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# EUROwire

wire Düsseldorf

The International Magazine for the Wire & Cable Industries



ISSN 1463-2438

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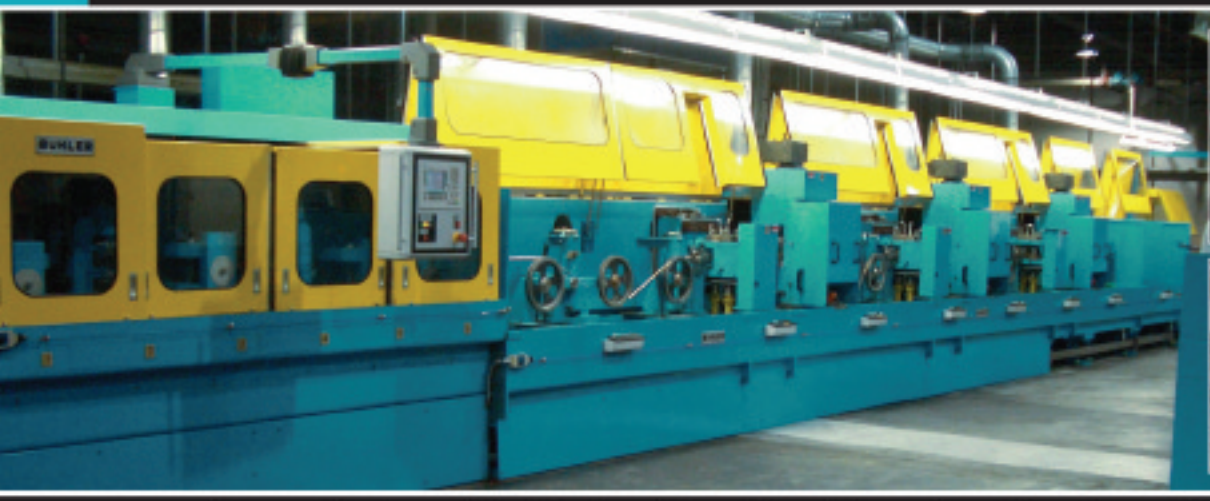

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wire Düsseldorf

# Looking back… looking forward

Two years ago, when I was anticipating my first visit to wire Düsseldorf, the credit crisis was in its infancy. Northern Rock had just been nationalised. It was to be July before Fannie Mae and Freddie Mac needed rescue, and after these two financial giants threatened to topple it seemed banks across the globe were poised to fall like ninepins. Before long industry in general, and manufacturing industry in particular, was shaky from the aftershocks.

In April 2008 I was struck by the optimism of many of the exhibitors I met. There was certainly a view that, though recession was a possibility, it was as likely that industry would talk itself into recession as be pushed.

Of course, we know how the situation spiralled, and many businesses were forced to look at streamlining, shrinking and shedding to survive. Some haven't survived, and it would be intriguing to know if those who sounded so very optimistic in 2008 were simply in denial. I hope not: I prefer to believe that an optimistic outlook and positive thinking will win through.

Either way, the reality is that the UK, at least, has just been declared officially out of recession. Within the cycle of wire Düsseldorf we're coming out on the other side, and while the actual shape of the recovery has yet to show itself (the debate continues as to whether it's V, W, U or L-shaped) there's evidence that faith in the future is alive and well.

What leads me to believe that? This issue's wire Düsseldorf feature. It was with some trepidation that I awaited editorial submissions confined to new products and technology for 2010. I needn't have worried. The R & D departments of manufacturers from all sectors have been busy and there will be a healthy crop of new machines and ingenuity to see at the show.

Although the UK's quarter growth of 0.1% doesn't tempt me into believing it's the beginning of the end of recession, it's a move in the right direction. For now we just have to stay positive, and productive.

Gill Watson



## The International Magazine for the Wire and Cable Industries


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* Front cover courtesy of Sikora AG.
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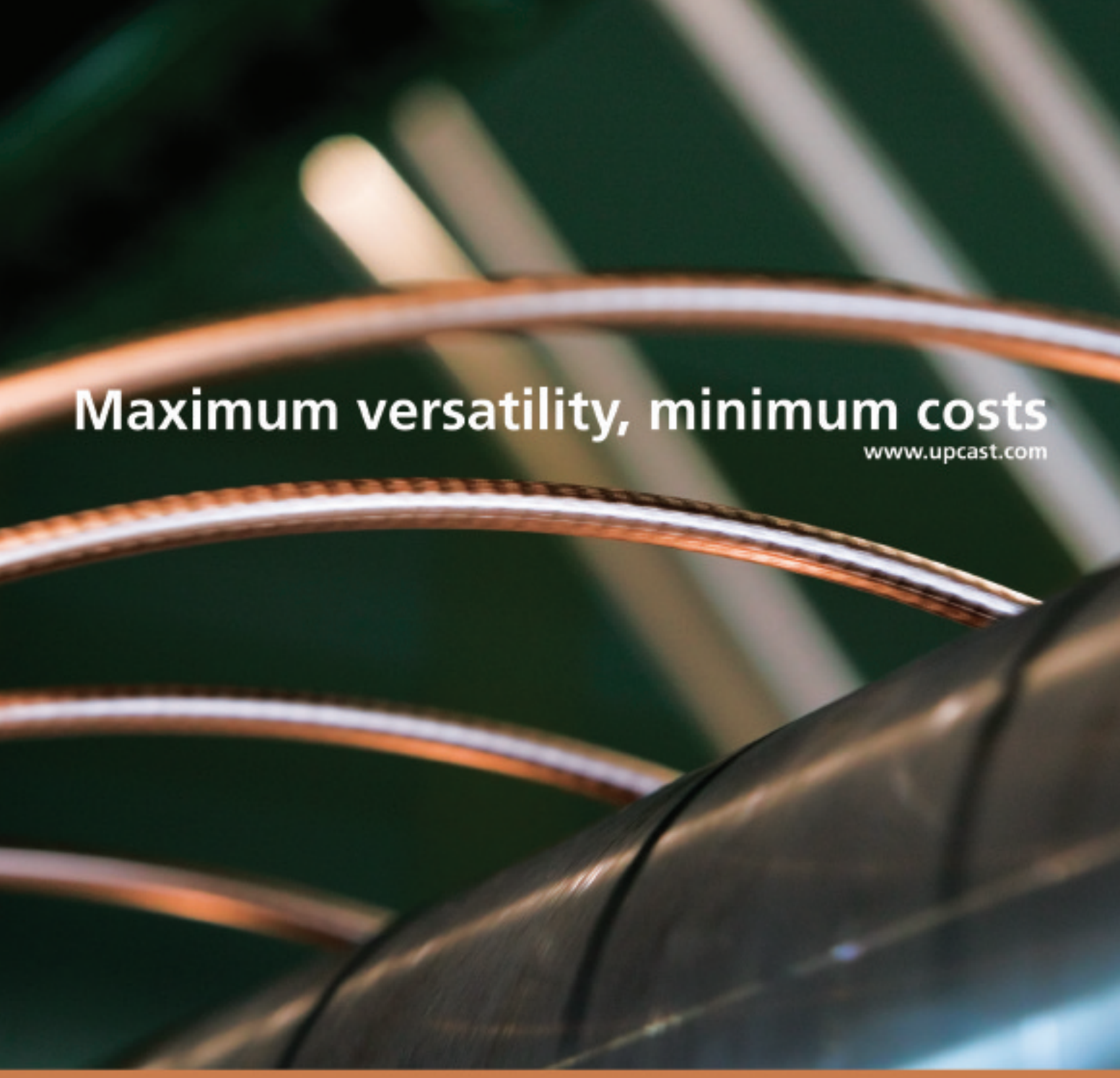


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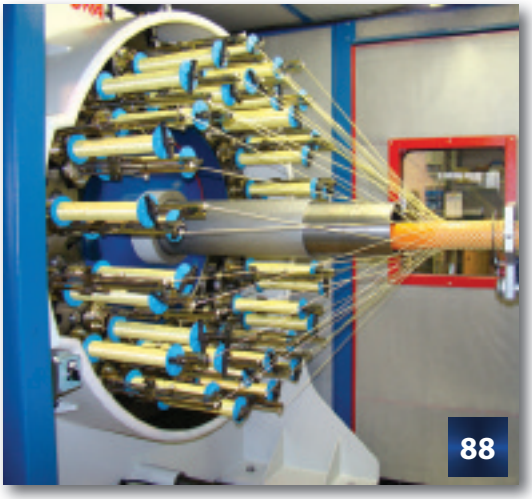
# contents

## Technical Articles











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Spools, reels and pre-packaging systems

### Getting Technical

Advances in TPE styrenic block copolymer compounding for UL flame retardant cable applications

