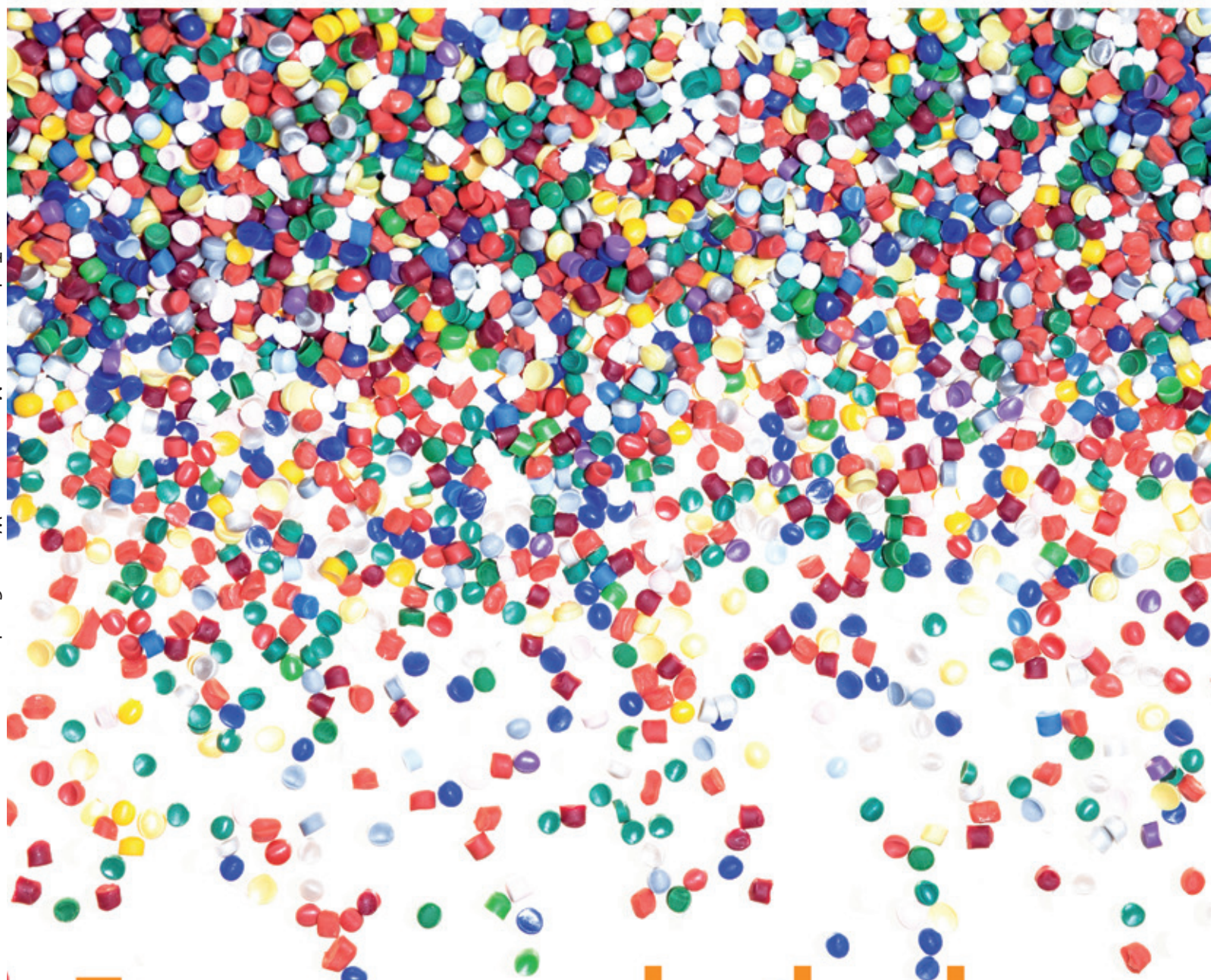




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See page 80 for further details

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It's all ship shape as the orders come in

New contracts, new appointments and a novel way of providing electricity are very much the theme running through the Corporate News section in this issue of *EuroWire*.

Tratos Cables has won a contract to supply wiring for three container ships, all responsible for taking goods all over the globe, while a number of companies have employed new staff in a variety of roles, which is all excellent news for the industry.

A French zoo is also very much looking to the future by building a new processing plant to convert waste into electricity!

The zoo is building a \$3m facility to generate electricity by burning biogas – collected from animal droppings and other organic waste. The full story can be found on page 7.

Also in this issue we are taking a look at the wire and cable industry in the UK in the final of our 'Focus On' features. It's encouraging to see not only a proud history of achievement for UK companies, but also for investment for the future. The feature starts on page 30.

On page 38 you can catch up with all the latest developments from companies in the compounds, colourants and masterbatches sector.

This is also an ideal opportunity to remind readers to send us their editorial, free of charge, for use in the September issue of sister publication *Wire & Cable ASIA*.

The magazine will be looking forward to the Southeast Asia exhibition in Thailand, in September.

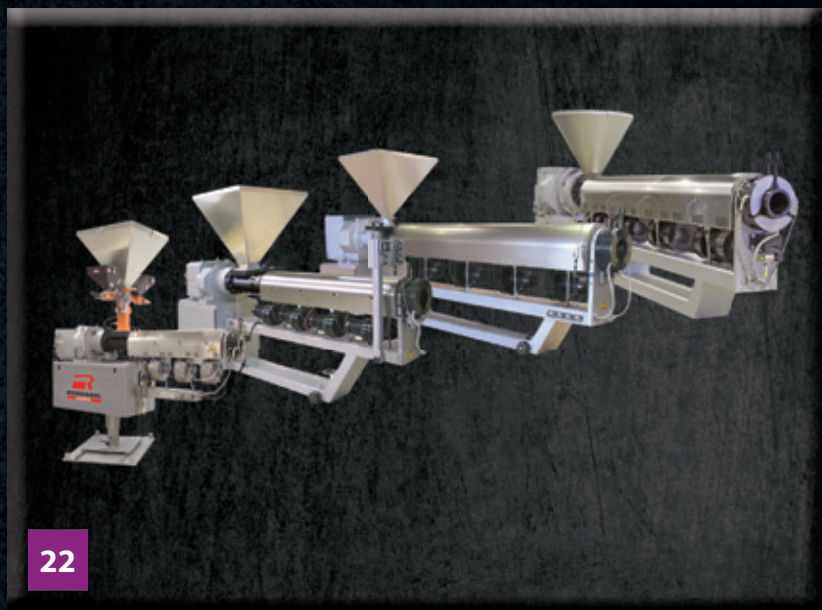
Send your editorial and pictures to me at david@intras.co.uk



David Bell
Editor

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- wire South America 2013 show
- wire Southeast Asia show

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dates for your diary ...

wire South America 2013

October 2013

1-3: **wire South America** –
trade exhibition – São Paulo, Brazil

Organisers:

Messe Düsseldorf/Grupo Cipa

Fax: +49 211 45 60668

Email: infoservice@messe-duesseldorf.de

Website: www.wiresa.com.br

September 2013

17-19 Sept: **wire/Tube SE Asia** –
trade exhibition – Bangkok, Thailand

Organisers:

Messe Düsseldorf Asia Pte Ltd

Fax: +65 6332 9655

Email: wire@mda.com.sg

Website:

www.wire-southeastasia.com

November 2013

4-5 Nov: **CabWire World
Conference** – conference – Milan,
Italy

Organisers:

ACIMAF, CET, IWCEA, IWMA, WAI

Fax: +44 1926 314755

Email: info@iwma.org

Website: www.cabwire.com

10-13 Nov: **IWCS 2013** –
trade exhibition –
Charlotte Convention Center,
Charlotte, NC, USA

Organisers:

IWCS

Tel: +1 717 993 9500

Email:

phudak@iwcs.org

Website: www.iwcs.org

2014

March 2014

11-15 Mar: **METAV** – trade
exhibition – Düsseldorf, Germany

Organisers: Verein Deutscher
Werkzeugmaschinenfabriken e.V.
(VDW)

Fax: +49 (0)69 756081 74

Email: metav@vdw.de

Website: www.metav.com

April 2014

7-11 Apr: **wire 2014** – trade
exhibition – The Fairgrounds,
Düsseldorf, Germany

Organisers:

Messe Düsseldorf GmbH

Fax: +49 211 456 0668

Email:

infoservice@messe-duesseldorf.de

Website: www.wire.de



▲ *Tratos has won the order to supply cables for three container ships, including MSC Angela*

Anchors aweigh for Tratos cables

SPECIALIST European cable manufacturer Tratos has won the order to supply cables for three container ships: MSC Tamara, MSC Angela and MSC Kim, all of which are

used to deliver a huge variety of goods to ports worldwide.

The Tratos Marine cables were selected on

account of their high quality manufacture and competitive pricing, as well as accreditations that ensure optimum safety, making them suitable for a variety of vessels.

Tratos Marine is a range of quality, highly cost-effective shipboard cables designed specifically for ship and navy vessel installation.

Not only do these cables have a lower intrinsic cost in comparison to other ranges on the market with similar properties, they also allow for lower installation and operational costs due to their design and the components used, which reduce dimension and weight by approximately 20 per cent.

Tratos Marine cables are flame retardant to IEC 60332-3A and fire resistant to IEC 60331. In line with the company's dedication to developing environmentally friendly solutions, the cables produce very low smoke and corrosive gas emissions. This range has been approved by the Italian Military Marine and NATO.

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



▲ *Tekmar manufactures the Teklink subsea cable protection system*

Tekmar, a supplier of subsea cable protection, has been OHSAS 18001 accredited, enhancing its excellent Health and Safety reputation.

This is the third standard the company has received in recent months, following the renewal of the ISO 9001 quality management and ISO 14001 environmental management standards.

OHSAS 18001 is an internationally accepted certification for the method of assessing and auditing

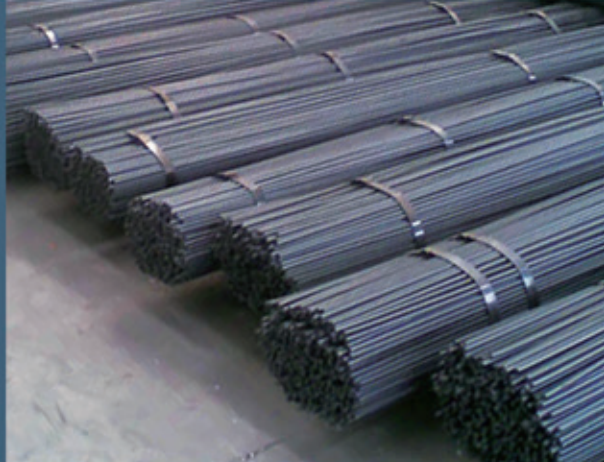
occupational health and safety management systems. This is aimed at minimising risks, providing a safe working environment for employees and visitors, and demonstrates a commitment to maintaining an effective health and safety policy.

Tekmar is the developer and manufacturer of the Teklink cable protection system.

Tekmar Energy – UK
Website: www.tekmar.co.uk



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Website: www.tjkmachinery.com

E-mail: tjk@tjkmachinery.com

French zoo to generate its own electricity



FRANCE'S Beauval Zoo is making plans for a new processing plant to convert waste into electricity.

The \$3 million facility, expected to be in operation by next spring, will generate electricity by burning biogas collected from animal droppings and other organic waste.

Most of the zoo animals are expected to contribute, with giant pandas alone producing over 65 pounds of fuel every day!

Beauval Zoo estimates that the processing plant will cut energy costs by

40 per cent, and unused electricity will be sold to the region's power company for additional gains.

"This initiative is a perfect fit in the policy of sustainable development that we have been applying for a long time," zoo spokeswoman Delphine Delord told French news site, The Local.

Biogas systems utilising organic waste have gained momentum as a renewable energy alternative across the US and Europe.

Beauval Zoo – France
Website: www.zoobeauval.com

Unused used plant

Mathiasen Machinery Inc has been awarded an exclusive contract to sell a 2009 Redex 5-stand rolling mill and two compact RESY® filtration systems.

The equipment was built in 2009, but never installed and is still in its original shipping crates.

"This is a great opportunity for a manufacturer to save time and money to add production capabilities.

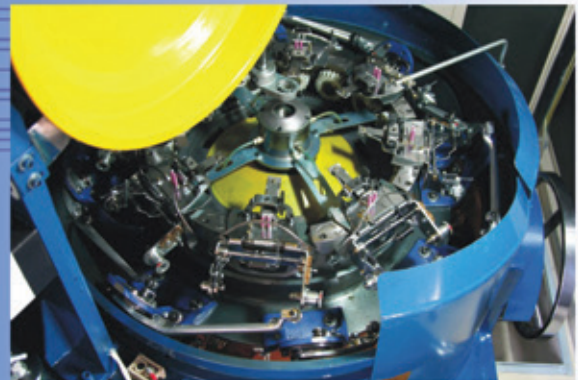
"This high quality equipment is ready to ship now," said Mike Mathiasen, co-owner of Mathiasen Machinery Inc.

The rolling mill is rated to produce a cross sectional area of 2mm² to 125mm² with a yearly capacity of 15,000 tonnes.

Mathiasen Machinery – USA
Website: www.mathiasen-machinery.com

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Stepping down after 13 years

BENJAMIN Bill has retired from Pelican Wire Company after 13 years.

Mr Bill joined Pelican Wire as the sales manager in 2000, but later assumed the role of purchasing manager, where he developed strong relationships with Pelican Wire's key suppliers.

His sales skills and experience helped Pelican Wire secure its role in the resistance wire, thermocouple and RTD wire and cable sector.

Joseph Karkoski, CFO, said: "Ben has the ability to start a conversation with anyone; he will go into a room full of strangers and leave knowing everyone on a personal level and their life stories."

Mr Bill said: "It was a blessing working with such great colleagues, not to mention the wonderful suppliers I had the pleasure of working with. It is amazing how much the company has grown since I first started working here, and I think it's safe to say that Pelican Wire will be around for a very long time."

Pelican Wire is a 100 per cent employee-owned custom wire and cable manufacturer.

Pelican Wire – USA

Website: www.pelicanwire.com

AFL integrates TCC

Following the integration of TCC Group into AFL, TCC is to be known as AFL Services Europe Limited, assuming the AFL brand.

"AFL is known for both quality services and reliable products that deliver value to our customers," said Paul Thompson, general manager for AFL Services.

"As a leader in the North American market, we now have the opportunity to strengthen and broaden our customer relationships in Europe. The rebranding of TCC Group to AFL furthers our commitment to provide exceptional service abroad."

TCC Group was acquired by AFL in 2011 to expand its reach into the European market. Now known as AFL Services Europe Ltd, the company will continue to design, build, install and maintain next generation networks across the United Kingdom, Ireland and Europe.

AFL Services – USA

Website: www.aflglobal.com

Strengthening position

Pentre Group has purchased Farres after a 20-year association.

The group, incorporating Hearl Heaton, is celebrating 25 years serving the international wire and cable industry and is now a leading European manufacturer of all types of reels, drums, spools and bobbins.

With four factories in the UK and one in Rakovnik, Czech Republic, Pentre sees this acquisition as an exciting and important move to allow it to strengthen its position in southern Europe and North Africa.

Pentre Group – UK

Website: www.pentregroup.com

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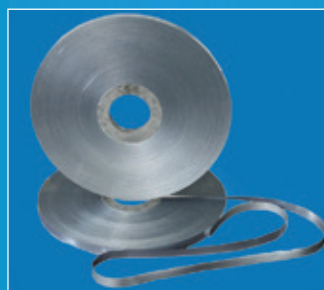
1. Semi-conductive Binding Tape Series

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



2. Water-blocking Tape Series

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



3. Insulation Binding Tape Series

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

4. Flame Retardant Tape Series

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

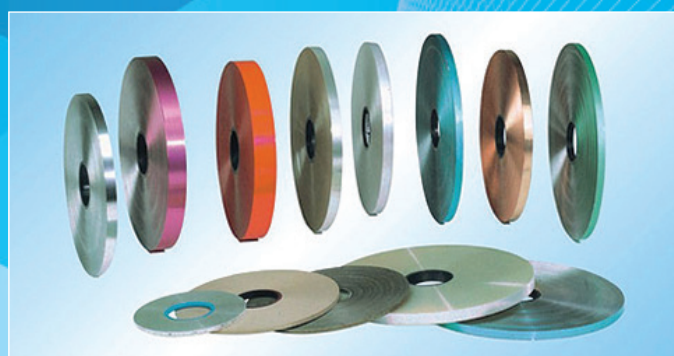


5. Metal Shielding Tape

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

6. Filling Rope Series

- Water-blocking filling rope
- Semi-conductive water-blocking filling rope
- High temperature-resistant filling rope
- PP filling rope
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Prime minister goes to the wire (mill)

Hannelore Kraft, prime minister of North Rhine Westphalia, visited ArcelorMittal's site in Duisburg to view the company's new high-technology wire rod mill.

The new rolling mill in Ruhrort is testimony to ArcelorMittal's commitment to the Duisburg site.

The investment of over €130m will enable a significant reduction in energy costs, increase the plant's productivity and support jobs and training positions.

The Duisburg plant supplies semi-finished products for forging in addition to high-strength and ultra-high-strength wire rods for the car industry and renewable energy sector, including offshore wind turbines.

Michel Wurth, group management board member for long carbon worldwide, said:

"Germany is an important location for the manufacture of products with high value creation.

"The new wire rod mill will make a significant contribution to us being able to retain and expand our leading market position. We therefore appeal to the public authorities in Germany and Europe to support the industry and strengthen its competitiveness."

As an energy-intensive company, ArcelorMittal relies on huge quantities of electricity, which has to be bought in.

The high electricity prices in Germany are said to threaten the competitiveness of the industry and the future of the Duisburg plant.

ArcelorMittal – Luxembourg
Website: www.arcelormittal.com

US aluminium plant under closure threat

EMPLOYEES of a western Kentucky aluminium smelter have been told of plans to close the plant on 20th August – unless the management can secure lower electricity rates.

Century Aluminum has been in negotiations with its power supplier, Big Rivers Electric, for over a year. Both parties confirmed they are still trying to negotiate a deal before the deadline.

Legislation to lower the smelter's electric bill was introduced during the General Assembly, but was pulled because of misinformation surrounding the issue.

Century spokesman Mike Dildine said that telling the workforce of the company's plans fulfilled a federal requirement, but that it coincided with Century giving notice to its largest customer, Southwire Co, that it would terminate its contract unless a power agreement is reached.

"Typically, that is a 60-day notice," Mr Dildine said. "We felt that since our contract with Southwire is a four-month notice, we should let our employees know too. We are still doing everything we can to get a competitive rate."

Big Rivers spokesman Marty Littrel believes the two companies can reach an agreement. "I think we're moving in the right direction," he said.

Century Aluminum – USA **Website:** www.centuryaluminum.com



▲ Century Aluminium's Hawesville site. Photograph courtesy of www.statejournal.com

Fibre optics in deep water

TE SubCom has signed a contract with Chevron USA Inc to connect the Jack & St Malo offshore facility with an undersea fibre optic communications system in the Gulf of Mexico. The cable system is scheduled for completion in May 2014.

Jack & St Malo fields are located 280 miles south of New Orleans at a depth of 7,000 feet. The fields are supported by a semi-submersible platform which will be connected by 106km of submarine cable, subsea equipment, and a new branching unit to an existing fibre network.

TE SubCom – USA **Website:** www.subcom.com

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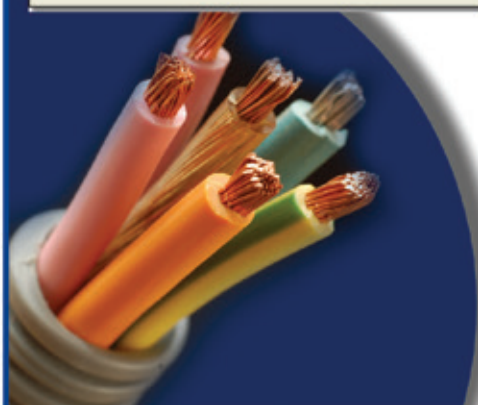
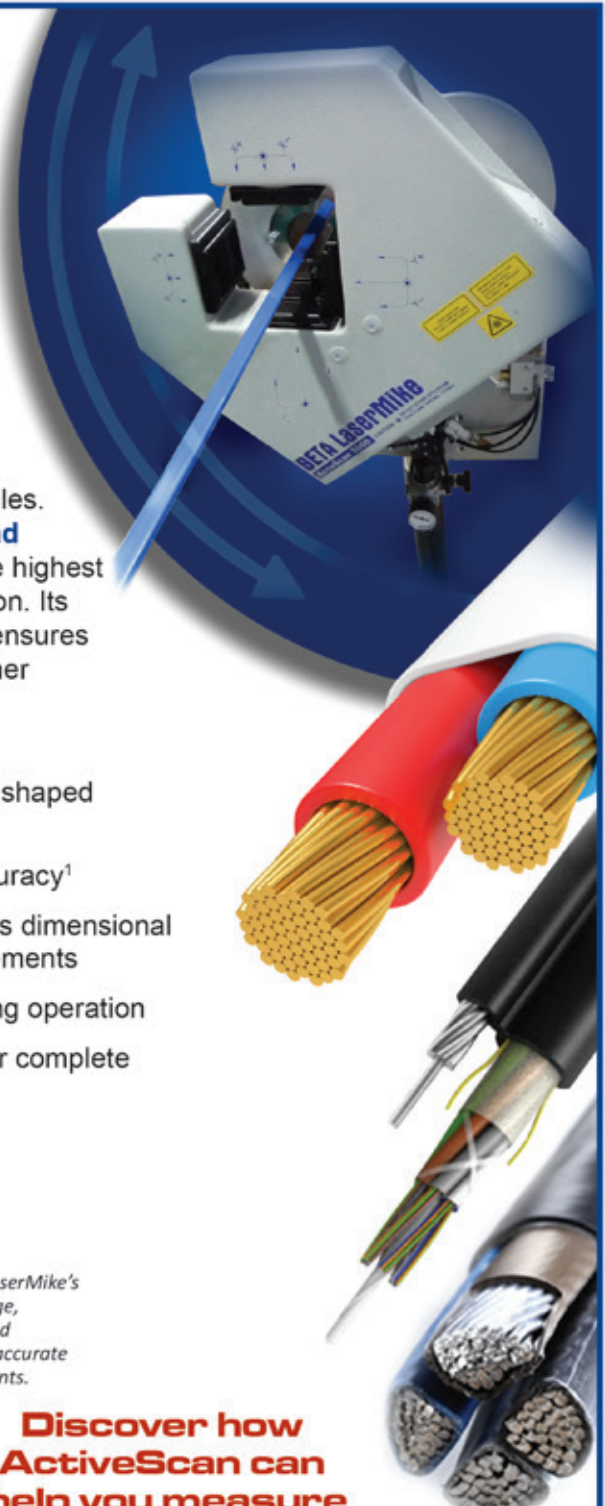
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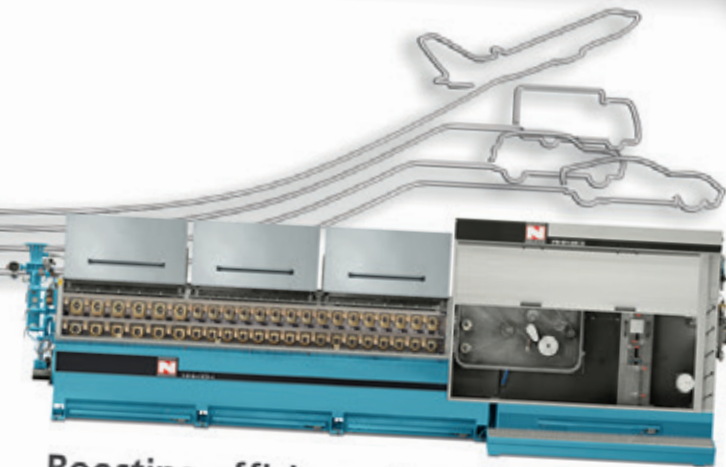
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Boosting efficiency the economical way: NIEHOFF MMH for aluminium wire

The solution for efficient aluminium multi-wire production in the automobile and aviation industries: NIEHOFF MMH lines. For years NIEHOFF, the market leader in the field of multi-wire drawing of aluminium wire for automotive wire, has demonstrated using this patented technique that aluminium wire can be produced efficiently, economically and with outstanding quality.

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New single-mode fibre for 12,000km

DESIGNER and manufacturer of fibre optic network products, OFS, has introduced TeraWave™ ULA ocean fibre, a new single-mode fibre designed for 100Gbs coherent transport in submarine systems for distances up to 12,000km.

TeraWave ULA fibre is designed to provide a unique combination of the industry's largest effective area, excellent cabling performance and significantly reduced attenuation for reliable coherent transmission at 100Gbs over trans-oceanic distances. Used in shorter length applications, the fibre is said to provide even better non-linearity performance for increased spectral efficiency.

OFS manufactures TeraWave ULA fibre using proprietary processes to produce fibre with low water peak (LWP) performance and ultra-low polarisation mode dispersion (PMD).

The new fibre is optimised for ultra-long haul networks that use advanced modulation formats and coherent detection, such as transoceanic networks where extreme distances between shore end terminals limit the per-channel launch power in dense wavelength division multiplexing (DWDM) transmission.

Compared to earlier generations of submarine fibres, TeraWave ULA fibre reduces the performance limitations introduced by fibre non-linearities, thereby supporting higher spectral efficiency and lower repeater spacing.

Applications without repeaters, such as coastal festoons and deep water crossings, can also take advantage of the large effective area of TeraWave SLA ocean fibre, which permits higher power handling capacity without additional distortion, meaning more channels at higher speeds over longer distances before amplification is required.

OFS – USA

Website: www.ofsoptics.com

Keeping rolling. . .

Company founder FG Theis started production of flat wire and profiles more than 100 years ago.

Now the company rolls in thicknesses of 0.15-5mm and in widths ranging from 1mm to 50mm in all grades and qualities.

The company's highly precise and varied flat wires include narrow steel strips and complete profiles. These have stringent tolerances, seamless edge shapes, linear straightness and absolute flatness. These properties are achieved through sophisticated calibration coordination and precise shaping in multi-roller profile rolling plants.

All types of edges can be provided, including natural edges, cut, rolled or chased edges. Special edges can also be manufactured to meet customers' technical drawings.

Complete profiles are manufactured on different tandem rolling mills for profiles, using round wire or pre-split steel strip. The company's own tool making plays a large part here, guaranteeing precise profile shaping with the narrowest of radii and angles.

Friedr. Gustav Theis Kaltwalzwerke GmbH – Germany

Website: www.theis.de

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EIC membership for Tratos

SPECIALIST Italian cable manufacturer Tratos has become a member of the Energy Industries Council (EIC).

The EIC provides one of the most comprehensive sources of energy projects and business intelligence in the energy sector.

A not-for-profit organisation wholly owned by its members, the EIC currently has over 600 members who collectively employ over a million people and generate over £100 billion in revenues out of their UK-based operations.

Manufacturing in the UK exceptionally high quality electric and fibre optic cables for the energy sector, Tratos believes membership of the EIC will allow the company to gain access to a wider audience than ever before.

Maurizio Bragagni, export director of Tratos, said: "Membership of the EIC not only provides us with access to EIC's global online project database with details of thousands of future and active projects across all energy sectors, but it also provides us with the opportunity to engage and network with organisations and individuals in this field.

"We see it as an exciting opportunity to showcase our product range and manufacturing expertise. We believe UK manufacturing has a lot to offer, including quality and innovation."

Tratos manufactures cables for a wide variety of energy sector applications including nuclear, oil and gas, defence and fusion, along with specialist cables for a number of niche markets.

Cables are manufactured in modern, sophisticated production facilities with fully trained personnel and technical backup. These are located in Knowsley, Merseyside, along with a further two factories in Italy.

Tratos Cavi - Italy
Website: www.tratos.eu

Customer satisfaction is paramount

Customer service has remained an important target for Ajax and Turner, with staff training and after-sales services being paramount.

The Indian company provides customers with recutting and repolishing services for polycrystalline diamond, natural diamond and tungsten carbide dies. These services eliminate the defects and wear marks in the die after the wire drawing process.

Each die can be re-calibrated at the request of the customer. Ajax and Turner also provides in-house die polishing instruments.

Ajax and Turner Wire Dies Co - India
Website: www.ajaxturner.com



▲ Specialist cables from European manufacturer Tratos



▲ In-house diamond die polishing machine

Job losses ahead for Tata?

UP to 300-400 jobs may be lost as a result of steel giant Tata Steel's plans to shut down two research and development facilities in the UK, moving them overseas, including to India.

The company informed the UK government of its plans to close its technology centres on Teesside, and in Rotherham, South Yorkshire, over the next 18 months.

The Sunday Times reported that Tata might then move this research to the Netherlands and India.

In November last year the company revealed plans to restructure its British business; the plans include 12 sites and 900 jobs.

Its European operations have been hit by a combination of high energy costs, falling demand and plummeting steel prices – down five per cent in the last month.

The European steel operations of Tata, a result of its acquisition of Corus in 2007 for an estimated £6.7 billion, is believed to be operating with towering debts of £3.4 billion.

Tata Steel employs around 19,000 workers in Britain and controls 46 per cent of the domestic market.

Despite the tough environment, it has invested hundreds of millions of pounds in the British operations, including £185 million on a new blast furnace at Port Talbot in south Wales – the company's prime asset in the UK.

Its other large plant in Scunthorpe produces flat-steel products,

used mainly in the construction and infrastructure markets. Tata has previously dismissed talk of selling some of its British assets but it is believed the company may seek a partner to invest in its Lincolnshire plant.

Tata Steel UK – UK

Website: www.tatasteeleurope.com

New signing for Zumbach

Zumbach Electronic has boosted its UK team with the appointment of Adam Franklin as customer service engineer.

Mr Franklin joined the Swiss company after gaining more than ten years' experience in the field of vision inspection and measurement.

He has already completed his new service team member's training at Zumbach's head office in Switzerland.



▲ New customer service engineer Adam Franklin

Zumbach Electronic Ltd – UK

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Changes at the top since acquisition

ALPHAGARY has announced key personnel changes as part of its ongoing restructuring plan since its acquisition by Mexichem.

Chuck Hayes has been named plant manager at the company's Pineville, North Carolina, facility reporting to Daniel DeLisle, general manager. Mr Hayes had been plant manager at AlphaGary's now consolidated Bayshore, New Jersey, facility. He had prior experience at Roscom before joining the company.

"Hayes was part of the integration team, transferring equipment and capabilities from Bayshore to the Pineville facility," said Mr DeLisle.

"He is now overseeing the task of maximising the efficiency we created by operating out of this significantly expanded facility."

On the commercial side, Rick Peiczarka was named national sales manager, also reporting to Mr DeLisle. He is responsible for overseeing AlphaGary's US sales team and for fully coordinating all commercial activities.

Mr Peiczarka joined the company in 2007

as southeast regional sales manager. He was previously with Clariant.

Denise Wallace has been rehired by AlphaGary to fill the spot of southeast regional sales manager. She is a company veteran who previously had covered Ohio, Michigan, Indiana and Toronto.

She started at AlphaGary in 1990 and held various marketing and sales positions working at the Leominster, Massachusetts, headquarters before taking the midwest sales position.

Operating out of AlphaGary's UK facility, Richard Day has been named as its new European sales manager.

He brings over 25 years of commercial management experience in the compounding business, and was most recently with AEI Compounding.

Reporting to Mr DeLisle, he will have full commercial responsibility for AlphaGary's European customer base, managing the team of sales representatives and distribution partners.

AlphaGary Corporation – USA
Website: www.alphagary.com

Tulsa's new engineers

Tulsa Power has welcomed two new members to the company.

Gary Thompson has joined as engineering manager. With over 19 years of experience, Mr Thompson has a diverse knowledge base, and will provide leadership and engineering solutions in the further development of new products for a wider range of applications. He has a bachelor's degree in mechanical engineering and a master's degree in engineering management from Washington State University.

Gene Bell has also joined the controls engineering team. Mr Bell has over 26 years of experience in creating state-of-the-art control systems for a wide range of equipment. His expertise is in a variety of control platforms and brands and significant servo experience. As the company grows through new product development, Tulsa Power believes that automation expertise will become increasingly important.

Tulsa Power – USA
Website: www.tulsapower.com

Connecting Mallorca and Ibiza

REE (Red Eléctrica de España), the transmission system operator of the Spanish electricity system, has awarded Prysmian Group a contract for the supply of a second circuit of the interconnection between the Balearic Islands of Mallorca and Ibiza.

The project involves the design, supply and installation of a high-voltage AC cable system, consisting of 132kV cables and associated optic fibres, to transmit 118MVA and along a total route of over 123km (115km submarine and 8.6km overland). The system will interconnect the two islands to enable integration of Ibiza into the Peninsular network system via the existing Romulo (Iberian Peninsula-Mallorca) cable system.

The submarine cables for the Mallorca-Ibiza link will be manufactured at Prysmian's Arco Felice plant, Naples, while land cables and optical components of the submarine link will be manufactured in Vilanova i la Geltrú, Spain. Marine cable operations in deep waters (up to 750m) will be carried out using the group's own vessel, Giulio Verne. Cable installation and protection will be completed during 2015.

Prysmian has a long track record in the development of submarine interconnection milestone projects in the Mediterranean region.

The group is also a founding member of the industrial partnership Medgrid, launched to study the feasibility of a high-voltage direct current interconnection project to transmit electricity from solar or wind power plants to load centres on either rim of the Mediterranean.

Prysmian – Italy

Website: www.prysmian.com



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Worldwide furnace vision as a result of acquisition

LOI Thermprocess GmbH has signed an agreement with the European Capital SA SICAR for the acquisition of MTH. The acquisition remains subject to usual conditions precedent including the approval by the relevant antitrust authorities.

MTH is a holding company based in Menden, Germany, and controls the companies Schmetz (Germany, established in 1945), BMI (France, 1947), Mahler (Germany, 1950), IVA/RIVA (Germany/Poland, 1984) and Huisen-MTH (China, 2006).

MTH employs 321 employees in the fields of manufacturing and service for vacuum and atmospheric furnaces for a wide range of markets (heat treatment centres, aerospace, machine tooling and automotive) with a strong focus on Germany, Western Europe and Asia/China.

MTH's product portfolio encompasses horizontal and vertical vacuum furnaces, supplied by the German company Schmetz and the French company BMI.

Batch and continuous type atmospheric furnaces are covered by the two

German companies IVA and Mahler. The Chinese company Huisen, with its recently extended workshop and pre-assembly workshop, near Shanghai covers the entire product range for Chinese and Asian customers.

The acquisition of the MTH and its entire portfolio of highly specialised personnel will contribute to furthering Tenova's engineering know-how, capability and experience, especially in the field of after-sales service where MTH is a leading company.

Furthermore, the acquisition of MTH will provide a unique opportunity for Tenova, through its subsidiary company LOI Thermprocess GmbH, to expand the furnace business in the fields of heat treatment equipment and services for parts and components.

The vision is to create a worldwide furnace company covering the entire range of equipment and services for heat treatment processes in steel, automotive, aerospace and machine tool industries.

Tenova Group – Italy
Website: www.tenovagroup.com

Swiss FTTH deployment

Utility Energie Wasser Bern will use Keymile's MileGate multi-service access platform in a fibre-to-the-home deployment in Bern, Switzerland. The MileGate IP-based access platform can accommodate up to 480 optical fibre lines in an 8-HU sub-rack.

The energy utility, in partnership with Swisscom, the national carrier, is using a point-to-point architecture based on FTTH transmission technology from Ericsson. The partners expect to connect 90 per cent of all buildings in the city by 2017.

Swisscom will contribute 60 per cent of the necessary funding. The utility company is to deploy the network to 70 per cent of the town.

