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# Wire & Cable

July 2017

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## ASIA 线缆展



WireShow 2017

Date:08.30-09.01

Booth: W5D03



Tube & Wire Southeast Asia 2017

Date:09.19-09.21

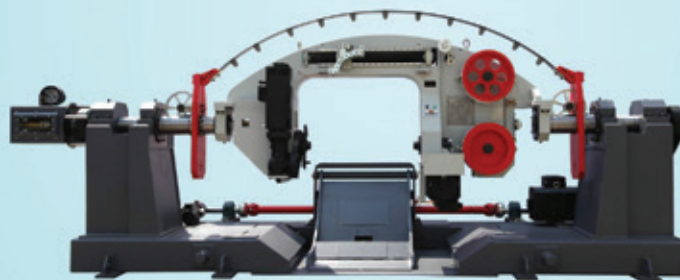
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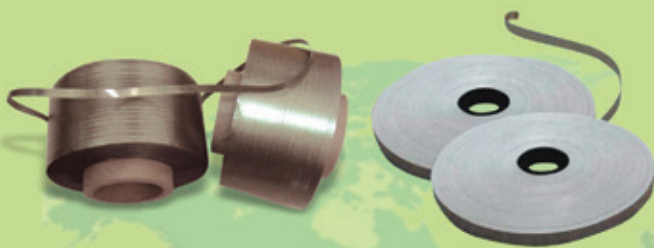
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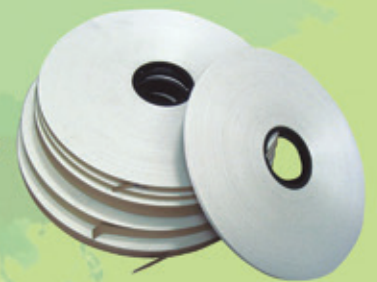
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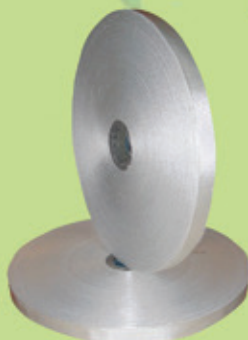
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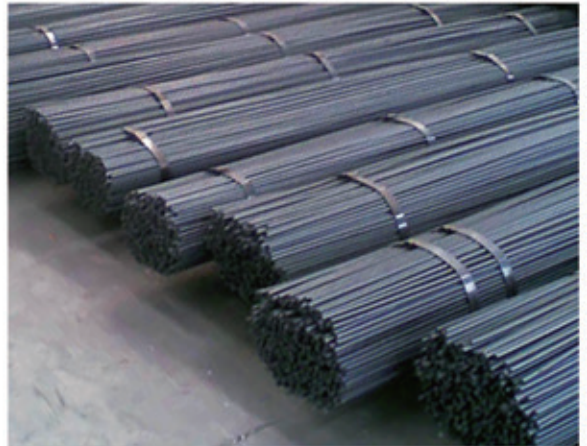




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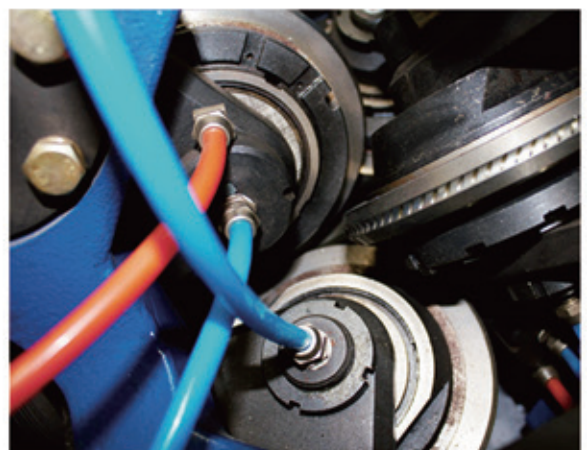
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Wire & Cable ASIA is published six times a year. It is distributed throughout North and South-east Asia to registered readers in wire, cable and wire component producer and consumer industries. Annual subscriptions are available from just US\$80.

《亚洲线缆》一年出版六期，面向整个北亚、东南亚地区的电线、电缆和线材制品的生产商和用户发行。订阅一年：欧元140；英镑120；美元195。



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# Quality throughout industry

If the importance of the American market needed highlighting, it was left to this year's Interwire to drive the message home to both exhibitors and visitors alike.

"This was one of the best Interwires on record," exclaimed one exhibitor; "Interwire 2017 was a solid show and provided us with good leads," hailed another.

The Wire Association International – organisers of the three-day exhibition and annual convention – were also enthused by attendance figures at its workshops, with a number being standing room only.

WAI president David Hawker was rightly enthusiastic about the event, staged at Atlanta, Georgia's World Congress Center.

"We had a sold-out exhibit floor, tremendous involvement of corporate sponsors, and incredible level of volunteer participation, which all point to the health and commitment of WAI's support network," said Mr Hawker. "The level and stature of the attendees confirm that Interwire is a core event in our industry."

Our review starts on page 52.

Quality also seems to be a keyword for a number of companies in this issue, with Leoni being singled out as the Germany-headquartered business celebrates its 100<sup>th</sup> anniversary.

The company – with sales last year of some €4.4 billion – launched a successful reorganisation of its wiring systems divisions in China, Mexico and India last year, and acquired a 51 per cent stake in the Chinese wiring systems manufacturer Wuhan Hengtong Automotive. For full details, turn to page 20.



David Bell  
Editor

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## When and where

### 2017

19–21 September:  
**wire Southeast Asia** –  
trade exhibition –  
Bangkok, Thailand  
**Organisers:**  
Messe Düsseldorf  
Asia Pte Ltd  
**Fax:** +65 6337 4633  
**Email:** wire@mda.com.sg  
**Website:** www.  
wire-southeastasia.com

### 2017

3–5 October:  
**wire South America** –  
trade exhibition –  
São Paulo, Brazil  
**Organisers:**  
Messe Düsseldorf GmbH  
**Fax:** +49 211 4560 668  
**Email:** info@  
wire-south-america.com  
**Website:** www.  
wire-south-america.com

### 2017

8–11 October:  
**IWCS Technical  
Symposium** –  
conference and  
exhibition –  
Orlando, Florida, USA  
**Organisers:**  
IWCS  
**Tel:** +1 717 993 9500  
**Email:** phudak@iwcs.org  
**Website:** www.iwcs.org

### 2017

7 November:  
**CabWire 2017** –  
conference –  
Düsseldorf,  
Germany  
**Organisers:**  
IWMA  
**Fax:** +44 121 781 7404  
**Email:** info@iwma.org  
**Website:**  
www.iwma.org





○ With a line speed of up to 200m/min, the loose tubes are stranded at 2,500rpm

# A new concept to help performance and cost

SZ-STRANDING for fibre optic cables has been improved. Rosendahl and Nextrom have elaborated a concept which coordinates performance and costs in one line.

What has been achieved is a low total cost of ownership (TCO). This is a result of higher overall equipment effectiveness (OEE) and longer product lifetime, with fewer spare part needs. The line itself is designed for a short set-up time, which also supports increased OEE.

Performance improvement speed is usually a key factor. With a line speed of up to 200m/min, the loose tubes are stranded at 2,500rpm.

But speed alone does not fulfil all the requirements a manufacturer has on a production line. Integrated components also have to react precisely at high speeds. The new ROBI cross binder from Rosendahl Nextrom keeps up with the speed while at the same time securing low tension for the stranded bundle.

The active yarn tension control ensures that the tension

does not harm the tubes or bundle. When it comes to thin-wall products, the ROBI demonstrates accurate binding quality with perfect tension – even when crossbinding soft tubes or soft bundles.

Currently, the OFC 70/RL-R SZ-stranding line is claimed to offer the shortest reversal time on the market. The company can also provide a tailor-made lay plate design depending on the product mix.

DPT is Rosendahl Nextrom's solution for space-saving payoff design for loose tubes. The integration of two payoff positions in one common machine frame helps to save shop floor space. The DPT is available in two sizes, either for spools with up to 800mm or up to 1,000mm flange diameter.

Especially regarding product designs with two or more layers of stranded tubes, the DPT can reach its full potential in terms of space savings.

**Rosendahl Nextrom – Austria**  
**Website:** [www.rosendahlnextrom.com](http://www.rosendahlnextrom.com)



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# 11<sup>th</sup> Wire and Cable conference heads to Munich

GERMANY has emerged as a world renewable energy leader, which makes the country the perfect place to understand the future of wire and cable consumption in power generation.

This year's CRU-organised Wire and Cable conference will include special highlight sessions that focus on the future of renewable energy, connected living, automotive electronics and subsea wire and cable usage.

These sessions will explore next-generation applications of wire and cable and how they will impact producers, traders and distributors around the world.

CRU provides analysis of the optical fibre and cable industry from every angle, giving insight into industry trends, from price movements to changes in demand.



○ Nicola Coslett  
CRU Events creates industry leading commercial and technical events around the world, and chose to bring the conference to Munich as the Bavarian capital is Germany's undisputed technology centre and boasts one of the world's largest IT, communication and automotive industry hubs.

"We are really excited about the conference this year," said Nicola Coslett, CEO of CRU Events. "It is such an exciting time for the wire and cable industry.

"As with previous years, the event will open with shared plenary sessions and then split into streams that drill down separately on energy cable and communication cable issues.

"In this way, we bring together the entire supply chain from across global wire and cable industry. Opening sessions will explore the key regional markets and the economic factors affecting wire and cable trade flows," she added.

The event will have over 30

presentations packed into a two-day programme, in addition to a site visit to the Niehoff plant.

There will be a number of in-depth papers on copper, aluminium, optical fibre, coatings and other input markets, as well as a showcase of the latest

technical innovations that may disrupt this sector. The conference is being held 17<sup>th</sup>-19<sup>th</sup> July at The Westin Grand in Munich, Germany.

**CRU – UK**

**Website:**

[www.wireandcableconference.com](http://www.wireandcableconference.com)

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## Increasing commitment in China

CIMTEQ Ltd, a software provider for the design and manufacturing of cables, has signed a partner agreement with Shanghai Hooding International Trading Co Ltd to develop Cimteq software solutions services for wire and cable companies in China, strengthening the company's commitment to deliver innovative software products and services to the cable manufacturing industry in the country.

Shanghai Hooding and Cimteq will work closely together to develop the Chinese market for Cimteq software. This partnership ensures that local expertise and support is available for Cimteq implementations in China.

Bruce Lau, general manager at Shanghai Hooding, said: "It is our honour for Shanghai Hooding to form a deep and professional partnership with Cimteq to bring innovation and make the Smart Factory and Industry 4.0 a reality for Chinese cable and wire manufacturers."

Ali Shehab, CEO at Cimteq, added: "Our partnership with Shanghai Hooding allows us to serve the Chinese market through a local partner which will greatly strengthen our market position and boost our development pace across China.

"At Cimteq, we are committed to providing innovative software solutions that add value by increasing efficiency,



○ From left, Ali and Amanda Shehab, of Cimteq, and Bruce Lau, of Shanghai Hooding

improving quality, decreasing lead times and reducing costs, and we look forward to continue developing our position in China as a leading provider of software solutions to the wire and cable industry."

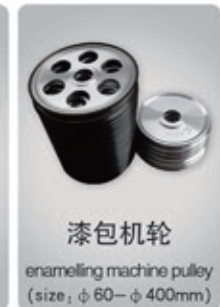
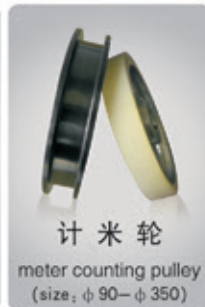
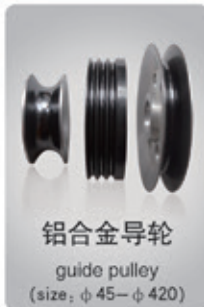
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## Industry 4.0 – intelligent and flexible production processes

IN Germany, the term “Industry 4.0” was first introduced in 2011 at the Hannover Messe and defines the digital agenda of the German Federal Government under the leadership of the Federal Ministry of Economics and Technology as well as the Federal Ministry of Education and Research.\*

It stands for the connection of industrial production with advanced information and communication technology. The result: production processes are independently coordinated by intelligent machines; service robots cooperate in an intelligent way with humans during assembly; and (unoccupied) transportation vehicles complete logistic orders autonomously.

Towards the end of the 18<sup>th</sup> century, “Industry 1.0” was introduced by the launch of mechanical production facilities. With the invention of mass production at the end of the 19<sup>th</sup> century, “Industry 2.0” was introduced due to the use of conveyor belts and electrical energy.

“Industry 3.0” and the use of electronic engineering and IT for the automation of production superseded this in 1969.



○ Harry Prunk of Sikora

Due to various possibilities of the “Internet of Things” and intelligent machines, we are now on the cusp of the next revolution – Industry 4.0.

Smart factories are based on once passive parts, such as tools, machines or means of transport, which have been equipped with “eyes and ears” (sensors) and “hands and feet” (actuators) and are operated centrally via IT systems in real-time. Therefore, the complete lifecycle of a product, from the idea to the development, production, usage and maintenance up to the recycling is monitored and controlled.

The introduction of Industry 4.0 influences working and living environments of humans and enables a more efficient interaction between employees and intelligent production machines. This development opens up chances for reorganisation of work, for example, healthy designed workplaces as well as flexible and family-friendly work time regulations.

“As an innovative technology company, Sikora has always focused on the trends and the possibilities resulting from Industry 4.0,” said Harry Prunk, executive board of Sikora.

“Almost every Sikora device is now built with integrated Wi-Fi (WLAN) or with a network interface to enable a network of several lines and even to connect complete production facilities. Industry 4.0 leads to optimised and reproducible processes.

“Furthermore, due to the intelligent recording and analysis of production data, our customers are able to produce more efficiently and with reproducible quality.”

\*Similar programmes are, for example, “Industrial Internet Consortium” (IIC) in the USA or “Industrial Value Chain Initiative” (IVI) in Japan. China, South Korea and several other European countries also work on comparable platforms.

**Sikora International Corp – USA**  
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## Partnership to supply Reelex payout tubes



○ *Reelex's lineup of injection-moulded parts used in packaging*

REELEX Packaging Solutions has reached an agreement to partner with Carris Reels, of Proctor, Vermont, USA, to manufacture, sell and distribute plastic Reelex payout tubes used in every Reelex<sup>®</sup> package.

For well over 30 years, Reelex has been a distributor of payout tubes around the globe, and has sold the injection-moulded parts via its Patterson, New York, facility. Reelex has begun transitioning licensees to purchase and receive their payout tubes through Carris. By mid-year, Reelex will no longer be selling or distributing Reelex packaging materials.

"This partnership is a win-win for everyone involved, as it allows Reelex to focus on equipment and technology development, while Carris becomes a 'one-stop shop' for both Reelex and reel packaging materials," said Timothy Copp, vice president of business development at Reelex.

"As a leader in wire and cable packaging consumables, Carris shares the same mutual customers, which means that from the customer's perspective the switch is simple. There are many great benefits for customers in this partnership, including superior logistics, distribution closer to their facilities, consolidation of shipments, improved customer service and more."

Initially, Carris will manufacture and distribute from its Vermont facility, but later in the year will begin stocking high-volume inventory at facilities closer to customers, including potential locations in North Carolina, Indiana, Canada and Mexico.

Reelex payout tubes are divided into "Reelex I" and "Reelex II" product lines, and vary in length from 2" to 6".

**Reelex Packaging Solutions Inc - USA**  
Website: [www.reelex.com](http://www.reelex.com)



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## Tenova's new order for a walking beam furnace



○ A walking beam furnace from Tenova

TENOVA has recently been contracted by NLMK, one of the major Russian steel companies, for a 320t/h walking beam furnace for the hot flat shop HRS at its plant in Lipetsk, Russia.

After a competitive selection, the awarding of the contract to Tenova is recognition of the company's long-standing expertise as well as of its innovative technology.

Tenova adopted the best available technologies (BAT) and its latest technical innovations to satisfy and overcome the expectations of the customer.

The company maintains high customer satisfaction from its customers in a very demanding market in terms of performance.

Ultra-Low NOx Flexytech® technology will be used to reach outstanding results in performance, also representing a new benchmark for reheating furnaces. It allows companies to achieve very low values in term of NOx emission and low fuel consumption. Startup of the furnace is scheduled for September 2019.

**Tenova – Italy**  
**Website:** [www.tenova.com](http://www.tenova.com)

## €350m contract for Anglo-French link

Prysmian Group has secured a contract worth around €350 million with IFA2 SAS, a joint venture between National Grid IFA2 Ltd – part of National Grid UK – and RTE of France. The contract is for the turnkey design, manufacture and installation of a submarine and land power cable link to connect Tourbe in France to Chilling in Hampshire, UK.

The high voltage direct current (HVDC) interconnection will operate at  $\pm 320$ kV DC and will allow up to 1,000 MW of power to be transferred between the countries. The HVDC cable system comprises approximately 25km route

length in France, running from the Tourbe converter station in Northern France to the landing point close to Caen.

The subsea route is just over 200km and will land at the south coast of the UK at Solent Airport near Fareham where the UK converter station is to be located. In addition to the HVDC cable link, the contract includes a high voltage alternating current (HVAC) link that will connect the converter station to a local substation in Chilling, UK. This includes 2km land sections at each end with a 5km subsea section between them.

The subsea cables will be manufactured in the Prysmian production facility in Pikkala, Finland, whilst the land cables will be manufactured at the Prysmian factory in Gron, France. The installation of the land sections will also involve resources and facilities from Prysmian France and Prysmian UK, whose headquarters are situated in the local area. The Prysmian cable laying vessels *Cable Enterprise* and *Ulisse* will be utilised in the installation of the cables. Commissioning is scheduled for 2020.

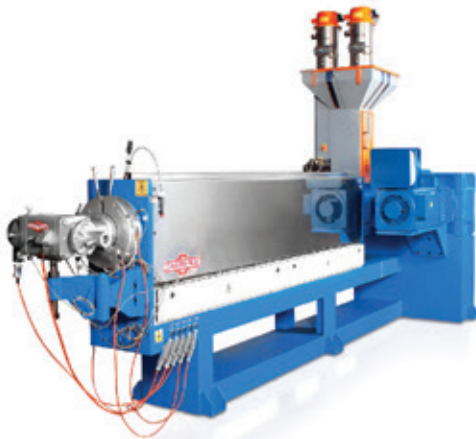
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### UNIT-II :

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Gurgaon 122050, Haryana, INDIA





○ Leoni's 'Factory of the Future' will be erected on a 134,000m<sup>2</sup>-sized area (computer graphic)

## Quality is a mindset as Leoni celebrates 100 years

THE quality of its products and services is so important to Leoni that the term is even central to its corporate slogan: "The quality connection".

Yet what exactly is key to the goods being of outstanding calibre? Siham Touriz, quality manager with Leoni, answers this question in the context of the company's 100-year anniversary. She is one of five people who quite subjectively commented on the principal topics involving Leoni.

The video with her testimony is accessible on the company's website at [100.leoni.com](http://100.leoni.com) as well as several social media channels.

"Quality is at the core of everything we do in the company," said Ms Touriz, who heads the quality management of Leoni's wiring systems division in Morocco.

"So when we are talking about quality we mean not just the end product, but the entire value creation process. This means we are speaking about technology, materials, processes, methods and services."

It is important to Ms Touriz that the perfectionist aspiration required is not a matter for the quality department or individual facilities alone.

"At Leoni, we have a common definition of quality," she emphasises, "and that is: Quality is the fulfilment of the requirements of our customers as well as other stakeholders. These



○ Manufacture of wiring systems at Wuhan Hengtong Automotive, China

include governments, society and our colleagues."

From the Moroccan's perspective, Leoni stands out by working in comparable ways around the world: whether at a plant in the Americas, Asia, Africa or Europe – identical standards prevail, resulting in the same level of quality.

The staff members who are the focal point of production in the labour-intensive manufacture of wiring systems are of key significance to Ms Touriz.

"You have to change employees'

mindset for quality to ensue. Quality has to be created and produced," said the manager, who has been with Leoni for almost ten years.

She says that, in return, staff at her Moroccan locations receive recognition for excellent performance.

"When an assembly worker has done something especially well, we encourage him or her. I thank them for everything about them. The whole management team will go to the staff member and say: "Well done; great job."

**Leoni AG – Germany**  
**Website:** [www.leoni.com](http://www.leoni.com)



## A bright future lies ahead

Leoni, with about 79,000 employees worldwide, generated sales of €4.4 billion in the fiscal year 2016 (2015: €4.5 billion).

Earnings before interest and taxes (EBIT) amounted to €78.1 million (2015: €151.3 million). At the financial statement press conference, Dieter Bellé, CEO and president, explained that this decline is mainly due to restructuring expenses of €31.4mn and losses due to a fraud case of approximately €40mn.

On an adjusted basis, EBIT improved by about 12 per cent to €160.2 million (2015: €143.6 million).

In 2016 the company's two divisions – Wiring Systems Division (WSD) and Wire and Cable Solutions (WCS) – realised more than three per cent organic growth in terms of earnings before interest and taxes.

**Investments:** In the 2016 financial year, Leoni invested €211 million in property, plant and equipment. This investment related mainly to the expansion of wiring systems production capacity in China, North Africa and Eastern Europe and rebuilding work at the plant in Kitzingen, Germany. Furthermore, about €134 million was invested in research and development.

**Projects in China, Mexico and India:** WSD, which develops, produces and distributes ready-to-install cable harnesses for passenger cars and commercial vehicles, launched a reorganisation in 2016.

One of the outstanding business activities was the acquisition of a 51 per cent stake in the Chinese wiring systems manufacturer Wuhan Hengtong Automotive. This step strengthens Leoni's position in the Asian market as it now also supplies Dongfeng Peugeot Citroën Automobile, China's second largest car manufacturer.

In mid-2017 the new Leoni plant in Merida, Mexico, will start operation and strengthen the company's position in America.

The WCS division, which develops, manufactures and sells wires, strands, tapes and optical fibres as well as electromechanical components, enlarged its capacity to produce

By Konrad Dengler

standard automotive cables; commissioned a PVC processing line in China; and began its installation of an irradiation crosslinking line in India.

Alongside the consistently good automotive cables business in Europe and the Americas, there was increased demand especially from the robotics, medical technology as well as automation and drive technology sectors. The division streamlined its portfolio in 2016 as part of its strategic realignment towards becoming a solution provider as well as a systems and development partner.

To that end, it sold its Leoni Studer Hard GmbH subsidiary and initiated the disposal of its electrical appliance cables business, which is to be completed in the first half of 2017. On the other hand, Leoni acquired in February 2017 a two-thirds holding in Adaptricity AG, an ETH Zürich spin-off.

Leoni will be able to deploy proprietary software that generates time series-based simulations, for example to optimise power distribution grids by applying SmartGrid technologies. The company will thereby contribute to intelligent power distribution.

Leoni is now going to realise its 'Factory of the Future' project in the town of Roth near the company's headquarters in Nuremberg and will be investing €90 million in the facility.

The construction phase officially started on 5<sup>th</sup> April this year. On a 134,000m<sup>2</sup> area buildings covering a total floor space of about 57,000m<sup>2</sup> will be erected with the intention of it being one of Europe's most modern cable plants.

Besides additional production capacity, the buildings will comprise a laboratory and development centre for innovative products and an educational and advanced training facility.

Leoni expects to start step-by-step relocation of its ongoing production from the existing plant in Roth in early 2019. Relocation of the roughly 800 employees to the new factory is likely to be completed in mid-2020.

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## The answer to recycling needs

GUIDETTI Srl was founded in the 1980s with the purpose of always finding updated solutions to recycling needs.

Its machines are designed in such a manner as to combine the following factors:

- Economy: Profits coming from different sources; time-saving in terms of manpower with consequent economic and financial profitability
- Ecology: Recovery of materials through dry systems and low energy consumption

Guidetti's machines are made according to parameters of compact dimensions and weight, allowing great mobility and easy installation and maintenance.

For more than 20 years the company has been providing turnkey solutions thanks to its qualified engineers, available for customised solutions. Its 1,500m<sup>2</sup> test lab is available for demonstrations and materials testing.

For the wire industry, the company has developed a line of machines that recover copper and aluminium coming from cables' scrap with a purity of



○ The new compact granulator of the Sincro Mill series

almost 100 per cent. Another line of machines may recover all the PVC scraps from the extruder.

The new compact granulator of the Sincro Mill series is a versatile solution that allows the processing,

simultaneously, of rigid copper cables and very thin ones, without the necessity of pre-selection, reducing the loss of metals in the tailings to a value very close to zero.

**Guidetti Srl – Italy**  
**Website:** [www.guidettisrl.com](http://www.guidettisrl.com)

## AIM hits the target with 25 years of growth

AIM Inc has grown from a small manufacturing company to an internationally recognised active machinery exporter via the company's two facilities located in North America and Europe.

Since 1992, AIM has helped hundreds of manufacturers become more profitable and more competitive by providing commitment to innovation, top quality, and rapid response tech support.

