guided identification of the drawing die wear.

CPA acts as turnkey project supplier for the production of steel cord wire, bead wire, hose wire, saw wire and others, and combines this with the related process know-how.

CPA Wire Technologies GmbH – Austria

Website: www.cpa.at



▲ *Crosshead from Erocarb*

New crossheads for extrusion lines

Erocarb produces many types of crosshead, from simple cartridge units for PVC to filling and jacketing units including equipment for CV lines and various crossheads for fluoropolymer cables and tubes.

The company's factory with multiple NC machines allows full control of the delivered units. A new "T" range has now been added: crossheads for multi-layers tubes and pipes. These crossheads are delivered with manual centring.

Their distributors are defined for the specific polymers used: HDPE, PEX, EVOH and adhesive. The parameters of the distributors can be sized to the thickness of each layer for a stable co-extrusion process.

Even Hastelloy® execution is available for extrusion of fluoropolymer. In this case the internal distributor will always be heated.

The connection to the crosshead is perpendicular or angled to the extrusion line. On multiple layers crossheads, the layer entry correspondence to the extruder position can be chosen freely.

Erocarb SA – Switzerland

Website: www.erocarb.ch



▲ Plasma Annealer for high speed annealing of stainless steel and nickel alloy wire

High-speed alternative for continuous annealing

Wire, rope and tubes made of stainless steel and nickel alloys have so far been annealed predominantly in tube or radiance furnaces. Most traditional tube annealing furnaces operate in multiline configurations, due to their low production speed.

Plasmait GmbH has introduced a second-generation plasma annealer designed for wire, rope and tubes made of stainless steel and nickel alloys and with cross-sections of up to 20mm². With this new concept Plasmait allowed for an increase of continuous annealing speeds of stainless steels and nickel alloys.

The slow speed of traditional tube furnaces means that the annealing of stainless steel and nickel alloy wires generally involves a multi-line set up. Multi-line process is logistically demanding and involves multiple payoffs and take-ups that can require substantial capital outlay. A multi-line annealing plant takes a large workshop space and locks considerable money in working capital related to the material being processed on each of the annealing lines. Furthermore, slow annealing speed means that the drawing or rolling processes have to be performed separately, off-line from annealing, which adds to the complexity of process logistics.

The higher process speed of the new plasma annealer allows a single line plasma annealing plant to substitute multiple lines of a tube annealer, whilst retaining the same output capacity. In some cases it is also possible for the

plasma annealer to operate in-line with a drawing or a rolling machine.

Plasma – an ionised gas – is maintained in the plasma chamber at low pressure. In the plasma chamber the electric field accelerates ions towards the surface of the processed material and electrons towards the outer wall of the chamber. Ion bombardment results in heating on the surface of the processed material. The electrons have virtually no mass and carry no energy, therefore do not heat the plasma chamber. This makes plasma annealing an efficient technique to heat the material, resulting in only a very small percentage of power being lost as dissipated heat in the plasma chamber.

Rapid heating and reduced time of recrystallisation results in fine grain size.

Small grain size with uniform crystal structure in the longitudinal and transversal direction improves materials' susceptibility to cold working and resistance to surface cracking.

Annealing power is controlled instantaneously and with a high degree of accuracy via power supply. This allows the operator to accurately target mechanical properties and provides greater flexibility in new product development.

Ion bombardment or ion sputtering on the material surface results in removal of the upper surface layer. Dirty deposits, soaps, lubricants and fine oxides break under the ion bombardment in the plasma chamber.

The debris and other cracked surface contamination are sucked out of the plasma chamber by the vacuum system and are filtered out through the exhaust installation. The dry surface cleaning and degreasing being performed simultaneously with plasma annealing is of particularly benefit to applications with demanding surface requirements in sectors such as medical, welding or aerospace.

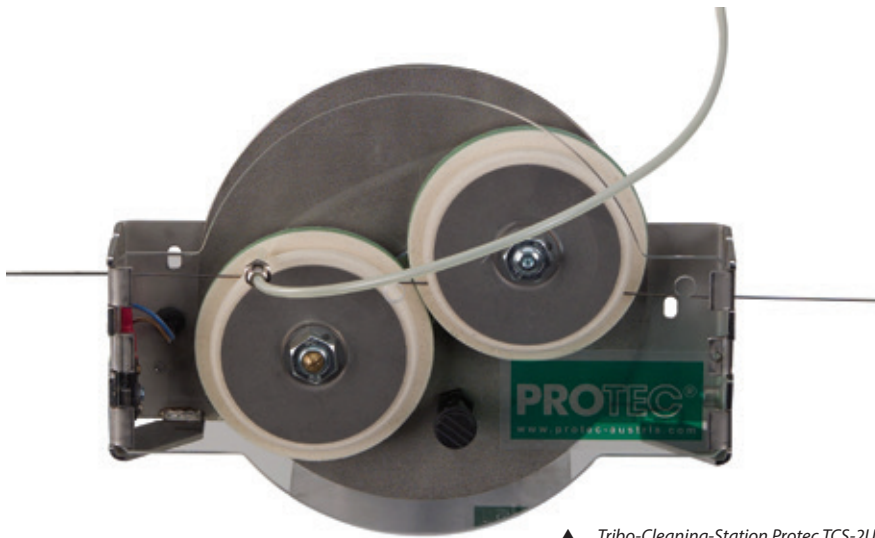
Plasmait GmbH – Austria
Website: www.plasmait.com

Wires for the spring industry

To service the spring industry in Switzerland and Austria, Hempel Wire Ltd has a range of EN10270-3 (1.4310) wires, 0.8 to 6mm, available for call off from stock in Dübendorf, Switzerland. The company has also established itself as a strategic partner for special grades such as 17/7Ph, X750, Duplex and Super Duplex, and with a production range of 0.8 to 18mm can satisfy most demands. As members of IST and UKSMA it can also assist with any technical queries.

Hempel Wire Ltd, the specialist wire producer within the Hempel Special Metals Group, has moved production of profile wire in stainless and nickel-based alloys to a purpose built manufacturing facility in Rotherham, UK. Round and profiled wire production is now based at the same site.

Hempel Special Metals AG – Switzerland
Website: www.hempel-metals.com



▲ Tribo-Cleaning-Station Protec TCS-2U

Wire lubrication system

Protec has developed a system for fine cleaning and coating of welding wire: Protec WLS (wire lubrication system). The system removes drawing oil residues and coats the wire with a fine layer.

The needs of feeding behaviour, ignition behaviour and consistent performance for welding wire increased dramatically with growing automation of welding processes and higher productivity goals.

Protec developed a system in cooperation with wire manufacturers and end-users. The core of this solution is the special "Wire-Balm" fluid, which is applied either

at the wire factory or by end-users directly at the welding station.

Benefits in the welding process include stable arc with excellent ignition; optimum feeding and high process stability; reduced spatter; reduced hydrogen entry; and higher lifetime of wear parts (liner and tip).

For end-users Protec offers the fluid Wire-Balm Protec WLS04. This fluid can simply be applied by felt pads and clips, so a "tandem method" is used: a pad soaked with Wire-Balm is followed by a dry pad to wipe off over-dose and dirt.

At the wire factory, the application can

be automated easily by using the Tribo-Cleaning-Station Protec TCS-2U. The application at factory level leads to the additional benefit of protection for the wire surface (corrosion protection).

Protec offers two fluid product lines for wire manufacturers: Dry-Balm Protec WLS03 (dry, waxy coating, with special corrosion protection); and Wire-Balm Protec WLS04 (oily coating, with additional cleaning effect).

As an example of how companies can benefit from WLS, Protec states that at German automotive OEM's factories the uptime of welding robots was increased significantly by the use of Protec WLS. Other examples of use are a crane manufacturer using high-strength steel, exhaust system plants using heat resisting steel, and companies running orbital welding processes for building pipelines or wind power plants.

Protec, based in Salzburg, Austria, specialises in optimising welding processes through bio-chemical additives. The product range contains two fields: anti-spatter surface protection and wire fine-cleaning and coating. Due to product development in partnership with users, Protec solutions are focused on concrete benefits and proven in use from the beginning. Protec has been in the market for more than 15 years, selling solutions to more than 40 countries worldwide.

Protec – Austria
Website: www.protec-austria.com

Wire drawing die expertise

Eder Engineering GmbH supplies die-tool processing equipment and dies to the international wire and cable industry, and exports 98 per cent of its output worldwide.

The company is a technological leader and global player in the wire drawing die tool and particularly in the drawing die machine technology sector (hardware and software). The company states that its machines benefit the customer by longer life for the die, and higher tonnage drawn; accurate reconditioning of the die; durability with minimal maintenance costs; lower operational costs (less consumption of power and consumables due to high efficiency); reduction of manpower (high degree of automation built-in); easy operation; and the experience and proven after-sales support of Eder.

Eder's product range consists of approximately 80 per cent machines, 10 per cent wire drawing die tools and 10 per cent software (technical assistance).

These products are supplied to the wire and cable industry in over 80 countries and the latest technological developments are regularly presented at all international wire trade fairs and technical symposiums in Europe, North America and Asia.



▲ Identification of an EDDS-2 marked die-tool

Recently Eder has also developed the EDDS-2, which provides fully automatic dot-peening marking of costly die-tools by means of a durable tungsten carbide marking pin, producing an individual DataMatrix code within seconds.

Eder Engineering GmbH – Austria
Website: www.eder-eng.com



Photo: bigstockphoto.com – 'Entrance to the famous subway station Stadtpark in Vienna, Austria' by Vladimir Mucibabic

Welded wire mesh plants

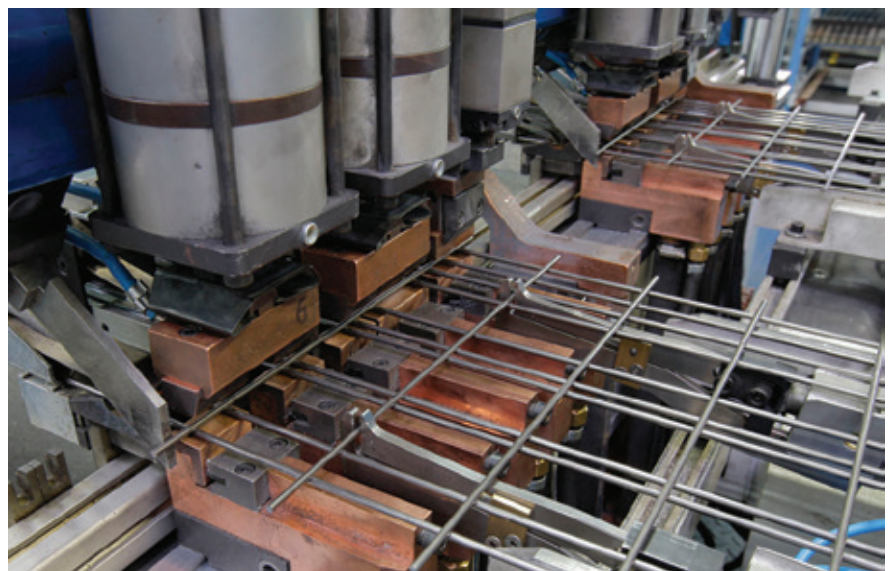
For almost a century, Schlatter has been supplying production plants to a worldwide clientele. From the beginning, resistance welding was the core technology.

Schlatter's product portfolio is mainly focused on production plants for welded wire mesh as well as on welding systems for joining profiles such as railway rails.

The plants for welded wire mesh follow modular design principles and may be easily optimised for a particular working range. Schlatter delivers mesh welding plants for the filigree bird cage as well as for heavy reinforcement meshes.

The company states that its welding plants are known for short change over times, high productivity and price recoverability. The company's rail welding systems joint railway rails with flash butt welding technology in a reproducible high quality. Mobile and stationary systems are in operation worldwide.

With the Jäger brand, Schlatter Germany



▲ Resistance welding is a core technology for Schlatter

is a leading producer of weaving and finishing machines for PMC fabric (paper machine clothing).

Jäger weaving machines produce this multi-layer high-tech fabric for top speed paper machines. The Jäger product portfolio covers wire weaving machines and wire crimping machines for versatile applications.

Schlatter designs innovative products and turnkey plants with high customer benefits.

The group operates a worldwide sales and service organisation to ensure customer support for the whole lifecycle of a Schlatter product.

Schlatter Industries AG – Switzerland
Website: www.schlattergroup.com

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Test methods for cables incorporating reduced bend radius fibres

By Wayne Kachmar, ADC Telecommunications, USA

Abstract

This article will attempt to compare mechanical performance parameters of waveguide cables with optical performance of both conventional fibres and reduced bend radius fibres. The coordination of mechanical and optical test data can point to more appropriate test criteria for cables with reduced bend radius fibres. This will ensure a more robust characterisation criterion appropriate to this new class of fibre.

Introduction

The advent of both single mode and multi-mode bend insensitive fibres has brought into question whether existing cable test plans accurately characterise a cable design to provide expected lifetimes. Presently, most published test plans rely on delta attenuation values at discrete wavelengths as pass/fail criteria for various mechanical criteria. With the introduction and use of new reduced bend radius fibre types, less robust cable designs can now pass such standardised cable tests. This result can lead to possible substandard cable designs that can generate future failures in the field. Long-term stresses may be placed on the optical waveguides and not be reflected in the delta attenuation measurement protocols currently prescribed by standardised tests such as Telcordia GR-409 and GR20.

Fibre improvements

Telcordia GR-409 is the current standard of specifications for indoor fibre cables, while Telcordia GR-20 provides technical reference for outdoor cables. Some companies, such as Verizon, have more sophisticated versions that reference GR-20 and GR-409, but also add additional qualifications. Together, this specification documentation dictates the mechanical performance standards agreed upon by

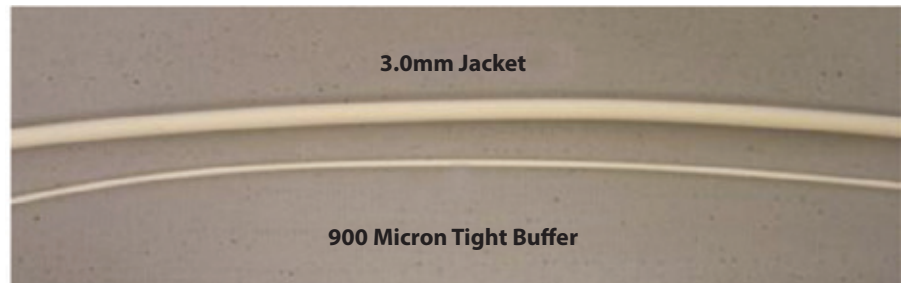
the customer and manufacturer. More recently, however, fibre improvements, particularly in reduced bend radius fibres, are challenging the industry to revisit the test standards for fibre. With the increased performance features of reduced bend radius fibres versus conventional fibres, existing standards may no longer be a "one size fits all" measurement.

Several optical fibre manufacturers developed conventional optical fibres in the 1970s. Over the years, there have been few significant improvements outside of coating developments to improve

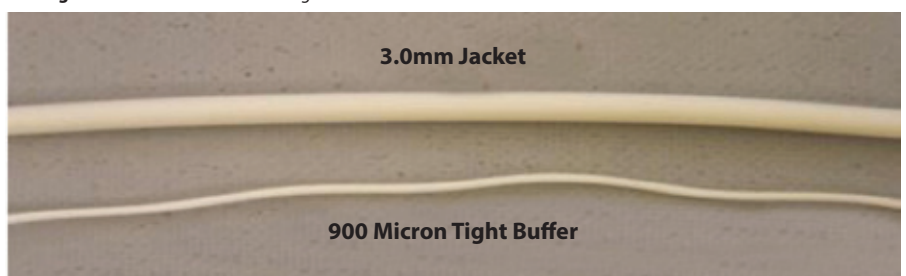
the fibre's inherent ability to withstand mechanical forces on its environment. But aside from innovations during the draw process, improving the overall empirical tensile properties of optical waveguides, improvements to optical fibre designs have been relatively minor until about five years ago. At that time, several concepts emerged to improve on other fibre characteristics, such as physical strength and bending characteristics. This was the introduction of reduced bend radius fibres.

Reduced bend radius fibres include several viable technologies.

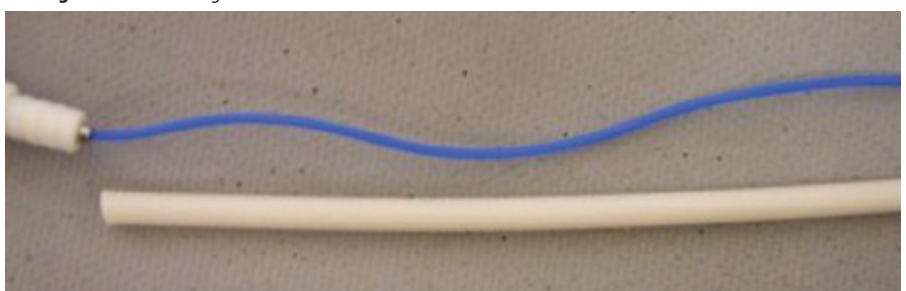
▼ **Figure 1:** Fibre with <1% shrinkage



▼ **Figure 2:** Fibre with >4.5% shrinkage



▼ **Figure 3:** <5% shrinkage cable connector interface



They include 'trench-assisted' varieties, 'voids-assisted' fibre, photonic-crystal or 'holey fibres,' and several other types and technology combinations. When compared with conventional fibre, each of these new innovations has improved the characteristics and mechanical performance of today's optical fibre.

However, during the same time frame, the existing test regimes have remained basically unchanged, continuing to rely on attenuation change based on physical, mechanical and environmental testing. Attenuation continues to be the preferred methodology for determining a fibre's performance. However, testing reduced bend radius fibres using the same methods for conventional single mode and multi-mode fibre does not take into consideration the unique properties of these new fibres. With that in mind, let's look at how attenuation is induced in conventional fibres and reduced bend radius fibres.

Macrobends and Microbends

So what exactly changed with the introduction of reduced bend radius fibres? The most obvious improvement was the fibre's ability to bend more tightly, that is, its bend sensitivity was reduced. These fibres can be bent to a 10, 7.5 or even 5mm radius with no noticeable increase in attenuation or damage to the glass in a long-term environment. Resistance to macrobend and microbend loss was also significantly increased. In fibre optic transmissions, a macrobend refers to a large visible bend in the optical

▼ **Figure 4:** FOTP-33 long gauge tensile test fixture



fibre that can cause extrinsic attenuation, a reduction of optical power in the glass. Microbends are defined as nearly invisible imperfections in the optical fibre, usually created during the manufacturing process. These tiny imperfections can also cause a reduction in optical power, or increased attenuation. However, microbends may also occur from the stress compression of the plastics placed on the glass due to polymer shrinkage on the fibre.

In conventional fibre, attenuation increases indicate when a microbend has occurred in the fibre. However, in a reduced bend radius fibre, attenuation changes are typically minimal and the same microbend may not be discovered until an extreme failure in the performance of the cable. Therefore, the failure is going to occur over time as the cable is handled, installed or ages. Modern aging techniques used for testing, such as extreme heat exposure, may not exhibit a failure on today's new reduced bend radius fibres.

Insufficient test methods

The existing test methods for conventional optical fibre are based on mechanical testing and attenuation changes, but they do not specify the cable design being tested. Therefore, if a reduced bend radius fibre is undergoing the same tests, its minimal sensitivity to microbending may allow it to pass the test while a microbend could still cause the fibre to stress over time. That means some cable designs could still be created with inherent failures in design, yet they could pass existing testing standards based solely on what is contained in GR-409 for tight-buffered fibres.

In loose-tube outdoor fibre cables, covered by the GR-20 standard, there are a number of tests that may determine whether the fibres are under some stress or strain. Currently, the only requirement for strain testing is contained in TIA-455-33B section FOTP-33a. This covers tensile testing for these cables using a component for measuring fibre strain.

The question becomes whether less than five per cent shrinkage, as stated in this specification, is still an acceptable standard or benchmark. It could be too broad a measurement based on the fact that new bend insensitive fibres will not show the same sensitivity. If any flaw or defect in the fibre could possibly be missed by current testing standards, yet could have a significant impact in deployed fibres over time, then new criteria such as fibre strain



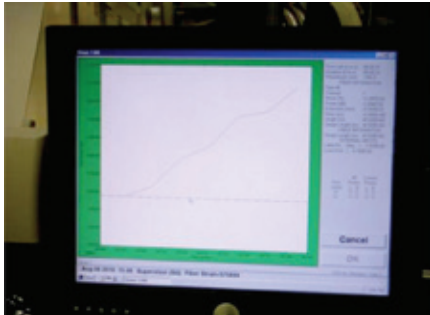
▲ **Figure 5:** Optical fibre strain gauge measurement system

should be added to current test methods, specifications and standards.