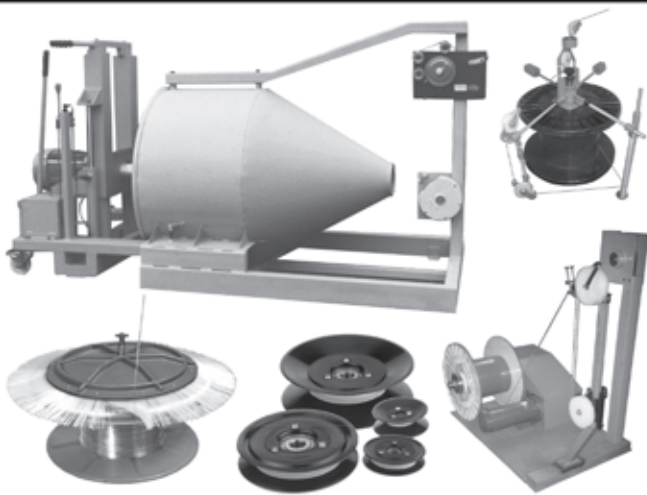
The fibre optic network will connect approximately 82,000 households, with each receiving four optical fibres.

Energie Wasser Bern – Switzerland
Website: www.ewb.ch

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Transatlantic Cable

Bay Bridge's broken bolts

▶ For the problematic eastern span of the new San Francisco-Oakland Bay Bridge, an elusive fix and blame to go around

State senators on 14th May pressed California Department of Transportation (Caltrans) officials at a hearing on their plans for dealing with suspect steel parts in the new San Francisco-Oakland Bay Bridge. "I understand that this is a big project, but we seem to have problem after problem after problem," one of the senators said to Caltrans director Malcolm Dougherty.

Whether the bridge will open to public traffic, as planned, on Labor Day (2nd September), depends heavily on how quickly a retrofit can be completed to replace the function of 32 bolts that broke in March after being tightened down by contractors. Caltrans and other agencies have struggled to determine a fix for the broken bolts – also known as rods.

On 23rd May, officials overseeing construction of the bridge presented an update on a plan, previously announced by the toll bridge programme oversight committee, to compensate for the broken bolts by installing large steel saddles over two seismic safety devices on the span. And the officials themselves received an update: about ongoing testing of the other fixtures on the bridge.

Reporting from Oakland in the *Contra Costa Times* (22nd May), Lisa Vorderbrueggen wrote that the use of large galvanised steel fasteners on a project in 2001 – the retrofit of the Richmond-San Rafael bridge – had led engineers to adopt the same specifications for the bolts that snapped this year on the Bay Bridge.

Weakened molecular structure

Noting "the well known phenomenon" of weakened molecular structure in high-strength steel coated with zinc, with attendant risk of embrittlement and fractures, Ms Vorderbrueggen wrote, "National standards caution engineers about [the use of galvanisation], and the Caltrans bridge design manual prohibits it on ordinary spans."

Referencing dozens of documents, emails and letters released by Caltrans, the *Times* reported that – in designing the unique self-anchored suspension span for the Bay Bridge in 2003 – state and private engineers believed that modifications in steel rod manufacture, developed for the Richmond-San Rafael retrofit, would sufficiently reduce the risk of hydrogen embrittlement.

The adaptation "does the trick for galvanising high-strength rods," a Caltrans engineer told colleagues in April 2003 – an assurance that, ten years later, would prove faulty. In early March, a third of 96 high-strength threaded rods – three inches in diameter and 17 to 24 feet long – broke in key seismic stabilisers on the Bay Bridge span.

Ms Vorderbrueggen wrote: "Engineers blame hydrogen embrittlement triggered by the combination of susceptible steel, the presence of hydrogen atoms trapped during galvanising, and the heavy load on the fasteners."

- ▶ Caltrans, Bay Area Toll Authority, the bridge contractor, and the team of private engineering consultants hired to design the span are now striving to determine whether a proposed \$5 million to \$10 million repair job can be finished in time to open the bridge on schedule.

Steel

▶ Drop in American and European crude steel production is more than offset by higher Asian output, especially in China

The most recent data from the Brussels-based World Steel Association showed global crude steel production rising 1.2 per cent in April compared with April 2012, as higher output from Asia – notably China – contrasted with declining output in other major steel producing regions.

Worldsteel on 21st May reported that global production rose to 132.1 million tons in April compared with 130.5 million tons in the same month of last year, while crude steel production in China, the world's largest steel producer, increased 6.8 per cent year-on-year to 65.7 million tons. Japanese and Indian steel production also rose, 1 per cent and 3.5 per cent, respectively, offsetting declines in South Korea and Taiwan.

Excluding China, production in the rest of the world declined 3.7 per cent year-on-year in April to 66.5 million tons, according to data from the 63 countries contributing to the report. Worldsteel member-states account for some 85 percent of global steel output.

North American crude steel production fell 5.7 per cent year-on-year in April to 10.1 million tons, driven by a 7.3 per cent drop in US crude steel production to 7.3 million tons. South American steel production dropped 3 per cent compared with April 2012, to 3.9 million tons, as Brazilian crude steel production fell 1.6 per cent to 3 million tons.

Transatlantic cable

In the 27-member European bloc, crude steel production fell 4.9 per cent year-on-year in April to 14.1 million tons, as three of the country's four largest steel producing members cut back production.

Germany, France and Italy reduced their production by 0.9 per cent, 12.3 per cent and 11.6 per cent, respectively. Spain bucked the trend, its production rising 10.3 per cent compared with April 2012.

Crude steel production in the Commonwealth of Independent States dropped 6.9 per cent year-on-year in April, to 8.9 million tons, reflecting a 4.3 per cent and 8.4 per cent reduction, respectively, in Russian and Ukrainian steel output.

Crude steel production from Turkey, another large steel producer, dropped 0.7 per cent to 2.9 million tons. As to crude steel capacity utilisation worldwide, it reached 80 per cent in April, up from 79.1 per cent in March but down two percentage points from April 2012.

Telecom

Verizon's proposal to 'cut the copper off' in rural areas: a practical workaround – or a ploy to drop vital services?

"For more than a century, Americans have made and received phone calls in their homes over a network of copper wires.

Now one of the biggest American phone companies, citing the damage inflicted by Hurricane Sandy, is asking regulators to let it start switching residential customers from wired to wireless service."

Writing in the *International Herald Tribune*, Patrick McGeehan cited a proposal by Verizon to substitute a new form of wireless phone service, not only in storm-ravaged communities but also in other areas where it might prefer to discontinue maintaining the old copper wires. The switchover would, Mr McGeehan said, effectively turn the home phones of customers in these areas into "tethered cellphones." ("Wireless Home Phones: A Plan Strikes a Chord," 20th May)

The New York-based telecom company had already started offering the service, Voice Link, in a few places in the Northeast and also in Florida, where its copper wires have been damaged by storms or otherwise degraded. On 16th May, state regulators in New York approved a trial of Voice Link on Fire Island, a beach community where many homes and businesses were without phone service since Hurricane Sandy hit last October.

As described by Mr McGeehan, Voice Link is a device that plugs into an electrical outlet and connects standard home phones to a local cellular system. It replicates traditional residential service in many ways, but critics note that it lacks some capabilities that could prove crucial in an emergency.

Unlike the service provided over copper cables Voice Link requires new batteries if electricity is out for two days or more, as it was for millions of residents in the Northeast after Hurricane Sandy hit. It also neither provides a connection to the Internet nor allows for data transmission.



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Transatlantic cable

- Mr McGeehan noted that Verizon stands to save many millions of dollars if it were no longer required to replace damaged copper wiring in flood-prone areas, or maintain existing cables elsewhere.

The Federal Communications Commission (FCC) reported in May that another big telecom, AT&T, also intends to "seek authority to serve millions of current wireline customers, mostly in rural areas, with a wireless-only product."

Trade

At a 'fork in the road' with respect to renewable energy, the US will bargain with China on solar panel prices

According to officials and trade advisers in Beijing, Brussels and Washington, the United States and the European Union have decided to negotiate individual settlements with China in the world's largest anti-dumping and anti-subsidy trade cases, involving China's roughly \$30 billion a year in solar panel shipments to the West.

As noted by Keith Bradsher of the *New York Times*, a plan that emerged in broad outline in May would essentially carve up the global solar panel market into regional markets.

It would sharply raise the price of solar panels exported from China, the world's dominant producer, by requiring Chinese

companies to charge more and, as well, limiting the total number of solar panels they may ship. ("US and Europe Prepare to Settle Chinese Solar Panel Cases," 20th May)

"Negotiations with China are still in a very early stage, so it may take several months before a final deal, if any, is struck," Mr Bradsher reported. If an agreement is reached, Chinese companies would no longer be charged steep American taxes on their exports of solar panels.


The US is collecting tariffs totalling about 30 per cent while the European Union was expected to impose similar tariffs of about 50 per cent on 5th June, with backdating to 5th March a possibility.

Chinese producers have partly bypassed the American tariffs by performing one stage in the solar panel manufacturing process outside mainland China: turning solar wafers into solar cells in nearby Taiwan.

Mr Bradsher observed that a negotiated deal would close that loophole in the American tariffs. The European trade case does not have the same loophole.

The goal of both sets of tariffs, and of the price and quantity regulations that could replace them, is to protect American and European manufacturers from what they and the administration of US president Barack Obama see as unfair competition.

Some two dozen American and European solar panel manufacturers have cut back production or gone bankrupt in the last three years, setbacks widely attributed to the prevalence of underpriced Chinese product in the market.



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Northeast Ohio

A surge in patents obtained by manufacturers is seen as a harbinger of new prosperity in Thomas Edison country

"As tech companies amass the lion's share of patents in the New Economy, some of America's oldest manufacturers are matching them stride for stride, invention for invention. In manufacturing centres like Northeast Ohio, some companies as old as their industries are continuing to innovate like startups."

Writing in the *Cleveland Plain Dealer*, Robert L Smith noted the year 2011, when Diebold Inc, a company that began as a safe maker in 1859, earned more than 100 patents on innovations in areas like computer software and cryptography.

Rockwell Automation also passed the 100-plus mark that year, for discoveries made in its Cleveland-area research labs. The century-old Goodyear Tire & Rubber Co took out no fewer than 128 patents.

The quickening pace of patenting by manufacturers is a sign of economic recovery; but according to experts consulted by Mr Smith it is also a critical step toward future success. Research and development allows companies like Diebold, Rockwell and Goodyear to compete and often define the state-of-the-art in global industries, said Tom Waltermire, the president of the regional business-attraction agency Team NEO. He told the *Plain Dealer*, "It's why they're alive."

Mr Smith reported that researchers at the Brookings Institution, one of Washington's oldest think tanks, "see a bigger splash and a model to be championed."

They say the quest for discovery sends ripples across a regional economy and does more than just about anything else to promote prosperity. ("Patent Study Finds Venerable Cleveland Companies Innovating Like Startups," 27th May)

As it studied the pace of patenting across America, Brookings found that patents and their pursuit spark investment and innovation, which in turn leads to wealth creation, higher wages, and often new jobs.

There is not a shopping mall or a stadium project that does all of that, said Jonathan Rothwell, a Brookings researcher and the lead author of "Patenting Prosperity: Invention and Economic Performance in the United States and its Metropolitan Areas."

"What we're saying is that innovation is a fundamental part of long-term economic growth," Mr Rothwell said. "The value that comes out of these inventions has widespread public benefits."

For Greater Clevelanders, the work of Thomas Edison, born in Milan, Ohio, is a ready example. Edison's inventions did more than light the night, wrote Mr Smith: they kindled General Electric Company. A hundred years later, GE Lighting remains one of the region's major employers and taxpayers.

Dorothy Fabian
USA Editor

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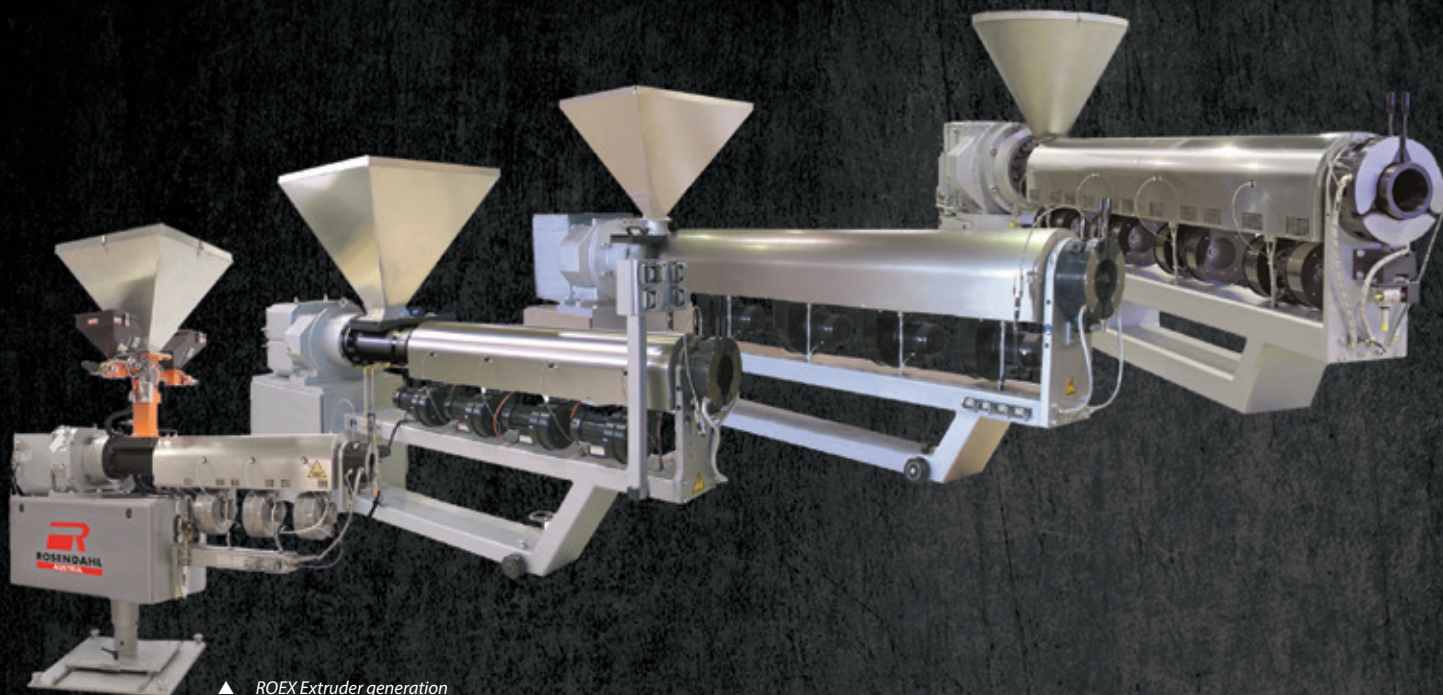
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▲ ROEX Extruder generation

Maximum energy efficiency

ROSENDAHL has been one of the leading companies in extrusion lines for many years. One of the biggest milestones on the way towards this aim was the continuous improvement which led to the ROEX Extruder generation.

To achieve a reduction in power consumption, Rosendahl focused on the extruder unit (the main consumer of energy in an extrusion line) and developed measures to enhance the energy efficiency of the new Rosendahl Extruder generation ROEX.

The following improvements were made:
The drive has been modified from DC

technology to state-of-the-art A/C power technology. Additionally the thyristor rectifier which caused enormous wastage due to reactive power was omitted.

By converting to a direct screw drive by means of a planetary gear motor mechanical losses were reduced. The planetary gear is directly driven by four symmetrically aligned motors ("compact motor and gearbox design").

Thanks to an optimised processing unit (screw and feeding section) the material output could be massively increased while, at the same time, reducing energy consumption.

During the development of the new Extruder generation ROEX special attention was paid to additional electrical power consumers like the heating and cooling section. A new design of the heating elements in combination with the cooling channels and the fans allowed substantially faster reactions of the extruder temperature control.

The effect of this was not only a precise control but also a reduction of the power consumption of the heating and cooling section.

Further machines of the Rosendahl extrusion lines were subjected to measures to increase efficiency.

New single fusion splicer

Fujikura Europe has launched the 70S fusion splicer, replacing its FSM-60S core alignment fusion splicer. The latest addition to Fujikura's fusion splicer range, the 70S has been designed to be more ergonomic, faster and more durable than the FSM-60S, reducing splicing time to just seven seconds.

A rugged construction design resists rain and dust, and will withstand a 30" drop test on six sides. Two of the newest features include an automated wind protector and a tube heater, developed for quicker splicing cycles and to reduce the number of operational steps. The unit also includes a high-resolution LCD monitor, powerful Li-ion battery and built-in training videos.

The 70S's redesigned carry case can be used as a table for faster preparation for mobile splicing, and a separate working table is included in the standard package.

This is the second fusion splicer launched this year by Fujikura, following the release in February of the 12S.

Fujikura Europe – UK

Website: www.fujikura.co.uk

It is of great importance to Rosendahl that the latest technologies are constantly applied (eg use of more efficient electronic components like AC motors, illuminants, conflation of several PLC systems, regulators and relays).

Rosendahl also uses a high-level line control system. This system coordinates the processes of all machines and demands only the power which is required for each particular process.

Rosendahl's ROEX Extruder generation saves compared to conventional production lines from 15 to 25 per cent energy for the entire production line with a comparable productive capacity.

Rosendahl Maschinen GmbH – Austria
Website: www.rosendahl-austria.com

Intelligent communication interfaces

PROFIBUS DP and Profinet IO industrial fieldbus standards have been used successfully for communication between devices of different manufacturers in automated production lines.

With a new update to its Profibus DP interface, Zumbach is raising the usability of its devices to a new level. In addition, Profinet IO Industrial Ethernet is now available for the entire Zumbach family of devices.

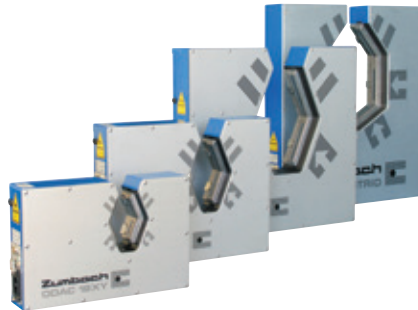
In industrial production, numerous automation, engineering and visualisation systems are connected to a bus. The Profibus interface enables centralised control of all devices involved in the production process as well as many standard diagnostic functions – and all this via a secure and fast connection (up to 12 Mbps).

The cyclic collection and preparation and reliable evaluation of the measuring data via the interface has a significant effect on the quality of the monitoring.

Zumbach's communication via Profibus DP not only significantly improves the workflow between individual production units, but also requires little hardware (one engineering tool for all devices), reducing investment and service costs. Thanks to the bus topology, sensors can be coupled and uncoupled during operation.

Practically every Zumbach device is available for use in Profibus DP structures – directly or via a Profibus interface. Through the use of an intelligent protocol, the complete functionality of each sensor is fully supported from the initialisation step all the way to the actual data exchange.

Specifically, the Profibus firmware has been adapted and the GSD file has been significantly improved. Now it provides for an easier, faster and more cost-effective installation:



▲ A selection of gauges with Profibus/Profinet interface

- Easy drag-and-drop installation: install device-specific language version of the GSD file (DE, FR; EN), then drag the Zumbach device to the user interface of the customer
- Actual value acquisition: operational readiness with two inputs thanks to device-specific parameters, very easy to add measured quantities/modules

Profinet IO – the successor to Profibus DP – is designed for data exchange between Ethernet-based field devices. The open industrial Ethernet standard meets the increasing demands of automation reliably and sustainably with optimum flexibility, efficiency and performance. Zumbach has developed a new GSDML file for Profinet which makes the implementation of Profibus and Profinet easy and practically identical.

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

Ultrol® cleared for nuclear use

General Cable's low-voltage line of Ultrol 60+ nuclear qualified cable has completed third-party environmental qualification testing.

Ultrol 60+ cables are intended to support both the existing nuclear fleet and Gen III reactors, following a five-year testing and certification programme to develop a second generation 60-year-life product line.

Adhering to design control requirements from ASME NQA-1 and US NRC 10CFR50 Appendix B, under the regulatory guidelines of the utilities and reactor manufacturers, extensive third-party testing has ensured conformance of Ultrol 60+ to all nuclear requirements.

Kinectrics, formerly Ontario Hydro Technologies, and General Cable's choice for testing and product qualification, completed thermal ageing, radiation exposure and Design Basis Events (DBE) to a total integrated dosage of up to 350 MRad gamma radiation, proving a 60+ year service life.

Confirmatory testing demonstrates that the products meet prior industry standards, as well as Gen III+ reactor profile requirements.

Ultrol 60+ medium-voltage cables are currently undergoing the same 60-year-life nuclear qualification testing.

General Cable – USA
Website: www.generalcable.com

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New PlasmaAnnealer for fine stainless steel and nickel alloy wire

PLASMAIT has introduced a new PlasmaAnnealer for fine and small diameter stainless steel and nickel alloy wire.

The annealer can be used for small cross-section round, flat and shaped wire as well as for fine ropes and tubes made of stainless steel and nickel alloys.

This new concept allows for a radical increase of continuous annealing speeds that can surpass 15m/s in the case of fine wire sizes of austenitic stainless steels.

With such speeds annealing can be performed in-line with drawing or rolling, substituting multiple lines of a traditional tube furnace.

The annealer features compact design, high energy conversion efficiency, and very low gas consumption, and gives the operator the ability to target mechanical properties with a great degree of accuracy.

Rapid heating and reduced time of recrystallisation result in fine grain size with uniform crystal structure.

The PlasmaAnnealer can cold start production in a few minutes and can be stopped quickly. This avoids the lengthy heating-up and cooling-down times and associated energy costs that are symptomatic of a conventional furnace.

Ion sputtering on the material surface results in fine dry surface cleaning and surface oxide removal, which have proved beneficial to applications with demanding surface requirements.

High-speed trials on the new line can be performed at Plasmait's facility in Austria.

The annealer can process different type of materials used in applications such as: fine wire for mesh and textile, filter wire, EMS mesh wire, electronics resistance wires, heating element wires, copper clad steel and copper clad aluminium wires, as well as wires, ropes and tubes for medical, jewellery, aerospace and similar applications.

Plasmait GmbH – Austria

Website: www.plasmait.com



▲ The new annealer from Plasmait

New range from I.L.E.S, Italy

I.L.E.S. Industrial Furnaces in Pianengo, Italy, has introduced a new range of unattended automatic lines for stabilisation, tempering, structural hardening, ageing, pre-heating and stress-relieving heat treatments.

These lines are composed of the following main system components:

Horizontal chamber electric furnace, with forced air circulation and 700°C maximum working temperature, with high thermal efficiency obtained by insulation with the more advanced ecological ceramic fibres, assembled in several layers with differentiated density, without thermal bridges.

Heating is with massless wire elements, placed directly into the air circuit, using a patented system of vitrification of the surfaces which are in contact with the air; assembling specially shaped baffle and fan for the air circulation.

All of these elements allow a temperature uniformity obtained spatially in the treatment chamber, according to AMS 2750 D and CQ19 standards requirements.

Storage system with two, four, six or eight positions.

Main characteristics include: Useful load for each position of the storage system from 500 to 3,000 kg; specific software for managing the line with no operator; saving of up to 60 different thermal cycles; supervisor system with advanced diagnostics, for monitoring of the production as well as for detecting anomalies; SMS Telecommunication System, to send diagnostic messages to different users, according to the occurred event; paperless



▲ The new line from I.L.E.S

recorder for product certification, arranged to be linked to the company's network; and air cleaner for smoke and smells.

I.L.E.S. Srl Industrial Furnaces – Italy

Website: www.iles.it



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Seamless aluminium sheathing of high voltage cables

WITH six lines now in production, BWE's SheathEx™ process is becoming the new alternative to seamless aluminium sheathing of high voltage cables. A further line will be installed and commissioned in Europe during the second quarter of this year.

The SheathEx process is an extension of the well established Conform™ and Conklad™ continuous extrusion technology. The SheathEx machine extrudes a continuous and seamless aluminium tube from two 12mm diameter rods around a high voltage cable core. BWE collaborated with high voltage power cable producers in China to develop the product and process specifications for this new and unique technology.

The SheathEx machine incorporates a large crosshead to accommodate the large diameter dies required for cable sheathing. The aluminium sheath is seamless, with no weld line or bead. The twin groove mode of operation ensures the aluminium sheath is concentric.

BWE's patented induction heating system provides a very even temperature distribution around the tooling, leading to very stable running conditions, and consistent properties in the aluminium tube. The feedstock material is standard CCR aluminium rod, which is readily available and cheap, compared to other materials (such as flat aluminium sheets used in a welding line).



▲ A BWE SheathEx production line

The cable core passes continuously through the crosshead. A cooled insertion tube protects the cable core on entry to the crosshead, and rapid quench of the aluminium tube immediately after the die, prevents thermal damage to the core.

Downstream from the SheathEx machine the cable sheath is corrugated in-line and coiled onto large drums. The SheathEx process is a continuous (no stop marks), reliable (no weld) and cost effective (cheap materials, low energy etc) method of sheathing high voltage power cables.

SheathEx, Conform and Conklad are registered trade marks of BWE Ltd. International patents have been filed for the SheathEx process, SheathEx tooling system, machine arrangement, control method and induction heating technology that is employed.

BWE Ltd – UK
Website: www.bwe.co.uk

Matt TPU for wire and cable

Huntsman Polyurethanes has developed a non-blooming, matt, polyester-based solution for the wire and cable market. Irogran® A 85 C 5024 DP is a new material to eliminate the risk of blooming (when additives migrate to the surface of a material and become visible).

Blooming has no effect on the mechanical performance of cable, but it is unsightly and is an issue that cable manufacturers have looked to resolve. Irogran A 85 C 5024 DP is a halogen-free TPU that offers a consistent matt finish and stable extrusion qualities.

Easy to process, the product is thought well suited to wire and cable applications such as jacketing, spiral and data cables.

A number of customers have already trialled the product, which has passed third party RoHS and halogen-free tests. The compound is targeted for use in China, but the company anticipates interest from elsewhere.

Henry Yao, market development manager for greater China at Huntsman Polyurethanes, said: "Irogran A 85 C 5024 DP is an important addition to our wire and cable portfolio. There are other matt technologies available on the market, but this is unique in terms of the formulation and its non-blooming properties."

Huntsman Polyurethanes – USA
Website: www.huntsman.com

Cost-effective high technology

EUROLLS SpA, a leader in the field of steel rolling mills and rolling micro-cassettes for the production of round and shaped steel wires, thanks to the evolution of Team Meccanica machinery, has played an important part among manufacturers of drawing systems and treatment lines.

Eurolls has committed itself into the development of the engineering sector, through which it offers complete production lines, fully developed in-house, with its own technologies and following criteria of high technological content, low environmental impact and extreme flexibility.

The bead wire production line is the high resistance steel wire used to reinforce the 'heel' of tyres, in other words, the rubber ring that links the tyre to the rim.

This wire usually has a diameter between 0.78mm and 2mm and is made of high carbon steel (0.7-0.9%) coated by a deposit of bronze (0.4-1g/kg) that guarantees an excellent adherence between steel and rubber compound.

The installed line has a net production capacity of 20,000 tons/year on average diameter of 1mm and works with 20 wires simultaneously, even with different diameters and speeds.

The work cycle process is:

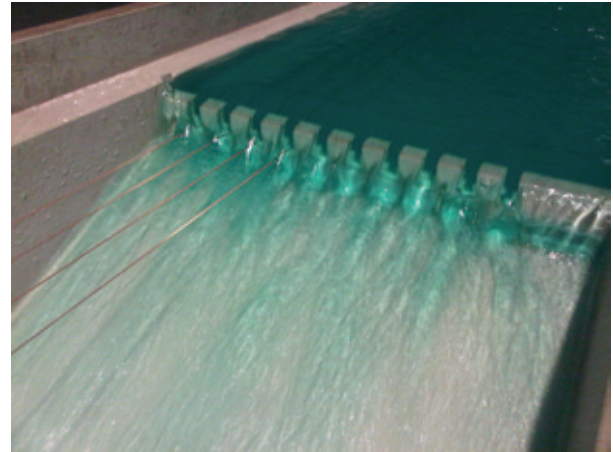
1. Motorised pay-offs for spools with net capacity of 2,000kg and complete with adjustable systems for drawing wires
2. Stress relieving furnace made of lead, working at approximately 400°C, internal

length of 10,000mm, with electric heating and interchangeable, removable panels; insulation of the tank with 300mm thick glass-ceramic refractory; insulation of the surface with hard, lifting sheets made of vermiculite and thickness of 100mm

3. Cooling tank in water with temperature control
4. Electrolytic pickling in sulphuric acid with nine plates, 3,000A/10V
5. Four-stage washing with dynamic and mechanical cleaning systems
6. Electrolytic activation in sulphuric acid with six plates, 1,000A/10V
7. Three-stage washing with dynamic and mechanical cleaning systems
8. Bronzing unit in two independent sections, ten wires each, with the possibility to use different washing compositions
9. Three-stage washing with dynamic and mechanical cleaning systems
10. Hot washing (90°C) with final tank for protective and antioxidant bath
11. Drying tunnel in hot air (140°C)
12. Take-ups for standard packing on Z2 spools and reel-less coils.

Further characteristics of the line are:

- Treatment tanks in PP for washing up to 60°C/stainless steel for higher temperatures
- Tank for lead in iron alloy pilling (thickness 40mm)
- Low energy consumption thanks to



▲ Bronzing unit – exit wire

thermal insulation and heat recovery during the process

- Low water consumption thanks to the use of multistage cooling systems with intermediate air-wipes and large use of recycling
- Possibility of full recovery of residual acid and iron from baths by systems of enrichment, filtration and centrifugation
- Lack of waste due to an automatic wire lifting system which raises the wire out of the acid and bronzing baths during line stoppage for spool replacement in winding/unwinding phases
- Stratification system of wire in winding managed by software with possibility of automatic correction of non-uniformity
- Continuous monitoring of the process from the operator station and possibility of remote supervision.

Eurolls SpA – Italy
Website: www.eurolls.com



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Accuracy is a critical factor

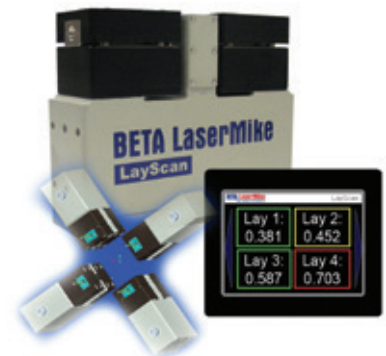
BETA LaserMike recognises that the accurate measurement of lay length in twisted pairs is a critical factor in Category cable performance. The latest LayScan system enables telecommunication cable manufacturers to dramatically improve product performance, quality and consistency.

Until now, the ability to accurately measure the lay length of twisted-pairs at the cabler and twinner stations has been a manual and time-consuming process. This manual process results in inaccurate and unreliable measurements.

Factors such as the pair lay length and the variations of the lay in twisted-pair Category cables, such as Cat 5e/6/6a/7a products, directly affects crosstalk performance. Cables that do not meet the far- and near-end crosstalk and product quality specifications wind up being scrapped, significantly costing manufacturers in rework, materials and overall productivity losses.

With the focus on producing higher quality cable in less time and at a lower cost, the LayScan measurement system from Beta LaserMike offers manufacturers an accurate and consistent method to measure the lay length of twisted pairs used in telecommunication cables.

The LayScan system enables manufacturers to simultaneously measure four pairs at the cabler to confirm the accuracy of twisted-pair cable construction during production. This non-contact system uses four individual



▲ The latest LayScan system from Beta LaserMike

pair lay sensors and Beta LaserMike's LaserSpeed length and speed gauge to perform the high-speed lay length measurements.

A data acquisition and control system effectively collects and processes each lay length in the cable and allows the full use of the customer's off-line analysis tools such as trend charts, statistical analysis, or FFT analysis to readily observe, measure, and report systematic lay variations within each lay.

Data can be easily stored on a local PC. The LayScan system performs measurements to within 0.025mm (0.001") overall accuracy on the same twisted pair. It can measure lay lengths up to 25.4mm (1") at throughput speeds up to 152.4m/min (500ft/min).

Beta LaserMike – USA
Website: www.betalasermike.com

New wire for high-quality reed switches

Sandvik's new wire, Safeni 52, has precisely the right material characteristics and a new level of feedability that contributes to higher throughput with less downtime.

Safeni 52 is a soft magnetic iron-nickel alloy with high magnetic permeability, low coercive force, and a low content of non-metallic inclusions. Its thermal expansion is compatible with glass used in reed switches.

Using Safeni 52 wire, reed switch manufacturers can rely on consistently high surface quality, which contributes to the wire's feedability. It runs through equipment cleanly, contributing to higher production throughput with increased uptime as well as high end-product quality and reliability.

Packaging is designed to reduce tangled spools and the wire exhibits remarkable straightness with little cast or helix. Together these benefits give

manufacturers switching to Safeni 52 wire the potential to take on more business without capital investment. Reed switches incorporating Safeni 52 have a very consistent level of reliability and long operational lifetimes, which will contribute to a high yield with very good quality.

Pure Sandvik Safeni 52 wire is produced entirely in-house by Sandvik. The company controls the entire process, from alloy melting and wire drawing through to packaging, and, thus, the quality and reliability of the product. Before leaving the plant, the wire is rigorously tested.

In addition, Sandvik's close proximity to customers worldwide ensures a robust and reliable material supply chain. Safeni 52 wire is available in a wide variety of forms and diameters.

Sandvik Wire – Sweden
Website: www.smt.sandvik.com

Extra clean wire at high speed

— Advertiser on behalf of Decalub

THE BHW wire cleaning system is used in the most demanding applications, allowing extreme high cleaning speed, with all carbon steel wires (including 0.90%C), mechanically descaled or acid cleaned, bare or pre-coated, drawn with calcium or sodium lubricants.

The BHW system is particularly recommended for cleaning applications in which a conventional process is inappropriate, especially with wires drawn upon severe conditions resulting in increased heat and burned lubricant tightly bound to the wire surface and embedded in micro-cavities.

The BHW system provides the ultimate combination of simplicity and effectiveness: Acid-free, caustic-free, without ultrasonic and chemicals.

Economical and environmentally friendly, this completely 'green' system provides significant process savings in production of clean H/C and L/C wires.



▲ Wire cleaning by BHW system

The BHW system incorporates new technology which enables normal plant cold water to be converted into the most unique "micro-abrading liquid" agent used for cleaning of dry drawn wire, in-line, at high speed, at virtually zero energy consumption, providing extra-clean wire.

Basically, it is a sensitive multi-layer displace/fine scrub/flush cleaning system, benefiting from water immersed high

density ultra-fine brush bristles providing hydro dynamic cavitations at bristles/wire interface that smoothly impact wire surface separating lubricant residue from base material, washing away dispersed contaminants by moving wire, exiting the unit very clean of white-metal appearance.

The BHW system cleans drawn wire from lubricant residue in applications prior to heat treatment or coating, including galvanising, annealing, patenting, plating, welding (chain, mesh), painting, plastic coating, Al or Cu cladding, etc.

In a typical application, the 2.6 mm (0.102") drawn wire is cleaned in-line at 12 m/s (2,400 ft/min) with 4 or 5 x BHW units, obtaining an extra clean wire, enabling direct galvanising and other metallic or plastic coatings.

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Focus on

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History and innovation lead the way for UK firms

Some of the companies who put the Great into Britain's wire and cable industry

From bombings to Harry Potter – and still going strong

ORMISTON Wire, one of Britain's longest running family businesses, celebrates its 220th birthday this year.

The company, which was formed in 1793 by Philip Ormiston in the city of London, is still going strong under the stewardship of his sixth-generation descendant Mark Ormiston.

The entire 220-year history of Ormiston Wire can be viewed as an interactive timeline on its Facebook page.