Listed three times in a row in the Inc 500/5000 and twice awarded with the Illinois Governor's exports award, AIM has been named one of the most innovative companies in the wire machinery market.

On Friday, 31<sup>st</sup> March, AIM threw a party to mark a milestone and celebrate the company's 25<sup>th</sup>

anniversary with all employees, representatives, suppliers and customers.

During the event, Constantine Grapsas said: "We have achieved this

milestone through the arduous work, dedication of our associates and our culture of customer service that exists throughout the entire organisation.

"We have dedicated ourselves to 25 years of product innovation and manufacturing efficiencies to provide our customer with the highest quality and value of products and service."

Through the years AIM has always stayed true to the company's motto "Forming our future with yours", and has forged alliances and partnerships globally and is continuing to do so in order to enable wire component manufacturers to be more productive than ever before.



○ Constantine Grapsas speaks at AIM's celebration earlier this year

**AIM Inc – USA**  
**Website:** [www.aimmachines.com](http://www.aimmachines.com)



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## Award for Dow's DGDK-6924 NT EXP 1

DOW Electrical and Telecommunications (E&T), a business unit of The Dow Chemical Company, has been awarded the 2017 Ringier Technology Innovation Award in the category "Plastics Raw Materials and Additives" for DGDK-6924 NT EXP 1, which will be commercialised under the Axeleron™ product family.

This is the first accolade for the product, celebrating Dow's latest solution in high-end data cable insulation. The information and communications technology (ICT) industry has seen radical changes with rising market demands and technological innovations.

To accommodate the larger amount of data required from e-commerce, digital television and Internet services, wires and cables today need to accelerate data transfer with better

end-user data signal efficiency, lower attenuation and longer thermal ageing life.

Dow E&T understands that the demand for increased speed of data transfer and the reliable connections that come from low signal losses need to influence wire and cable design for the ICT market.

The smart design of DGDK-6924 NT EXP 1 addresses two main issues in the industry.

Its high expansion rates of 40 to 70 per cent and uniform pore structure enable stable signal transmission and high data transmission speed in high-end LAN/data cables.

The compound also provides greater production efficiency at a high line speed of 1,400m/min.

A representative from the Ringier Award committee elaborated, "DGDK-6924 NT EXP 1 stands out from the competition with its high performance material, raising the standards in the industry by ensuring quality connections and consistent network performance.

"The market will also benefit from this solution through reduced manufacturing cost of the cables from improved production efficiency."

The 2017 Ringier Awards feature a total of nine categories with various nominations across Asia Pacific.

In the category of "Plastics Raw Materials and Additives", entries were judged against a stringent set of standards by a panel of experienced judges as well as through online votes cast by the public.

"With more than 40 years of participation in the industry, we have a long history of providing excellent products to drive momentum to meet customers' needs and expectations," said Robert Tarimo, telecommunications global strategic marketing manager for Dow Electrical and Telecommunications.

"We are encouraged and proud of this accolade, as it serves as a testament of our commitment to provide the marketplace with accelerated solutions."

"With each innovation, Dow E&T continues to bring to the industry a world-class family of insulation and jacket compounds that are essential for our customers' success."

Expanding the Axeleron™ product family, Dow Electrical & Telecommunications is creating a foundation for the future by uniting its offering to the telecommunications industry under the Dow Axeleron name.

The Dow product family includes the entire portfolio of solid, cellular and coaxial insulation as well as jacketing compounds for coaxial, copper LAN/twisted pair and fibre optic cables.

**Dow Electrical and Telecommunications – USA**  
**Website:** [www.dow.com](http://www.dow.com)

## TT Cables boosts operations with the implementation of CableBuilder

TT Kabeli doo (TT Cables) has decided to implement CableBuilder to boost its engineering, costing and quoting processes.

The announcement, from InnoVites BV, will allow TT Cables to design a cable that accurately meets its customers' needs in the shortest possible timescale and in the most cost-effective manner.

The flexibility and the powerful functionality of CableBuilder convinced TT Cables to equip its engineers with this tool.

CableBuilder, a component of the CableSuite set of solutions, will take the engineering, costing and quoting capabilities at TT Cables to the next level.

CableBuilder is used in over 100 cable factories.

Dario Tomić, managing director at TT Cables, said: "CableBuilder directly contributes to the objective of TT Cables to provide our customers high quality cables that perfectly meet their needs. CableBuilder allows us to become smarter and faster in the key processes of our business."

InnoVites is partner of Cimteq, the owner of the CableBuilder software. InnoVites also delivers ERP software for wire and cable manufacturers and distributors.

This InnoVites CableERP solution is also part of the CableSuite and based on the cloud-based Microsoft Dynamics AX software.

CableERP is tailor-made for the needs of wire and cable distributors and manufacturers. The InnoVites CableERP software is fully integrated with CableBuilder.

**InnoVites BV – The Netherlands**  
**Website:** [www.innovites.com](http://www.innovites.com)

## Resistance wire boost puts Alloy in great shape

A UK manufacturer has recorded 50 per cent growth in sales for its resistance wire after winning customers based on lead times and those looking for European quality material.

Alloy Wire International, formed in 1946, targeted customers involved in the food and bag sealing industry at the recent Interpack exhibition and had six technical experts on hand over the seven days to discuss requirements for hot cutting wire, wire for cutting food and wire for heat sealing.

It also used the international show to showcase its new 'Wire Finder' app, which makes it even easier for clients to find the material they need by name, application or properties.

"Interpack gave us the ideal opportunity to build on a fantastic 12 months when it comes to resistance wire. Early estimates suggest we enjoyed a 50 per cent increase on the same period last year and this has been down to a number of reasons, including the vast amount of stock we hold, quality of wire and how quickly we can deliver," said Angus Hogarth, sales director at Alloy Wire.

Alloy Wire International, which exports to more than 50 countries around the globe, has been manufacturing resistance wire for over 70 years.



○ The Alloy Wire head office

This means material produced in the UK is used to cut polystyrene foam, seal bags used in food and to cut through cheese, cakes, sausage meat and even ice cream.

The firm can also provide profiled curved wire that is used for vacuum sealing.

"We are receiving a lot of interest due to the fact we stock resistance wire from 0.025mm to 3mm in diameter and

that customers can buy in small quantities (from 3 metres) to suit their exact manufacturing requirements," added Mr Hogarth.

In addition to resistance wire, Alloy Wire International manufactures round, flat and shaped profile wire, with more than 60 different exotic alloys in stock at any one time.

**Alloy Wire Ltd – UK**  
**Website:** [www.alloywire.com](http://www.alloywire.com)

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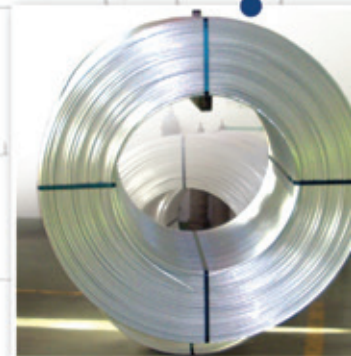
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## AIM looking to the future

AUTOMATED Industrial Machinery Inc (AIM) and T Butler Engineering Ltd (TBE) have formed a strategic alliance enabling wire component manufacturers to be more productive.

The two companies will join forces to market solutions that join AIM's smart CNC machines with TBE's high volume production and customised turnkey solutions, offering a unique proposition to prospective customers around the globe.

Commencing in Q2 2017, both companies will offer each other's solutions, with AIM also providing support for TBE customers in North and South America.

The two market leaders in high speed wire component machine manufacturing are teaming up to deliver a complete customer service solution, from highly technological software support to an integrated, intelligent and fast production experience.

"Nothing is more important than making our customers more productive," said Constantine Grapsas, president of AIM Inc.

"We are thrilled to announce this strategic alliance with TBE, which will simplify the customer experience across sales, service and support and

empower our mutual customers to be far more productive."

Thomas Butler, managing director of TBE, Ireland, said: "We are delighted to formally announce this strategic alliance with AIM Inc. We believe that we can combine TBE's niche capability for complex and integrated projects with AIM's smart bending solutions and vast presence in the United States; together offering an unparalleled level of manufacturing capability and flexibility to our mutual customers, serving the market together on a truly innovative platform."

AIM has headquarters in the USA with a second location in Europe. Committed to innovation, quality and rapid response tech support, it manufactures a broad line of wire bending machines, from below 1mm to over 25mm wire diameters.

TBE Ltd has headquarters in Ireland and provides high quality, customised, high speed wire forming, spring making and special purpose production equipment from 1mm to 12mm wire diameters.

### AIM Inc – USA

Website: [www.aimmachines.com](http://www.aimmachines.com)

### T Butler Engineering Ltd – Ireland

Website: [www.tbe.ie](http://www.tbe.ie)

## New role for Herbert at Miltec

Herbert Freyre joined Miltec at the end of September 2016 as a manufacturing engineer and was recently promoted to manufacturing engineering manager.

He has years of experience in several industries, including aerospace and oil and gas. Mr Freyre has a diverse set of skills that he uses to define manufacturing processes while working closely with production staff.

He has experience with cost reduction, continuous improvement, training of staff, quality systems, and equipment maintenance and reliability. He has a BS Degree in mechanical engineering from Catholic University of Peru. He also has an MBA and holds a Lean Six-Sigma Green Belt Certification.

Bob Blandford, Miltec's president, said: "We are fortunate to have found such a talented individual to support our growth and development."

### Miltec UV – USA

Website: [www.miltec.com](http://www.miltec.com)



○ Herbert Freyre



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## myNDC is launched

NDC has launched its NDC service cloud, myNDC, which will simplify the customer's interaction with the company, ensure focus of the customer service team on problem solving and, most importantly, enable flawless execution, supporting its customers.

The company is excited to offer incident management tools to its customers in the Americas, EMEA and Asia Pacific immediately at launch and this will be followed with a local introduction to the China market later this year.

myNDC will simplify IT infrastructure to replace multiple applications that were used to provide customer service. myNDC enables a seamless customer service agent experience to create tickets, and view a customer's installed base or their service history, allowing the team to focus and prioritise service requests.

NDC's service team will be able to execute service requests more comprehensively using a knowledge base, and optimise its global resources to deliver excellent levels of service. Customers will even be able to generate their return materials authorisations (RMAs) through myNDC.

Mahesh Havildar, VP operations and global customer service for NDC, said: "The company has adopted a deliberate business mindset in the team of 'get going, get better and get ahead' for implementing the myNDC service cloud to immediately deliver these benefits to its customers – and to keep evolving and improving."

**Beta LaserMike (an NDC Technologies brand) – USA**  
**Website:** [www.betalasermike.com](http://www.betalasermike.com)

## Exhibitions boost for WTM

WTM returned from Interwire and wire Russia in an enthusiastic mood. The company had many visitors at both exhibitions with many focusing on advanced technologies and looking for WTM's solution to enhance products with up-to-date equipment.

WTM offers consolidated technology in answer to the most sophisticated taping productions with tape or yarns, and also with in-line sintering/curing processes, and assures a wide range of wrapping heads, in horizontal or vertical modules, for any different taping materials and cable dimensions in different machine combinations.

The company is able to provide a level of technology allowing customers to solve the most critical tape application problems, that is particularly appreciated in the production and shielding of high frequency coaxial cables, twin axial and high-rate data transmission cables, aeronautic/aircraft assembly aerospace cables, military systems, wireless communications and cloud computing connections.

WTM also presented its new single-twist stranding machine for the production of sophisticated LAN cables (Cat 5/6/7/7a/8).

**WTM Srl – Italy**  
**Website:** [www.wtmachinery.com](http://www.wtmachinery.com)





Issued to Mario Frigerio S.p.A.

# power of

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○ 新生产线的速度最高可达200米/分钟, 松管的绞和速度可达到2,500rpm

# 实现最佳成本 绩效比

光缆的SZ绞和技术得到大幅提升。Rosendahl和Nextrom正在合作开发一项技术, 提升生产线在性能和成本方面的表现。

这项技术最终可以让总拥有成本(TCO)降至极低的水平。这样的结果源自总设备使用效率(OEE)更高, 产品使用期限更长, 备用零件的需求量更小。生产线本身的设计可以实现更短的设置时间, 也为提高OEE表现作出了贡献。

性能改善的速度通常是衡量性能的一个重要因素。新生产线的速度最高可达200米/分钟, 松管的绞和速度可达到2,500rpm。

但是仅凭速度本身并不能满足制造商对生产线的要求。集成的组件必须要在高速的情况下实现精准反应。Rosendahl Nextrom推出的全新ROBI交叉捆绑机可以在保持高速的前提下, 保持绞和束的低张力。

对纱线张力进行主动控制, 确保张力不会伤害松管或管束。对于薄壁产品, ROBI显示出了精准的绑缚质量和完美的张

力表现, 即使对软质松管或软质束进行交叉捆绑也能完全胜任。

目前, OFC 70/RL-R SZ绞和生产线实现了市场中最短的换向时间。公司还可以根据产品的组合情况, 对分线板进行定制设计。

DPT是Rosendahl Nextrom为节省松管放线空间而设计的解决方案。

通过在一个通用设备框架中整合两个放线位置, 有效地节省了设备占用的销售空间。DPT提供两个尺寸, 适用于最大800mm线轴或最大1,000mm直径球琅。

在产品方面, DPT采用了两个或更多层的绞和管, 在节省空间方面实现了它的最大潜能。

**Rosendahl Nextrom – 奥地利**  
网址: [www.rosendahlnextrom.com](http://www.rosendahlnextrom.com)

## CRU第11届线材和线缆大会在慕尼黑召开

德国已崛起为世界可再生能源领域的领军国家。想要了解发电行业未来线材和线缆消耗情况的话，德国可谓最佳地点。

今年CRU组织的线材和线缆大会将包括几场特殊的主题会议，主题包括可再生能源、互联生活、汽车电子及水下线材和线缆使用的未来发展。这些会议将探索线材和线缆的下一代应用，以及它对全球制造商、交易商和经销商所带来的影响。

从价格波动到需求变化，CRU从各方面对光纤和电缆行业进行了分析，提供了



○ Nicola Coslett

行业趋势的真知灼见。CRU举办的商业和技术活动具有行业领先的地位。该组织之所以在慕尼黑举行本次盛世，是因为这个巴伐利亚的州府是德国无可争议的技术中心，也是全球最大的IT、通讯和自动化工业核心。

CRU Events的CEO Nicola Coslett表示：“我们对今年的大会充满期待。这对线材和线缆行业来说是一个令人兴奋的时刻。”如前几年一样，本次活动首先将进行几场全体大会，然后是分组会议，分别讨论能源电缆和通讯电缆领域的问题。

她补充道：“通过这种方式，我们将全球线材和线缆行业的整个供应链聚集在一起。开幕的几场会议将讨论重要区域市场及影响线材和线缆贸易往来的经济因素。”

本次活动两天的日程中包括30多场演讲，还有现场参观Niehoff工厂。活动期间，将推出对铜、铝、光学纤维、涂层和其他投入市场进行深度分析的论文，还将展示可能为该领域带来巨变的最新技术创新。CRU线材和线缆大会将于7月17-19日在德国慕尼黑的威斯汀大酒店召开。

CRU - 英国

网址:

[www.wireandcableconference.com](http://www.wireandcableconference.com)

### TT Cables以CableBuilder项目改善运营

TT Kabeli doo (TT Cables)决定实施CableBuilder项目，来改善公司的工程、成本和报价流程。InnoVites BV发表的这项声明表示，TT Cables让公司可以在最短的时间范围内、以最具有成本效益的方式，设计出精准符合客户需求的线缆。

鉴于CableBuilder极大的灵活性和强大的实用性，TT Cables将其列为公司工程师的一项重要工具。CableBuilder是CableSuite系列解决方案的一部分，将TT Cables在工程、成本和报价方面的能力推向一个新高度。CableBuilder目前已应用于100多家线缆公司。

TT Cables的管理董事Dario Tomić说：“CableBuilder可以为TT Cables实现公司目标作出重要贡献，为我们的客户提供高品质线缆，充分满足他们的需求。CableBuilder让我们重要的业务环节变得更智能、更快速。”

CableBuilder软件的所有者是InnoVites公司，也是Cimteq的合作伙伴。InnoVites还为线材和线缆制造商和经销商提供先进的ERP软件。InnoVites的CableERP解决方案也是CableSuite的一部分，以目前普遍使用的Microsoft Dynamics AX软件为基础开发而成。

CableERP是根据线材和线缆经销商和制造商的需求量身定制而成。InnoVites CableERP软件可与CableBuilder实现完全集成。

InnoVites BV - 荷兰  
网址: [www.innovites.com](http://www.innovites.com)

## Tenova获得俄罗斯NLMK步进式炉新订单



○ Tenova获得步进式锅炉订单

Tenova最近与俄罗斯主要的钢铁厂NLMK签署了订购协议，将在其位于俄罗斯利佩茨克(Lipetsk)工厂中安装热轧平板钢材的320t/h步进式炉。

Tenova获得这份订单是经过激烈竞争后获得的成果，充分证明了公司多年来积累的专业技术和创新技术。实际上，Tenova以最佳可行技术(BAT)及其最新技术创新，满足并超越客户的期望值。

在竞争激烈的市场中，以性能赢得最高级别客户，获得市场领军地位，这对公司而言无疑是一个伟大的成就。

Ultra-Low NOx Flexytech® 技术将用于实现性能的最优化结果，它也代表了全世界再热炉的新标准。通过这项技术，公司可以大幅减少NOx排放，降低能源消耗，为公司带来更好的价值。该锅炉预计在2019年9月投入使用。

Tenova - 意大利  
网址: [www.tenova.com](http://www.tenova.com)



## 合作供应Reelex放线管

Reelex Packaging Solutions与Carris Reels公司（位于美国佛蒙特州普罗科特市）签订了一项合作协议，共同生产、销售和经销Reelex放线管，用于每一个Reelex®套件之中。

Reelex公司是一家放线管全球商，拥有30多年的行业经验。该公司在纽约州的帕特森市（Patterson）拥有一家注塑模具零部件工厂。从五月起，Reelex将开始其许可过渡程序，最终将通过Carris公司购买和获得其销售的放线管。到今年年中，该公司将不再销售或经销Reelex套件材料。

Reelex的业务开发副总裁Timothy Copp说：“这是一次共赢式合作，它让Reelex能够专注于设备和技术发

展，Carris则可以成为Reelex和线盘包装材料的‘一站式’企业。作为线材和线缆包装耗材领域的领军企业，Carris与我们共享相同的客户群体，这是一种互利关系。因为从客户的角度来看，整个流程变得更加简单。这次合作给客户带来了许多益处，比如物流更高效，经销网络距离客户工厂更近，运输实现统一，客户服务得到改善等。”

Carris在合作之初仍将立足于其佛蒙特的工厂进行生产和经销。但今年晚些时候，他们将开始在距离客户更近的工厂中提高库存数量，包括北卡罗来纳、印第安纳、加拿大、墨西哥等地的潜在位置。

Reelex的放线管分为Reelex I和Reelex



○ Reelex的注塑模具零件用于包装领域

II两种产品线，长度从2英寸到6英寸不等。

Reelex Packaging Solutions Inc – 美国  
网址: [www.reelex.com](http://www.reelex.com)

## 放眼未来

Automated Industrial Machinery Inc (AIM) 和 T Butler Engineering Ltd (TBE) 公司已形成战略联盟，帮助线材组件生产商实现更高的产能。

这两家公司将合作开发市场解决方案，将AIM的智能CNC设备与TBE的大批量生产和定制全包解决方案相结合，向全球的潜在客户提供真正独一无二的提案。

该项合作将于2017年第二季度开始，两家公司将互相提供解决方案，AIM还将向TBE在北美和南美的客户提供支持。

客户服务：在高速线材组件设备制造领域中，这两家公司都是市场领军企业。强强联合将带来全方位客户服务解决方

案，从高科技软件支持，到集成、智能和快速的生产实践。

AIM Inc总裁Constantine Grapsas表示：“让我们的客户实现更高产能，是我们最重要的使命。对于这次与TBE的战略合作，我们感到非常兴奋。这将简化整个销售、服务和支持过程中的客户体验，提高双方客户的能力，实现更高产能。”

爱尔兰企业TBE的总经理Thomas Butler说：“很高兴正式宣布与AIM Inc的这项战略联盟。TBE在完成复杂一体化项目方面能力卓越，AIM则拥有先进的折弯解决方案，在美国市场中的市场占有率很高。两者相结合，我们可以向双方客户提供前所未有的制造能力和灵活

性，在一个真正的创新平台上共同为市场服务。”

AIM的总部位于美国，在欧洲拥有一家分支机构。公司致力于创新、质量和快速响应的技术支持，生产世界上类型最全面的线材弯折设备产品，适用线材直径从1mm到25mm不等。TBE Ltd的总部位于爱尔兰，提供高品质定制设备，涵盖高速线材成型、弹簧制造和特殊目的的生产设备，适用于直径1mm到12mm不等的线材。

AIM Inc – 美国  
网址: [www.aimmachines.com](http://www.aimmachines.com)

T Butler Engineering Ltd – 爱尔兰  
网址: [www.tbe.ie](http://www.tbe.ie)

## Alloy Wire 的电阻丝热销，提升公司业绩

一家英国制造商以优化的交付周期和高品质欧洲材料赢得客户，将电阻丝销量提高50%。

Alloy Wire International成立于1946年，主要服务食品和封袋行业客户。该公司参加了最近举行的国际加工与包装机械展览会（Interpack），派出六名技术专家，在七天的展会期间探讨热切线材、食品切割线材和热密封线材等话题。

利用这次国际展览，公司还推出了一款全新的Wire Finder应用，让客户可以更方便地根据名称、应用或性能寻找材料。

Alloy Wire的销售总监 Angus Hogarth说：“过去12个月中，Interpack提供了一个绝佳的机遇，我们的电阻丝销售情况极好。早些时候的预估显示，我们今年的电阻丝销售较去年同期增长50%，这其中的原因有很多，包括我们进行了大量囤货、电阻丝的质量以及我们的快速交付能力。”

Alloy Wire International拥有70多年的电阻丝生产历史，产品出口至全球50多个国家。

这家英国企业生产的产品用途广泛，比如切割泡沫塑料，密封袋则用于

封装食品和切割奶酪、蛋糕、香肠甚至是冰淇淋。公司现在还可提供异型曲线条线材，成功应用于真空封装。Hogarth补充道：“我们库存中的电阻丝界面直径从0.025至3毫米不等，吸引了很多客户的关注。客户可以小批量购买（3米起），以适应他们具体的生产要求。”

除了电阻丝，Alloy Wire International还生产圆形、变形和异型截面的线材，始终保持60多种特殊合金储备。

Alloy Wire Ltd – 英国  
网址: [www.alloywire.com](http://www.alloywire.com)

## 工业4.0 – 智能和灵活的生产程序

在德国，2011年汉诺威工业博览会上首次引进了“工业4.0”这个概念，它明确了德国联邦政府的数字议程，该议程由德国经济和技术部与教育和研究部两个部门负责。\*

它主张将工业制造与先进的信息和通讯技术联结在一起。这项举措的结果是：由智能机器对生产程序进行独立协调，服务机器人以智能方式在组装过程中与人类进行合作，（无人）运输车辆可以自发地完成物流订单。

“工业1.0”源自18世纪末机械化生产设施的面世。随着19世纪末量产技术的出现，传送带和电能的应用将“工业2.0”推上工业舞台。

随后在1969年，自动化生产所使用的电子工程和IT技术又让“工业3.0”取代了“工业2.0”。随着“物流网”和智能机器所带来的无限可能性，现在我们又迎来了下一代变革：工业4.0。

智能工厂的建设，为曾经的无源组件（比如工具、机器和运输方法）安装上了“眼睛和耳朵”（感应器）以及“手和脚”（操纵机构），并通过IT系统进行实时集中控制。因此，我们可以对一个产品的完整生命周期进行监督和控制，从概念到开发、生产、使用、维护一直到最后的回收。

工业4.0的引进对人类的工作和生活环境带来了重大影响，可以在工人和智能制造设备之间实现更高效的互动。这一发展为我们带来了工作重组的机遇。比如，以健康的方式设计的工作场所，以及可以兼顾家庭的弹性工作时间制度。

Sikora执行委员会的Harry Prunk表示：“作为一家创新技术公司，Sikora一直都很关注工业4.0所引发的趋势和可能性。”

如今，几乎所有的Sikora设备都安装了集成 Wi-Fi (WLAN)



○ Sikora的Harry Prunk

或网络接口，以实现多线网络，甚至可以将整个生产设施连接在一起。工业4.0引领我们实现优化且可再生的程序。”

“此外，由于可以对生产数据进行智能记录和分析，我们的客户可以实现更高效的生产，实现可重复制造的品质。”

\*相似的项目包括：美国的工业网络联合会（IIC, Industrial Internet Consortium）或日本的“工业价值链行动”（IVI, Industrial Value Chain Initiative）。此外，中国、韩国和其他几个欧洲国家也在研发类似的平台。