What might work in bulk cable may not work in cable connector interfaces, and what may pass testing today might not work over the expected life of the fibre. The existing aging cycle was developed using high temperature only to detect changes in the jacket and buffering compounds, such as hardening, cracking or shrinkage over the aging process. Today, it may be wise to consider whether those compounds will fail or not when testing is based on different parameters. One such area is thermal coefficient of linear expansion. This is the rate of expansion and contraction of a material over a given temperature profile. The rate of polymer change is typically an order of magnitude compared to glass.

For example, if continuous shrinkage occurs beyond the normal shrinkage tests and is identified by increased attenuation, how do you detect it in reduced bend radius fibres where no or minimal increased attenuation is detected? The answer is that you would not – until perhaps the fibre reaches a pivot point where it is no longer a viable long-term communications medium.

In the loose-tube cable environment, the opposite can potentially occur. That is, there could be too much excess fibre length and the fibre would bunch up – not due to shrinkage, but because an attenuation increase was not detected in the reduced bend radius fibre. The individual tube is not tested for shrinkage separately but may be coiled for several metres in a transition housing and not have the design of the overall cable to control shrinkage in the individual loose tube. The bottom line is that since attenuation resistance is increased in reduced bend radius fibres, microbends and other stresses on the fibre may not be detectable with today's testing



▲ **Figure 6:** Fibre strain vs tensile loading

standards for conventional fibre. These existing standards should be carefully reviewed and appropriate criteria added to specifically include the unique characteristics of reduced bend radius fibres.

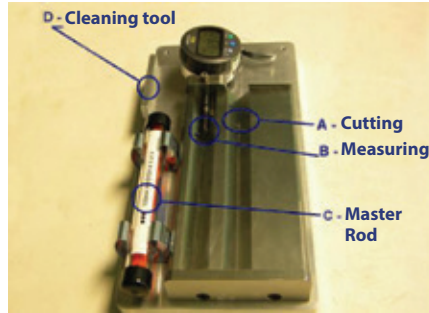
New testing considerations

There is a need for the addition of several new test criteria to GR-409 and GR-20 in light of the unique characteristics of reduced bend radius fibre types. For example, a means of measuring fibre strain should be added to existing test criteria. Strain or stress should be measurable on both indoor and outdoor fibre cables during tensile FOTP-33b, aging and other mechanical testing processes where this type of testing is not currently conducted.

This may be difficult without introducing a new family of qualification tests for fibre strain, but the new reduced bend radius fibres demand it.

A second consideration for changing testing methods may be to measure delta excess fibre length, in loose tube type cables, before and after ageing, and also in individual tubes. For instance, attenuation and excess length could be measured before ageing and temperature cycling processes, and then again following these processes. They would then be compared to established pass/fail criteria. Current specifications do not require this type of testing, nor do they require testing in a loose configuration. All testing is currently done on spools or coils. In a loose-tube configuration in a coil, you can have a great deal more excess length and relaxed length than in a straight line. Attenuation increases would be less evident without the ability to measure excess length as a mechanical test.

It is worth noting that new measurements should include the very long wavelength of 1,625nm. These new measurements would propose additional qualifications for that wavelength where the microbend edge moves in as the fibre is strained.



▲ **Figure 7:** High precision shrinkage gauge

Although this is a requirement of some customers in their own standards, it is not part of the existing generic fibre standards. Cable shrinkage testing needs to move to a higher level of repeatability and gauges for this purpose have been designed. The range of testing and the effect of fibre extrusion from the cable core need to be determined as well. This is only a secondary effect of GR 326 the test standard for cable connectors and cable assemblies.

Conclusions

The introduction of reduced bend radius fibres, and their emerging popularity in fibre-to-the-premise (FTTP) architectures, is cause for concern when it comes to the current GR-409, GR-20, GR 326 and other specification standards written for conventional fibres. New tests should be proposed to accurately define their unique characteristics to better ensure long-term reliability.

A cable design that takes advantage of the tighter bend radius fibre would most certainly show much higher attenuation using conventional single mode fibre. In other words, a reduced bend radius fibre would survive very well in an environment where conventional fibre would not.

The cable to connector interface may create new aging models where cable shrinkage can lead to unacceptable fibre bend radii at the cable/connector interface. The results of which will only show up after loose cable assemblies are aged and then moved. This alone indicates the need for a set of revised test standards and requirements for reduced bend radius types of fibre.

Cable designs tested to GR 409 or GR 20 are requirements for GR 326 testing. The need exists to use fibre strain and cable shrinkage as well as fibre extrusion from cables after aging as a more complete precursor to GR326 testing.

Also with increased environmental operating ranges of cables becoming the norm, thermal co-efficient of linear

expansion values need to be incorporated into specification performance precursor requirements.

This article proposes to update existing standards, particularly the GR-409 specifications for required tolerance for shrinkage and fibre strain. Otherwise, it is possible for sub-par cable designs to pass existing standards as they are written and be deployed in the field.

It should be recognised that conventional fibre and reduced bend radius fibre exhibit different properties and characteristics, and test criteria should be written to address the requirements of both.

Therefore, the proposal is to consider adding more focused test criteria to existing standards specifications. This in effect creating a new class of GGR-409 and GGR-20 qualifications specifically identifying the fibres used and qualified in any specific cable designs.

Re-purposing the current standards with new reduced bend radius fibres in mind will enable service providers to take full advantage of the unique characteristics these fibres bring to the table, particularly in today's FTTP deployments. ■

Acknowledgments

The author would like to acknowledge the help of Wagner Aguiar, Ken Nardone, Henry Rice, and Bill Jacobsen in obtaining data and test information for this paper.

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Drahtschneiden – ein neues Zeitalter beginnt

VERGESSEN Sie das Durchschneiden des Bands, denn der Schnitt des Kupferdrahts war das wesentliche Thema als SAMP Shanghai eine offizielle Eröffnungsfeier für seine neue Anlage in Malu Town veranstaltete.

Die neue Anlage - ausgelegt für die Herstellung von Maschinen und Ausrüstungen für die Draht- und Kabelindustrie - erstreckt sich auf einer Fläche von 4.500m². Somit wird die Präsenz von SAMP in der Region mit der neuen Produktionseinheit nach dem Stand der Technik verdoppelt.

Die Zeremonie des Durchschneidens des Bands wurde auf unkonventionelle Weise durchgeführt – mit Honoratioren, die die Eröffnung des Gebäudes durch den Schnitt eines Kupferdrahts bekanntgaben - das Endprodukt der im Werk von Shanghai hergestellten Maschinen.

Mehrere hundert Gäste aus 20 verschiedenen Ländern nahmen an der Abendfeier teil, einschließlich Wang Chun, Bürgermeister von Malu Town, Vincenzo De Luca, Generalkonsul von Italien in Shanghai, Dominique Perroud, Geschäftsführer von SAMP Shanghai und Antonio Maccaferri, Präsident der SAMP Group, der auch zur Feier des Tages eine Rede hielt. Die Erläuterungen von Perroud heben den Schwerpunkt der SAMP Group hinsichtlich des chinesischen Markts und des Markts der Vereinigung südostasiatischer Staaten hervor: „In den letzten Jahren hat SAMP eine außerordentliche Entwicklungszeit



▲ Honoratioren eröffnen die neue SAMP-Anlage

in China erlebt, dank des anhaltenden Vertrauens unserer Kunden und der harten Arbeit unserer Angestellten, deren Engagement und Fachkenntnis.“

“Heute führt eine große und absolut fortschrittliche Produktionsanlage in eine neue Zuwachsstufe. Unser Ziel ist es, den Kunden das zu geben was sie am meisten benötigen und schätzen, in kostengünstiger und nachhaltiger Weise. Diese neue flexible Anlage wird

es uns ermöglichen, unsere aggressiven Wachstumspläne auf dem asiatischen Markt umzusetzen.“

Nach der Zeremonie, nahmen alle Gäste an einem Galadinner im Marriott Hotel in Jiading teil, wo durch traditionelle chinesische Musikshows mit Tänzen ein stimmungsvoller Abend stattfand.

Sampsistemi Spa – Italien

Website: www.sampsistemi.com

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- Preiswerte Werkzeuge und komplette Qualitätskontrolle jedes Walzverfahrens. Die Werkzeuge werden in wenigen Minuten ersetzt.

Beide Stationen verfügen über einen Mechanismus des gesteuerten Starts des Gewindewalzens, hydraulischen Klemmens, Mechanismus ohne Kegeligkeit für parallele Gewinde und mikrometrische Gewindedruckschrauben sowie einen WS-Drehzahlsteller, automatische Luftabschaltung und zwei Bedienerpulte.

Videx Machine Engineering Ltd – Israel

Website: www.videx.co.il

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Dieser Standort schließt neue Fertigungsanlagen für die Produktion von neuen Rotationsmaschinen sowie ein Bestand von Gebrauchtgeräten ein. Mit einer Gesamtfläche von 5.000m² und auch mit neuen Büros, wird das Unternehmen eine noch höhere Fertigungskapazität hochwertiger Maschinen erzielen können.

Stark involviert in Untersee-, Versorgungs- und Offshore-

Rotationskabelmaschinen sowohl für Starkstromkabel wie Stahlseile, stellt das Unternehmen immer noch seine Standardauswahl von Verseilmaschinen her, wie z. B. steife Verseilmaschine, Rohrverseilmaschine, Bügelschlagverseilmaschine, Korbverseilmaschine, Trommelverseilmaschine, Bogenverseilmaschine, Doppelschlagbündler.

Flymca & Flyro – Spanien
Website: www.flymca.com

Uhing stellt eine Flanschabtastung der nächsten Generation für Rollringgetriebe vor

IM Jahre 2004 hat Uhing seiner Produktauswahl eine berührungslose Flanschabtastung FA für Rollringgetriebe hinzugefügt.

Die preisgünstige Lösung, die automatisch die Umschaltpunkte der Getriebe der Rollringverlegungen korrigiert, unterstützt die Mitarbeiter in Produktionsfirmen manueller Justierungsarbeiten und senkt demzufolge Zeiterfordernisse und Kosten.

Uhing hat nun die zweite Generation dieses Produktes auf den Markt gebracht – ausgestattet mit einer neuen Sensortechnik und weit gefächerten Funktionsauswahl.

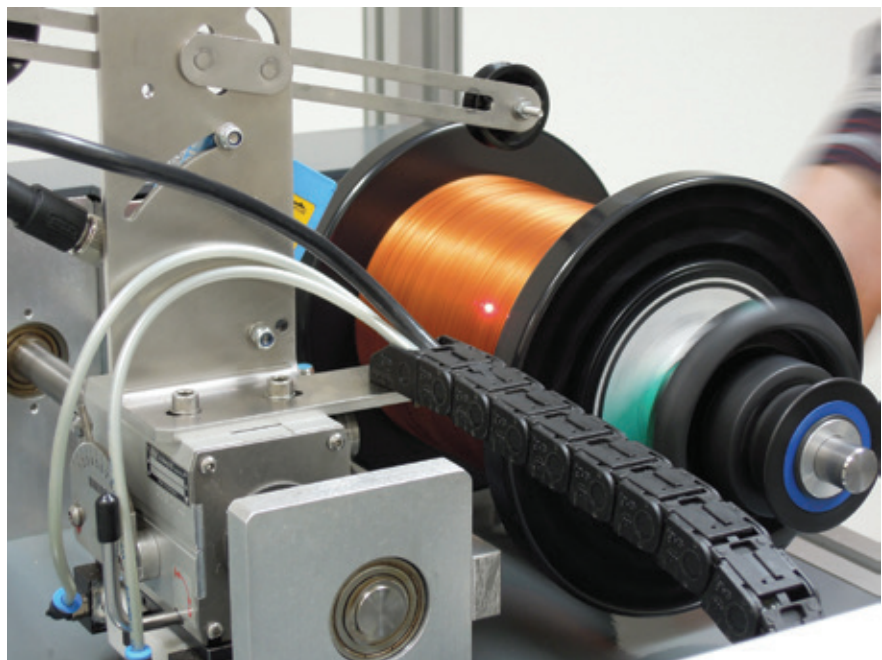
Oft sitzt eine neue Spule nicht an exakt der Position der vorherigen, obwohl sie gleich breit ist, oder die Spule hat umfangreiche Breitentoleranzen.

Die berührungslose Flanschabtastung FA korrigiert automatisch den Umschaltpunkt der Verlegung.

Diese Funktion macht schnell aus der FA eine unentbehrliche Vorrichtung für Unternehmen, deren Produkte zu wickeln sind, insbesondere für den Betrieb rund um die Draht- oder Kabelproduktion.

Eine neue Eigenschaft liegt in der Fähigkeit des Produkts automatisch die Breite der Spulen und auch die Art des Flanschs zu erkennen - gerade ausgerichtet oder anders als 90 Grad.

Die Flanschabtastung passt sich der



▲ System der zweiten Generation von Uhing

neuen Position und Breite an, wenn eine Spule nach dem Spulenwechsel mit einer ungleichen Breite genutzt wird.

Die wichtigste Neuheit der FA II ist die Laser-Sensorik. Sie ersetzt die bisher genutzte Lichtschranken-Abtastung. Der Sensor zur Flanschabtastung wird auf der Verlegung montiert.

In einem definierten Bereich erfasst er den Abstand zwischen der Oberfläche des Spulenkerns und der maximal erlaubten, in der Systemsoftware hinterlegten Höhe und speichert diesen Wert als Referenzabstand für jede neue Lage.

Während des Wickelns misst die Flanschabtastung laufend den entsprechenden Abstand und vergleicht ihn mit dem Referenzabstand.

Wird die zulässige, ebenfalls im System eingestellte Höhenabweichung überschritten, so wird der Umschaltvorgang ausgelöst. Auf einem Display wird die gemessene Höhe oder die zulässige Höhenabweichung visualisiert.

Joachim Uhing KG GmbH & Co – Deutschland
Website: www.uhing.com

Prüfmethoden für Kabel, die Fasern mit reduziertem Biegeradius enthalten

Von Wayne Kachmar, ADC Telecommunications, USA

Übersicht

Diese Studie wird versuchen die mechanischen Leistungsparameter von Wellenleiterkabeln mit der optischen Leistung herkömmlicher Fasern sowie Fasern mit reduziertem Biegeradius, zu vergleichen.

Die Koordination mechanischer und optischer Prüfdaten kann auf passende Prüfkriterien für Kabel mit Fasern mit reduziertem Biegeradius hinweisen. Das wird robustere Bezeichnungskriterien sichern, die sich für diese neue Klasse von Fasern eignen.

Einleitung

Das Aufkommen biegeunempfindlicher Monomode- sowie Multimodefasern wird hinterfragt, ob die bestehenden Kabelprüfpläne ein Kabelaufbau genau bezeichnen um die erwartete Lebensdauer sicherzustellen.

Derzeit verlassen sich die meisten veröffentlichten Prüfpläne auf Delta-Dämpfungswerte bei diskreten Wellenlängen als Kriterium ob die Prüfung für verschiedene mechanische Kriterien bestanden oder nicht bestanden wurde. Mit der Einführung und dem Einsatz neuer Typen von Fasern mit reduziertem Biegeradius, können nun weniger robuste Kabelaufbauten diese standardisierten Kabelprüfungen bestehen.

Dieses Ergebnis kann zu möglichen unzulänglichen Kabelaufbauten führen, die im Feld zukünftige Störungen erzeugen könnten. Langfristige Belastungen könnten an den optischen Wellenleitern angesetzt werden und sich nicht in den Delta-Dämpfungsmessprotokollen reflektieren, die derzeit durch standardisierte Prüfungen wie z. B. nach Telcordia GR-409 und GR-20, vorgeschrieben werden.

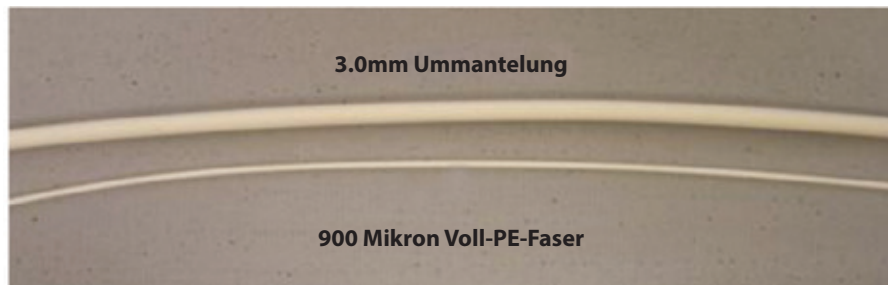
Faserverbesserungen

Telcordia GR-409 ist der derzeitige Standard der Spezifikationen für Innenraum-Faserkabel, während Telcordia GR-20 einen technischen Bezug für Außenkabel bietet. Einige Unternehmen, wie z. B. Verizon, besitzen hochentwickeltere Versionen, die sich auf GR-20 und GR-409 beziehen, aber auch zusätzliche Qualifikationen hinzufügen. Gemeinsam schreibt diese Spezifikationsdokumentation die mechanischen Leistungsnormen vor, die

zwischen dem Kunden und dem Hersteller vereinbart werden. In letzterer Zeit stellen jedoch die Faserverbesserungen, insbesondere Fasern mit reduziertem Biegeradius betreffend, eine Herausforderung für die Industrie dar, um die Teststandards für Fasern zu überdenken.

Mit gesteigerten Leistungsmerkmalen der Fasern mit reduziertem Biegeradius im Vergleich zu herkömmlichen Fasern, könnte es sein, dass die bestehenden Normen nicht mehr als eine Messung „one size fits all“ (Universalgröße) gelten.

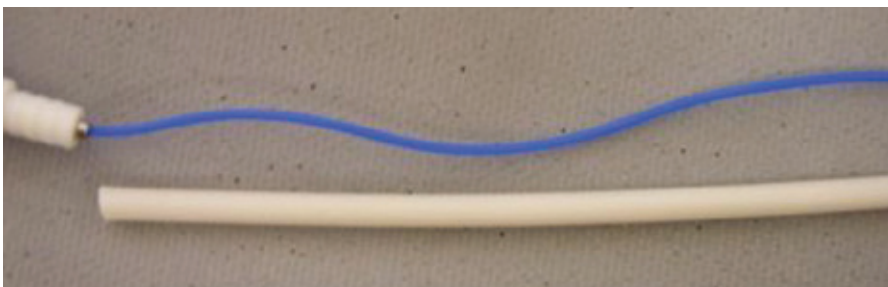
▼ Bild 1: Faser mit <1% Schrumpfung



▼ Bild 2: Faser mit >4,5% Schrumpfung



▼ Bild 3: Kabel-Steckerschnittstelle mit <5% Schrumpfung



Mehrere Hersteller von Lichtwellenleiter haben herkömmliche Lichtwellenleiter in den 70er Jahre entwickelt. Im Laufe der Jahre gab es nur wenige wichtige Verbesserungen außerhalb der Beschichtungsentwicklungen zur Steigerung der inhärenten Fähigkeit der Fasern, um den mechanischen Kräften in deren Umgebung zu widerstehen.

Aber neben den Innovationen während des Ziehverfahrens, die die gesamten empirischen Eigenschaften der Zugfestigkeit der optischen Wellenleiter steigern, waren die Verbesserungen gegenüber der Lichtwellenleiteraufbauten bis auf die ca. letzten fünf Jahre, relativ gering. Zu jener Zeit wurden verschiedene Konzepte entwickelt, um weitere Fasereigenschaften zu verbessern, wie z. B. Widerstandsfähigkeit und Biegemerkmale. Das war die Einführung der Fasern mit reduziertem Biegeradius.

Fasern mit reduziertem Biegeradius umfassen verschiedene durchführbare Techniken. Darunter die "trench-assisted" Auswahl, "voids-assisted" Faser, photonische Kristallfaser oder "holey fibres" und verschiedene andere Typen- sowie Technologiekombinationen. Im Vergleich zur herkömmlichen Faser, hat jede dieser neuen Innovationen die Eigenschaften und die mechanische Leistung der heutigen Lichtwellenleiter verbessert.