# dates for your diary . . .

## wire Düsseldorf 2010

**April 2010**

12–16: **wire/Tube Düsseldorf** – trade exhibition –
Düsseldorf, Germany
**Organisers**: Messe Düsseldorf GmbH
**Fax**: +49 211 45 6087 7793
**Email**: wire@messe-duesseldorf.de
**Website**: www.wire.de

**May 2010**

12–13: **Wire Expo** – technical conference and trade exhibition – Milwaukee, Wisconsin, USA
**Organisers**: Wire Association International (WAI)
**Fax**: +1 203 453 8384
**Website**: www.wirenet.org

**September 2010**

21–24: **wire China 2010** – trade exhibition – Shanghai, China
**Organisers**:
Messe Düsseldorf China
**Fax**: +86 21 5027 8138
**Email**: wire@mdc.com.cn
**Website**: www.wirechina.net

**November 2010**

7–10: **59th IWCS** – technical conference –
Providence, Rhode Island, USA
**Organisers**: IWCS Inc
**Fax**: +1 732 389 0991
**Email**: admin@iwcs.org
**Website**: www.iwcs.org

18–20: **Wire & Cable India** – trade exhibition – Mumbai, India
**Organisers**: CII
**Fax**: +91 22 2493 9463
**Email**: info@ciionline.org
**Website**: http://cii.in

## 2011

**April 2011**

3–5: **Interwire** – trade exhibition – Atlanta, Georgia, USA
**Organisers**: Wire Association International (WAI)
**Fax**: +1 203 453 8384
**Email**: info@wirenet.org
**Website**: www.wirenet.org

**May 2011**

tbc: **wire Russia 2011** – trade exhibition –
Moscow, Russia
**Organisers**:
Messe Düsseldorf GmbH
**Fax**: +49 211 4560 7740
**Email**: info@wire-russia.com
**Website**: www.wire-russia.com

**June 2011**

19–23: **JICABLE** – technical conference and trade exhibition – Versailles, France
**Organisers**: SEE
**Email**:
jicable@see.assoc.fr
**Website**: www.jicable.org

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▲ *Dennis Heron and Karen Traten of the Make-A-Wish Foundation, accepting the $7,727.31 cheque from Allied Wire staff*

# Charity Week success

Allied Wire & Cable's 2009 Charity Week in December raised $9,223.31, benefitting seven charities. The Make-A-Wish Foundation received $7,727.31 and six other charities, American Farmland Trust, ASPCA, Autism Speaks, Coalition to Support America's Heroes, Meals on Wheels Association of America and Susan G Komen for the Cure, each received $250.

Each year, Allied sets aside a portion of sales for a full week in December to donate to a chosen charity. This year's benefactor, the Make-A-Wish Foundation, was chosen by Allied's customers in a month-long poll held on its website.

Allied greatly appreciates all the support it has received from customers that made this Charity Week a success.

**Allied Wire & Cable – USA**
**Email**: info@awcwire.com
**Website**: www.awcwire.com

# Schaaf machines will continue

Bremer develops and produces machines for the manufacture and repair of drawing die tools, offering individual software, knowledge and technical assistance. In the company's largest takeover to date, Bremer has purchased the former Schaaf building, the capital and current assets, and retained some of the former workers. This move is in line with the company's strategy to become a clearly structured technology company with international orientation.

Bremer's target is to further strengthen and develop to become a complete supplier for wire drawing companies, both in Germany and abroad, and to increase the turnover and revenue strength of the company by organic growth and international expansion.

Schaaf was an established and renowned name in the wire industry. The Schaaf machine programme to process diamond and Compax drawing dies is said to remain the most comprehensive in the field of diamond drawing die tool manufacturing.

Bremer will continue the service and supply of spare parts for Schaaf machines in cooperation with former Schaaf customers.

**Willi Bremer GmbH – Germany**
**Fax**: +49 2778 2190
**Email**: bremer.willi@t-online.de
**Website**: www.bremer-willi.de

# Chemicals company faces squeeze

On 2nd February 2010, SKion GmbH informed Altana that it is holding 129,342,421 shares, representing around 95 per cent of the Altana shares. SKion also requested that Altana AG convene a shareholders meeting, pursuant to 327a section 1 of the German Stock Corporation Act (AktG). In this shareholders meeting a resolution on the transfer to SKion GmbH of the shares held by the remaining shareholders (in return for an appropriate cash compensation) could be passed (a so-called "squeeze out").

The move follows SKion's voluntary public offers to Altana shareholders during November and December 2009 by which means, and by means of further acquisitions of shares, SKion GmbH had been continuously increasing its shareholding in Altana AG to the current percentage of ownership.

Ms Susanne Klatten is the sole shareholder of SKion GmbH, and is also acting as vice chair of the supervisory board of Altana AG. The Altana group includes the Elantas electrical insulation division.

**Altana AG – Germany**
**Fax**: +49 281 670 1114
**Email**: info@altana.com
**Website**: www.altana.com

# Plastics industry loses a pioneer in PVC and thermoplastic manufacturing

After a brief illness, John "Jack" Gallant, aged 77, a long-time employee of AlphaGary Corporation, passed away on 28th December 2009 at his home, surrounded by his wife, Betty, and his family.

Dave Kiddoo, of AlphaGary Corporation, writes: "Jack was a pioneer and well-known expert in PVC and thermoplastic manufacturing with over 50 years' experience in such positions as line supervisor, R&D manager and VP of manufacturing.

"Jack truly enjoyed his profession and worked nearly full-time until his death, as Director of Color Management at AlphaGary. Through his distinguished career, Jack also worked with Blaine Chemical, Great American Chemical, Abbott Industries and Lynn Plastics.

"Jack proudly served in the United States Air Force from 1950–1952, stationed in England and deployed throughout Europe and North Africa.

"A devoted husband and dedicated father and grandfather, his family was everything to him. Jack loved spending time with his wife and family, vacationing and driving his convertible on the coast of Southern Maine. He enjoyed walking the Marginal Way, Perkins Cove and eating at the Maine Diner.

"Jack had a wonderful sense of humour and was loved by all who knew him. He always took the time to know and share his thoughts with friends and colleagues.

"Jack was larger than life. He was outgoing, always cheerful and genuine to his cherished family, friends and work colleagues." Bob Gingue, AlphaGary's managing director, reflects, "While Jack brought tremendous spirit, dedication and innovation to the development and growth of plastic compounding, his true legacy is the sincere warmth and joyous love he and Betty have deeply instilled within their family. He was so important to so many. He will be sadly missed by all who knew him."

▲ *John "Jack" Gallant with his wife, Betty*

**AlphaGary Corporation – USA**
**Email**: dkiddoo@alphagary.com

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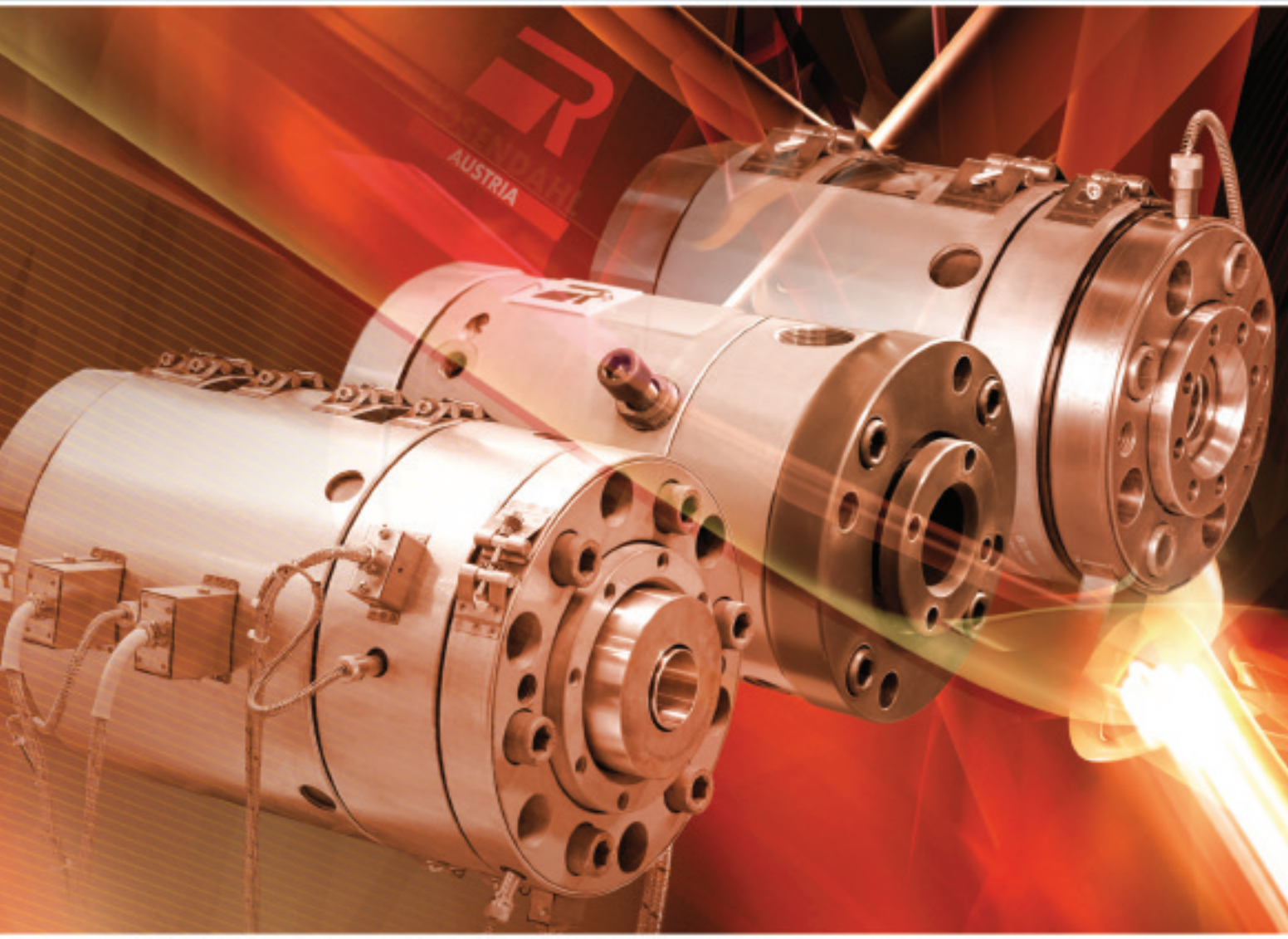