**Sikora International Corp – 美国**  
网址: [www.sikora.net](http://www.sikora.net)

## 加强与中国市场的合作

Cimteq Ltd是一家线缆设计和制造软件提供商。该公司与Shanghai Hooding International Trading Co Ltd签订了一项合伙协议，共同开发Cimteq软件解决方案，服务于中国的线



○ 左起: Cimteq的Ali和Amanda Shehab, Shanghai Hooding的Bruce Lau

材和线缆企业，以此强化公司对中国市场的承诺，为中国的线缆制造工业输入更多创新软件产品和服务。

Shanghai Hooding和Cimteq将密切合作，共同开拓Cimteq软件的中国市场。通过这次合作，可以让Cimteq在中国实施的过程中获得更好的本土专业知识和支持。

Shanghai Hooding的总经理Bruce Lau表示：“很荣幸Shanghai Hooding能够与Cimteq建立深入而专业的合作关系，为中国线材和线缆制造商带来创新，让智能工厂和工业4.0的落实成为可能。”

Cimteq的CEO Ali Shehab补充道：“我们与Shanghai Hooding之间的合作让我们可以通过本土合作伙伴服务中国市场，这将充分夯实我们的市场地位，加快我们在整个中国的发展步伐。”

Cimteq致力于提供创新软件解决方案，通过提供效率、改善质量、缩短交付周期和减少成本，为客户提供更多附加值。我们期待夯实我们在中国的市场地位，成为线材和线缆行业软件解决方案的领军企业。”

**Cimteq Ltd – 英国**  
网址: [www.cimteq.com](http://www.cimteq.com)



## Leoni百年诞辰，品质铸就卓越品牌

对于Leoni公司而言，产品和服务的质量如此重要，甚至已经深深刻在企业口号之中：品质相连。

但是，商品实现超凡品质的关键是什么呢？值此公司百年诞辰之际，Leoni的质量经理Siham Touriz给出了这个问题的答案。为庆祝这一重大节日，公司特别录制了一个视频。由五名员工讲述了他们对Leoni相关重要主题的看法。Siham Touriz就是其中之一。

这份记录了她观点的视频已经上传到公司网站100.leoni.com和若干社交网站渠道之中。Siham Touriz在Leoni的摩洛哥布线系统分公司工作，担任质量管理负责人。她表示：“质量是我们公司所有工作的核心。”

因此，当我们谈论质量时，我们所指的不只是成品，还包括整个价值创造过程。这就意味着我们要关注技术、材料、工艺、流程、方法和服务。”

Touriz女士认为，这种追求完美的态度不应只限于质量部门，也不能只是某一个工厂的事情，这一点非常重要。她强调：“Leoni对质量有一个通用的定义，那就是：质量就是满足客户和其他利益相关方的要求，包括政府、社会和我们的同事们。”

作为一个摩洛哥人，她注意到Leoni在世界各地都有着稳定的高标准表现。无论是在美国、亚洲、非洲或欧洲，这些工厂实行的是相同的质量标准，从而实现了相同的质量成果。



○ 武汉恒通公司的布线系统生产

Touriz认为，对于布线系统这种劳动密集型制造业而言，位于生产过程核心的工人们是非常重要的环节。

这位经理在Leoni已经效力近10年。她说：“你必须改变员工们对质量的观念模式，确保实现最佳质量。质量必须创造出来，生产出来。”她说，在摩洛哥的工厂中，保持高质量的员工会获得卓越绩效的奖励。

“如果装配线的工人的工作特别突出，我们就会对其进行奖励。我非常感谢他们所做的一切。”整个管理团队会来到这位员工的面前，对他说：“做得好，太棒了！”

Leoni AG – 德国  
网址: [www.leoni.com](http://www.leoni.com)



○ Leoni的“未来工厂”占地面积为134,000平方米(电脑绘制图像)

## Dow的DGDK-6924 NT EXP 1荣获大奖

Dow Electrical and Telecommunications (E&T) 是 The Dow Chemical Company 下属的业务单位。

该公司的 DGDK-6924 NT EXP 1 荣获了 2017 年 Ringier 技术创新奖“塑料原材料和添加剂”类别的大奖。该产品的商业化将列入公司的Axeleron™产品系列之中。

这是该产品荣获的第一项荣誉，也是 Dow公司在高端数据线绝缘材料方面推出的最新解决方案。

随着市场需求的不断增加和技术创新的发展水平，信息和通讯技术 (ICT) 行业已经历了重大变革。为适应来自电子商务、数字电视和网络服务对更大数据容量的需求，如今的线材和线缆行业需要提供更快的数据传输产品，提高终端用户的数据信号效率，降低衰减量，延长热老化寿命。

Dow E&T 非常清楚，市场对更高的数据传输速度、可靠连接的低信号损失的需求将影响对ICT市场线材和线缆的设计。DGDK-6924 NT EXP 1的职能设计解决了行业内两个主要问题。

40%至70%的高扩充率以及均匀的孔结构在高端LAN/数据线缆中实现了稳定的信号传输和高速的数据传输。这种合成物还可以在1,400m/min的高速线路中带来更高的生产效率。

Ringier奖委员会的一名代表评价道：“DGDK-6924 NT EXP 1以其高性能材料在竞争中脱颖而出，以其有保证的高品质连接和稳定的网络表现，为行业设立了更高的标准。更高的

生产效率还可以减少线缆的生产成本，为市场带来更大的裨益。”

2017 Ringier奖面向亚太地区创新企业，共设有九个类别的奖项。在“塑料原材料和添加剂”类别中，由经验丰富的专家组成的评选委员会将按照一套严格的标准对入围者进行筛选，同时还会通过在线投票的方式进行公开评选。

Dow Electrical and Communications的电信全球战略营销经理Robert Tarimo说：“我们公司在行业内拥有40多年的从业历史，长期以来，一直都以优秀的产品不断满足客户的需求，超越客户的期望值。这一荣誉让我们深感骄傲，同时也倍感鼓舞，因为它有力地证明了我们的承诺：向市场提供高速解决方案。

Dow E&T通过每一次创新，不断向会场提供世界顶级的绝缘和夹套产品，为我们客户的成功做出重要贡献。”

Dow Electrical & Telecommunications 正在不断拓展Axeleron™品牌的产品类别，通过Dow Axeleron品牌与电信行业进行密切合作，为未来打造坚实的基础。

Dow的产品系列包括固态线缆绝缘、移动网络线缆绝缘和同轴绝缘材料，还包括同轴线缆、铜质LAN/双绞线和光纤线缆的夹套合成产品。

Dow Electrical and Telecommunications – 美国  
网址: [www.dow.com](http://www.dow.com)

## Leoni推出极具发展前景的项目

德国纽伦堡的Leoni AG公司是一家线缆和线缆系统的制造商和供货商，主要面向汽车等工业领域。该公司全球员工约79,000人，2016财年的销售额达到44亿欧元(2015年为45亿欧元)。息税前利润(EBIT)为7810万欧元(2015: 1.513亿欧元)。在公司的财报发布会中，Leoni AG的CEO和董事长Dieter Bellé对这一业绩下滑现象做出了解释：公司重组成本3140万欧元，并且公司牵扯进了一项舞弊案，造成了大约4000万欧元的损失。

调整后的数据显示，EBIT增加大约12%，达到1.602亿欧元(2015年：1.436亿欧元)。尽管业绩有所下降，但Leoni股票还是很受欢迎，这可能说明了投资者看好公司未来的发展。2016年，公司的两个部门——布线系统部(WSD)和线材和线缆解决方案部(WCS)的EBIT数据均实现了3%的有机增长。公司的总销售额中，WSD的贡献为60%，WCS的贡献为40%。从客户市场的角度来看，公司80%的收入来自汽车行业，剩余的20%来自其他分部。

投资。在2016财年，Leoni在土地、工厂和设备方面的投资为2.11亿欧元。这笔投资的主要用途为：扩展公司在中国、北非和东欧地区的布线系统生产能力，重建公司在德国基钦根的工厂。此外，公司还在研发方面投入了1.34亿欧元。

中国、墨西哥和印度的项目。WSD部门主要为乘用车和商务车开发、生产和销售可即刻安装的电缆线束。该部门在2016年进行了重组。

作者 Konrad Dengler

该部门开展的业务活动中，最重要的一项就是收购了武汉恒通汽车线束有限公司(中国布线系统生产商)51%的股份。此次收购后，Leoni现在可向中国第二大汽车制造商—东风雪铁龙供应产品，进一步强化了Leoni在亚洲市场的地位。

2017年中期，Leoni在墨西哥梅里达的新工厂将正式开始运营，此举巩固了公司在美洲地区的地位。关于美国新政府关税政策事宜，一名董事会成员表示，作为一家在国际范围内开展业务的企业，公司熟悉如何应对政治不确定性，未来发展仍然非常乐观。

WCS部门的工作主要是开发、制造和销售线材、支架、卷带、光线以及机电元件。该部门扩大了其标准汽车线缆的生产能力，在中国委托了一家PVC加工生产线，在印度的辐照交联生产线也已开始安装。

公司在欧洲和美洲的汽车线缆业务持续走强，市场需求也在不断增加，特别是机器人、医疗技术、汽车和驱动技术领域。该分部在2016年对其产品组合进行了优化，这也是公司向战略改组迈出的重要一步，其目的是成为解决方案提供商以及系统和开发合作伙伴。

为了实现这个目标，公司出售了Leoni Studer Hard GmbH子公司，启动了家电线缆业务的出售程序，将于2017年上

半年完成。另一方面，Leoni在2017年2月收购了Adaptricity AG公司(苏黎世联邦理工学院校办企业)三分之二的股份，将以其在电工学方面的专业知识，提高集团在软件支持咨询服务方面的能力。

Leoni将能够通过专利软件生成时间序列仿真，比如通过SmartGrid技术优化配电网。通过这项技术，公司将可以为智能配电领域做出贡献。

新工厂。Leoni目前正在进入“未来工厂”项目的实施工作。该工厂位于罗斯镇，毗邻公司在纽伦堡的总部，整体设施投资将达到9000万欧元。

工厂施工已于今年4月5日正式启动。项目占地面积134,000平方米，厂房总建筑面积57,000平方米，致力于打造欧洲最现代的线缆生产工厂。

除了为公司增加产能，新工厂中还有一个用于创新产品研发的实验室和研发中心，此外还配备了一个教育和高级培训设施。

生产的侧重点为汽车业使用的线缆，比如自动驾驶汽车使用的数据线。新工厂预计年产量为400,000km，产品类别既有电信和基础设施使用的光电缆线，也有替代型驾驶系统汽车所使用的高压充电线缆。Leoni预计在2019年初，将逐步将其生产从当前位于洛特的工厂转移至新工厂。此次搬迁工作所涉及的员工数量大约为800人，预计将于2020年中期结束。

## AIM实现了25年发展目标

AIM Inc从一个规模制造企业起家，如今发展成为国际知名的知名机械设备出口企业，在北美和欧洲设有两个分厂。自1992年起，AIM以创新、顶级品质和快速反应的技术支持，帮助数百家制造企业实现了更高利润、更强竞争力的目标。

公司曾连续三次列入Inc 500/5000(美国快速成长私营企业排名)之列，曾两次荣获伊利诺伊州长颁发的出口企业奖。公司还成功被评选为线材设备市场中最具创新的企业之一。

3月31日星期五，AIM召开了盛大的25周年派对，与所有员工、代表、供货商和客户一起，共同庆祝这个对公司而言非常重大的历史时刻。

Constantine Grapsas在活动中说：“我们能够取得这样的重大成就，离不开我们艰苦的努力、员工们的众志成城以及贯穿我们整个企业、优秀的客户服务文化。25年来，我们始终坚持产品创新和生产效率，为客户提供最高品质和最高价值的产品和服务。”

在这些年的发展历程中，AIM始终切实贯彻公司理念：与您携手，塑造我们的未来。公司在全球范围内建立了合作和伙伴关系，并将继续拓展这一合作范围，让线材组件生产商可以实现更高的产能。

AIM Inc - 美国

网址: [www.aimmachines.com](http://www.aimmachines.com)



○ Constantine Grapsas在今年初举行的AIM庆祝活动中发言



## 回收需求的解决方案



○ Sincro Mill 系列的全新紧凑型造粒机

Guidetti Srl公司成立于20世纪80年代，始终致力于为回收利用的需求寻找更优化的解决方案。公司的设备设计方法将以下几项因素结合起来，充分实现了最佳效果：经济方面：不同的效益来源；人力方面节省的时间，在经济性和财务方面实现了更大的效益。生态方面：通过干燥系统和低能耗实现材料的回收。

Guidetti的机器制造采用紧凑型尺寸和重量参数，实现了良好的移动性，便于安装和维护。在20多年的发展历程中，公司的工程师团队以其卓越的能力，为客户提供全包解决方案，还可以根据客户需求进行定制设计。公司占地1,500平方米的测试实验室可进行演示和材料测试。公司已为线材行业开发了一套机械生产线，可以回收来自线缆碎片的铜和铝，纯度接近100%。另外一个机器设备线可以从挤出口回收PVC碎片。

Sincro Mill系列的全新紧凑型造粒机提供了使用范围更广泛的解决方案，可以与刚性铜质线缆和超细线缆的生产工艺同步，不需要进行预选，将尾料金属损失降至接近零。

Guidetti Srl – 意大利  
网址: [www.guidettisrl.com](http://www.guidettisrl.com)

## 连接英法的3.5亿欧元合同

Prysmian Group与IFA2 SAS 签订了一项价值3.5亿欧元的合同。IFA2 SAS 是National Grid IFA2 Ltd (隶属于英国国家电网)与法国的RTE公司成立的联营企业。这项合同包括对一个海底和陆地电力电缆项目进行设计、制造和安装。该电缆项目将连接法国的图尔布(Tourbe)和英国汉普郡的切灵(Chilling)。

能源项目高级副总裁 Massimo Battaini 表示：“这对Prysmian而言是一个意义重大的项目，我们很高兴能够被国家电网和RTE这两家最重要的客户选中，这充分证明，在海底电缆传输系统领域中，我们具备了全球市场和技术领军者的地位。”

高压直流(HVDC)互联的运行电流大约为±320kV DC，可在两个国家之间进行最高1,000 MW的电力传输。该 HVDC 电缆系统中，法国境内的长度大约25km，从法国北部的图尔布换流站，一直到卡昂附近的着陆点。

海底部分的线路长度大约为200km，将在英国南部海岸的索伦特机场(Solent Airport)登陆，这里毗邻富勒姆(Fareham)，也是项目英国境内换流站的所在地。

除了HVDC电缆链路，这项合同还包括一个高压交流电(HVAC)链路，连接变电站与英国切灵当地的一个变电所。在该线路的两端分别有一段各2km的

## 推出myNDC 云服务

NDC推出了NDC服务云端myNDC，该项技术可以简化客户与公司的互动，确保客户服务团队能够着重于解决问题。最重要的是能够实现无误执行，对客户提供支持。公司即将在美洲、欧洲、中东和非洲以及亚太地区推出事故管理工具。该工具将在今年晚些时候在中国推出。

myNDC将简化IT基础设施，替换客户服务所使用的多项应用。myNDC可以实现无缝客户服务代理体验，创建单据，查看已安装用户基数或他们的服务历史，允许团队关注服务请求并将其列为优先事项。

NDC的服务团队将可以用知识库更全面地执行服务请求，优化全球资源，提供卓越的服务。客户甚至还能通过myNDC生成他们的退料授权(RMA)。

NDC的运营和全球客户服务副总裁 Mahesh Havildar 说：“为了让myNDC服务云端在实施后可以马上向客户提供这些裨益，并不断发展和改进，公司在经过深思熟虑后，为团队打造了‘get going, get better and get ahead (前进, 改善, 领先)’的业务理念。”

myNDC为客户增加了一条与公司接触的可信渠道，将客户的服务请求以及工作状态全部展示在他们面前。我们欢迎客户使用myNDC，该项云服务更优化的参与性和简单的操作一定会让客户满意。”

Beta LaserMike (NDC Technologies 下属品牌) – 美国  
网址: [www.betalasermike.com](http://www.betalasermike.com)

陆地线路，中间还有5km的海底线路部分。

海底电缆将在Prysmian位于芬兰皮卡拉(Pikkala)的生产工厂制造，陆地电缆将在法国戈隆(Gron)的Prysmian工厂制造。陆地部分的安装，还需要使用Prysmian法国工厂和Prysmian英国工厂的资源和设备，为此，将在当地设立总部。Prysmian在安装电缆的过程中，将使用Cable Enterprise和Ulisse的电缆铺设车。

该系统的试运行时间预计在2020年。

Prysmian Group – 意大利  
网址: [www.prysmian.com](http://www.prysmian.com)





○ A wide range of radiation cross-linkable, high temperature-resistant compounds for automotive applications from Melos and Inhol

# Compounds for the automotive world

MELOS and cooperation partner Inhol offer a wide range of radiation cross-linkable, high temperature-resistant compounds for automotive applications such as battery cables and primary wire.

Various halogen-free and halogenated products are formulated to meet standards like SAE, HMC, JASO, ISO and LV. Automotive wires, made of Melos Cable Compounds, have been approved worldwide by well-known car manufacturers.

The Mecoline RDX product portfolio features a variety of solutions for cable and wire manufacturers supplying to the automotive industry.

The Mecoline range consists of six thin-wall insulation compounds for

primary wire, selected to meet the high demands of the industry. Furthermore, several solutions for battery cables can be chosen, including full- or semi-flexible and oil-resistant compounds, based on either polyolefins or fluoroelastomers.

Halogen-free insulation compounds (Mecoline I RDX 1213 F & Mecoline I RDX 1229 F) are suitable for operating temperatures up to 125°C.

These fast-curing radiation cross-linkable formulations can be processed at very high line speeds. The main applications include small gauge primary insulation (SAE J1128) and appliance wire.

To reach the higher spheres of the thermometer, you should consider

halogenated Mecoline RDX compounds. Maximum operating temperatures of 150°C to 225°C can be achieved easily. For temperatures over 200°C, sophisticated formulations based on fluoropolymers are required.

Additionally, certain products offer high abrasion- or chemical media-resistance, flexibility and unique setups to serve applications such as battery cables in hybrid cars or electric vehicles. Formulations are specifically designed for standards like ISO 6722, ISO 14572, SAE J1127 or SAE J1128.

**Melos GmbH – Germany**  
Website: [www.melos-gmbh.com](http://www.melos-gmbh.com)

**Inhol BV – The Netherlands**  
Website: [www.inhol.com](http://www.inhol.com)





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# 13

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-  China
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-  Malaysia
-  Indonesia
-  Bangladesh
-  Philippines
-  India
-  Singapore



## Inspection and analysis of plastic pellets

THE purity of the material is an important criterion in plastic production and processing. Sikora's programme of innovative inspection, analysis and sorting devices inspects raw plastic material and detects impurities inside the pellets as well as on their surface.

Online analysis: The Purity Scanner for the online inspection and sorting of plastic pellets has been successfully integrated into production lines worldwide. Plastic manufacturers, processors and end users use this innovative device that combines X-ray and optical technologies to check their plastic material on-line for contamination.

In the segment of cable production, specifically those companies producing medium, high and extra-high voltage cables as well as subsea cables are focusing on this technology.

Offline analysis: For smaller throughputs as well as production lines



○ Purity Concept X with tray

where sample testing is sufficient, or for the control of incoming goods, Sikora developed the Purity Concept Systems. The analysis devices offer inspection by X-ray technology (X), optics (V) or infrared technology (IR).

The Purity Concept X inspects up to 3,000 pellets (200ml) that are placed on a tray. Within seconds, these pellets are inspected for contamination. Subsequently, contaminated pellets are optically highlighted, which makes the extraction of the individual contamination significantly easier.

Sikora recommends the combination of the Purity Scanner and Purity Concept X for a comprehensive process optimisation. After the Purity Scanner has successfully detected and sorted contaminated pellets, these pellets are again checked and optically marked by the Purity Concept X.

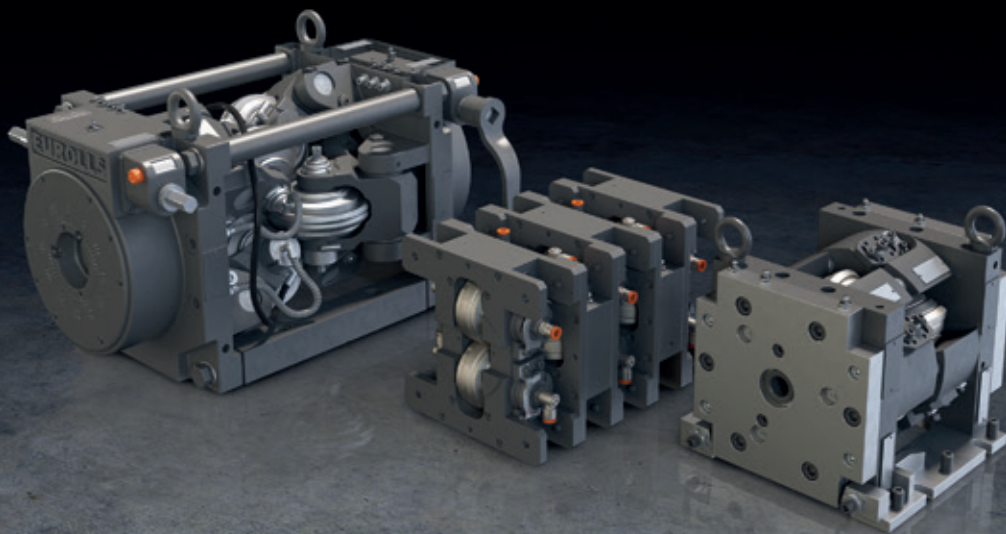
This interaction of on-line and off-line inspection and analysis enables the absolute control of the material purity as well as knowledge to prevent future contamination.

**Sikora AG – Germany**  
**Website:** [www.sikora.net](http://www.sikora.net)

## EUROLLS

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## New data cable showcased

THE Stuttgart, Germany-based Lapp Group showcased a new CAN bus cable for commercial vehicles such as fire engines at Hannover Messe 2017. Lapp is expanding its range of Unitronic® data cables. A durable spiral cable is another new addition.

Unitronics Bus Heat 6722 is a data cable that falls under the CAN bus standard. It is especially suitable for vehicle bodies. 250,000 commercial vehicles are registered every year in Germany alone. They include fire engines, low loaders and snow-clearing vehicles.

The CAN (Controller Area Network) bus is often used as a communication standard. However, there were previously no specifically adapted cables to suit these applications. Lapp is now changing this situation by launching the new cable. Not only does it withstand oil, petrol, diesel, lubricants, UV light, the wind and the elements, it is also temperature-resistant between -40 and +105°C in accordance with DIN/ISO 6722 Class B.

As this cable is also sometimes laid in passenger transport vehicles, certification under ECE R118 (Burning Behaviour of Materials Used in Interior Compartments) is mandatory. According to this regulation, the sheath material must be halogen-free so that, in the event of a fire, a person's airways are not chemically burnt when the blazing plastic comes into contact with extinguishing water. As a result,



○ The CAN bus cable Unitronic Bus Heat 6722 can be installed inside vehicles thanks to its optimised fire behaviour

only a sheath made of special polyurethane can be used here.

The Unitronics Bus Heat 6722 also has a particularly small diameter. The Lapp engineers managed to achieve this by forming a star quad, also known as a twisted quad, with the cores in the cable. This saves space and weight and allows for narrow bending radii.

The cable has a highly flexible sheath and fine-wired strands, so it is suitable for installation in moving applications such as an extendible fire ladder, for example. Unitronics Bus Heat 6722 is available in four variants with core cross-sections of 0.25 to 0.75mm<sup>2</sup> to cover a variety of participant numbers and different cable lengths.

The Unitronic® Spiral is a specialist product. As its name suggests, the product is a spiral data transfer cable. The Lapp cable is particularly robust

and designed for use in material handling, conveyor systems or control technology.

Lapp uses PUR sheaths for its spiral cables. Unlike PVC, PUR's restoring force is retained for years – even when it is subjected to constant loading. This has been proven in tests performed in Lapp's own test centre, during which the cable was stretched and relaxed again 60,000 times.

Lapp enables users to order all their spiral cables from a single source. The cable is available in two variants: the shielded Unitronic Spiral and the unshielded Unitronic Spiral LiF2Y11Y. The former variant has cores with PVC insulation and copper wires, while the latter has PE insulation. The core cross-section is 0.14 or 0.25mm<sup>2</sup>.

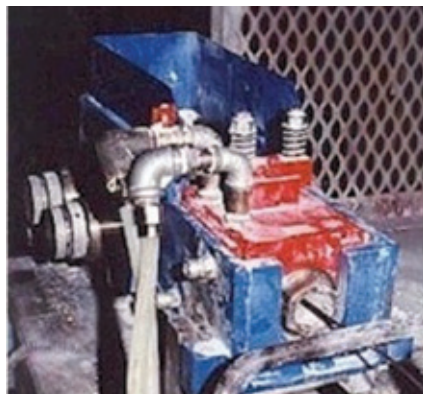
**Lapp Group – Germany**  
Website: [www.lappgroup.com](http://www.lappgroup.com)

## Die wear – how to eliminate it

Unavoidable fines (abrasive particles), the most destructive lubricant contaminants in wire drawing, are no longer alarming since the introduction of the Decalub green and dry rod preparation and wire lubrication, including PDH coating system.