Ormiston Wire began trading in 1793 as a manufacturer of spring-wire for corsets and wigs but soon diversified in the 19th century as one of



Photo: bigstockphoto.com – 'Changing of the Guards' by Birute Vjeličkė



Photo: bigstockphoto.com - Big Ben and Westminster Bridge, London, UK by Andrey Omelyanchuk

wide audience. And in the 21st century the company was once again helping children to suspend disbelief when it supplied the wire that made the broomsticks fly in Harry Potter.



▲ *Tracing the history of Ormiston Wire*

Ormiston Wire celebrates its 220th birthday as a thriving business that still provides a dizzying array of wire to any size or length, with facilities for rolling, winding, rewinding, spooling, braiding, bunching, stranding and plastic coating, according to specification.

Ormiston Wire Ltd – UK

Website: www.ormiston-wire.co.uk

Energy Minister's visit for launch

UK Government Business and Energy Minister Michael Fallon MP has formally opened Fenix Fluor Ltd, a multi-million pound joint venture between Mexichem UK Ltd and AGC Chemicals Europe Ltd.

Based at Mexichem Fluor's Rocksavage site in Runcorn, UK, Fenix Fluor will manufacture chlorodifluoromethane, a key raw material in the production of fluoropolymers used in the automotive, aerospace and construction industry.

The venture will directly provide up to 20 new jobs, and over 70 construction workers were involved in the refurbishment.

The minister said: "The UK's globally competitive chemicals sector is worth over £40 billion a year and remains a key driver for growth.

"It is one of the largest manufacturing sectors in the UK and around 90 per cent of these companies export their sought after products around the world. New projects such as Fenix Fluor demonstrate the confidence that global



▲ *Pictured, from left, Dave Smith, Mexichem, UK Government Business and Energy Minister Michael Fallon MP, and Hiroyuki Okuno, president and CEO, AGC Chemicals Europe Ltd, at the launch of Fenix Fluor Ltd*

many innovative manufacturers that drove Britain's industrial revolution.

However, there have been ups as well as downs. The 150th anniversary of the company, which occurred during World War II, was sadly marked by the factory being bombed but, with such a heritage to preserve, the Ormiston family relocated and rebuilt the business.

The company was rewarded for its efforts with a boom period during the 1960s and 1970s and it was during this time that Ormiston provided vital support for some of the biggest television stars of the decade.

Gerry Anderson's Thunderbirds puppets were lifted by Ormiston Wire, bringing the products of the business to a



companies like Mexichem Fluor have in the UK as a place to do business and expand their operations, while creating valuable new jobs for local communities."

Hector Valle, chief executive, Mexichem Fluor, said: "Fluoropolymers will become an increasingly important part of Mexichem's business in the future."

"The launch of Fenix Fluor demonstrates our commitment to developing the best products and solutions for our customers."

Hiroyuki Okuno, president and CEO, AGC Chemicals Europe Ltd, said: "AGC Chemicals Europe Ltd is pleased to have secured a local, stable supply of chlorodifluoromethane (R22) vital for the production of Fluon® PTFE and Fluon® ETFE. This strengthening of the supply chain enables us to remain competitive in high performance fluoropolymers in Europe."

Fenix Fluor Ltd – UK
Website: www.mexichem.com
Website: www.agecce.com

New sales manager for Metalube

Metalube has appointed Wayne Thornhill as sales manager of the Manchester-based operation.

Mr Thornhill has a wealth of experience and joins Metalube from metalworking fluids specialist, Cimcool, where he was area sales engineer for the UK's Midlands and North West regions.



▲ Wayne Thornhill

He previously worked for 11 years with Houghton in the quality control and technical service and development areas, becoming the Centre of Excellence Chemist for rust preventatives and heat treatment products for Europe.

"I am delighted to join Metalube at such an exciting time. I look forward using my expertise to support the company in key areas of the business," said Mr Thornhill.

His regions will include the UK, Balkans and South East Asia. He will also be responsible for bringing new product lines to market.

Doug Hunt, commercial director, added: "This is a very welcome appointment. Wayne brings extensive experience and knowledge to our business."

"We look forward to his involvement with new and existing customers; he will be a valuable asset to our team."

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

Russian appointment

RichardsApex Europe Ltd, UK, the subsidiary of RichardsApex Inc, Philadelphia, USA, has appointed North-west Company of Supply (CZKSK) Ltd, St Petersburg, Russia, as the national representative for the RichardsApex range of lubricants and compounds for the metal forming industry.

According to RichardsApex Europe managing director Don Neville: "CZKSK is well established and known throughout the wire and cable industry in Russia as the agent for a broad range of technologies encompassing dies, speciality tapes, compounds and wire and cable machinery."

"What's more, they have a domestic warehousing and supply network which will enable RichardsApex to adopt a solid and comprehensive local presence for our Russian customers to turn to and rely on."

RichardsApex Europe Ltd – UK
Website: www.richardsapex.com

BAR sets the products level even higher

Following a successful 2012, Bar Products and Services Ltd has continued to grow, and with new staff and equipment to support this growth, plans are already being put into place for further investment in the Yorkshire-based precision tooling company.



▲ Exports account for more than 75 per cent of sales

Major orders for the wire rope industry have already been received and shipped to various companies in Europe and the UK – a very promising start to 2013 which could make it the most successful year of the firm's 20-year history. Worldwide export sales now account for over 75 per cent of the company's sales.

"We have not only taken on experienced staff to cover the company's immediate growth, we have also started a new apprenticeship scheme to provide for our future skill requirements," said Steven Rika, managing director.

Preparations are already well underway for the industry flagship exhibition in Düsseldorf in 2014, where it will once again display the extensive range of its products to illustrate the company's capabilities.

Bar Products and Services Ltd – UK Website:
www.barproductsandservices.com

British pioneers in cold pressure welding

PWM Ltd, based in Kent, has been at the forefront of cold welding technology for more than 25 years. The company is a leading firm in the design and manufacture of high-performance cold welding machines and dies, and a global supplier to the international wire and cable industry.

Cold pressure welding is a method for permanently joining non-ferrous metals and their alloys without heat, fillers or fluxes. PWM's proven cold welding technology produces a weld that is stronger than the parent material, without sacrificing electrical integrity.

Most non-ferrous metals can be cold welded, including alloys such as Aldrey, Tripple E, Constantan, 70/30 brass, zinc, silver and silver alloys, nickel, and gold. Plated wires, such as tinned copper, silver plate, and nickel plate can all be welded to themselves or to plain copper.

PWM machines and dies are designed and made in PWM's own workshops by the company's skilled engineers to stringent quality standards.

This ensures PWM has complete control over all aspects of manufacture, and all products are thoroughly tested throughout production.

As a global supplier, PWM has developed a comprehensive range of cold welding machines to suit a wide variety of applications, from small hand-held manual welders for joining fine copper/aluminium wire from 0.1mm, up to large, heavy-duty powered rod welders with capacities of up to 30mm diameter.

All of PWM's cold welders are clean, quiet and safe to operate. The powered machines in the range are designed to be as energy efficient as possible. Even the largest model in PWM's range, the P1500 rod welder, only requires a small electrical current to drive the hydraulic pump motor.



▲ Managing director Steve Mepsted with a rod welder

PWM machines are also designed to be low maintenance and easy to operate, saving time and effort.

Dies can be standard or custom made for round or profile wires and rods to suit customers' requirements. PWM can also custom make dies for welding two different sizes of wire or rod, enabling manufacturers to weld different wire sizes together quickly when changing reels.

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Photo: bigstockphoto.com – 'Edinburgh Cityscape and Castle from Calton Hill, Scotland, UK' by Vichaya Kiatying-Angsulee

priority at PWM and the company offers a highly personal technical advice and support service. PWM's specialist staff have over 30 years' experience of cold welding techniques and applications and are happy to advise customers and help them find the most cost-effective cold welding solution for their project.

PWM's on-going research and development programme ensures that it continues to offer wire and cable manufacturers the most advanced and comprehensive range of cold welders in the world. To explain the cold weld process, the company recently developed a series of videos demonstrating the technique, which can be viewed at www.pwmltd.co.uk

PWM's worldwide network of experienced agents, together with the UK team, provides fast and efficient on-site support with full back-up and after-sales service for all PWM products.

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

New division for metals research

Continuous casting technology specialist Rautomead Limited has recently formed its new 'Advancing Metals Technology' (AMT) division, a scientifically-based metals research and development structure within the company.

The specific focus of the division is on the scientific exploration and development of non-ferrous metals and processes to drive improvements in metallurgical efficiency in a wide range of global production processes and end-user applications.

In addition to pursuing in-house research projects, the new division's mandate also covers involvement in a wide range of

individual projects with universities and research groups in the UK and overseas. Further collaborations are also on-going with both existing and prospective customers, with the goal of providing new and innovative processes and products within the non-ferrous metals technology market.

Through harnessing its market-leading expertise in the field of graphite technology, and transferring the skills it has developed in continuous casting as the basis for these collaborations, the division's objectives consist of developing imaginative and economical technological solutions with operating systems that will offer significant end user processing improvements and application enhancement benefits.

Specifically, such collaborative objectives consist of innovating technologies which are clean, safe and environmentally friendly, help shorten the manufacturing process, provide economies on the small to medium scale, deliver reduced operating costs, enhance product quality and often embrace materials recycling.

Recent examples of Rautomead AMT collaborative projects, which illustrate the breadth of scope of the division, include the application of Rautomead resistance furnaces in a metals "reclamation by electrolysis" process; the development of a rheo-extrusion process for aluminium alloys; investigating alternative methods to produce thin strip Fecralloy material; production methods and alternative applications on nano-materials; melting and continuous casting of alternative non-ferrous elements; the use of cored wire technologies as alloy feeders in a continuous casting environment; and the in-process monitoring of alloy levels in a continuous casting environment.

Further collaborations are on-going, or are being sought, in the areas of "lightweighting" material, with specific

focused target applications in automotive, aerospace and renewables.

Rautomead Ltd – UK
Website: www.rautomead.co.uk

International face of companies

UK-based Stanaway Wire is European agent for USA-based L&P Wire Tie Systems and international agent for both L&P Wire International and MountJoy Wire Corporation.



▲ John Stanaway, of Stanaway Wire

Principal products include aluminium wire, annealed wire, baling wire, bedding and upholstery wire, brush wire, chrome silicon wire, fish hook wire, flat wire, Galfan coated wire, galvanised HT wire for auto-baling, galvanised MS wire,

hard drawn MB wire, low carbon wire, music wire, musical string wire, patented wire, plated wire, plow steel wire, profile wire, rocket wire, saw wire, shaped wire, stitching wire, oil tempered wire, tin coated wire and ultra fine wire.

Principal John Stanaway has been involved in the wire industry in a career now spanning five decades. A past winner of the UK's most prestigious customer service award (the Unisys/Management Today Service Excellence Award), Mr Stanaway conducts his business with an open, ethical and honest approach which has, he believes, won him the respect of colleagues, customers and competitors alike.

Stanaway Wire – UK
Website: www.stanawaywireconsulting.com

SheathEx technology at its best

BWE Ltd is a British engineering company specialising in continuous extrusion machines and cold pressure welders for many different applications.



▲ A typical BWE Conform 550i installation for copper bus bar and sections

Conform™ and Conklad™ are well-established continuous extrusion technologies in the non-ferrous, cable and tube industries. Typical applications include copper and aluminium rectangular wire (magnet wire for transformers), solid aluminium conductor (SAC for cables) copper bus bar, trolley wire and other shaped conductors, AS wire, OPGW, CATV, round refrigeration tube, multiport or PFC tubes in different alloys.

With six lines currently in production, BWE's SheathEx™ technology is fast becoming the new alternative to seamless aluminium sheathing of high voltage cables. A further line will be installed and commissioned in Europe this year.

The SheathEx process provides a continuous (no stop marks), reliable (no weld) and cost effective (cheap materials, low energy etc) method of sheathing high voltage power cables.

A new Conform machine has been specifically designed to extrude solid aluminium conductor (round or sector shaped) from 2 x 9.5mm diameter rods, providing a cost-effective process to a product in demand.

BWE continues to manufacture and supply a complete range of cold welders and dies for a fast, cost-effective and reliable solution to welding non-ferrous materials from fine wire to round rod. SheathEx, Conform and Conklad are registered trade marks of BWE Ltd.

BWE Ltd – UK

Website: www.bwe.co.uk

Top team promotions

Two new managing directors have been appointed at specialist engineering group Meltech to prepare for continued growth and to meet specific customer requirements.

Helen Williams has been promoted from manufacturing director to managing director of Meltech Engineering, and Peter Drever has been promoted from sales and marketing director to managing director of Meltech CRE (Continuous Rotary Extrusion), a major specialism within the group.



Photo: bigstockphoto.com – 'Giant's Causeway', Northern Ireland, UK by Joe Gough

The new appointments come on the back of a period of sustained growth for Meltech, based in Blackburn, UK. Founded more than 30 years ago, it stands out as a North West engineering company which weathered the worst effects of the downturn in UK manufacturing by developing a determined approach to worldwide exports, focusing on blue chip customers and harnessing its considerable technical strengths.



▲ Chairman Marcus Moir, centre, with Peter Drever and Helen Williams

In recent years, Meltech has picked up orders from multinational companies such as Technip, Oceaneering and Parker Scanrope, delivering projects in Russia, USA, Europe and South America.

Meltech Group has now been organised to emphasise its four operating divisions, three of which – Heat Treatment, CRE, (Continuous Rotary Extrusion) and Cable Machinery – are product driven. The fourth, TPS (Total Process Solutions),

offers feasibility and project planning, project management, QHSE, reporting and on-site contract management in support of major contracts fulfilled by the others.

Whilst Mr Drever and Ms Williams will have MD responsibilities for individual companies within the group, their expertise will be harnessed as appropriate, across all divisions within the group.

Meltech Engineering – UK
Website: www.meltech.co.uk

Oil resistance in cables

Cables demonstrating various degrees of oil resistance are specified for use in a number of applications such as railways, shipbuilding, offshore platforms and wind turbines.

Often the most difficult performance parameter for the cable sheath is the retention of mechanical properties after immersion in IRM902 and IRM903 oils at elevated temperatures. Standards for offshore drilling rigs may also require resistance to oil drilling muds, which can be more demanding in this respect. Cables used in these applications also have the added difficulty of having to be installed and to operate in very cold climates.

Some typical standards are BS7655-1.4 2000 Insulation and sheathing for cable elastomeric cables, BS7655-1.5 2000, Insulation and sheathing for cables - coil end leads, BS7655 2.0

2000 Sheathing compounds for ships wiring and offshore applications, BS7655 2.6 1997 Ordinary duty oil resisting types, EN50306-1 2002 Railway rolling stock cables having special fire performance, EN50305 2002 Railway rolling stock cables - thin wall, EN50264-1 Railway rolling stock cables - standard wall, and IEC 60092-359 Sheathing materials for shipboard power and telecom cables.

These types of cable are usually made using rubber as the sheathing and insulation. However, there are a number of companies who are keen to enter this market who do not have the use of the continuous vulcanisation (CV) line necessary to cure the rubber. In addition, even in those companies that have this technology, there can be a shortage of capacity and it is expensive to install more.

SX-0620 is a new grade of crosslinkable oil resistant sheathing compound, which has exceptional resistance to IRM902 and IRM903 and, at the same time, is flexible even at cold temperatures. It employs the Sioplas crosslinking technique, which also means that it can be processed on conventional cable extrusion equipment.

An added benefit is that because the Sioplas process is a low pressure process, it is not necessary to use hard rubber insulated cores to avoid deformation during the CV process. If the applicable standard allows Sioplas crosslinked or even thermoplastic insulated conductors, these can be used instead, thus making important savings on processing costs and possibly CV capacity.

Photo: bigstockphoto.com – 'Ranoch Moor, Scotland, UK' by Alexander Morrow



If the construction of the cable is two layer, with an inner insulating layer and an outer to provide the oil resistance, the inner layer can be without flame retardancy and SX554 is an ideal flexible choice. If the construction requires additional fire performance then SX-0612 is recommended, or SX559 for the highest fire performance.

AEI Compounds Ltd – UK
Website: www.aeicompounds.com

Long-term stability

It is almost one year since Anglia Metal began manufacturing plain and tin-plated copper wire in the UK for export worldwide, and the company continues to grow and is showing long-term stability within the copper market.



▲ Copper wire from Anglia Metal

Anglia Metal supports a wide and highly demanding range of industrial sectors such as automotive, data, power, defence, specialised cables and various other applications using copper wire. Quality requirements of these markets are ever increasing and the company is continuously developing systems and improving its processes, flexibility and knowledge.

As a BSI-approved company, quality is a key factor to providing first class products to its customers.

Anglia's aim is to progress with its continued excellence in customer service and expand the business into other areas.

Anglia Metal Ltd – UK
Website: www.angliametal.com

Leading SAF™ technology

Technical Absorbents provides high levels of innovation and product development expertise to the global cable market with its Super Absorbent Fibre (SAF™) technology.

The basic functionality of SAF™ is its ability to absorb up to 200 times its own weight in water, or 60 times its own weight in saline, at an extremely fast absorption rate. Being fibre-based, it can be precisely tailored into a diverse range

of non-woven tape and yarn formats that offer the potential for enhanced design and performance.

SAF™ is already a key component for spun yarns and non-woven tapes that provide optimum protection for internal and external cable applications. This dry active system of water-blocking protection for cable cores affords prevention of water passage along the cable from a joint or point of sheath damage. This is achieved by a water-swallowable yarn or tape being placed within the cable during manufacture.

In some instances, cables that suffer damage can start to take on water. If a SAF™ containing tape or yarn is in place, this will rapidly absorb the liquid at the point of entry and swell to form a gel, blocking any further water ingress.

This ensures any damage is minimal, fully contained and is easy to locate and repair. This situation can occur in many different cable types, including telecoms, medium and high voltage, industrial and underwater. Without such water-blocking technology, the results of water ingress into the cable can be costly and very problematic.

There are three types of power


cables: low, medium and high voltage. Water-blocking is generally required only in medium and high voltage cables that use cross linked polyethylene (XLPE) insulation. In copper cabling water can ingress into the cable by diffusion through the outer polyethylene sheath. This is a high risk occurrence due to the fact that such cabling is typically laid underground in areas likely to be damp and wet. The presence of water will degrade signal strength due to capacitance changes.

Water-blocking protection of an optical cable core is accomplished by surrounding it with a dry water-swallowable tape and yarn that will stop the entry and migration of water should the cable's outer jacket be breached.

This protective measure is included primarily to maintain the mechanical integrity of the cable itself (eg prevent ice crush from within the cable, fungus growth, or corrosion of metallic cable members when present). The water-blocking protection is placed in the buffer tubes with the optical fibre during manufacture of the cable.

Technical Absorbents – UK
Website: www.techabsorbents.com

KEIR - BackBone™ Flyer Bow




US Patent #6,233,513
#5,809,703 and Other
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- Bow shaped like a wing for improved aerodynamics and low cw factor
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- Wear bushings can be changed while bow is mounted on the rotor

Advantages:

- Lower power (amps) consumption and reduced noise
- Higher TPM – maintaining wire quality
- Reduced bow breakage
- Increased life on wear surfaces reducing down-times and maintenance
- Wire breaks are contained within the bow – extending bow life



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Compounds, colourants & masterbatches

'The international standard for the "live" wire is brown.'

Unfortunately for the newcomer to house-wiring colour codes, primers do not stop with basic brown. Black wires are connected to brass-colored screws, white to silver, blue to white, green/yellow to green. Three-way circuits impose their own rules on blue, red and white wires. Switched live voltage applications are more complex – and colour-critical – still.

The obvious lesson here is that colourants are vitally important in the production of electrical wire, with zero tolerance for error. And what applies to the ultimate product – the coloured wire – is no less true of the masterbatches that impart that colour and the compounds that render insulation and jacketing materials capable of retaining it.

The companies reviewed in this section of *EuroWire* never allow themselves to lose sight of the basics. An industry whose customers are always setting new and higher standards for safety, sustainability and reliability demands no less.

Expansion continues

As part of its continued expansion in Europe, Tosaf – a manufacturer of compounds, additives and master- batches for the plastics industry – has opened Tosaf Iberica SL in Barcelona, Spain. This new company is the seventh in the row of Tosaf's marketing and sales subsidiaries spread throughout Europe, placed in Germany, Italy, France, The Netherlands, Turkey and the UK. Sales manager of Tosaf Iberica is Roger Alba.

David Alarcón Pérez is heading the local colour division. In close cooperation with a local logistics centre – Compañía Internacional de Almacenes SA – Tosaf Iberica provides a high responsiveness to customers' demands.

Tosaf Iberica SL – Spain

Website: www.tosaf.com

Research and innovation

Fainplast has inaugurated a new research and development laboratory with a total area of 200m², which also includes the new department dedicated to quality control of polyolefin products – a total investment amounting to €300,000.

Around 20 skilled technicians are employed in the new laboratory, which is fitted with advanced machinery and equipment. This new investment confirms the highly innovative vocation of the Italian company, which constantly invests in new technologies in order to improve product standards and remain a leading company in the plastics sector at an international level. Besides the new laboratory, Fainplast is also investing in a new warehouse for the storage of finished products for a total covered area of 1,850m² on a total area of 3,700m².

Fainplast has always believed in constant innovation as the key to their business success. For this reason last June they tested and implemented a new system that has increased the plant automation of the halogen-free department.

This system is based on a depalletiser robot that, in the initial phase of production, allows speeding up the procedures enhancing and increasing the dosage of the products. Two new large and six smaller silos were installed for the storage of raw materials in an investment worth €1m.

Fainplast Srl – Italy

Website: www.fainplast.it

A first for Li Chang

Established in 1995, Guangzhou Li Chang Fluoroplastics Co Ltd manufactures raw materials for fluoroplastics and is the first company in mainland China manufacturing environmentally friendly coloured fluoroplastics. The company is also ISO9001 certified.

The annual output of the company's main product FEP (F46) is 2,600 tons, ETFE (F40) is 100 tons and PFA is 400 tons. These materials are widely used in high-temperature resistance electric wire and cable.

The main characteristics are:

- FEP (fluorinated ethylene propylene): Fine lubricity, insulation, high temperature resistance, flame retardant, radiation resistance
- PFA (polytetrafluoro ethylene): Fine heat resistance, cold resistance, chemical durability, insulation, lubricity, breaking and cracking resistance.
- ETFE (ethylene-tetrafluoroethylene): Similar to FEP

Guangzhou Li Chang Fluoroplastics Co Ltd – China

Website: www.gdlichang.com

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Specialist in development and manufacture

Mixer specialises in the development and manufacture of elastomeric or polyolefin-based compounds exclusively for the wire and cable industry.

Insulation and sheathing compounds for low, medium and high voltage applications include automotive, industrial power, energy distribution, mining and appliances.

Mixer has developed an MV EPDM compound that no longer contains lead. The material exhibits both electrical and physical properties that are comparable to that of leaded compounds. Cable manufacturers are now able to produce cables with environmentally friendly compounds that are code compliant and reliable, at the same final cost of traditional leaded cables.

HFFR bedding compounds with LOI of up to 90% are available for high flame retardant applications. Mixer's colour masterbatches are compatible with all polymers (PVC, PE, EPDM).

The company's on-site laboratory provides testing of material properties and behaviours. Technical assistance is available to optimise the operational parameters of extrusion lines.

Mixer SpA – Italy
Website: www.mixercompounds.com

Redesigned and modified

The well-known range of Plasticolor dosing units has recently been completely redesigned and modified.

The new Plasticolor 1500 and 2500 series now has integrated neckpiece slides for the quantity tests, a round shaped material inlet and a round shaped quick discharge. The material flow and dosing precision have been clearly influenced by these modifications.



▲ The Plasticolor 1500

The sealing at the screw shaft has also been improved in order to be able to also handle dusty material and certain powders.

By utilising a new motor generation the output ranges have also been increased. For instance, the Plasticolor 1500 is up to 35kg/hr and the Plasticolor 2500 is 160kg/hr.

Woywod Kunststoffmaschinen GmbH & Co Vertriebs KG – Germany
Website: www.plasticolor.de




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Benefits of standards for wire and cable products

By Lawrence B Ingram, Alcan Cable, a General Cable company

Abstract

Standards have a significant effect on the marketplace. These many benefits are realised by the suppliers, manufacturers and customers as a result of cable, properly developed, meeting good standards. Lack of participation in standards development by a company places it at a competitive disadvantage.

This paper discusses the basis and value realised through participation in standards development. Standards aid new product development decision-making. They bring value and benefits to you and the company. They provide a benchmark for the new product. They can specify the temperature rating, fire performance, conductor and insulation resistance, physical and chemical properties of the cable product, for example.

Standards provide the opportunity for marketing and sales to decide whether to develop a product that is limited in capability or one that meets more stringent performance criteria.

Participation by manufacturers, suppliers and Standards Development Organizations (SDO) are all a critical part of this process. The benefits of participating in standards development are established.

1 Introduction

The wire and cable industry and standards are inextricably linked. Electrical fires have resulted in thousands of essentially unnecessary deaths during the past 100 years. For example, in 2009 there were 802 civilian deaths, 2,500 injuries and \$2.53 billion in property damages as a result of 65,800 electrical fires in homes⁽¹⁾.

The fire causes were electrical failure/malfunction, and electrical distribution or lighting equipment in the home. Amazingly, the number of electrical fires was actually down by about one-third based upon the 1980 to 1998 reporting period of the report

issued in January of this year. This is part of the reason the National Electric Code (NEC) and Standards bodies have issued and revised the many Wire & Cable Standards we manufacture cable to today.

2 Basis for Standards

Standards have three basic objectives:

- 1 They must function effectively
- 2 They must satisfy a legitimate objective
- 3 They must be relevant

Standards help to provide safe products. The products are sustainable and bring benefits to people around the globe. Voluntary consensus standards are the foundation of the US, North American and global economy. They are the building blocks for innovation and competitiveness⁽²⁾.

The World Trade Organization (WTO) recognises that international standards have a legitimate and significant impact on industrial efficiency and expansion of world trade. Standards are essential to strengthen the world economy and maintain product integrity and competitiveness around the globe⁽³⁾. Standards developed by ASTM International and Underwriters Laboratories (UL) are widely accepted internationally. More than 150 countries signed the agreement on Technical Barriers to Trade (TBT), obligating them to take part in the development of international standards through the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC). Unfortunately, strong harmonised standards are not always the practical result.

The International Electrotechnical Commission (IEC) tries for one solution. The WTO states that "international standards should not give preference to characteristics or requirements of specific countries or regions where different needs or interests exist in other countries or regions"⁽³⁾.

Technical committees develop the standards. They must recognise that good IEC standards require an international solution where the developed standard reflects the needs of the global market.

Failure to reach true consensus only sustains market barriers and impedes the development of a truly global market⁽³⁾.

Some North American proposals to the IEC have been blocked from implementation even though billions of units are installed and used safely worldwide⁽³⁾. Implementation of one solution through ISO/IEC cannot force the global market to create a limiting standard when there are two or more safe approaches to the same result.

This result is anti-competitive, leading to entry barriers in a particular market. Your participation in ASTM or other standards development activities can strengthen and improve these building blocks for innovation and competitiveness.

2.1 Goal of Standards: Safety

2.1.1 Reduce the Chances of Headlines Like This: Iroquois Theater Fire – Dec 30, 1903⁽⁴⁾ At least 605 people die

The cause – a shorted arc light set a curtain on fire, and then the stage set materials ignited a significant amount of wood trim.

Problems: there were unfinished fire escapes, no extinguishers, sprinklers, alarms, telephones, or water connections, and blocked exits. The theater attendance exceeded 2,000 and the building was over capacity and at SRO. This tragedy contributed to produce better fire codes and standards.

Some results and improvements: this tragedy led to panic bars, a sheet metal screen to be raised and lowered between the audience and stage (not universally adopted by Codes & Standards) and doors of public buildings that must open in the direction of egress.

Wire and cable and electrical equipment standards were not implemented until later in the century. Standards support the minimum properties required for safety and performance.

Every three years the NEC is significantly revised to keep pace with technology and further enhance protection against electrical fire and shock hazards. The absence of, or poorly written, standards would significantly reduce the quality of life on earth. Good standards serve as a barrier to sub-standard products. Standards should bring value, be effective and not act as a barrier to free trade. You can help this process.

2.1.2 Value of Standards Development:

Standards are developed by a consensus reached based upon input from a variety of interests. Producers, users, testing companies and customers each bring their perspective to the standards development process. This process adds value because it develops standards that are effective, relevant, and credible based upon the integrity of the developers⁽⁵⁾.

Advances in technology influence standards. They evolve as wire and cable (W&C) technology changes. This makes all of us, as producers and users, important, with our input being vital for good standards to bring value and benefits. Wire and cable products meet demanding electrical test, physical, mechanical and chemical property performance criteria for a variety of rated temperatures.

Standards development revolves around generation of performance data and information to permit safe practices during installation, testing and usage of wire and cable products. We expect these products to last for 30 or more years.

ASTM was cited by The 1947 President's Conference on Fire Prevention⁽⁶⁾ for its recognition that performance rather than specific materials should decide the future course of fire safety. Performance allows for new materials developments to raise safety standards to the next level.

2.1.3 Benefits of Standards Development:

a **Safety** – The NEC and ASTM, among others, provide practical guidance to help safeguard employees and the public from hazards during the installation, operation, and maintenance of electric supply and communication lines and associated equipment. The NEC covers a broad range of electrotechnical areas, including storage batteries,

transformers, conductors, switchgear, circuit breakers, physical clearances, cable terminations, safety warning signs, and protective clothing for workers installing electrical equipment.

To provide for electrical safety, methods that determine the level of insulation resistance to transmission of electricity through various substrates have been developed⁽⁷⁾. One measure is volts per mil determined by ASTM D149⁽⁸⁾. This method is a measure of the dielectric breakdown voltage and dielectric strength of the insulation. The value is high for a good insulation material.

Another measure is dielectric constant (DC) or dissipation factor (DF) measured by fluid displacement using ASTM D1531⁽⁹⁾. Electrical resistance to breakdown by treeing in insulation is measured by ASTM D3756⁽¹⁰⁾. The value is low for a good insulation material. ASTM D4872⁽¹¹⁾ is a test method for dielectric testing of wire and cable filling compounds. The inclined plane tracking and erosion test, ASTM D2303⁽¹²⁾, or the dust and fog tracking and erosion resistance test, ASTM D2132⁽¹³⁾, evaluate tracking resistance on the contaminated surface of an insulation material.

b **Physical Properties and Chemical Resistance** – Tensile strength, elongation low temperature and room temperature impact, crush resistance, and additionally, oil, gasoline, and ozone resistance can be evaluated for the operating environment. Examples of performance standards that contain these performance properties are ASTM D470⁽¹⁴⁾, UL 44⁽¹⁵⁾ and UL 83⁽¹⁶⁾.

c **Flame and Smoke performance** – Various levels are attained depending on the required level of safety. For cable, UL 44 contains FT1 – dripping particles, FT2 – horizontal and FT4 vertical tray fire tests for example. Additional examples of W&C fire and smoke performance tests are shown in *Table 1*.

Electrical cable product fire safety performance has been evolving. Fire safety is partly based upon control of ignition, the rate of heat released, and flame spread or smoke released during a fire. These are critical measures and are evaluated by UL 1685⁽²⁵⁾ and ASTM D5537⁽²³⁾, for example. The amount of heat released determines how quickly a fire can spread. Greater and more rapid heat release will overcome some fire resistant additives. More heat released creates a greater fire

fighting challenge for firefighters who arrive on the scene. Controlling the amount and intensity of the heat and smoke released will allow trapped people more time to escape safely and property damage may be less extensive.

The level of smoke can obscure vision and inhibit or prevent people from escaping from a fire scene. There are standards designed to measure the level of smoke through standards such as UL1685⁽²⁵⁾, ASTM E662⁽²⁴⁾, or smoke obscuration measured by ASTM D5424⁽²¹⁾. ASTM Standard D5485⁽²²⁾, first issued in 1994, addresses the corrosion of electronic systems as a result of fire damage. Loss of electronic systems can affect alarms and other critical systems in buildings. These revised and newer standards reflect the evolution toward better fire safety.

d **Temperature performance** – 75 or 90°C rating defines performance of cable for overload capability, or operating temperatures for example.

2.1.4 Electrical Fire Safety⁽²⁷⁾ Report issued by the US Fire Safety Administration

The Problem: During a typical year, home electrical problems account for 26,100 fires and more than \$2 billion in property losses. About half of all residential electrical fires involve electrical wiring. Statistically, December and January are the most dangerous months for electrical fires. Fire deaths are highest in winter months with more indoor activities, and increases in lighting, heating, and appliance use. The bedroom is the leading area of fire origin for residential building electrical fires. However, electrical fires that begin in the living room/family room/den areas result in the most deaths.

The Causes of Electrical Fires: Most electrical distribution fires result from problems with “fixed wiring” such as faulty electrical outlets and old wiring. Problems with cords (such as extension and appliance cords), plugs, receptacles, and switches also cause many home electrical fires. Light fixtures and lamps/light bulbs are also leading causes of electrical fires. Many avoidable electrical fires can be traced to misuse of electric cords. These include overloaded circuits, poor maintenance, and running the cords under rugs or in high traffic areas for example.

2.1.5 Marketing Considerations

Standards are necessary for business success. Having people who are standards experts in your organisation is essential.

Many of our cable businesses are international. Therefore companies need standards experts who are intimately familiar with several national standards.

New materials must meet the same performance criteria of developed materials, and receive temperature ratings based upon standards performance protocols such as relative thermal index. The issued standard creates a level performance playing field for manufacturers. This enables companies to act by investing in product development resources⁽²⁸⁾.

3 Standards Development Organizations (SDO)

- ASTM International develops both Standard Test Methods and Product Standards
- UL and CSA related to the respective country National Electric Code in the US and Canada
- Insulated Conductor Engineers Association
- ISO and IEC, discussed previously
- Other international organisations include GB/T (China), NOM (Mexico), and BS (Great Britain)

ASTM International is a globally recognised leader in the development and delivery of international voluntary consensus standards⁽²⁹⁾. Today, some 12,000 ASTM standards are used around the world to improve product quality, enhance safety, facilitate market access and trade, and build consumer confidence.

ASTM's leadership in international standards development is driven by the contributions of its members, who include more than 30,000 of the world's top technical experts and business professionals representing 135 countries.

Working in an open and transparent process and using ASTM's advanced electronic infrastructure, ASTM members deliver the test methods, specifications, guides, and practices that support industries and products worldwide. UL and Canadian Standards Association (CSA) undertake development of safety standards⁽⁷⁾ in the United States and Canada, respectively.

These two organisations make a significant contribution to the national electrical code of their country. In the United States, the National Fire Protection Association (NFPA) issues the National Electric Code. Materials suppliers and cable manufacturers can propose changes to the UL and CSA standards

Test	Type Test	Test Comment
D1929 ⁽¹⁷⁾	Ignition Temperature	Measures ignition temperature of plastics
D2863 ⁽¹⁸⁾	Oxygen Index	Percent of oxygen needed to sustain flame
D3801 ⁽¹⁹⁾	Extinguishing	Vertical flame, extinguishing characteristics
D3874 ⁽²⁰⁾	Ignition	Ignition of material by hot wire sources
D5424 ⁽²¹⁾	Smoke	Vertical cable tray smoke measurement
D5485 ⁽²²⁾	Corrosion	Cone calorimeter corrosion test
D5537 ⁽²³⁾	Fire load	Heat release, flame spread, mass loss
E 662 ⁽²⁴⁾	Smoke Spread	Amount of smoke
UL 1685 ⁽²⁵⁾	Cable Vertical Tray	Vertical tray fire spread, smoke release
UL 2196 ⁽²⁶⁾	Fire Resistive Cable	Tests for fire resistive cable, (fire stop)

▲ Table 1: Standards examples of ASTM and UL wire and cable fire and smoke tests⁽⁷⁾

and subsequently obtain changes in the national electrical code. This occurs after demonstrating that new materials or cables product meet rigorous and demanding performance capability. For North America, UL and CSA have a significant stake in assuring the safety of products that provide expected performance.