# Rosendahl Crosshead Series

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# Three new independent agents

Fort Wayne Wire Die, Inc (FWWD) and its European sales office, Fortek GmbH, have announced the addition of three new independent agents to its global sales force, expanding its reach in Eastern Europe, the Mediterranean, Australia and New Zealand.

Branislav Jerinkic is an independent representative with 13 years' experience in the wire and cable industry, primarily in the sales of tube and wire drawing lubricants. With a master's degree in chemical science and an additional 20 years' experience in the chemical industry, he is said to bring unique wire-drawing technology expertise to Fortek customers throughout Serbia, Montenegro, Croatia, Slovenia, Bulgaria, Macedonia, Bosnia and Herzegovina (email: bfgbjerinkic@sezampro.yu).

Fortek customers in Greece can call on George Symeonides of Druna Ltd. During his decade in the wire and cable industry, Symeonides has experience representing suppliers of steel and tungsten carbide rolls and cassettes, extrusion tools, carbide saw blades, graphite products, lubricants, machinery and other products (email: gps@druna.gr).

In Australia and New Zealand, Oliver Blaufelder of Machinery Forum Pty Ltd will offer Fort Wayne Wire Die customers 30 years' experience in the wire and cable industry. With a bachelor of manufacturing engineering degree and a near lifetime of touring cable plants around the world, Blaufelder offers customers highly skilled applications and service support (email: machinery@machineryforum.com.au).

For over 70 years Fort Wayne Wire Die Inc has designed and manufactured high-precision wire drawing dies and hard-material components for the wire and cable industry.

**Fort Wayne Wire Die Inc – USA**
**Fax**: +1 260 747 4269
**Email**: sales@fwwd.com
**Website**: www.fwwd.com

# Open house achieves its AIM

▲ *Visitors getting the lowdown on new AIM technology*

Over 150 visitors from across the world attended the open house staged by AIM, in collaboration with IncRMG, ENTRON, Krueger Steel and Fanuc Robotics. The event was hosted at the AIM factory in Addison, Illinois on 16th and 17th November, to coincide with the Fabtech trade show.

AIM Inc and the co-sponsors rolled out their new developments with ten machines on display, covering the majority of wire bending and manufacturing requirements. The new "Synchro" bender was especially well received.

Fanuc Robotics showcased its new, low inertia robots along with vision inspection and in-line tracking where a robot picked parts from a moving conveyor.

BF Entron demonstrated the new mid-frequency DC welding controls, welding parts produced by a 2D AIM wire bender. RMG showcased a new descaler line, feeding a wiredrawing machine that in turn fed a 16mm 3-dimensional AIM CNC bender. Krueger Steel provided all the wire used for the open house.

"The turnout was better than that of a trade show. We sold three new machines at the open house," said Constantine Grapsas, the company's founder and managing director.

**AIM Inc – USA**
**Fax**: +1 630 458 0730
**Email**: info@aimmachines.com
**Website**: www.aimmachines.com

# New shareholder in Italian WWM

Supplier of wiredrawing machines for the steel wire industry, Ernst Koch GmbH & Co KG now holds a 49% share in Italian manufacturer, Welding Wire Machineries Srl (WWM).

WWM supplies producers of welding wires around the world and, in the past, Koch has implemented many joint projects with the company. Koch expects its shareholding in WWM to result in even better cooperation in terms of the development of new welding wire machines and equipment, as well as in obtaining greater expertise in the production of welding electrodes and flux-cored welding wire.

According to executive director Jochen Koch, WWM could also partner with his long-established company when it comes to equipment that complements the drawing machines.

"Working with WWM allows us to enter the Italian market directly. This will facilitate both the distribution of our own machines and the commercialisation of our joint projects while we will also benefit from the possibility to purchase additional components and equipment," explained executive director Thomas Voss.

**Ernst Koch GmbH & Co KG – Germany**
**Fax**: +49 2372 985 167
**Email**: sales@koch-ihmert.de
**Website**: www.koch-ihmert.com

# Niehoff and Dr Menge acquire all shares in NBM

Maschinenfabrik Niehoff and Dr Rainer Menge, the industry's annealing specialist, have emerged as the sole owners of Niehoff Bühler GmbH NBM. Founded as a joint venture in 2002 between Niehoff, Dr Menge, and the rolling mill manufacturer Bühler & Co, NBM launched its production of advanced annealer technology.

In 2008 Bühler became insolvent and sought to sell its stake in NBM, resulting in the final sale and transfer of its shares to the two other founding partners. Dr Menge, who headed the NBM joint venture, has been appointed managing director of NBM which is now headquartered at the main Niehoff facility in Schwabach, Germany, where the NBM annealers are built and tested.

NBM specialises in the development and manufacture of Niehoff's RI type continuous inductive annealers for the wire industry. The annealers come in a range of sizes and have been successfully used by wire makers throughout the industry for a number of years.

**NBM GmbH – Germany**
**Fax**: +49 9122 977 155
**Email**: info@niehoff.de
**Website**: www.niehoff.de

# New CEO to steer strategy

Bridon, a manufacturer of specialist wire and rope solutions, has announced the appointment of Jonathan Templeman to the role of CEO.

Based at Bridon's headquarters in Doncaster, Jonathan's key role will be to develop a strong vision and strategy that will provide a development framework for Bridon over the next five years. He will also be responsible for reinforcing Bridon's brand, whilst strengthening the company's position worldwide. Jonathan was previously CEO with ESAB Global, a leading manufacturer of welding wires and equipment.

Talking about his appointment Jonathan said, "I am delighted at this opportunity to build on the strength and reputation of such a strong brand like Bridon. With a heavy presence in the oil and gas, mining, construction and structural markets, I look forward to expanding the business into new markets and new product areas across these industries, taking our customer service to the next level.

"Bridon has remained resilient during the recession and is now well placed to benefit from recovery in some of our end-user markets."

Bridon was originally formed in 1924 from an amalgamation of wire rope producers. Specialist manufacturing investor, Melrose PLC, acquired Bridon in 2008.

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

# 200 years of reeling

Hearl Heaton, part of Pentre Group, has celebrated its 200th anniversary. Pentre with Hearl Heaton is among world leaders in ABS (plastic flanged) high-speed process reels for the international wire, cable, telecommunication and optical fibre industry.

Pentre Group offers machinery manufacturers and wire and cable producers a selection of reels, drums and associated ancillaries from a single source. The company designs, manufactures and supplies a comprehensive range of high-speed steel and plastic ABS process reels, plywood, MDF and cardboard reels, wholly moulded plastic spools, formers and steel and wooden shipping reels and drums.

Pentre's operation is focused on developing technically advanced processing solutions for today's high-speed wire and cable manufacturing plants, including those incorporating the latest robotic handling systems.

Pentre's process reels and drums range in flange diameter from 100mm (3.9") up to specialist drums weighing up to 40 tons (designed to carry 260 tons of umbilical cable), and a comprehensive range of fully machined and dynamically balanced, precision steel reels.