In the most demanding applications, the PDH die wear is reduced to about 0.2 micron per tonne, meaning the three-body abrasive wear is virtually eliminated. Generation of abrasive particles (fines), continuously liberated from the wire surface during drawing, are PDH captured, encapsulated and transported with drawn wire out of the machine.

The lubricant film created is of such a



○ Wire coating by PDH system

configuration as to induce a hydrodynamic lubricant activity causing migration of all lubricant

contaminants without interference with the die, meaning the removal of abrasive particles prevents die wear, enabling frictionless wire drawing at extreme speed (not limited) and low temperature.

The PDH high-performance specific coat is hard, having high density, adjustable in thickness, and largely sufficient to retain all liberated abrasive particles from the wire surface.

Applications include all plain carbon wires up to 0.98 per cent carbon, coated or uncoated, and stainless steel alloy wires up to 26 per cent chromium.

**Decalub – France**  
Website: [www.decalub.com](http://www.decalub.com)

## Lower operating cost and increased efficiency

A NEW vacuum resin dryer enables more moulding and extrusion processors to obtain the advantages of vacuum dryers over conventional desiccant systems, including lower operating cost, increased efficiency and greater control over the drying process.

The VBD™ 300 vacuum dryer from Maguire Products Inc achieves throughputs of up to 300lb (136kg) per hour, which is double the capacity of the company's VBD 150 model. While the VBD 150 is sized for the throughputs of many injection moulding machines and of small extrusion lines like those for medical tubing, the new VBD 300 model opens the benefits of vacuum resin drying to a broader range of applications. Maguire also offers the VBD 1000 dryer for high-volume operations.

In comparison with desiccant dryers, the VBD vacuum dryer consumes 60 per cent less energy, dries resin in one-sixth the time, and substantially reduces the heat history to which polymer is exposed. The speed with which the VBD system removes moisture makes properly dried polymer available for production only 35 minutes after a cold start.

Like other VBD models, the VBD 300 dryer is a gravimetric system that employs load cells that precisely monitor the weight of material at two critical points, enabling precise control over material consumption and documentation of process conditions for certification to customers.

Use of load cells also enhances control over the drying process, according to Frank Kavanagh, vice president of sales and marketing for Maguire Products.

VBD vacuum dryers use gravity to move material through three vertically arranged stages of the drying process, with the discharge of material from one stage to the next controlled by high-speed slide-gate valves with an accuracy per dispense of  $\pm 4$  grams.

The vessels for the three stages are, from top to bottom: a heating hopper



○ The VBD™ 300 vacuum dryer from Maguire Products

that brings resin to a target temperature; a vacuum vessel in which vacuum reduces the boiling point of water, causing moisture within the pellets to volatilise and be forced out of the pellet into the low-pressure environment surrounding it; and a pressurised retention/take-away hopper that is continually purged by a membrane air dryer to maintain the target level of dryness until the material is discharged. The vacuum vessel and retention hopper are mounted on load cells.

The VBD 300 dryer has an intuitive, easy-to-use touchscreen controller that allows operators to manage all drying parameters from just one screen. Like all Maguire equipment, the new dryer comes with a five-year warranty.

**Maguire Products Inc – USA**  
**Website:** [www.maguire.com](http://www.maguire.com)



**Wire Technology & Machinery**

Via Austria, 12 - 35127 Padova - ITALY  
[www.wtmachinery.com](http://www.wtmachinery.com) - [info@wtmachinery.com](mailto:info@wtmachinery.com)

### Taping Equipment



### Single Twist Lines



### Production range:

- Wrapping, binding, spinning, screening machines with concentric heads having dynamic dancer, for spools and pads;
- High performance single twist lines with high speed backtwist feeders;
- Rewinding lines with in-line measuring and quality control systems;
- Take-up and pay-off units for reels up to DIN 1600, also in traversing version with horizontal axis for precision flat wires laying;
- Caterpillars and capstans for any wire shape, for small and medium section;
- Cable peeling machines for large diameters;
- Ancillary, testing, special and customized equipment.





## Tehran, 5-8 December 2017

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## Swiss manufacturer showcases next-generation connectivity solutions

HUBER+SUHNER, a manufacturer of components and systems for optical and electrical connectivity, unveiled its latest data centre solutions to the American market at Data Center World Global earlier this year.

At the event, the company showcased its LISA side access system – designed to further improve flexibility, practicality and user-friendliness with regard to cross-connect solutions – as well as IANOS, Huber+Suhner’s most advanced and adaptable fibre management system to date.

The expanded IANOS system offering is based on a modular cassette/tray solution. This facilitates rapid deployments as well as easy alterations for best-in-class handling and scalability, all of which are key factors in operating data centres.

The design allows complete customisation and configuration offerings according to various customer needs.

“It is Huber+Suhner’s pioneering modular network technology which has allowed it to be recognised across Europe for its ability to efficiently produce and integrate modern, reliable and future-proof data centre technology,” said Tony Walker, head of data centre business development.

“We now hope to bring this success to the US market, especially given that the US has some of the largest data centre infrastructures in the world, providing a range of services from commercial, industrial, military and defence applications – all of which Huber+Suhner is capable of providing solutions for.”

Huber+Suhner has a history of involvement in the modernisation and future-proofing of large-scale data centres in a multitude of network systems around the world.

Its ‘Building Block’ technology has seen the company upgrade outdated and inefficient networking infrastructures from a 10G serial to be capable of supporting a 40G and 100G parallel optics, a network that is modern, reliable and future-proof.

Data centres in general face issues including overheating, limited network cable transmission range and reliability of service.

These issues are directly addressed and mitigated through the integral modular and compact design of Huber+Suhner’s data centre solutions reducing the risk of system failures and maintaining a reliable, sustainable and cost-effective communication infrastructure.

**Huber+Suhner – Switzerland**  
**Website:** [www.hubersuhner.com](http://www.hubersuhner.com)

## Stable energy chain for lift devices

TSUBAKI Kabelschlepp has launched the TTK series, a new cable carrier for small installation spaces in harsh conditions, as required for example with lifting devices.

TKK39 is self-cleaning and extremely stable, while remaining light and compact. It delivers particularly high torsional rigidity and supports long unsupported travel of up to 5m.

The space-saving design of the TTK39 offers, among other things, an installation height of only 142mm – in comparison to alternative solutions, Tsubaki Kabelschlepp was able to reduce the installation height by 65 per cent.

The energy chain can be used when both self-supported and gliding. It supports speeds of up to 3m/s and accelerations of 9m/s<sup>2</sup>. Short steel connecting elements allow for swift and easy assembly – they are directly bolted onto the console or support.

The chain links are made entirely of plastic, whereby Tsubaki Kabelschlepp also offers hybrid chains with aluminium stays and steel chains as an alternative to this particular weight-optimised version.

“Our new TTK series was specifically designed for use in lifting devices, aerial lifts and platforms,” said Werner Eul, product manager cable carrier systems.

“Due to the compact arrangement of the telescopic boom, large extension lengths are possible and the high torsional rigidity provides a straight extension.”

These properties have a positive effect in other application areas, for example, in agricultural, municipal and construction machinery, in drilling or in the cement industry.

“In general, the TTK39 proves itself wherever harsh environmental conditions meet limited design space, and good lateral stability and torsional rigidity are required,” he added.

In lifting devices, energy chains in an external arrangement are exposed to the weather conditions and, depending on the application, can be affected by dirt or falling objects.



○ Tsubaki Kabelschlepp presents with the TTK series a new cable carrier for small installation spaces in harsh environmental conditions

To ensure smooth operation despite these difficult conditions, the cable carriers of the TTK series are equipped with a dust, dirt and chip-proof stroke system as standard. The dirt simply runs off the very smooth surface.

The energy chain is self-cleaning in movable applications: specially installed bevels break up the dirt so that it can then be discharged – compacting or caking is therefore avoided.

The divider construction of the TTK39

is also ingenious: the cable carrier is equipped with lockable brackets for optimal cable protection which swivel inwardly at any position depending on the stay variant.

Dividers which are adjustable or fixable in 2mm increments together with a flexible height separation made of plastic or aluminium enable optimal separation of the cables.

**Tsubaki Kabelschlepp – Germany**  
**Website:** [www.kabelschlepp.de](http://www.kabelschlepp.de)

## Meeting requirements

Ajex & Turner, India, produces high quality trapezoidal wire drawing dies and sector shaped conductor dies.

The company is able to serve its customers with any special tooling, such as shape drawing dies (trolley, oval, trapezoidal, rectangular, square, triangle, sector, etc) and sector shaped compacting dies for bunching and stranding lines.

Fundamentally this kind is used in the wire design and cable manufacture industries. Trapezoidal/shaped wire drawing dies apply to rod break down machines and drawing machines, and are used in wire drawing.

Sector shaped compacting dies (D shape sector dies) are used on rigid stranding machines and are suitable for use in the production of low voltage underground power cables or similar.

**Ajex & Turner Wire Dies Co – India**  
**Website:** [www.ajexturner.com](http://www.ajexturner.com)





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Contact Person: Vivian



Add: Fangxiang Industrial Zone, Yangzhou City, China

## Braiding and taping both under and over the braid

NIEHOFF'S rotary braiding machine type BMV16.Z is designed for the processing of bare or coated round or flat wire made of copper, aluminium or stainless steel with single-wire diameters of 0.05 to 0.3mm.

Yarns and fibres made of plastic can also be processed on this braider. The machine is suited for the production of data, control and coaxial cables or automotive hybrid cables into which a tape must be inserted before and after braiding.

Braids for battery cables, strand braids and the mechanical reinforcement of pressure hoses can also be produced.

Another characteristic of the machine is an integrated central taping device, type BZ380. The combined braiding and taping processes result in floor space savings, the elimination of detached rewinding processes and an increase in product quality.



○ Rotary braiding machine type BMV 16 Z with BZ 380

By means of a refined control system, BMV braiding machines can work for a long time unattended and without operator intervention.

**Maschinenfabrik Niehoff GmbH & Co KG – Germany**  
Website: [www.niehoff.de](http://www.niehoff.de)

## Getting tough

L-com Global Connectivity has released a new line of armoured M12 cable assemblies for use with industrial Ethernet, test equipment, I/O connectivity, sensors and actuators, and industrial automation. The assemblies use outdoor CMX-rated, double-shielded FR-TPE cable.

The inner cable jacket is resistant to oil, UV and weld splatter, and is rated for 600V. Additional features include IP68-rated M12 connectors to protect against liquids and particulates. The inner cable is flex-tested to one million cycles at 10x cable outside diameter and ten million cycles at 20x cable outside diameter. Stainless steel armour with 1,500psi crush resistance protects the cable from damage.

“Our new premium M12 cable assemblies are designed to exceed category standards and ensure uninterrupted network performance,

even in harsh industrial or severe weather environments. An IP68 rating, outer armour and inner shield makes these cables...withstand the most demanding applications,” said Dustin Guttadauro, product manager.

The M12 assemblies feature a double-shielded braid and foil design for maximum EMI/RFI protection.

**L-com Global Connectivity – USA**  
Website: [www.l-com.com](http://www.l-com.com)



○ L-com armoured M12 cable assemblies

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○ Melos和Inhol为汽车应用领域提供类型广泛的辐射交联耐高温化合物

# 用于汽车行业的 化合物

Melos及其合作伙伴Inhol向汽车业客户提供类型广泛的辐射交联耐高温化合物，可用于电池电缆和初级电路等领域。

公司的各种无卤素和卤化产品的制作工艺符合SAE、HMC、JASO、ISO和LV等标准。

采用Melos线缆化合物制作的汽车线缆已广泛用于世界各地的知名汽车生产商，并获得客户的一致好评。

Mecoline RDX产品组合包括适用于线缆和线材制造商的多样化解决方案，主要面向汽车行业。

Mecoline的产品范围包括六种用于初级电路的薄壁绝缘复合材料，可以满足汽车

行业的高需求。此外，还针对电池线缆设计了集中解决方案，包括全弹性或半弹性耐油化合物，其基质材料为聚烯烃或氟橡胶。

不含卤素的绝缘化合物(Mecoline I RDX 1213 F 和 Mecoline I RDX 1229 F) 适用的操作温度最高可达 125°C。

这些可快速固化的辐射交联构成可以在极快的生产线速度下进行加工。

主要应用领域包括小规模初级绝缘设备(SAE J1128) 和电器线材。

如果需要耐受更高的温度范围，应该考虑卤化的Mecoline RDX化合物。这种产品可轻松应对 150°C至225°C的最

高操作温度。如果温度超过200°C，就需要以含氟聚合物为基质的更精制的产品。

此外，有些产品还具有极高的耐磨损或耐化学媒介性质，超强的弹性和独一无二的设置方式，可用于混合动力汽车或电动汽车的电池电缆等领域。

形态设计完全符合ISO6722、ISO14572、SAE J1127 或 SAE J1128 的设计标准。

**Melos GmbH – 德国**  
网址: [www.melos-gmbh.com](http://www.melos-gmbh.com)

**Inhol BV – 荷兰**  
网址: [www.inhol.com](http://www.inhol.com)

## 塑料粒料的检查和分析

在塑料生产和加工过程中，材料的纯度是重要的质量标准之一。Sikora推出了创新的检查、分析和分拣设备，可以对塑料原材料进行检查，找出粒料内部和表面可能存在的不纯现象。

线上分析：纯度扫描仪用于塑料粒料的在线检查和分拣，该设备已成功与世界各地的生产线集成。这一创新设备将X射线和光学技术巧妙地结合在一起，供塑料生产商、加工商和终端用户在线检查其塑料材料是否存在污染现象。污染的材料会自动分拣出来。

在线缆生产领域，特别是生产中压、高压和超高压电缆以及海底电缆的企业，尤其需要这项技术的帮助。

线下分析：对于产量较小以及样品测试充分的生产线，或对进货进行控制的工厂，Sikora还开发了纯度概念系统(Purity

Concept System)。这个分析仪器可通过X摄像技术(X)、光学技术(V)或红外线技术(IR)进行检查。检查的目标是粒料、薄片、薄膜/塑料带的污染情况。

纯度概念分析仪X可以对最多3000个粒料(200ml)的托盘进行检测。这些粒料的污染检测工作可以在几秒钟内完成。随后会对污染的粒料进行光学强化检测，让检查单个粒料污染情况变得更加容易。

Sikora建议将纯度扫描仪和纯度概念分析仪X结合使用，实现更全面的程序优化。纯度扫描仪检测完毕，并对污染粒料进行分拣后，这些粒料会由纯度概念分析仪X再次进行检测和光学标注。

这种线上、线下检测和分析相结合的形式，可以对材料纯度实现绝对的控制，同时还可以了解如何在未来避免污染情况的再次发生。



带托盘的纯度概念分析仪X

Sikora AG – 德国  
网址: [www.sikora.net](http://www.sikora.net)

## 展示新数据线

在2017年汉诺威工业博览会中，德国斯图加特的Lapp Group公司展示了一种全新的CAN巴士线缆，主要用于救火车等商用车辆。

Lapp公司目前正在扩展其Unitronic®数据线的产品类型。结实耐用的螺旋电缆是公司新增的另外一个产品。

Unitronics Bus Heat 6722数据线符合CAN公交车线缆标准的要求，尤其适合应用于车身部分。每年仅德国一地就新增25万辆商用汽车，包括救火车、低货架挂车或扫雪车。

CAN(域控网)巴士通常会被当作通讯行业的标准。但是之前并没有符合这些应用的特定线缆类型。Lapp公司推出的新线缆将改变这一现状。

这种线缆不仅可以耐石油、汽油、才有、润滑油、UV射线、大风和各种恶劣天气，还可用于-40到+105°C的温度范围内。该线缆的设计符合DIN/ISO 6722 Class B的规定。

由于这种线缆有时候还会用于乘用车之中，因此获得ECE R118(室内空间使用材料的燃烧标准)许可并非必需。根据这项规定，线缆的护套材料决不能含有卤素，确保在出现火灾的时候，燃烧的塑料与灭火的水相接触时，不会造成人员呼吸道化学灼伤。因此，唯一能用于制作护套的材料就是特殊的聚氨酯。



CAN巴士线缆Unitronic Bus Heat 6722的优化防火性能，使其可以安装在汽车内部

Unitronics Bus Heat 6722线缆还有超小直径的尺寸。Lapp的工程师通过星绞四线组实现了这个目标，这种形状又被称为扭结四线组，缆芯位于线缆内。这种设计可以节省空间，减少重量，实现狭窄的弯折半径。

线缆具有超灵活的护套和超细纤维，是安装移动设备的理想选择，比如可延长的救火车梯等。Unitronics Bus Heat 6722提供四种不同的缆芯界面规格，面积从0.25至0.75mm<sup>2</sup>不等，可适用于各种参与人数和不同的线缆长度。

The Unitronic® Spiral是一种专业性极高的产品。如其名字所述，它是一种螺旋型数据传输线缆。Lapp的线缆非常耐用，可用于材料处理、传动带系统或控制技术系统。

Lapp的螺旋型线缆使用PUR护套。与PVC不同的是，PUR的复原力可以保持数年，即使持续加载也不会改变。

在Lapp自有实验中心进行的测试已经证明了这一性能。在这项测试中，这种线缆进行了6万次反复的拉伸和放松。

Lapp可以让用户通过一个来源购买所有需要的螺旋线缆。这种线缆有两个规格：加护套的Unitronic Spiral和不加护套的Unitronic Spiral LiF2Y11Y。

前一种线缆为PVC绝缘缆芯，线材为铜质；后一种线缆则采用了PE绝缘材质。缆芯的截面面积为0.14或0.25mm<sup>2</sup>。

Lapp Group – 德国  
网址: [www.lappgroup.com](http://www.lappgroup.com)



## 更低的运营成本，更高的效率

这种全新的真空树脂干燥机可包含更多模具和挤出处理设备，实现超出传统干燥系统的巨大优势，包括更低的运营成本，更高的效率以及对干燥程序更好的控制。

VBD™ 300 真空干燥机是 Maguire Products Inc 推出的新产品，可以实现最高300lb (136kg)/小时的产量，比公司的VBD 150型号产量高一倍。

VBD 150的规格适用于很多种注塑模型设备和小型挤出生产线，比如医疗管材生产线。

全新的VBD 300型号则将真空树脂干燥的优势带给更多的应用领域。Maguire还提供适用于大容量运营的VBD 1000干燥器。

与使用干燥剂的干燥设备相比，VBD真空干燥机的能耗不及其60%，干燥树脂的时间仅为前者的六分之一，还可以大幅减少暴露在聚合物过程中的累积热。

VBD系统的速度可以在冷启动后35分钟内，清除水汽，为生产线提供干燥程度恰当的聚合物。

与其他VBD型号设备一样，VBD 300干燥器是一种重量分析系统，采用加载单元，在两个关键点精准监控材料的重量，对材料消耗进行精准控制，记录流程的状况，以便向客户提供相关证明。

Maguire Products的销售和营销副总裁 Frank Kavanagh表示，使用加载单元还可以强化对干燥过程的控制。

他说：“加载单元控制可以根据模型机器或挤出机的加工率，精准匹配干燥速度，这一点对于尼龙等高科技聚合物的恰当干燥尤为重要。由于有了加载单元控制，生产结束后在干燥机中不会留下任何材料，因此就可以立刻启动下一次生产操作。”

VBD真空干燥机利用重力，将材料在垂直设立的三个干燥阶段中进行传送，在高速滑动阀门的控制下，将材料从一个过程移送至下一个过程，每次分配的精准度上下差别不到4克。

三个阶段的干燥工具从上到下分别为：加热漏斗，让树脂达到预定的温度；真空管，以真空降低水的沸点，让粒料内的水汽挥发，并进入周围的低压环境。

最后一个是加压保留/出口漏斗，可以通过一个膜空气干燥器进行持续清除，保持设定的干燥水平，直到材料被移出。真空管和存放漏斗安装在加载单元中。

VBD 300干燥器有一个便于使用、视觉直观的触摸屏控制器，可以让操作员在一个屏幕中管理所有干燥参数。

与所有 Maguire设备一样，这款全新的干燥器提供五年保修。



● Maguire Products出品的VBD™ 300真空干燥器

Maguire Products Inc – 美国  
网址: [www.maguire.com](http://www.maguire.com)

## 如何避免模具磨损现象

在电线拉丝工艺中不可避免地会产生粉尘(研磨颗粒)，这也是对润滑油破坏性最大的污染源。

但使用Decalub绿色环保干燥操作杆制备及电线润滑(包括PDH图层系统)可以有效解决这个问题。

在要求最严苛的应用情况中，PDH模具磨损、被降到不可测量的程度(约每吨0.2微米)，这意味着三体磨料磨损已真正已消除。拉丝期间从电线表面不断释放的研磨颗粒(粉剂)由PDH捕获、封装并随着拉丝电线在模块间转移，直至移出机器。

按此配置形成润滑油膜，引入流体动力润滑活性，在无需模具干预的情况下转移润滑剂污染——这意味着采用电线无摩擦拉丝模式，去除封装的研磨颗粒并防止模具磨损，实现超速(无限制)和低温情况下的线材无摩擦拉丝。

PDH高性能专用涂层很硬，密度很大，厚度可以调节，足以维持所有来自导线表面释放的研磨颗粒。

该项技术的应用包括所有普通碳钢线材，最高碳含量0.98%，涂层情况不受限制。也适用于铬含量最高26%的不锈钢合金线材。

Decalub – 法国

网址: [www.decalub.com](http://www.decalub.com)



● PDH系统的漆包线涂层

## 为起重装置提供稳定能链

Tsubaki Kabelschlepp推出TKK系列新产品，这种线缆载体适用于条件严苛而狭小的安装空间，比如在起重装置内。TKK39是一种可以自清洁、超稳定、轻质紧凑的设备。它可实现超高的扭转刚度，无支撑一栋的最长距离为5米。

TKK39具有杰出的节省空间设计，安装高度仅为142mm。与同类型其他解决方案相比，Tsubaki Kabelschlepp可将安装高度减少65%。

在自支撑和联网的两种情况下均可以使用能链。设备可支持最快3m/s的速度，加速9m/s<sup>2</sup>。钢制短连接组件可以实现快速简单的组装，可以直接用螺栓安装在操作台或支撑架上。设备的链条完全由塑料制成，Tsubaki Kabelschlepp还提供混合型链条配铝制支撑条和钢链，作为这一独特重量优化版本设备的替换件。

线缆载体系统产品经理Werner Eul说：“我们全新的TKK系列主要应用于起重设备、平面起重机和平台。”

由于安装有紧凑型伸缩臂，因此可实现更大的延展长度，更高的扭转刚度，实现平滑扩展。”

这些性能在其他应用领域中也起到了积极的作用：比如在农业、市政和建筑设备领域，钻井和石油行业等等。他补充道：“总体而言，TKK39可以在任何严苛的环境条件下和受限的设计空间中，保持所需要的良好侧稳定性和扭转刚度。”

在起重设备中，来自外部的能链会暴露在气候条件下，因此根据应用情况的不同，可能会受尘土或掉落物体的影响。



○ Tsubaki Kabelschlepp推出TKK系列新产品，适用于条件严苛而狭小的安装空间

为了确保顺畅的操作过程，有效解决这一困难，TKK系列线缆载体安装有防尘、防土和防碎片的冲程系统，作为系统的标配。尘土会从设备的光滑表层滑落。

能链在可移动应用中可进行自清洁：特别安装的斜面可以让尘土滑落，然后排出，避免尘土粘结或成块。

TKK39的分配器结构也非常独特：线缆载

体上安装有可锁定的支架，可进行优化的线缆保护，可根据支架的类型向内旋转至任何角度。

分配器为可调设计，也可以增加2mm后固定。分离高度可调节，采用塑料和铝制成，可实现线缆的优化分隔。

**Tsubaki Kabelschlepp – 德国**  
网址: [www.kabelschlepp.de](http://www.kabelschlepp.de)

## 瑞士生产商展示下一代连接解决方案

Huber+Suhner是一家光学和电器连接组件和系统生产商。在今年初，公司在Data Center World Global展览中，推出了面向美国市场的最新数据中心解决方案。

在活动期间，公司还展示了其LISA侧门禁系统 - 其设计可以进一步改善交叉连接解决方案的灵活性、实用性和用户友好性。IANOS是Huber+Suhner推出的另一款尖端产品，是目前最先进、最具适应性的光纤管理系统。

拓展的IANOS系统以模块盒/托盘解决方案为基础打造。这种解决方案可以实现快速部署，更改方式也很简单，可实现业内最顶级的处理性能和伸缩性能。这些都是当今数据中心运营的核心要素。设备可以根据客户的需求进行全定制和个性配置。

数据中心业务开发部的 Tony Walker说：“Huber+Suhner开拓性的模块网络技术，让我们的产品在欧洲各地受到广泛欢迎，因为它能够帮助客户进行高效生产，可集成现代的、可靠的、适用未来的数据中心技术。”

“我们将这一成功产品带到美国市场，特别是因为美国拥有世界上最大的数据中心基础设施，提供商业、工业、军事和国防应用等方面的服务。在所有这些领域，Huber+Suhner都能为其提供解决方案。”

Huber+Suhner曾多次在世界各地的不同网络系统中，参与现代化和未来适用的大型数据中心建设工作。公司的“构件”技术，可以对过时和低效的网络基础设施进

行升级，从10G系列升级至能够支持40G和100G平行光缆系统。

这样的系统也是现代社会需要的，性能可靠，也适用于未来的需求。

数据中心外在的常规问题包括：过热、网络线缆传输范围有限，服务可靠性无法保障。

有了Huber+Suhner的数据中心解决方案，就可以用完整的模块和紧凑的设计直接解决和环节这些问题，减少系统故障的风险，保持通讯基础设施的可靠性、可持续性和成本效益。

**Huber+Suhner – 瑞士**  
网址: [www.hubersuhner.com](http://www.hubersuhner.com)



# India Insight



## wire India date is set

THE dates for next year's wire India have been announced.