IEC wire and cable product standards are harmonised and international. The harmonisation efforts are complex since each country has an opportunity to comment and vote on the technical merits of a standard under development or being revised.

The International Standards Organization (ISO) develops standards for the world so that products such as automobiles or electro technical products that are manufactured on several continents are developed and produced to uniform standards. Your input is needed so that cable manufacturers, suppliers and other experts work with the standards development organisations to create new standards, update standards as a result of

evolving technology, and review existing standards to ensure that relevance and value is maintained.

There is always a need to develop standards more rapidly for the evolving materials development work constantly ongoing. These efforts by people are required to provide the highest quality standards to meet electrical, fire safety and performance criteria. This makes your participation critical to the process.

3.1 Why Help Develop Consensus Standards?

- Working on standards developments helps people to see another company's perspective
- Working on standards helps a person to understand the reason behind a test or a product standard
- The understanding gained allows your company to develop consistency and repeatability in testing and reporting
- Your company brings its experiences to standards development. Having standards experts in your organisation is essential for continued success

- e It is vital to have continuity of personnel. When today's expert retires, then the next designee can seamlessly go forward for the company. New and more participation is needed
- f Your participation benefits the industry, fosters competition and stimulates global trade
- g There has been a reduction of support for standards development

The message to take away from this is – standards are crucial for the future of your business. You must petition the management of your company and communicate the value and benefits obtained from participation in standards organisation work.

3.2 Benefits of Technical Committee Membership⁽²⁹⁾

3.2.1 Employer Benefits:

- a Ability to influence content of codes and standards
- b Contribution to improved safety and performance of products
- c Early awareness of new or revised requirements

3.2.2 Personal Benefits:

Professional development, networking and recognition.

3.2.3 Small Manufacturer Representation:

More than half of the members participating in ASTM's standards developing technical committees are employed in enterprises with 500 or fewer employees.

3.3 Standards Development Opportunities

3.3.1 Smart Grid, photovoltaic, wind and other types of grid connections

3.3.2 Micro grid Standards – self-supporting such as hospitals, military, university, etc

3.3.3 Determination of heat energy and the savings through reduction in usage of carbon based fuels⁽²⁸⁾

3.3.4 The standards of today are prescriptive⁽⁷⁾

Standards need to become performance based. New materials can improve the performance with higher V/mil, better abuse resistance, and yet, in wire and cable, standards remain locked within

artificial constraints based upon 1960's and earlier technology. General Electric Co once advertised: "Progress is our most important product". New materials can provide better wire and cable products.

The benefits provided by standards are high. This value must be enhanced by recognition of the dynamic changes occurring in W&C products and movement towards development of performance based standards.

4 Conclusions

4.1 All of us need to work toward maintaining and improving standards

4.2 It is essential that you and your organisation participate to develop and maintain strong vibrant standards

4.3 Work is needed and challenges abound in the areas of smart grid, energy efficiency and nanotechnology developing areas of cable products

4.4 Standards must continue to bring value and benefits to the users of products

5 Acknowledgement

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- 10 ASTM D3756 Standard Test Method for Evaluation of Resistance to Electrical Breakdown by Treeing in Solid Dielectric Materials Using Diverging Fields

- 11 ASTM D4872 Standard Test Method for Dielectric Testing of Wire and Cable Filling Compounds
- 12 ASTM D2303 Standard Test Methods for Liquid-Contaminant, Inclined-Plane Tracking and Erosion of Insulating Materials
- 13 ASTM D2132 Standard Test Method for Dust-and-Fog Tracking and Erosion Resistance of Electrical Insulating Materials
- 14 D470 Standard Test Methods for Crosslinked Insulations and Jackets for Wire and Cable
- 15 UL 44 Thermoset-Insulated Wires and Cables
- 16 UL 83 Thermoplastic-Insulated Wires and Cables
- 17 ASTM D1929 Standard Test Method for Determining Ignition Temperature of Plastics
- 18 ASTM D2863 Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)
- 19 ASTM D3801 Standard Test Method for Measuring the Comparative Burning Characteristics of Solid Plastics in a Vertical Position
- 20 ASTM D3874 Standard Test Method for Ignition of Materials by Hot Wire Sources
- 21 ASTM D5424 Standard Test Method for Smoke Obscuration of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration
- 22 ASTM D5485 Standard Test Method for Determining the Corrosive Effect of Combustion Products Using the Cone Corrosimeter
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Nahtlose Aluminiumummantelung von Hochspannungskabeln

MIT den sechs nun in Produktion befindlichen Linien, ist das SheathEx™-Verfahren von BWE dabei, die neue Alternative für nahtlose Aluminiumummantelung von Hochspannungskabeln zu werden. Während des zweiten Quartals des laufenden Jahres wird in Europa eine weitere Linie installiert und in Betrieb genommen.

Das SheathEx-Verfahren ist eine Erweiterung der gut eingeführten Conform™- und Conklad™-kontinuierlichen Extrusionstechnologie. Die SheathEx-Maschine extrudiert ein kontinuierliches und nahtloses Aluminiumrohr aus zwei 12mm Durchmesser großen Stäben um eine Hochspannungskabelseele. BWE hat mit Herstellern von Hochspannungs-Stromkabeln in China zusammengearbeitet, um die Produkt- und Verfahrensspezifikationen für diese neue und einzigartige Technik zu entwickeln.

Die SheathEx-Maschine integriert einen großen Querkopf um Ziehsteine mit großen Durchmessern aufzunehmen, die für die Kabelummantelung erforderlich sind. Die Aluminiumummantelung ist nahtlos, ohne Bindaht oder Wulst. Der



▲ Eine Produktionslinie SheathEx von BWE

Betriebsmodus mit Doppelrille sichert, dass die Aluminiumummantelung konzentrisch ist.

Das von BWE patentierte System der induktiven Erwärmung bietet eine sehr gleichmäßige Temperaturverteilung um das Werkzeug, die wiederum zu sehr stabilen Betriebsbedingungen sowie einheitlichen Eigenschaften im Aluminiumrohr führt.

Rohmaterialien sind standardmäßig CCR-Aluminiumstangen, die leicht erhältlich und preiswert sind, im Vergleich zu anderen Werkstoffen (wie z. B. in einer Schweißlinie eingesetzte Flachaluminiumbleche).

Die Kabelseele läuft ständig durch den Querkopf. Ein gekühltes Einlaufrohr schützt die Kabelseele am Einlauf zum Querkopf und ein sofort nach dem Ziehstein vorgesehene schnelles Abschrecken des Aluminiumrohrs verhindert Wärmeschäden an der Kabelseele.

Der SheathEx-Maschine nachgeschaltet, wird die Kabelummantelung Inline gewellt und auf großen Trommeln aufgewickelt.

Das SheathEx-Verfahren ist die kontinuierliche (ohne Anhaltezeichen), zuverlässige (keine Bindaht) und kostengünstige (preiswertes Material, energiearm usw.) Methode, um Hochspannungs-Stromkabel zu ummanteln.

SheathEx, Conform und Conklad sind eingetragene Markenzeichen von BWE Ltd. Internationale Patente wurden für das eingesetzte SheathEx-Verfahren, das SheathEx-Werkzeugsystem, die Maschinenanordnung, das Steuerungsverfahren und die induktive Erwärmungstechnik angemeldet.

BWE Ltd – UK
Website: www.bwe.co.uk

Französischer Zoo soll seinen eigenen Strom selbst erzeugen

Der französische Beauval Zoo plant eine neue Verarbeitungsanlage um Müll in Strom zu verwandeln.

Die 3 Millionen US Dollar Anlage, die im kommenden Frühling in Betrieb genommen wird, wird Strom durch die Verbrennung von Biogas herstellen, bestehend aus Tier-Mist und anderem Biomüll.

Es wird angenommen, dass die meisten Zootiere dazu beitragen werden, insbesondere mit den großen Pandas, die schon alleine jeden Tag über 65 Pfund Treibstoff erzeugen!

Beauval Zoo schätzt, dass durch die Verarbeitungsanlage um 40 Prozent Energiekosten eingespart werden



▲ Große Pandas werden zur Stromversorgung des Zoos beitragen. Aufnahme mit freundlicher Genehmigung von www.zoobeauval.com

und dass der ungenutzte Strom den Elektrizitätsversorgern der Region als zusätzlicher Gewinn verkauft werden kann.

„Diese Initiative passt sich perfekt unserem schon vor längerer Zeit entwickelten Nachhaltigkeitskonzept an“ erzählte die Zoo-Sprecherin Delphine Delord dem französischen Nachrichtenportal „The Local“.

Biogas-Systeme, bei denen Biomüll eingesetzt wird, haben als erneuerbare Energiealternative in den gesamten USA und in Europa an Boden gewonnen und können für Entwicklungsländern von besonderer Wichtigkeit sein, wo zuverlässiger Strom anders nicht zur Verfügung stehen könnte.

Beauval Zoo – Frankreich
Website: www.zoobeauval.com

Intelligente Kommunikationsschnittstellen

PROFIBUS DP und Profinet IO industrielle Feldbusstandards wurden erfolgreich für die Kommunikation zwischen Geräten verschiedener Hersteller von automatisierten Produktionslinien eingesetzt.

Mit einer neuen Aktualisierung dieser Profibus DP-Schnittstelle, steigert Zumbach die Verwendbarkeit seiner Geräte auf einen neuen Level. Darüber hinaus steht nun Profinet IO industrielles Ethernet für die ganze Zumbach-Gerätefamilie zur Verfügung.

In der industriellen Produktion sind mehrere Automatisierungs-, Engineering- und Visualisierungssysteme mit einem Bus verbunden. Die Profibus-Schnittstelle ermöglichte eine zentrale Steuerung aller Geräte, die am Produktionsprozess beteiligt sind sowie viele Funktionen der Standarddiagnosen – und das alles über eine sichere und schnelle Verbindung (bis zu 12 Mbps).

Die zyklische Sammlung und Vorbereitung sowie zuverlässige Bewertung der Messdaten über die Schnittstelle haben eine wesentliche Auswirkung auf die Qualität der Überwachung.

Die Kommunikation von Zumbach über Profibus DP verbessert nicht nur den Workflow zwischen einzelnen Produktionseinheiten deutlich; sie reduziert außerdem aufgrund des geringen Aufwands an Hardware (ein Engineering-Werkzeug für alle Geräte) die Investitions- und Service-Kosten. Dank der Bustopologie können Sensoren während des Betriebs an- und abgekoppelt werden.

Praktisch stehen alle Zumbach-Geräte



▲ Eine Auswahl an Messgeräten mit Profibus-/Profinet-Schnittstelle

für den Einsatz in Profibus DP-Strukturen, direkt oder über eine Profibus-Schnittstelle, zur Verfügung. Mittels Einsatz eines intelligenten Protokolls wird die gesamte Funktionalität jedes Sensors von der Initialisierung bis hin zum eigentlichen Datenaustausch vollständig unterstützt.

Im Besonderen wurde bei Profibus die Firmware angepasst und die GSD-Datei signifikant verbessert. Nun bietet es eine einfachere, schnellere und kostengünstigere Installation:

- Einfache drag'n'drop Installation: gerätespezifische Sprachversion der GSD-Datei (DE, FR, EN) installieren, anschließend Zumbach-Gerät auf kundenseitige Oberfläche ziehen
- Istwerterfassung: funktionsbereit mit

zwei Eingaben dank gerätespezifischer Parameter, einfachstes Ergänzen von Messgrößen/ Modulen

Profinet IO - der Nachfolger von Profibus DP - ist für den Datenaustausch zwischen Ethernet-basierten Feldgeräten ausgelegt. Der offene industrielle Ethernet-Standard erfüllt die steigenden Anforderungen in der Automatisierung, zuverlässig und nachhaltig bei bester Flexibilität, Effizienz und Performance.

Zumbach hat eine neue GSDML-Datei für Profinet entwickelt, damit ist die Umsetzung von Profibus und Profinet einfach und nahezu identisch.

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

Position wird gestärkt

Pentre Group hat Farres nach 20jähriger Verbandszugehörigkeit erworben.

Die Gruppe, die Hearl Heaton aufgenommen hat, feiert ihre 25jährige Tätigkeit in der internationalen Draht- und Kabelindustrie und ist nun ein führender europäischer Hersteller für alle Arten von Haspeln, Trommeln, Rollen und Spulen.

Mit vier Betrieben im UK und einem in Rakovnik/Tschechien, betrachtet Pentre diesen Erwerb als einen spannenden und wichtigen Schritt, um seine Position in Südeuropa und Nordafrika zu stärken.

Pentre Group – UK

Website: www.pentregroup.com

Ungenutzte Anlage

Mathiasen Machinery Inc wurde ein Exklusivvertrag für den Verkauf eines Redex 5-strängigen Walzwerks von 2009 und zwei kompakter RESY®-Filterungssysteme erteilt.

Die Ausrüstung wurde im Jahre 2009 gebaut, aber nie installiert und ist immer noch in deren Original-Versandkisten.

Das Walzwerk wurde für die Produktion von Querschnitten von 2mm² bis 125mm² mit einer Jahreskapazität von 15.000 Tonnen entworfen.

Mathiasen Machinery – USA

Website: www.mathiasen-machinery.com

Vorteile der Normen für Draht- und Kabelprodukte

Von Lawrence B Ingram, Alcan Cable, ein Unternehmen der Gruppe General Cable

Übersicht

Normen haben eine wesentliche Auswirkung auf den Markt. Zahlreiche Vorteile ergeben sich für Lieferanten, Hersteller und Kunden als Ergebnis entsprechend sachgemäß entwickelter Kabel, die hohe Normen erfüllen. Nimmt ein Unternehmen an der Normenentwicklung nicht teil, so führt dies zu einem Wettbewerbsnachteil. Dieser Artikel befasst sich mit der Grundlage der Normen und den Ergebnissen, die sich aus der Teilnahme an Normenentwicklungen ergeben. Normen unterstützen neue Produktentwicklungsentscheidungen.

Sie bringen Ihnen und Ihrem Unternehmen somit einen Mehrwert und Vorteile und setzen Maßstäbe für neue Produkte. Damit können z. B. Temperaturnennwert, Brandverhalten, Leiter- und Isolationswiderstand, physikalische und chemische Eigenschaften der Kabelprodukte spezifiziert werden.

Normen bieten dem Marketing und Verkauf die Möglichkeit zu entscheiden, ob ein Produkt entwickelt werden sollte, dessen Fähigkeit begrenzt ist oder jenes, das strengere Leistungskriterien erfüllt. Die Beteiligung von Herstellern, Lieferanten und Standard-Entwicklungsorganisationen (*SDO - Standards Development Organizations*) bilden einen wesentlichen Teil dieses Verfahrens. Die durch die Teilnahme an Normenentwicklungen erzielten Vorteile sind erprobt. Schlüsselworte: Kabel; Flamme; Isolationswiderstand; Sicherheit; Rauch; Normen; Draht.

1 Einleitung

Die Draht- und Kabelindustrie ist untrennbar mit den Normen verbunden. Elektrische Brände haben in den letzten 100 Jahren tausende von eigentlich überflüssigen Todesfällen verursacht. Im Jahre 2009 ergaben sich z. B. 802 zivile Tote, 2500 Verletzte und 2,53 Mrd. USD Vermögensschäden als Ergebnis von 65.800 elektrischen Wohnungsbränden⁽¹⁾. Die Brände wurden durch elektrische

Ausfälle und Störungen sowie elektrische Verteilungs- oder Beleuchtungsanlagen in Wohnungen verursacht. Entsprechend einem Bericht, der Januar dieses Jahr erschien, reduzierte sich eigentlich erstaunlicherweise die Anzahl elektrischer Brände um ein Drittel basierend auf einen Bezugszeitraum zwischen 1980 und 1998. Das ist teilweise der Grund weshalb das Nationale Elektrische Code (NEC) und die Standardisierungsbehörden zahlreiche Draht- und Kabelnormen veröffentlicht und überarbeitet haben, die bei der aktuellen Kabelherstellung eingesetzt werden.

Deswegen sollten Sie und alle Beteiligten im Sektor sich Organisationen anschließen, wie z. B. ASTM International (die amerikanische Standardisierungsbehörde), um durch Ihre Organisationen die Normen weiterhin zu verstärken und zu verbessern, die zu diesem Fortschritt beitragen.

2 Grundlage der Normen

Normen haben drei grundlegende Ziele.

- 1 Sie sollen wirksam wirken
- 2 Sie sollen einen berechtigten Zweck erfüllen
- 3 Sie sollen sachbezogen sein

Normen tragen dazu bei sichere Produkte zu liefern. Die Produkte sind nachhaltig und bringen den Menschen weltweit Nutzen. Freiwillige Konsensnormen schaffen die Grundlagen der amerikanischen, nordamerikanischen und der Weltwirtschaft. Sie stellen die Bausteine für Innovation und Wettbewerbsfähigkeit dar⁽²⁾.

Die Welthandelsorganisation (WTO) hat anerkannt, dass internationale Normen einen berechtigten und wesentlichen.

Einfluss auf die industrielle Effizienz und Expansion des Welthandels haben. Normen sind grundlegend bei der Stärkung der Weltökonomie und um die Integrität und Wettbewerbsfähigkeit des Produkts weltweit beizubehalten⁽³⁾.

Die durch ASTM International und Underwriters Laboratories (UL) entwickelten Normen sind international weitgehend angenommen. Mehr als 150 Länder haben das Abkommen über Technische Handelshemmnisse (TBT) unterzeichnet und sich somit verpflichtet an der Entwicklung internationaler Normen durch die Internationale Standardisierungsorganisation (ISO) und die Internationale Elektrotechnische Kommission (IEC) teilzunehmen. Leider sind stark harmonisierte Normen nicht immer ein praktisches Ergebnis.

Die Internationale Elektrotechnische Kommission (IEC) bemüht sich eine Lösung zu finden. Die WTO erklärt, dass „internationale Normen nicht Eigenschaften oder Anforderungen spezifischer Länder oder Regionen bevorzugen sollten, wegen den unterschiedlichen Anforderungen oder Interessen zwischen den verschiedenen Ländern oder Regionen“⁽⁴⁾.

Die technischen Komitees entwickeln die Normen. Sie müssen erkennen, dass geltende IEC-Normen eine internationale Lösung fordern, entsprechend welcher eine Norm entworfen wird, die die Bedürfnisse des Weltmarkts widerspiegelt.

Wenn eine tatsächliche Übereinstimmung nicht erzielt wird, werden lediglich die Markthindernisse unterstützt und die Entwicklung eines wirklich weltweiten Markts behindert⁽³⁾. Einige nordamerikanische, der IEC vorgestellte Vorschläge wurden hinsichtlich der Anwendung blockiert obwohl Milliarden von Einheiten weltweit installiert und sicher genutzt werden⁽³⁾.

Die Anwendung einer einzigen Lösung durch ISO/IEC kann den Weltmarkt nicht forcieren, eine begrenzende Norm zu schaffen wenn zwei oder mehrere sichere Ansätze zum gleichen Ergebnis bestehen. Dieses Ergebnis ist wettbewerbswidrig, da es zu Zugangsbeschränkungen in einem besonderen Markt führt. Ihre Teilnahme an der Entwicklung der Normen von ASTM oder anderen Normen kann diese Bausteine für Innovation und Wettbewerbsfähigkeit verstärken und bessern.

2.1 Ziel der Normen: Sicherheit

2.1.1 Reduzierung der Headlines wie: **Brand im Iroquois Theater – 30 Dezember 1903⁽⁴⁾ Mindestens 605 Menschen kamen ums Leben**

Die Ursache – Ein Kurzschluss bei einer Bogenlampe zündete einen Vorhang an, und dann entzündete das Bühnenbildmaterial eine beträchtliche Menge an Holzverkleidungen.

Probleme: die Notausgänge waren nicht fertiggestellt, Feuerlöscher, Brausen, Alarmer, Telefone und Wasseranschlüsse waren nicht vorhanden und die Ausgänge waren gesperrt. Mit über 2000 Theaterbesuchern entstand im Gebäude eine Überbelegung: alle Sitzplätze waren ausverkauft und viele Stehplätze waren besetzt. Diese Tragödie trug dazu bei, bessere Brandcodes und -normen zu schaffen.

Einige Ergebnisse und Verbesserungen: Diese Tragödie führte zur Einführung von Panikstangen, Metallblechabschirmungen, die zwischen den Zuschauern und der Bühne gehoben und gesenkt werden (nicht allgemein von Codes und Normen übernommen) und Türen öffentlicher Gebäude, die sich in Ausgangsrichtung öffnen müssen. Die Normen für Draht und Kabel sowie jene für elektrische Ausrüstungen wurden erst später im Laufe des Jahrhunderts implementiert. Die Normen bestimmen die Mindesteigenschaften, die für die Sicherheit und Leistung gefordert werden.

Alle drei Jahre wird das NEC wesentlich überarbeitet um mit der Technologie und den weiter erhöhten Schutz gegen die Risiken von elektrischen Bränden und Stromschlägen Schritt zu halten. Nicht vorhandene oder nicht ausreichende Normen würden die Lebensqualität auf der Erde wesentlich reduzieren.

Gute Normen dienen als Sperre gegenüber minderwertigen Produkten. Normen sollten Wert zuführen, leistungsfähig sein und nicht als Sperre gegenüber dem Freihandel wirken. Sie können zu diesem Prozess beitragen.

2.1.2 Wert der Normenentwicklung:

Normen werden durch einen Konsens entwickelt, basierend auf einem Input vielfältiger Interessen. Hersteller, Benutzer, Prüfunternehmen und Kunden, alle bringen ihre Sicht zu den Normenentwicklungsverfahren ein. Dieses Verfahren fügt einen Mehrwert hinzu, weil es Normen entwickelt, die wirksam, sachbezogen und glaubwürdig sind basierend auf der Seriosität der Entwickler⁽⁵⁾.

Die technologischen Fortschritte beeinflussen Normen. Sie entwickeln sich weiter während die Draht- und Kabeltechnologie sich verändert. Demzufolge sind wir alle, als Hersteller und Benutzer, mit unseren Beiträgen wichtig, die wesentlich sind, um gute Normen für Wert und Vorteile zu erreichen.

Draht- und Kabelprodukte erfüllen anspruchsvolle Leistungskriterien bei elektrischen Prüfungen sowie physikalische, mechanische und chemische Eigenschaften für eine Vielzahl von Temperaturnennwerten.

Normenentwicklung dreht sich um die Generierung von Leistungsangaben und -informationen, die sichere Arbeitsweisen während der Installation, Prüfungen und die Benutzung von Draht- und Kabelprodukten zulassen. Wir erwarten, dass diese Produkte zumindest 30 Jahre lang oder darüber hinaus bestehen.

Der ASTM wurde während der Präsidentenkonferenz zum Brandschutz im Jahre 1947⁽⁶⁾ für seinen Ansatz erwähnt, der darin bestand, dass eher die Leistung als das spezifische Material den zukünftigen Verlauf des Brandschutzes entscheiden sollte. Die Leistung ermöglicht neue Materialentwicklungen um das Sicherheitsniveau auf den nächsten Level zu bringen.

2.1.3 Vorteile der Normenentwicklung:

a **Sicherheit** – Neben anderen Behörden bieten NEC und ASTM praktische Anleitungen um die für die Sicherheit zuständigen Mitarbeiter sowie Öffentlichkeit gegen die Gefahr während der Installation, des Betriebs und der Wartung der elektrischen Ausrüstungen und der Kommunikationsleitungen und den dazugehörigen Ausrüstungen zu unterstützen. NEC deckt eine große Auswahl an elektrotechnischen Bereichen, einschließlich Akkumulatoren, Transformatoren, Leiter, Schaltgeräte, Leistungsschalter, Freiraum, Kabelabschlüsse, Sicherheitswarzeichen und Schutzkleidung für das Personal, das elektrische Ausrüstungen installiert.

Um für die elektrische Sicherheit zu sorgen wurden Methoden entwickelt, die das Niveau des Isolierungswiderstands gegenüber der Stromübertragung durch verschiedene Trägermaterialien bestimmen⁽⁷⁾. Ein Maß ist das durch ASTM D149⁽⁸⁾ festgelegte Volt pro Mil.

Diese Methode ist eine Messung der dielektrischen Abbruchspannung und der dielektrischen Festigkeit der Isolierung.

Der Wert ist bei einem guten Isolationsmaterial hoch. Ein weiteres Maß ist die dielektrische Konstante oder der Verlustfaktor, die durch eine Flüssigkeitsverdrängung mit Einsatz von ASTM D1531⁽⁹⁾ gemessen werden. Die elektrische Durchbruchfestigkeit durch Verästelung bei der Isolierung wird durch ASTM D3756⁽¹⁰⁾ gemessen. Der Wert ist bei einem guten Isolationsmaterial niedrig.

ASTM D4872⁽¹¹⁾ ist eine Prüfmethode für die dielektrische Prüfung der Draht- und Kabelfüllmischungen. Die Prüfung von Kriechstrom und Erosion mit geneigter Fläche gemäß ASTM D2303⁽¹²⁾ oder die Prüfung der Kriechstrom- und Erosionsfestigkeit mit Staub und Nebel gemäß ASTM D2132⁽¹³⁾, bieten eine Bewertung der Kriechstromfestigkeit auf der kontaminierten Oberfläche eines Isolationsmaterials.

b **Physikalische Eigenschaften und chemische Widerstandsfähigkeit**

– Zugfestigkeit, Dehnung, Auswirkung bei niedriger Temperatur und bei Raumtemperatur, Deformationsbeständigkeit und darüber hinaus können Öl-, Benzin- und Ozonbeständigkeit für das Arbeitsumfeld bewertet werden. Beispiele der Leistungsnormen, die diese Leistungseigenschaften enthalten sind ASTM D470⁽¹⁴⁾, UL 44⁽¹⁵⁾ und UL 83⁽¹⁶⁾.

c **Flammen- und Rauchleistung**

– verschiedene Level werden erreicht, abhängig vom geforderten Sicherheitsniveau. Für Kabel, sind in der UL 44 z. B. die Prüfungen FT1 (tropfende Partikel), FT2 (Brandtests mit horizontaler Ablage) und FT4 (Brandtests mit vertikaler Ablage) enthalten. Weitere Beispiele für Brand- und Rauchleistungsprüfungen im Draht- und Kabelbereich sind in der nachfolgenden *Tabelle 1* dargestellt.

Die Brandschutzleistungen für Kabelprodukte haben sich entwickelt. Brandschutz basiert teilweise auf einer Steuerung der Zündung, die Geschwindigkeit der Wärmefreisetzung sowie Flammenausbreitung oder den während eines Brands freigesetzten Rauch.

Das sind die kritischen Abmessungen, die z. B. durch UL 1685⁽²⁵⁾ und ASTM D5537⁽²³⁾ bewertet werden. Die Menge an Wärmefreisetzung bestimmt die Ausbreitungsgeschwindigkeit eines Feuers. Eine größere und schnellere Wärmefreisetzung werden einige feuerhemmende Additive vereiteln. Eine höhere Wärmefreisetzung bedeutet für die Feuerwehr am Brandort, eine

größere Herausforderung bei der Brandbekämpfung.

Indem die Menge und die Intensität freigesetzter Wärme und Rauch gesteuert werden, wird eingeschlossenen Menschen die Möglichkeit geboten, mehr Zeit für eine sichere Flucht zu haben, wobei die Sachschäden geringer sein könnten.

Die Rauchdichte könnte die Sicht vernebeln und Menschen die Flucht von einem Brandort versperren oder verhindern. Es gibt Normen, die entworfen wurden um die Rauchdichte durch Normen wie z. B. UL1685⁽²⁵⁾, ASTM E662⁽²⁴⁾ oder die Rauchvernebelung durch ASTM D5424⁽²¹⁾ zu messen. Die zuerst im Jahre 1994 veröffentlichte ASTM-Norm D5485⁽²²⁾ spricht die Korrosion elektronischer Systeme infolge eines Brandschadens an. Der Ausfall von elektronischen Systemen kann die Alarme beeinflussen sowie andere kritische Systeme in Gebäuden. Diese überarbeiteten und neuen Normen spiegeln die Entwicklung gegenüber einem besseren Brandschutz wider.

- d **Temperaturleistung** – die 75 oder 90°C Klassifizierung bestimmt z. B. die Kabelleistung für Überlastfähigkeit oder Betriebstemperaturen.

2.1.4 Bericht über den elektrischen Brandschutz⁽²⁷⁾

Der von der amerikanischen Brandschutzbehörde herausgegeben wurde.

Das Problem: Im Laufe eines normalen Jahres führen elektrische Probleme im Haushalt zu 26.100 Brandfällen und über 2 Mrd. USD Vermögensschäden. Zirka die Hälfte aller elektrisch ausgelösten Wohnungsbrände sind mit der elektrischen Verkabelung verbunden. Statistisch sind Dezember und Januar die gefährlichsten Monate für elektrische Brände.

Die meisten Todesfälle bei Bränden ereignen sich in den Wintermonaten, die durch vermehrte Tätigkeiten in den Innenräumen gekennzeichnet sind sowie einen erhöhten Einsatz von Beleuchtung, Erhitzung und Haushaltsgeräten.

Das Schlafzimmer ist der erste Brandentstehungsraum im Falle von elektrischen Bränden in Wohngebäuden.

Obwohl elektrische Brände, die in den Bereichen des Wohnzimmers/Familienraums/Hobbyraums beginnen, zu den meisten Todesfällen führen.

Test	Typ	Test Kommentar
D1929 ⁽¹⁷⁾	Zündtemperatur	Maßeinheiten Brandtemperatur von Kunststoffen
D2863 ⁽¹⁸⁾	Sauerstoffindex	Prozentsatz von Sauerstoff, das gefordert wird um die Flamme aufrechtzuerhalten
D3801 ⁽¹⁹⁾	Erlöschen	Vertikale Flamme, Löschungseigenschaften
D3874 ⁽²⁰⁾	Zündung	Zündung von Material durch warme Drahtquellen
D5424 ⁽²¹⁾	Rauch	Messung des Rauchs einer vertikalen Ablage für Kabel
D5485 ⁽²²⁾	Korrosion	Cone-Kalorimeter Korrosionsprüfung
D5537 ⁽²³⁾	Brandlast	Wärmefreisetzung, Flammenausbreitung, Massenverlust
E 662 ⁽²⁴⁾	Rauchfreisetzung	Rauchmenge
UL 1685 ⁽²⁵⁾	Vertikale Ablage für Kabel	Brandausbreitung in einer vertikalen Ablage, Rauchfreisetzung
UL 2196 ⁽²⁶⁾	Feuerfestes Kabel	Tests für feuerfeste Kabel (Flammensperre)

▲ **Tabelle 1:** Beispiele der ASTM- und UL-Normen bei Brand- und Rauchtests für Draht und Kabel⁽⁷⁾

Die Ursachen der elektrischen Brände: Die meisten Brände, an denen elektrische Verteilungsanlagen beteiligt sind, entstehen aus Problemen mit der „festen Verdrahtung“ wie mangelhafte Steckdosen und veraltete Verdrahtung.

Probleme mit Kabeln (wie z. B. Verlängerungskabel und Kabel für Haushaltsgeräte), Stecker, Steckdosen und Schalter verursachen auch zahlreiche elektrische Brände in den Wohnungen. Leuchtkörper und Lampen/Glühbirnen sind ebenfalls Hauptursachen für elektrische Brände.

Viele vermeidbare elektrische Brände können auf ein Kabelmissbrauch zurückgeführt werden. Das schließt z. B. überlastete Kreisläufe, unsachgemäße Wartung und die Verlegung von Leitungen unter Teppichen oder in Gebieten mit hoher Verkehrsdichte ein.

2.1.5 Marketingbetrachtungen

Normen sind für den Unternehmenserfolg erforderlich. Es ist von wesentlicher Bedeutung in der eigenen Organisation über Mitarbeiter als Normenexperten

zu verfügen. Viele unserer in Kabel spezialisierten Unternehmen sind weltweit tätig. Deswegen brauchen Unternehmen Normenexperten, die mit vielen inländischen Normen eng vertraut sind. Neue Werkstoffe müssen dieselben Leistungskriterien entwickelter Werkstoffe erfüllen, und Temperaturbewertungen einhalten, die auf Normen-Leistungsprotokollen basieren, wie z. B. der entsprechende thermische Index. Die veröffentlichte Norm schafft den Herstellern eine Chancengleichheit in Bezug auf die Leistungen. So können die Unternehmen in Produktentwicklungsressourcen⁽²⁸⁾ investieren.

3 Standard-Entwicklungsorganisationen (SDO)

- ASTM International entwickelt Normen-Testmethoden sowie Produktnormen

- UL und CSA beschäftigen sich mit dem inländischen elektrischen Code je in den USA und in Kanada
- Insulated Conductor Engineers Association
- ISO und IEC, zuvor beschrieben
- Weitere internationale Organisationen, einschließlich GB/T (China), NOM (Mexiko), BS (Großbritannien)

ASTM International ist ein weltweit anerkannter Marktführer in der Entwicklung und Lieferung von internationalen freiwilligen Konsensnormen⁽²⁹⁾. Heute werden weltweit zirka 12.000 ASTM-Normen eingesetzt, um die Produktqualität zu erhöhen, die Sicherheit zu verbessern, den Marktzugang und den Handel zu vereinfachen und das Verbrauchervertrauen aufzubauen.

Die Marktführung von ASTM in der internationalen Normenentwicklung wird durch die Beiträge seiner Mitglieder angetrieben, die weltweit über 30.000 technische Spitzenfachleute und Geschäftsexperten einschließen, die 135 Länder vertreten.

Das Arbeiten in einem offenen und transparenten Verfahren, mit Einsatz einer fortschrittlichen elektronischen Infrastruktur von ASTM, ermöglicht es den ASTM-Mitgliedern die Prüfmethoden, Spezifikationen, Leitfäden und Verfahren zu bieten, die Industrien sowie die Produkte weltweit unterstützen.

UL und CSA (Canadian Standards Association) beschäftigen sich mit der Entwicklung der Sicherheitsniveaus⁽⁷⁾ je in den USA und in Kanada.

Diese zwei Organisationen haben einen wesentlichen Beitrag für die Entwicklung des nationalen elektrischen Codes der jeweiligen Länder geleistet. In den USA, erstellt der amerikanische Verband für Brandverhütung (National Fire Protection Association – NFPA) den inländischen elektrischen Code. Materiallieferanten und Kabelhersteller können in Bezug auf UL- und CSA-Normen Änderungen vorschlagen und nachträglich Änderungen im inländischen elektrischen Code realisieren.

Das erfolgt durch den Nachweis, dass das neue Material oder die Kabelprodukte die strengen und anspruchsvollen Leistungsfähigkeitsanforderungen erfüllen. Für Nordamerika spielen UL und CSA eine wichtige Rolle dabei, die Sicherheit der Produkte zu sichern, die die erforderlichen Leistungen bieten.

Die Draht- und Kabelproduktnormen von IEC sind harmonisiert und international. Die harmonisierten Bemühungen sind komplex, da jedes Land die Möglichkeit hat zu kommentieren

und für die technischen Vorteile einer Norm, die entwickelt oder überarbeitet wird, zu stimmen. Die Internationale Standardisierungsorganisation (ISO) entwickelt weltweit Normen, damit Produkte wie z. B. Automobile oder elektrotechnische Produkte, die in verschiedenen Kontinenten hergestellt werden, gemäß einheitlichen Normen entwickelt und erzeugt werden.

Ihr Input ist erforderlich, damit Hersteller, Lieferanten und weitere Fachleute im Bereich Kabel mit den Standardentwicklungsorganisationen zusammenarbeiten, um neue Normen zu schaffen, Normen infolge der technologischen Fortschritte zu aktualisieren und vorhandene Normen zu überarbeiten, um sicherzustellen, dass die Relevanz und der Wert erhalten werden.