Jedoch blieben während desselben Zeitraums die bestehenden Testverläufe grundsätzlich unverändert und hingen weiterhin vom Dämpfungswechsel ab, basierend auf physikalische, mechanische und Umgebungsprüfungen. Die Dämpfung ist weiterhin die bevorzugte Methodik zur Bestimmung der Leistung

▼ **Bild 4:** FOTP-33 Zugprüfungsrichtungen für Längsmesser



einer Faser. Die Prüfung von Fasern mit reduziertem Biegeradius mit Einsatz derselben Methoden für herkömmliche Monomoden- und Multimodenfasern berücksichtigt aber nicht die einzigartigen Eigenschaften dieser neuen Fasern. Mit dieser Vorstellung werfen wir einen Blick auf die Weise in der die Dämpfung in herkömmlichen Fasern und in Fasern mit reduziertem Biegeradius induziert wird.

Makro- und Mikrobiegungen

Was veränderte sich also mit der Einführung von Fasern mit reduziertem Biegeradius? Die offensichtlichste Verbesserung lag in der Fähigkeit die Fasern fester zu biegen, d. h. dass ihre Krümmungsempfindlichkeit reduziert wurde.

Diese Fasern können bis zu einem Radius von 10, 7,5 oder sogar 5mm gebogen werden, ohne beträchtliche Erhöhung der Dämpfung oder Beschädigung des Glases in einer langfristigen Umgebung. Der Widerstand gegen den Verlust von Makro- und Mikrobiegungen wurde ebenfalls wesentlich erhöht.

Bei den Lichtwellenleiterübertragungen bezieht sich eine Mikrobiegung auf eine sehr breite sichtbare Biegung im Lichtwellenleiter, die eine extrinsische Dämpfung, bzw. eine Reduzierung der optischen Leistung im Glas, verursachen kann. Mikrobiegungen werden als fast nicht sichtbare Mängel in Bereich Lichtwellenleiter bezeichnet, die in der Regel während des Herstellungsverfahrens erzeugt werden. Diese winzigen Mängel können auch zu einer Reduzierung der optischen Leistung oder zu einer erhöhten Dämpfung führen. Mikrobiegungen können aber auch durch die Druckspannung der Kunststoffe auftreten, die wegen der Polymerschrumpfung der Faser am Glas eingesetzt werden.

Bei einer herkömmlichen Faser, zeigt die Dämpfungserhöhung an wann eine Mikrobiegung in der Faser eingetreten ist. In einer Faser mit reduziertem Biegeradius sind die Dämpfungswechsel jedoch in der Regel gering und dieselbe Mikrobiegung könnte bis zu einem extremen Ausfall der Kabelleistung nicht entdeckt werden.

Demzufolge wird der Ausfall im Laufe der Zeit eintreten, während das Kabel behandelt oder installiert wird bzw. altert. Bei den modernen für die Prüfung eingesetzten Alterungstechniken, wie z. B. extreme Wärmeexposition, könnte sich ergeben, dass ein Ausfall bei den heutigen Fasern mit reduziertem Biegeradius nicht nachgewiesen wird.



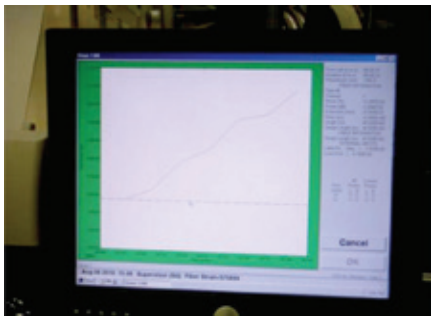
▲ **Bild 5:** Messsystem mit Lichtwellenleiter-Dehnungslehre

Unzureichende Prüfmethode

Die bestehenden Prüfmethode für herkömmliche Lichtwellenleiter basieren auf mechanischen Prüfungen und Dämpfungswechseln, aber sie spezifizieren nicht den getesteten Kabelaufbau. Wenn demzufolge eine Faser mit reduziertem Biegeradius denselben Prüfungen unterzogen wird, könnte deren minimale Empfindlichkeit gegenüber der Mikrobiegung dazu führen, dass diese Faser die Prüfung besteht während eine Mikrobiegung immer noch verursachen könnte, dass die Faser im Lauf der Zeit beansprucht wird. Das bedeutet, dass einige Kabelaufbauten immer noch mit inhärenten Projektausfällen hergestellt werden könnten und dabei sogar vorhandene Teststandards bestehen könnten, lediglich basierend auf das was nach GR-409 für Voll-PE-Faser enthalten ist.

Bei Hohlader-Außenlichtwellenleiter, abgedeckt durch den GR-20 Standard, sind eine Menge Prüfungen vorgesehen, die bestimmen könnten, ob sich die Faser unter den Belastungen und Dehnungen befinden. Derzeit ist die einzige Anforderung für die Dehnungsprüfung in TIA-455-33B Abschnitt FOTP-33a eingeschlossen. Das schließt Zugprüfung für diese Kabel ein, mit Einsatz eines Elements zur Messung der Faserdehnung.

Die Frage ist ob weniger als fünf Prozent Schrumpfung, wie in der vorliegenden Spezifikation beschrieben, immer noch ein annehmbarer Standard oder Bezugswert ist. Es könnte ein zu breiter Messwert sein, basierend darauf, dass neue biegeunempfindliche Fasern nicht dieselbe Empfindlichkeit aufweisen werden. Wenn jeder Mangel oder Fehler in der Faser möglicherweise bei den laufenden Teststandards verfehlt werden



▲ Bild 6: Faserdehnung gegen Zugbelastung

könnte, so könnte dies mit der Zeit einen wesentlichen Einfluss auf die verlegten Fasern haben, in diesem Fall sollten neuen Kriterien, wie z. B. die Faserdehnung bei den aktuellen Testmethoden, -spezifikationen und -standards hinzugefügt werden.

Das was bei Kabelmeterware funktionieren könnte, könnte sich dann für Kabelstecker-Schnittstellen nicht eignen, und das was heute die Prüfungen bestehen könnte, könnte dann morgen für die erwartete Lebensdauer der Faser nicht funktionieren.

Der bestehende Alterungszyklus wurde mit Einsatz hoher Temperaturen entwickelt nur um die Änderungen an den Ummantelungs- und Umhüllungs-Compounds zu erkennen, wie z. B. Verfestigung, Risse oder Schrumpfung über das Alterungsverfahren. Heute könnte es klug sein zu berücksichtigen, ob diese Compounds die Prüfungen, wenn diese auf andere Parameter basieren, bestehen oder nicht bestehen werden. Einer dieser Parameter ist der Wärmeausdehnungskoeffizient der linearen Ausdehnung. Das ist die Rate der Ausdehnung und Schrumpfung eines Materials innerhalb eines bestimmten Temperaturprofils. Die Rate der Polymerveränderung ist in der Regel eine Größenanordnung im Vergleich zu Glas.

Wenn sich z. B. eine kontinuierliche Schrumpfung über die normalen Schrumpfungsprüfungen ergibt und durch eine erhöhte Dämpfung identifiziert wird, wie kann dies bei Fasern mit reduziertem Biegeradius erkannt werden, wo keine oder nur eine minimal erhöhte Dämpfung erfasst wird? Die Antwort ist, dass dies nicht erkannt werden wird – bis vielleicht die Faser ein Wendepunkt erreicht, wo sie nicht mehr ein funktionsfähiges langfristiges Kommunikationsmedium ist.

Beim Hohladerkabel kann potentiell das Gegenteil entstehen. Das bedeutet, dass sich eine übermäßige Faserüberlänge ergibt und die Fasern Haufen bilden könnten – nicht wegen der Schrumpfung, sondern weil eine Dämpfungserhöhung nicht in der Faser mit reduziertem Biegeradius erfasst wurde.



▲ Bild 7: Schrumpfungsmessgerät mit hoher Präzision

Das einzelne Rohr wird nicht gesondert hinsichtlich der Schrumpfung geprüft, sondern könnte für verschiedene Meter in einen Übergangshohler aufgewickelt werden und nicht über den Aufbau des gesamten Kabels verfügen, um die Schrumpfung in der einzelnen Hohlader zu prüfen, d.h. dass da die Dämpfungsbeständigkeit in den Fasern mit reduziertem Biegeradius erhöht wird, die Mikrobiegungen und andere Belastungen der Faser mit den heutigen Prüfstandards für herkömmliche Fasern nicht detektiert werden könnten.

Die bestehenden Standards sollten sorgfältig überprüft werden und geeignete Kriterien sollten hinzugefügt werden, um speziell die einzigartigen Eigenschaften der Fasern mit reduziertem Biegeradius einzuschließen.

Neue Betrachtungen bei der Prüfung

Es besteht der Bedarf GR-409 und GR-20 mit verschiedenen neuen Prüfkriterien zu ergänzen, angesichts der einzigartigen Eigenschaften der Fasertypen mit reduziertem Biegeradius. Ein Mittel zur Messung der Faserspannung sollte z.B. den bestehenden Prüfkriterien hinzugefügt werden.

Belastungen oder Dehnungen sollten bei Innen- sowie Außenfaserkabeln während der Ziehprüfung FOTP-33b, der Alterung und anderen mechanischen Prüfverfahren messbar sein, dort wo diese Art Prüfungen derzeit nicht durchgeführt werden. Das könnte sich zwar als schwierig erweisen ohne die Einführung einer neuen Reihe von Qualifikationstests für die Faserdehnung, jedoch wird es von den neuen Fasern mit reduziertem Biegeradius gefordert.

Weitere Bedenken bei der Änderung der Prüfmethoden könnten darin bestehen, die Delta-Faserüberlänge zu messen, in Kabeln des Typs Hohlader, vor und nach der Alterung sowie in einzelnen Rohren. Die Dämpfung und die Überlänge

könnten z. B. vor der Alterung und den Temperaturdurchlaufverfahren gemessen werden, und nochmals nach diesen Verfahren. Sie könnten dann mit den bewiesenen Kriterien bestanden/nicht bestanden verglichen werden. Von den gängigen Spezifikationen werden weder dieser Typ Prüfung noch die Prüfung in einer Hohlader-Konfiguration gefordert. Sämtliche Prüfungen werden derzeit an Spulen oder Ringen durchgeführt. Bei einer Hohlader-Konfiguration in einem Ring, könnte man eine große Menge Überlängen und entspannte Längen haben, im Vergleich zur einer geraden Linie. Die Dämpfungserhöhungen würden weniger offensichtlich sein ohne die Möglichkeit die Überlänge als mechanische Prüfung zu messen.

Es ist beachtenswert, dass neue Messungen, die sehr lange Wellenlänge von 1625nm enthalten sollten. Diese neuen Messungen würden zusätzliche Qualifikationen für diese Wellenlänge vorschlagen, wo die Kante der Mikrobiegung einzieht während die Faser gespannt wird. Obwohl dies eine Anforderung einiger Kunden-Standards ist, gehört es nicht zu den bestehenden allgemeinen Faserstandards. Die Prüfung der Kabelschrumpfung müsste auf eine höhere Ebene der Wiederholbarkeit versetzt werden und die für diesen Zweck vorgesehenen Messgeräte wurden ebenfalls entwickelt. Die Auswahl an Prüfungen und die Wirkung der Faserextrusion aus der Kabelseele müssen ebenfalls festgelegt werden. Das ist nur eine Begleiterscheinung nach GR 326, der Prüfstandard für Kabelstecker und Kabelsätze.

Schlussfolgerungen

Die Einführung von Fasern mit reduziertem Biegeradius, und deren zunehmendes Interesse an den Bauweisen Fibre-To-The-Premise (FTTP), ist Anlass zur Sorge was die aktuellen GR-409, GR-20, GR 326 und andere Spezifikationsstandards angeht, die für herkömmliche Fasern entwickelt wurden. Neue Prüfungen sollten vorgeschlagen werden, um deren einzigartige Eigenschaften sorgfältig zu bestimmen und somit eine langfristige Zuverlässigkeit besser sichern zu können.

Ein Kabelaufbau, der von der Faser mit engerem Biegeradius profitiert, würde ganz bestimmt eine viele höhere Dämpfung aufweisen mit Einsatz herkömmlicher Monomodfasern. Anders gesagt, eine Faser mit reduziertem Biegeradius würde in einer Umgebung sehr gut fortbestehen, wo hingegen herkömmliche Fasern nicht so erfolgreich sein würden. Die Schnittstelle zwischen Kabel und Stecker

könnte neue Alterungsmodelle schaffen, wo die Kabelschrumpfung zu nicht annehmbaren Faserbiegeradien bei der Kabel-/ Steckerschnittstelle führen kann. Die entsprechenden Ergebnisse werden nur zu sehen sein nachdem die Hohlader-Kabelsätze gealtert sind und dann verlegt werden.

Das zeigt schon alleine den Bedarf einer Reihe von überarbeiteten Prüfstandards sowie Anforderungen für Fasern des Typs mit reduziertem Biegeradius an.

Die nach GR 409 oder GR 20 geprüften Kabelaufbauten sind Anforderungen für die Prüfung nach GR 326. Der Bedarf besteht die Faserdehnung und die Kabelschrumpfung sowie die Faserextrusion der Kabel nach der Alterung zu benutzen, als weitaus kompletter Vorläufer der GR326-Prüfung.

Mit den zunehmenden Umgebungseinsatzbereichen der Kabel, die der Normalfall werden, ist es erforderlich den Wärmekoeffizient der linearen Ausdehnungswerte in den Vorläuferanforderungen der Spezifikationsleistung einzuschließen.

Diese Publikation schlägt vor, die vorhandenen Standards zu aktualisieren, insbesondere die GR-409-Spezifikationen für die geforderte Schrumpfungs- und Faserdehnungstoleranz.

Anderenfalls ist es möglich für unterdurchschnittliche Kabelaufbauten die vorhandenen Standards zu bestehen, so wie sie geschrieben sind und im Feld verlegt werden.

Es müsste anerkannt werden, dass herkömmliche Fasern und Fasern mit reduziertem Biegeradius unterschiedliche Eigenschaften und Merkmale vorzeigen, und das Prüfkriterium sollte erstellt werden um sich für die Anforderungen beider zu eignen.

Demzufolge liegt der Vorschlag darin zu überdenken, den bestehenden Standardspezifikationen fokussiertere Prüfkriterien hinzuzufügen.

Das schafft tatsächlich eine neue Klasse von Qualifikationen GGR-409 und GGR-20, die speziell die Faser identifizieren, die in jeglichen spezifischen Kabelaufbauten eingesetzt und qualifiziert werden.

Mit der Vorstellung einer Neuausrichtung der aktuellen Standards mit den neuen Fasern mit reduziertem Biegeradius, wird es den Diensteanbietern ermöglicht völlig von den einzigartigen von diesen Fasern gebotenen Eigenschaften zu profitieren, vor allem in der heutigen FTTP-Verlegung.

Danksagungen

Der Autor möchte sich bei Wagner Aguiar, Ken Nardone, Henry Rice und Bill Jacobsen bedanken, für deren Unterstützung um die Daten und Prüfinformationen des vorliegenden Artikels zu erlangen. ■

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Перерезание проволоки в новую эру

Забудьте о перерезании ленточки, перерезание медной проволоки стало повесткой дня на церемонии открытия нового завода в городе Малу, принадлежащего «SAMP Shanghai».

Новый завод, построенный для производства станков и оборудования кабельной и проволочной промышленности, занимает территорию в 4500 м², что удваивает присутствие «SAMP» в данном регионе с новым ультрасовременным производственным оборудованием.

Церемония открытия была проведена необычным способом: почетные гости объявили открытие здания, перерезав медную проволоку – конечную продукцию оборудования, создаваемого на заводе «Shanghai».

Несколько сотен гостей из 20 различных стран посетили церемонию, включая господина Ванг Чун – губернатора города Малу, господина Винченцо де Лука – генерального консула Италии в Шанхае, господина Доминика Перруд – управляющего директора «SAMP Shanghai» и господина Антонио Маккаферри – президента «SAMP Group», который также произносил речь по случаю открытия. В своей речи господин Перруд подчеркнул сосредоточенность «SAMP Group» на китайском рынке и рынке государств Юго-Восточной Азии: «За последние годы «SAMP» пережила исключительный период



▲ Почетные гости отмечают открытие нового завода «SAMP»

развития в Китае благодаря непрерывному доверию наших клиентов и напряженной работе наших сотрудников, их преданности делу и опыту». «Сегодня огромный и суперсовременный производственный завод начинает новый этап роста. Мы стремимся предоставить нашим клиентам то, в чем они больше всего нуждаются, при этом контролируя уровень цен. Этот новый гибкий в эксплуатации завод предоставит нам

возможность реализовать наши планы активного роста на азиатском рынке».

После церемонии все гости приняли участие в торжественном ужине в отеле «Marriott» в Цзядине, где атмосфера оживленного вечера была создана при помощи традиционной китайской музыки и танцев.

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«Videx Machine Engineering Ltd» – Израиль
Вебсайт: www.videx.co.il

Новый завод открывает свои двери

«Flymca» и «Flyro» открыли новый завод.

Завод включает в себя новое производственное оборудование для изготовления вращающихся механизмов, а также склад использованного оборудования. При общей площади завода в 5000 м², а также с новыми офисами, компания сможет намного увеличить производительность высококачественного оборудования. Задействованная в отрасли подводных лодок, шлангокабелей, а также

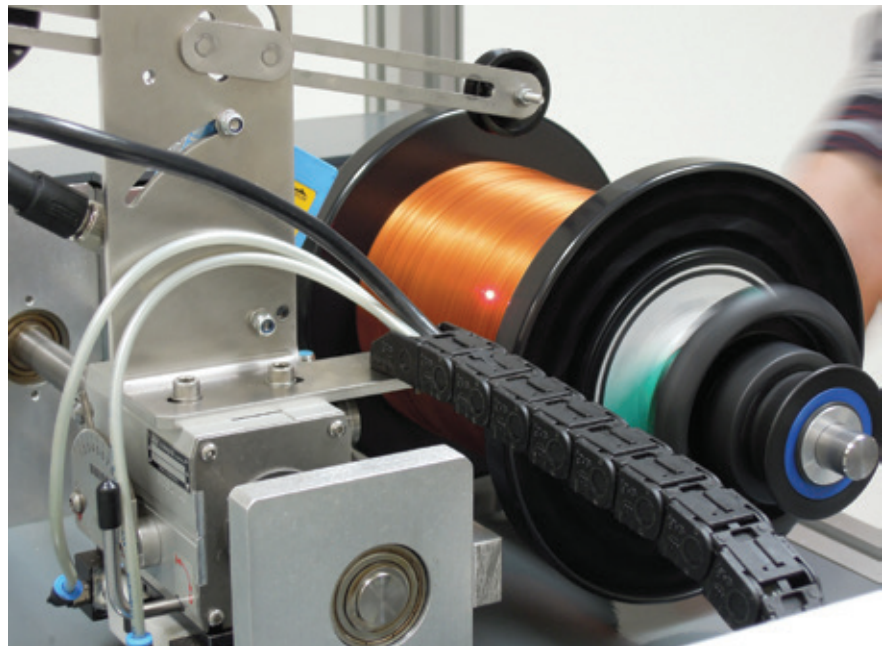
шельфового оборудования с вращающимися кабелями, либо с силовыми кабелями и стальными канатами, компания также производит машины для стандартной оплетки кабелей такие, как: жесткорамные крутильные машины, машины планетарного типа, крутильные машины сигарного типа, драмтвистеры, машины двойного кручения.

«Flymca» и «Flyro» – Испания
 Вебсайт: www.flymca.com

Уинг выпустил новое поколение фланцевой системы обнаружения для передаточных механизмов с вращающимся кольцом

В 2004 году Уинг добавил к ассортименту своей продукции бесконтактную фланцевую систему обнаружения для передаточных механизмов с вращающимся кольцом. Данное экономически выгодное решение, которое автоматически корректирует точку разворота подвижного кольца механизмов поворота, облегчает работу сотрудникам производственных компаний, освобождая их от ручной работы, и, таким образом, экономит время и денежные расходы. Сейчас Уинг запустил второе поколение данной продукции – оборудованное новой сенсорной технологией и обладающее расширенным диапазоном эксплуатации.