**Pentre Group – UK**
**Fax**: +44 1924 400 803
**Email**: info@hearlheaton.co.uk
**Website**: www.pentregroup.com

# Institute 'springs' a new website

The Institute of Spring Technology (IST) has launched a new version of its website. Designed to be more attractive than its predecessor, and with clearer navigation, the new site provides full details of the services, equipment, testing and technical expertise available at IST.

The new site has been developed in-house and incorporates extra information, improved graphics, moving pictures and significantly more downloadable content than ever before.

Additions to the site include:

- Expanded details of IST's range of spring testing equipment
- "Meet the staff" page
- History of IST
- Information on British and European funded IST research

IST Members will also have access to their own "Members Only" area, containing information and resources to enhance the service offered to them.

**Institute of Spring Technology – UK**
**Fax**: +44 114 252 7997
**Email**: ist@ist.org.uk
**Website**: www.ist.org.uk

# Composite conductor working group for China

Fushi Copperweld, Inc has announced that the company's subsidiary, Fushi International (Dalian) Bimetallic Cable Co Ltd has been appointed to form and organise China's first ever composite conductor working group by the National Standardization Administration of China. The National Standardization Administration (SAC), established in April 2001, is authorised by the State Council of the People's Republic of China to draft, formulate, and implement state laws and regulations on product standardisation.

Upon formation, the working group will be the first standards setting body within China for composite conductors. The working group, which will draw together a number of well-known industry experts, leaders, and enterprises, will be tasked with formulating a nationwide standard for composite conductor wires within the telecommunication, electrical, automotive, railway, industrial and utility industries, as well as in other high frequency signal and power transmission areas. In 2007, the company, with the Number 23 Research Institute of China Electronics and Technology Group and other industry experts, formulated a national standard for copper-clad aluminium wire (CCA). The proposed national standard for CCA has been formally approved by the National Standards Committee and awaits industry implementation.

**Fushi Copperweld Inc – China**
**Website**: www.fushicopperweld.com

# Increased circulation a boost at wire Düsseldorf 2010

At this year's wire Düsseldorf 2010 exhibition, leading trade magazines *EuroWire* and *Wire & Cable ASIA* will be distributed to incoming visitors from a purpose-built stand in the main North Entrance to the exhibition halls (stand number EN03).

Paul Browne, group advertising manager, explains: "We have been able to secure this excellent distribution point in addition to our regular stand in Hall 11 (11D28). The additional location will ensure that all visitors to the exhibition are given an opportunity to pick up a magazine on entry to the show grounds.

"Our aim is to provide our clients and advertisers with the maximum possible coverage for their businesses during one of the most important shows in our industry's calendar. Times have been tough over the last year and we want to make sure our advertisers get maximum benefit from their investment in our magazines."

*EuroWire* magazine already has a circulation of in excess of 18,000 copies to 89 countries worldwide, whilst *Wire & Cable ASIA* magazine has a circulation of over 12,000 copies to China and Southeast Asia.

The boosted circulation for wire Düsseldorf 2010 exhibition will increase the overall circulation of the magazine by 20% to over 36,000 copies worldwide (joint circulation).

Paul Browne added: "Now we are offering a heightened service to our clients at the biggest show in our industry. We're giving our advertisers better publicity and exposure, while providing readers with a free magazine full of show highlights and the latest industry news at the world's number one wire and cable trade show."

**EuroWire, Intras Ltd – UK**
**Fax**: +44 1926 314755
**Email**: intras@intras.co.uk
**Website**: www.intras.co.uk

# 58th IWCS success!

The 2009 (58th) International Wire and Cable and Connectivity Conference took place between 8th and 11th November with nearly 1,100 attendees, 124 exhibitors, nine professional development courses and 108 technical papers. Papers presented included new and emerging technologies in materials, cable design, applications, and connectivity. Delegates from 32 countries and nearly half of the States participated, making the 58th IWCS conference a great success.

The 59th IWCS conference is scheduled for November 7th to 10th 2010, to be held in Providence, Rhode Island, and the show will be back in Charlotte in 2011.

**International Wire & Cable Symposium – USA**
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**Website**: www.iwcs.org

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# Successful FTTH conference

The inaugural Fibre-to-the-Home Middle East conference, held in Amman in November 2009, was reported a great success.

The two-day conference was held under the patronage of the Jordanian minister of ICT, His Excellency Eng Basem Al Rousan, who made the opening speech, participated in a press conference and toured the exhibition hall.

Dr Mashour Abu Daka, minister of telecommunications and IT in Palestine, gave a keynote speech, unveiling statistics that show the growing demand in high-speed Internet.

The conference programme offered a series of high-level presentations covering all important aspects of FTTH networks. This included technical sessions where the latest solutions for FTTH deployment and operation were presented. Case studies from Middle East, Europe and Asia gave insight in the day-to-day operation of FTTH networks, and a special workshop discussed the business case for FTTH.

Over 260 delegates were gathered in the Amman Grand Hyatt Zara Expo, where 14 exhibitors were presenting leading edge technologies. This is further evidence that interest for Fibre-to-the-Home is growing in the Middle East region.

All analysts speaking at the conference confirmed that there is huge potential for local FTTH take-up, contributing to the region's sustainable economic growth. Faris Awartani, chair of the FTTH Council Europe Middle East group, declared that the success of this event would encourage the "Middle East group to intensify its efforts to further promote FTTH, with studies of regional market opportunities and better information about FTTH and its benefits to society, the economy and the environment."

The next FTTH Middle East conference will be held in 2010.

**FTTH Council Europe – Belgium**
**Fax**: +32 2503 2277
**Email**: info@ftthcouncil.eu
**Website**: www.ftthcouncil.eu

# A new name in the field

Dexsen SA has launched a new company, Dexsen Asia, as a supplier of auxiliary equipment such as payoffs, take-ups, pulling caterpillars, capstans and taping heads for the wire and cable industry. Dexsen Asia is a subsidiary company of Dexsen (Belgium) Europe and a joint venture with Micro Supply Consortium Sdn Bhd (Malaysia) Asia.

All equipment is designed in Europe and manufactured in Malaysia with strict quality control and under the technical supervision of Dexsen (Belgium) Europe. It complies with all European standards. All necessary support, commissioning, after sales service, spare parts, and detailed documentation with a complete operator manual are supplied.

**Dexsen SA – Belgium**
**Fax**: +32 4369 3877
**Website**: www.dexsen.com

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## ABOUT KEMAITE

KEMAITE PRODUCTS is the professional manufacturer that produces the widely range of foils and tapes for wire and cable industry. Against excellent management system, we get the good reputation of our products and service in the global market, we will build up the bright future together with you.

## EXBOND™ TAPES

KEMAITE produces the steel copolymer tape, aluminum copolymer tape, copper copolymer tape for copper cable and optical cable.

## COMPANY CULTURE

We input the culture of "Chinese Ding" to our company culture, it shows the idea of "quality, responsibility and honor", our faith is "the quality and the customer's satisfaction is priority".

## FIREFREE™ TAPES

KEMAITE produce the mica tape and glass nonwoven fabrics for the fire resistance cable application.

## MACHINERY

KEMAITE provide the slit facility to many customers to improve the logistics and services, the slit machine has the special designation and suitable for the perfect slitting for foils and tapes.

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# 35 years of forming

British company Pave Automation has celebrated 35 years in business.

The company first developed the automation of wire forming and bending equipment during the early 1970s, when it introduced a machine for forming tubular heating element shapes. Although the initial automated techniques were actuated and controlled pneumatically, they provided valuable experience for the development of Pave's first CNC wire forming machine, the Variform 6, in 1985.

To support its active in-house research and development programme, Pave required a permanent test bed facility. This resulted in the formation of a subsidiary company, Automated Wire Bending Ltd, in 1991, now a manufacturer of formed-wire products in its own right.

Pave's focus on technical innovation produced the patented 'Trueline' wire straightening system in 1993, and a wire stabiliser unit in 1997. More recently, the company developed and introduced new software with animated touch-screen icons to speed and simplify programming.

The company's range of wire forming equipment is designed and manufactured in-house at its production facility in Peterborough, which incorporates a specialist machine shop and fabrication unit.

Managing director Tony Perna, who founded Pave in 1974, attributes the company's continuing success to its ability to innovate and produce high-quality, technically advanced machines at competitive prices. "Ongoing investment in R&D enables us to provide manufacturers with the latest and best wire forming technology to improve productivity, and because we design and manufacture in-house and sell direct, we can pass on significant cost-efficiencies to our customers."

**Pave Automation – UK**
**Email**: pave@enterprise.net
**Fax**: +44 1733 563500
**Website**: www.pave-wire.com

# Madem in Romania

Madem Group's newest manufacturing plant, Madem Romania, officially started operations in Bistrita Nasaud, Romania, with several local officials, clients, suppliers, and friends attending.