Der Bedarf Normen schneller zu erarbeiten für die Entwicklung der sich dauernd weiter entwickelnden Werkstoffe, besteht jederzeit. Diese Anstrengungen werden von den Menschen verlangt, um die hochwertigsten Normen zu bieten, die die Elektro-, Brandschutz- und Leistungskriterien erfüllen. Ihre Teilnahme wird somit für das Verfahren entscheidend.

3.1 Warum sollte man die Entwicklung von Konsensnormen unterstützen?

- a An Normenentwicklungen zu arbeiten hilft Menschen, eine andere Unternehmensperspektive zu betrachten.
- b An Normen zu arbeiten, unterstützt, den Grund für eine Prüfung oder eine Produktnorm zu verstehen.
- c Durch die gewonnene Erkenntnis kann Ihr Unternehmen die Beständigkeit und Wiederholbarkeit bei den Prüfungen und der Berichterstattung entwickeln.
- d Ihr Unternehmen bringt die eigenen Erfahrungen in die Normenentwicklung ein. Um weiterhin viel Erfolg zu haben, ist es von wesentlicher Bedeutung in der eigenen Organisation über Normenexperten zu verfügen.
- e Es ist sehr wichtig personelle Kontinuität zu haben. Wenn ein Fachmann von heute in den Ruhestand geht, kann der darauffolgende Beauftragte nahtlos für das Unternehmen vorwärts gehen. Eine neue und mehr Beteiligung wird gebraucht.
- f Ihre Teilnahme nutzt der Industrie, fördert den Wettbewerb und regt den Welthandel an.
- g Eine Reduzierung des Supports zeigt sich bei der Normenentwicklung.

Die daraus zu entnehmende Nachricht ist: Normen sind für die Zukunft Ihres Unternehmens entscheidend.

Sie müssen die Geschäftsführung Ihres Unternehmens motivieren und sie über den Wert und die Vorteile informieren, die durch die Teilnahme an der Normenorganisationsarbeit erzielt wird.

3.2 Vorteile aus der Mitgliedschaft am Technischen Komitee⁽²⁹⁾

3.2.1 Vorteile für den Arbeitgeber:

- a Fähigkeit den Inhalt von Codes und Normen zu beeinflussen
- b Dazu beitragen, die Sicherheit und Leistung der Produkte zu verbessern
- c Früheres Bewusstsein der neuen oder überarbeiteten Anforderungen

3.2.2 Persönliche Vorteile:

Die berufliche Fortbildung, das Networking und die Anerkennung.

3.2.3 Vertretung von Kleinherstellern:

Über die Hälfte der Mitglieder, die an den technischen Komitees der Normenentwicklung von ASTM teilnehmen, sind in Unternehmen angestellt, die 500 oder weniger Mitarbeiter beschäftigen.

3.3 Durch Normenentwicklung gebotene Möglichkeiten

3.3.1 Intelligentes Stromnetz, Photovoltaik, Windmühlen und andere Arten von Netzanschlüssen

3.3.2 Mikronetz-Normen – selbsttragend, wie bei Krankenhäusern, Militäranwendungen, Universitäten, usw

3.3.3 Bestimmung der Wärmeenergie und Einsparungen durch die Reduzierung des Einsatzes von kohlenstoffbasierte Treibstoffe⁽²⁸⁾

3.3.4 Die Normen von heute sind vorschreibend⁽⁷⁾

Normen müssen leistungsorientiert sein. Neue Werkstoffe können die Leistungen mit höherem V/mil verbessern und den Widerstand besser ausnutzen, dennoch bleiben im Draht- und Kabelbereich die Normen innerhalb künstlichen Beschränkungen blockiert, die auf einer Technologie der 60iger Jahre oder zuvor basieren. General Electric Co. hat angekündigt: „Der Fortschritt ist unser wichtigstes Produkt“. Neue Werkstoffe können bessere Draht- und Kabelprodukte bieten. Die von den Normen gebotenen Vorteile sind hoch. Dieser Wert muss durch die Anerkennung der dynamischen Änderungen verstärkt werden, die in den Draht- und Kabelprodukten entstehen und durch einen Schritt in Richtung Entwicklung leistungsbasierter Normen.

4 Schlussfolgerungen

4.1 Wir alle haben in Richtung Einhaltung und Verbesserung der Normen zu arbeiten

4.2 Es ist von grundlegender Bedeutung, dass Sie und Ihre Organisation dabei teilnimmt stark pulsierende Normen zu entwickeln und einzuhalten.

4.3 Daran zu arbeiten sowie reichlich vorhandene Herausforderungen sind erforderlich in den zu entwickelnden Bereichen intelligenter Stromnetze, Energieeffizienz und der Nanotechnologie von Kabelprodukten.

4.4 Normen müssen weiterhin den Produktnutzern Wert und Vorteile bringen.

- the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)
- 19 ASTM D3801 Standard Test Method for Measuring the Comparative Burning Characteristics of Solid Plastics in a Vertical Position
 - 20 ASTM D3874 Standard Test Method for Ignition of Materials by Hot Wire Sources
 - 21 ASTM D5424 Standard Test Method for Smoke Obscuration of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration
 - 22 ASTM D5485 Standard Test Method for Determining the Corrosive Effect of Combustion Products Using the Cone Corrosimeter
 - 23 ASTM D5537 Standard Test Method for Heat Release, Flame Spread, Smoke Obscuration, and Mass Loss Testing of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration
 - 24 ASTM E662 Test Method for Specific Optical Density of Smoke Generated by Solid Materials
 - 25 UL 1685 Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables
 - 26 UL 2196 Tests for Fire Resistive Cables
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5 Danksagung

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- 9 ASTM D1531 Standard Test Methods for Relative Permittivity (Dielectric Constant) and Dissipation Factor by Fluid Displacement Procedures
- 10 ASTM D3756 Standard Test Method for Evaluation of Resistance to Electrical Breakdown by Treeing in Solid Dielectric Materials Using Diverging Fields
- 11 ASTM D4872 Standard Test Method for Dielectric Testing of Wire and Cable Filling Compounds
- 12 ASTM D2303 Standard Test Methods for Liquid-Contaminant, Inclined-Plane Tracking and Erosion of Insulating Materials
- 13 ASTM D2132 Standard Test Method for Dust-and-Fog Tracking and Erosion Resistance of Electrical Insulating Materials
- 14 D470 Standard Test Methods for Crosslinked Insulations and Jackets for Wire and Cable
- 15 UL 44 Thermoset-Insulated Wires and Cables
- 16 UL 83 Thermoplastic-Insulated Wires and Cables
- 17 ASTM D1929 Standard Test Method for Determining Ignition Temperature of Plastics
- 18 ASTM D2863 Standard Test Method for Measuring

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Бесшовная алюминиевая оболочка высоковольтных кабелей

С шестью работающими в настоящее время производственными линиями технология SheathEx™ от компании «BWE» становится новой альтернативой бесшовной алюминиевой оболочке высоковольтных кабелей. Еще одна линия будет установлена и запущена в Европе во втором квартале этого года.

Технология SheathEx - это развитие хорошо зарекомендовавших себя технологий непрерывной экструзии Conform™ и Conklad™. Установка SheathEx прессует непрерывную и бесшовную алюминиевую трубку из двух 12 мм прутков вокруг высоковольтного кабеля. «BWE» сотрудничали с производителями высоковольтных кабелей в Китае для разработки продукции и технических характеристик для данной новой и уникальной технологии.

Установка SheathEx состоит из направляющей головки большого размера для обработки калибров большого диаметра, необходимых для заключения кабеля в оболочку. Алюминиевая оболочка бесшовная, без сварного шва или наплавного слоя. Двойной паз режима работы



▲ Производственная линия SheathEx компании «BWE»

обеспечивает концентричность алюминиевой оболочки.

Запатентованная «BWE» система индукционного нагрева обеспечивает одинаковое распределение температуры вокруг оборудования, что приводит к чрезвычайно устойчивым эксплуатационным условиям и постоянным характеристикам в алюминиевой трубке. Сырьевой материал является стандартным CCR алюминиевым прутком, доступным в продаже и недорогим по сравнению с другими материалами (такими, как плоские алюминиевые листы, используемые для линии сварки).

Жила кабеля непрерывно проходит через направляющую головку. Охлажденная вставная трубка защищает кабельную жилу на входе в головку, и резкое закалывание алюминиевой трубки сразу же после фильеры предотвращает тепловое повреждение жилы.

На выходе из устройства SheathEx кабельная оболочка гофрируется на распределительном устройстве и свертывается в большие катушки.

Технология SheathEx является непрерывным (отсутствуют перетяжки), надежным и экономичным (дешевые материалы, низкое энергопотребление и т.д.) методом заключения высоковольтного кабеля в оболочку.

SheathEx, Conform и Conklad - зарегистрированные торговые марки «BWE Ltd.». Были оформлены международные патенты на технологию SheathEx, инструментальную систему SheathEx, компоновку устройства, метод управления и технологию индукционного нагрева, которые применяются.

«BWE Ltd» – Великобритания
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Французский зоопарк будет производить собственное электричество

Французский зоопарк Бюваль строит планы по созданию новой перерабатывающей установки для получения электричества из отходов.

Ожидается, что объект стоимостью 3 миллиона долларов, будет запущен следующей весной и будет вырабатывать электричество сжиганием биогаза, полученного из экскрементов животных и других органических отходов. Планируется, что животные внесут существенный вклад, к примеру, только панды производят более 65 тонн топлива ежедневно!



▲ Гигантская панда внесет вклад в электроснабжение зоопарка. Фотографии предоставлены www.zoobeauval.com

По подсчетам зоопарка Бюваль установка по переработке снизит цены на электроэнергию на 40%, а неиспользованное электричество

будет продано региональной электроэнергетической компании для получения дополнительного заработка.

«Данная инициатива великолепно отражает политику устойчивого развития, которой мы придерживаемся долгое время», - заявила представитель зоопарка Делфин Делорд на французском новостном сайте «The Local».

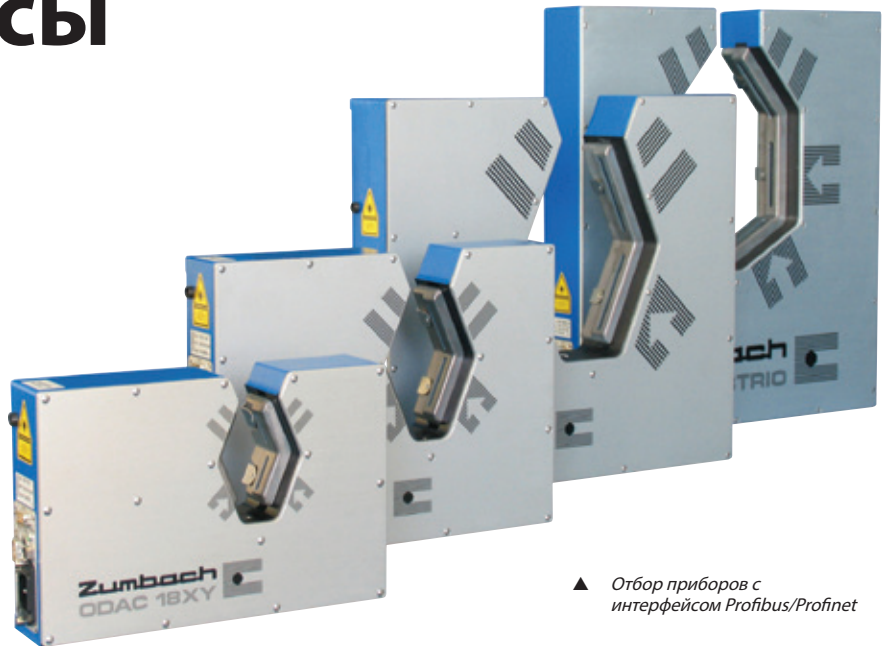
Системы биогаза по утилизации органических отходов получили распространение в качестве альтернативы возобновляемой энергии в США и Европе и могут быть особенно ценными в развивающихся странах, где надежные источники электроэнергии иногда недоступны.

«Beauval Zoo» – Франция
Вебсайт: www.zoobeauval.com

Интеллектуальные связанные интерфейсы

Промышленные стандарты индустриальной коммутационной сети и протокол Profinet успешно использовались для связи между устройствами различных производителей в автоматических производственных линиях. С усовершенствованием интерфейса индустриальной коммутационной сети «Zumbach» повышает удобство и простоту использования устройства, выводя его на новый уровень. Кроме того, Profinet IO Industrial Ethernet сейчас доступен для всей семьи устройств «Zumbach».

В промышленном производстве, многочисленные процессы автоматизации, инжиниринга и системы проектирования соединены с шиной. Интерфейс индустриальной коммутационной сети позволяет централизовать управление всеми устройствами, задействованными в производственном процессе, а также многими стандартными диагностическими функциями - и все это через надежное и быстрое соединение (до 12 Мегабит в секунду). Циклический сбор и подготовка, а также надежная оценка данных по измерению через интерфейс оказывает значительный эффект на качество контроля. Связь «Zumbach» через индустриальную коммутационную сеть не только значительно улучшает рабочий процесс между отдельными производственными модулями, но для этого также необходимо небольшое количество аппаратуры (одно инжиниринговое средство для всех устройств), снижающее инвестиции и стоимость обслуживания. Благодаря топологии шины сенсоры могут соединяться и разъединяться в процессе функционирования.



▲ Отбор приборов с интерфейсом Profibus/Profinet

Практически все оборудование «Zumbach» доступно для использования с индустриальной коммутационной сетью, которая подключается напрямую или через интерфейс Profibus.

При использовании интеллектуального протокола функциональность каждого сенсора полностью поддерживается, начиная от инициализации и вплоть до действительного обмена данными.

Например, прошивка Profibus была адаптирована и файл разрешения значительно улучшился. Сейчас она обеспечивает более легкую, быструю и экономичную установку:

- Легкая установка путем перетаскивания: установите версию языка на каждом устройстве файла разрешения (DE, FR, EN), затем перетащите устройство «Zumbach» в интерфейс пользователя заказчика.

- Показатель действительной величины: операционная готовность с двумя входами благодаря параметрам для каждого устройства, очень легко добавить измеряемое количество/модули.

Profinet IO - следующее поколение после Profibus DP - создан для обмена данными между периферийными устройствами на основе Ethernet. Открытый промышленный стандарт Ethernet отвечает растущим требованиям надежности автоматизации и стабильности с оптимальной гибкостью, эффективностью и функциональностью. «Zumbach» разработал новый GSDML файл для Profinet, который делает функционирование Profibus и Profinet легким и практически аналогичным.

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

Хет-трик аккредитации «Tekmar»

Компания «Tekmar», поставщик подводной кабельной защиты получила аккредитацию OHSAS 18001, повысив свою превосходную репутацию в сфере охраны труда и безопасности. Это третий стандарт, полученный компанией за последние месяцы, после обновления стандартов ISO 9001 по контролю качества и ISO 14001 по рациональному природопользованию. OHSAS 18001 – это международно-признанный сертификат по методу оценки и проверки гигиены труда и системы контроля над безопасностью. «Tekmar» – разработчик и производитель системы кабельной защиты Teklink, используемой для защиты кабелей питания в сложной, динамичной подводной среде.

«Tekmar Energy» – Великобритания Вебсайт: www.tekmar.co.uk

Неиспользованная установка для эксплуатации

«Mathiasen Machinery Inc» получили эксклюзивный контракт на продажу прокатного стана с пятью клетями и двух комплектов систем фильтрации RESY®. Оборудование было выпущено в 2009 году, но никогда не устанавливалось, и все еще находится в первоначальных упаковочных ящиках.

Прокатный стан рассчитан на производство поперечного сечения от 2-х мм до 125-мм с годовой производительностью 15,000 тонн.

«Mathiasen Machinery» – США
Вебсайт: www.mathiasen-machinery.com

Преимущества стандартов для проволочной и кабельной продукции

Лоуренс Б. Инграм, «Alcan Cable», «General Cable company»

Аннотация

Стандарты обладают существенным влиянием на рыночную нишу. Данные преимущества получены поставщиками, производителями и клиентами в результате должного кабельного проектирования, отвечающего высоким стандартам. Недостаточное участие в разработке стандартов компанией ставит ее в негодное положение по отношению к конкурентам. В данной работе освещена основа и польза, выявленные путем участия в разработке стандартов. Стандарты облегчают принятие решения по разработке новой продукции. Они приносят выгоду и пользу вам и вашей компании. Они предоставляют ориентиры для новой продукции. К примеру, они могут определять значение температуры, характеристики пожарной опасности, сопротивление токопроводящей жилы и изоляционное сопротивление, физические и химические параметры кабельной продукции. Стандарты дают возможность специалистам торговли и маркетинга решить, следует ли разрабатывать продукцию, которая ограничена по производительности, или ту, которая отвечает более строгим критериям качества. Важную роль в этом процессе играет участие производителей, поставщиков и организаций-разработчиков стандартов. Установлены преимущества участия в разработке стандартов. Ключевые слова: кабель; пламя; изоляционное сопротивление; безопасность; дым; стандарты; проволока.

1 Введение

Стандарты проволочной и кабельной промышленности неразрывно связаны. Пожары, возникающие при возгорании электросистемы, унесли тысячи жизней

за последние 100 лет. Так, к примеру, в 2009 жертвами 65800 пожаров, возникших от возгорания в домах электропроводки, стали 802 человека, 2500 пострадали, и был нанесен ущерб имуществу на сумму 2,53 миллиарда долларов. Пожар вызывает отказ или нарушение системы электроснабжения, а также повреждение электrorаспределительного и осветительного оборудования в домах. Удивительным является тот факт, что число пожаров при электровозгораниях было примерно на треть меньше с 1980 по 1998 годы согласно отчету, опубликованному в январе этого года. Отчасти по этой причине Национальные электротехнические нормы и правила («NEC») и органы стандартизации составили и переработали многие кабельные и проволочные стандарты, по которым в настоящее время производятся кабели. Вот почему вам и вашим предприятиям следует вступить в такие организации, как «Американское общество по материалам и их испытаниям» («ASTM International») и через ваши организации влиять на ужесточение и улучшение стандартов, которые способствуют данному развитию.

2 Основа стандартов

Стандарты имеют три основные задачи. 1 – Они должны действовать эффективно, 2 – Они должны удовлетворять законным целям, 3 – Они должны быть релевантны. Стандарты обеспечивают изготовление безопасной продукции. Продукция является безопасной и приносит выгоду людям по всему миру. Добровольно согласованные стандарты легли в основу Северной Америки и глобальной экономики. Они являются четырьмя структурными составляющими инноваций и конкурентоспособности ⁽²⁾. Всемирная

торговая организация (ВТО) признает, что международные стандарты имеют закономерное и значительное влияние на эффективность промышленного производства и расширение мировой торговли. Стандарты существенно укрепляют сферу мировой экономики и обеспечивают стабильность и конкурентоспособность продукции по всему миру. Стандарты, разработанные «Американским обществом по материалам и их испытаниям» и компанией «Underwriters Laboratories (UL)» повсеместно признаны. Более 150 стран подписали соглашение о технических барьерах в торговле, обязывающее их принять участие в разработке международных стандартов посредством Международной организации стандартизации и Международной электротехнической комиссии. К сожалению, четко согласованные стандарты не всегда являются результатом на практике.

Международная электротехническая комиссия пытается найти решение. Согласно ВТО «международные стандарты не должны отдавать предпочтение параметрам или требованиям конкретных стран или регионов, когда различные потребности и интересы существуют в других странах и регионах». Технические комитеты занимаются разработкой стандартов. Они должны признать, что стандарт международной электротехнической комиссии МЭК требует международного решения, чтобы разработанный стандарт отражал потребности международного рынка. Неспособность достичь всеобщего согласия только укрепляет рыночные преграды и препятствует развитию истинно международного рынка ⁽³⁾. Некоторые северо-американские предложения МЭК были отклонены и не осуществлены, не смотря на то, что миллиарды блоков используются

по всему миру ⁽³⁾. Реализация одного решения посредством Международной организации по стандартизации/МЭК не может потребовать от международного рынка создать ограничивающий стандарт, где два или более надежных подхода приведут к одному результату. Данный результат направлен против конкуренции и ведет к входным барьерам в определенном рынке. Ваше участие в Американском обществе по испытанию материалов или других мероприятиях по разработке стандартов может укрепить и улучшить данные структурные элементы инновации и конкурентоспособности.

2.1 Цель стандартов: Безопасность

2.1.1 Уменьшить вероятность подобных заголовков: Пожар в чикагском театре «Ирокез» – 30 декабря 1903⁽⁴⁾

Погибли по меньшей мере 605 человек. Причина пожара – замыкание дуговой лампы привело к возгоранию занавеса, и пламя быстро разгорелось от деревянных декораций на сцене. Нарушения: пожарные выходы были не до конца оснащены, не было огнетушителей, разбрызгивателей, сигнализации, телефонов, гидрантов, выходы были заблокированы. Количество зрителей превысило 2000, и здание было переполнено.

Данная трагедия стала толчком к созданию более четких пожарных норм и стандартов. Некоторые результаты и улучшения: Данная трагедия привела к появлению аварийной штанги, поднятию и понижению металлического листового экрана между публикой и сценой (не принято в международных нормах и стандартах), а также обязательному открытию дверей в направлении «от себя» во всех общественных зданиях. Но кабельные и проволочные стандарты не были применены до конца века. Стандарты утверждают минимальные характеристики, необходимые для безопасности и эксплуатации. Каждые три года Национальные электротехнические нормы и правила были существенно изменены для соответствия технологиям и дальнейшего повышения класса защиты от пожаров при электротехнических возгораниях и опасностях поражения током. Отсутствие стандартов или плохо составленные стандарты значительно уменьшили бы качество жизни на земле. Жесткие стандарты служат барьером для низкокачественной продукции. Стандарты должны приносить пользу, быть эффективными и не становятся барьером для свободной торговли. Вы можете внести свой вклад в данный процесс.

2.1.2 Значение разработки стандартов:

Стандарты разрабатываются по согласованию, основанному на сведениях об интересах различных сторон. Производители, пользователи, компании, проводящие испытания и заказчики приносят свое видение стандартов в процессе их разработки. Данный процесс добавляет значимость, так как только при этом можно получить эффективные, актуальные и заслуживающие доверия стандарты, основанные на взаимодействии разработчиков. Технологические достижения влияют на стандарты. Они формируют кабельные и проволочные технологические изменения. Это делает наш общий вклад – производителей и пользователей – существенно важным для четких стандартов, которые приносят пользу и выгоду. Кабельная и проволочная продукция отвечает электрическим испытаниям, механическим и химическим характеристикам эксплуатации для ряда номинальных температур. Разработка стандартов включает определение рабочих характеристик и информацию для разрешения безопасной эксплуатации при установке, испытаниях или использовании кабельной и проволочной продукции. Ожидаемый

срок эксплуатации у такой продукции должен составлять 30 лет или более.

«Американское общество по испытанию материалов» цитировали на президентской конференции по предотвращению пожаров в 1947 году ⁽⁶⁾ по вопросу признания того, что технические характеристики, а не материал должны решать вопросы безопасности в будущем. Технические характеристики позволяют поднять стандарты безопасности на другой уровень при разработке материалов.

2.1.3 Преимущества разработки стандартов:

а. Безопасность – «NEC» и «ASTM» помимо прочего предоставляют практическое руководство, помогающее защищать сотрудников и общественность от опасности при установке, эксплуатации и ремонте линий коммуникации и электропередач и соответствующего оборудования.

«NEC» охватывает широкий диапазон электротехнических приборов, включая аккумуляторы, трансформеры, проводники, распределительную аппаратуру, предохранители, зазоры, кабельные окончания, предупредительные знаки

▼ **Таблица 1.** Стандартные примеры испытаний задымленности и возгорания проволоки и кабеля по стандартам ASTM и UL ⁽⁷⁾

Испытание	Типовые испытания	Комментарий
D1929 ⁽¹⁷⁾	Температура возгорания	Измеряет температуру возгорания пластика
D2863 ⁽¹⁸⁾	Кислородный индекс	Процент кислорода, необходимый для поддержания пламени
D3801 ⁽¹⁹⁾	Тушение	Вертикальное пламя, характеристики тушения
D3874 ⁽²⁰⁾	Возгорание	Возгорание при наличии источника высокого напряжения
D5824 ⁽²¹⁾	Дым	Вертикальный кабельный лоток для измерения дыма
D5485 ⁽²²⁾	Коррозия	Испытание коррозии при помощи конического калориметра
D5537 ⁽²³⁾	Горючая нагрузка	Распространение тепла, распространение пламени, потеря массы
E 662 ⁽²⁴⁾	Распространение дыма	Объем дыма
UL 1685 ⁽²⁵⁾	Кабельный вертикальный короб	Распространение огня в вертикальном коробе, распространение дыма
UL 2196 ⁽²⁶⁾	Огнеупорный кабель	Испытания огнеупорного кабеля (огневая преграда)

безопасности и защитную одежду для рабочих, устанавливающих электрооборудование.

Для обеспечения электробезопасности были разработаны методы определения уровня изоляционного сопротивления к передаче электрической энергии через различные основы⁽⁷⁾. Одно из измерений согласно «ASTM D149» - вольт на одну тысячную дюйма⁽⁸⁾. Данный метод измеряет напряжение пробоя изоляции и диэлектрическую прочность изоляции. Для хорошего изоляционного материала показатель должен быть высоким. Другой показатель – это измерение диэлектрической константы или тангенс угла диэлектрических потерь, определенный путем вытеснения жидкости согласно ASTM D1531⁽⁹⁾. Электрическое сопротивление к полке при утолщении в изоляции измеряется согласно ASTM D3756⁽¹⁰⁾. Для хорошего изоляционного материала показатель должен быть низким. ASTM D4872⁽¹¹⁾ – это метод испытаний для диэлектрических испытаний кабельных и проволочных наполнителей. Испытание на наклонной плоскости и испытание эрозии, ASTM D2303⁽¹²⁾, или испытания пыли и тумана и испытание на устойчивость к эрозии, ASTM D2132⁽¹³⁾ оценивает трекинговость на загрязненной поверхности изоляционного материала.

б. Физические параметры и химическая стойкость – предел прочности, влияние на вытяжение при низкой и комнатной температурах, сопротивление сжатию и, кроме того, масло, бензин и озоностойкость могут быть измерены для рабочей среды. Примеры технических стандартов эксплуатации, которые содержат данные технические характеристики - ASTM D470⁽¹⁴⁾, UL 44⁽¹⁵⁾ и UL 83⁽¹⁶⁾.

в. Показатели задымленности и воспламенения – различные уровни достигаются в зависимости от требуемого уровня безопасности. Для кабелей UL 44 содержит FT1 – капельные частички, FT2 – горизонтальный и FT4 испытание воспламенения на вертикальном подносе. Дополнительные примеры испытаний водной подушки и испытание на способность к дымообразованию показаны в Таблице 1 ниже.

Стали развиваться эксплуатационные характеристики пожарной безопасности продукции электрического кабеля. Пожарная безопасность частично основана на контроле возгорания, объеме тепла на выходе и распространении пламени или дыма во время пожара. Данные показатели являются критическими и оцениваются, к примеру, в UL 1685⁽²⁵⁾, а также ASTM D5537⁽²³⁾. Объем выделяемого тепла

определяет, как быстро может распространяться пожар. Больше и более интенсивное выделение тепла преодолевает некоторые устойчивые к пламени компоненты. Большой объем выделяемого тепла создает сложное препятствие для пожарных, которые приезжают на место происшествия. Контроль выпускаемого объема и интенсивности тепла и дыма предоставит больше времени людям, оставшимся в помещении для безопасного выхода, и ущерб имуществу будет менее значительным.

Уровень задымленности может уменьшить видимость и стать преградой для выхода из помещения, в котором произошло возгорание. С помощью таких стандартов, как UL1685⁽²⁵⁾, ASTM E662⁽²⁴⁾ можно измерить уровень задымленности, а матирование дымом измеряется в ASTM D5424⁽²¹⁾. Стандарт ASTM D5485⁽²²⁾, впервые составленный в 1994 году. Потери в электросистемах могут включать сигнализации и другие аварийные системы зданий. Данные исправленные и обновленные стандарты отражают эволюцию на пути к пожарной безопасности.

d. Температурная рабочая характеристика – 75 или 90.С диапазон определяет рабочие характеристики кабеля для способности переносить перегрузку, или, к примеру, рабочие температуры.

2.1.4 Безопасность электрических печей⁽²⁷⁾

Отчет, составленный комитетом по пожарной безопасности в США, выявил проблему: обычно в течение года проблемы с электричеством в домах являются причиной 26100 пожаров и ущерба, нанесенного имуществу более чем на 2 миллиарда долларов. Около половины всех пожаров по причине электровозгорания среди местных жителей происходят из-за электропроводки. По статистике, декабрь и январь – самые опасные месяцы для таких пожаров. Число смертей по причине пожара достигает максимума в зимние месяцы, когда растет время нахождения в помещении, увеличивается освещение, отопление и использование электроприборов. Спальная комната лидирует среди мест возникновения возгорания в жилых помещениях при пожарах. Однако, пожары, начавшиеся в жилой комнате/гостиной/комнате из-за возгорания электропроводки, уносят больше жертв. Причины пожаров при возгорании электропроводки: большинство таких пожаров происходят из-за проблем с «исправленной электропроводкой», например неисправными розетками

и старой проводкой. Проблемы со шнурами электроприборов (такими, как удлинители и установочный шнур) могут также стать причиной пожара в жилом помещении. Светильники и лампы/лампы накаливания могут быть неправильно подключены к электропроводке. Многие пожары, которые можно было бы предотвратить, случаются по причине возгорания электропроводки. Сюда относится перегруженная цепь, ненадлежащая эксплуатация, проводка, проходящая под ковром или в месте, где часто ходят.

2.1.5 Маркетинговые соображения

Стандарты необходимы для успеха в бизнесе. Наличие специалистов, являющихся экспертами в сфере стандартов, имеет существенное значение для вашей организации. Многие кабельные предприятия являются международными. Тем не менее, компании нуждаются в экспертах по стандартам, которым хорошо знакомы несколько национальных стандартов. Новые материалы должны отвечать тем же рабочим характеристикам, что и уже имеющиеся материалы и иметь температурный диапазон, основанный на стандартном протоколе эксплуатации, например, на относительном тепловом индексе. Выпущенный стандарт создает уровень эксплуатации и равные условия для производителей. Это позволяет компаниям вкладывать инвестиции в ресурсы по разработке продукции⁽²⁸⁾.

3 Организации, занимающиеся разработкой стандартов

- «ASTM International» разрабатывает как методы испытания стандартов, так и стандарты продукции
- «UL» и «CSA» отвечают за национальные электрические стандарты в США и Канаде соответственно
- «Insulated Conductor Engineers Association» («Ассоциация инженеров по изолированным проводникам»)
- «ISO» и «IEC», упоминавшиеся ранее
- К другим международным организациям относятся «GB/T» (Китай), «NOM» (Мексика), «BS» (Великобритания)

«ASTM International» является всемирно признанным лидером в области разработки и создания международных добровольных согласованных стандартов⁽²⁹⁾. Сегодня, около 12000 ASTM стандартов используются во всем мире для улучшения качества

продукции, повышения безопасности, облегчения доступа на рынки и торговли, и завоевания доверия потребителей. Лидирующая позиция «ASTM» в разработке международных стандартов обеспечивается за счет взносов его членом, которые включают в себя более 30000 из лучших технических специалистов в мире и бизнес-профессионалов, представляющих 135 стран мира. Работая в открытом и прозрачном процессе и используя передовую электронную инфраструктуру, члены «ASTM» создают методы испытаний, технические условия, руководства и практики, которые снабжают промышленность и продукцию во всем мире. «UL» и «Канадская ассоциация стандартов» («CSA») берут на себя разработку стандартов безопасности ⁽⁷⁾ в Соединенных Штатах и Канаде, соответственно.

Эти две организации вносят значительный вклад в национальные электрические стандарты своей страны. В Соединенных Штатах, «Национальная Ассоциация по защите от пожаров» («NFPA») выпускает национальные электрические стандарты. Поставщики материалов и производители кабеля могут предлагать «UL» и «CSA» внести изменения в стандарты и впоследствии добиться изменений в национальных электрических стандартах. Это происходит после демонстрации, которая выявляет, что новые материалы или кабельная продукция отвечают самым строгим и требовательным рабочим характеристикам. Для Северной Америки, «UL» и «CSA» играют значительную роль в обеспечении безопасности продукции, которая отвечает ожидаемым эксплуатационным характеристикам.

Стандарты «IEC» кабельной и проволочной продукции являются согласованными и международными. Процесс согласования является сложным, поскольку каждая страна имеет возможность оставлять свой комментарий и голосовать за технические преимущества разрабатываемого или согласуемого стандарта. Международная организация стандартизации («ISO») разрабатывает стандарты для всего мира, так что продукты, такие как автомобили или электротехнические изделия, которые производятся на нескольких континентах, разрабатываются и производятся по единым стандартам. Ваш вклад необходим для сотрудничества кабельных производителей, поставщиков и других специалистов с организациями по разработке стандартов для создания новых стандартов, обновления стандартов в соответствии с развивающимися

технологиями, и пересмотра существующих стандартов, для гарантии сохранения их актуальности и значимости.

Всегда существует необходимость разрабатывать стандарты для более быстро развивающихся технологий материалов, опытно-конструкторские работы по которым постоянно продолжают. Этими усилиями людей требуется обеспечить самые высокие стандарты качества для удовлетворения электрической, пожарной безопасности и рабочих характеристик. Это придает вашему участию решающее значение для процесса.

3.1 Почему необходимо помогать в разработке согласованных стандартов?

- а. Работа над развитием стандартов помогает людям видеть перспективу другой компании.
- б. Работа над стандартами помогает человеку понять причину испытаний или стандартов продукции.
- в. Полученное понимание позволяет вашей компании разработать постоянство и повторяемость испытаний и отчетности,
- г. Ваша компания приносит своим опытом вклад в разработку стандартов. Наличие экспертов по стандартам в вашей организации имеет решающее значение для дальнейшего успеха.
- д. Крайне важно иметь преемственность кадров. Когда эксперт сегодняшней уходит на пенсию, следующий назначенный может беспрепятственно вести компанию вперед. Новое участие и его расширение является необходимым.
- е. Ваше участие идет на пользу отрасли, способствует развитию конкуренции и стимулирует мировую торговлю
- ж. В настоящее время поддержка в отрасли разработки стандартов сокращается.

Вывод, который можно извлечь из всего вышесказанного: стандарты имеют решающее значение для будущего вашего бизнеса. Вы должны обратиться в управление вашей компании и рассмотреть пользу и выгоду, получаемые от участия в работе организаций по стандартизации.

3.2 Преимущества членства в техническом комитете ⁽²⁹⁾

3.2.1 Преимущества работодателя:

- Способность влиять на содержание норм и стандартов
- Вклад в повышение безопасности и производительности продукции

- Осведомленность о новых пересмотренных требованиях

3.2.2 Личные преимущества:

Профессиональный рост, работа в команде, признание

3.2.3 Небольшое представительство производителей:

Более половины членом, участвующих в комитетах «ASTM» по разработке технических стандартов, работают на предприятиях с 500 или менее сотрудников.