Часто бывает так, что новая катушка находится не в точно таком же положении, как предыдущая, хотя она имеет такую же ширину, или что катушки имеют широкие допуски ширины. Бесконтактная фланцевая система обнаружения корректирует точку разворота системы перемещения автоматически. Данная функция вскоре сделает систему незаменимым устройством в компаниях, чья продукция выпускается в мотках, в частности, в компаниях по производству проволоки или кабеля. Новой функцией является способность продукции автоматически определять ширину катушки и тип фланца: прямой, или с непрямым углом. Фланцевая система обнаружения адаптируется к новому положению и ширине, если катушки с различной шириной используются после смены одной из катушек.



▲ Второе поколение от Уинга

Наиболее значимым свойством системы является лазерный сенсор. Он заменяет применявшуюся ранее систему световой защиты. Датчик обнаружения фланца крепится на перемещающуюся систему. В пределах указанного диапазона он захватывает смещение между поверхностью центра катушки и максимально допустимой высоты, запрограммированной в программном обеспечении, и сохраняет данное значение в качестве исходного значения смещения для каждого нового

слоя. В процессе намотки, фланцевая система обнаружения постоянно измеряет соответствующее смещение и сравнивает его с сохраненным образцом. Система размотки срабатывает, когда допустимое отклонение высоты, также хранящееся в памяти системы, превышено. Дисплей показывает измеренную высоту или допустимую высоту отклонения.

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Методы испытаний для кабелей, состоящих из волокна с уменьшенным радиусом изгиба

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Краткий обзор

В данной работе содержится попытка сравнить механические эксплуатационные параметры светопроводных кабелей с оптическими характеристиками как стандартизованного волокна, так и волокна с уменьшенным радиусом изгиба. Соотношение механических и оптических результатов испытаний может указать на наиболее приемлемые критерии испытаний для кабелей с волокном уменьшенного радиуса изгиба. Это, в свою очередь, предоставит более точные критерии описания данного нового типа волокна.

Введение

Появление как одномодового, так и многомодового сгибаемого прочного волокна поставило под сомнение точность характеристик проектирования кабелей при кабельных испытаниях, необходимых для разработки кабелей с определенным сроком эксплуатации. В настоящее время, большинство известных планов испытаний основаны на дельта-значении вытягивания при дискретной длине волны в качестве критерия соответствия/несоответствия механическим показателям. С появлением и использованием новых типов волокна с уменьшенным радиусом изгиба, все меньше типов кабелей качественного проектирования могут сегодня пройти такие стандартные кабельные испытания. Это может привести к возможному отклонению от стандартов при проектировании кабелей, которые будут впоследствии непригодны в данной сфере. Оптические волноводы могут подвергаться долговременной нагрузке, которая не будет отражена в протоколах измерения дельта-значения вытягивания,

обязательных в настоящее время при стандартизованных испытаниях, таких, как «Telcordia GR-409» и «GR20».

Усовершенствованное волокно

«Telcordia GR-409» является текущим стандартом спецификаций для оптико-

волоконных кабелей, применяемых в помещении, тогда как «Telcordia GR-20» является образцом технических характеристик для кабелей на открытом воздухе. Некоторые компании, такие как «Verizon», используют более современные образцы, ссылающиеся на «GR-20» и «GR-409», однако добавляя при этом дополнительные модификации. В совокупности, данная документация по спецификации

▼ Цифра 1. Волокно со стягиванием <1%



▼ Цифра 2. Волокно со стягиванием >4.5%



▼ Цифра 3. Кабельный разъем рабочей поверхности со стягиванием <5%



диктует стандарты механической прочности, согласованные заказчиком и производителем. Тем не менее, в последнее время, усовершенствованное волокно, в частности, волокно с уменьшенным радиусом изгиба, требует пересмотра промышленных стандартов волоконных испытаний. С улучшенными механическими характеристиками, существующие стандарты уже не могут быть универсальным измерением.

Несколько производителей оптоволоконна разработали стандартное оптоволоконно в 1970-х гг. Со временем, было сделано несколько значительных усовершенствований вне сферы покрытия по улучшению специфических характеристик противостояния механическому воздействию на волокно. Но помимо инноваций в чертежах возникли значительные модернизации по улучшению опытных эластичных характеристик оптических волноводов, усовершенствования проектирования оптоволоконна были незначительными еще 5 лет назад. После этого возникли несколько концепций по улучшению других характеристик волокна, таких как механическая прочность и характеристики сгибания. Это положило начало эры волокна с уменьшенным радиусом изгиба.

Волоконсуменьшеннымрадиусомизгиба охватывает несколько конкурентных технологий. Они включают типы волокна, используемого в траншеях, в пустотах, фотонно-кристаллический тип волокна или, так называемое, «дырявое волокно», а также некоторые другие типы и технологические сочетания. При сравнении их с обычным волокном

▼ **Цифра 4.** Становка для испытаний эластичности длины FOTP-33



становятся очевидны преимущества характеристик и механическая прочность современного оптоволоконна.

Однако, в то же самое время, режимы проверки остались практически неизменными, основанными все еще на изменении вытягивания при физических, механических испытаниях и испытаниях в окружающей среде. Вытягивание продолжает оставаться предпочтительным методом определения прочности волокна. Стоит отметить, что при испытаниях волокна с уменьшенным радиусом изгиба с использованием тех же методов, что и для обычного одномодового и многомодового волокна не учитываются уникальные характеристики данных новых волокон. Принимая во внимание данный факт, давайте рассмотрим, как обычно вытягиванию подвергается обычное волокно и волокно с уменьшенным радиусом изгиба

Макроизгибы и микроизгибы

Так что же именно изменилось с появлением волокна с уменьшенным радиусом изгиба? Самое очевидное улучшение произошло в способности волокна гнуться более туго, то есть, был уменьшен диапазон гибкости. Данные кабели могут гнуться при радиусе 10, 75 и даже 5 мм без видимого увеличения вытягивания или разрушения стекловолокна при длительном нахождении в окружающей среде. Устойчивость к потерям при макроизгибе и микроизгибе была значительно увеличена.

При пропускной способности оптического волокна под макроизгибом понимается большой видимый изгиб в оптическом волокне, который может вызывать внешнее вытягивание, сокращение оптической мощности стекловолокна. Микроизгибами являются почти невидимые дефекты в оптическом волокне, возникающим обычно в процессе производства. Эти крошечные дефекты могут также вызывать сокращение оптической мощности, или увеличенное вытягивание. Тем не менее, микроизгибы могут возникать только сильным сжатии пластика, помещенного на стекло по причине стягивания полимера на волокне.

В обычном волокне увеличение вытягивания указывает на возникновение микроизгиба на волокне. Однако, на волокне с уменьшенным радиусомизгиба,изменениевытягивания происходит обычно минимально, и те



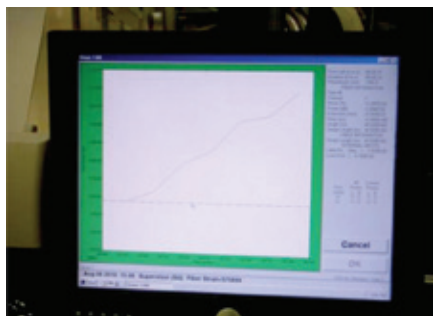
▲ **Цифра 5.** Система измерения нагрузки оптоволоконна

же самые микроизгибы невозможно обнаружить до серьезных нарушений в работе кабеля. А нарушение можно будет выявить только со временем при применении кабеля после его установки или изнашивания. Современные технологии изнашивания, такие как увеличение температуры, используемые при испытаниях, не способны выявить дефект нового волокна с уменьшенным радиусом изгиба.

Непригодные методы испытаний

Существующие методы испытаний обычного оптоволоконна основаны на механических испытаниях и изменениях вытягивания, но они не указывают, что проектирование кабеля было испытано. Следовательно, волокно с уменьшенным радиусом изгиба подвергается тем же испытаниям, его минимальная чувствительность к микроизгибам может позволить пройти испытания, тогда как микроизгибы могут со временем все же стать причиной излишней нагрузки на волокно. Это означает, что некоторые модели кабелей могут создаваться со свойственными им дефектами при проектировании, хотя они все же могут соответствовать существующим стандартам испытаний, основанным исключительно на содержании «GR-409» для волокон с тугой буферной оболочкой.

Для оптических кабелей со свободной укладкой волокон в трубке, используемых на открытом воздухе, входящих в стандарт «GR-20», существует ряд испытаний, которые могут определить, подвергается ли волокно нагрузке. В настоящее время, единственное требование по нагрузке содержится в «in TIA-455-33B», раздел



▲ Цифра 6. Нагрузка и эластичность волокна

«FOTP-33a». Сюда входит и испытание на растяжение с использованием компонента для измерения нагрузки на волокно.

Возникает вопрос, является ли до сих пор значение в меньше, чем пять процентов стягивания, как указано в данной спецификации, приемлемым стандартом или образцом. Это могло бы быть слишком неточным измерением, если учитывать тот факт, что новое нечувствительное к изгибам волокно не выявит той же чувствительности. Если любой дефект или недостаток волокна может быть упущен в современных стандартах испытаний, и в то же время, это может значительно сказаться на изготовленном волокне со временем, когда новые такие критерии, как нагрузка на волокно будут добавлены в современные методы испытаний, спецификации и стандарты.

То, что может быть верным для большинства кабелей, может не подходить для границы кабельных разъемов, а те кабели, которые проходят испытания сегодня, могут не соответствовать ожидаемому сроку эксплуатации волокна. Существующая оценка срока износа была произведена при проверке высокими температурами только для выявления изменений в компонентах кожуха и сабвуфера, таких как отвердевание, растрескивание, стягивание из-за процесса износа.

Сегодня, было бы разумно рассчитать, прошли бы данные компоненты испытания, которые основаны на других параметрах. Одним из таких параметров является термический коэффициент, или линейное расширение. Он показывает норму расширения и сокращения материала при данном температурном профиле. Норма изменения полимера обычно является определением мощности, сравниваемое со стекловолном.

К примеру, если постоянное стягивание превышает нормальный показатель стягивания при испытании и определяется увеличенным вытягиванием, как же можно это



▲ Цифра 7. Точность в измерении стягивания

определить в волокне с уменьшенным радиусом изгиба, где есть либо минимальное, либо отсутствует вытягивание? Ответ прост: сделать это невозможно, по крайней мере, до тех пор, пока волокно не износится настолько, что перестанет быть пригодным долговечным средством связи.

С оптическими кабелями со свободной укладкой волокон в трубке может произойти обратная ситуация. Так, длина волокна может быть слишком большая, и волокно будет собираться, не из-за стягивания, а из-за увеличения вытягивания, которое не наблюдалось в волокне с уменьшенным радиусом изгиба.

Отдельные трубы не испытываются на стягивание, но могут быть скручены на переходных участках и не иметь проектирование общего кабеля для контроля стягивания в каждой из трубок со свободной укладкой волокон. Можно сделать вывод, что, поскольку сопротивление вытягиванию увеличено в волокне с уменьшенным радиусом изгиба, микроизгибы и другие виды нагрузки на волокно невозможно обнаружить в соответствии с современными стандартами испытаний обычного волокна. Данные существующие стандарты должны быть тщательно пересмотрены и добавлены новые критерии для уникальных характеристик волокна с уменьшенным радиусом изгиба.

Новые принципы испытаний

Необходимо добавить некоторые новые критерии испытаний к «GR-409» и «GR-20» в свете уникальных характеристик типа волокна с уменьшенным радиусом изгиба. К примеру, средство измерения нагрузки волокна должно быть добавлено к существующим критериям испытаний. Нагрузку можно измерять как для кабелей, используемых в

помещении, так и для оптоволоконных кабелей, применяемых на открытом воздухе при растяжении «FOTP-33b», при износе и других процессах механических испытаний, где данный тип испытаний не проводится. Это может быть затруднительно без введения нового класса испытаний нагрузки на волокно, но это крайне необходимо для волокна с уменьшенным радиусом изгиба.

Еще одним принципом изменения методов испытаний может стать измерение дельта-избыточной длины волокна, в оптических кабелях со свободной укладкой волокон, до и после испытаний на износ, а также в отдельных трубках.

Например, вытягивание и избыточная длина могут быть измерены до испытания на износ и процессов циклического изменения температуры, а затем после них. Затем показатели необходимо сравнить для установления критерия соответствия/несоответствия. Современные спецификации не требуют данного вида испытаний, не нужны эти испытания и в свободной комбинации. Сегодня все испытания проводятся на катушках.

При свободной укладке трубок в катушке, можно получить большую избыточную длину и длину в размотанном состоянии, чем в прямой линии. Увеличение вытягивания было бы очевидным без возможности измерять увеличенную длину с помощью механического испытания.

Стоит отметить, что новые измерения должны включать очень большую длину волны – 1625 нм. Данные новые измерения стали бы основой для появления дополнительных критериев оценки длины волны, где край микроизгиба сдвигается при нагрузке на волокно. Хотя это уже является требованием некоторых заказчиков в их собственных стандартах, это не является неотъемлемой частью существующих стандартов качества волокна.

Испытания на стягивание кабеля необходимо поставить на более высокий уровень частотности, и спроектировать приборы специально для этой цели. Диапазон испытаний и воздействие вытеснения волокна из кабеля также необходимо определить. И это только последствия стандарта испытаний «GR 326» для кабельных соединителей и кабельной арматуры.

Выводы

Появление волокна с уменьшенным радиусом изгиба и рост его

популярности при проведении линии волокна в архитектурные здания вызывают беспокойство, когда речь идет о существующих «GR-409», «GR-20», «GR 326» и других стандартах спецификации, созданных для обычных волокон. Должны быть предложены новые испытания для точного определения их уникальных характеристик для обеспечения более долгого срока эксплуатации.

Проектирование кабелей, использующее волокно с более жестким радиусом изгиба, наверняка бы показало большее вытягивание при использовании обычного одномодового волокна. Другими словами, волокно с уменьшенным радиусом изгиба могло бы иметь гораздо больший срок эксплуатации в среде, где обычное волокно быстро изнашивается.

Кабель рабочих поверхностей контактов соединителя мог бы создать новые модели износа, где стягивание кабеля может привести к неприемлемым радиусам сгиба волокна на кабельной/соединительной рабочей поверхности. Результаты этого могут проявиться лишь после того, как отдельные разъемы кабелей изнашивались и сменяются. Только этот факт указывает на необходимость пересмотра стандартов и требований волокна с уменьшенным радиусом изгиба.

Проектирование кабелей, испытываемое согласно «GR 409» или «GR 20» является требованием для испытаний «GR 326». Существует необходимость использования нагрузки волокна и стягивания, а также вытеснения волокна после износа в качестве более полной заготовки для испытаний «GR326».

С устанавливаемой нормой функционирования кабелей в окружающей среде, значение термального коэффициента или линейного расширения должно быть включено в спецификацию функционирования по требованиям к заготовке.

Данная работа предлагает пересмотреть существующие стандарты, в частности, спецификации «GR-409» для требуемой выносливости к стягиванию и нагрузке на волокно.

В противном случае, кабели низкого качества будут соответствовать тем стандартам, которые созданы и используются в данной сфере. Необходимо признать, что обычное волокно и волокно с уменьшенным радиусом изгиба обладают разными свойствами и характеристиками, и критерии испытаний должны быть созданы для соответствия требованиям

обоих. Следовательно, предлагается рассмотреть добавление более точных критериев в существующие стандарты спецификаций. Это, фактически, станет созданием нового класса спецификаций «GGR-409» и «GGR-20», точно характеризующих волокна, используемые в конкретных видах кабеля. Изменение современных стандартов с учетом волокна с уменьшенным радиусом изгиба позволит обслуживающим организациям извлечь максимальную выгоду из уникальных характеристик данного типа волокна, в частности, при применении FTTP. ■

Благодарность

Автор выражает благодарность Вагенру Агвейру, Кену Нардону, Генри Райсу и Биллу Якобсену за помощь в сборе информации об испытаниях для данной работы.

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Inauguration d'une nouvelle époque avec le fil de cuivre

OUBLIONS la coupe du ruban traditionnelle, pour célébrer l'ouverture de la nouvelle installation à Malu Town, où SAMP Shanghai a tenu une cérémonie d'inauguration officielle en coupant cette fois un fil de cuivre.

La nouvelle installation conçue pour la fabrication de machines et d'équipements pour le secteur du fil et du câble, couvre une surface de 4.500m² ; avec cette unité de production ultramoderne SAMP a presque doublé sa présence dans la région.

La cérémonie de coupe du ruban a été célébrée de façon non conventionnelle: à cette occasion, les autorités ont déclaré l'ouverture de l'installation en coupant un fil de cuivre, le produit final des machines réalisées dans l'installation de Shanghai.

Plusieurs centaines d'invités provenant de 20 pays différents ont participé à la cérémonie du soir, y compris Wang Chun, Gouverneur de Malu Town, M. Vincenzo De Luca, Consul Général d'Italie à Shanghai, M. Dominique Perroud, Directeur Général de SAMP Shanghai, et M. Antonio Maccaferri, président du Groupe SAMP, qui a également tenu plusieurs discours pour célébrer l'occasion. Les commentaires de M. Perroud ont mis en évidence l'intérêt du Groupe SAMP pour le marché Chinois et pour le marché de l'association des nations de l'Asie du Sud-Est (ANASE): "Au cours des dernières



▲ Autorités lors de l'inauguration de la nouvelle installation de SAMP

années, SAMP a expérimenté une période de développement exceptionnel en Chine, grâce à la confiance continue de nos clients, aux efforts constants de nos employés, à leur dévouement et à leur expérience.

Aujourd'hui, une installation de production de grandes dimensions et absolument à l'avant-garde nous transporte dans une nouvelle époque de croissance. Notre objectif consiste à offrir à nos clients ce qu'ils exigent et apprécient le plus, d'une façon rentable et écologiquement

saine. Cette nouvelle installation flexible nous permettra de réaliser nos plans de croissance énergique pour le marché asiatique."

Après la cérémonie, les invités ont participé à un dîner de gala à l'Hôtel Marriott de Jiading où la musique et la danse traditionnelle chinoises ont animé la soirée.

Sampsistemi SpA – Italie
Website: www.sampsistemi.com

Rouleaux à fileter à double broche

Les nouveaux rouleaux à fileter à double broche de Videx sont conçus pour le laminage de filets au-dessus et au-dessous de l'épaule. Les filets peuvent être différents ou similaires.

Les deux têtes sont indépendantes, ce qui permet d'éviter toute interférence entre elles et d'utiliser des matrices de roulage simples et économiques.

Ces nouveaux rouleaux offrent les avantages suivants:

- Réglages indépendants garantissant une meilleure qualité sur chaque filet.
- Vitesses de production supérieures. La deuxième opération ne cause pas le ralentissement de la machine.

- Manutention réduite qui évite ainsi de mélanger les parties.
- Outillages économiques et contrôle total de la qualité de chaque opération de laminage. Les outillages sont remplacés en quelques minutes seulement.

Les deux stations sont équipées: d'un système de démarrage de laminage des filets contrôlé, d'un dispositif de serrage hydraulique, d'un mécanisme à conicité nulle pour filets parallèles et d'une vis de pression pour filets micrométriques, d'un dispositif de contrôle de la vitesse, d'un robinet d'arrêt automatique et de deux panneaux de contrôle pour l'opérateur.

Videx Machine Engineering Ltd – Israël
Website: www.videx.co.il

Un nouvel établissement ouvre ses portes

Flymca & Flyro a inauguré un nouvel établissement.

L'établissement comprend d'autres installations pour la production d'un nouvel équipement de rotation ainsi qu'un stock d'équipement d'occasion.

La société avec une surface totale de 5 000m² et de nouveaux bureaux, sera en mesure d'atteindre une capacité de production des équipements nettement supérieure.

Très engagée dans le secteur des équipements de rotation pour câbles sous-marins, ombilicaux et off-shore, pour les câbles de puissance et pour les câbles d'acier, la société réalise encore sa gamme standard de toronneuses rigides, tubulaires, câbleuse à lyres, planétaires, assembleuses à réception tournante, et tordeuses à double torsion.

Flymca & Flyro – Espagne
Website: www.flymca.com

Uhing lance son système de relèvement des brides

EN 2004 Uhing a complété sa gamme de produits avec le système de détection des brides sans contact FA pour les actionnements avec anneaux de rotation.