The show will be held in Mumbai's exhibition centre from 27<sup>th</sup> to 29<sup>th</sup> November 2018. The 7<sup>th</sup> international exhibition for the wire and cable industry will be held concurrently with Tube India, Metallurgy India, and Welding and Cutting India.

The four trade shows will cover the complete spectrum of metal working and processing.

The events will have the support of the international associations – IWCEA (International Wire and Cable Exhibitors Association), IWMA (International Wire and Machinery Association), ACIMAF (Italian Wire Machinery Manufacturers Association), WCISA (Wire and Cable Industry Suppliers Association) and ITA (International Tube Association).

The Indian associations SWMAI (Steel Wire Manufacturers Association of India) and AIWMA (All India Welded Mesh Manufacturers Association) will also be involved.

At the last event in 2016, wire India, Tube India and Metallurgy India were attended by 406 exhibitors presenting their latest developments.

In addition to exhibitors from India, the shows featured

country pavilions from Austria, China, Italy, Germany and the USA. Around 12,300 trade visitors are said to have attended, representing a 28 per cent increase over the previous event.

**Messe Düsseldorf GmbH – Germany**  
**Website:** [www.wire-india.com](http://www.wire-india.com)

### New office for long products manufacturer

Viraj Profiles Ltd, a manufacturer and exporter of stainless steel long products including wire rod, wire, welding wire and fasteners, has announced a major expansion of its business in northern India.

The company, headquartered in Mumbai, has opened its first sales and marketing office away from its home ground with an office in New Delhi.

Mrs Pooja Mehra has been appointed director for sales and marketing.

**Viraj Profiles Ltd – India**

**Website:** [www.viraj.com](http://www.viraj.com)

## India moves into Brazil

The Indian power company Sterlite Power has secured two power transmission projects in Brazil, auctioned by Agência Nacional de Energia Elétrica, Brazil's national power regulator. The auction was of 31 new power transmission projects across 19 states to produce 13,132MVA of power over 7,400km of new transmission lines.

Sterlite Power won two projects, one to establish a 114.4km 230kV transmission line in the state of Rio Grande de Sul, and another for a 145km 230kV line in the state of Pernambuco.

Total investment on the two projects is estimated at \$200 million.

Pratik Agarwal, CEO of Sterlite Power, said: "In Brazil 60 per cent [of] projects are generally delayed, but the government has shown the intent to improve this trend by inviting global tenders and investors like us."

"We have also partnered with engineering procurement and construction players like GE, Incomisa, Angevix and Marte, who have started work on securing environmental, right of way and crossing clearances that normally take one-and-a-half years in Brazil," Mr Agarwal continued, adding: "However, the laws are project friendly, and even courts interfere only on compensation-related issues."

**Sterlite Power Ltd – India**

**Website:** [www.sterlitepower.com](http://www.sterlitepower.com)

## Cable cooperation

Pune Municipal Corporation (PMC) is developing a civic fibre optic cable network, spreading over 2,300km in the city. Not only will the administration no longer need to spend money on broadband for civic services, but it will also generate revenue from the network.

"The project to lay fibre optic cables has been undertaken. These cables will be laid through ducts along the roadside. The civic body has to provide a number of services which are Internet based," confirmed the municipal commissioner, Kunal Kumar.

"If we have our own network, it will reduce the financial burden on the civic body as the PMC will not have to spend money on fees to be paid to service providers."

The roadside ducts are the subject of a tendering process and, once available, will be used by private companies to augment their own Internet and cellphone service. The civic body will utilise the same infrastructure to build its cable network.

**Pune Municipal Corporation – India**

**Website:** [www.punecorporation.org](http://www.punecorporation.org)

## Cooperation secures HVDC contract

A consortium of Siemens and Sumitomo Electric Industries Ltd has won an order from the Indian transmission operator

Power Grid Corporation of India for an HVDC transmission system. The 200km-long HVDC connection will be India's first DC link featuring voltage-sourced converter (VSC) technology. VSC offers a stable and flexible reactive power control, independent of active power control, and additional features to support AC systems.

Siemens will supply two converter stations with two parallel converters, each rated 1,000MW, using its VSC HVDC technology. Sumitomo Electric will be responsible for the XLPE HVDC cable system in the DC circuit.

The Pugalur-Trichur  $\pm 320$ kV HVDC system will connect Pugalur in Tamil Nadu to Trichur in Kerala state, south-west India. The Trichur converter station will be connected via underground XLPE HVDC cable to a transition station, also being built by Siemens. Sumitomo Electric will supply a 128km XLPE HVDC cable system comprising four cables for a route of 32km each.

From the converter station at Pugalur, power will be transmitted via an overhead line to the transition station. Siemens' scope of supply for the turnkey project encompasses design, engineering, supply and installation, as well as commissioning and major equipment supplies of the complete HVDC stations, including converter valves, transformers, cooling systems and control and protection technology.

The combined order volume for Siemens and Sumitomo Electric is approximately \$520 million. The grid connection is scheduled to be in operation in the first half of 2020.

**Power Grid Corporation of India - India**

**Website:** [www.powergridindia.com](http://www.powergridindia.com)

## Chandigarh upgrade

After receiving approval from the Joint Electricity Regulatory Commission (JERC), the Chandigarh Electricity Department has launched a tender for the conversion of overhead lines to an underground system and a replacement of infrastructure in the city's Sector 8.

Sector 8 was chosen for the pilot scheme as its infrastructure is around 50 years old and frequently breaks down, especially during peak summer season. Department officials feel the scheme will help reduce distribution losses and outages. With augmentation of the power distribution system, load growth over the next five years will also be regulated.

At present the department only has one 220kV substation, with five 33kV substations and thirteen 66kV substations across the city. A substation is usually assumed to have a life span of 25 years; six 66kV substations have exceeded that time span.

The Chandigarh administration is also in the process of implementing a smart grid project under the national smart grid mission (NSGM). The administration is to meet 70 per cent of costs, with 30 per cent of the total project cost borne by NSGM.

**Chandigarh Electricity Department – India**

**Website:** [www.chandigarh.gov.in](http://www.chandigarh.gov.in)





## Overview

- The show proved a successful one for PWM, a manufacturer of cold welding equipment, which exhibited two of its best-selling machines at the event. “Visitor numbers were good and the booth was busy, with our EP500 rod welder and heavy-duty M101 cold welder in particular generating a lot of interest,” said managing director Steve Mepsted.
- Exhibitor Orlando Martinez of Davis-Standard LLC said: “The overall impression of the D-S team is that Interwire 2017 was a solid show and provided us with good leads. We learned about good projects we did not know about, and had a chance to meet with customers we’re currently working with in a more relaxed setting. Atlanta is such a great venue for this show.”
- “This was one of the best Interwires on record,” said Jeff Swinchatt, director of sales and marketing for The MGS Group. “We were excited to see all our friends from the industry and meet some new ones. This year’s event highlighted serious conversations and enthusiasm for our newest system capability. It was a great opportunity to show off our latest accomplishments and catch up with our friends.”



## Review

### Praise heaped on Interwire 2017

President of organisers the Wire Association International, David Hawker, led the plaudits to Interwire, which was staged in Atlanta, Georgia, USA, in May. "Interwire was a success and it accomplished a number of our objectives. The training and technical programmes and the Ferrous Symposium helped educate a cross section of industry professionals," enthused Mr Hawker.

This year's event comprised three sections: Interwire 2017; WAI's 87<sup>th</sup> Annual Convention; and its first Global Ferrous Rod & Wire Symposium. More than 3,800 attended.

"We had a sold-out exhibit floor, tremendous involvement of corporate sponsors, and incredible level of volunteer participation, which all point to the health and commitment of WAI's support network," added Mr Hawker.

"The level and stature of the attendees confirm that Interwire is a core event in our industry.

"During the show, we recognised four individuals from our manufacturing base for their contributions to the industry. I thank all who contributed to and attended the event and I look forward to Interwire 2019."

The Interwire exposition comprised more than 400 exhibitors from 25 countries that participated to showcase wire and cable products, machinery, ancillary equipment, and services, with 65 companies being first-time exhibitors. The footprint of the show consumed 110,000ft<sup>2</sup> of exhibition space in Hall A of the Georgia World Congress Center. This first-time "conference within a conference" was a discrete programme focusing exclusively on topics of interest to the ferrous industry.

The GFRWS schedule ran concurrently with Interwire offering technical presentations on processing, equipment improvements, testing, quality, and measurement techniques. The programme also featured a reception at the College

Football Hall of Fame.

The WAI issued its top honours to Richard R Miller, a former Southwire Company executive and winner of the Donnellan Memorial Award; and to Harold Moss, Mordica Memorial Award winner. Keynote speaker Rick Smith, a 3D printing expert and best-selling author, had the full attention of the audience during his talk.

The manufacturing management workshop provided tailored instruction for operations managers and supervisors to pick up where on-the-job training leaves off.

Additional highlights included a two-part tour of Southwire Company LLC in Carrollton, Georgia, where visitors saw its utility products plant and its building wire cable plant; WAI's welcome reception at the Omni Hotel; a member rewards luncheon and raffle; and association leadership meetings.

The Wire Association International – USA  
Website: [www.wirenet.org](http://www.wirenet.org)



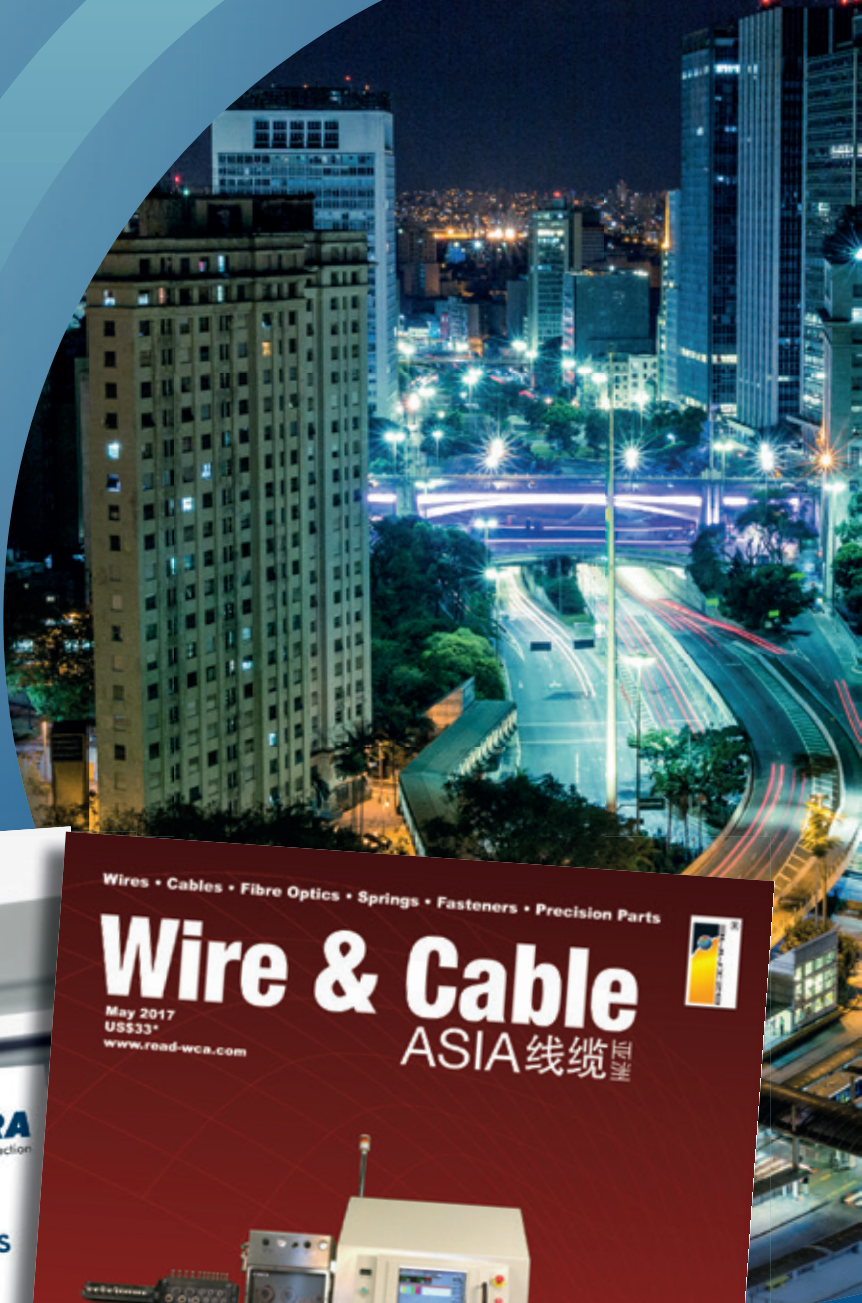


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## An Asia-Pac perspective on the year 2017 in telecommunications

Coming up on mid-year, telecom experts began to air their views as to what the full year would mean for their industry.

Writing in *Techseen*, Ian Watterson, the managing director - Asia Pacific of CSG International (CSGI), predicted that by the end of 2017 the continuing transformation of business models will have brought about a "drastic transformation of the telecom landscape."

A multinational corporation headquartered in Englewood, Colorado, USA, CSGI provides business support systems (BSS) software and services to the telecom industry worldwide. Mr Watterson is credited with expanding CSGI's presence and client base in Australia, China, Hong Kong, India, Indonesia, New Zealand, the Philippines and Singapore. Much abbreviated, these are the main trends he sees as shaping the communications sector this year: ("Three Telecommunication Trends to Watch in 2017," 7<sup>th</sup> April)

- The Internet of Things (IoT) has introduced a whole new level of connectivity to the industry. The IoT-driven customer experience will become more sophisticated and spur innovations across all industry verticals.

IoT-powered evolution will better position service providers to drive profits from selling network and data services on the "B2B2X" model. As a case in point, Singapore's Singtel is embracing 5G and investing in data, digitisation and cybersecurity in the context of the IoT.

Monetising IoT will require service providers to operate on an open, interoperable and virtualised digital services platform. Ecosystems of partners will be needed to deliver digital services, making the ability to manage the revenues with myriad partners a critical component of a provider's infrastructure.

- We are now past the multi-device era and are moving into that of multi-connected devices, making the service provider's ability to move data to both businesses and consumers more important than ever. Accordingly, Internet tech giants will dive heavily into video, especially live content.

The streaming of live, premium content will permit consumers to access content and information in real time on their device of choice. Social networks and streaming services will look toward the next-generation experience that puts viewers closer to the action; or even in the action, through the leveraging of virtual reality.

- In 2017 we will go beyond mobile. Being everywhere consumers are, and providing them with a personalised experience, will be critical for service providers already expected to make recommendations for new content and services. Now such personalisation will evolve to include recommendations based on device, content, viewing preferences, location, and demographic and behavioural data.

Rather than choosing from pre-existing bundles of channels or services, consumers will have the flexibility to build customised content packages – a mix of streamed, live and on-demand content. The provider's platform will monitor the customer's usage and offer suggestions on types of services.

Coupled with a focus on 5G, this effective profiling of the consumer will translate to new opportunities for the service provider to furnish its subscriber base with increasingly sophisticated app experiences.

## Under an agreement reached by the Palestinian and Israeli governments, 3G mobile service is coming to the West Bank

As reported by Khaled Abu Amer of *Al-Monitor*, the Washington-based media site covering the Middle East, on 5<sup>th</sup> April the Palestinian Ministry of Telecommunications and Information Technology (MTIT) signed a final agreement with Israel under which Palestinian telecommunications companies will provide 3G services in the West Bank governorates; and, after more than ten years of negotiations on the issue, enabling Wataniya Mobile to operate a 2G mobile system in the Gaza Strip.

Suleiman Zuhairi, the deputy minister of MTIT, told Mr Amer that the Palestinian Authority is to receive two allotments of 10 megahertz (MHZ) each of 3G services. The first will be for the exclusive use of Wataniya Mobile and another Palestinian mobile service provider, Jawwal; the second, for shared use between the two Palestinian companies and two Israeli companies, Cellcom and Pelephone. Mr Zuhairi said in April that Jawwal and Wataniya Mobile will invest \$50 million each to provision and activate the 3G service within three to six months. Sweden's Ericsson will manage the technical aspects of the sharing arrangement to avoid any overlapping of functions.

## The telecom ecosystem is rife with cyber danger. But a promised USA initiative for countering cybercriminals is in limbo

"I will appoint a team to give me a plan within 90 days of taking office," President-elect Donald Trump said in January, in relation to his pledge to address the issue of cybersecurity. The deadline pledge was repeated. On 13<sup>th</sup> January, a week after the initial statement, Mr Trump tweeted, "My people will have a full report on hacking within 90 days!"

On 19<sup>th</sup> April, President Trump hit his 90-day mark. As noted by *Politico*, a Washington, DC-area journal that covers policy and politics in the USA





and internationally, the deadline was missed. Mr Trump did convene a 31<sup>st</sup> January meeting at the White House with professionals including Rudolph Giuliani, who heads a group tasked with building private-sector partnerships on cybersecurity. Mr Trump said in his remarks then, “We must protect federal networks and data. We operate these networks on behalf of the American people and they are very important.”

But is there a team? Is there a plan? Normally the National Security Council (NSC) would be prominent in an effort of this kind. But on 19<sup>th</sup> April a spokesman told *Politico* that he was unaware of any NSC involvement. Mr Giuliani continues his private-sector work, but a spokesperson for the former mayor of New York City confirmed that he was not involved in any 90-day report for the White House. *Politico* said it was unable to obtain a direct explanation for the missed deadline, and the response of a White House deputy press secretary was uninformative. Reporters Edward-Isaac Dovere, Eric Geller and Matthew Nussbaum do not consider this a small matter. Given the issues at play, they wrote, “Cybersecurity experts worry that missing this particular set deadline could have significant consequences and speaks to deeper concerns about the White House not grappling with clear threats.” (“Trump Blows His Deadline on Anti-Hacking Plan,” 20<sup>th</sup> April)

➤ One expert – Michael Sulmeyer, director of the Belfer Center Cybersecurity Project at Harvard University and former director of Cyber Policy Plans and Operations at the Defense Department – took note of the “unfortunate precedent” of the missed deadline. Mr Sulmeyer placed the issue in the context of that week’s news: “Given... that North Korea conducted one of the most serious cyberattacks against the United States, we should expect the new administration to be on the case.”

Ned Price, who worked for the CIA during George W Bush’s presidency and was a spokesman for the National Security Council in the Obama White House, told *Politico* that missing the announced deadline demonstrates “a lackadaisical approach to what intelligence officials have routinely said is [our] biggest national

security threat.” To this expert, the lapse speaks to the level of priority that the administration assigns to cybersecurity – “which apparently isn’t much.”

➤ Mr Price made a further point of the stark contrast this makes with the way Mr Obama addressed the cybersecurity issue over eight years, and especially during the last stretch.

### Elsewhere in telecom . . .

➤ Finnish network operator Elisa and its technology partner Nokia reported having successfully tested 5G mobile data transmission using the 3.5GHz band – the first such achievement in Europe, according to the companies. The test, which took place on 7<sup>th</sup> April in Rusko, Finland, saw a 5G signal transmitted on the 3.5GHz band between base station and terminal, with data speeds peaking at 1.5Gbps. A lowest latency of 1.5 milliseconds was recorded. In Finland, the 3.5GHz band is scheduled to become available to telecoms on 31<sup>st</sup> December 2018, to be followed by deployment of the band for commercial 5G use.

➤ The French communications and media group Vivendi is threatening legal action against Italy’s Communications Regulatory Authority (Autorita per le Garanzie nelle Comunicazioni, or Agcom) following a ruling that Vivendi must reduce its stake in either Telecom Italia or pay-TV firm Mediaset. As reported by *TeleGeography* (19<sup>th</sup> April), Agcom says Vivendi’s interests in the two firms – over 24 per cent in Telecom Italia and almost 29 per cent of Mediaset – contravene Italy’s “Gasparri Law”, which precludes any one party from becoming too dominant in the media sector. It has given the French company a year to lower its shareholding in one of the units.

*TeleGeography* cited a *Financial Times* report to the effect that the ruling appears to deal a blow to Vivendi’s plans to create a major communications, media and content empire in southern Europe. The French group released a response to the Agcom decision, arguing that it “neither controls nor exercises a dominant

influence on Mediaset.” It added that it is considering legal action to block the ruling, including a formal complaint to the European Commission of a breach of EU law.

➤ Canada is strengthening its commitment to net neutrality. The Canadian Radio-television and Telecommunications Commission (CRTC) has declared that Internet service providers should treat data traffic equally. As noted by Colin Mann of *Advanced Television* (21<sup>st</sup> April), essentially the CRTC is publishing a new framework that supports a fair marketplace in which providers compete on price, quality of service, speeds, data allowance and service offerings. The CRTC is of the view that differential pricing generally gives an unfair advantage or disadvantage to certain content providers and consumers. Accordingly, the agency said, it has established a clear and transparent regulatory structure to govern differential pricing practices. Mr Mann commented, “Its move puts Canada in contrast to North American neighbour USA, with FCC chairman Ajit Pai a long-time foe of the net neutrality rules.”

➤ The US Federal Communications Commission (FCC) has proposed a reform of the pole attachment process and copper retirement, two issues it said hamper the growth of wireline broadband services. While service providers could continue to trench fibre, under the FCC plan the ability to access utility poles would permit the leveraging of infrastructure to speed up a network deployment in a city or town. Copper retirement has been a contentious issue for ILECs (incumbent local exchange carriers), which want to shut down legacy services that have low usage, and CLECs (competitive local exchange carriers) that use copper to deliver lower-speed Ethernet services. Long-time customers who still rely on traditional copper-based voice service must also be considered by the regulator.

Sean Buckley of FierceTelecom reported (21<sup>st</sup> April) that the FCC said its proposed reforms will help accelerate deployment of next-generation networks and services by removing barriers to investment at the federal, state and local level.