3.3 Возможности разработки стандартов

3.3.1 Интеллектуальные сети электропередачи, фотогальванические сети и другие типы подключения к электросистеме

3.3.2 Стандарты микросетей – автономные сети, используемые в военной сфере, медицине, университетах и т.д

3.3.3 Определение тепловой энергии и экономии за счет сокращения использования топлива на основе углерода ⁽²⁸⁾

3.3.4 Современные стандарты являются нормативными ⁽⁷⁾

Стандарты должны быть основаны на рабочих характеристиках. Новые материалы могут улучшить производительность с более высоким В / мил, улучшить сопротивление, и тем не менее, проволочные и кабельные стандарты остаются запертыми в искусственных рамках 1960-х годов на основе более ранних технологий. Компания «General Electric» когда имела слоган: «Прогресс – наш самый важный продукт». Новые материалы могут обеспечить лучшую кабельно-проводниковую продукцию. Преимущества, обеспечиваемые стандартами, являются высокими. Эта польза должна быть повышена за счет признания динамических изменений, происходящих в проволочной и кабельной продукции, и движения в сторону развития производительности на основе стандартов.

4 Выводы

4.1 Всем нам нужно работать в направлении сохранения и улучшения стандартов

4.2 Очень важно, чтобы вы и ваша организация принимали участие в развитии и поддержании инициативы по разработке стандартов.

4.3 Необходимо провести работу в области проблем интеллектуальных сетей, эффективности использования энергии и нанотехнологий, развивающихся областей кабельной продукции.

4.4 Стандарты должны продолжать приносить пользу и выгоду пользователям продукции.

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- [20] ASTM D3874 Standard Test Method for Ignition of Materials by Hot Wire Sources/ASTM D3874 Стандартный метод испытания возгорания материалов путем применения нитей накала
- [21] ASTM D5424 Standard Test Method for Smoke Obscuration of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration/ASTM D5424 Стандартный метод испытания матирования дымом изоляционных материалов, находящихся в электрических или оптоволоконных кабелях при горении в вертикально расположенном кабельном лотке
- [22] ASTM D5485 Standard Test Method for Determining the Corrosive Effect of Combustion Products Using the Cone Corrosimeter/ASTM D5485 Стандартный метод испытания для определения коррозионного эффекта продуктов сгорания при использовании конического коррозиметра
- [23] ASTM D5537 Standard Test Method for Heat Release, Flame Spread, Smoke Obscuration, and Mass Loss Testing of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration/ASTM D5537 Стандартный метод испытания выделения тепла, распространения пламени, матирования дымом и испытания потери массы изоляционных материалов, находящихся в электрических или оптоволоконных кабелях при горении в

- [24] ASTM E662 Test Method for Specific Optical Density of Smoke Generated by Solid Materials/ASTM E662 Стандартный метод испытания специфической оптоволоконной плотности дыма, выделяемого твердыми материалами
- [25] UL 1685 Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables/UL 1685 Испытания распространения огня и дымоудаления в вертикальном лотке электрических и оптоволоконных кабелей
- [26] UL 2196 Tests for Fire Resistant Cables/UL 2196 Испытания огнестойких кабелей
- [27] www.usfa.fema.gov/citizens/home_fire_prev/electrical.sht
- [28] Adele Bassett, Consensus Building, Standardization News, May/June 2012, pg 26-29./ Адель Бассетт «Достижение компромисса», новости стандартизации, май/июнь 2012
- [29] www.ASTM.org Website

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Revêtement d'aluminium sans jonctions pour câbles haute tension

AVEC six lignes actuellement en production, le processus SheathEx™ de BWE est en voie de devenir la nouvelle alternative en matière de revêtement des câbles haute tension avec un habillage en aluminium sans jonctions. Durant le deuxième trimestre de cette année, BWE installera et mettra en service en Europe une ligne additionnelle.

Le processus SheathEx représente une extension de sa technologie d'extrusion testée en permanence Conform™ et Conklad™. La machine SheathEx est conçue pour l'extrusion de tubes de longueur illimitée et sans jonctions à partir de deux barres de diamètre de 12mm autour du câble à haute tension.

BWE a collaboré avec des producteurs chinois de câble électriques haute tension pour développer les spécifications du produit et du processus de cette technologie inédite et unique.

La machine SheathEx est caractérisée par une tête transversale incorporée de grandes dimensions sur laquelle sont installées deux matrices de grand diamètre pour extruder le revêtement des câbles. Le revêtement d'aluminium ne présente aucune jonction, ni ligne,



▲ Ligne de production SheathEx de BWE

ni cordon de soudage. La modalité d'usinage à double rainure garantit la concentricité du revêtement d'aluminium.

Le système de chauffage à induction breveté de BWE permet de distribuer la température de façon extrêmement uniforme autour des équipements, en déterminant ainsi des conditions d'exploitation très stables et des propriétés uniformes dans le tube d'aluminium.

La matière première utilisée dans le processus est une barre d'aluminium CCR standard, facilement disponible et économique par rapport aux autres matériaux (tels que les tôles d'aluminium

plates utilisées dans les lignes de soudage).

Le noyau du câble passe à travers la tête transversale de façon continue. Au moment de son entrée dans la tête transversale, le noyau du câble est protégé par un tube d'introduction refroidi qui refroidit rapidement le tube d'aluminium immédiatement après la matrice en évitant ainsi des dommages thermiques éventuels au noyau.

En aval de la machine SheathEx, le revêtement du câble est ondulé en ligne et il est enroulé sur des dévidoirs de grandes dimensions. Le processus SheathEx est une méthode continue (sans marques d'arrêt), fiable (sans soudures) et économique (emploi de matériaux économiques, à basse énergie, etc) pour revêtir les câbles haute tension.

SheathEx, Conform et Conklad sont des marques déposées de BWE Ltd. Le processus SheathEx, le système d'usinage SheathEx, la disposition des machines, la méthode de contrôle et la technologie de chauffage à induction ont été enregistrés avec des brevets internationaux.

BWE Ltd – Royaume-Uni
Website: www.bwe.co.uk

Un parc zoologique français produira sa propre électricité

Le ZooParc français de Beauval va construire une nouvelle unité pour la conversion des déchets en électricité.

La mise en service de l'usine, dont la valeur s'élève à 3 millions de dollars américains, est prévue pour le printemps prochain. L'installation produira de l'électricité au moyen de la combustion de biogaz dérivés des excréments des animaux et d'autres déchets organiques.

Dans ce but, la majorité des animaux du parc zoologique apporteront leur contribution, parmi lesquels les pandas géants qui produisent à eux seuls plus de 65 livres de matériau combustible par jour!

Le parc zoologique de Beauval estime



▲ Les pandas géants contribueront à la production de l'énergie électrique dans les parcs zoologiques. Photographie imprimée avec l'autorisation de www.zoobeauval.com

que l'installation permettra de réduire les coûts de l'énergie d'environ 40%. L'électricité inutilisée sera vendue à des entreprises d'énergie électrique de la région pour augmenter les rendements.

"Cette initiative s'inscrit parfaitement dans le cadre de notre politique de développement soutenable que nous étions en train de développer depuis de nombreuses années", a déclaré la porte-parole Delphine Delord au nouveau portail de news françaises "The Local".

Les systèmes pour produire du biogaz à partir des déchets organiques ont gagné du terrain comme alternative énergétique renouvelable aux États-Unis et en Europe et peuvent être particulièrement précieux pour les pays en voie de développement pour lesquels, au contraire, l'électricité fiable pourrait être autrement impossible.

Zoo Beauval – France
Website: www.zoobeauval.com

Interfaces de communication intelligentes

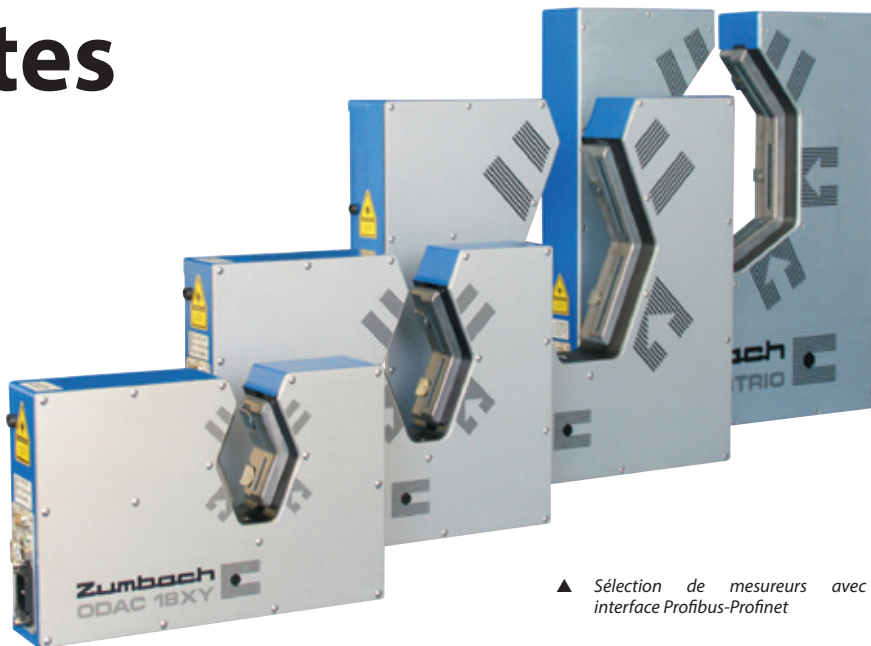
LES normes concernant les bus de terrain industriels Profibus DP et Profinet IO ont été utilisées avec succès pour la communication entre les dispositifs de divers fabricants dans les lignes de production automatisées.

La modernisation de son interface Profibus DP permet à Zumbach d'atteindre un nouveau niveau d'utilisabilité de ses dispositifs. En outre, Ethernet Industrial Profinet IO est actuellement disponible pour toute la gamme de dispositifs Zumbach.

Dans la production industrielle, de nombreux systèmes d'automatisation, de conception et d'affichage sont connectés à un bus. L'interface Profibus permet d'effectuer un contrôle centralisé des dispositifs concernés par le processus de production ainsi que de nombreuses fonctions de diagnostic standard, et ce, au moyen d'une connexion rapide et sûre (jusqu'à 12Mbps).

La préparation et la collecte cycliques, associées à une évaluation fiable des mesures au moyen de l'interface, influencent de façon significative la qualité du contrôle. La communication de Zumbach au moyen du Profibus DP non seulement améliore considérablement le flux de travail entre les unités de production individuelles, mais exige également un matériel réduit (un seul outil d'ingénierie pour la totalité des dispositifs), en contenant ainsi les coûts d'investissement des services.

Grâce à la topologie du bus, les capteurs peuvent être accouplés et désaccouplés durant l'exploitation. En pratique, les dispositifs Zumbach peuvent être utilisés



▲ Sélection de mesureurs avec interface Profibus-Profinet

dans des structures avec Profibus DP, directement ou au moyen d'interface Profibus. En utilisant un protocole intelligent, la fonctionnalité de chaque capteur est entièrement supportée, de l'initialisation à l'échange des données réelles.

En particulier, le micrologiciel du Profibus a été adapté et le fichier GSD a été amélioré substantiellement. Actuellement, il offre une installation plus facile, rapide et économique.

- Installation simple de la fonction "glisser-déposer": installer la version du fichier GSD dans la langue d'utilisation du dispositif, (allemand, français, anglais); ensuite glisser le dispositif Zumbach jusqu'à l'interface de l'utilisateur du client.
- Acquisition de la valeur actuelle:

disponibilité opérationnelle avec deux entrées grâce à des paramètres spécifiques du dispositif, il est très facile d'ajouter des modules/quantités mesurées.

Profinet IO, successeur du Profibus DP, est conçu pour l'échange de données entre les dispositifs de champ basés sur Ethernet.

Le standard industriel Ethernet ouvert répond à la demande croissante de fiabilité et de soutenabilité de l'automatisation avec flexibilité, efficacité et des performances excellentes.

Zumbach a développé un nouveau fichier GSDML pour Profinet. Cela rend l'application de Profibus et Profinet facile et pratiquement identique.

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

Installation restée inutilisée

La société Mathiasen Machinery Inc s'est adjugée un contrat exclusif pour la vente d'une installation à 5 cages Redex de 2009 et deux systèmes de filtrage RESY® compacts. L'équipement a été réalisé en 2009, mais il n'a jamais été installé et il est encore dans les caisses de transport originelles.

"C'est là une grande opportunité pour un fabricant d'économiser du temps et de l'argent et d'augmenter sa capacité productive. Cet équipement de haute qualité est prêt pour la livraison", a déclaré Mike Mathiasen, copropriétaire de Mathiasen Machinery Inc.

L'installation de laminage a été projetée pour produire des sections transversales de 2mm² à 125mm² avec une capacité productive de 15 000 tonnes par an.

Mathiasen Machinery – États-Unis
Website: www.mathiasen-machinery.com

Pentre Group renforce sa position

Pentre Group a racheté la société Farres après une association durée 20 ans.

Le groupe qui a également incorporé Hearl Heaton, célèbre aujourd'hui 25 ans d'activités dans le secteur international du fil et du câble et est actuellement un producteur leader européen de tous types de dévidoirs, tourets, bobines et fuseaux.

Avec quatre établissements au Royaume-Uni et un à Rakovník, en République Tchèque, pour Pentre cette acquisition est un pas important et stimulant vers la consolidation de sa position en Europe du Sud et en Afrique du Nord.

Pentre Group – Royaume-Uni
Website: www.pentregroup.com

Avantages des normes pour les produits de fil et câble

Par Lawrence B Ingram, Alcan Cable, société du groupe General Cable

Résumé

Les normes ont un impact important sur le marché. Les avantages pour les fournisseurs, les producteurs et les clients dérivant d'un câble développé de façon appropriée et conforme à des normes correctes sont nombreux. Une société est désavantagée par rapport à la concurrence si elle ne participe pas au développement des normes.

Cet article traite les aspects de base des normes et les résultats pouvant être obtenus en participant au développement des normes. Les normes contribuent à la prise des décisions pour le développement de nouveaux produits. Elles créent une valeur ajoutée qui vous permet de gagner des avantages et à votre société d'obtenir des bénéfices. Elles fournissent un paramètre de référence pour le nouveau produit.

Elles peuvent par exemple spécifier les valeurs de la température, le comportement au feu, la résistance du conducteur et de l'isolement, les propriétés physiques et chimiques du câble.

En outre, les normes offrent aux professionnels du marketing et aux vendeurs l'opportunité de décider si développer un produit ayant des capacités limitées ou un autre répondant à des exigences de performances plus rigoureuses.

La participation des fabricants, des fournisseurs et des organisations au développement des normes (*SDO - Standards Development Organizations*) représente un aspect essentiel de ce processus. Les avantages résultant de la participation au développement des normes sont indéniables. Mots-clés: câble, flamme, résistance de l'isolement, sécurité, fumée, normes, fil.

1 Introduction

L'industrie du fil et du câble est inextricablement liée aux normes. Les incendies d'origine électrique ont causé des milliers de décès inutiles au cours de ces 100 dernières années.

Par exemple, en 2009 il y a eu 802 décès de civils, 2 500 blessés et des dommages aux propriétés s'élevant à 2,53 milliards de dollars américains, à la suite de 65 800 incendies d'origine électrique dans les maisons⁽¹⁾.

Les causes des incendies étaient dues à des pannes électriques et à des fonctionnements défectueux dans les systèmes de distribution électrique ou d'éclairage domestiques. Incroyablement, le nombre d'incendies dans les installations électriques s'était effectivement réduit d'un tiers par rapport à la période de référence de 1980 à 1998 citée dans un rapport publié en janvier dernier.

En partie c'est la raison pour laquelle le Code Électrique National (NEC) et les organismes de normalisation ont publié et révisé les nombreuses normes concernant le fil et le câble sur la base desquelles aujourd'hui les câbles sont fabriqués.

C'est pourquoi vous et les opérateurs du secteur devriez adhérer à des organisations telles que ASTM International (organisme américain de normalisation) et participer à travers les organisations au développement du processus de renforcement et de perfectionnement des normes contribuant à ce progrès.

2 Fondement des normes

Les normes ont trois objectifs de base:

- 1 Fonctionner efficacement
- 2 Satisfaire à un objectif légitime
- 3 Être pertinentes

Les normes contribuent à fournir des produits sûrs. Les produits sont soutenables et apportent des avantages aux populations du monde entier. Les normes adoptées par consensus volontaire constituent le fondement de l'économie américaine, nord-américaine et globale. Ce sont les piliers fondamentaux sur lesquels reposent l'innovation et la compétitivité⁽²⁾.

L'organisation mondiale du commerce (O.M.C.) reconnaît que les normes internationales ont un impact légitime et

significatif sur l'efficacité et sur l'expansion du commerce mondial. Les normes sont essentielles pour renforcer l'économie mondiale et pour maintenir l'intégrité et la compétitivité des produits dans le monde⁽³⁾.

Les normes développées par ASTM International et Underwriters Laboratories (UL) sont largement acceptées au niveau international. Plus de 150 pays ont signé l'accord concernant les obstacles techniques au commerce (OTC) les obligeant à participer au développement de normes internationales à travers l'organisation internationale de normalisation ISO (*International Standards Organization*) et à travers la commission électrotechnique internationale IEC (*International Electrotechnical Commission*). Malheureusement, les normes fortement harmonisées n'en représentent pas toujours un résultat concret.

La Commission Électrotechnique Internationale (CEI) est en train de chercher une solution. D'après l'organisation mondiale du commerce "les normes internationales ne devraient pas privilégier les caractéristiques ou les exigences de pays ou de régions spécifiques compte tenu de la diversité des exigences et des intérêts existant entre les différents pays et les différentes régions"⁽³⁾.

Les commissions techniques développent les normes et doivent reconnaître que les normes CEI valables exigent une solution internationale sur la base de laquelle développer une norme réfléchissant les nécessités du marché global. L'absence d'un consensus réel ne fait que soutenir en fait les barrières du marché et empêcher le développement d'un marché réellement global⁽³⁾.

La réalisation de quelques propositions nord-américaines présentées à la CEI a été bloquée bien que des milliers d'unités soient installées et utilisées dans des conditions de sécurité dans le monde entier⁽³⁾. L'application d'une solution unique à travers les normes ISO/CEI ne peut pas obliger le marché global à créer une norme restrictive lorsqu'il existe deux ou plusieurs approches sûres amenant au même résultat.

Ce résultat s'avère anticoncurrentiel et amène à la création de barrières à l'entrée d'un marché spécifique. Votre participation aux activités de développement des normes de ASTM ou d'autres normes peut donc renforcer et améliorer ces piliers fondamentaux pour l'innovation et la compétitivité.

2.1 Objectif des normes: sécurité

2.1.1 Réduire la probabilité de titres tels que: Incendie au Théâtre Iroquois – 30 décembre 1903⁽⁴⁾ Au moins 605 personnes ont perdu la vie

La cause – Le court circuit d'une lampe à arc a incendié un rideau et ensuite les matériaux de la scène ont causé l'incendie d'une grande quantité de revêtements en bois.

Problèmes: les sorties de secours n'étaient pas complétées, il n'y avait pas d'extincteurs, d'appareils d'arrosage, d'alarmes, de téléphones ni de raccordement au réseau d'eau et les sorties étaient bloquées.

La capacité du théâtre était de 2 000 personnes, le nombre de personnes présentes dépassait largement ce nombre et il y avait des places debout uniquement. Cette tragédie contribua à la mise au point de codes et de normes anti-incendie meilleurs.

Quelques résultats et perfectionnements: la tragédie a amené à l'adoption de barres anti-panique, à l'installation d'écrans métalliques à soulever et à baisser entre le public et la scène (non adoptés universellement par les Codes et les Normes) et à des portes de bâtiments publics s'ouvrant en direction de la sortie.

Les normes concernant les équipements électriques et les fils et câbles ne furent appliquées que par la suite au cours du siècle. Les normes représentent un support pour les propriétés minimales requises aux fins de la sécurité et des performances.

Tous les trois ans, les normes NEC sont révisées de façon radicale pour progresser avec la technologie et améliorer davantage la protection contre les incendies d'origine électrique et les risques d'électrocution. L'absence de normes ou des normes insuffisantes réduirait considérablement la qualité de la vie dans le monde.

Les bonnes normes sont utiles comme barrière contre les produits non conformes à la norme. Les normes devraient ajouter de la valeur, être efficaces et ne pas agir en tant que barrière au libre commerce. Vous, vous pouvez contribuer à ce processus.

Essai	Essai d'essai	Essai Commentaire
D1929 ⁽¹⁷⁾	Température d'allumage	Mesures de la température d'allumage des matières plastiques
D2863 ⁽¹⁸⁾	Indice d'oxygène	Pourcentage d'oxygène pour soutenir la flamme
D3801 ⁽¹⁹⁾	Extinction	Flamme verticale, caractéristiques d'extinction
D3874 ⁽²⁰⁾	Allumage	Allumage de matériau de sources de fil chaudes
D5424 ⁽²¹⁾	Fumée	Mesure de la fumée avec plateau vertical pour câble
D5485 ⁽²²⁾	Corrosion	Essai de corrosion avec calorimètre conique
D5537 ⁽²³⁾	Charge d'incendie	Émission de chaleur, propagation de la flamme, perte de masse
E 662 ⁽²⁴⁾	Propagation de la fumée	Quantité de fumée
UL 1685 ⁽²⁵⁾	Plateau vertical pour câble	Propagation de l'incendie avec plateau vertical, émission de fumée
UL 2196 ⁽²⁶⁾	Câble ignifuge	Essais pour câble ignifuge (dispositif coupe-feu)

▲ **Tableau 1:** Exemples des normes ASTM et UL dans le cas d'essais d'inflammabilité et d'émission de fumée pour fils et câbles⁽⁷⁾

2.1.2 Valeur du développement des normes:

Les normes sont développées grâce à un consensus obtenu sur la base des contributions apportées en fonction de différents intérêts. Producteurs, utilisateurs, société d'essai et clients: tous contribuent avec leur point de vue au processus de développement des normes. Ce processus ajoute de la valeur puisqu'il développe des normes efficaces, pertinentes et vraisemblables basées sur l'intégrité des développeurs⁽⁵⁾.

Les progrès technologiques influencent les normes. Ces dernières évoluent au fur et à mesure que la technologie du fil et du câble change. Ce fait nous rend tous, en tant que producteurs et usagers, importants puisque nos contributions sont vitales pour produire de bonnes normes créant de la valeur et apportant des avantages.

Les produits de fil et câble répondent à de rigoureux critères de performance concernant les essais électriques et les propriétés physiques et chimiques pour des valeurs de température différentes.

Le développement de normes est axé sur la génération de données et d'informations concernant les performances pour consentir des pratiques sûres durant l'installation, l'essai et l'utilisation des produits de fil et câble. La durée prévue de ces produits est de 30 ans et plus.

ASTM a été citée durant la conférence concernant la prévention des incendies tenue par le Président en 1947⁽⁶⁾ pour avoir reconnu que le cours futur de la sécurité contre l'incendie doit être établi par les performances plutôt que par des matériaux spécifiques. Les performances permettent de développer de nouveaux matériaux pour amener les normes de sécurité au niveau successif.

2.1.3 Bénéfices du développement des normes:

a Sécurité – La NEC et la ASTM, parmi d'autres organismes, fournissent l'assistance pratique pour aider à protéger les employés et le public contre tous risques éventuels durant l'installation, le fonctionnement et l'entretien des équipements électriques,

des lignes de communication et des équipements correspondants. La NEC couvre un ample nombre de secteurs électrotechniques, tels qu'accumulateurs, transformateurs, conducteurs, dispositifs de commutation, interrupteurs, espace physique, terminaisons de câbles, signaux d'avertissement et équipements de protection individuelle pour les installateurs d'équipements électriques.

Des méthodes permettant de déterminer le niveau de résistance de l'isolement à la transmission d'électricité à travers plusieurs substrats ont été développées pour offrir la sécurité électrique⁽⁷⁾. Une mesure est représentée par les *volts/mils* établie par la norme ASTM D149⁽⁸⁾.

Cette méthode représente une mesure de la tension de rupture diélectrique et de la rigidité diélectrique de l'isolement. Pour un bon matériel isolant la valeur est élevée. Une autre mesure est la constante diélectrique ou le facteur de dissipation mesurée par le déplacement des fluides conformément à la norme ASTM D1531⁽⁹⁾.

La résistance électrique à la rupture au moyen de l'essai d'arborescence dans l'isolement est mesurée par la norme ASTM D3756⁽¹⁰⁾. Pour un bon matériel d'isolement la valeur est réduite. La norme ASTM D4872⁽¹¹⁾ représente une méthode d'essai pour l'essai diélectrique des composés de remplissage de fils et des câbles.

L'essai de résistance au cheminement et à l'érosion avec plan incliné conformément à la norme ASTM D2303⁽¹²⁾ ou l'essai de résistance au cheminement et à l'érosion avec poudre et brouillard conformément à la norme ASTM D2132⁽¹³⁾ évalue la résistance au cheminement de la surface contaminée d'un matériau isolant.

b Propriétés physiques et résistance chimique

– La résistance à la traction, l'élongation, l'impact à basse température et à la température ambiante, la résistance à l'écrasement, et en outre, la résistance à l'huile, à l'essence et à l'ozone peuvent être évaluées pour l'environnement opérationnel. Des exemples de normes de performances contenant ces propriétés sont ASTM D470⁽¹⁴⁾, UL 44⁽¹⁵⁾ et UL 83⁽¹⁶⁾.

c Comportement à la flamme et au feu

– Différents niveaux sont atteints en fonction du niveau de sécurité requis. En ce qui concerne le câble, la norme UL 44 comprend par exemple les

essais FT1 (égouttement particules), FT2 (essais de résistance au feu avec plateau horizontal) et FT4 (essais de résistance au feu avec plateau vertical). Des exemples supplémentaires de comportement des fils et des câbles à la flamme sont illustrés au *Tableau 1* ci-dessous.

Les performances de protection contre les incendies des câbles électriques ont subi une évolution. La protection contre les incendies est partiellement basée sur le contrôle de l'allumage, sur la vitesse de dégagement de la chaleur et sur la propagation de la flamme ou de la fumée émise au cours d'un incendie. Ces mesures sont décisives et sont évaluées, par exemple, selon les normes UL 1685⁽²⁵⁾ et ASTM D5537⁽²³⁾.

La quantité de chaleur dégagée détermine la vitesse de propagation d'un incendie. Une émission de chaleur majeure et plus rapide peut rendre vaine l'action de certains additifs résistants au feu. Le contrôle de la quantité et de l'intensité de la chaleur et de la fumée dégagée permettra aux personnes bloquées d'avoir à disposition plus de temps pour se mettre à l'abri et de réduire les dommages matériels.

La densité de la fumée peut obscurcir la vue et inhiber ou empêcher aux personnes la fuite du lieu de l'incendie. Il existe des normes conçues pour mesurer la densité de fumée comme la norme UL1685⁽²⁵⁾ et la norme ASTM E662⁽²⁴⁾, ou la norme ASTM D5424⁽²¹⁾ qui mesure l'obscurcissement par la fumée. La norme ASTM D5485⁽²²⁾, publiée la première fois en 1994, se réfère à la corrosion des systèmes électroniques résultant des dommages causés par un incendie.

La perte des systèmes électroniques peut influencer les alarmes et d'autres systèmes critiques des bâtiments. Ces normes révisées et plus modernes reflètent l'évolution vers une majeure sécurité en cas d'incendies.

d Performances de température

– Des températures de 75 ou 90°C déterminent, par exemple, des performances du câble en ce qui concerne la capacité de surcharge ou les températures d'exploitation.

2.1.4 Rapport concernant la sécurité en cas d'incendie d'origine électrique⁽²⁷⁾ publié par l'Organisme de Contrôle pour la Protection contre les incendies américain

Le problème: Durant une année typique, les problèmes aux installations

électriques domestiques s'élèvent à 26 100 incendies et à plus de 2 milliards de dollars américains de dommages matériels. Environ la moitié de la totalité des incendies d'origine électrique dans les bâtiments résidentiels concernent le câblage électrique. Statistiquement, les mois de décembre et de janvier sont les plus dangereux pour les incendies d'origine électrique. Les décès causés par les incendies sont plus élevés pendant les mois d'hiver caractérisés par plus d'activités à l'intérieur, par une majeure utilisation de l'éclairage, du chauffage et d'appareils électroménagers.

La chambre à coucher est le lieu dans lequel se déclenchent le plus souvent les incendies aux systèmes électriques dans les bâtiments résidentiels. Toutefois, les incendies de nature électrique qui sont déclenchés dans la salle à manger, le salon ou dans le bureau causent la majorité des décès.

Les causes des incendies d'origine électrique:

La majorité des incendies concernant les systèmes de distribution électrique sont dus à des problèmes avec le "câblage fixe" tel que prises électriques défectueuses et vieux câblages. Les problèmes avec les câbles (tels que les câbles rallonge ou des appareils électroménagers), les fiches électriques, les prises de courant et les interrupteurs causent également de nombreux incendies d'origine électrique dans les maisons. Même les accessoires pour l'éclairage, les lampes et les ampoules font partie des principales causes d'incendies de nature électrique.

La cause de nombreux incendies d'origine électrique évitables peut être attribuée à un mauvais emploi des câbles électriques comme par exemple les circuits surchargés, un entretien insuffisant, le passage des câbles sous les tapis ou dans des zones à trafic élevé.

2.1.5 Considérations de caractère commercial

Les normes sont nécessaires pour obtenir un résultat commercial positif. Compter parmi son personnel des experts en matière de normes est essentiel. Un grand nombre de nos entreprises spécialisées en câbles sont internationales. Par conséquent, les entreprises ont besoin d'experts en matière de normes possédant une connaissance approfondie d'un grand nombre de normes nationales.

Les nouveaux matériaux doivent satisfaire aux mêmes critères de performance que les matériaux développés et respecter les valeurs nominales de température basées sur les protocoles concernant les performances des normes comme l'indice thermique relatif.

La norme publiée crée une parité des conditions de concurrence équitables pour les producteurs. Cela permet aux entreprises d'agir en investissant dans des ressources pour le développement des produits⁽²⁸⁾.

3 Organisations de développement des normes (SDO)

- L'organisation ASTM International s'occupe du développement des méthodes d'essai normalisées et de normes de produits
- UL et CSA, s'occupent du code électrique national respectivement aux États-Unis et au Canada
- Insulated Conductor Engineers Association
- ISO et IEC, cités précédemment
- D'autres organisations internationales comme GB/T (Chine), NOM (Mexique), BS (Royaume-Uni)

ASTM International est une organisation leader reconnue à un niveau international en ce qui concerne le développement et l'émission de normes internationale basées sur le consensus volontaire⁽²⁹⁾. Actuellement, l'on utilise environ 12 000 normes ASTM de par le monde dans le but d'améliorer la qualité des produits, augmenter la sécurité, faciliter l'accès au marché et construire la fiabilité du consommateur.

Le leadership d'ASTM dans le développement de normes internationales est guidée par les contributions apportées par ses membres, qui comprennent plus de 30 000 experts et professionnels parmi les plus importants au niveau mondial et représentant 135 pays.

En travaillant avec un processus ouvert et transparent et en utilisant l'infrastructure électronique avancée de ASTM, les membres de l'organisation fournissent des méthodes d'essai, des spécifications, des guides et des pratiques soutenant les industries et les produits dans le monde entier.

UL et CSA (Canadian Standards Association) s'occupent du développement des normes de sécurité⁽⁷⁾ respectivement aux États-Unis et au Canada. Ces deux organisations contribuent de façon significative au développement du code électrique national pour leur pays. Aux États-Unis, l'association nationale de protection contre les incendies NFPA (*National Fire Protection Association*) publie le code électrique national. Les fournisseurs de matériaux et les fabricants de câbles

peuvent proposer des modifications aux normes UL et CSA et ensuite obtenir des modifications au code électrique national. Cela est possible après avoir démontré que les nouveaux matériaux ou les produits de câbles répondent aux exigences rigoureuses et strictes de capacité de performances. Pour l'Amérique du Nord, les organisations UL et CSA jouent un rôle significatif en ce qui concerne la garantie de la sécurité des produits fournissant les performances prévues.

Les normes de produits IEC pour le fil et les câbles sont harmonisées et internationales.

Les efforts d'harmonisation sont complexes, chaque pays ayant l'opportunité de commenter et de voter les mérites techniques d'une norme en cours de développement ou de révision.

L'organisation internationale de normalisation ISO (*International Standards Organization*) développe des normes globales de manière à ce que les produits tels que les voitures ou les produits électrotechniques fabriqués dans différents continents soient développés et produits selon des normes uniformes.

Vos contributions sont nécessaires de manière à ce que les produits, les fournisseurs et d'autres experts en câbles travaillent conjointement avec les organisations de développement des normes pour créer de nouvelles normes ou pour les mettre à jour en fonction de l'évolution technologique et pour réviser les normes existant déjà afin d'en garantir la pertinence et la valeur.

Il est absolument toujours nécessaire de développer le plus rapidement possible des normes devant s'adapter au progrès des matériaux constamment en évolution.

Ces efforts sont requis pour fournir des normes d'une qualité plus élevée pour satisfaire aux critères électriques, de protection contre les incendies et de performances. Votre participation au processus est donc essentielle.

3.1 Pourquoi soutenir le développement de normes basées sur le consensus?

- a Travailler sur le développement de normes aide les personnes à considérer le point de vue d'autres entreprises
- b Travailler sur les normes aide à comprendre la raison derrière un essai ou une norme relative à un produit
- c Cette compréhension permet à votre entreprise de développer la cohérence et la répétabilité des essais et des rapports

d Votre entreprise contribue avec son expérience au développement des normes. La présence d'experts dans votre entreprise est essentielle pour assurer un succès constant

e Il est essentiel d'avoir une continuité du personnel. Lorsque l'expert d'aujourd'hui démissionne, celui qui le remplacera pourra poursuivre le travail sans solution de continuité pour l'entreprise. Une nouvelle et plus ample participation est nécessaire

f Votre participation apporte des avantages à l'industrie, encourage la concurrence et stimule le commerce global

g Il y a eu une réduction du soutien au développement des normes

Le message en résultant est que les normes sont fondamentales pour le futur de votre entreprise. Vous devez solliciter la direction de votre société et communiquer la valeur et les avantages dérivant de la participation au travail d'organisation des normes

3.2 Bénéfices dérivant de l'appartenance à la commission technique⁽²⁹⁾

3.2.1 Bénéfices pour l'employeur:

- a Possibilité d'influencer le contenu des codes et des normes
- b Contribution pour améliorer la sécurité et les performances des produits
- c Connaissance précoce de nouvelles spécifications ou des spécifications révisées

3.2.2 Avantages personnels:

Développement professionnel, réseautage et reconnaissance.

3.2.3 Représentation de petits fabricants:

Plus de la moitié des membres participant aux commissions techniques de développement des normes ASTM sont employés dans des entreprises comptant environ 500 employés.

3.3 Opportunité de développement des normes

3.3.1 Connexions de réseaux intelligents, photovoltaïques, éoliennes et d'autres types

3.3.2 Les normes pour micro réseaux – indépendants comme dans le cas d'hôpitaux, applications militaires, universités, etc.....

3.3.3 Détermination de l'énergie thermique et des économies grâce à la réduction de l'utilisation de carburants à base de carbone⁽²⁸⁾

3.3.4 Les normes d'aujourd'hui sont prescriptives⁽⁷⁾

Les normes doivent être converties en normes basées sur les performances. Les nouveaux matériaux peuvent améliorer les performances avec des valeurs de V/mil plus élevées pour mieux exploiter la résistance; toutefois, les normes pour fils et câbles restent bloquées dans des contraintes artificielles basées sur la technologie des années soixante, voire même précédentes.

Une fois la société General Electric Co. a déclaré: "Le progrès est le notre produit le plus important".

Les nouveaux matériaux peuvent fournir de meilleurs produits de fil et câble. Les avantages offerts par les normes sont élevés.

Cette valeur doit être augmentée en reconnaissant les changements dynamiques qui ont lieu dans les produits de fil et câble et l'avancement vers le développement de normes basées sur les performances.