Cette solution économique qui corrige automatiquement les points d'inversion de marche des mécanismes d'avancement à anneaux de rotation, évite aux travailleurs des usines d'effectuer les réglages manuellement en réduisant ainsi les temps et les coûts.

Uhing a lancé la deuxième génération de ce produit, équipée d'une nouvelle technologie de détection à capteurs et d'une gamme de fonctions plus ample.

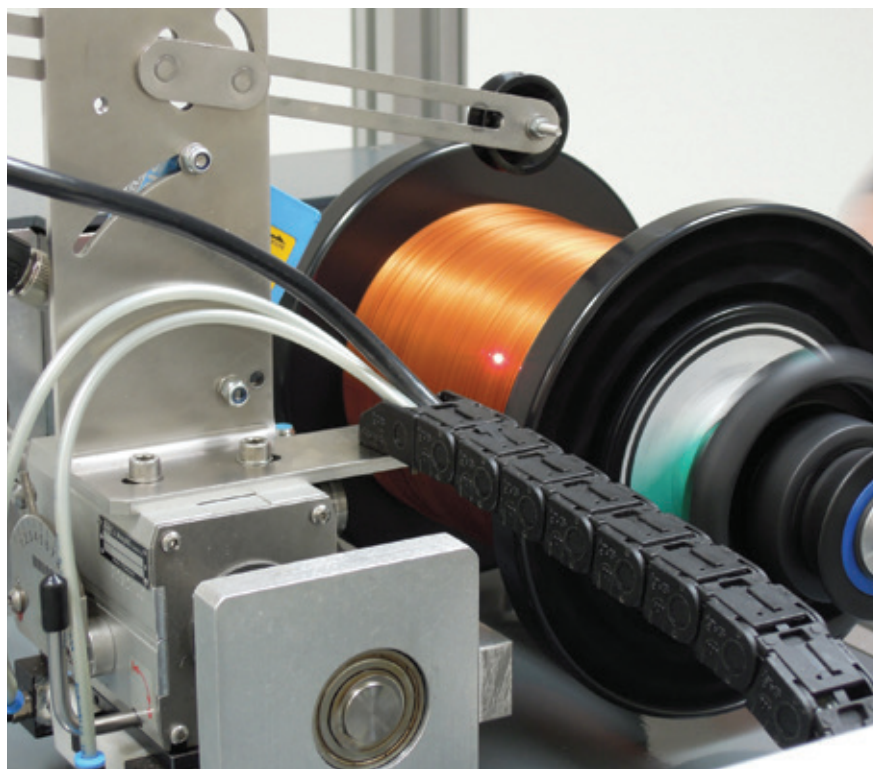
Il arrive souvent qu'une nouvelle bobine ne soit pas exactement dans la même position que la précédente, bien que la largeur soit la même, ou que les bobines présentent de grandes tolérances de largeur.

Le système de détection des brides sans contact FA corrige automatiquement le point d'inversion de marche du mécanisme d'avancement.

Cette fonction a vite fait du système FA un dispositif indispensable pour les sociétés fabriquant des produits devant être enroulés, notamment les sociétés spécialisées dans la production de fil et de câble.

Une nouvelle caractéristique du système est la possibilité de relever automatiquement la largeur des bobines et le type de bride (droit ou différent de 90 degrés). Si l'on emploie une bobine de largeur différente après le changement de la bride, le système releveur de la bride s'adapte aux nouvelles position et largeur.

La principale nouveauté du système FA II est le capteur à laser, qui remplace le



▲ Système de deuxième génération de Uhing

système de détection à photocellule utilisé précédemment. Le capteur qui relève la bride doit être installé sur le système de trancanage.

Dans un champ de mesure spécifique, il capture le déplacement (offset) entre la surface du noyau de la bobine et la hauteur maximale admissible mémorisée dans le logiciel du système, et effectue le sauvetage de cette valeur comme valeur de déplacement de référence pour chaque nouvelle couche.

Durant l'enroulement, le système de détection de la bride mesure

constamment le déplacement correspondant de chaque bobine et effectue une comparaison entre ce dernier et le déplacement de référence. Lorsque le déplacement de hauteur admissible, également mémorisé dans le système, est dépassé, l'inversion de marche est déclenchée.

La hauteur moyenne mesurée ou la déviation de hauteur admissible sont affichées sur un écran.

Joachim Uhing KG GmbH & Co – Allemagne
Website: www.uhing.com

Méthodes d'essai pour les câbles avec fibres à rayon de courbure réduit

Par Wayne Kachmar, ADC Telecommunications, États-Unis

Résumé

L'objectif de cet article est de comparer les paramètres des performances mécaniques de câbles de guide d'onde avec des fonctions optiques dans les fibres conventionnelles et dans les fibres à rayon de courbure réduit. La coordination des données d'essai mécaniques et optiques permet d'établir des critères d'essai plus appropriés pour les câbles avec des fibres à rayon de courbure réduit. Cela assurera un critère de caractérisation plus solide, indiqué pour cette nouvelle classe de fibres.

Introduction

L'arrivée des fibres insensibles à la courbure, de type monomode et multimodes, a mis en question l'efficacité de caractérisation des plans d'essai actuels des câbles afin d'obtenir la durée prévue. Actuellement, la majorité des plans d'essai publiés se basent sur les valeurs de différence d'atténuation à des longueurs d'onde discrètes comme critères de succès/échec pour différents paramètres mécaniques.

Avec l'introduction et l'utilisation de nouveaux types de fibres à rayon de courbure réduit, des conceptions de câbles moins robustes peuvent maintenant passer avec succès ces essais de câbles standardisés. Ce résultat peut amener à d'éventuelles conceptions de câbles de qualité inférieure pouvant entraîner des inconvénients locaux. Des sollicitations à long terme pourraient se vérifier dans les guides d'onde optiques et ne pas apparaître dans les protocoles de mesure de la différence d'atténuation actuellement recommandés par les essais standards tels que Telcordia GR-409 et GR20.

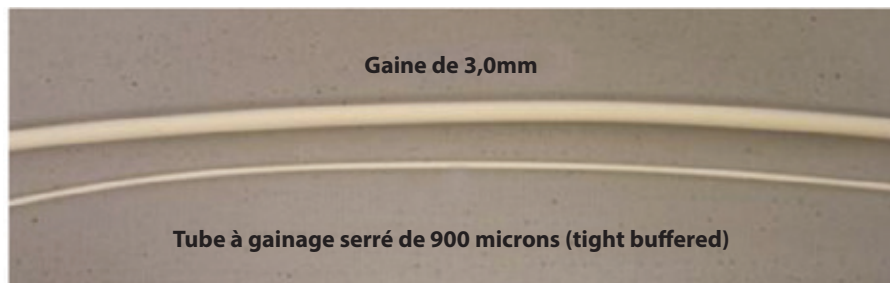
Perfectionnements de la fibre

Telcordia GR-409 est le standard courant pour les spécifications des câbles à fibres d'intérieur, tandis que Telcordia GR-20 fournit une référence technique pour les câbles d'extérieur.

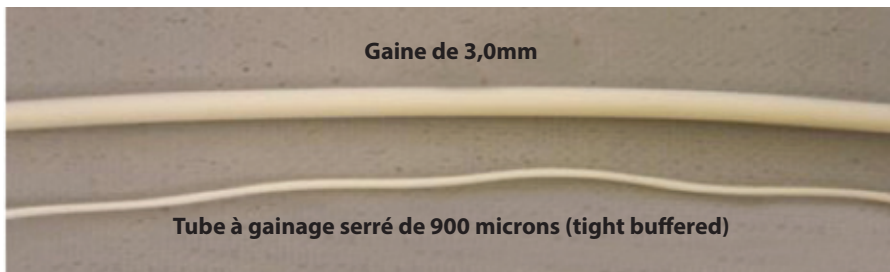
Certaines sociétés comme Verizon, utilisent des versions plus sophistiquées des normes de référence GR-20 et GR-409, ainsi que des classifications supplémentaires.

Ensemble, ces spécifications définissent les normes pour les performances mécaniques convenues entre le client et le fabricant.

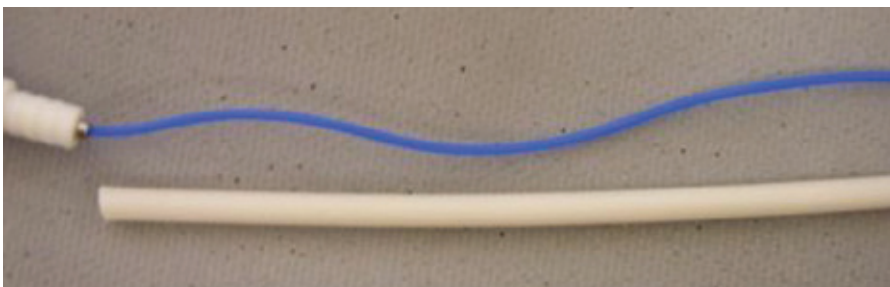
▼ **Figure 1:** Fibre avec contraction <1%



▼ **Figure 2:** Fibre avec contraction >4,5%



▼ **Figure 3:** Interface de connecteur de câble avec contraction <5%



Toutefois, les perfectionnements récemment obtenus en matière de fibres, notamment en ce qui concerne les fibres à rayon de courbure réduit, défient l'industrie afin qu'elle remette en question les normes des essais pour les fibres. Avec l'amélioration des caractéristiques de performances des fibres à rayon de courbure réduit par rapport aux fibres conventionnelles, les normes existant déjà ne peuvent plus représenter un système de mesure universel.

De nombreux fabricants de fibres optiques ont développé des fibres optiques conventionnelles au cours des années 70. Au fil des ans, les améliorations significatives ont été rares à l'exception des développements du revêtement pour améliorer la capacité intrinsèque de la fibre de supporter les forces mécaniques dans son environnement. Toutefois, à part les innovations du processus d'étirage, améliorant les propriétés empiriques générales de résistance à la traction des guides d'onde optiques, les améliorations des conceptions des fibres optiques n'ont guère été importantes jusqu'à il y a cinq ans environ. A cette époque-là, plusieurs conceptions ont été mises au point pour améliorer les autres caractéristiques de la fibre, telles que la résistance physique et les caractéristiques de courbure. C'est ainsi que les fibres à rayon de courbure réduit ont été introduites.

Les fibres à rayon de courbure réduit comprennent plusieurs technologies praticables. Elles comprennent des versions «*trench-assisted*», des fibres «*voids-assisted*», des fibres de cristal photonique ou microstructurées (*holey fibres*) et plusieurs autres combinaisons de types et de technologies.

▼ **Figure 4:** Dispositif d'essai de traction pour jauge longitudinale FOTP-33



La comparaison avec la fibre conventionnelle, montre que chacune de ces innovations a amélioré les caractéristiques et les performances mécaniques de la fibre optique actuelle.

Toutefois, durant ce même laps de temps, les régimes d'essai existant déjà sont restés essentiellement inchangés, et ils dépendent toujours de la variation d'atténuation basée sur les essais physiques, mécaniques et environnementaux.

L'atténuation reste la méthodologie préférée pour déterminer les performances d'une fibre. Toutefois, l'essai des fibres à rayon de courbure réduit utilisant les mêmes méthodes utilisées pour la fibre traditionnelle monomodale et multimodale ne considère pas les propriétés spécifiques de ces nouvelles fibres.

Cela dit, allons maintenant examiner comment l'atténuation est induite dans les fibres conventionnelles et dans les fibres à rayon de courbure réduit.

Macrocourbures et Microcourbures

Voyons donc ce qui a exactement changé avec l'introduction des fibres à rayon de courbure réduit. L'amélioration la plus évidente est la capacité de la fibre de se plier davantage, c'est-à-dire que sa sensibilité aux courbures a été réduite.

Ces fibres peuvent être pliées jusqu'à 10, 7,5 ou même 5mm de rayon sans aucune augmentation d'atténuation appréciable ni dommage au verre dans un environnement à long terme. La résistance à la perte par macrocourbures et microcourbures a également augmenté considérablement.

Dans les transmissions avec fibres optiques, par macrocourbure l'on entend une ample courbure visible dans la fibre optique qui peut causer une atténuation extrinsèque, c'est-à-dire une réduction de puissance optique dans le verre.

Par contre, les microcourbures sont définies comme des imperfections quasiment invisibles dans la fibre optique, généralement créées pendant le processus de fabrication.

Ces petites imperfections peuvent également causer une réduction de la puissance optique ou une augmentation de l'atténuation. Toutefois, les microcourbures peuvent également résulter des contraintes de compression des matériaux plastiques utilisés sur le verre à cause de la contraction du polymère sur la fibre.



▲ **Figure 5:** Système de mesure avec jauge de déformation de la fibre optique

Dans les fibres conventionnelles, les augmentations d'atténuation indiquent qu'une microcourbure s'est produite dans la fibre. Toutefois, dans une fibre à rayon de courbure réduit, les changements d'atténuation sont généralement négligeables, et il est possible que la même microcourbure reste dissimulée jusqu'à l'apparition d'une défaillance extrême dans les performances du câble.

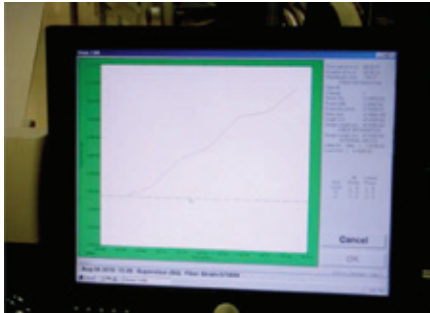
Par conséquent, la défaillance peut se produire dans le temps lors de la manipulation ou l'installation du câble ou pendant son vieillissement. Il est possible que les techniques de vieillissement modernes utilisées pour les essais, telles que l'exposition à la chaleur extrême, ne montrent pas une défaillance sur les fibres à rayon de courbure réduite actuelles.

Méthodes d'essai insuffisantes

Les méthodes d'essai existant déjà pour les fibres optiques traditionnelles sont basées sur des essais mécaniques et sur des changements d'atténuation, mais elles ne spécifient pas la conception du câble soumis à l'essai.

Par conséquent, si une fibre à rayon de courbure réduite est soumise aux mêmes essais, sa sensibilité minimale à la microcourbure peut permettre à la fibre de passer l'essai avec succès alors qu'une microcourbure pourrait néanmoins causer des sollicitations à la fibre dans le temps.

Cela signifie que certaines conceptions de câble pourraient être conçues avec des défauts de conception intrinsèques et satisfaire quand même aux normes d'essai courantes qui sont basées uniquement sur les exigences de la norme GR-409 pour les fibres avec construction à gainage serré (*tight buffered*).



▲ **Figure 6:** Déformation de la fibre par rapport à la charge de traction

Dans le cas des câbles à fibres à tubes assemblés (*loose tube*) pour les installations extérieures, relevant de la norme GR-20, il existe plusieurs essais pouvant établir si les fibres sont sujettes à une sollicitation ou à une déformation.

Actuellement, la seule spécification pour l'essai de déformation est contenue dans la norme TIA-455-33B, section FOTP-33a.

Cette norme concerne les essais de résistance à la traction pour les câbles qui utilisent un composant pour mesurer la déformation de la fibre.

La question qui se pose maintenant est si une contraction inférieure à cinq pour cent, comme affirmé dans cette spécification, est encore un standard ou un paramètre de référence acceptable.

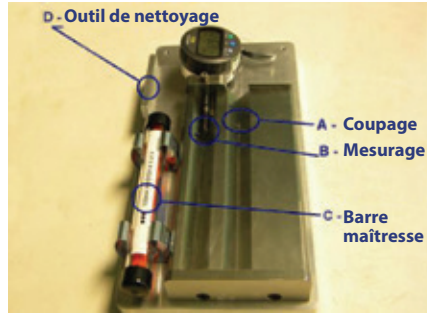
Cette valeur pourrait être une mesure excessivement ample étant donné que les nouvelles fibres insensibles aux courbures ne montreraient pas la même sensibilité.

Si une imperfection ou un défaut de la fibre peut être négligé par les normes d'essai courantes, et cela au fil des années pourrait influencer de façon significative les fibres installées, il faudrait alors intégrer de nouveaux critères dans les méthodes d'essai, les spécifications et les normes d'essai courantes, par exemple la déformation de la fibre.

Ce qui pourrait fonctionner pour un câble Bulk, pourrait ne pas être indiqué pour les interfaces des connecteurs des câbles, et ce qui pourrait passer avec succès un essai aujourd'hui, pourrait ne pas fonctionner pour la durée de vie prévue de la fibre.

Le cycle de vieillissement existant déjà a été développé en utilisant des températures élevées uniquement pour relever les changements des composants du revêtement et du gainage, tels que le durcissement, la rupture ou la contraction durant le processus de vieillissement.

Aujourd'hui il peut être utile de considérer si ces composés échouent ou pas



▲ **Figure 7:** Jauge de contraction haute précision

lorsque l'essai se base sur des paramètres différents. Un de ces paramètres est le coefficient de dilatation thermique linéaire, à savoir la vitesse de dilatation et de contraction d'un matériau dans un profil de température donné.

Généralement, la vitesse de variation du polymère est un ordre de grandeur comparé avec le verre.

Par exemple, si une contraction continue supérieure à celle des essais de contraction normaux se vérifie et que celle-ci est identifiée par une augmentation d'atténuation, comment est-il possible de l'identifier dans les fibres à rayon de courbure réduit où les augmentations d'atténuation sont nulles ou négligeables?

La réponse est que ce n'est peut-être pas possible, tant que la fibre n'atteint pas un point de virage où elle n'est plus un moyen de communication à long terme possible.

Dans l'environnement de câbles à tubes assemblés, le contraire peut se produire. Cela signifie qu'il pourrait y avoir un excès de longueur de fibre et que la fibre pourrait s'entasser, non pas à cause de la contraction, mais à cause d'une augmentation d'atténuation non relevée dans la fibre à rayon de courbure réduit.

Le tube n'est pas essayé tout seul et à part pour la contraction, mais il peut être enroulé sur plusieurs mètres dans un boîtier temporaire sans avoir la structure de tout le câble global pour contrôler la contraction dans le tube libre uniquement.

En conclusion, étant donné que la résistance à l'atténuation est majeure dans les fibres à rayon de courbure réduit, les microcourbures et d'autres sollicitations sur la fibre peuvent être non relevables avec les normes d'essai courantes pour les fibres conventionnelles.

Les normes en vigueur devraient être méticuleusement revues de façon à transposer les caractéristiques spécifiques des fibres à rayon de courbure réduit moyennant l'intégration de critères appropriés.

Nouvelles considérations concernant les essais

Il est nécessaire d'intégrer les normes GR-409 et GR-20 avec de nouveaux critères d'essai à la lumière des caractéristiques spécifiques de la fibre à rayon de courbure réduit. Par exemple, il serait opportun d'intégrer les critères d'essai existant déjà avec une méthode pour mesurer la déformation de la fibre.

On devrait mesurer la déformation ou les sollicitations sur les câbles à fibres d'intérieur et d'extérieur pendant l'essai de traction FOTP-33b, le vieillissement et effectuer des essais mécaniques supplémentaires lorsque ce type d'essai n'est pas actuellement prévu.

Cela pourrait être difficile sans l'introduction d'une nouvelle catégorie d'essais de qualification pour la déformation de la fibre, mais les nouvelles fibres à rayon de courbure réduit l'exigent.

Une autre considération à propos du changement des méthodes d'essai peut concerner la mesure de la différence de longueur en surplus de la fibre dans les câbles du type à tubes assemblés, avant et après le vieillissement, et également dans les tubes individuels.

Par exemple, l'atténuation et la longueur excédante de la fibre peuvent être mesurées avant les processus de vieillissement et de variation cyclique de la température, et de nouveau après ces processus. Elles peuvent être ensuite comparées pour établir les critères de succès/échec.

Les spécifications courantes n'exigent pas ce type d'essai, ni l'essai dans une configuration de tubes assemblés.

Actuellement, la totalité des essais est effectuée sur bobines ou rouleaux. Dans une configuration à tubes assemblés avec rouleau, la longueur en surplus et la longueur relâchée peuvent être considérablement supérieures par rapport à une ligne droite.

Les augmentations d'atténuation seront moins évidentes sans la possibilité de mesurer la longueur en surplus comme essai mécanique.

Il faut remarquer que les nouvelles mesures devraient comprendre la longueur d'onde très longue de 1625nm.