## 2017 年亚太地区电信行业展望

转眼即将进入年中，电信专家们也开始忙着对今年对行业的影响发表各自的观点。CSG International (CSGI)的亚太地区总经理Ian Watterson在为 Techseen 网站撰写的文章中预测，截止2017年，业务模式的持续转型将带来“电信行业的巨变”。

CSGI公司是一家跨国企业，总部位于科罗拉多州的英格尔伍德 (Englewood)。公司主要向世界各地的电信行业提供业务支持系统 (BSS) 软件和服务。在CSG向澳大利亚、中国、香港、印度、印尼、新西兰、菲律宾和新加坡获得的展示和客户群方面，Watterson先生功不可没。他对今年塑造通讯行业的主要趋势进行了总结，下文为内容简介：(Three Telecommunication Trends to Watch in 2017, 4月7日)

- ▶ 物流网 (IoT) 已经实现了行业连接性的新高度。物流网驱动的客户体验将更加尖端，更具有创新型，涉及整个行业的垂直领域。物流网推动的变革，将为服务提供商带来更有利的地位，通过“B2B2X”模式出售网络和数据服务获利。举个例子，新加坡的Singtel公司目前已采用5G网络，在物流网的背景中对数据、数字化和网络安全进行投资。物流网的商业化将要求服务提供商在开放、相互合作和虚拟化数字服务平台上运营。需要构建合伙人之间的生态系统，以便提供数字服务，这使得管理众多应收收益合伙人的能力成为供应商基础设施的重要组成部分。
- ▶ 我们已经结束了多设备时代，正在迈进多连接设备的阶段。因此，服务提供商能否向业务和客户领域提供数据的重要性尤甚以往。相应的，网络技术巨头将在视频领域进行大量投入，特别是直播内容。尖端的直播流媒体内容将允许消费者在其选择的设备上实时获取内容和信息。社交网络和流媒体将迎来下一代体验，让观众们可以更近距离地接触行动，甚至可以通过虚拟现实进入行动之中。
- ▶ 在2017年，我们的发展将超越移动性。可以在任何地点向消费者提供个性化体验，这对服务商而言将是至关重要的环节。目前的市场趋势已经开始要求服务提供商向消费者提供新内容和服务的建议。这样的个性化将进一步演化，发展成为根据设备、内容、观看偏好、地点、人口结构及行为数据，向消费者提供针对性的建议。消费者不再只是从已经准备好的频道和服务中做出选择，还拥有构建定制内容包的灵活性，这个内容包中将包括各种类型现场点播流媒体内容。提供商的平台将会监督客户的使用情况，根据服务类型提供建议。在着重发展5G网络的同时，这种对用户的高效剖析将演变为服务提供商的新机遇，向订阅用户群体提供不断提升的更先进的用户体验。

4月19日是特朗普这个90天承诺的截止日期。Politico是华盛顿特区的一份期刊，主要报道美国以及世界各地的政策和政治资讯。该期刊指出，特朗普未能在截止日期内兑现他的诺言。

特朗普于1月31日在白宫召开了一次由专业人员参加的相关会议，其中包括Rudolph Giuliani，他所带领团队的任务是在网络安全方面与私营部门建立合作。

特朗普总统当时表示：“我们必须保护联邦网络和数据，我们代表美国人民运营这些网络，它们非常重要。”

但是，他所说的团队在哪里？计划在哪里？通常来说，这项工作应该由美国安全委员会 (NSC) 主要负责。但是在4月19日，一位发言人告诉Politico的记者，他没有听说NSC参与其中。

Giuliani先生继续他在私营部门领域的工作。但是这位纽约市前市长的一位发言人却确认，他并没有参与任何白宫90天报告之类的工作。

Politico说，对于截止日期已过的问题，目前无法得到直接的解释，而白宫助理新闻秘书也没有提供任何相关信息。记者Edward-Isaac Dove、Eric Geller和Matthew Nussbaum认为这不是一小事。

他们在文章中写道：“网络安全专家担心的是，错过这个具体设定的截止日期可能会带来严重的后果。他们更深层的担心是，白宫可能并没有意识到真正的威胁所在。” (Trump Blows His Deadline on Anti-Hacking Plan, 4月20日)

▶ 专家Michael Sulmeyer是哈佛大学Belfer Center网络安全项目的主任，曾在国防部网络政策计划和行动中担任主任。他对总统错过截止日期的评价是：“很遗憾，但已有先例”。Sulmeyer先生将这个问题放在了本周的新闻背景中进行讨论：“考虑到.....北朝鲜正在对美国进行最严重的网络攻击，我们应该希望新政府能重视起这个问题。”

Ned Price曾于乔治·W·布什执政期间在CIA供职，在奥巴马执政期间担任国家安全委员会的发言人。他告诉Politico，错过所宣布的截止日期说明：“毫不重视情报官员经常提到的问题是（我们国家）最大的国家安全威胁。”在这位专家看来，这次过失说明了新一任政府对网络安全问题给予的关注度“很显然并不多”。

▶ Price先生进一步指出了鲜明的对比：奥巴马在任的八年中不断解决网络安全的问题，特别是在最后一年中更是关注此事。

## 巴勒斯坦和以色列之间签订了一项协议，让3G移动网络走进约旦河西岸

Al-Monitor是华盛顿的一家媒体网站，主要关注中东地区新闻动态。该网站记者Khaled Abu Amer报道，4月5日，巴勒斯坦通讯和信息技术部 (MTIT) 与以色列签订了一项最终协议。根据该协议，巴勒斯坦电信公司将向约旦河西岸的省份提供3G网络服务。在此之前，就此事宜已进行了十年多的协商。迈出这一重大举措后，Wataniya Mobile公司将在加沙地带运营一个2G移动网络系统。

MTIT的副部长Suleiman Zuhairi对Amer说，巴勒斯坦政府的每个3G服务都会获得两个10MHz的网络份额。第一个数据份额由Wataniya Mobile和另外一家巴勒斯坦移动数据服务提供商Jawwal独家使用；第二个数据分配则由这两家巴勒斯坦公司和两个以色列公司Cellcom、Pelephone共享。

Zuhairi先生在四月表示，Jawwal和Wataniya Mobile将分别投资5000万，在3-6个月的时间内提供和激活3G服务。

瑞典的爱立信公司将对共享安排提供技术管理服务，避免存在功能重叠现象。

## 电信生态系统中充满了网络危险。但一项前景看好的美国反网络犯罪行动却陷入困境

美国总统特朗普在一月即将上任前，曾就网络安全问题许下这样的承诺：“在上任后90天内，我将任命一个团队，并获得一份计划书。”

他反复强调了这项计划的截止日期。1月13日，就在他首次提到这个问题一周后，他在推特中说：“美国人民将在90天内看到关于反黑客问题的完整报告。”



## Automotive

### Briefly but pointedly, Tesla overtakes General Motors in market capitalisation. Observers see a harbinger of things to come

“Don’t blame the weight of history on Detroit’s automakers. It’s a legacy none of them can escape anytime soon – no matter how much profit they book selling pickups and SUVs, or how deeply they move into mobility services and self-driving cars.”

Daniel Howes, associate business editor of the *Detroit News*, went on to note that investors have memories. Only yesterday, it seems, the CEOs of General Motors, Ford Motor and Chrysler Group were asking Congress and the Bush administration for help to avoid a collapse that would have devastated the USA industrial Midwest. (“Burden of History Weighs on Detroit vs Tesla,” 11<sup>th</sup> April)

Eight years ago a new president, Barack Obama, ordered GM and Chrysler into Chapter 11 bankruptcy in exchange for a financial lifeline extended by the US Treasury in the name of American taxpayers. At this point, in Mr Howes’s view, American carmakers “begin to atone for decades of conducting themselves as if generally accepted economic rules do not apply” inside the Detroit bubble. The rules do apply, he observed – as the global financial meltdown amply demonstrated.

His purpose in reviewing this unhappy period was to help make sense of a contemporary news item that has puzzled much of the media: the announcement, on 10<sup>th</sup> April, that Tesla, the Palo Alto, California-based maker of electric vehicles, had briefly passed General Motors to become the most valuable USA automaker by market capitalisation. It had already overtaken Ford, and long ago surpassed the value of Fiat Chrysler.

Given that Tesla has had only two profitable quarters in its 13 years of existence, during which it produced exactly three car models, the perplexity may seem understandable. But not to Mr Howes, who sees Tesla chairman Elon Musk as a different breed from the Detroit auto executives. He is selling a vision of the future largely unencumbered by a legacy past, wrote Mr Howes: “no unions and no plant closings, no bankruptcies and no asset sales, no long history of insular management standing astride reality yelling stop.”

☞ To be sure, said Mr Howes, Tesla’s symbolic but important win owes more to its potential than what it has done to this point. And those who follow the career of the colourful Tesla chairman Mr Musk know that he has not kept all of his occasionally extravagant promises.

But Tesla generates extraordinary enthusiasm, as attested by hundreds of thousands of \$1,000 deposits for its Model 3. If Mr Musk can deliver on his pledge to produce 500,000 units of the new \$40,000 model by the end of next year, according to the *Detroit News* his company “will redefine the industry.”

☞ In short, Tesla is future-minded, vaultingly ambitious, and not afraid to call its shots. Like Mr Howes, John Voelcker, the editor of *Green Car Reports*, perceives a stark contrast between Tesla and its rivals. Asserting that investors see in Tesla a company firmly focused on the future of autonomous and electric cars and renewable energy, he wrote, “The market simply doesn’t believe that the Detroit makers are focusing sufficiently on the future – or that they won’t repeat the sins of the past that drove them into bankruptcy.” (“Q: Why is Tesla worth more than GM? A: The sins of Detroit,” 13<sup>th</sup> April)

### Spurning moderation and environmental concerns, US automakers take SUVs to new levels of luxury, speed and performance

If the electric car (EV) manufacturer Tesla is challenging the Detroit old guard (See “Tesla overtakes General Motors”), the New York International Auto Show in April provided plenty of evidence that the big car companies are mounting a spirited defence.

Americans have made it plain that they want luxurious sport utility vehicles. The show demonstrated that, in a period of low fuel prices, the carmakers are prepared to satisfy the demand.

New SUVs dominated media previews of the show on 12<sup>th</sup> April and, as noted by Bill Vlasic of the *New York Times*, “the new vehicles are all about muscle.” (“Bigger, Faster, More Lavish: Americans Crave SUVs, and Carmakers Oblige,” 12<sup>th</sup> April)

Mr Vlasic cited the release by Ford Motor of a more powerful version of its extra-large Lincoln Navigator. There also were high-octane offerings in the Jeep and Mercedes-Benz lines. And General Motors “moved to cement its leadership in the category with a midsize model capable of towing a 20-foot speedboat.”

President Donald Trump’s pledge to revisit the Obama administration’s fuel-economy standards no doubt plays a part in the swerve away from electrified models and smaller, high-mileage passenger cars.

“We don’t think that the rate of growth of SUVs will necessarily continue,” Mike Manley, head of Fiat Chrysler’s Jeep division, told Mr Vlasic. “But we do believe the shift to them is permanent.”

Of course, that is heavily dependent on the extension of a trend line that has inched upward since gasoline dropped below \$3 a gallon in 2014. If concerns about harmful emissions and global warming fall on deaf ears in Detroit, a rise in the price of gasoline would be harder to ignore.

Jack Gillis, public affairs director for the Consumer Federation of America, a non-profit group that supports stringent fuel-economy rules, acknowledged that economic conditions are going to drive improvements in fuel efficiency more than environmental considerations. He told the *Times*, “Consumers will rethink their decision to buy a larger vehicle when it starts costing more to fill their gas tanks.”

Meanwhile, according to the research firm *Autodata*, pickup trucks and SUVs accounted for about 62 per cent of all new vehicles sold in the USA in the first quarter, compared with 57 per cent in the same period of 2016.

This March, more than 70 per cent of the vehicles sold in the domestic market by GM and Ford were trucks and SUVs, and the proportion was even higher – about 85 per cent – for Fiat Chrysler. As noted by Mr Vlastic, the Big Three automakers of Detroit and their foreign rivals are working overtime to add new or updated SUVs to their lineups.

### Other automotive notes . . .

Its current preoccupation with high-riding, spacious SUVs does not mean that Detroit is altogether conceding the electric vehicle market to Tesla and other EV makers. After taking its first domestic deliveries of the Cadillac CT6 plug-in in March, General Motors has begun selling the China-produced sedan in the USA. The arrival and sales were first reported by *InsideEVs*.

The new plug-in hybrid – a 335-horsepower luxury car that can go 31 miles on electricity alone and from zero to 60 miles per hour in a little over 5 seconds – is priced at \$75,095 before federal and state tax credits for electric vehicles. That is almost \$12,000 higher than the sticker price of the petrol-powered model.

As noted by Danny King on the automotive news and car shopping website *Autoblog* (13<sup>th</sup> April), Chinese interest in new models featuring alternative and environmentally friendlier drivetrains prompted GM to produce the plug-in hybrid in China. Additionally, the decision shortens the distance to the battery maker LG Chem in South Korea, which is producing the CT6's battery packs.

Mr King also wrote that GM has said it expects the Cadillac CT6 plug-in to move more units in China than in the USA.

## Energy

### Could piezoelectric crystals in great numbers 'turn road rumble into watts'? California puts it to the test

"Most energy harvesting schemes are on a human scale, like using your swinging arms to power a wristwatch or your dancing legs to power a nightclub sound-and-light show. Why not go big by harvesting the road vibrations caused by cars and trucks?"

Writing in *IEEE Spectrum*, senior editor Philip E Ross presented this as the idea behind California's newly funded experiment "to turn road rumble into watts." It relies on piezoelectric crystals, which when squeezed produce a bit of electric current. Such crystals are often used in audio equipment to turn sounds into signals or vice-versa; but,

as explained by Mr Ross, enough of them, put together, possibly could run streetlights, sensors and other highway equipment. ("Good Vibrations? California to Test Using Road Rumbles as a Power Source," 19<sup>th</sup> April)

A total of \$2.3 million is to be invested in two projects. First, the pavement of a 200-foot stretch of roadway near the campus of the University of California, Merced, north of Fresno, will be fitted out with piezoelectric generators approximately three-quarters of an inch wide. Engineering professor Jian-Qiao Sun told the *San Francisco Chronicle* that these will be stacked like coins.

The second project, to be run by Pyro-E, LLC (San Jose), will use similar devices to generate power for off-road use. The company said it hopes to scavenge enough power to supply 5,000 residences.

By recovering energy that would have gone to waste, such systems count as renewable energy sources under the state's green-energy policy. If the results are promising, California state officials say the system now under consideration would be expanded to other roads.

But, noted Mr Ross of *IEEE*, the problem is that nothing, "not even waste energy," comes free. Installing generating devices and keeping them running would add to the costs of road maintenance. And engineers might be tempted to design roads to vibrate just a little more than otherwise so as to increase the efficiency of the harvesting – thus causing the roads to crumble even faster.

"It might be all too easy for piezoelectric proponents to convince themselves that they're getting a free lunch when they aren't," Mr Ross warned. And the true economic break-even point would be hard to estimate.

His excess of caution very likely derives from the fact that the experiment has been tried before. The *Spectrum* in 2010 reviewed a similar pilot project by Innowattech, an Israeli startup. Its apparent success piqued the interest of a California state legislator, who proposed the project soon to get underway in Merced.

But, Mr Ross reported, "Innowattech is now going out of business."

## Trade

### The United Steelworkers protest a broken promise by Mr Trump, claiming its members have fallen victim to political bartering

"Even for President Donald J Trump, who minced words on virtually nothing during his campaign, his rhetoric on trade was especially seething from the start."

Daniel Moore of the *Pittsburgh Post-Gazette* noted in particular Mr Trump's excoriation of China, which struck a chord with voters in Pennsylvania steel country during the election campaign. In January the Economic Policy Institute, a Washington think tank, reported that from 2001 to 2015



Chinese trade policies triggered the loss of about 3.4 million American jobs – 136,700 of them in Pennsylvania.

Candidate Trump's indignation at this was everything an angry voter could have desired. And he embraced the view of steel industry officials and analysts that there could be no major progress on trade issues unless it were first acknowledged that China has taken action to make its steel exports more attractive than the USA-made product. This led straight to the issue of currency manipulation, and Mr Trump waded right in.

During the 2016 election campaign he said that he would label China a currency manipulator "on day one" of his administration.

Thus Mr Trump's assertion to the *Wall Street Journal* (12<sup>th</sup> April) that he would not label China a currency manipulator was received in many quarters as a stunning volte-face and a repudiation of one of his signature campaign promises. The United Steelworkers (USW), North America's largest industrial union with 1.2 million members and retirees, was especially stung. ("Trump's Sudden Reversal on Chinese Trade Disappoints Steel Workers," 14<sup>th</sup> April)

## 'Just another politician'

On 13<sup>th</sup> April, the USW released a lengthy statement by its international president Leo W Gerard denouncing Mr Trump's changed stance. The title says it all: "USW Condemns Administration's Position on China's Currency Policies; Trump Voters Expect Him to Keep His Promises."

Media coverage of Chinese President Xi Jinping's visit to Mr Trump's "weekend White House" in Florida in early April indicates that their meeting went well. As noted by Mr Moore of the *Post-Gazette*, some political analysts have suggested that Mr Trump agreed to drop his major trade issues in exchange for Chinese cooperation on North Korea.

Mr Gerard of the USW was not placated. "Workers are not interested in having their jobs used to incentivize China to help deal with the nuclear threat of North Korea," he wrote. "The president's recent statements send a signal that he may be just another politician saying one thing to get elected and doing something else once in office."

☛ President Trump took to Twitter to defend his refusal to take the Chinese to task. China, he tweeted, had not been manipulating its currency for months.

This is true enough, as attested by no less an authority than the United States Department of the Treasury. Reflecting the views of most economists, Treasury in its 14<sup>th</sup> April exchange-rate report to Congress said that China had in fact recently been striving to keep its currency, the renminbi, from falling against the US dollar and other currencies.

This is, of course, in direct contravention of a policy of keeping the renminbi low to give Chinese exporters a competitive edge by making their goods more affordable overseas and other nations' products costlier

for Chinese buyers. But the Treasury Dept noted that, before its recent course correction, Beijing had intervened in currency markets for about a decade to depress the value of the renminbi.

☛ There it stands – for the present. But, Mr Moore wrote, "the magnitude of the currency issue is immense." And it is not going away.

The Steelworkers have an ally in Senate Democratic leader Chuck Schumer, who has asserted that Mr Trump's decision to break his campaign promise on China was symptomatic of a lack of real action on trade against Beijing. According to Senator Schumer the best way to get China to cooperate with the USA on North Korea is to be "tough" on trade – the "number one thing China's government cares about."

## Work visas

### As the USA makes it harder for tech talent from overseas, Chile issues a new, liberalised visa for the same cohort

The president of Chile, Michelle Bachelet, has announced the launch of the Chilean Tech Visa which reduces the approval process to just 15 days for foreign entrepreneurs, technical talent, and investors eager to start up a tech company in Chile, or work for one. The action came as US Citizenship and Immigration Services, pursuing a different strategy altogether, has set about making the American equivalent, the H-1B visa, even more difficult to obtain.

Tas Bindi of *ZDNet* reported that the new Chilean visa is also geared toward science professionals interested in establishing a base in Chile. Additionally, entrepreneurs selected for Startup Chile's accelerator programmes or one of its three lines of financing will also be able to acquire a visa within 15 days of application. Ms Bindi quoted the Chilean daily *La Tercera* as saying that President Bachelet wants to create a "virtuous cycle" where everyone wins. ("Chile Introduces Lenient Tech Visa as US Applies Limitations on Immigration," 4<sup>th</sup> April)

According to the Startup Chile website, since its inception in 2010 that programme has sponsored more than 1,300 startups; and, of these – collectively valued at about \$1.4 billion – at least 51 per cent are still active. But the co-founder of a travel startup in Santiago told *ZDNet* that a lenient visa programme is essential to retaining people drawn to the Startup Chile offer of 12-month work visas, equity-free grants of up to 60 million pesos (US\$93,000), office space, and a bank account.

So the tech visa initiative is the logical next step for Chile, whose project for attracting tech talent has fallen short of its goals because of the logistics and bureaucracy of doing business in the country. Nathan Lustig, managing partner at the Santiago-based venture capital firm Magma Partners, told Ms Bindi that fast-tracking the visa acquisition process is a "giant leap forward" as it will make it easier to launch and grow a global business from Chile. In the process, he said, it will take the country "from an extraction-based economy to a knowledge-based one."

Mr Lustig made the point that founders and top talent have long dreamed of working in Silicon Valley and New York City. Recently, however, he said, changes to immigration and visa policy in the USA “have left many top founders, engineers, designers, and creatives looking elsewhere for opportunities in countries that welcome them with open arms.”

In Mr Lustig’s view, this presents an opportunity for Chile. And the country’s president is grasping it.

## Australia, too, is toughening up on temporary worker visas

The name Trump does not appear in the 18<sup>th</sup> April announcement by Australian Prime Minister Malcolm Turnbull that a visa programme covering nearly a million temporary foreign workers in Australia was to be scrapped by his government.

But it was prominent in the *PTI* (*Press Trust of India*) leader to the news report: “Donald Trump Effect? Australia Abolishes Visa Program Used Largely by Indians.”

In light of the previous item (“As the USA makes it harder for tech talent”) Australia indeed seems to be taking example of the United States in the matter of visas for foreign workers. “We are an immigration nation,” said Mr Turnbull. “But the fact remains: Australian workers must have priority for Australian jobs, so we are abolishing the 457 visa, the visa that brings temporary foreign workers into our country.”

The programme known as 457 visa allows businesses to employ foreign workers for a period of up to four years in skilled jobs for which Australian workers are in short supply. Growing unemployment in Australia had drawn attention, and resentment, to the foreign workers, the majority of whom are from India, followed by the United Kingdom and China.

According to *ABC News*, as of 30<sup>th</sup> September, 2016, there were 95,757 workers in Australia on the 457 visa. But, Mr Turnbull said in April, “We will no longer allow 457 visas to be passports to jobs that could and should go to Australians.”

In addition to a new temporary visa programme, with new restrictions, the prime minister declared that something else would be new: an “Australians first” approach to skilled migration. Hence the perceived congruence with President Donald Trump’s “America First” pledge in his inaugural address. According to Mr Turnbull the new temporary worker visa will be designed specifically to recruit “the best and brightest in the national interest.”

In its deadpan report on the prime minister’s remarks, *PTI*, the Indian news agency, quoted Mr Turnbull as saying that the new programme will ensure that foreign workers are brought into Australia to fill critical skill gaps – “and not brought in because an employer finds it easier to recruit a foreign worker than go to the trouble of hiring an Australian.”

Why hiring an Australian should present more of an obstacle course for a prospective employer was not explained.

*PTI* noted that the announcement on the Australian temporary worker visa came days after Mr Turnbull visited India to discuss a range of issues including national security, counterterrorism, education and energy, and six agreements were signed. No mention was made of whether he and his host, Prime Minister Narendra Modi, took up the matter of Indian temporary workers in Australia.

## The air lanes

### Flight cutbacks by Dubai-based Emirates, paring its service to five American cities, will benefit USA airlines

Citing security restrictions imposed by the Trump administration, which have weakened air travel demand in the countries of the Middle East, Emirates Airline is reducing its number of USA-bound flights. In April the biggest Persian Gulf carrier said it will cut back on flights to five of the 12 US cities it serves.

Service to Boston, Seattle and Los Angeles will drop to once a day from twice. In Florida, daily service to Orlando and Fort Lauderdale will shrink to five flights a week, for an overall reduction of 25 flights per week for the airline, according to the Associated Press.

The USA has banned on-board electronics on flights from some Middle Eastern airports and attempted to block travel from six predominantly Muslim nations.

As noted by *Bloomberg* reporters Deena Kamel, Michael Sasso and Mary Schlangenstein, that trims the competition from Emirates, which is perceived by long-haul USA operators as a persistent irritant.

American Airlines, Delta Air Lines and United Continental have complained for two years that \$50 billion in government support has enabled Emirates, Etihad Airways and Qatar Airways to compete unfairly.

Now, with fewer flights, some Emirates passengers may switch to big European airlines and their USA partners for travel from the Middle East and Asia. (“US Airlines Get a Break as Emirates Trims Flights After Trump’s Bans,” 19<sup>th</sup> April)

Joe DeNardi, an analyst at Stifel Financial Corp (St Louis, Missouri), told *Bloomberg*, “Any reduction in capacity from them is only a good thing for USA airlines.”

For its part, Emirates candidly acknowledged its reasons for the cutbacks. In a statement announcing the decision, the company said, “The recent actions taken by the US government relating to the issuance of entry visas, heightened security vetting, and restrictions on electronic devices in aircraft cabins have had a direct impact on consumer interest and demand for air travel into the USA.”