4 Conclusions

4.1 Nous devons tous travailler pour maintenir et améliorer les normes

4.2 Il est essentiel que vous et vos organisations participiez au développement et au maintien des normes solides et énergiques

4.3 Le travail nécessaire et les défis abondent dans les secteurs des réseaux intelligents, de l'efficacité énergétique, et des nanotechnologies des produits de câble en voie de développement

4.4 Les normes doivent continuer à apporter de la valeur et des avantages aux utilisateurs de produits

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- 9 ASTM D1531 Standard Test Methods for Relative Permittivity (Dielectric Constant) and Dissipation Factor by Fluid Displacement Procedures
- 10 ASTM D3756 Standard Test Method for Evaluation of Resistance to Electrical Breakdown by Treeing in Solid Dielectric Materials Using Diverging Fields
- 11 ASTM D4872 Standard Test Method for Dielectric Testing of Wire and Cable Filling Compounds
- 12 ASTM D2303 Standard Test Methods for Liquid-Contaminant, Inclined-Plane Tracking and Erosion of Insulating Materials
- 13 ASTM D2132 Standard Test Method for Dust-and-Fog Tracking and Erosion Resistance of Electrical Insulating Materials
- 14 D470 Standard Test Methods for Crosslinked Insulations and Jackets for Wire and Cable
- 15 UL 44 Thermoset-Insulated Wires and Cables
- 16 UL 83 Thermoplastic-Insulated Wires and Cables
- 17 ASTM D1929 Standard Test Method for Determining Ignition Temperature of Plastics
- 18 ASTM D2863 Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)
- 19 ASTM D3801 Standard Test Method for Measuring the Comparative Burning Characteristics of Solid Plastics in a Vertical Position
- 20 ASTM D3874 Standard Test Method for Ignition of Materials by Hot Wire Sources
- 21 ASTM D5424 Standard Test Method for Smoke Obscuration of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration
- 22 ASTM D5485 Standard Test Method for Determining the Corrosive Effect of Combustion Products Using the Cone Corrosimeter
- 23 ASTM D5537 Standard Test Method for Heat Release, Flame Spread, Smoke Obscuration, and Mass Loss Testing of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration
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5 Remerciements

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Zoo francese genererà la propria elettricità

Lo zoo francese Beauval sta progettando un nuovo impianto per la conversione dei rifiuti in elettricità.

La messa in marcia dello stabilimento, del valore di 3 milioni di dollari, è programmata per la prossima primavera. L'impianto produrrà elettricità tramite la combustione di biogas raccolto dagli escrementi di animali ed altri rifiuti organici.

A questo scopo si prevede il contributo della maggior parte degli animali dello zoo, con i panda giganti che da soli producono più di 65 libbre di materiale combustibile al giorno!

Lo zoo Beauval stima che l'impianto consentirà di ridurre i costi dell'energia di circa un 40%. L'elettricità inutilizzata

sarà venduta ad aziende di energia elettrica della regione per aumentare i rendimenti.

La portavoce dello zoo Delphine Delord ha così dichiarato al portale francese "The Local": "Questa iniziativa si accorda perfettamente con la nostra politica di sviluppo sostenibile che stavamo sviluppando da lungo tempo".

I sistemi per produrre biogas a partire da rifiuti organici hanno ricevuto un notevole impulso come alternativa energetica rinnovabile in tutti gli Stati Uniti e in Europa e possono essere particolarmente preziosi nei paesi in via di sviluppo dove, al contrario,



▲ I panda giganti contribuiranno alla produzione di energia elettrica dello zoo. Fotografia pubblicata con la cortese autorizzazione di www.zoobeauval.com

potrebbe essere impossibile disporre di elettricità affidabile.

Zoo Beauval - Francia
Website: www.zoobeauval.com

Rivestimento di alluminio senza giunzioni per cavi di alta tensione

CON sei linee attualmente in produzione, il processo SheathEx™ di BWE si sta rivelando la nuova alternativa per rivestire cavi di alta tensione con un rivestimento di alluminio senza giunzioni.

Durante il secondo trimestre di quest'anno, BWE installerà e metterà in servizio in Europa una linea aggiuntiva.

Il processo SheathEx rappresenta un ampliamento della sua collaudata tecnologia di estrusione in continuo Conform™ e Conklad™.

La macchina SheathEx è progettata per l'estrusione di tubi di lunghezza illimitata e senza giunzioni a partire da due barre del diametro di 12mm attorno ad un nucleo di cavo di alta tensione.

BWE ha collaborato con produttori cinesi di cavi elettrici di alta tensione per sviluppare le specifiche del prodotto e del processo di questa nuova e unica tecnologia.

La macchina SheathEx presenta una testa trasversale incorporata di grandi dimensioni sulla quale vengono installate le matrici di grande diametro



▲ Linea di produzione SheathEx di BWE

per estrudere il rivestimento dei cavi. Il rivestimento di alluminio non presenta giunzioni, linee di saldatura né cordoni. La modalità di processo a doppia scanalatura garantisce la concentricità del rivestimento di alluminio.

Il sistema di riscaldamento a induzione brevettato di BWE consente di distribuire la temperatura in modo estremamente uniforme attorno agli attrezzi, conferendo così un'elevata stabilità al processo e proprietà uniformi al tubo di alluminio.

Il materiale grezzo utilizzato nel processo è una barra di alluminio CCR standard, facilmente reperibile ed economica rispetto ad altri materiali (come le lamine

piane di alluminio utilizzate nelle linee di saldatura).

Il nucleo del cavo attraversa la testa trasversale in modo continuo. Al suo ingresso nella testa trasversale il nucleo del cavo è protetto da un tubo di introduzione refrigerato che raffredda rapidamente il tubo di alluminio immediatamente dopo la matrice evitando possibili danni termici al nucleo.

A valle della macchina SheathEx, il rivestimento del cavo è corrugato in linea e avvolto su tamburi di grandi dimensioni.

Il processo SheathEx è un metodo continuo (senza segni di arresto), affidabile (senza saldature) ed economico (impiego di materiali economici, a bassa energia, ecc.) per rivestire cavi di alta tensione.

SheathEx, Conform e Conklad sono marchi registrati di BWE Ltd. Il processo SheathEx, il sistema di attrezzaggio SheathEx, la disposizione delle macchine, il metodo di controllo e la tecnologia di riscaldamento a induzione sono stati registrati con brevetti internazionali.

BWE Ltd - Regno Unito
Website: www.bwe.co.uk

Interfacce di comunicazione intelligente

GLI standard per i bus di campo industriali Profibus DP e Profinet IO sono stati utilizzati con successo per la comunicazione fra dispositivi di diversi fabbricanti nelle linee di produzione automatizzate.

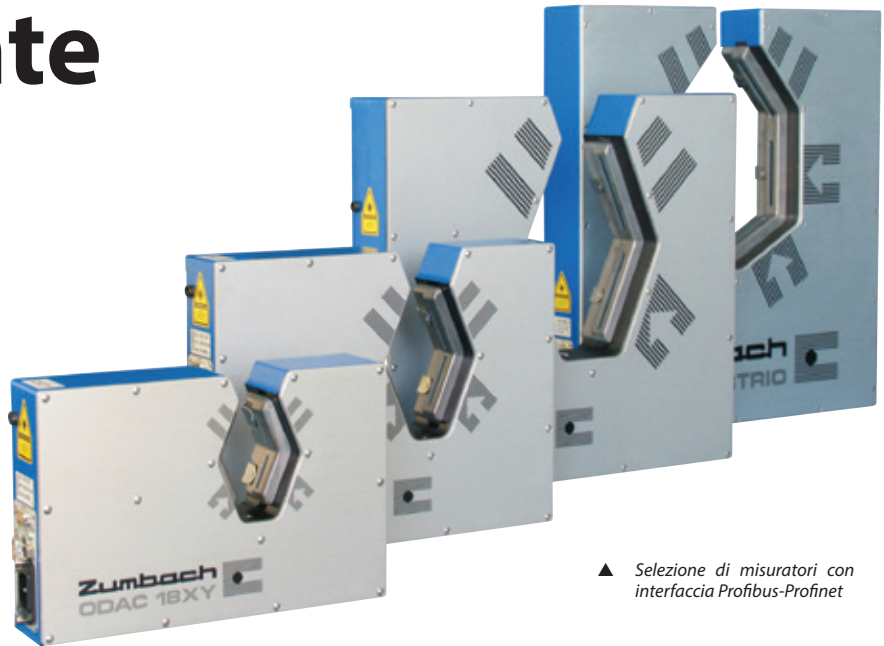
Con un aggiornamento della sua interfaccia Profibus DP, Zumbach sta accrescendo l'utilizzabilità dei propri dispositivi ad un nuovo livello. Inoltre, è ora disponibile Ethernet Industrial Profinet IO per l'intera gamma di dispositivi Zumbach.

Nella produzione industriale, numerosi sistemi di automazione, progettazione e visualizzazione sono collegati ad un bus. L'interfaccia Profibus consente di effettuare un controllo centralizzato di tutti i dispositivi interessati al processo di produzione nonché numerose funzioni di diagnosi standard e ciò attraverso una connessione rapida e sicura (fino a 12Mbps).

La preparazione e raccolta cicliche, associate ad una valutazione affidabile delle misure mediante l'interfaccia, influiscono in modo significativo sulla qualità del monitoraggio.

La comunicazione di Zumbach mediante Profibus DP non solo migliora notevolmente il flusso di lavoro fra unità produttive individuali, ma richiede anche poco hardware (un solo strumento di progettazione per tutti i dispositivi), contenendo i costi di investimento dei servizi. Grazie alla topologia del bus, i sensori possono essere accoppiati e disaccoppiati durante il funzionamento.

Praticamente tutti i dispositivi Zumbach



▲ Selezione di misuratori con interfaccia Profibus-Profinet

possono essere utilizzati in strutture con Profibus DP, direttamente o per mezzo di interfaccia Profibus. Utilizzando un protocollo intelligente, tutta la funzionalità di ciascun sensore è interamente supportata, dall'inizializzazione allo scambio dei dati reali.

In particolare, per il Profibus è stato adattato il firmware ed è stato migliorato sostanzialmente il file GSD. Attualmente offre un'installazione più facile, rapida ed economica.

- Installazione semplice della funzione "drag-and-drop": installare la versione del file GSD nella lingua di utilizzo del dispositivo (tedesco, francese, inglese), quindi trascinare il dispositivo Zumbach fino all'interfaccia dell'utente del cliente.

- Acquisizione del valore attuale: disponibilità operativa con due input grazie a parametri specifici del dispositivo, molto più facile aggiungere moduli/quantità misurate.

Profinet IO, successore del Profibus DP, è progettato per lo scambio di dati fra dispositivi di campo basati su Ethernet. Lo standard industrial Ethernet aperto soddisfa la crescente domanda di affidabilità e sostenibilità dell'automazione con flessibilità, efficienza e prestazioni eccellenti. Zumbach ha sviluppato un nuovo file GSDML per Profinet. Questo rende l'applicazione di Profibus e Profinet facile e praticamente identica.

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

Impianto rimasto inutilizzato

La società Mathiasen Machinery Inc si è aggiudicata un contratto esclusivo per la vendita di un impianto di laminazione da 5 gabbie Redex del 2009 e due sistemi di filtraggio RESY® compatti. L'equipaggiamento è stato costruito nel 2009, ma non è mai stato installato ed è ancora conservato nei contenitori di trasporto originali.

"Per un fabbricante si tratta di una grande opportunità di risparmiare tempo e denaro e aumentare la sua capacità produttiva. Questo equipaggiamento di alta qualità è pronto per la spedizione", ha dichiarato Mike Mathiasen, proprietario di Mathiasen Machinery Inc. L'impianto di laminazione è stato progettato per produrre sezioni trasversali da 2mm² a 125mm² con una capacità produttiva di 15.000 tonnellate l'anno.

Mathiasen Machinery – Stati Uniti
Website: www.mathiasen-machinery.com

Pentre Group consolida la propria posizione

Pentre Group ha acquistato Farres dopo una partnership durata 20 anni.

Il gruppo, che ha incorporato anche Hearl Heaton, festeggia 25 anni di attività nel settore internazionale del cavo e del filo ed è ora un produttore Europeo di spicco di tutti i tipi di aspi, tamburi, bobine e rocchetti.

Con quattro stabilimenti nel Regno Unito e uno a Rakovnik, nella Repubblica Ceca, Pentre considera questa acquisizione un passo significativo e stimolante verso il consolidamento della propria posizione nell'Europa meridionale e nel Nord Africa.

Pentre Group – Regno Unito
Website: www.pentregroup.com

Benefici delle norme per i prodotti per fili e cavi

A cura di Lawrence B Ingram, Alcan Cable, società del gruppo General Cable

Riassunto

Le norme hanno un importante impatto sul mercato. Numerosi sono i benefici per i fornitori, i produttori e i clienti che derivano da un cavo sviluppato in modo appropriato e conforme a norme corrette. La mancata partecipazione allo sviluppo delle norme pone una società in una condizione di svantaggio da un punto di vista della competizione.

Il presente articolo tratta degli aspetti basilari delle norme e dei risultati che si ottengono partecipando allo sviluppo delle stesse. Le norme aiutano a prendere le decisioni per lo sviluppo di nuovi prodotti. Creano valore aggiunto che consente a voi di ottenere dei vantaggi e alla vostra società dei benefici. Forniscono un parametro di riferimento per il nuovo prodotto. Ad esempio, possono specificare i valori della temperatura, il comportamento al fuoco, la resistenza del conduttore e dell'isolamento, le proprietà fisiche e chimiche del cavo.

Le norme offrono inoltre a commerciali e venditori l'opportunità di decidere se sviluppare un prodotto che ha capacità limitate oppure un altro che soddisfa requisiti di prestazione più rigorosi. La partecipazione da parte di fabbricanti, fornitori e organizzazioni per lo sviluppo delle norme (*SDO - Standards Development Organizations*) costituisce un aspetto essenziale di questo processo. I benefici risultanti dalla partecipazione allo sviluppo delle norme sono innegabili. Parole chiave: cavo, fiamma, resistenza dell'isolamento, sicurezza, fumo, norme, filo.

1 Introduzione

L'industria del filo e del cavo è inestricabilmente legata alle norme. Gli incendi di origine elettrica hanno provocato migliaia di morti del tutto inutili negli ultimi 100 anni. Ad esempio, nel 2009 si sono verificati 802 decessi di civili, 2500 feriti e danni alla proprietà per 2,53 miliardi di dollari americani, in seguito a 65.800 incendi di origine elettrica nelle abitazioni⁽¹⁾.

Le cause degli incendi erano dovute a guasti e malfunzionamenti elettrici e degli impianti di distribuzione elettrica o di illuminazione domestici. Incredibilmente, il numero di incendi negli impianti elettrici si era effettivamente ridotto di un terzo rispetto al periodo di riferimento dal 1980 al 1998 citato in un rapporto pubblicato nel gennaio di quest'anno.

Questa è in parte la ragione per cui il Codice Elettrico Nazionale (NEC) e gli organismi di normalizzazione hanno pubblicato e revisionato le numerose norme sul cavo e sul filo in base alle quali oggi si fabbricano i cavi.

Motivo per cui Voi e tutti gli operatori del settore dovrete aderire a organizzazioni come l'ASTM International (organismo di normalizzazione statunitense) e partecipare attraverso le organizzazioni allo sviluppo del processo di rafforzamento e perfezionamento delle norme che contribuiscono a questo progresso.

2 Aspetti basilari delle norme

Le norme hanno tre obiettivi di base:

- 1 Funzionare efficacemente
- 2 Soddisfare un obiettivo valido e
- 3 Essere pertinenti

Le norme contribuiscono a fornire prodotti sicuri. I prodotti sono sostenibili e apportano benefici alle popolazioni in tutto il mondo. Le norme basate sul consenso volontario costituiscono il fondamento dell'economia americana, nordamericana e globale. Sono i pilastri fondamentali su cui poggiano l'innovazione e la competitività⁽²⁾.

L'organizzazione mondiale del commercio (O.M.C.) riconosce che le norme internazionali hanno un impatto legittimo e significativo sull'efficienza e sull'espansione del commercio mondiale. Le norme sono essenziali per rafforzare l'economia mondiale e mantenere l'integrità e la competitività dei prodotti nel mondo⁽³⁾.

Le norme sviluppate da ASTM International e Underwriters Laboratories (UL) sono largamente accettate a livello internazionale. Oltre 150 paesi hanno firmato l'accordo sulle barriere tecniche al commercio (TBT) che li obbligano a partecipare allo sviluppo di norme internazionali attraverso l'organizzazione internazionale di normalizzazione ISO (*International Standards Organization*) e la commissione elettrotecnica internazionale IEC (*International Electrotechnical Commission*). Sfortunatamente, le norme fortemente armonizzate non ne rappresentano sempre un risultato concreto.

La commissione elettrotecnica internazionale IEC sta tentando di trovare una soluzione. Secondo l'organizzazione mondiale del commercio "le norme internazionali non dovrebbero privilegiare le caratteristiche o i requisiti di determinati paesi o regioni data la diversità di esigenze e di interessi esistente fra i vari paesi e regioni"⁽³⁾.

Le commissioni tecniche sviluppano le norme e devono riconoscere che delle norme IEC valide richiedono una soluzione internazionale in base alla quale si sviluppi una norma che rispecchi le necessità del mercato globale. Di fatto, il mancato raggiungimento di un consenso reale non fa che sostenere le barriere di mercato e impedire lo sviluppo di un mercato veramente globale⁽³⁾.

La realizzazione di alcune proposte nordamericane presentate alla IEC è stata bloccata nonostante vengano installate e utilizzate migliaia di unità in condizioni di sicurezza in tutto il mondo⁽³⁾. L'applicazione di una unica soluzione attraverso le norme ISO/IEC non può costringere il mercato globale a creare una norma limitante quando esistono due o più approcci sicuri allo stesso risultato. Questo risultato si dimostra anticoncorrenziale e porta alla creazione di barriere all'ingresso di un particolare mercato. La vostra partecipazione alle attività di sviluppo delle norme di ASTM o di altre norme può rafforzare e migliorare questi pilastri fondamentali per l'innovazione e la competitività.

2.1 Obiettivo delle norme: Sicurezza

2.1.1 Ridurre le probabilità di titoli come: *Incendio nel Teatro Iroquois – 30 dicembre 1903*⁽⁴⁾ *Almeno 605 persone hanno perso la vita*

La causa – Il corto circuito di una lampada ad arco ha incendiato una tenda e i materiali del palcoscenico hanno quindi provocato l'incendio di una notevole quantità di rivestimenti in legno.

Problemi: Le uscite antincendio non erano state completate, mancavano estintori, spruzzatori, allarmi, telefoni né collegamenti idrici e le uscite erano bloccate. La capienza del teatro era di 2000 persone, il numero delle persone presenti superava ampiamente tale capienza e molti spettatori erano in piedi. Questa tragedia contribuì alla messa a punto di codici e normative migliori.

Alcuni risultati e miglioramenti: La tragedia ha dato origine alle barriere antipatico, all'installazione di schermi metallici da alzare e abbassare fra il pubblico e il palcoscenico (non adottati universalmente da Codici e Normative) e all'adozione di porte di edifici pubblici che devono aprirsi nella direzione dell'uscita.

Le norme per gli equipaggiamenti elettrici e per i fili e i cavi non furono applicate che in seguito, nel corso del secolo. Le norme stabiliscono le proprietà minime richieste ai fini della sicurezza e delle prestazioni. Ogni tre anni, le norme NEC vengono revisionate radicalmente per mantenere il passo con la tecnologia e migliorare ulteriormente la protezione contro gli incendi di origine elettrica e i rischi di scosse. L'assenza di norme o norme insufficienti ridurrebbero considerevolmente la qualità della vita nel mondo.

Le buone norme servono come barriera per i prodotti inferiori allo standard. Le norme dovrebbero apportare valore, essere efficaci e non agire come barriera nel commercio libero. Voi potete contribuire a questo processo.

2.1.2 Valore dello sviluppo delle norme:

Le norme vengono sviluppate grazie ad un consenso raggiunto in base ai dei contributi in funzione di vari interessi. Produttori, utilizzatori, società di prova e clienti: tutti contribuiscono con la propria prospettiva al processo di sviluppo delle norme. Questo processo aggiunge valore poiché sviluppa norme efficaci, pertinenti e credibili basate sull'integrità dei progettatori⁽⁵⁾. I progressi tecnologici influenzano le norme. Queste evolvono con il variare della tecnologia del filo e del cavo.

Ciò ci rende tutti, come produttori e utilizzatori, importanti, poiché le nostre proposte sono vitali per produrre buone norme che creino valore aggiunto e apportino benefici. I prodotti di filo e cavo soddisfano rigorosi criteri di prestazione nelle prove elettriche, e nelle proprietà fisiche, meccaniche e chimiche per diversi valori di temperature. Lo sviluppo di norme è imperniato sulla generazione di dati e informazioni sulle prestazioni per consentire delle pratiche sicure durante l'installazione, la prova e l'utilizzo dei prodotti di filo e cavo. La durata prevista di questi prodotti è di 30 anni e oltre.

L'ASTM è stata citata durante la conferenza sulla prevenzione degli incendi del Presidente del 1947⁽⁶⁾ per il suo riconoscimento che il futuro corso della sicurezza antincendio debba essere stabilita dalle prestazioni piuttosto che dai materiali specifici. Le prestazioni consentono di sviluppare nuovi materiali per portare le norme di sicurezza al livello successivo.

2.1.3 Benefici dello sviluppo delle norme:

a **Sicurezza** – La NEC e la ASTM, fra altri organismi, forniscono assistenza pratica per aiutare a proteggere i dipendenti e il pubblico da eventuali rischi durante l'installazione, il funzionamento e la manutenzione degli equipaggiamenti elettrici, delle linee di comunicazione e dei relativi equipaggiamenti. La NEC copre un ampio numero di settori elettrotecnici, come accumulatori, trasformatori, conduttori, dispositivi di commutazione, interruttori, spazio fisico, terminazioni di cavi, segnali di avvertimento ed equipaggiamenti di protezione individuale per gli installatori di equipaggiamenti elettrici.

Per offrire sicurezza elettrica, sono stati sviluppati metodi che determinano il livello di resistenza dell'isolamento alla trasmissione di elettricità attraverso vari substrati⁽⁷⁾. Una misura è costituita dai *volt/mil* stabilita dalla norma ASTM D149⁽⁸⁾. Questo metodo rappresenta una misura della tensione di rottura dielettrica e rigidità dielettrica dell'isolamento. Per un buon materiale isolante il valore è elevato.

Un'altra misura è la costante dielettrica o il fattore di dissipazione misurato dallo spostamento di fluido utilizzando la norma ASTM D1531⁽⁹⁾. La resistenza elettrica alla rottura mediante la prova di arborescenza nell'isolamento è misurata dalla norma ASTM D3756⁽¹⁰⁾. Per un buon materiale di isolamento, il valore è basso. La norma ASTM D4872⁽¹¹⁾ rappresenta un metodo di prova per la prova dielettrica di composti di riempimento di fili e cavi. La prova di resistenza a tracciamento

ed erosione con piano inclinato secondo la norma ASTM D2303⁽¹²⁾ o la prova di resistenza a tracciamento ed erosione con polvere e nebbia secondo la norma ASTM D2132⁽¹³⁾ valuta la resistenza a tracciamento della superficie contaminata di un materiale isolante.

b **Proprietà fisiche e resistenza chimica** – La resistenza alla trazione, l'allungamento, l'impatto a bassa temperatura e alla temperatura ambiente, la resistenza allo schiacciamento, e inoltre la resistenza all'olio, alla benzina e all'ozono si possono misurare per l'ambiente operativo. Esempi di norme di prestazioni che contengano queste proprietà sono ASTM D470⁽¹⁴⁾, UL 44⁽¹⁵⁾ e UL 83⁽¹⁶⁾.

c **Comportamento alla fiamma e al fuoco** – Vengono raggiunti diversi livelli in base al livello di sicurezza richiesto. Per quanto riguarda il cavo, la norma UL 44 comprende ad esempio le prove FT1 (gocciolamento particelle), FT2 (prova di resistenza al fuoco con vassoio orizzontale) e FT4 (prova di resistenza al fuoco con vassoio verticale). Ulteriori esempi di comportamento dei fili e dei cavi alla fiamma e al fuoco sono illustrati nella *Tabella 1* di seguito.

Le prestazioni di sicurezza antincendio dei cavi elettrici hanno subito un'evoluzione. La sicurezza antincendio si basa parzialmente sul controllo dell'accensione, sulla velocità di emissione del calore e sulla propagazione della fiamma o del fumo emesso da un incendio. Queste misure sono cruciali e vengono valutate, ad esempio, secondo le norme UL 1685⁽²⁵⁾ e ASTM D5537⁽²³⁾.

La quantità di calore emesso determina la velocità di propagazione di un incendio. Una emissione di calore maggiore e più rapida può vanificare l'azione di alcuni additivi resistenti al fuoco. Una maggiore quantità di calore emesso richiede un maggior intervento da parte dei pompieri sul luogo dell'incendio. Il controllo della quantità e dell'intensità del calore e del fumo emessi consentirà alle persone intrappolate di avere a disposizione più tempo per portarsi in salvo e di ridurre i danni materiali.

La densità di fumo può oscurare la vista e inibire o impedire alle persone di fuggire dal luogo dell'incendio. Esistono norme progettate per misurare la densità di fumo come la norma UL1685⁽²⁵⁾ e ASTM E662⁽²⁴⁾, o la norma ASTM D5424⁽²¹⁾ che misura l'oscuramento provocato dal fumo.

La norma ASTM D5485⁽²²⁾, pubblicata la prima volta nel 1994, si riferisce alla corrosione dei sistemi elettronici in seguito ai danni provocati da un incendio. La perdita dei sistemi elettronici può influenzare gli allarmi ed altri sistemi critici degli edifici. Queste norme revisionate e più moderne riflettono l'evoluzione verso una maggiore sicurezza in caso di incendi.

d Prestazioni rispetto alla temperatura – Temperature di 75 o 90°C determinano, ad esempio, le prestazioni del cavo per quanto riguarda la capacità di sovraccarico o le temperature di esercizio.

2.1.4 Rapporto sulla sicurezza in caso di incendio di origine elettrica⁽²⁷⁾ pubblicato dall'Organo di Controllo per la Sicurezza Antincendio americano

Il problema: Durante un anno tipo, i problemi agli impianti elettrici domestici ammontano a 26.100 incendi e a oltre 2 miliardi di dollari americani di danni materiali. Circa la metà di tutti gli incendi di origine elettrica in edifici ad uso residenziale riguardano il cablaggio elettrico.

Statisticamente, i mesi di dicembre e gennaio sono i più pericolosi per gli incendi di origine elettrica. I decessi causati da incendi sono più elevati nei mesi invernali caratterizzati da più attività all'interno, da un maggior utilizzo dell'illuminazione, del riscaldamento e degli elettrodomestici.

La stanza da letto è il luogo in cui si sviluppano più spesso incendi ai sistemi elettrici negli edifici ad uso residenziale. Tuttavia, gli incendi di natura elettrica che hanno origine nella sala da pranzo, nel salone o nello studio, causano la maggior parte dei decessi.

Le cause degli incendi di origine elettrica: Gran parte degli incendi che interessano i sistemi di distribuzione elettrica è dovuta a problemi con "il cablaggio fisso" come prese elettriche difettose e cablaggi vecchi. I problemi con cavi (come i cavi di prolunga o degli elettrodomestici), spine, prese e interruttori provocano anche numerosi incendi di origine elettrica nelle abitazioni.

Anche gli accessori per l'illuminazione, le lampade e le lampadine rientrano fra le cause maggiori di incendi di natura elettrica.

La causa di numerosi incendi evitabili di natura elettrica può essere ricondotta ad un uso inappropriato dei cavi elettrici come per esempio circuiti sovraccaricati,

Prova	Tipo di prova	Prova Commento
D1929 ⁽¹⁷⁾	Temperatura di accensione	Misure della temperatura di accensione di materie plastiche
D2863 ⁽¹⁸⁾	Indice di ossigeno	Percentuale di ossigeno necessario per sostenere la fiamma
D3801 ⁽¹⁹⁾	Estinzione	Fiamma verticale, caratteristiche di spegnimento
D3874 ⁽²⁰⁾	Accensione	Accensione di materiale da sorgenti di filo caldo
D5424 ⁽²¹⁾	Fumo	Misurazione del fumo con vassoio verticale per cavo
D5485 ⁽²²⁾	Corrosione	Prova di corrosione con calorimetro a cono
D5537 ⁽²³⁾	Carico d'incendio	Emissione di calore, propagazione della fiamma, perdita di massa
E 662 ⁽²⁴⁾	Propagazione del fumo	Quantità di fumo
UL 1685 ⁽²⁵⁾	Vassoio verticale per cavo	Propagazione dell'incendio con vassoio verticale, emissione di fumo
UL 2196 ⁽²⁶⁾	Cavo ignifugo	Prove per cavo ignifugo (barriere antifiamma)

▲ Tabella 1: Esempi delle norme ASTM e UL nel caso di prove d'incendio e di dispersione del fumo per fili e cavi⁽⁷⁾

scarsa manutenzione, passaggio dei cavi sotto i tappeti o in zone ad alto traffico.

2.1.5 Considerazioni di carattere commerciale

Le norme sono necessarie per ottenere un risultato commerciale positivo. Avere fra il proprio personale esperti in materia di norme è essenziale. Molte delle nostre imprese specializzate in cavi sono internazionali.

Pertanto, le imprese necessitano di esperti in materia di norme che possiedono una conoscenza approfondita di un gran numero di norme nazionali. I nuovi materiali devono soddisfare gli stessi criteri di prestazioni dei materiali sviluppati e rispettare valori nominali di temperatura che si basano su protocolli relativi alle prestazioni delle norme come l'indice termico relativo.

La norma pubblicata crea una parità di condizioni da un punto di vista delle prestazioni per i produttori. Ciò consente alle imprese di agire investendo in risorse di sviluppo dei prodotti⁽²⁸⁾.

3 Organizzazioni di sviluppo delle norme (SDO)

- L'organizzazione ASTM International si occupa dello sviluppo di metodi di prova normalizzati e di norme di prodotti
- UL e CSA, si occupano del codice elettrico nazionale rispettivamente negli Stati Uniti e nel Canada
- Insulated Conductor Engineers Association
- ISO e IEC, citati precedentemente
- Altre organizzazioni internazionali come GB/T (Cina), NOM (Messico), BS (Regno Unito)

ASTM International è un leader riconosciuto a livello internazionale per quanto riguarda lo sviluppo e l'emissione di norme internazionali basate sul consenso volontario⁽²⁹⁾.

Attualmente, si utilizzano circa 12.000 norme ASTM nel mondo allo scopo di migliorare la qualità dei prodotti,

umentare la sicurezza, facilitare l'accesso al mercato e al commercio e costruire la fiducia del consumatore. La leadership di ASTM nello sviluppo delle norme internazionali è guidata dai contributi dei suoi membri, che comprendono oltre 30.000 fra i maggiori esperti e professionisti a livello mondiale in rappresentanza di 135 paesi.

Lavorando con un processo aperto e trasparente e utilizzando l'infrastruttura elettronica avanzata di ASTM, i membri di ASTM forniscono metodi di prova, specifiche, guide e pratiche che supportano le industrie e i prodotti in tutto il mondo.

UL e CSA (Canadian Standards Association) si occupano dello sviluppo di norme di sicurezza⁽⁷⁾ rispettivamente negli Stati Uniti e in Canada. Queste due organizzazioni contribuiscono in modo significativo allo sviluppo del codice elettrico nazionale del rispettivo paese.

Negli Stati Uniti, l'associazione nazionale di protezione contro gli incendi NFPA (*National Fire Protection Association*) pubblica il codice elettrico nazionale. I fornitori di materiali e i fabbricanti di cavi possono proporre modifiche alle norme UL e CSA e successivamente ottenere delle modifiche nel codice elettrico nazionale.

Ciò è possibile dopo aver dimostrato che i nuovi materiali o i prodotti di cavi soddisfano rigorosi ed esigenti requisiti di capacità di prestazione. Per il Nordamerica, le organizzazioni UL e CSA hanno un ruolo significativo nel garantire la sicurezza dei prodotti che forniscono le prestazioni previste.

Le normative di prodotto IEC per fili e cavi sono armonizzate e internazionali. Gli sforzi di armonizzazione sono complessi dato che ciascun paese ha l'opportunità di commentare e votare i meriti tecnici di una norma in corso di sviluppo o di revisione. L'organizzazione internazionale di normalizzazione ISO (*International Standards Organization*) sviluppa norme globali in modo che i prodotti come le automobili o i prodotti elettrotecnici fabbricati in diversi continenti vengano sviluppati e prodotti secondo norme uniformi.

I vostri contributi sono necessari in modo che i produttori, i fornitori e altri esperti di cavi lavorino assieme alle organizzazioni di sviluppo delle normative per creare nuove norme o aggiornarle in base all'evoluzione tecnologica e per revisionare le norme esistenti al fine di garantirne la pertinenza ed il valore.

È assolutamente sempre necessario sviluppare il più rapidamente delle norme che si devono adattare al progresso di

materiali in costante evoluzione. Questi sforzi sono richiesti per fornire le norme di qualità più elevata per soddisfare i criteri elettrici, di sicurezza antincendio e di prestazioni. La vostra partecipazione al processo è pertanto essenziale.

3.1 Perché supportare lo sviluppo di norme basate sul consenso?

- Lavorare sullo sviluppo di norme aiuta le persone a considerare il punto di vista di altre imprese.
- Lavorare sulle norme aiuta a comprendere la ragione che sta dietro ad una prova o a una normativa relativa a un prodotto.
- Tale comprensione consente alla vostra impresa di sviluppare la coerenza e la ripetibilità delle prove e dei rapporti.
- La vostra impresa contribuisce con la propria esperienza allo sviluppo delle norme. Avere esperti di norme nella vostra società è fondamentale per un successo costante.
- È molto importante avere continuità di personale. Quando l'esperto di oggi si ritira, colui che lo sostituirà potrà proseguire il lavoro senza soluzione di continuità per l'impresa. È necessaria una nuova e maggiore partecipazione.
- La vostra partecipazione apporta benefici all'industria, incoraggia la concorrenza e stimola il commercio globale.
- Si è verificata una riduzione del supporto per lo sviluppo delle norme.

Il messaggio che ne deriva è che le norme sono fondamentali per il futuro della vostra impresa. Voi dovete sollecitare la direzione della vostra società e comunicare il valore e i benefici derivanti dalla partecipazione al lavoro di organizzazione delle norme.

3.2 Benefici derivanti dall'appartenenza alla commissione tecnica⁽²⁹⁾

3.2.1 Benefici per il datore di lavoro:

- Possibilità di influenzare il contenuto di codici e norme
- Contributo per migliorare la sicurezza e le prestazioni dei prodotti
- Conoscenza precoce di requisiti nuovi o revisionati

3.2.2 Benefici personali:

Sviluppo professionale, maggiori contatti e riconoscimento.

3.2.3 Rappresentazione di piccoli fabbricanti:

Più della metà dei membri che partecipano alle commissioni tecniche di sviluppo delle norme ASTM sono impiegati in imprese con circa 500 dipendenti.

3.3 Opportunità di sviluppo delle norme

3.3.1 Connessioni di reti intelligenti, fotovoltaiche, eoliche ed altre tipologie

3.3.2 Norme per microreti – indipendenti come nel caso di ospedali, applicazioni militari, università, ecc...

3.3.3 Determinazione dell'energia termica e dei risparmi attraverso la riduzione dell'utilizzo di carburanti a base di carbonio⁽²⁸⁾

3.3.4 Le norme di oggi sono prescrittive⁽⁷⁾

Le norme devono essere convertite in norme basate sulle prestazioni. I nuovi materiali possono migliorare le prestazioni con valori di V/mil più elevati e sfruttare meglio la resistenza; tuttavia, le norme per i fili e i cavi restano bloccate entro vincoli artificiali che si basano sulla tecnologia degli anni sessanta se non addirittura precedente.