Ces nouvelles mesures détermineraient des qualifications supplémentaires pour la longueur d'onde là où le bord de la microcourbure se déplace vers l'intérieur

pendant la déformation de la fibre. Bien que certains clients exigent ce critère dans leurs normes, il n'est pas prévu par les normes générales actuelles concernant les fibres.

Les essais de contraction des câbles ont besoin de passer à un niveau de répétabilité supérieur et en fait, des instruments de mesure spécifiques ont été conçus. Il est en outre nécessaire de déterminer la gamme d'essais et l'effet de l'extrusion de la fibre du noyau du câble.

Ce n'est qu'un effet secondaire de la norme GR 326, à savoir la norme d'essai pour les connecteurs de câbles et les câbles assemblés.

Conclusions

L'introduction des fibres à rayon de courbure réduit et leur croissante popularité dans les architectures des fibres FTTP (*fiber-to-the-premise*) est une cause de souci quand il s'agit d'appliquer les normes GR-409, GR-20, GR 326 actuelles et d'autres spécifications standard créées pour les fibres conventionnelles. De nouveaux essais devraient être proposés pour définir de façon précise leurs caractéristiques spécifiques et pour garantir une majeure fiabilité à long terme.

Une conception de câble basée sur des fibres à rayon de courbure plus étroit présenterait certainement une atténuation considérablement supérieure en utilisant la fibre monomode conventionnelle. En d'autres termes, une fibre à rayon de courbure réduit aurait une durée optimale dans un environnement inapproprié pour les fibres conventionnelles. L'interface du câble au connecteur peut amener à la création de nouveaux modèles de vieillissement où la contraction du câble peut entraîner des rayons de courbure de la fibre inacceptables à l'interface câble/connecteur.

Les résultats ne seront visibles qu'après le vieillissement et le déplacement des câbles à tubes assemblés. Cela suffit à indiquer la nécessité d'une série de normes d'essais révisées et de spécifications pour les types de fibre à rayon de courbure réduit.

Les conceptions des câbles testés conformément aux normes GR 409 ou GR 20 sont les spécifications requises pour l'essai selon la norme GR 326. Il est nécessaire d'utiliser la déformation de la fibre et la contraction du câble ainsi que l'extrusion de la fibre des câbles après le processus de vieillissement comme le précurseur le plus complet des essais GR326.

En outre, avec l'augmentation des gammes opérationnelles environnementales des câbles qui deviennent la norme, les valeurs du coefficient de dilatation thermique linéaire doivent être intégrées dans les exigences du précurseur des performances de la spécification.

Cette étude propose une mise à jour des normes existant déjà, en particulier des spécifications GR-409 concernant les tolérances requises pour la contraction et la déformation de la fibre. Différemment, il est possible que les conceptions des câbles avec des valeurs inférieures aux valeurs acceptables soient approuvées par les normes courantes telles qu'elles sont écrites et installées in situ.

Il faut reconnaître que la fibre traditionnelle et la fibre à rayon de courbure réduit présentent des propriétés et des caractéristiques différentes, et les critères d'essai devraient être adaptés pour répondre aux exigences de toutes les deux.

Par conséquent, il s'agit d'intégrer des critères d'essai plus appropriés aux spécifications de normes existant déjà. En effet, cela entraîne la création d'une nouvelle classe de qualifications GGR-409 et GGR-20 qui identifient de façon spécifique les fibres utilisées et qualifiées pour toute conception de câble.

Le fait de reformuler les normes courantes en tenant compte des fibres à rayon de courbure réduit permettra aux fournisseurs de services de bénéficier au maximum des caractéristiques uniques offertes par ces fibres, en particulier les installations FTTP actuelles. ■

Remerciements

L'auteur souhaite remercier Wagner Aguiar, Ken Nardone, Henry Rice, et Bill Jacobsen pour les données et les informations obtenues pour les essais mentionnés dans le présent article.

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Taglio del filo di rame per l'inaugurazione di una nuova epoca

TRALASCIAMO il taglio del nastro tradizionale, in quanto per celebrare la cerimonia di apertura ufficiale del nuovo stabilimento di SAMP Shanghai nel distretto di Malu, per il taglio è stato scelto il filo di rame.

Il nuovo stabilimento, progettato per la fabbricazione di macchinari ed equipaggiamenti per l'industria del filo e del cavo, si sviluppa su una superficie di 4.500 metri quadrati, quasi raddoppiando la propria presenza nella regione con questa nuova unità produttiva all'avanguardia.

La cerimonia del taglio del nastro è stata condotta in modo alquanto originale: in questa occasione infatti le autorità hanno dichiarato l'apertura dello stabilimento tagliando un filo di rame, il prodotto finale dei macchinari costruiti nello stabilimento di SAMP Shanghai.

Diverse centinaia di ospiti di oltre 20 nazionalità diverse hanno partecipato all'evento serale fra cui il Governatore di Malu, Wang Chun, il Console Generale d'Italia a Shanghai, Vincenzo De Luca; il Direttore di stabilimento di SAMP Shanghai, Dominique Perroud, e il Presidente del Gruppo SAMP, Antonio Maccaferri che ha tenuto dei discorsi per dare importanza all'evento. Le osservazioni del Sig. Perroud hanno evidenziato l'interesse particolare del



▲ Autorità impegnate nell'inaugurazione del nuovo stabilimento di SAMP

Gruppo SAMP per il mercato cinese e per il mercato dell'associazione delle Nazioni del sud-est asiatico (ASEAN): "Negli ultimi anni SAMP ha registrato una crescita eccezionale in Cina, grazie alla continua fiducia dei nostri clienti e all'impegno costante del nostro staff altamente qualificato.

"Lo stabilimento produttivo assolutamente all'avanguardia che inauguriamo oggi segna per l'azienda una nuova fase di crescita. Il nostro obiettivo è quello di fornire ai nostri clienti ciò che più richiedono e apprezzano, in maniera

efficiente ed ecosostenibile. Il nuovo stabilimento flessibile ci darà la capacità necessaria per realizzare i nostri piani di espansione energetica per il mercato asiatico."

A seguito della cerimonia ufficiale, tutti gli invitati si sono spostati presso l'hotel Marriott di Jiading per la cena di gala, durante la quale una serie di spettacoli di musica e danze tradizionali cinesi hanno allietato la serata.

Sampsistemi SpA - Italia
Website: www.sampsistemi.com

Rulli filettatori a doppio mandrino

I nuovi rulli filettatori a doppio mandrino di Videx sono progettati per laminare filetti sopra e sotto la spalla. I filetti possono essere diversi o simili.

Le due teste sono indipendenti, consentendo di evitare interferenze fra di esse, e l'utilizzo di matrici di laminazione semplici ed economiche.

Questi nuovi rulli offrono i seguenti vantaggi:

- Regolazioni indipendenti che garantiscono una migliore qualità di ciascun filetto.
- Velocità di produzione più elevate. La seconda operazione non provoca il rallentamento della macchina.
- Riduzione delle operazioni di movimentazione eliminando il rischio di mescolare i pezzi.
- Attrezzature economiche e controllo totale della qualità di ciascuna operazione di laminazione. Possibilità di sostituire gli attrezzi in solo pochi minuti.

Entrambe le stazioni dispongono di avvio controllato della laminazione dei filetti, bloccaggio idraulico, meccanismo senza conicità per filetti paralleli e viti a pressione per filetti micrometrici, e inoltre dispositivo di controllo della velocità in c.a., arresto automatico distribuzione dell'aria e due pannelli di controllo per operatori.

Videx Machine Engineering Ltd - Israele
Website: www.videx.co.il

Un nuovo stabilimento apre le porte

Flymca & Flyro ha aperto un nuovo stabilimento.

L'impianto comprende nuovi stabilimenti per la produzione di nuove macchine rotative ed un deposito di equipaggiamenti usati.

La società, che occupa una superficie totale di 5.000m² e conta anche dei nuovi uffici, potrà raggiungere una capacità produttiva di macchinari di alta qualità di gran lunga superiore.

Particolarmente attiva nel settore delle macchine rotative per cavi sottomarini, ombelicali e offshore, sia per cavi di potenza, sia per cavi di acciaio, la società produce tuttora la propria gamma standard di trefolatrici rigide, tubolari, a tazza, planetarie, torcitori a tamburo, cordatrici ad arco, trefolatrici a doppia torcitura.

Flymca & Flyro – Spagna
Website: www.flymca.com

Uhing lancia il sistema di rilevamento di flangia per azionamenti con anelli rotanti di prossima generazione

NEL 2004 Uhing ha completato la propria gamma di prodotti con il sistema di rilevamento di flangia senza contatto FA progettato per azionamenti con anelli rotanti.

Questa soluzione economica, che corregge automaticamente i punti di inversione di marcia dei meccanismi di avanzamento con anelli rotanti, evita ai lavoratori delle fabbriche interventi di regolazione manuali, riducendo così i tempi e i costi.

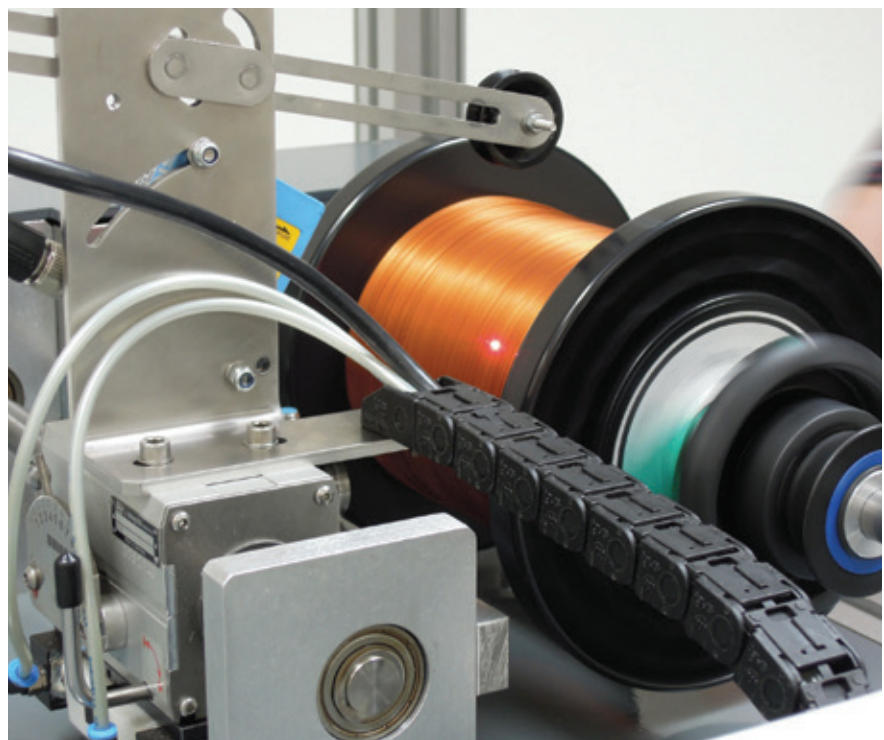
Uhing ha lanciato la seconda generazione di questo prodotto, ora equipaggiato con la nuova tecnologia di rilevamento a sensori e con una gamma di funzioni più ampia.

Accade sovente che una bobina nuova non si trovi esattamente nella stessa posizione della precedente, sebbene abbia la stessa larghezza, oppure che le bobine presentino grandi tolleranze di larghezza.

Il sistema di rilevamento di flangia senza contatto FA corregge automaticamente il punto di inversione di marcia del meccanismo di avanzamento.

Questa funzione ha subito reso il sistema FA un dispositivo indispensabile per le imprese che fabbricano prodotti destinati all'avvolgimento, in particolare per le imprese specializzate nella produzione di filo o cavo.

Una nuova caratteristica del sistema è la possibilità del prodotto di rilevare automaticamente la larghezza delle bobine e il tipo di flangia (diritto o diverso da 90 gradi). Il sistema di rilevamento flangia si adatta alla nuova posizione e larghezza se viene utilizzata una bobina



▲ Sistema di seconda generazione di Uhing

con una larghezza diversa dopo il cambio bobina.

La novità più importante del sistema FA II è il sensore laser, che sostituisce il sistema di rilevamento a fotocellula utilizzato precedentemente. Il sensore che rileva la flangia viene montato su un sistema guidafile. In un determinato campo, cattura la distanza fra la superficie del nucleo della bobina e l'altezza massima ammissibile memorizzata nel software del sistema, e salva questo valore come distanza di riferimento per ciascun nuovo strato.

Durante l'avvolgimento, il sistema di rilevamento flangia misura costantemente la relativa distanza e la confronta con la distanza di riferimento.

Quando si supera la deviazione di altezza ammissibile, anch'essa memorizzata nel sistema, viene attivata l'inversione. L'altezza misurata o la deviazione di altezza ammissibile sono visualizzate su uno schermo.

Joachim Uhing KG GmbH & Co – Germania
Website: www.uhing.com

Metodi di prova per cavi di fibra ottica con raggio di curvatura ridotto

A cura di Wayne Kachmar, ADC Telecommunications, Stati Uniti

Riassunto

Il presente articolo intende presentare un confronto fra i parametri delle prestazioni meccaniche dei cavi di guida d'onda con funzioni ottiche sia nelle fibre convenzionali sia nelle fibre con raggio di curvatura ridotto.

Coordinando i dati di prova meccanici e ottici si possono stabilire criteri di prova più appropriati per i cavi di fibra con raggio di curvatura ridotto.

Ciò assicurerà un criterio di caratterizzazione più solido, appropriato per questa nuova classe di fibra.

Introduzione

L'avvento delle fibre insensibili alle curvature, di tipo monomodale e multimodale, ha posto in dubbio l'efficacia di caratterizzazione degli attuali piani di prova dei cavi per ottenere la vita utile prevista.

Attualmente, la maggior parte dei piani di prova pubblicati si basa su valori di differenza di attenuazione a lunghezze d'onda discrete come criteri di esito positivo/negativo per vari parametri meccanici.

Con l'introduzione e l'utilizzo di nuovi tipi di fibra a raggio di curvatura ridotto, ora le forme costruttive di cavi meno solide possono superare queste prove standardizzate per cavi. Questo risultato può condurre a progetti di cavo di qualità inferiore che possono generare guasti sul campo.

Potrebbero prodursi sollecitazioni a lungo termine nelle guide d'onda ottiche e non comparire nei protocolli di misura della differenza di attenuazione attualmente raccomandati dalle prove standardizzate come Telcordia GR-409 e GR20.

Perfezionamenti della fibra

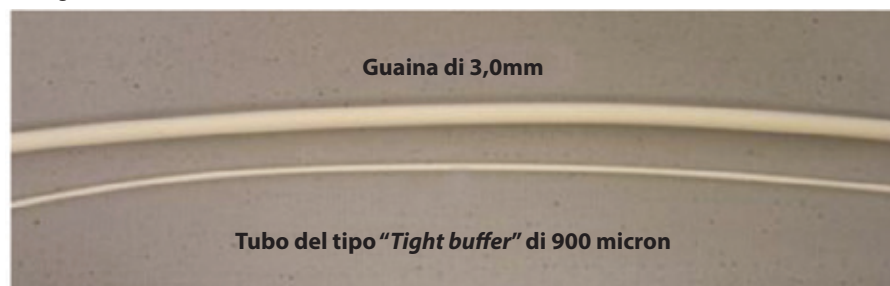
Telcordia GR-409 è la norma corrente applicata per le specifiche dei cavi di fibra per installazione interna, mentre Telcordia GR-20 fornisce un riferimento tecnico per i cavi d'esterno. Alcune società come Verizon, utilizzano versioni più sofisticate delle norme di riferimento GR-20 e GR-409, e aggiungono anche delle classificazioni supplementari.

Queste specifiche insieme definiscono le norme per le specifiche meccaniche concordate fra il cliente e il fabbricante.

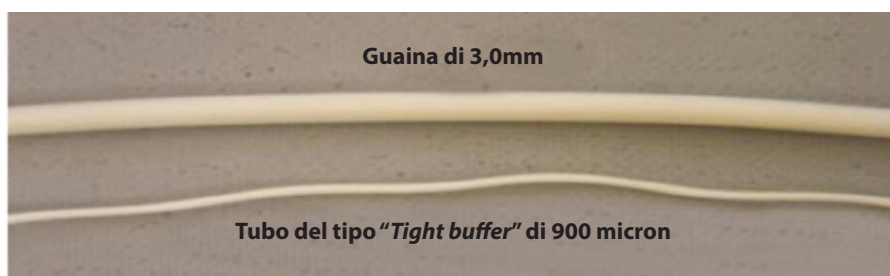
Tuttavia, i perfezionamenti ottenuti recentemente nelle fibre, in particolare in quelle con raggio di curvatura ridotto, stanno sfidando l'industria affinché riveda le norme di prova per le fibre.

Con il miglioramento delle caratteristiche di prestazione delle fibre con raggio di curvatura ridotto rispetto alle fibre

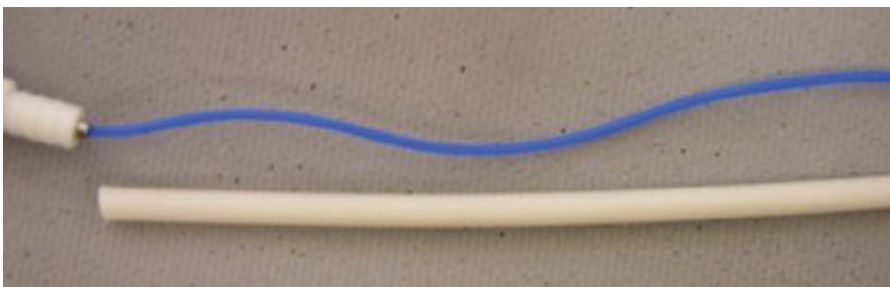
▼ **Figura 1:** Fibra con contrazione <1%



▼ **Figura 2:** Fibra con contrazione >4,5%



▼ **Figura 3:** Interfaccia di connettore di cavo con contrazione <5%



tradizionali, le norme esistenti non possono continuare a stabilire un sistema di misura universale.

Numerosi fabbricanti di fibre ottiche hanno sviluppato fibre ottiche tradizionali negli anni '70. Nel corso degli anni, vi sono stati pochi miglioramenti significativi, a parte gli sviluppi dei rivestimenti, per migliorare la capacità intrinseca della fibra di sopportare le forze meccaniche nel proprio ambiente.

Tuttavia, a parte le innovazioni del processo di trafilatura, che migliora le proprietà empiriche generali di resistenza alla trazione delle guide d'onda ottiche, i perfezionamenti delle forme costruttive delle fibre ottiche furono relativamente poco importanti fino a circa cinque anni fa. In quell'epoca, furono messe a punto numerose forme costruttive per migliorare altre caratteristiche della fibra, quali la resistenza fisica e le caratteristiche di curvatura. Fu così che furono introdotte le fibre con raggio di curvatura ridotto.

Le fibre con raggio di curvatura ridotto includono varie tecnologie praticabili. Esse comprendono versioni "trench-assisted", fibre "voids-assisted", fibre a cristallo fotonico o microstrutturate (holey fibres) e diverse altre combinazioni di tipi e tecnologie. Da un confronto con la fibra tradizionale, risulta che ciascuna di queste recenti innovazioni ha migliorato le caratteristiche e le prestazioni meccaniche della fibra ottica attuale.

Tuttavia, in questo stesso lasso di tempo, i processi di prova esistenti sono rimasti sostanzialmente invariati e continuano a dipendere dalla variazione di attenuazione basata sulle prove fisiche, meccaniche

▼ **Figura 4:** Dispositivo di prova di trazione per misuratore longitudinale FOTP-33



e ambientali. L'attenuazione continua ad essere la metodologia preferita per determinare le prestazioni di una fibra.

Tuttavia, la prova delle fibre con raggio di curvatura ridotto utilizzando gli stessi metodi impiegati per la fibra tradizionale monomodale e multimodale non prende in considerazione le proprietà specifiche di queste nuove fibre.

Ciò detto, esaminiamo ora come si induce l'attenuazione nelle fibre tradizionali e nelle fibre con raggio di curvatura ridotto.

Macrocurvature e Microcurvature

Vediamo cosa è esattamente cambiato con l'introduzione delle fibre con raggio di curvatura ridotto. Il miglioramento più evidente riguarda la capacità della fibra di piegarsi maggiormente, vale a dire che è stata ridotta la sua sensibilità alla curvatura.