Present were Madem Group president Mr Gino Mazzoccato, administrative director Mr Rafael Romagna, accompanied by Mr Ovidiu Cretu, governor of Bistrita Nasaud, and Mr Vitor Gobbato, Brazilian ambassador to Romania.

Madem Romania is supplying local customers and, during 2010, will increase service to other countries throughout Eastern Europe.

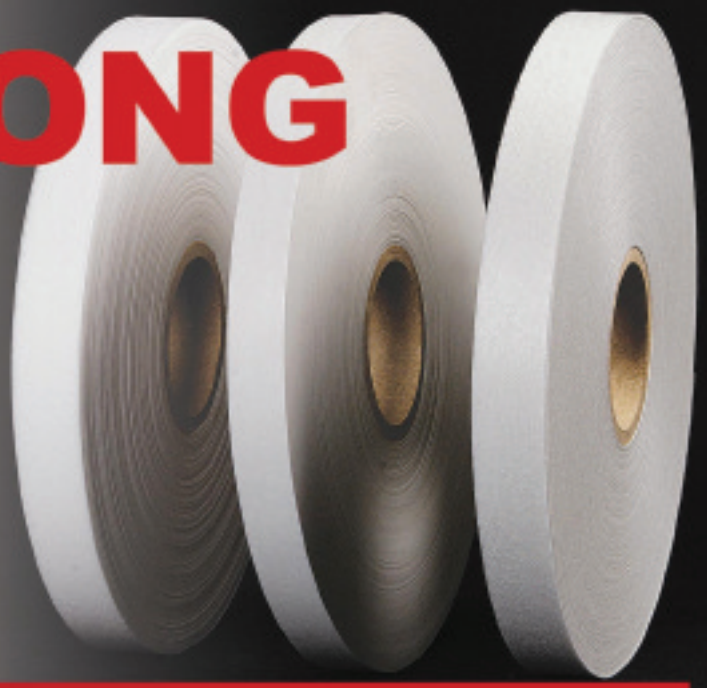
▲ *The inauguration ceremony at Madem Romania*

"Madem Romania is strategically located in a prime region boasting renewable lumber reserves and a strong customer base of small to medium sized cable manufacturers and suppliers, with whom Madem Romania has formed mutually beneficial partnerships.

"Today, along with our partners, we are proud to be part of the Eastern European market, servicing our customers while continuously striving to improve quality in our processes," says Cristian Outeiral, general manager Madem Romania.

**Madem Reels – Brazil**
**Email**: madem@madem.com.br
**Fax**: +55 54 3462 5900
**Website**: www.mademreels.com

# TIANRONG TAPES



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# New services on offer

Goodwin Machinery Ltd is proud to announce its continued commitment to the wire and cable industry with the purchase of the spares division of Cable Machinery Spares Ltd.

Goodwin Machinery Ltd is able to supply all spare parts, drawings and full refurbishment and repair services for B&F Carter Ltd, Winget Syncro, Hanson & Edwards and Babcock Wire Equipment.

Goodwin Machinery has also taken on board the gearbox repair and refurbishment service from CMS. This will continue to be carried out using the same skills and commitment as before with the added experience of Goodwin's own staff. Goodwin Machinery will continue to supply used wire and cable machinery.

**Goodwin Machinery Ltd – UK**
**Fax**: +44 1204 534415
**Email**: goodwin-ltd@btconnect.com
**Website:** www.goodwinmachinery.co.uk

# Software cooperation

InnoVites BV has contracted Crypsis to co-develop technology that allows InnoVites' customers to reduce material costs. Crypsis applies state-of-the-art optimisation technology to determine the optimal cutting plans in cable manufacturing and distribution operations. InnoVites integrates this technology in its ERP business software, helping its customers to minimise scrap and handling costs, while maintaining highest delivery performance.

**InnoVites BV – The Netherlands**
**Email**: info@innovites.com
**Website**: www.innovites.com

**Crypsis – India**
**Email**: contact@crypsis.net
**Website**: www.crypsis.net

# Prysmian acquires 51% of Ravin Cables

The Prysmian Group has taken a majority 51% controlling stake in the Indian group of Ravin Cables for an overall investment of around €26 million.

With turnover of around €45 million in the financial year April 2008 – March 2009, Ravin is among India's best known cable manufacturers, with a range including low and medium voltage cables and a market that extends to Africa and the Middle East. Apart from its principal manufacturing facility in Pune, near Mumbai, Ravin is also present in the Emirate of Fujairah with the company Power Plus Cable Co LLC, a joint venture with the Government of Fujairah, and for which it is in charge of operational management. Power Plus is already equipped to produce high voltage cables. The group has a total of 355 employees in its two facilities in India and the Arab Emirates.

"We are very pleased we have found a well-reputed, well managed and competitive partner in India who is also present in the Middle East," commented Valerio Battista, Prysmian's chief executive. "One with whom we look to pursue a growth strategy with a primary focus on development in the areas of high-tech cables for utilities as well as industrial cables. This operation also allows us to have a manufacturing presence in another strategic market."

The Indian market for high voltage cables and systems is expected to grow rapidly, doubling its size in the next three years. The new joint venture's goal is to more than double the turnover by 2012, particularly by developing the mix of higher added value products.

**Prysmian Group – Italy**
**Website**: www.prysmian.com

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### Quadromatik 400

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### Reelmatik 350D

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### Doublematik 400

Automatic spool or coil packing line for single or multi cores cables diameter from 2.5mm up to 14mm with two spool (100 meters length) and coils per minute line capacity.

### Reelmatik 350

Automatic spool winding line for multi cores flat or round cable diameter from 2.5mm up to 14mm with two spool (100 meters length) per minute line capacity.

### Coilmatik 280

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# Uhing sponsors student project

From November 2009, Joachim Uhing KG GmbH & Co will sponsor five teams of students of the Department of Mechanical Engineering of Kiel University of Applied Sciences to allow the future engineers to gather first-hand engineering experience.

The project for freshmen students, called startIng! was launched several years ago and simulates an engineer's profession. Sponsor companies, headquartered in and around Kiel, present a problem that the teams must solve within a week.

At the same time, the teams are competing for the best solution. Employees of the project sponsors and upper division students act as coaches.

Uhing's problem was to optimise an existing non-contact spool flange detection system used to automatically reverse Uhing traversing gears. A particular requirement was to reduce the space requirements and to increase resistance against damage and soiling.

The realistic experience of an engineer's daily work gave the participants the opportunity to put their vocational choice to a test.

All of the offered solutions being feasible, they were presented to a jury of academics and employees of sponsoring companies for judging. The winning team solved the problem of keeping the transmitter and receiver of a light barrier clean using rotating segmented discs.

Uhing's favoured suggestion was to exchange the delicate optical sensor with a robust ultrasonic sensor, a solution that not only reduces the mechanic complexity but also solves several aspects of the problem.

Uhing is currently investigating whether the theoretical approach can measure up to the metrological precision of a light barrier.

**Joachim Uhing KG GmbH & Co – Germany**
**Fax**: +49 4347 90640
**Email**: info@uhing.com
**Website**: www.uhing.com

# 150,000km installed base for OPGW

Prysmian Cables & Systems has reached a major milestone with its optical ground wire (OPGW) business with the latest delivery of a system which takes its total installed worldwide cable volume past the 150,000km mark.

OPGW cable forms an integral part of an overhead electricity network, performing both the primary function of a conventional earth conductor together with the provision of a state-of-the-art communications link thanks to the optical fibres contained within.

The project is being carried out with one of the main power utilities in Eastern Europe, with the cable manufactured at Prysmian's main facility at Vilanova, near Barcelona together with the production unit in Soracaba, Brazil. Prysmian also produced the optical fibres within the cable at the company's facility in Battipaglia, Italy.

Since supply of OPGW began in 1984, Prysmian's aluminium tube technology design has been installed into a wide range of environments in all five continents.

"This is an important achievement for us and confirms the commitment shown by our customers in our OPGW system over the last quarter of a century," said Mr Raul Gil, head of Prysmian's global OPGW business.

"We have now installed our system in more than 80 countries around the world and we are delighted to reach this significant point in the product's history."

**Prysmian Cables & Systems – Italy**
**Website**: www.prysmian.com

# 40th anniversary book commemorates a History of Achievement

The largest and most influential corporate membership association for the wire, cable and wire product industries is celebrating its 40th anniversary in 2010.

A new IWMA publication marks this important milestone by tracing the Association's development from 1970 to 2010. The commemorative book, "History of Achievement, Positive Future", has been sent to every current member and to many important fellow organisations, partners and contacts in the industry.

The 68-page publication needed many hours of research to compile and in addition to a narrative history of the IWMA includes an appendix of key dates, founder members, an historical list of past and present member companies, officers and board members, scholarship awardees, speakers awards and conference history.