Una volta, la società General Electric Co. ha dichiarato: "Il progresso è il nostro prodotto più importante". I nuovi materiali possono fornire migliori prodotti per fili e cavi. I benefici che offrono le norme sono elevati.

Questo valore deve essere incrementato riconoscendo i cambiamenti dinamici che si verificano nei prodotti per fili e cavi e l'avanzamento verso lo sviluppo di norme basate sulle prestazioni.

4 Conclusioni

4.1 Tutti dobbiamo lavorare per mantenere e migliorare le norme

4.2 È essenziale che voi e le vostre organizzazioni partecipiate allo sviluppo e al mantenimento di norme solide ed energiche

4.3 È necessario lavorare e le sfide abbondano nei settori in via di sviluppo delle reti intelligenti, dell'efficienza energetica e delle nanotecnologie di prodotti per cavi

4.4 Le norme devono continuare ad apportare valore e benefici agli utilizzatori di prodotti

5 Ringraziamenti

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- 13 ASTM D2132 Standard Test Method for Dust-and-Fog Tracking and Erosion Resistance of Electrical Insulating Materials
- 14 D470 Standard Test Methods for Crosslinked Insulations and Jackets for Wire and Cable
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- 16 UL 83 Thermoplastic-Insulated Wires and Cables
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Revestimiento de aluminio sin costuras para cables de alta tensión

CON seis líneas actualmente en producción, el proceso SheathEx™ de BWE se está convirtiendo en la nueva alternativa para revestir cables de alta tensión con cubierta de aluminio sin costuras. En el segundo trimestre de este año BWE instalará y pondrá en marcha otra línea en Europa.

El proceso SheathEx es una ampliación de su consolidada tecnología de extrusión en continuo Conform™ y Conklad™. La máquina SheathEx extruye tubo de longitud ilimitada y sin costuras a partir de dos varillas de 12mm de diámetro alrededor de un núcleo de cable de alta tensión.

BWE contó con la colaboración de productores chinos de cables eléctricos de alta tensión para desarrollar las especificaciones del producto y del proceso de esta nueva y única tecnología.

La máquina SheathEx dispone de un cabezal grande donde se montan las hileras de diámetro grande para extruir la cubierta de los cables. La cubierta de aluminio no tiene costuras, líneas de



▲ Línea de producción SheathEx de BWE

soldadura ni cordones. El uso de una rueda de dos ranuras durante el proceso garantiza concentricidad a la cubierta de aluminio.

El sistema de calentamiento por inducción patentado de BWE permite distribuir la temperatura de manera muy uniforme alrededor del utillaje, lo que da alta estabilidad al proceso y uniformidad al tubo de aluminio. El material utilizado en el proceso es una varilla de aluminio CCR estándar, barata y fácil de encontrar comparada con otros materiales (como las láminas de aluminio usadas en las líneas

de soldadura). El núcleo del cable atraviesa el cabezal de manera continua.

A su entrada por el cabezal el núcleo es protegido por un tubo de inyección refrigerado que enfría rápidamente el tubo de aluminio justo después de la hilera, evitándole cualquier daño térmico al núcleo.

Después de pasar por la máquina SheathEx, la cubierta del cable es corrugada en línea y bobinada en tambores grandes. El proceso SheathEx es un método continuo (sin marcas de paradas), fiable (sin soldaduras) y rentable (uso de materiales baratos, poca energía, etc) para revestir cables de alta tensión.

SheathEx, Conform y Conklad son marcas registradas de BWE Ltd. El proceso SheathEx, el sistema de utillaje SheathEx, la disposición de las máquinas, el método de control y la tecnología de calentamiento por inducción han sido registrados con patentes internacionales.

BWE Ltd – Reino Unido
Website: www.bwe.co.uk

Zoo francés genera su propia electricidad

El zoológico francés Beauval está planeando implantar otra planta de conversión de desechos orgánicos en electricidad.

La puesta en marcha de la planta, valorada en 3 millones de dólares, está programada para la próxima primavera. La planta producirá electricidad quemando biogás procedente de las heces animales y otros desechos orgánicos.

Para ello se cuenta con el aporte de la mayoría de los animales del zoo, donde sólo los pandas gigantes producen más de 30 Kg de material combustible al día.

El zoológico Beauval estima que la planta permitirá recortar los costes de energía en un 40%. La electricidad inutilizada será vendida a empresas de suministro eléctrico de la zona

para sacarle mayor rendimiento.

El diario digital sueco The Local reporta en su sección dedicada a Francia declaraciones de la portavoz del zoo Delphine Delord: "Esta iniciativa encaja perfectamente con la política de desarrollo sostenible que llevamos imponiendo desde hace tiempo".

Los sistemas para producir biogás a partir de desechos orgánicos han recibido un gran impulso como alternativa energética renovable por todos los Estados Unidos y Europa, y pueden ser de aportación especialmente valiosa en países en vías de desarrollo



▲ Los pandas gigantes contribuirán a la producción de energía eléctrica del zoo. Fotografía por cortesía de www.zoobeauval.com

donde, de lo contrario, podría ser imposible disponer de sistemas de electricidad fiables.

Zoo Beauval – Francia
Website: www.zoobeauval.com

Interfaces de comunicación inteligente

LOS estándares de bus de campo industriales Profibus DP y Profinet IO han sido utilizados con éxito para la comunicación entre dispositivos de distintos fabricantes en líneas de producción automatizadas.

Con una nueva actualización de su interfaz Profibus DP, Zumbach está llevando la utilizabilidad de sus dispositivos a un nivel más elevado. Además, ahora el estándar de Ethernet Industrial Profinet IO está disponible para toda la gama de dispositivos Zumbach.

En la producción industrial numerosos sistemas de automatización, ingeniería y visualización están conectados a un bus. La interfaz Profibus permite efectuar un control centralizado de todos los dispositivos involucrados en el proceso de producción, además de muchas funciones de diagnóstico estándares (y todo esto por medio de una conexión rápida y segura de hasta 12 Mbps).

La preparación y recogida cíclica, unidas a la evaluación fiable de las medidas por medio de la interfaz, influyen significativamente en la calidad de la monitorización.

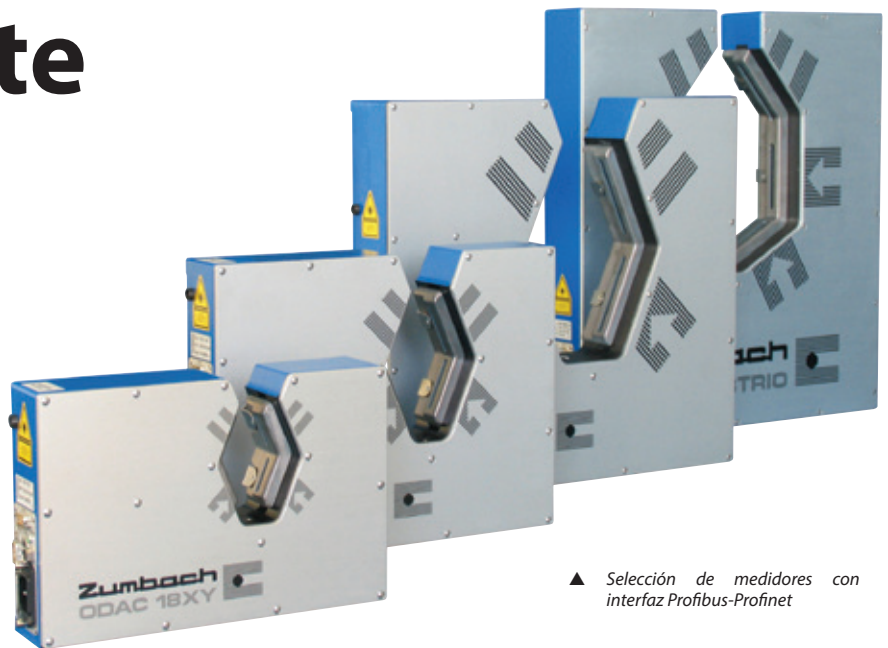
La comunicación de Zumbach mediante Profibus DP no sólo mejora notablemente el flujo de trabajo entre las distintas unidades de producción, sino que además requiere poco hardware (una sola herramienta de ingeniería para todos los dispositivos), lo que limita la inversión y los costes de servicio. Gracias a la topología del bus, los sensores pueden ser acoplados y desacoplados durante el funcionamiento.

Planta sin estrenar desde 2009

Mathiasen Machinery Inc se ha adjudicado un contrato de exclusividad para vender una planta de laminación de 5 cajas Redex y dos sistemas de filtrado RESY® compactos. El equipo fue fabricado en 2009, pero nunca ha sido instalado y sigue en su embalaje original listo para su despacho.

"Para un fabricante es una gran oportunidad de ahorrar tiempo y dinero para aumentar su capacidad productiva. Este equipo de alta calidad ya está listo para su despacho", dijo Mike Mathiasen, co-propietario de Mathiasen Machinery Inc. La planta de laminación está proyectada para producir secciones de 2mm² a 125mm² con una capacidad productiva de 15.000 toneladas al año.

Mathiasen Machinery – Estados Unidos
Website: www.mathiasen-machinery.com



▲ Selección de medidores con interfaz Profibus-Profinet

Prácticamente, todos los dispositivos Zumbach pueden ser utilizados en estructuras con Profibus DP, directamente o por medio de interfaz Profibus. Utilizando un protocolo inteligente, toda la funcionalidad de cada sensor es soportada de principio a fin, desde la inicialización hasta el intercambio de datos actuales.

Concretamente, para el Profibus se ha adaptado el firmware y se ha mejorado sustancialmente el archivo GSD. Ahora, es posible realizar la instalación de manera más fácil, rápida y rentable.

- Fácil instalación "arrastrar y soltar": instale la versión del archivo GSD en el idioma que usa el dispositivo (alemán, francés, inglés) y luego arrastre el dispositivo Zumbach hasta la interfaz de usuario del cliente.
- Adquisición del valor actual:

disponibilidad operativa con dos entradas gracias a parámetros específicos del dispositivo, muy fácil de añadir módulos/cantidades medidas.

Profinet IO, sucesor de Profibus DP, está diseñado para intercambiar datos entre dispositivos de campo basados en Ethernet.

El estándar abierto de Ethernet Industrial responde a la creciente demanda de fiabilidad y sostenibilidad de automatización con excelente flexibilidad, eficiencia y rendimiento. Zumbach ha desarrollado un nuevo archivo GSDML para Profinet. Esto hace de la implementación de Profibus y Profinet una aplicación fácil y prácticamente idéntica.

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

Consolidando posiciones

El Grupo Pentre ha adquirido la empresa Farres después 20 años de asociación.

El grupo, que cuenta con Hearl Heaton entre sus empresas, celebra este año su 25º aniversario al servicio del sector del cable y alambre y es actualmente un productor europeo líder en la fabricación de todo tipo de carretes, tambores y bobinas.

Con cuatro fábricas en el Reino Unido y una en Rakovnik, en la República Checa, Pentre ve esta adquisición como una maniobra importante y emocionante que le permitirá reforzar su posición en el sur de Europa y norte de África.

Pentre Group – Reino Unido
Website: www.pentregroup.com

Beneficios de las normas para productos de alambre y cable

Por Lawrence B Ingram, Alcan Cable, sociedad del grupo General Cable

Resumen

Las normas tienen gran repercusión en el mercado. Los proveedores, fabricantes y clientes obtienen muchas ventajas de cables desarrollados correctamente y conformes a las normas. La falta de participación de una compañía en el desarrollo de las normas la pone en una situación de desventaja competitiva.

Este artículo trata sobre los objetivos de base de las normas y el valor que se obtiene participando en su desarrollo. Las normas ayudan a tomar decisiones para desarrollar nuevos productos. Aportan valor y beneficios a ustedes y a su compañía. Ofrecen un estándar de referencia para el nuevo producto. Por ejemplo, pueden especificar los valores de temperatura, el comportamiento frente al fuego, la resistencia del conductor y del aislamiento, las propiedades físicas y químicas del producto de cable.

Las normas ofrecen oportunidades a los que operan en el sector de marketing y ventas para decidir si desarrollar un producto de capacidad limitada o uno que cumple requisitos más estrictos. La participación de fabricantes, proveedores y organizaciones de desarrollo de normas (*SDO - Standards Development Organizations*) constituye una parte fundamental de este proceso.

Las ventajas de participar en el desarrollo de normas son un hecho. Palabras claves: cable, llama, resistencia del aislamiento, seguridad, humo, normas, alambre.

1 Introducción

La industria del alambre y del cable está estrechamente vinculada a las normas. Los incendios de origen eléctrico han causado miles de muertes innecesarias durante los últimos 100 años.

Por ejemplo, en 2009 se produjeron 802 muertes de civiles, 2.500 accidentes y daños a la propiedad por valor de 2.530 millones de dólares americanos, debidos a 65.800 incendios eléctricos en hogares⁽¹⁾.

Las causas de los incendios eran debidas a fallos/mal funcionamiento eléctricos y de los sistemas de distribución eléctrica o iluminación domésticos. Por increíble que parezca, el número de incendios por causas eléctricas era casi un tercio menos que entre los años 1980 y 1998 del informe publicado en enero de este año.

En parte, es por esto por lo que el código eléctrico nacional NEC (*National Electric Code*) y los organismos de normalización han publicado y revisado las numerosas normas sobre alambre y cable con las cuales se fabrican actualmente los cables.

Por esto ustedes y otros como ustedes deberían unirse a organizaciones como ASTM International (asociación estadounidense para pruebas y materiales) y participar a través de dichas organizaciones en el continuo desarrollo y mejora de las normas que contribuyen a este progreso.

2 Aspectos de base de las normas

Las normas tienen tres objetivos de base:

- 1 Deben funcionar eficazmente
- 2 Deben cumplir un objetivo válido y
- 3 Deben ser pertinentes

Las normas ayudan a proveer productos seguros. Los productos son sostenibles y aportan ventajas a personas de todo el mundo. Las normas de consenso voluntario son la base de la economía americana, norteamericana y global. Representan las piezas de base para la innovación y la competitividad⁽²⁾.

La Organización Mundial del Comercio (O.M.C.) reconoce que las normas internacionales tienen un impacto legítimo y significativo en la eficiencia y expansión del comercio mundial. Las normas son esenciales para reforzar la economía mundial y mantener la integridad y la competitividad de los productos en el mundo⁽³⁾.

Las normas desarrolladas por ASTM International y Underwriters Laboratories (UL) son ampliamente aceptadas a nivel internacional. Más de 150 países firmaron el acuerdo sobre las barreras técnicas al comercio (*TBT - Technical Barriers to trade*) que los obligan a tomar parte en el desarrollo de normas internacionales a través de la organización internacional de normalización ISO (*International Standards Organization*) y la comisión electrotécnica internacional IEC (*International Electrotechnical Commission*). Desafortunadamente, no siempre se obtienen normas fuertemente armonizadas.

La comisión electrotécnica internacional IEC trata de buscar una solución. La OMC afirma que "las normas internacionales no deberían dar preferencia a las características o a los requisitos de determinados países o regiones si en otros países o regiones existen otras necesidades o intereses"⁽³⁾.

Las comisiones técnicas desarrollan las normas. Éstas deben reconocer que las buenas normas IEC deben ofrecer una solución internacional y que las normas desarrolladas deben reflejar las necesidades del mercado global. La falta de un consenso real sólo sostiene barreras de mercado e impide el desarrollo de un mercado verdaderamente global⁽³⁾.

La implementación de algunas propuestas norteamericanas hechas a la IEC ha sido bloqueada a pesar de que se hayan instalado y usado miles y miles

de unidades en todo el mundo con seguridad⁽³⁾. La implementación de una sola solución a través de normas ISO/IEC no puede forzar el mercado global a crear una norma limitante cuando existen dos o más métodos seguros para obtener el mismo resultado. Este resultado no es competitivo y crea barreras de entrada en ciertos mercados.

Su participación en las actividades de desarrollo de las normas ASTM u otras normas puede reforzar y mejorar estas piezas de base para la innovación y la competitividad.

2.1 Objetivo de las normas: Seguridad

2.1.1 Leer menos titulares como el siguiente: *Incendio en el Teatro Iroquois – 30 de diciembre de 1903⁽⁴⁾ Al menos 605 muertos*

La causa – El cortocircuito de una lámpara de arco prendió fuego a una cortina y luego los materiales del escenario incendiaron una cantidad significativa de adornos de madera.

Problemas: Había salidas de incendio incompletas, ningún extintor, ni rociadores, alarmas, teléfonos o tomas de agua y las salidas estaban bloqueadas. En el teatro había más de 2000 personas, el edificio había superado su capacidad y muchos espectadores estaban de pie. Esta tragedia contribuyó a producir códigos y normas mejores.

Algunos resultados y mejoras: Esta tragedia llevó a las barras antipánico para salidas de emergencia, constituidas por una barra de chapa metálica que se sube y baja entre el público y el escenario (no adoptadas universalmente por códigos y normas) y a las puertas de edificios públicos que deben abrirse en dirección a la salida.

Las normas para equipos eléctricos y alambre y cable no fueron implementadas hasta más tarde en ese siglo. Las normas establecen las propiedades mínimas requeridas para la seguridad y las prestaciones. Cada tres años, las normas NEC son revisadas detalladamente para mantenerse al día con la tecnología y mejorar más la protección contra los incendios de origen eléctrico y los peligros de descargas eléctricas.

La falta de normas o la existencia de normas mal redactadas reducen significativamente la calidad de vida del mundo. Las buenas normas sirven de barrera contra los productos por debajo de los estándares. Las normas deben aportar valor, ser eficaces y no actuar como barrera para el comercio libre. Ustedes pueden contribuir en este proceso.

2.1.2 Valor del desarrollo de normas:

Las normas son desarrolladas mediante consenso alcanzado en base a los aportes de distintos intereses. Productores, usuarios, compañías de ensayo y clientes, todos aportan su perspectiva durante el desarrollo de las normas. Este proceso añade valor porque desarrolla normas que son eficaces, pertinentes y creíbles en base a la integridad de los desarrolladores⁽⁵⁾.

Los avances tecnológicos influyen en las normas. Las normas evolucionan al cambiar la tecnología del alambre y del cable. Esto nos convierte a todos nosotros, productores y usuarios, en figuras importantes, dado que nuestras sugerencias son vitales para producir buenas normas que aporten valor y ventajas.

Los productos de alambre y cable cumplen estrictos criterios de prestaciones en ensayos eléctricos y de prestaciones físicas, mecánicas y químicas para varios valores de temperatura.

El desarrollo de normas se basa en la generación de datos e información sobre las prestaciones para ofrecer prácticas seguras para la instalación, el ensayo y el uso de productos de alambre y cable. La duración prevista para estos productos es de 30 años o más.

La ASTM fue citada en la conferencia sobre prevención de incendios del Presidente de 1947⁽⁶⁾ por su reconocimiento de que son las prestaciones, y no los materiales, el factor que debe determinar el curso futuro de la seguridad contra incendios. Las prestaciones permiten desarrollar nuevos materiales para llevar las normas de seguridad al nivel sucesivo.

2.1.3 Ventajas del desarrollo de normas:

a **Seguridad** – La NEC y la ASTM, entre otros organismos, proveen asistencia práctica para ayudar a proteger a los trabajadores y al público contra posibles peligros durante la instalación, el funcionamiento y el mantenimiento de líneas de comunicación y de suministro eléctrico, y equipos relacionados. La NEC cubre una amplia gama de áreas eléctricas, como acumuladores, transformadores, conductores, dispositivos de conmutación, interruptores, espacio físico, terminaciones de cables, señales de advertencia y equipos de protección individual para instaladores de equipos eléctricos.

Para ofrecer seguridad eléctrica, se han desarrollado métodos que determinan el nivel de resistencia del aislamiento a la transmisión de electricidad a través

de varios sustratos⁽⁷⁾. Una medida es *voltios/mil* determinada por la norma ASTM D149⁽⁸⁾. Este método es una medida de la tensión de ruptura dieléctrica y rigidez dieléctrica del aislamiento. El valor es alto para un buen material aislante. Otra medida es la constante dieléctrica o el factor de disipación medidos por desplazamiento de fluido usando la norma ASTM D1531⁽⁹⁾.

La resistencia eléctrica a la ruptura mediante ensayo de arborescencias en el aislamiento es medida por la norma ASTM D3756⁽¹⁰⁾. El valor es bajo para un buen material aislante.

La ASTM D4872⁽¹¹⁾ constituye un método de ensayo para la prueba dieléctrica de compuestos de llenado de alambres y cables. El ensayo de tracking y erosión por plano inclinado ASTM D2303⁽¹²⁾ o el ensayo de tracking y erosión por polvo y niebla ASTM D2132⁽¹³⁾ miden la resistencia a las corrientes de fuga de la superficie contaminada de un material aislante.

b **Propiedades físicas y resistencia química**

– La resistencia a la tracción, el alargamiento, el impacto a baja temperatura y temperatura ambiente, la resistencia al aplastamiento y además, la resistencia al aceite, a la gasolina y al ozono se pueden examinar para el entorno de funcionamiento. Ejemplos de normas de prestaciones que contienen estas propiedades son las ASTM D470⁽¹⁴⁾, UL 44⁽¹⁵⁾ y UL 83⁽¹⁶⁾.

c **Comportamiento frente a la llama y al humo**

– Según el nivel de seguridad requerido se alcanzan varios niveles. Para el cable, la norma UL 44 contiene, por ejemplo, FT1 (ensayo de goteo de partículas), FT2 (ensayo de resistencia al fuego de bandeja horizontal) y FT4 (ensayo de resistencia al fuego de bandeja vertical). Otros ejemplos de ensayos de comportamiento frente al fuego y al humo de alambre y cable están ilustrados en la *Tabla 1* siguiente.

La seguridad frente al fuego de los productos de cable eléctricos ha evolucionado. La seguridad frente al fuego se basa en parte en el control del encendido, la velocidad de emisión del calor, y en la propagación de la llama o la emisión de humo durante un incendio. Estas medidas son fundamentales y son evaluadas por las normas UL 1685⁽²⁵⁾ y ASTM D5537⁽²³⁾, por ejemplo. La cantidad de calor emitido determina la rapidez con que se puede propagar un incendio. Una emisión de calor mayor y más rápida puede anular la acción de algunos aditivos resistentes al fuego.

Una emisión de calor más potente supone un reto de lucha contra el fuego mayor para los bomberos en el lugar del incendio. Controlando la cantidad e intensidad del calor y la densidad del humo se dará más tiempo a las personas atrapadas a escapar con seguridad y se limitará los daños a la propiedad.

La densidad del humo puede oscurecer la visión e inhibir o impedir escapar del incendio. Hay normas diseñadas para medir la densidad de humo como las UL1685⁽²⁵⁾, ASTM E662⁽²⁴⁾, o el oscurecimiento por humo como la ASTM D5424⁽²¹⁾. La norma ASTM D5485⁽²²⁾, publicada por primera vez en 1994, se refiere a la corrosión de sistemas electrónicos a consecuencia de un incendio. La pérdida de sistemas electrónicos puede afectar a las alarmas y otros sistemas de extrema importancia de los edificios. Estas normas revisadas y nuevas reflejan la evolución hacia una seguridad mayor en caso de incendios.

- d **Prestaciones frente a la temperatura** – Temperaturas de 75 ó 90°C determinan, por ejemplo, las prestaciones del cable en lo que se refiere a capacidad de sobrecarga o temperaturas de funcionamiento.

2.1.4 Seguridad frente a incendio de origen eléctrico⁽²⁷⁾ - Informe publicado por el gobierno americano sobre seguridad contra incendios

El problema: Durante un año típico, los problemas domésticos por causas eléctricas ascienden a 26.100 incendios y más de 2.000 millones de dólares americanos de pérdidas de bienes. Aproximadamente la mitad de todos los incendios eléctricos residenciales están relacionados con el cableado eléctrico.

Estadísticamente, diciembre y enero son los meses más peligrosos para los incendios eléctricos. Las muertes en incendios registran los valores más altos en los meses invernales, que es cuando la gente pasa más tiempo en casa, usa más la luz, la calefacción y los electrodomésticos.

El dormitorio es el lugar de origen del incendio más corriente en los incendios eléctricos de edificios residenciales. Sin embargo, los incendios eléctricos que inician en la sala de estar o en el estudio causan el mayor número de muertes.

Las causas de los incendios eléctricos:

La mayoría de los incendios causados por la instalación eléctrica se deben a problemas con el "cableado fijo" como tomas eléctricas defectuosas y cableados viejos.

Ensayo	Tipo de ensayo	Ensayo Comentario
D1929 ⁽¹⁷⁾	Temperatura de encendido	Medidas de la temperatura de encendido de plásticos
D2863 ⁽¹⁸⁾	Índice de oxígeno	Porcentaje de oxígeno necesario para alimentar la llama
D3801 ⁽¹⁹⁾	Apagamiento	Llama vertical, características de apagamiento
D3874 ⁽²⁰⁾	Encendido	Encendido de material por fuentes de alambre caliente
D5424 ⁽²¹⁾	Humo	Medida de humo de bandeja de cable vertical
D5485 ⁽²²⁾	Corrosión	Ensayo de corrosión de calorímetro de cono
D5537 ⁽²³⁾	Carga de fuego	Emisión de calor, propagación de la llama, pérdida de masa
E 662 ⁽²⁴⁾	Propagación del humo	Cantidad de humo
UL 1685 ⁽²⁵⁾	Bandeja de cable vertical	Propagación del incendio de bandeja vertical, emisión de humo
UL 2196 ⁽²⁶⁾	Cable resistente al fuego	Ensayos para cable resistente al fuego (detención del fuego)

▲ **Tabla 1:** Ejemplos de normas de ASTM y UL Ensayos de fuego y de humo de alambre y cable⁽²⁷⁾

Los problemas con los conductores (como cables de extensión o de electrodomésticos), enchufes, tomas de corriente e interruptores causan también muchos incendios eléctricos domésticos. Los accesorios de iluminación y las lámparas o bombillas también son causa de incendios eléctricos. Muchos incendios eléctricos evitables pueden ser debidos al uso inadecuado de cables eléctricos. Éstos incluyen circuitos sobrecargados, mantenimiento insuficiente y el paso de cables debajo de alfombras o en áreas de alta circulación, por ejemplo.

2.1.5 Consideraciones de carácter comercial

Las normas son necesarias para tener éxito comercial. Disponer de expertos en normas en su organización es esencial. Muchas de nuestras compañías especializadas en cables son internacionales. Por lo tanto, las compañías necesitan expertos en normas que conozcan bien un gran número normas nacionales. Los materiales nuevos deben cumplir los mismos criterios de prestaciones que los materiales desarrollados y respetar valores nominales de temperatura basados en los protocolos

de prestaciones de las normas, como el índice térmico relativo. La norma publicada establece paridad de prestaciones para todos los productores. Esto permite a las compañías invertir en recursos de desarrollo de productos⁽²⁸⁾.

3 Organizaciones de desarrollos de normas

- ASTM International desarrolla métodos de ensayo normalizados y normas de productos
- UL y CSA, se ocupan del código eléctrico nacional de sus respectivos países, en los Estados Unidos y Canadá
- Insulated Conductor Engineers Association
- ISO e IEC, citadas arriba
- Otras organizaciones internacionales como GB/T (China), NOM (México), BS (Reino Unido)

ASTM International es líder reconocida globalmente en el desarrollo y entrega de normas de consenso voluntario

internacionales⁽²⁹⁾. Actualmente, se usan en todo el mundo aproximadamente 12.000 normas ASTM para mejorar la calidad de los productos, incrementar la seguridad, facilitar el acceso al mercado y al comercio, y construir la confianza del consumidor. El liderazgo de ASTM en el desarrollo de normas internacionales es sostenido por los aportes de sus miembros, entre los que se incluyen más de 30.000 destacados profesionales expertos en campo técnico y comercial de 135 países distintos.

Trabajando de manera abierta y transparente y usando la infraestructura electrónica avanzada de ASTM, los miembros de ASTM proveen métodos de ensayo, especificaciones, guías y prácticas utilizadas por la industria y los productos de todo el mundo.

UL y CSA (Canadian Standards Association) se encargan del desarrollo de normas de seguridad⁽⁷⁾ en los Estados Unidos y Canadá, respectivamente.

Estas dos organizaciones contribuyen significativamente al desarrollo del código eléctrico nacional de sus países. En los Estados Unidos, la asociación nacional de protección contra incendios NFPA (*National Fire Protection Association*) publica el código eléctrico nacional.

Los proveedores de materiales y los fabricantes de cables pueden proponer modificaciones de las normas UL y CSA y obtener luego modificaciones del código eléctrico nacional.

Esto es posible después de demostrar que los nuevos materiales o los productos de cable cumplen rigurosos y estrictos requisitos de prestaciones. Para Norteamérica, UL y CSA juegan un papel significativo a la hora de garantizar seguridad a los productos que ofrecen las prestaciones esperadas.

Las normas para productos de alambre y cable IEC son armonizadas e internacionales. Los esfuerzos de armonización son complejos, dado que cada país puede comentar y votar sobre los méritos técnicos de una norma en fase de desarrollo o de revisión.

La organización internacional de normalización ISO (*International Standards Organization*) desarrolla normas a escala mundial de manera que productos como coches y productos eléctricos fabricados en varios continentes son desarrollados y producidos según normas uniformes.

Necesitamos sus sugerencias para que productores, suministradores y otros expertos en cables colaboren con las organizaciones de desarrollo de normas para crear normas nuevas o actualizarlas

de acuerdo con la evolución de la tecnología y revisen normas existentes para asegurar su continua relevancia y valor.

Sigue siendo necesario desarrollar con gran rapidez normas que acompañen el continuo desarrollo de materiales en constante evolución. Estos esfuerzos sirven para ofrecer normas de máxima calidad para cumplir los requisitos eléctricos, de seguridad contra incendios y de prestaciones. Por esto, su participación en el proceso es fundamental.

3.1 ¿Por qué desarrollar normas de consenso?

- Trabajar en el desarrollo de normas ayuda a ver la perspectiva de otras compañías.
- Trabajar en las normas ayuda a comprender el motivo que se esconde detrás de un ensayo o de una norma para un producto.
- Entender estos elementos le permite a su compañía desarrollar coherencia y repetibilidad de pruebas e informes.
- Su compañía aporta su experiencia al desarrollo de las normas. Tener expertos en normas en su organización es esencial para un éxito continuo.
- Es muy importante tener continuidad de personal. Cuando el experto de hoy se jubila, su sucesor puede continuar el trabajo sin problemas en la compañía. Se necesita nueva y mayor participación.
- Su participación supone beneficios para la industria, impulsa la competición y estimula el comercio global.
- Se ha registrado un descenso de soporte en el desarrollo de normas.

La conclusión que se debe sacar de todo esto es que las normas son cruciales para el futuro de su empresa. Hagan una petición a la dirección de su compañía y comuniquen el valor y las ventajas que se obtienen participando en el trabajo de organización de las normas.

3.2 Beneficios de ser miembro de la comisión técnica⁽²⁹⁾

3.2.1 Beneficios del empleador:

- Posibilidad de influenciar el contenido de códigos y normas
- Contribución para mejorar la seguridad y las prestaciones de los productos
- Conocimiento temprano de requisitos nuevos o revisados

3.2.2 Beneficios del personal:

Desarrollo profesional, se aumentan los contactos, reconocimiento.

3.2.3 Representación de pequeños fabricantes:

Más de la mitad de los miembros que participan en las comisiones técnicas de desarrollo de las normas ASTM son empleados en empresas de 500 o menos empleados.

3.3 Oportunidades del desarrollo de normas

3.3.1 Conexiones de redes inteligentes (*smart grid*), fotovoltaicas, eólicas y de otros tipos

3.3.2 Normas para microrredes – independientes como las para hospitales, aplicaciones militares, universidades...etc

3.3.3 Determinación de la energía térmica y de los ahorros mediante la reducción del uso de carburantes a base de carbono⁽²⁸⁾

3.3.4 Las normas de hoy son prescriptivas⁽⁷⁾

Las normas deben convertirse en normas basadas en las prestaciones. Los nuevos materiales pueden mejorar las prestaciones con V/mil más altos y aprovechar mejor la resistencia, y con todo, las normas para alambre y cable quedan bloqueadas en vínculos artificiales que se basan en la tecnología de los años sesenta y antes.

La compañía General Electric Co. una vez declaró: "El progreso es nuestro producto más importante". Los nuevos materiales pueden proveer productos de alambre y cable mejores. Los beneficios que proveen las normas son grandes. Este valor debe ser incrementado reconociendo los cambios dinámicos que ocurren en los productos de alambre y cable y el avance hacia el desarrollo de normas basadas en las prestaciones.

4 Conclusiones

4.1 Todos necesitamos trabajar para mantener y mejorar las normas

4.2 Es esencial que usted y su organización participen en el desarrollo y mantenimiento de normas sólidas y energéticas

4.3 El trabajo es necesario y los retos abundan en las áreas en desarrollo de las redes inteligentes, de la eficiencia energética y del desarrollo de nanotecnologías de productos de cable

4.4 Las normas deben continuar llevando valor y beneficios a los que usan los productos

5 Agradecimientos

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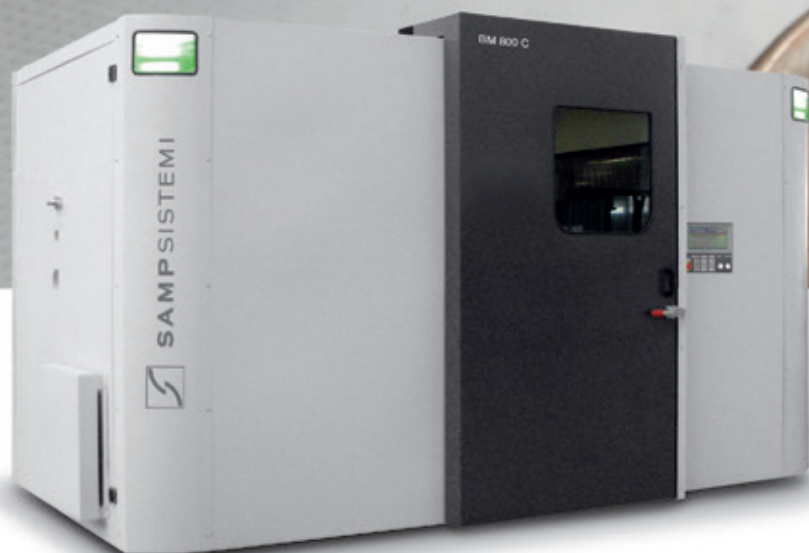
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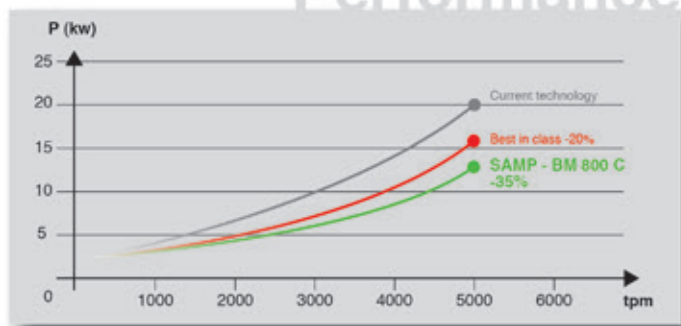
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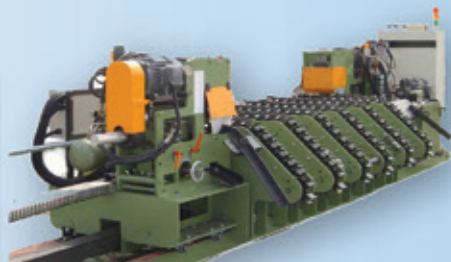
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