Queste fibre possono curvarsi fino a 10, 7,5 o persino 5mm di raggio senza alcun aumento di attenuazione apprezzabile né danno al vetro in un ambiente a lungo termine. È stata inoltre notevolmente aumentata la resistenza alle perdite per macrocurvature e microcurvature.

Nelle trasmissioni con fibra ottica, una macrocurvatura è un'ampia curvatura visibile nella fibra ottica che può causare un'attenuazione estrinseca, ovvero una riduzione della potenza ottica nel vetro.

Le microcurvature, invece, si definiscono come imperfezioni quasi invisibili nella fibra ottica, che si creano generalmente durante il processo di fabbricazione.

Queste piccole imperfezioni inoltre possono causare una riduzione della potenza ottica, o un aumento di attenuazione. Tuttavia, le microcurvature possono essere anche dovute alle tensioni di compressione dei materiali plastici utilizzati sul vetro a causa della contrazione del polimero nella fibra.

Nelle fibre tradizionali, gli aumenti di attenuazione indicano che si è prodotta una microcurvatura nella fibra. Tuttavia, in una fibra con raggio di curvatura ridotto, le variazioni di attenuazione sono generalmente trascurabili e la stessa microcurvatura può passare inosservata fino a che si produce un guasto importante nelle prestazioni del cavo.

Di conseguenza, il guasto può avvenire con il trascorrere del tempo, durante la manipolazione o l'installazione del cavo o durante il suo invecchiamento.



▲ **Figura 5:** Sistema di misura con misuratore di deformazione della fibra ottica

Le moderne tecniche di invecchiamento utilizzate per le prove, quali l'esposizione al calore estremo, possono non mostrare un guasto sulle attuali fibre con raggio di curvatura ridotto.

Metodi di prova insufficienti

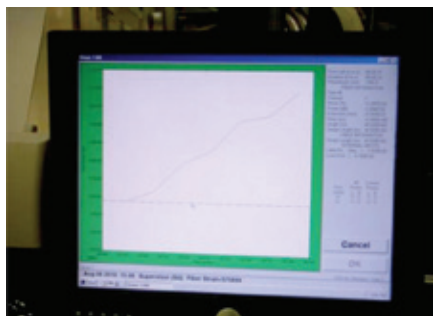
I metodi di prova esistenti per le fibre ottiche convenzionali si basano su prove meccaniche e variazioni di attenuazione, ma non specificano la forma costruttiva del cavo sottoposto alla prova.

Pertanto, se una fibra con raggio di curvatura ridotto è soggetta alle medesime prove, con una sensibilità minima alla curvatura potrebbe superare la prova anche con una microcurvatura che potrebbe generare tensioni nella fibra con il trascorrere del tempo.

Ciò significa che alcune strutture di cavo potrebbero essere concepite con difetti di progetto intrinseci e nonostante ciò comunque superare le prove delle norme esistenti che si basano esclusivamente sui requisiti della norma GR-409 per le fibre a struttura del tipo "tight buffered".

Nei cavi del tipo "loose-tube" per installazione esterna, regolamentati dalla norma GR-20, esistono diverse prove che possono stabilire se le fibre sono sottoposte a sforzo o deformazione. Attualmente, l'unico requisito per la prova di deformazione è contenuto nella norma TIA-455-33B, sezione FOTP-33a. Questa norma riguarda le prove di resistenza alla trazione per i cavi che utilizzano un componente per misurare la deformazione della fibra.

Ora il problema che si pone è se una contrazione inferiore al cinque per cento, come affermato in questa specifica,



▲ **Figura 6:** Deformazione della fibra rispetto al carico di trazione

è ancora uno standard o un valore di riferimento accettabile. Potrebbe essere un valore di misurazione troppo ampio dato che le nuove fibre insensibili alla curvatura non mostrerebbero la stessa sensibilità.

Se un'imperfezione o un difetto della fibra può essere trascurato dalle norme di prova correnti, e ciò può influenzare significativamente le fibre installate con il trascorrere del tempo, allora si dovrebbero integrare nuovi criteri, come la deformazione della fibra, ai metodi di prova, alle specifiche e alle norme di prova correnti.

Ciò che potrebbe funzionare per un cavo Bulk, può non essere adatto per le interfacce dei connettori di cavi, e ciò che può superare una prova oggi, potrebbe non funzionare durante la vita utile prevista della fibra.

Il ciclo di invecchiamento esistente è stato sviluppato utilizzando temperature elevate solo per rilevare eventuali variazioni nei componenti della guaina e del rivestimento, come l'incrudimento, la rottura o la contrazione durante il processo di invecchiamento. Oggi può essere opportuno considerare se questi composti falliscono o meno quando le prove si basano su parametri diversi. Uno di questi parametri è il coefficiente di dilatazione termica lineare, ovvero la velocità di espansione e di contrazione di un materiale in un dato profilo di temperatura.

Generalmente, la velocità di variazione del polimero è un ordine di grandezza comparato con il vetro.

Ad esempio, se si verifica una contrazione continua superiore a quella delle prove di contrazione normali e questa viene identificata da un aumento di attenuazione, com'è possibile identificarla nelle fibre con raggio di curvatura ridotto in cui gli aumenti di attenuazione sono nulli o trascurabili? La risposta è che non è possibile, fino a quando forse la fibra raggiunge un punto di svolta in cui non è più un mezzo di comunicazione funzionante a lungo termine.



▲ **Figura 7:** Misuratore di contrazione ad alta precisione

Nel caso di cavi del tipo "loose tube", può accadere l'opposto. Ciò significa che ci potrebbe essere una lunghezza di fibra eccedente e che la fibra potrebbe ammassarsi, non a causa della contrazione, ma a causa del mancato rilevamento di un aumento di attenuazione nella fibra con raggio di curvatura ridotto.

Il singolo tubo non viene testato separatamente per la contrazione, ma potrebbe essere avvolto per vari metri in un alloggiamento temporaneo senza avere la struttura dell'intero cavo per controllare la contrazione nel singolo "loose tube".

In sostanza, siccome la resistenza all'attenuazione è maggiore nelle fibre con raggio di curvatura ridotto, le microcurvature e altre sollecitazioni sulla fibra possono non essere rilevabili con le norme di prova correnti utilizzate per le fibre tradizionali.

Le norme in vigore dovrebbero essere attentamente revisionate in modo da recepire le caratteristiche specifiche delle fibre con raggio di curvatura ridotto mediante l'integrazione di criteri appropriati.

Nuove considerazioni sulle prove

È necessario integrare le norme GR-409 e GR-20 con nuovi criteri di prova che tengano conto delle caratteristiche specifiche della fibra con raggio di curvatura ridotto. Ad esempio, sarebbe opportuno completare i criteri esistenti con un sistema per misurare la deformazione della fibra.

Si dovrebbero misurare la deformazione o le sollecitazioni sui cavi di fibre per installazione interna ed esterna durante la prova di trazione FOTP-33b, l'invecchiamento e altre prove meccaniche, ove questo tipo di prove non sono attualmente previste. Ciò potrebbe essere difficile senza introdurre una nuova categoria di prove di classificazione per

la deformazione della fibra, ma le nuove fibre con raggio di curvatura ridotto lo richiedono.

Un'altra considerazione per cambiare i metodi di prova può riguardare l'introduzione della misurazione della differenza di lunghezza eccedente della fibra nei cavi del tipo "loose tube" prima e dopo l'invecchiamento e anche nei tubi singoli.

Ad esempio, l'attenuazione e la lunghezza eccedente della fibra si possono misurare prima dei processi di invecchiamento e le prove di variazione ciclica della temperatura e, nuovamente, dopo questi processi. Quindi, verrebbero confrontati per stabilire i criteri di esito positivo/negativo.

Le specifiche correnti non richiedono questo tipo di prova, né la prova in una configurazione libera ("loose tube") Attualmente, tutte le prove vengono eseguite su bobine o matasse. In una configurazione del tipo "loose tube" con matassa, la lunghezza eccedente e la lunghezza rilassata possono essere notevolmente superiori rispetto ad una linea retta.

Gli aumenti di attenuazione saranno meno evidenti senza la possibilità di misurare la lunghezza eccedente come prova meccanica.

Va osservato che le nuove misurazioni dovrebbero comprendere la lunghezza d'onda molto lunga di 1625nm. Queste nuove misurazioni comporterebbero delle classificazioni aggiuntive per la lunghezza d'onda dove il bordo della microcurvatura si sposta all'interno durante la deformazione della fibra.

Sebbene alcuni clienti impongono questo requisito nelle proprie norme, essa non è tuttavia inclusa nelle attuali norme generali riguardanti le fibre. Le prove di contrazione del cavo richiedono di passare a un livello di ripetibilità superiore e infatti sono stati progettati degli strumenti di misura specifici. Inoltre, è necessario determinare la gamma di prove e l'effetto dell'estrusione della fibra dal nucleo del cavo. Questo è solo un effetto secondario della norma GR 326, la norma di prova per connettori di cavi e sistemi di cavi.

Conclusioni

L'introduzione di fibre con raggio di curvatura ridotto e la loro crescente popolarità nelle architetture di fibre FTTP (*fiber-to-the-premise*) è oggetto di preoccupazione quando si tratta di applicare le norme correnti GR-409, GR-20, GR 326 e altre specifiche standard create

per le fibre convenzionali. Si dovrebbero proporre nuovi test per definire con precisione le loro caratteristiche specifiche e assicurare una maggiore affidabilità a lungo termine.

Una forma costruttiva di cavo che si avvantaggia delle fibre con raggio di curvatura più stretto, presenterà sicuramente un'attenuazione notevolmente superiore utilizzando la fibra monomodale convenzionale. In altre parole, una fibra con raggio di curvatura ridotto avrebbe un'ottima durata in un ambiente invece inadatto per la fibra convenzionale.

L'interfaccia del cavo al connettore può creare nuovi modelli di invecchiamento in cui la contrazione del cavo può comportare raggi di curvatura della fibra inaccettabili all'interfaccia cavo/connettore. I risultati saranno visibili solamente dopo l'invecchiamento e lo spostamento dei sistemi di cavi "loose tube".

Ciò è sufficiente a indicare la necessità di una serie di norme e requisiti di prova revisionati per tipi di fibra con raggio di curvatura ridotto.

Le forme costruttive di cavi testati conformemente alle norme GR 409 o GR 20 sono i requisiti per le prove secondo la norma GR 326. È necessario utilizzare la deformazione della fibra e la contrazione del cavo nonché l'estrusione della fibra dai cavi dopo l'invecchiamento come precursore più completo delle prove GR326. Inoltre, con l'aumento delle gamme operative ambientali dei cavi che diventa la norma, i valori del coefficiente di espansione termica lineare devono essere inclusi nei requisiti del precursore delle prestazioni della specifica.

Il presente studio si propone di aggiornare le norme esistenti, in particolare le specifiche GR-409 riguardanti le tolleranze richieste per la contrazione e la deformazione della fibra.

Altrimenti, è possibile che le forme costruttive dei cavi di livello inferiore alla media, siano approvate dalle norme correnti così come sono scritte e installate sul campo. Va riconosciuto che la fibra tradizionale e la fibra con raggio di curvatura ridotto presentano proprietà e caratteristiche distinte e i criteri di prova dovrebbero essere adattati ai requisiti di entrambe. Pertanto, la proposta è di considerare l'idea di integrare i criteri di prova più appropriati alle specifiche delle norme già esistenti.

Effettivamente, ciò comporta la creazione di una nuova classe di classificazioni GGR-409 e GGR-20 che identificano

in modo specifico le fibre utilizzate e classificate per qualsiasi forma costruttiva di cavo. Riformulare le norme correnti tenendo conto delle fibre con raggio di curvatura ridotto, consentirà ai fornitori di servizi di avvantaggiarsi al massimo delle caratteristiche uniche offerte da queste fibre, in particolare per le installazioni FTTP attuali. ■

Ringraziamenti

L'autore desidera ringraziare Wagner Aguiar, Ken Nardone, Henry Rice, e Bill Jacobsen per le informazioni e i dati ottenuti per le prove descritte nel presente articolo.

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Inaugurando una nueva era con hilo de cobre

OLVIDÉMONOS del tradicional corte de cinta inaugural, para celebrar la apertura de su nueva planta en Malu Town, SAMP Shanghai dio inicio a una gran ceremonia de inauguración cortando en esta ocasión hilo de cobre.

La nueva planta, proyectada para fabricar máquinas y equipos para el sector del hilo y del cable, ocupa una superficie de 4.500m², con cuya producción de vanguardia la empresa duplica su presencia en la zona.

El corte de cinta inaugural fue celebrado de manera poco convencional. En esta ocasión, los dignatarios que declararon la apertura de la planta cortaron hilo de cobre, el producto final de las máquinas fabricadas en la planta de Shanghai.

Varios centenares de invitados procedentes de 20 países asistieron a la ceremonia, en la que participó Wang Chun, gobernador de Malu Town, Vincenzo De Luca, Cónsul General de Italia en Shanghai, Dominique Perroud, director general de SAMP Shanghai, y Antonio Maccaferri, presidente del grupo SAMP, quien pronunció también varios discursos para el acontecimiento.

Los comentarios del Sr. Perroud pusieron en relieve el interés del grupo SAMP por el mercado chino y el mercado de la Asociación de Naciones del Sudeste Asiático: "En los últimos años, SAMP ha vivido una época de desarrollo extraordinario en China, gracias a la



▲ Dignatarios que inauguraron la nueva planta de SAMP

continua confianza de nuestros clientes y al duro trabajo llevado a cabo por nuestros empleados, a su dedicación y a su experiencia.

"Hoy, una planta de producción grande y absolutamente a la vanguardia abre una nueva era de crecimiento.

"Nuestro objetivo es ofrecer a nuestros clientes lo que más necesitan y valoran, de manera rentable y sostenible. Esta

nueva planta flexible nos permitirá poner en práctica nuestros planes de energético crecimiento en el mercado asiático."

Después de la ceremonia, todos los invitados asistieron a una cena de gala en el Hotel Marriott de Jiading, donde la música y danza tradicional china amenizaron la velada.

Sampsistemi SpA – Italia
Website: www.sampsistemi.com

Rodillos laminadores de roscas de doble eje

Los nuevos rodillos laminadores de roscas de doble eje de Videx están diseñados para laminar roscas por encima y por debajo del hombro del tornillo. Las roscas pueden ser distintas o parecidas.

Las dos cabezas son independientes, lo que evita que una interfiera con la otra y permite usar hileras de laminación simples y baratas.

Estos nuevos rodillos ofrecen las ventajas siguientes:

- Ajustes independientes que garantizan mejor calidad en cada rosca.
- Velocidades de producción más elevadas. La segunda operación no frena la máquina.

- Menos operaciones de manejo, lo que evita mezclar las piezas.
- Herramientas baratas y control total de la calidad de cada operación de laminación. Los útiles de trabajo son sustituidos en tan sólo unos minutos.

Las dos estaciones disponen de inicio de laminación de roscas controlado, sujeción hidráulica, mecanismo sin concididad para roscas paralelas y tornillos a presión para roscas micrométricas, además de controlador de velocidad de c.a., apagado de aire automático y dos paneles de mando para el operador.

Videx Machine Engineering Ltd – Israel
Website: www.videx.co.il

Planta nueva abre sus puertas

Flymca & Flyro han abierto una planta nueva.

La planta comprende nuevas instalaciones para la producción de máquinas giratorias nuevas y un almacén de maquinaria de ocasión.

La empresa, que se extiende por una superficie total de 5.000m² y cuenta también con oficinas nuevas, podrá llegar a una capacidad productiva de máquinas de alta calidad mucho mayor.

La empresa, muy activa en el sector de las máquinas giratorias para el tendido de cables submarinos, umbilicales y costa afuera, ya sea para cables de potencia, ya sea para cables de acero, también produce su propia gama de trenzadoras rígidas, tubulares, reunidoras, planetarias, pareadoras de tambor, cableadoras de lira, bunchadoras de doble torsión.

Flymca & Flyro – España
Website: www.flymca.com

Uhing lanza su sistema detector de brida para accionamientos con anillos rodantes de próxima generación

EN 2004 Uhing complementó su gama de productos con el sistema detector de brida sin contacto FA para accionamientos con anillos rodantes.

Esta económica solución, que corrige automáticamente los puntos de inversión de marcha de los mecanismos de avance con anillos rodantes, evita que los trabajadores de las fábricas tengan que efectuar ajustes a mano, acortando así tiempos y costes.

Uhing ha lanzado la segunda generación de este producto, que ahora llega equipado con la nueva tecnología de sensores y con una gama de funciones más amplia.

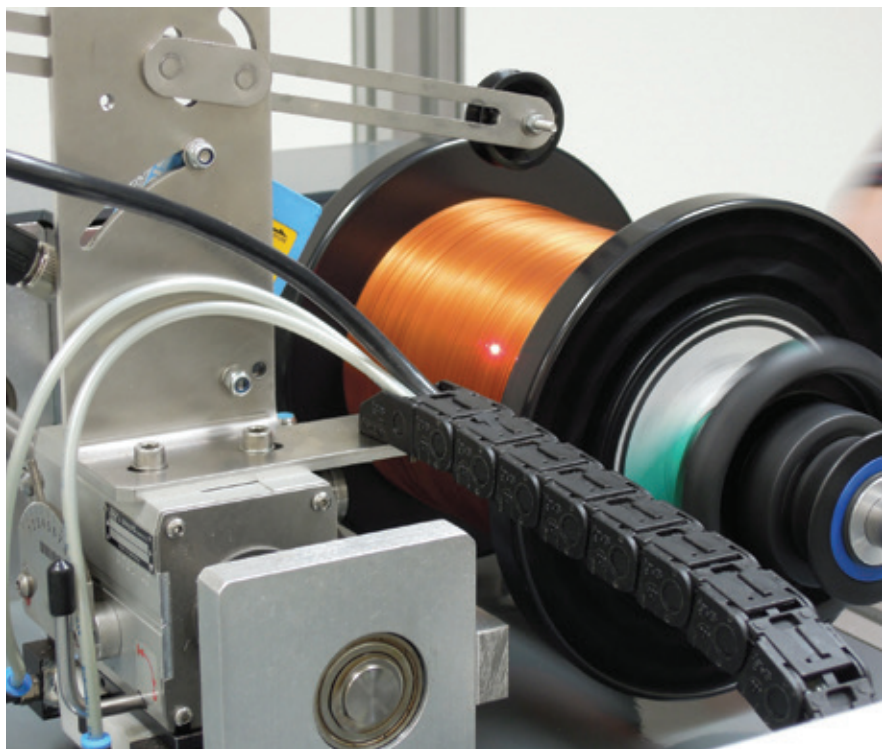
Sucede a menudo que un carrete nuevo no quede exactamente en la misma posición que el anterior, aunque tenga el mismo ancho, o que los carretes tengan grandes tolerancias de anchura.

El sistema detector de brida sin contacto FA corrige el punto de inversión de marcha del mecanismo de avance automáticamente.

Esta función convirtió pronto al sistema FA en un dispositivo indispensable para las empresas que fabrican productos que deben ser enrollados, en particular para empresas que producen hilo o cable.

Una característica nueva del sistema es la posibilidad de detectar automáticamente la anchura de los carretes y el tipo de brida (rectas o que no sean en 90 grados).

Si al cambiar de carrete, se usa un carrete de distinta anchura, el sistema detector de brida se ajusta a la nueva posición y anchura.



▲ Sistema de segunda generación de Uhing

La novedad más importante del sistema FA II es el sensor láser, que sustituye al sistema detector de barrera luminosa anterior.

El sensor que detecta la brida va montado en el mecanismo de avance. En un determinado campo de medida, captura la distancia (offset) entre la superficie del núcleo del carrete y la altura máxima admitida memorizada en el software del sistema, y guarda este valor como distancia de referencia para cada capa nueva.

Durante el bobinado, el sistema detector

de brida mide constantemente la distancia de cada carrete y lo compara con la distancia de referencia.

Cuando se supera la desviación de altura admitida, también memorizada en el sistema, se invierte el sentido de avance.

La altura medida o la desviación de altura admitida aparecen indicadas en una pantalla.

Joachim Uhing KG GmbH & Co – Alemania
Website: www.uhing.com

Métodos de prueba para cables de fibra óptica con radio de curvatura reducido

Por Wayne Kachmar, ADC Telecommunications, EE.UU.