Someone who has played a significant part in the IWMA's history and involvement with wire Düsseldorf is Manuel Mataré, a director of Messe Düsseldorf GmbH. The IWMA was delighted that Manuel accepted an invitation to write a foreword for the 40th anniversary book and for his closing remarks.

Manuel Mataré writes: "I am convinced that the IWMA will still be going strong in another 40 years' time and would like to thank the Association for giving me the opportunity of playing a small part in its history.

"I wish the IWMA all the very best for the future, and good luck."


▲ *IWMA's commemorative booklet, "History of Achievement, Positive Future"*

"History of Achievement, Positive Future" will be widely distributed at wire and cable exhibitions during 2010. Any reader interested in receiving a hard copy of the book is invited to contact the Association's Secretariat.

**IWMA – UK**
**Fax**: +44 1926 314755
**Email**: info@iwma.org
**Website**: www.iwma.org

# News of Wardwell

SKET Verseilmaschinenbau Magdeburg GmbH has acquired the assets of Wardwell. SKET had previously purchased the assets of Wardwell Europe and was also the highest bidder for the assets of the braiding machine manufacturer at auction on 14th December 2009.

A spokesperson for the German manufacturer and member of the WILMS Gruppe confirmed the acquisition and its plans to restart operations at the same location on 4th January 2010. "We are pleased to add the Wardwell brand and products to our program and offer more options to our customers.

"Wardwell has been supplying braiding equipment to the wire and cable industry for 98 years and has many prominent and loyal customers," said the source.

The new company will have a smaller work force, initially, and a new name – Stolberger Incorporated DBA Wardwell Braiding Co.

**Stolberger Incorporated DBA Wardwell Braiding Co – USA**
**Berlin email**: hbaumbach@spirka-schnellflechter.com
**USA email**: jtomaz@wardwell.com

# New use for established wire site

Webster & Horsfall, UK-based manufacturer of wire and strip products since 1720, is to redevelop its 10-acre business site in Birmingham, UK.

The company plans to consolidate its activities into 9,290m², representing around a third of the buildings on the site. Charles Horsfall explained: "For a manufacturing business, such as ours, to survive in the 21st century we need to modernise and invest, and the development of the site will generate an income stream from our surplus land."

The site, to be named Tyseley Energy Park, is well placed to appeal to other occupiers and negotiations are already under way.

**Webster & Horsfall Ltd – UK**
**Fax**: +44 121 766 5816
**Email**: sales@websterandhorsfall.co.uk
**Website**: www.websterandhorsfall.co.uk

# Fastener Fairs changes hands

International show organiser, Mack Brooks Exhibitions Group, has acquired the entire shareholding of Fastener Fairs Limited for an undisclosed figure.

Fastener Fair, which takes place in Stuttgart, Germany, is believed to be Europe's largest trade exhibition for fastener technology: 625 exhibitors and some 6,000 visitors attended the record exhibition in October 2009. A satellite event of the show, targeted to the Hungarian fastener and fixing market, is organised for Budapest in September 2010.

With Fastener Fairs Limited, Mack Brooks also acquired the Fastener+Fixing magazine.

Mack Brooks' chairman and CEO, Stephen Brooks, commented: "The highly targeted international trade show Fastener Fair fits in perfectly with the Mack Brooks portfolio of industrial trade exhibitions. We see significant potential to take forward the Fastener Fair brand as the leading event in the fastener and fixing sector."

The next event for the European fastener industry, Fastener Fair 2011, will take place from 22nd to 24th February 2011 at Messe Stuttgart, Germany.

**Fastener Fairs Ltd – UK**
**Website**: www.fastenerfair.com

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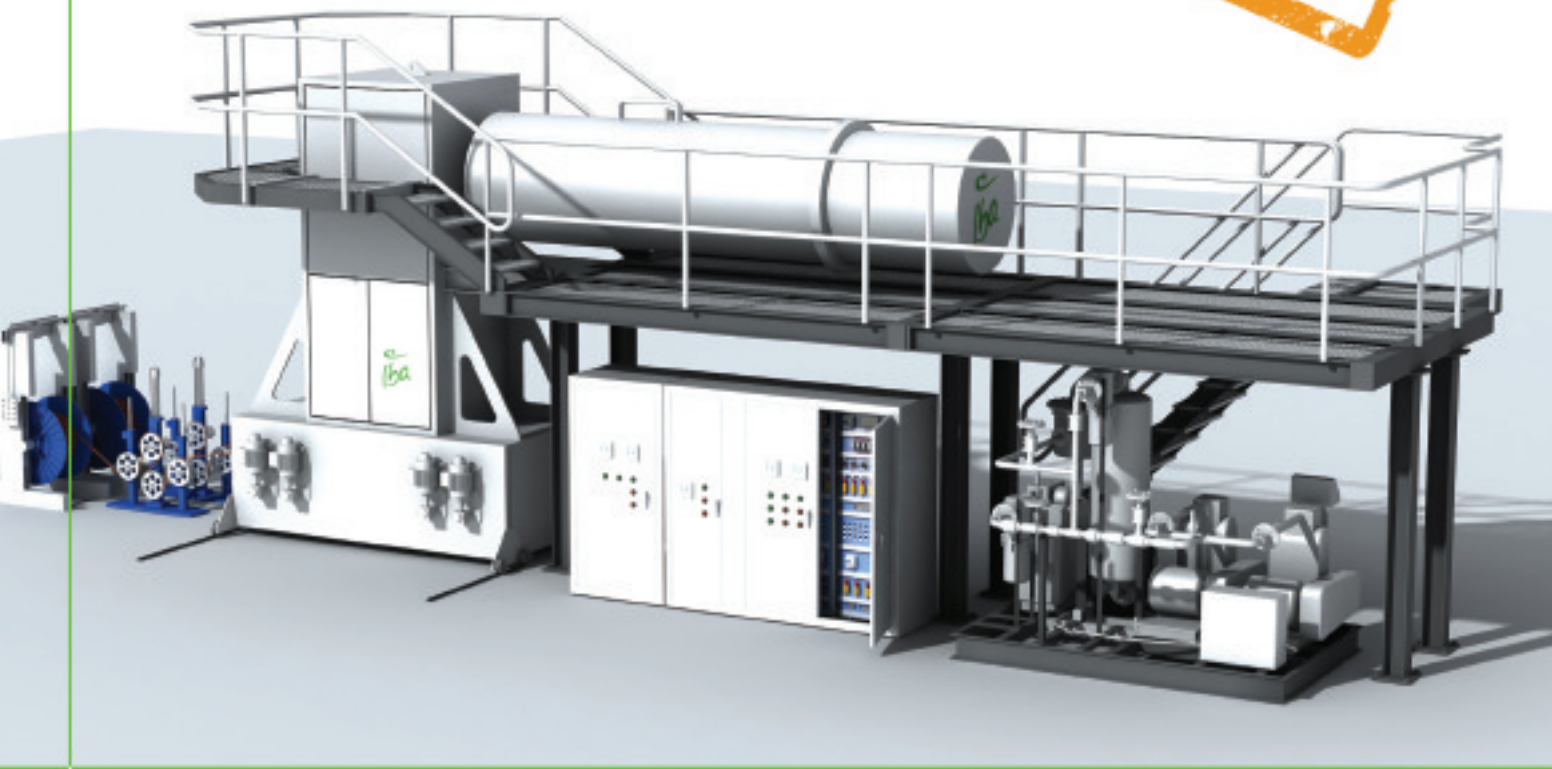

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▲ *Enkotec staff are delighted with the new buildings*

# Heat saving facelift

Enkotec A/S has completed a full renovation and facelift to its office and production buildings. The new front is constructed in glass and galvanised steel plate for long life and minimum maintenance and the construction is hoped to reduce heating loss.

Managing director Bent Petersen, commented: "I am sure this has a positive effect on both productivity and job satisfaction, and I believe that also our customers will benefit from our facelift.

"We are so thrilled with our new buildings that our stand design for the wire Düsseldorf 2010 show is based on our renewed image."

Enkotec's new image underlines the modernisation of the company products, people and strategy that has taken place since 2007, when Enkotec came under new ownership and management. During that period, Enkotec has launched several new nail machine models, as well as a threadrolling machine, and has streamlined the production based on Lean principles. There is also a strong focus on continuous staff training and using the latest manufacturing technologies. The company has indeed completed an external and internal facelift.

Bent Petersen concludes: "Our new image supports the high quality level we are working so hard to achieve at Enkotec. We are confident that we are more than ever prepared to meet the market demands within the nail industry."

**Enkotec A/S – Denmark**
**Fax**: +45 8652 4199
**Email**: sales@enkotec.dk
**Website**: www.enkotec.com

# Russian office

NOVA-S as, a producer of gabion production machinery, chain link fencing machinery and wire and strip forming machinery, has announced the opening of a new representation office in Russia.