**Dorothy Fabian**  
Features Editor



### 特斯拉的市场价值正在超越通用汽车，这一点应该毋庸置疑。观察家们已经看到了重大事件的先兆

《底特律新闻报》的商业副主编Daniel Howes表示：“历史对行业带来了重负，我们不能为此责怪底特律的汽车制造商。”

尽管汽车厂商们的账目显示他们的皮卡和SUV销售带来了大量盈利，或者他们深度参与了移动服务和自动驾驶汽车的领域，

但在历史遗留问题面前，没有人能快速抽身。”他还指出，投资者并非没有记性。通用、福特和克莱斯勒向国会和布什政府寻求帮助，避免企业彻底崩盘，进而摧毁美国中西部的工业经济（《历史重负对底特律vs特斯拉的压力》，4月11日）——这一幕仿佛就是昨天的事情。

随后，八年前上台的新总统奥巴马要求通用和克莱斯勒进入宪法11章的破产程序，作为交换，美国政府将延长对其进行的财政输血，只是这一输血用的都是美国纳税人的钱。

Howes先生认为，在这种情况下，美国汽车制造商“开始偿还他们数十年来欠下的债。在这几十年中，他们（在底特律的‘世外桃源’中）我行我素，好像普遍经济法则完全不适用一般。”

Howes先生观察到，这些规则其实是适用的，席卷各个行业的全球经济危机充分证明了这一点。

他之所以回顾这段令人不愉快的过去，是希望帮助我们了解最近让媒体大为困扰的一个新闻：4月10日，加州帕洛阿尔托的电动汽车制造商特斯拉宣布，公司目前在市场总值上已超过通用，成为美国价值最高的汽车制造商。在此之前，特斯拉已经赶超过了福特，还有更早之前的菲亚特克莱斯勒。

特斯拉成立时间仅13年，只有两个盈利的部门。而且在这13年的时间中，公司其实只推出了三款车型……这样的现实似乎令人非常费解。但Howes先生却另有看法，在他看来，特斯拉的董事长Elon Musk是完全不同于底特律汽车大佬们的类型。

Howes认为，Musk推销的是未来的愿景，这个愿景基本上没有受到历史负担的拖累。他写道：“没有工会，没有工厂关门，没有破产，没有资产变卖，没有迥异于其他行业、不符合现实、面临刹车的漫长管理历史。”

Howes先生说，可以确认的是，特斯拉这种带有象征意义却又非常重要的胜利更多地源自于它的潜力，而不是它目前所实现的成就。很多人对特斯拉华丽的承诺非常买账，但是特斯拉的老总Musk知道，他并没有完全兑现他时不时抛出的夸大其词的承诺。但特斯拉还是激起了人们不同凡响的热情，数十万人愿意为其新推出的Model 3支付1000美元的定金，就是最好的例证。Model 3的价格为4万美金，Musk先生承诺将在明年底生产50万台。《底特律新闻报》认为，如果此言当真，该公司“将改写汽车行业”。

简言之，特斯拉着眼于未来，拥有强大的野心，也不畏惧成为“江湖霸主”。对于特斯拉及其竞争对手之间的显著差异，Green Car Report杂志的编辑John Voelcker与Howes先生有着同样的观点。他相信，投资者眼中的特斯拉是一家着眼于自动化、电动汽车和可再生能源之未来的企业。他写道：“市场只是不信任底特律的老牌汽车厂商，不相信他们对未来予以足够的重视，或者说，他们是否会重复过去那些导致破产的错误。”（见“Q: Why is Tesla worth more than GM? A: The sins of Detroit”，4月13日）

### 美国的汽车生产商将现代化和环境问题撇到一边，将SUV的奢华感、速度和性能推到新高度

如果电动汽车(EV)制造商特斯拉正在挑战底特律的“老兵们”（见“Tesla overtakes General Motors”），那么四月举行的纽约国际车展则告诉我们，汽车大佬们正在进行全力反击。美国人的购车意图很直白：我们要豪华型运动多用途汽车。这次车展显示出，在油价走低的时代，汽车制造商们已经准备好满足美国人的这一需求。

在4月12日的车展媒体预览中，各种新型SUV成为展示主流。正如《纽约时报》的Bill Vlasic所说：“新车型只有一个关键词：肌肉。”（见“Bigger, Faster, More Lavish: Americans Crave SUVs, and Carmakers Oblige”，4月12日）

Vlasic先生提到了福特推出的一款新车，超大体型Lincoln Navigator更强动力版本。此外，Jeep和奔驰也推出了若干油老虎型新车。通用更是“攀上该类型汽车的巅峰，其新推出的中型轿车可以拖动20英尺长的快艇！”

特朗普总统承诺修改奥巴马政府的燃油经济标准，毫无疑问也引导市场开始偏离电动车以及小尺寸、长里程的乘用车。菲亚特克莱斯勒Jeep部门的负责人Mike Manley对Vlasic先生说：“我们认为SUV这种增长速度并不会持续。但我们相信人们对SUV的青睐将会长期持续。”

当然了，自从2014年石油价格跌至每加仑3美元以后，一直低迷的油价也是这一趋势的总要推动力。底特律的厂商们也许对有害气体排放和全球变暖置若罔闻，但油价上涨就会让他们坐不住了。

美国消费者协会是一家非盈利机构，支持政府采取更严格的燃油经济政策。该组织的公共事务主任Jack Gillis表示，目前的经济条件将让人们更多地考虑改善燃油效率，而非在环境方面的考量。他对《纽约时报》说：“如果油箱的花费开始增加，消费者们就会考虑是不是真的要买一辆更大的汽车。”

与此同时，研究机构Autodata的数据显示，一季度的皮卡和SUV销量占有所有新车销量的62%，这个数据在2016年同期为57%。今年三月，通用和福特在本土市场中出售的汽车，超过70%都是皮卡和SUV，菲亚特克莱斯勒的这个比例更高，达到85%。正如Vlasic先生指出的，底特律的三大汽车巨头和海外的竞争对手们正加班加点地在他们的产品中添加更多SUV车型，或对现有的SUV车型进行更新。

### 其他汽车行业资讯...

尽管市场对奢华宽敞的SUV需求旺盛，但并不代表底特律的制造商们将电动车市场拱手让给特斯拉和其他电动汽车制造商。通用在三月首次在国内出售Cadillac CT6插电式电动汽车，开始将这款在中国生产的电动汽车销回美国。InsideEVs首先对这一车型和销售情况进行了报道。

这款全新插电混合动力高档轿车拥有335马力的动力，纯电动情况下可行驶31英里，从静止到60英里/小时仅需5秒钟多，价格75,095美元，购车者还可在此价格基础上，享受联邦和州的电动汽车减税优惠。这样算下来，与同级别汽油动力车型相比，这款车的价格整整低了12,000美元。

Danny King在汽车新闻和购车网站Autoblog(4月13日)中写道，中国人对替代动力和环保型车辆的兴趣，推动了通用将混合动力汽车的生产转到中国。此外，这项决定也帮助韩国的电池生产商LG Chem可在中国市场中站稳脚跟。该公司目前正在生产CT6的电池组。King先生还写道，通用预计Cadillac CT6插入式混合动力汽车在中国的销量会超过美国。

## 能源

## 可否用大量的压电晶体“将道路变成一个大发电厂”？加州道路率先变成“试验场”

“大部分能源采集产品的规格都比较小，与人体成比例，比如用手臂晃动给腕表充电，或在夜店跳舞的时候，通过腿部的舞动为光影设备充电。那么，为什么不把它变大，将其安装在道路上，通过往来汽车和卡车的震动收集电力呢？”

IEEE Spectrum的高级编辑Philip E Ross所介绍的这个想法，就是加州政府资助的“道路震动发电”实验背后的理念。收集能源的介质为压电晶体，可以通过挤压产生少量电流。

这样的晶体通常用于音频设备，将声音和信号进行相互转化。但是正如Ross先生所解释的那样，如果这种晶体的数量足够多，将它们放在一起，可能就能为街灯、传感器和其他高速公路设备供电。（见“Good Vibrations? California to Test Using Road Rumbles as a Power Source”，4月19日）

两个项目的投入总计230万美元。首先，在福莱斯诺市(Fresno)莫切德(Merced)的加州大学小区附近，选择了一段200英尺长的公路，在上面安装压电式发电机，宽度大约为四分之三英尺。工程学教授Jian-Qiao Sun告诉《旧金山记事报》(San Francisco Chronicle)的记者，这些设备将会像硬币一样叠放在道路上。

第二个项目将由Pyro-E, LLC公司(圣何塞)负责开展，使用类似的设备在野外环境中进行发电。该公司表示，希望能收集到足够为5000户居民供电的电能。

这一发电系统是将可能浪费的能源进行转换回收，因此，在加州绿色能源政策中，这种系统归类为可再生能源设备。加州官员表示，如果结果令人满意，该系统将可能会扩展到其他道路上使用。

但是，IEEE的Ross先生也指出了其中的一个问题：世界上没有任何东西是免费的，“即使是浪费能源”。安装发电设备、保持设备运营，这方面的工作会增加道路维护的成本。工程师可能还会刻意设计出震动性略强的道路，以便增加能源采集的效率，这可能会造成道路破损的速度更快。

Ross先生警告到：“压电设备的支持者们轻易下了结论，自以为可以获得免费的午餐，但事实并非如此。”而且，很难预估真正的收支平衡点。

① 他之所以对这个实验抱有怀疑态度，是因为之前曾进行过同样的实验。2010年，The Spectrum的出版物中介绍了以色列初创企业Innowattech进行的一个类似的实验性项目。这个实验表面上取得的成功引发了加州政府的兴趣，于是通过提案，很快就在莫切德进行这项实验。

但是，Ross先生在文章中說：“Innowattech公司现在已经不复存在了。”

## 贸易

## 美国钢铁工人工会抗议特朗普食言，表示工会的成员沦为为政治交易的受害者

《匹兹堡邮报》的Daniel Moore写道：“尽管特朗普总统在竞选期间的语言表达空洞无物，但他在最初关于贸易的言辞却非常具有煽动力。”

Daniel Moore尤其指出了特朗普对中国的责难言辞，在大选过程中，他的这种态度引起了宾夕法尼亚州钢铁行业选民的共鸣。华盛顿的一家智囊团组织Economic Policy Institute在一月报道称，从2001年到2015年，中国的贸易政策导致美国340万人丢掉工作，其中136,700人在宾夕法尼亚。

候选人特朗普对此所表达的愤慨，是这些失业人群选民内心的呼声。钢铁行业的官员和分析师认为，除非中国采取措施，提高其钢铁出口产品的价格，让美国钢铁的价格可以与之竞争，否则，贸易问题就不可能有任何重大进展。

特朗普在竞选期间完全支持这个观点。这个问题又引出了操纵汇率的话题，特朗普对此也是予以猛烈抨击。在2016年的竞选过程中，他说他会在入主白宫后的“第一天”就将中国列为汇率操控国。

因此，当特朗普对《华尔街邮报》(4月12日)明确表示，他不会将中国列为汇率操控国时，此言一出，一片哗然。他态度转变之快令人震惊，这也是他再一次违背了他在竞选期间的代表性承诺。美国钢铁工人工会(USW)是北美地区最大的行业工会，共有120万名会员和退休人员。该组织对特朗普的态度尤其感到惊讶（见“Trump's Sudden Reversal on Chinese Trade Disappoints Steel Workers”，4月14日）

## “又一个政客”

4月13日，USW的国际主席Leo W Gerard发表了一份很长的声明，抗议特朗普改变立场。声明的标题就说明了一切：《USW谴责政府关于中国汇率政策的立场：特朗普选民希望他保持承诺》。

据媒体报道，四月初中国主席习近平访美期间，与特朗普在其佛罗里达的“周末白宫”进行会晤。报道显示这次会议非常顺利。正如邮报的Moore先生所说，很多政治分析师认为，特朗普同意放弃他主要的贸易问题，是为了换取中方在朝鲜问题上予以合作。

但这个观点并未让USW的Gerard先生聊感安慰。“用工人们的工作为‘奖励’，让中国帮助解决北朝向的核威胁，工人们对其并不感兴趣。总统最近的声明发出了一个信号，那就是，他可能又是一名选举前一套、选举后又一套的政客。”

② 特朗普总统在推特上对未把中国列为汇率操控国一事进行了辩护。他写道，中国在过去的几个月中一直都没有操控汇率的行为。

但事实上，不止一家机构给出了相反的意见，其中就包括美国财政部。美国财政部在4月14日向国会提交的汇率报告中，表达了大多数经济学家的观点，那就是：中国最近正在设法阻止人民币对美元和其他货币的贬值。按理说，保持人民币低位有助于刺激中国出口，也会让其生产的产品在海外更便宜，更具竞争优势，同时让其他国家的产品对中国买家而言更昂贵。想要实现这个目标，中国应该让人民币贬值才是。但财政部指出，中国政府在最近的路线纠正举措之前，曾经连续十年干预货币市场，打压人民币的价值。

③ 但问题仍然存在。但是Moore先生写道：“货币问题的影响范围非常广。”而且也不会消失。

民主党参议院领导Chuck Schumer是美国钢铁工人工会的“盟友”。他明确表示，特朗普决定打破竞选期间关于中国的承诺，说明他在针对中国的贸易问题上，缺乏实际的行动力。Schumer议员表示，要让中国与美国在朝鲜问题上进行合作，最佳的方法应该是在贸易上采取强硬态度，“这也是中国政府最关注的头等大事”。



## 工作签证

### 随着美国对海外高科技人才的美国签证批准日益严格，智利针对这样的人才出台了全新的宽松签证政策

智利总统Michelle Bachelet宣布推出“智利高科技签证”，对希望在智利成立高科技公司或工作的外国企业家、技术专业人士和投资者，予以最短15天的签证批准优待。这项政策的出台，正值美国移民局出台完全相反的措施之时。美国移民局宣布将对高科技人才的H-1B签证执行更严格的审批制度。

ZDNet的Tas Bindi报道称，新的智利签证政策还面向希望在智利设立基地的科学专业人员。此外，如果创业人员被选择成为Startup Chile的高科技孵化器项目，或获得三个融资渠道之一，也同样会享受15天签证申请的待遇。Bindi引用智利日报La Tercera的文章称：Bachelet总统希望打造一个共赢的“良性循环”（“Chile Introduces Lenient Tech Visa as US Applies Limitations on Immigration”，4月4日）

Startup Chile网站的报道显示，该项目自2010年启动以来，已经资助了1,300多家初创企业，总计价值约为14亿美元。如今至少51%的企业仍在正常运营。但圣地亚哥一家旅游初创企业的合作创始人却告诉ZDNet，这个诱人的签证政策本质上是以12个月的工作签证吸引人们加入Startup Chile，提供最高6000万比索（93000美元）的创业资金、办公场所和一个银行账户。

智利政府本希望用这个高科技签证计划来吸引高科技人才，作为合乎逻辑的下一步，但鉴于在该国经商的组织工作和官僚主义的拖累，该项目并未充分实现目标。圣地亚哥风投公司Maga Partners的管理合伙人Nathan Lustig告诉Bindi女士，快速跟踪签证申请过程是一个“巨大的飞跃”，这将更便于在智利成立和发展全球化企业。他说，在这个过程中，还需要整个国家“从一个以天然资源产业为主的经济体，转变为以知识为主的经济体。”

④ Lustig先生指出，公司创始人和顶级人才一直都梦想着在硅谷和纽约这样的地方工作。他说，但是最近美国出台的移民和签证政策“让很多顶级创始人、工程师、设计师和创意人员开始在张开双臂欢迎他们的其他国家寻找机会。”

Lustig先生认为，这对智利而言是一个机会。该国的总统也正在抓住这个机会。

### 与此同时，澳大利亚也收紧了短期工作签证申请的标准

澳大利亚总理Malcolm Turnbull 4月18日宣布，该国政府将取消一项签证计划，该计划涉及近100万在澳大利亚短期工作的外国人。在这份声明中并没有提及特朗普的名字。但对于印度新闻机构PTI (Press Trust of India)而言，特朗普的影响显而易见（“Donald Trump Effect? Australia Abolishes Visa Program Used Largely by Indians”）。

鉴于之前所讨论的话题（美国收紧高科技人才签证审批），澳大利亚在外国工作人员签证的问题上确实像是在步美国后尘。Turnbull先生表示：“我们是一个由移民组成的国家，但事实依然是：澳大利亚国籍的劳动力有获得澳大利亚工作的优先权。所以政府废除了457签证，该签证允许外国人到澳大利亚进行短期工作。”

这项被废除的457签证计划还允许企业可以聘用外国人从事本国劳动力短缺的技术性工作，最长时间4年。在澳大利亚，不断加剧的失业问题已经引起了公众的关注，进而引发了对在澳工作的外

国人的不满情绪。这些外国人中人数最多的是印度人，其次是英国人和中国人。ABC News的报道显示，截止2016年9月30日，持有澳大利亚457签证的共有95,757人。但是Turnbull先生在四月说：“我们将不再允许持有457签证的外国人申请应该聘用澳大利亚人的职务。”

除了这项关于签证的新政策，澳大利亚总理还宣布了几项新的限制措施，其中有些内容是前所未有的，比如对于技能性工作，采用“澳大利亚人为先”的政策。因此，这基本上就与特朗普就职演说中的“美国为先”的论调一致。

Turnbull总理表示，新的临时工作签证应该只限于招聘“为国家提供最大、最有用优势的人才”。PTI对澳大利亚总理所发表的声明进行了冷静客观的评价。文中引用了Turnbull先生的一段话，他说，这个新项目是为了引进外国人才来弥补澳洲在重要技能领域的技能欠缺，“而不是因为雇主聘用外国人要比本国人更容易。”

但为什么聘用澳大利亚人变得更加困难，政府却并未作出进一步解释。

④ PTI指出，这份关于澳大利亚短期工作签证的声明的出台时间刚好在Turnbull访问印度之后。两国在这次访问中讨论了关于国家安全、反恐、教育和能源等一系列问题，并签署了六项协议。他和印度总理Narendra Modi是否讨论了在澳大利亚临时工作的印度人的签证问题，并没有相关的报道。

## 航空公司

### 位于迪拜的阿联酋航空公司减少到五个美国城市的航班数量，此举将让美国航空公司受益

特朗普政府在安全方面的政策限制削弱了中东公民前往美国的航班需求。因此，阿联酋航空公司宣布减少其飞往美国目的地的航班数量。阿联酋航空的航班飞往12个美国城市。但该航空公司在四月宣布，将减少其中五个美国城市的航班数量。相关媒体报道显示，该公司飞往波士顿、西雅图和洛杉矶的航班数量将从原来的每天两班减少为一班。从佛罗里达州飞往奥兰多和劳德代尔堡的每日航班，也将削减为每星期五班。总体而言，每星期减少的航班数量总计为25班。

美国政府的新规定中对某些中东机场出港航班的机上电子产品携带问题作出了限制，还试图阻止六个穆斯林为主国家的乘客进入美国。Bloomberg的记者Deena Kamel、Michael Sasso和Mary Schlangenstein指出，阿联酋航空公司的竞争力削弱，这对美国长途飞行运营商而言是一个利好消息。

在过去两年中，由于阿联酋航空、阿提哈德航空和卡塔尔航空公司获得了本国政府500亿美元的支持，美国航空、达美航空和联合大陆航空公司在竞争中一直处于劣势。如今，由于航班数量减少，阿联酋的乘客如果想从中东和亚洲飞到美国，就需要选择欧洲航空公司和美国航空公司。（见“US Airlines Get a Break as Emirates Trims Flights After Trump's Bans”，4月19日）

Stifel Financial Corp (密苏里州圣路易斯) 的分析师Joe DeNardi对Bloomberg说：“这些中东航空公司的运输能力减弱对于美国航空公司而言是一个好消息。”

④ 阿联酋航空坦白地解释了削减航班的原因。在宣布这一举措的声明中，公司表示：“美国政府最近就美国签证所采取的措施强化了安全审查程序，对机舱内的电子产品携带进行了限制，这对乘客的利益和飞往美国的航班需求产生了直接影响。”

专栏编辑: Dorothy Fabian

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# Inspection and analysis of XLPE and HPTE material at medium- and high-voltage cable production

By Harry Prunk, Sikora AG, Bremen, Germany

## Abstract

Plastics that are used for the insulation of medium-, high- and extra-high-voltage cables have to comply with the highest purity standards. Most commonly XLPE (cross-linkable polyethylene) material is used for the insulation of cable. For cross-linking of the XLPE the cable passes through a CV tube (continuous vulcanisation tube) where it is exposed to high temperatures for the cross-linking.

Typically at the manufacturing of these types of cables the CV tube is filled with nitrogen and operated at a pressure of 10 bars. Before the cable can be further processed, such as the application of a screen as well as the outer sheaths, a degassing is necessary, which may take up to ten days. Commonly, the line is built as a CCV or VCV line (Catenary Continuous Vulcanisation or Vertical Continuous Vulcanisation).

The technology is well proven as it has been used for decades, but it involves high costs for the building and the production line. In addition, there is another method on the advance where high performance thermoplastic elastomer (HPTE), based on polypropylene, is used as insulation material. This new technology has been further invented by Prysmian and is published as the so called 'P-Laser' technology.<sup>[1]</sup> The material shows good electrical and thermo-mechanical properties, comparable and in some aspects even superior to those of XLPE.

The HPTE does not require a cross-linking section and no degassing treatments. That means that the complete cable can be manufactured in an in-line production process, where even the screening and the outer sheath could be applied in one production step. No matter which approach is applied, the demands for dielectric strength of XLPE and HPTE remains on the same high level and needs to be assured.

Important in this regard is the cleanliness of the insulating material. This is the point where the advanced purity inspection and sorting system comes into focus.

This paper will introduce an online inspection and sorting system that detects contamination inside and on the pellets such as metallic or organic contamination, colour variations, agglomerates, cross-contamination and foreign pellets. The system presented includes the unique combination of X-ray technology and an optical camera technology for highest detection probability for all sorts of contamination. Thus, the quality of XLPE or HPTE material and accordingly the production process are optimised and costs reduced.

Furthermore, the paper will briefly refer to an innovative offline system, which inspects and analyses small batches of pellets. This is further of importance to check pellets that have been sorted out by the online inspection and sorting system.

## XLPE and HPTE insulated medium- and high-voltage cable

Today, insulation material that is mainly in use for MV and HV cables is cross-linked polyethylene (XLPE). Cross-linked polyethylene is produced from polyethylene under high pressure with organic peroxides as additives. Under heat and pressure the cross-linking takes place. The individual molecular chains are linked with one another, and this results in a material change from a thermoplastic to an elastic material.

An advantage of XLPE as insulation for medium- and high-voltage cables is their low dielectric loss and their excellent electrical and physical properties for power transmission. As XLPE is resistant to thermal deformation and to ageing, an XLPE cable allows the carrying of large currents. Another feature is the easy installation of XLPE cable. It withstands small radius bending and is light in weight.<sup>[2]</sup>

Some years ago the company Prysmian invented a new type of cable where instead of XLPE a HPTE (high performance elastomer) is used. This material has equivalent characteristics to XLPE.



The difference is that there is no cross-linking and accordingly no by-products. HPTE is re-usable, allows shorter production time and reduced facility area, and is compatible with the existing network components. Both materials XLPE and HPTE are used for medium- and high-voltage cable production.

## Necessity of clean plastic material for MV and EHV cables

The purity of the plastic material that is used for the insulation of HV and EHV cables is highly important. The purer the compound (Figure 1), the lower the risk of a breakdown.

Metal impurities of 50µm may already cause damage to the end product with high follow-up costs. The repair of a defective subsea cable, for example, which has been damaged by contamination, can lead to weeks of downtime.

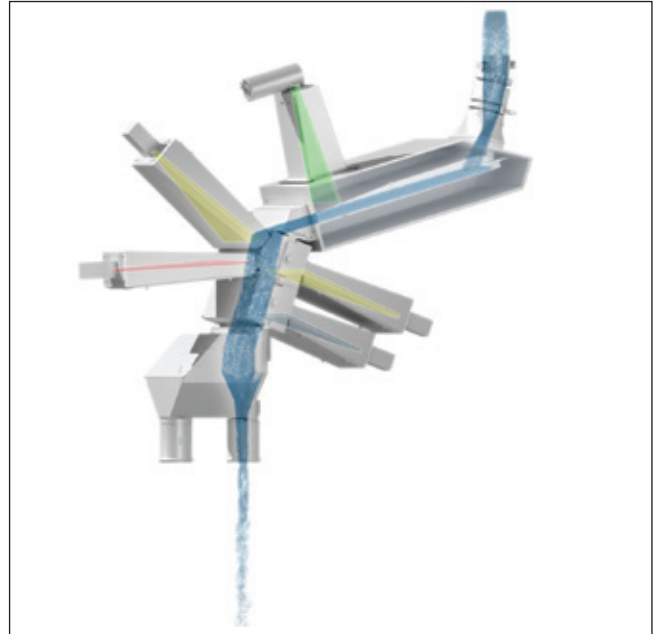
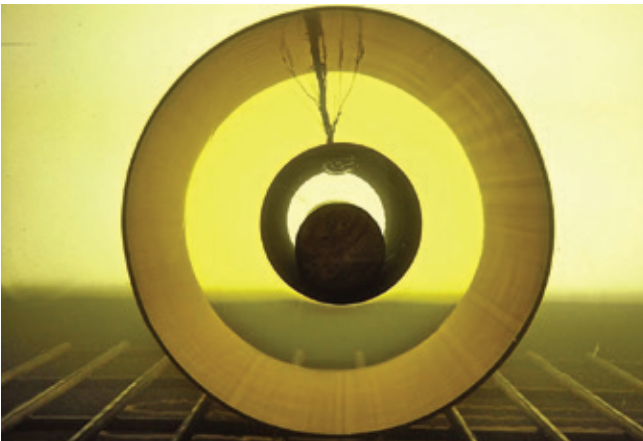
Furthermore, contaminated insulation compound and respective defective cables and consequential breakdowns at the discharge test affect the industry at the manufacturing process. As part of the production of EHV cables, they are tested in plant with a test voltage 2.5 times the nominal voltage.

Approximately, five to six breakdowns (Figure 2) a year are commonly registered by each production site causing tremendous losses.

○ Figure 1: High quality insulation compound:



○ Figure 2: Cross section of an EHV cable with breakdown



○ Figure 3: Inspection and sorting system with X-ray camera (green), optical (yellow), infrared (red), and colour (blue) cameras

One breakdown causes costs of up to €150,000 even before the cable is delivered to its dedicated position. In addition, valuable time is lost, making permitted delivery dates unachievable.

Often, non-agreed joints have to be used, damaging the quality image of the manufacturer, and this may lead to contractual penalties. It is for these reasons that some standards for high-voltage cables demand the exclusion of contamination from 75µm in the processed materials<sup>[3]</sup>. Moreover, there are guidelines from the AEIC (Association of Edison Illuminating Companies), which state that cables have to be designed in such a way that they are usable for at least 40 years.