Resumen

Este estudio intenta comparar los parámetros del rendimiento mecánico de los cables guía de onda con funciones ópticas constituidos por fibras convencionales y por fibras de radio de curvatura reducido.

Coordinando los datos de prueba mecánicos y ópticos se pueden establecer criterios de prueba más apropiados para los cables de fibra con radio de curvatura reducido. Esto aseguraría un criterio de caracterización más sólido, apropiado para esta nueva clase de fibra.

Introducción

El desarrollo de fibras insensibles a la curvatura monomodo y multimodo ha puesto en duda la efectividad de caracterización de los actuales planes de prueba de cables para obtener la vida útil esperada.

Actualmente, los planes de prueba más publicados se basan en valores de diferencia de atenuación a longitudes de onda discretas como criterios "pasa-no pasa" para varios parámetros mecánicos.

Con la introducción y el uso de nuevos tipos de fibra de radio de curvatura reducido, ahora dichas pruebas normalizadas pueden ser superadas por diseños de cables menos resistentes. Esto puede llevar a diseños de cable de calidad inferior que pueden generar fallos en campo.

A largo plazo podrían surgir tensiones en las guías de onda ópticas y no figurar en los protocolos de medida de la diferencia de atenuación establecidos actualmente en pruebas normalizadas como las Telcordia GR-409 y GR20.

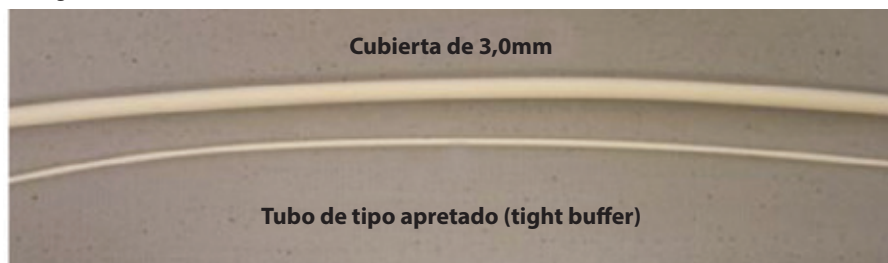
Mejoras de la fibra

Telcordia GR-409 es la norma corriente aplicada a los cables de fibra para interiores, mientras que Telcordia GR-20 representa una referencia técnica para cables de exterior. Algunas compañías, como Verizon, emplean versiones más sofisticadas que las de referencia GR-20 y GR-409, y añaden también otras clasificaciones.

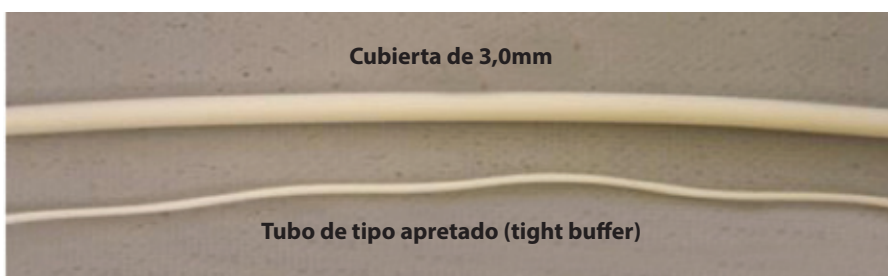
Estas especificaciones juntas definen las normas para las prestaciones mecánicas concordadas entre el cliente y el fabricante.

Sin embargo, las mejoras obtenidas recientemente en las fibras, concretamente en las de radio de curvatura reducido, están desafiando a la industria para que revise las normas de prueba para fibras.

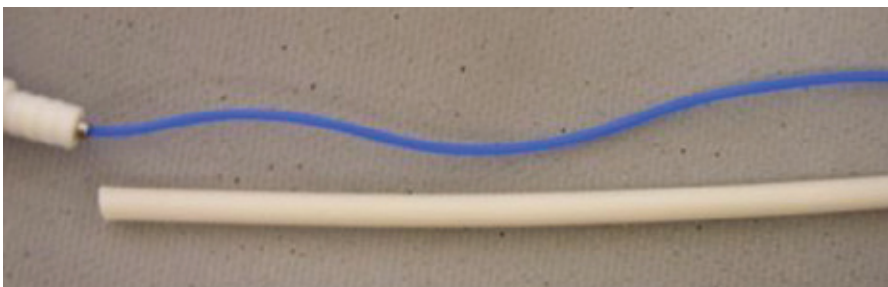
▼ **Figura 1:** Fibra con contracción <1%



▼ **Figura 2:** Fibra con contracción >4,5%



▼ **Figura 3:** Interfaz de conector de cable con contracción <5%



Con la mejora de rendimiento de las fibras con radio de curvatura reducido respecto a las fibras convencionales, las normas existentes no pueden seguir estableciendo un método de medida para tipo de cable.

Muchos fabricantes de fibra óptica desarrollaron fibras ópticas convencionales en los años setenta. A lo largo de los años se han visto pocas mejoras significativas, aparte de los desarrollos de los revestimientos, para mejorar la capacidad intrínseca de la fibra de soportar fuerzas mecánicas en su entorno.

Pero, aparte de las innovaciones del proceso de trefilado, que mejora las propiedades empíricas de resistencia a la tracción generales de las guías de onda ópticas, las mejoras de los diseños de la fibras ópticas fueron relativamente poco importantes hasta aproximadamente cinco años atrás.

En aquel momento, emergieron varios conceptos para mejorar otras características de la fibra, como la resistencia física y las características de curvatura. Esta fue la introducción de las fibras con radio de curvatura reducido.

Las fibras con radio de curvatura reducido incluyen varias tecnologías viables. Comprenden variedades "trench-assisted", fibra "voids-assisted", fibras de cristal fotónico o microestructuradas (*holey fibres*), y varias otras combinaciones de tipos y tecnologías. Cuando se comparan con la fibra convencional, resulta que cada una de estas innovaciones ha mejorado las características y las prestaciones mecánicas de la fibra óptica de hoy en día. Sin embargo, en ese mismo intervalo

▼ **Figura 4:** Dispositivo de prueba de tracción para medidor de longitudes largas FOTP-33



de tiempo, los procesos de prueba no cambiaron prácticamente, sino que siguieron basándose en el cambio de atenuación observado mediante pruebas físicas, mecánicas y ambientales.

La atenuación continúa siendo la metodología preferida para determinar las prestaciones de la fibra. Sin embargo, la prueba de fibras de radio de curvatura reducido utilizando los mismos métodos que con la fibra convencional monomodo y multimodo no toma en consideración las propiedades específicas de estas nuevas fibras.

Considerando esto, vamos a ver cómo se induce la atenuación en las fibras convencionales y en las fibras con radio de curvatura reducido.

Macrocurvaturas y microcurvaturas

Veamos, ¿qué ha cambiado exactamente con la introducción de las fibras de radio de curvatura reducido?

La mejora más evidente es la capacidad de la fibra para curvarse más, es decir, se ha reducido su sensibilidad a la curvatura. Estas fibras se pueden curvar hasta 10, 7,5 o incluso 5mm de radio sin aumentos de atenuación apreciables ni daño del vidrio en un entorno, a largo plazo. Se ha aumentado también significativamente la resistencia a pérdidas por macrocurvaturas y microcurvaturas.

En las transmisiones con fibra óptica, una macrocurvatura es una amplia curvatura visible en la fibra óptica que puede causar atenuación extrínseca, es decir, una reducción de la potencia óptica en el vidrio.

Las microcurvaturas, en cambio, se definen como imperfecciones casi invisibles de la fibra óptica, que se crean normalmente durante el proceso de fabricación. Estas pequeñas imperfecciones también pueden causar una reducción de la potencia óptica, o un aumento de atenuación.

Sin embargo, las microcurvaturas pueden ser debidas también a tensiones por compresión de los materiales plásticos utilizados en el vidrio a causa de la contracción del polímero en la fibra.

En la fibra convencional, los aumentos de atenuación indican que se ha producido una microcurvatura en la fibra. Sin embargo, en una fibra con radio de curvatura reducido, los cambios de atenuación suelen ser mínimos y la misma microcurvatura puede pasar desapercibida



▲ **Figura 5:** Sistema de medición con medidor de deformación de la fibra óptica

hasta que se produce un fallo importante en las prestaciones del cable. Por lo tanto, el fallo puede ocurrir con el transcurso del tiempo, mientras se maneja, se instala o envejece el cable.

Las técnicas de envejecimiento modernas que se usan para las pruebas, como la exposición a calor extremo, pueden pasar por alto un fallo en las fibras de radio de curvatura reducida corrientes.

Métodos de prueba insuficientes

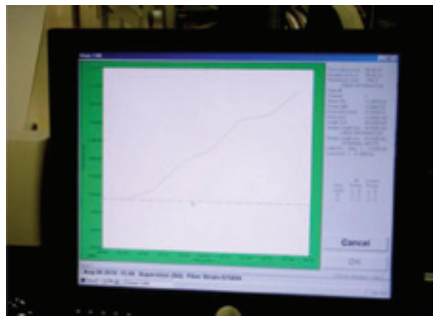
Los métodos de prueba existentes para fibra óptica convencional se basan en pruebas mecánicas y cambios de atenuación, pero no especifican el diseño del cable que se prueba.

Por lo tanto, si una fibra con radio de curvatura reducido está sujeta a las mismas pruebas, con una sensibilidad mínima a la microcurvatura podría pasar la prueba incluso con una microcurvatura que podría generar tensiones en la fibra con el paso del tiempo.

Esto significa que se podrían crear diseños de cables con fallos de diseño intrínsecos y a pesar de ello superar las pruebas de las normas existentes, que se basan únicamente en el contenido de la norma GR-409 para fibras de construcción apretada (*tight buffered*).

Para los cables de fibra de tubo holgado (*loose tube*) para exteriores, reglamentados por la norma GR-20, hay varias pruebas que pueden determinar si las fibras están sometidas a esfuerzo o deformación.

Actualmente, el único requisito para las pruebas de deformación está contenido en la norma TIA-455-33B sección



▲ **Figura 6:** Deformación de la fibra respecto a la carga de tracción

FOTP-33a. Esta cubre las pruebas de tracción de cables que usan un componente para medir la deformación de la fibra.

Ahora, la cuestión es si una contracción inferior al cinco por ciento, como se afirma en esta especificación, es o no es un valor o estándar de referencia aceptable. Podría ser un valor demasiado amplio porque las nuevas fibras insensibles a la curvatura no tendrían la misma sensibilidad.

Si un fallo o defecto de la fibra puede ser pasado por alto por las normas de prueba corrientes, y con el paso del tiempo puede afectar significativamente a las fibras instaladas, entonces, se deberían añadir nuevos criterios, como la deformación de la fibra, a los métodos, especificaciones y normas de prueba corrientes.

Lo que puede funcionar para un cable *bulk* puede no funcionar para interfaces de conectores de cables, y lo que puede pasar una prueba hoy, podría no funcionar durante la vida útil esperada de la fibra.

El ciclo de envejecimiento actual fue desarrollado usando altas temperaturas sólo para detectar cambios en los compuestos de la cubierta y del revestimiento, como el endurecimiento, agrietamiento o contracción durante el proceso de envejecimiento.

Hoy en día, puede ser acertado considerar si estos compuestos fallan o no cuando las pruebas se basan en distintos parámetros. Uno de estos parámetros es el coeficiente de dilatación térmica lineal, es decir la velocidad de expansión y contracción de un material en un determinado perfil de temperatura. Normalmente, la velocidad de variación del polímero es un orden de magnitud comparado con el vidrio.

Por ejemplo, si se produce contracción continua superior a la de las pruebas de contracción normales y es detectada por un aumento de atenuación, ¿cómo se detecta en fibras con radio de curvatura reducido donde no se generan aumentos de atenuación o son mínimos?



▲ **Figura 7:** Medidor de contracción de alta precisión

La respuesta es que no es posible, probablemente, hasta que la fibra no alcance un punto de no retorno donde ya no es un medio de comunicación a largo plazo viable.

En el caso de los cables de tubo holgado (*loose tube*), puede ocurrir lo contrario. Es decir, puede haber demasiada longitud de fibra en exceso y la fibra podría quedar apiñada, no debido a la contracción, sino por no haber detectado un aumento de atenuación en la fibra con radio de curvatura reducido.

El tubo solo no es probado separadamente para la contracción, pero puede ser enrollado varios metros en un alojamiento provisional y no tener el diseño de todo el cable para controlar la contracción sólo del tubo holgado.

Lo importante es que la resistencia a la atenuación es mayor en las fibras con radio de curvatura reducido, y por lo tanto, las microcurvaturas u otras tensiones de la fibra pueden no ser detectados con las normas de prueba corrientes para fibra convencional.

Las normas existentes deberían ser revisadas atentamente y se deberían añadir criterios apropiados para incluir las características específicas de las fibras con radio de curvatura reducido.

Nuevas consideraciones sobre las pruebas

Es necesario añadir nuevos criterios de prueba a las normas GR-409 y GR-20 dadas las características peculiares de la fibra de radio de curvatura reducido.

Por ejemplo, se debería añadir a los criterios de prueba existentes un sistema para medir la deformación de la fibra. Se debería medir la deformación o la tensión en cables de fibras de interiores y exteriores durante la prueba de tracción FOTP-33b; del mismo modo, se debería medir el envejecimiento y efectuar otras pruebas mecánicas cuando este tipo de

pruebas no esté previsto. Esto puede ser difícil sin introducir una nueva serie de pruebas de clasificación para deformación de la fibra, pero las nuevas fibras con radio de curvatura reducido lo exigen.

Otra consideración para cambiar los métodos de prueba puede ser introducir la medida de la diferencia de longitud de fibra en exceso en cables de tipo holgado antes y después del envejecimiento y también en tubos solos. Por ejemplo, la atenuación y la fibra en exceso se pueden medir antes de los procesos de envejecimiento y pruebas de variación cíclica de la temperatura, y, luego, de nuevo después de estos dos procesos. Luego, se compararían con los criterios establecidos de "pasa-no pasa".

Las especificaciones corrientes no requieren este tipo de pruebas o la prueba en configuración de tubo holgado. Normalmente, todas las pruebas se hacen en carretes o bobinas.

En un tubo holgado enrollado puede haber mucha más longitud en exceso y longitud relajada que en una línea recta. Los aumentos de atenuación serían menos evidentes sin la posibilidad de medir la longitud en exceso como prueba mecánica.

Conviene observar que las mediciones deberían incluir la longitud de onda larga de 1625nm. Estas nuevas mediciones supondrían clasificaciones adicionales para la longitud de onda donde el borde de la microcurvatura se mueve hacia adentro mientras la fibra se deforma.

Aunque algunos clientes imponen este requisito en sus propias normas, no está incluido en las normas actuales para fibra corriente.

Las pruebas de contracción del cable necesitan registrar un nivel de repetibilidad más alto; para ello se han diseñado instrumentos de medida específicos.

También es necesario determinar la gama de pruebas y el efecto de la extrusión de la fibra desde el núcleo del cable. Esto sólo es un efecto secundario de la norma GR 326, la norma de prueba para conectores de cables y conjuntos de cables.

Conclusiones

La introducción de fibras de radio de curvatura reducido y su creciente popularidad en las arquitecturas de fibra hasta las instalaciones (FTTP) es objeto de preocupación cuando se intenta aplicar las normas corrientes GR-409, GR-20, GR 326 y otras normas de especificación creadas para fibras convencionales.

Se deberían proponer nuevas pruebas para determinar atentamente sus características únicas para asegurar mayor fiabilidad a largo plazo.

Un diseño de cable que salga beneficiado con la fibra con radio de curvatura más estrecho mostraría seguramente una atenuación más alta usando fibra monomodo convencional. En otras palabras, una fibra con radio de curvatura reducido sobreviviría muy bien en un entorno donde una fibra convencional no podría.

La interfaz del cable al conector puede crear nuevos modelos de envejecimiento donde la contracción del cable puede llevar a radios de curvatura de la fibra inaceptables en la interfaz cable-conector.

El resultado sería perceptible solamente después de envejecer y mover el conjunto de cables de tubo holgado. Esto por sí solo indica que se necesita una serie de normas y requisitos de pruebas revisados para tipos de fibra con radio de curvatura reducido.

Los diseños de cables probados según las normas GR 409 o GR 20 son los requisitos para las pruebas según la norma GR 326. Es necesario usar la deformación de la fibra y la contracción del cable, además de la extrusión de la fibra en cables después del envejecimiento como precursor más completo de las pruebas GR326.

Además, con el mayor rendimiento operativo de los cables que se convierten en la norma, los valores del coeficiente térmico de expansión lineal deben ser incluidos en los requisitos del precursor de rendimiento de la especificación.

Este estudio propone actualizar las normas existentes, en particular las especificaciones GR-409 sobre la tolerancia requerida para la contracción y la deformación de la fibra.

De lo contrario, puede suceder que los diseños de cables de nivel inferior al estándar superen las normas existentes tal como están escritas y sean instalados en campo. Se debería reconocer que la fibra convencional y la fibra con radio de curvatura reducido tienen propiedades y características distintas, y los criterios de prueba deberían ser adaptados a los requisitos de ambas.

Por lo tanto, nuestra propuesta es considerar la idea de añadir criterios de prueba más apropiados a las especificaciones de las normas existentes.

Esto significa crear una nueva clase de clasificaciones GGR-409 y GGR-20 que identifiquen específicamente las fibras

usadas y clasificadas para cada diseño de cable específico. Rediseñar las normas corrientes considerando las fibras con radio de curvatura reducido permitirá a los proveedores de servicios aprovechar al máximo las características únicas que brindan estas fibras, en particular en instalaciones FTTP corrientes. ■

Agradecimientos

El autor expresa su agradecimiento a Wagner Aguiar, Ken Nardone, Henry Rice, y Bill Jacobsen por la ayuda prestada para obtener los datos y la información sobre las pruebas citadas en este estudio.

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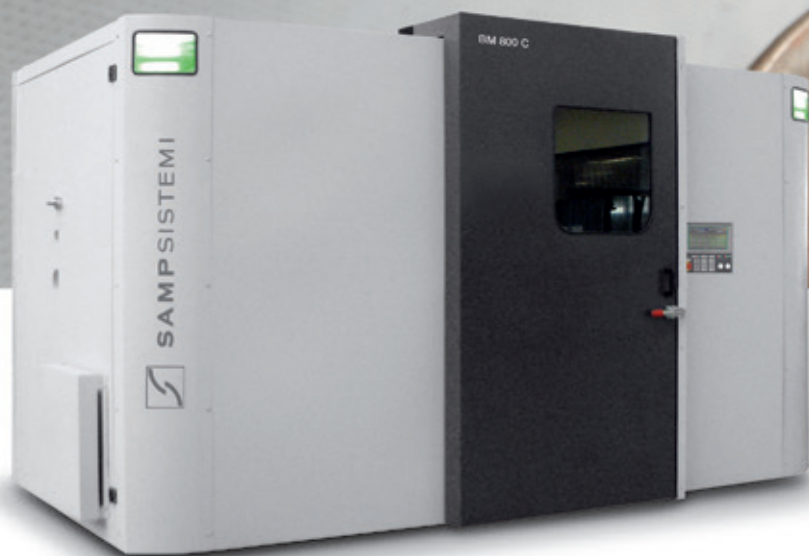
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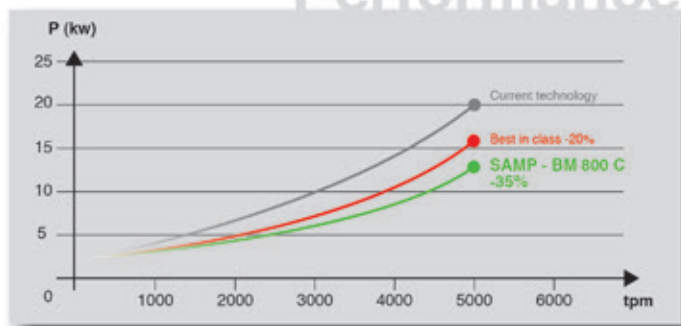
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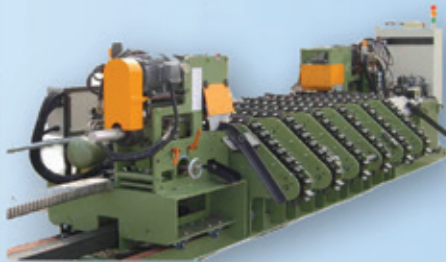
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