Full details of all NOVA-S representation offices, as well as information on the product range, are available on the company website.

**NOVA-S as – Slovakia**
**Fax**: +34 6242 468
**Email**: novas@novas.sk
**Website**: www.novas.sk

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website: www.jcdofama.com e-mail: jcdofama@163.com

# New site seeks comment

OM Lesmo Group has launched a new faster, friendlier website to keep customers informed of product developments, technical information, and to link to subsidiaries who represent various European machine and product manufacturers for the worldwide wire and cable industry.

The website is still under development but, by making it available now, OM Lesmo Group is inviting users to contribute to its further development. The new website will be available in its current form for a trial period for at least the first quarter of 2010, during which time enhancements will be made on the basis of suggestions and recommendations.

**OM Lesmo Group – Italy**
**Fax**: +39 039 6981148
**Email**: info@omlesmo.com
**Website**: www.omlesmo.com



# API licence granted

For over a hundred years Remer has been producing and distributing wire ropes for industry.

In 2009 Remer was awarded the American Petroleum Institute - API licence 9A-0076. This important goal confirms the capacity of the Italian firm, and gives the opportunity to serve clients with a wider range of high performance wire ropes.

As well as the new drilling line for oil wells, Remer produces wire ropes for fishing, elevators, rockfall barriers and cranes; also plastic covered steel wire ropes, spiral strands and cable laid ropes.

**Remer Srl – Italy**
**Fax**: +39 0735 583490
**Website**: www.remer.it

# Name change

The spring wire manufacturer previously trading as Garphyttan will be exhibiting at wire Düsseldorf under its new name, Suzuki Garphyttan, in 2010.

The name was changed as of 1st June 2009 after its incorporation into the Suzuki Metal Industry Co Ltd.

**Suzuki Garphyttan – Sweden**
**Fax**: +46 19 295 101
**Email**: info.se@sg-wire.com
**Website**: www.suzuki-garphyttan.com

# Cable system for the Middle East

Indian telecommunications company Tata Communications has signed agreements with operators in the Middle East to build a new cable system for the region. The company disclosed in a statement to the Mumbai stock exchange that the cable is to connect the region to major business hubs through the Tata Global Network.

The agreements were signed with Bahrain Internet Exchange, Nawras of Oman, QatarTelecom, Mobily of Saudi Arabia and Etisalat in the UAE.

**Tata Communications Ltd – India**
**Website**:
www.tatacommunications.com

# Armendariz to guide Wire Association in 2010

The Wire Association International (WAI) has announced the appointment of Dane G Armendariz as president of the association for a one-year term that commenced on 1st January 2010.

Armendariz will serve as chairman of the board of directors and as the 56th president of the 80-year-old association.

Continuing the excellent efforts of his predecessor, the 2009 WAI president Antonio Ayala, Armendariz will lead the association's growth initiatives. Organisational priorities for 2010 will include strengthening relationships with wire manufacturers and driving more educational products into the industry.

"Armendariz's extensive experience within the industry and with WAI is extremely valuable as the association is continuously evolving to meet the needs of the industry," said WAI executive director, Steven Fetteroll.

Armendariz has been an active member of WAI since joining the organisation in 1993. He is currently serving in his second term as a member of the board of directors and is a member of the executive committee. He is the business development manager in Henkel's Steel & Coil Group, which is part of the company's Adhesive Technologies sector.

With more than 30 years' experience in the surface treatment industry, Armendariz has worked in the fields of zinc phosphate, coatings, drawing compounds, and with most processes used in the treatment of ferrous metals.

Joining Armendariz for the 2010 term will be members of the association's 2010 executive committee: first vice president Dominique Perroud, SAMP USA Inc; second vice president, Nicholas Nickoletopoulos, Sivaco Wire group; executive committee member Richard R Miller, Southwire Co; and immediate past president Antonio Ayala, JJ Lowe Associates.

## WAI at wire 2010

The WAI's wire Düsseldorf stand will display the association's publications, products and services, including *Wire Journal International, The Wire Journal International 2010 Reference Guide*, its new publication in India: *Wire Bulletin*, and a range of association technical books, reports, DVDs and videos.

Also available on the stand will be news of WAI's International Technical Conference to be held 18th–20th October 2010, in Monterrey, Mexico, as well as information about WAI membership opportunities, its chapter network and Internet site.

The WAI stand, 11B25, is also the place to find booth booking and availability information for Wire Expo 2010 (12th–13th May 2010) in Milwaukee, Wisconsin, and Interwire 2011 (3rd–5th May 2011) in Atlanta, Georgia. Interwire is the Americas' largest trade show for the wire and cable industry, and will be co-located with The National Electrical Wire Processing Technology Expo.

**The Wire Association International Inc – USA**
**Fax**: +1 203 453 8384
**Website**: www.wirenet.org

## Agreement signed

Fushi Copperweld, Inc, a global manufacturer and innovator of copper-clad bimetallic wire used in a variety of telecommunication, utility, transportation and other electrical applications, has announced that its subsidiary, Fushi International (Dalian) Bimetallic Cable Co Ltd has entered into a definitive agreement to acquire Dalian Jinchuan Electric Cable Co Ltd for approximately $10.2 million.

**Fushi Copperweld Inc – China**
**Website**: www.fushicopperweld.com

## Taihan Electric sells Prysmian stake

South Korea's Taihan Electric Wire has raised about 400 billion won ($348 million) from the sale of its stake in Italian cable maker Prysmian SpA. Taihan said in a statement that the 9.9% stake in Prysmian was sold to overseas institutional investors in a block deal. It is selling non-core assets including stakes in other firms to reduce its debt level.

**Taihan Electric Wire – Korea**
**Website**: www.taihan.com

## Tyre cord acquisition

Bekaert, producer and supplier of drawn wire products and advanced coatings, announced in February the acquisition of two Bridgestone tyre cord plants and a multi-year supply agreement. The integration of the plants is planned to strengthen Bekaert's position in the tyre cord market, while the long-term supply agreement further enhances Bekaert's status as an important external supplier of tyre cord to Bridgestone.

**Bekaert – Belgium**
**Website**: www.bekaert.com

# WCMA's 2010 Distinguished Career awards

The Wire & Cable Manufacturers' Alliance has announced the recipients of its 2010 Distinguished Career award.

The 26th annual Awards Dinner and Investiture ceremony will take place on 24th April in Hartford, Connecticut, at the Connecticut Convention Center.

The recipients will be Thomas Lascoskie, plant manager at New Holland, Berk-Tek, a Nexans company; Mike Murphy, vice president, sales Isotec and Gepco Brand Products, General Cable; Paul Palmer, chairman (retired), of Chromatics, Inc; Lori Parent, strategic accounts manager for wire and cable, Breen Color Concentrates Inc; Ron Reed, president, Horizon Wire & Cable; Ken Tober, sales manager Wire & Cable, Daikin America, Inc; Stanley Trykowski, senior research chemist, S & E Specialty Polymers, and Janis Webb, North American sales manager cabling solutions, DuPont.

The late Dick and Harriet Callahan, founders of the Wire & Cable Clubs of America, started the tradition of recognising industry professionals in 1985. Following a nomination process, a selection committee of over a hundred previous award recipients vote on the candidates.