Accordingly, it is necessary to inspect the material for purity to 100 per cent before it enters the end product. Sample tests are not sufficient to exclude all contamination reliably.

Today, cable manufacturers use screens to catch impurities in the XLPE and HPTE melt before they get into the cable. The screens are positioned directly in the melt flow after the extruder, before the crosshead. However, these screens can get clogged by scorches, or excessive amounts of contaminants after certain run time. Then the melt pressure in the extruder may increase significantly.

Finally, the production has to be stopped in order to change the screens, which in turn means that later a joint is required at that position.

Joints where the cables are welded together are manually made and always critical, in particular with regard to subsea cables for offshore applications.

That is why cable manufacturers aim at delivering large cable lengths with only a minimum number of joints, as they contain a potential risk for breakdowns.

As clogged screens reduce the productivity of the line, reliable methods to detect and sort out contamination in the polyethylene material have to be implemented.

## XLPE and HPTE purity assurance before material processing: inspection and sorting

Today, for pellet inspection, systems are used either in laboratories or for online monitoring during the production process of the granules.

The majority of the systems are based on optical technology to detect contamination on the pellet. Contamination inside the pellets cannot be detected by these systems. The inspection and sorting system described in the following pages allows for 100 per cent online quality assurance by using X-ray technology and an optical technique.

Contaminations that are detected are identified by image processing software, characterised as contamination and automatically separated. The technology allows for the detection of impurities down to a size of 50µm.

### X-ray technology

The basic detection principle of the X-ray technology uses the different attenuation of the material. XLPE mainly comprises carbon.

The carbon atom has six protons in its core. A typical contamination would be steel particles from the extruder or granulator, which is mainly iron (FE). Iron has 26 protons in its core.

These 26 protons have a much higher X-ray attenuation than the six protons from the carbon and this results in a perfect contrast between the two materials in the X-ray image.

### Optical technology

Regarding the optical inspection, the illumination plays an essential role. In order to allow precise recordings of material flows at industrial speed, modern camera technologies (optical, infrared and colour cameras) are used. Powerful image processing software similar to the one used for the X-ray inspection is used to detect contamination with the optical system. Therefore, by setting a certain threshold, all contaminated pellets which are above the threshold in the mathematical algorithm are sorted out.

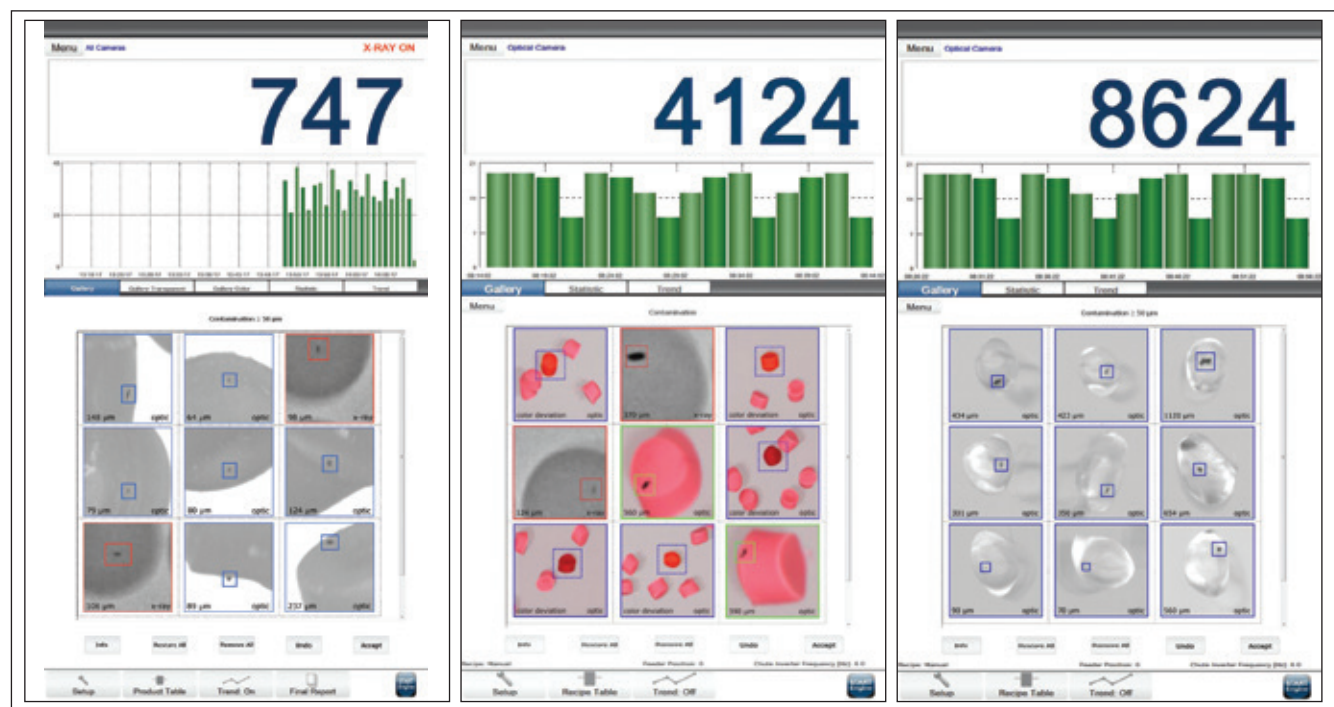
### Typical contamination detected by X-ray and optical technology

The combination of both X-ray and optical technologies enables the detection of contamination in the pellet itself and on its surface (Figure 4). The X-ray system inspects transparent and coloured (eg black) pellets as well as semi-conductive XLPE material for impurities. Typical impurities detected with X-ray are metallic as well as organic contamination and inhomogeneities (TiO<sub>2</sub>) inside the pellet. In addition, the optical system detects, for example, black specks on the pellet, foreign objects and foreign pellets as well as other organic or metallic contamination.

### Integration of the system in the production line

The system is typically installed between the hopper that is fed from the XLPE and HPTE supply (octabin, bag or silo) and the hopper of the extruder, whereas the compound is fed by gravity.

○ **Figure 4:** By means of X-ray technology and an optical inspection the system detects contamination inside the plastic pellet and on its surface. The system detects metal contamination, black specks, yellow discolourations and colour variations in transparent and non-transparent material







○ **Figure 5:** Offline inspection and analysis system

## On- and offline inspection and analysis of pellets, flakes and tapes/films

In addition to online inspection and sorting devices there are modular designed systems available for on- and offline inspection and analysis of pellets, flakes and tapes/films. These are used for smaller throughputs as well as production lines where sample testing is sufficient, or for the control of incoming goods.

Depending on application, the systems are equipped with X-ray technology (X), infrared technology (IR) or optical sensors (V) to be used during the production or for sample testing and detect contamination from 50µm. For example, a laboratory inspection and analysis device with X-ray technology (Figure 5) inspects up to 3,000 pellets (200ml) that are placed on a tray.

Within seconds, these pellets are inspected for contamination. Subsequently, contaminated pellets are optically highlighted, which makes the extraction of the individual contamination significantly easier.

For comprehensive process optimisation cable manufacturers combine an online inspection and sorting system with an offline inspection and analysis device.

Once contaminated pellets have been detected and sorted out, the laboratory system inspects these pellets again and marks contamination optically for an easy separation of all rejects. This interaction of online and offline inspection and analysis enables control of the material purity and allows the creation of a database to prevent future contamination.

## Conclusion

In summary, this paper outlined the reasons for the need of a high purity degree of XLPE and HPTE material used for the insulation of MV and EHV cables.

Furthermore, the paper introduced systems for on- and offline quality control of XLPE and HPTE that inspect the material before processing.

The presented inspection and sorting system detects contaminated pellets and separates them before they get into the extrusion process. The contamination may be in the raw material, but may have also been added at the handling and transport stage.

Accordingly, even if cable manufacturers keep on using screens, this technology assures that screens are not getting clogged with impurities from contaminated pellets and allows, therefore, a longer and safe production run. By using X-ray and optical technologies contaminants inside and on the pellet surface are detected, which guarantees 100 per cent quality control.

With the use of an offline inspection and analysis system for contaminated pellets that had been separated by the online inspection system, production processes can even be improved.

The material purity is controlled and the analysis gives information to prevent future contamination.

Taking these advantages together, the use of the introduced technologies for quality control of XLPE and HPTE material is essential to assure high-quality MV and EHV cables.

Simultaneously, by ensuring a high purity degree of XLPE and HPTE material, cost for re-manufacturing cables that failed the discharge tests can be saved and the efficiency of the cable production line is improved to a great extent.

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# XLPE和HPTE材料在中高压电缆生产中的检测和分析

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## 摘要

用于中压、高压和超高压电缆的绝缘塑料必须符合最高的纯度标准。最常用的电缆绝缘材料为XLPE(可交联聚乙烯)。交联XLPE电缆通过CV管(连续硫化管)时暴露于高温下。通常在制造这类电缆时, CV管内充满氮气且压力达到10巴。在可以进一步处理电缆之前, 例如进行电缆屏蔽以及安装外护套时, 需要进行脱气, 这可能需要长达10天的时间。通常, 该生产线是作为CCV(悬链式连续硫化)或VCV(立式连续硫化)线路建立的。经过数十年的应用, 该技术已经被充分验证, 但建筑物和生产线的成本较高。此外, 还有另一种方法, 使用基于聚丙烯的高性能热塑性弹性体(HPTE)作为绝缘材料。这种新技术已被Prysmian进一步开发, 并被公认为所谓的“P-Laser”技术。该材料具有良好的电气和热机械性能, 在某些方面与XLPE相当甚至优于XLPE。HPTE不需要交联环节, 也不需要脱气处理。这意味着整个电缆可在内联生产线上制造, 这允许在生产过程中直接进行电缆屏蔽和包外护套的操作。

无论应用哪种方法, XLPE和HPTE的绝缘强度应保持在同一较高水平, 并得到保障。就这一点而言, 重要的是绝缘材料的清洁度。这是高级纯度检测和分选系统的着重点。

本文将介绍一种在线检测和分选系统, 用于检测颗粒内和颗粒上的污染物, 如金属或有机污染物、颜色变化、附聚物、交叉污染物和无关颗粒物。本文所提出的系统是X射线技术和光学相机技术的独特组合, 可实现各种污染情况的最高检测率。通过这种方式, 优化了XLPE或HPTE材料的质量以及相应的生产过程, 降低了成本。

此外, 本文将简要介绍一种创新的脱机系统, 该系统能检查和分析小批量的粒料。更为重要的是检查由在线检查和分选系统整理出来的颗粒。

## XLPE和HPTE绝缘的中高压电缆

如今, 主要用于MV(中压)和HV(高压)电缆的绝缘材料是交联聚乙烯(XLPE)。交联聚乙烯由聚乙烯在高压下混合添加剂有机过氧化物而生成。在热和压力条件下, 发生交联反应。单一的分子链彼此连接并由热塑性材料变为弹性材料。XLPE作为中高压电缆绝缘材料的一个优点是它们的低介电损耗及其在电力传输过程中优异的电力和物理性能。由于XLPE能耐热变形和抗老化, 因此XLPE电缆可承载大电流。另一个特点是XLPE电缆便于安装。它可以承受较小的弯曲半径, 且重量轻。

几年前, Prysmian公司发明了一种新型电缆, 没有采用XLPE材料, 而是使用了HPTE(高性能弹性体)。这种材料具有与XLPE相同的特性。不同之处在于生产HPTE时不发生交联反应, 因此没有交联反应副产物, 且HPTE可重复使用, 这

可以缩短生产时间, 减少设施区, 并与现有网络组件相兼容。XLPE和HPTE两种材料均应用于中高压电缆生产。

## MV(中压)和EHV(超高压)电缆使用清洁塑料材料的必要性

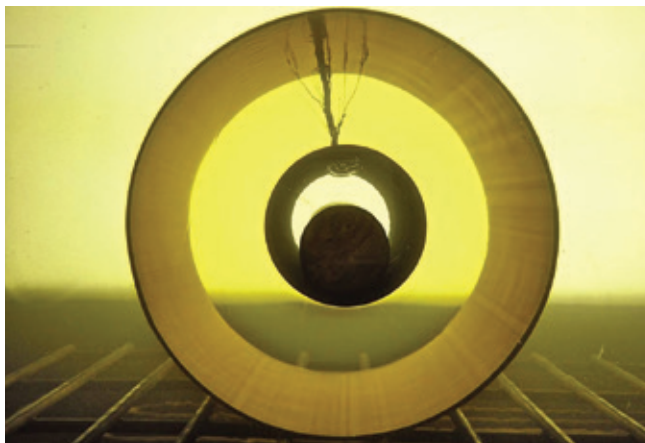
用于HV和EHV电缆绝缘的塑料材料的纯度非常重要。化合物越纯(图1), 降解的风险越低。

50 $\mu$ m直径的金属杂质就可能已经对成品造成了损害, 且会产生较高的后续费用。例如, 由于受到污染而损坏的海底电缆的维修可能导致数周的故障停机。此外, 污染的绝缘复合物不仅导致了有缺陷的电缆, 也间接导致了在制造过程内通电

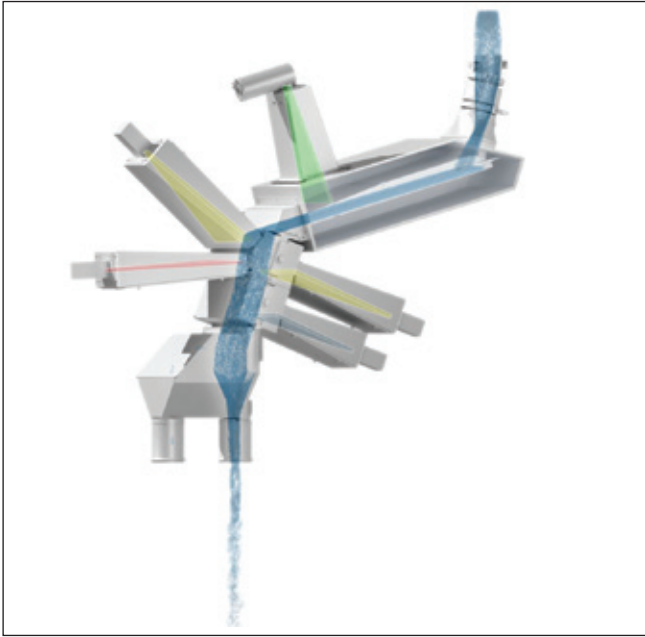
图1: 高品质绝缘复合材料



图2: 有故障EHV电缆的截面







○ 图3: 具有X射线摄像机(绿色)、光学(黄色)、红外(红色)和彩色(蓝色)摄像头的检查和分选系统

测试步骤中的故障。作为生产EHV电缆的一道工序，这些电缆会在工厂中进行额定电压2.5倍的测试。

每个生产基地大约每年会发生五至六起事故(图2)，这造成了巨大损失。即使在电缆交付到其专用位置之前，一个故障就会导致最高150,000欧元的损失。此外，这会浪费宝贵的时间，从而导致无法在指点时间交货。通常在这种情况下，不得不使用非约定的接头，这会影响制造商的品质形象，还可能会导致违约罚金。正是由于这些原因，在高压电缆的一些制造标准中，要求排除加工材料中直径为75 $\mu\text{m}$ 的污染物<sup>[2]</sup>。

此外，AEIC(爱迪生照明公司协会)的指导手册指出，电缆的设计使用年限必须至少为40年。于是，在进入最终生产之前，有必要检查材料纯度达到100%。抽样检测不足以可靠地排除所有污染物。

当下，电缆制造商对XLPE和HPTE熔体中的杂质在进入电缆之前进行筛选。筛网直接位于挤出机之后与十字头之间的熔体流中。然而这些筛网在一段时间的运行后可能会被焦炭或被过多的污染物堵塞。并且接下来挤出机中的熔体压力可能明显增加。必须停止生产来更换筛网，此时就需要一个接头来连接断点。电缆焊接在一起的接头由手工制作，特别是对于海上应用的海底电缆来说，这至关重要。接头具有潜在的故障风险，这也就是为什么电缆制造商致力于提供更长的电缆和最少的接头。由于堵塞的筛网会降低生产率，必须采取可靠的方法来检测和分选出聚乙烯材料中的污染物。

### XLPE和HPTE材料加工前的纯度保证：检验和分选

现如今，为了在原料颗粒的生产过程中进行颗粒检查，系统采用了实验室或在线监测的方法。

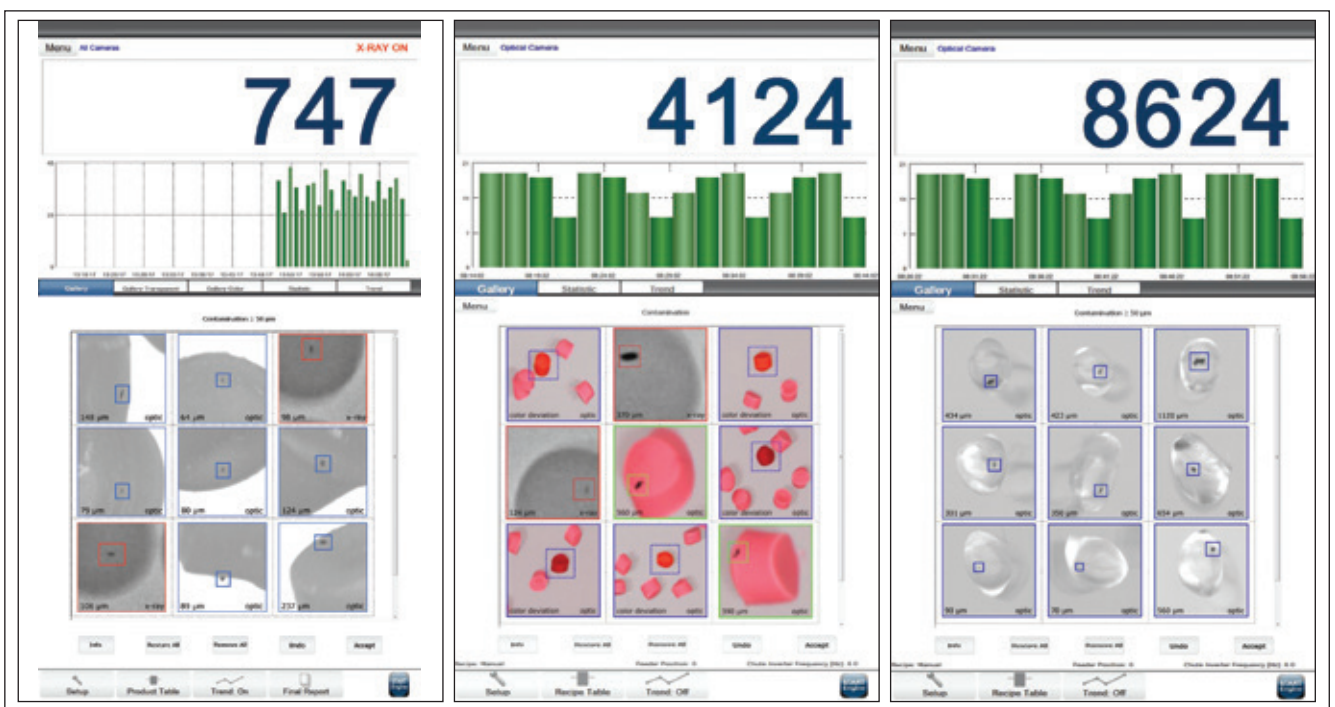
大多数检测系统基于光学技术来检测颗粒上的污染。这些系统不能检测颗粒内的污染物。

下面描述的检查 and 分选系统通过使用X射线技术和光学技术在线检测，保证100%的质量。检测到的污染物由图像处理软件识别，软件可识别并自动分离污染物。该技术可以检测直径低至50 $\mu\text{m}$ 的杂质。

### X射线技术

X射线技术的基本检测原理是利用不同材料的衰减差异。XLPE主要由碳元素组成。碳原子核内有6个质子。一种典型的污染物是来自挤出机或造粒机的钢颗粒，主要是铁

○ 图4: 通过X射线技术和光学检测，系统检测塑料颗粒内部及其表面上的污染物。该系统检测透明和不透明材料中的金属污染、黑点、黄色变色和颜色变化



(Fe)。铁原子核内有26个质子。所述26个质子的X射线衰减比来自碳的6个质子的衰减高得多，这使得X射线图像中的两种材料之间产生了完美的对比。

## 光学技术

在光学检查中，光照起着至关重要的作用。我们通过现代摄影技术(光学、红外、彩色照相机)实现了用工业速度精确记录材料流。我们使用类似于用于X射线检查的图像处理软件来检测光学系统的污染。通过设定一定的阈值，从而分离在数学算法中高于阈值的所有污染颗粒。

## X射线和光学技术检测到的典型污染物

X射线技术和光学技术的结合使我们能够检测到颗粒内部和其表面上的污染(图4)。X射线系统检测透明和有色(例如黑色)颗粒以及用于杂质的半导体XLPE材料。用X射线检测的典型杂质是金属，以及颗粒内的有机污染物和不同质二氧化钛(TiO<sub>2</sub>)。此外，光学系统可检测例如颗粒、异物和颗粒上的黑点以及其它有机或金属污染物。

## 生产线上的整合系统

该系统通常安装在从XLPE进料斗和HPTE供应器(纸箱、袋或料仓)和挤出机的料斗之间，原料通过重力进料。

## 在线和离线检查，分析颗粒、薄片和胶带/薄膜

除了在线检查和分选设备之外，还有模块化设计的系统可用于粒状、片状和胶带/薄膜的在线和离线检查和分析。这些系统可用于少量生产以及有足够样品进行测试的生产线或者用于进货控制。根据应用情况，系统选配备X射线技术(X)、红外技术(IR)或光学传感器(V)，用于直径50μm的污染物的生产或样品测试。例如，具有X射线技术的实验室检查和分析设备(图5)可以检查放置在托盘上的多达3,000个颗粒(200ml)。这些颗粒的污染检查在几秒钟内完成。随后，受污染的颗粒在屏幕上突出显示，这使得单独污染物的提取更加容易。

对于综合过程的优化，电缆制造商将在线检查、分选系统与脱机检查、分析设备相结合。一旦检测出污染的颗粒并整理出来，实验室系统再次检查这些颗粒，并以光刻的方式标记污染物，以便容易地分离所有废料。在线和离线检查和分析的这种交互能够控制材料纯度，并创建数据库以防止将来的污染。

## 结论

总结，本文概述了MV和EHV电缆绝缘需要使用高纯度XLPE和HPTE材料的原因。此外，本文介绍了XLPE和HPTE的在线和离线质量控制系统，在开工前对材料进行检查。

所提供的检查和分选系统检测污染的颗粒，并在进入挤出过程之前将其分离。原料中可能存在污染，也可能在处理 and 运输阶段产生污染。因此，即使电缆制造商继续使用筛网，该技术可确保筛网不会被污染颗粒中的杂质堵塞，从而提供更长且安全的生产运行周期。通过使用X射线和光学技术，检测到颗粒内部和外部的污染物，这100%地保证了质量控制。利用离线检查和分析系统甚至可以改进在线检测系统分离生产过程中的污染颗粒。材料纯度可控，系统分析提供信息以防止未来可能的污染。



图5: 脱机检查与分析系统

结合以上所有优点，使用引进的技术进行XLPE和HPTE材料的质量控制对于确保高质量的MV和EHV电缆至关重要。同时，通过确保高纯度的XLPE和HPTE材料，也可以节省出重新制造放电试验失败的电缆费用，这在很大程度上提高了电缆生产线的效率。

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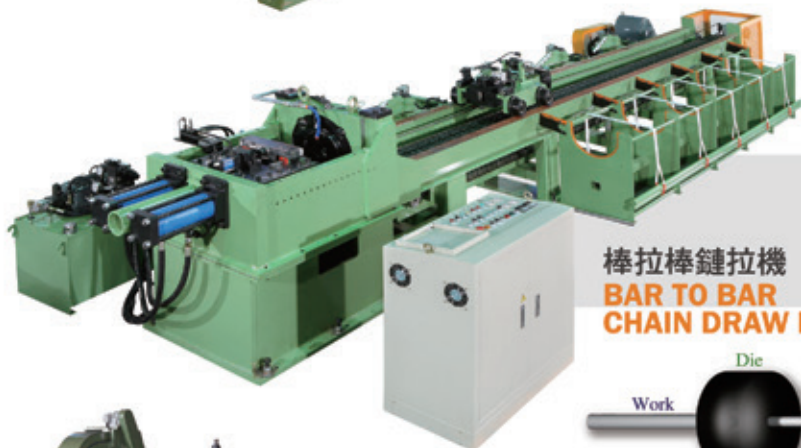
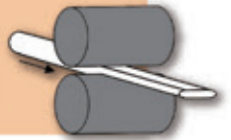


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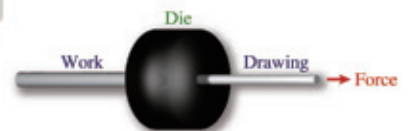
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