**Wire & Cable Manufacturers' Alliance – USA**
**Website**: www.wcmainc.org

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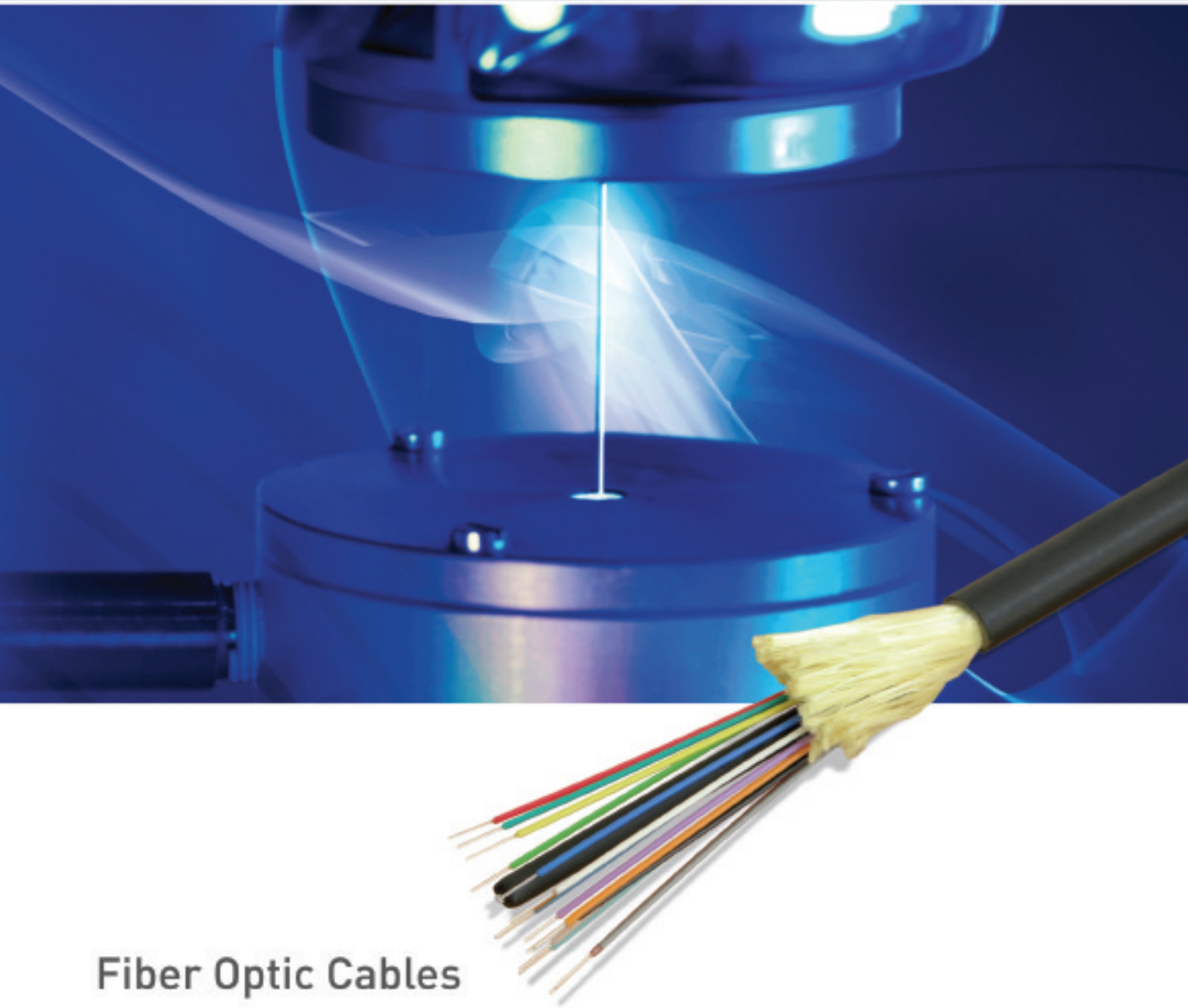

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## Telecom

### AT&T is exclusive carrier for the Apple iPad as well as the iPhone. But is its triumph over Verizon a Pyrrhic victory?

An open question is whether the most newsworthy event in the US on 27th January was President Barack Obama's first State of the Union address or the introduction by Apple Inc chief Steve Jobs of the company's iPad.

The slate-like tablet computer that falls somewhere between a laptop and a smartphone had prompted a frenzy of anticipation, notably an offer by the online gossip site Gawker of a bounty up to $100,000 for a report from anyone scoring verifiable face time with the iPad before its unveiling. Apple's threat of legal action to arrest the assault on its trade secrets did nothing to quell a clamorous public.

Now that the existence of the iPad has been confirmed (it is a half-inch thick, weighs 1.5lb, and has a 9.7" glass touch screen: "gorgeous," according to Mr Jobs), another question presents itself. What happens when the device is launched this spring? AT&T, exclusive network for the iPad, is already struggling to handle data requests from users of the phenomenally popular Apple iPhone in high-density metro areas across America. The carrier has itself acknowledged that its New York network is "performing at levels below [AT&T] standards."

Whether or not the already strained AT&T network is up to supporting the iPad was considered by, among others, staff writer Matthew Shaer of the *Christian Science Monitor*. AT&T blames the overload on data-guzzling iPhone users, and Mr Shear does not dispute that analysis. On average, he wrote in the paper's Horizons blog, "The feature-heavy phone gulps down ten times the network capacity" of other smartphones. ("Can AT&T handle the Apple iPad?", 28th January)

Possibly sensing that its victory over Verizon for an exclusive on the iPad could worsen its situation, AT&T in December said that it would take steps to rein in rampant data usage on the iPhone. "Incentives" offered to bandwidth hogs might include pay-per-use plans that meter monthly activity, or a pricing structure with graduated limits on how much data each phone may download.

The trouble is, iPhones come with an unlimited data plan, and at least some of the more than 42 million iPhone owners around the world have taken the trouble to read the fine print in their contracts. It has been called to the attention of AT&T that availing oneself of too much of something that is unlimited is impossible.

- Three models of the iPad ($499 to $699) will connect to the Internet by means of local Wi-Fi connections. Three later versions including 3G wireless access will cost an additional $130 and require a data plan from AT&T. Currently, Apple is offering two monthly options for the original iPad: unlimited ($29.99); and limited to 250 megabytes ($14.99).

  This set Mr Shear to wondering whether the iPad's 250MB monthly cap will mark the beginning of tiered pricing for the iPhone. Whether it does or not, he concluded, "The iPad will no doubt add more strain to an already encumbered network. And, for Apple, tethering the iPad to the fortunes of AT&T seems like a risky bid."

### Smartphone rivals Apple and Nokia trade accusations of patent infringement

In other news of Apple Inc (Cupertino, California), the company on 15th January filed a new patent infringement complaint with the US International Trade Commission (ITC) against the Finnish mobile devices giant Nokia. Setting the tone of the intensifying quarrel between two of the world's biggest names in smartphones, Bruce Sewell, Apple's general counsel and senior vice president, said in a release, "Other companies must compete with us by inventing their own technologies, not just by stealing ours."

Nokia, the world's largest maker of mobile phones, in December had lodged its own complaint with the ITC against Apple. The allegations here claim that Apple's iPhone, iPod and MacBook products, among others, had made use of Nokia patents. Apple, for its part, is alleging that Nokia replicated particular features of Apple's iPhone and violated 13 of its patents.

"It is almost inevitable for debates to surface, given that the smartphone market is the industry's most competitive and fastest-growing area," wrote Caroline Dobson of the *Epoch Times*. She cited *Bloomberg News* data as showing a third-quarter 2009 drop to 39.3% in Nokia's share of the market, from 42.3% a year earlier – to the presumed advantage of Apple and the Canadian firm Research In Motion. ("Nokia and Apple Locked in a Heated Patent Dispute," 21st January)

## The economy

### Good news raises consumer morale, but impact on the economy awaits an upturn in the labour market

Experienced bettors know that the most valuable piece of information they could obtain about a horse is ever outside their grasp: how the animal feels on the day of the race. Fortunately for those wagering on the economic expansion of the United States, the people whose spending accounts for some 70% of the US economy are able to disclose how they feel; and in January they did so. They are feeling better.

According to the Reuters/University of Michigan Index of Consumer Expectations, confidence among American consumers improved in January to the highest level in two years as the economic expansion prompted companies to slow the rate of job cuts. That is a far cry from job creation, but enough to boost consumer sentiment almost two points above the reading for December – a remarkable increase in only a month's time.

Stocks rose on publication of the well-regarded report – an official component of the Index of Leading Economic Indicators

devised by the US Department of Commerce. Within an hour, the Standard & Poor's 500 Index increased 1% to 1,094.86 in New York. The Reuters/Michigan news moreover coincided with the separate release of figures showing faster economic growth in fourth-quarter 2009 and in January, including stronger-than-anticipated results from a survey of Chicago-area purchasing managers.

According to the Commerce Department, the world's largest economy grew at a 5.7% annual rate in the final three months of 2009, the fastest pace in six years. The economy has been able to grow without taking on workers because of the extraordinary productivity of the workers already in place.

With orders on the increase, companies in January expanded at the quickest pace in more than four years. The Institute for Supply Management-Chicago Inc said its business barometer for the month climbed to 61.5, the highest level since November 2005, from 58.7 in December. Readings above 50 signal expansion.

- "Signs of a recovery are becoming increasingly visible to consumers," Ryan Sweet, a senior economist at Moody's Economy.com (West Chester, Pennsylvania) told *Bloomberg News*. "We're seeing some of the improvements in consumer confidence paying dividends to spending." ("Confidence among US Consumers Gains a Second Month amid Fewer Job Cuts," 29th January)

  But he also observed that consumers remain nervous about their jobs. In the same week, Federal Reserve policy said that, even as consumer spending picks up it is being constrained by a weak labour market. And *Bloomberg*'s Vincent Del Giudice wrote that further improvement in consumer sentiment sufficient to release purchasing power and sustain the recovery depends on job creation.

- President Barack Obama took the opportunity presented by the economic upturn to promote his proposal for a temporary tax credit to jump-start hiring. A firm that takes on a new employee in 2010 would receive a credit up to $5,000 against its income tax. Alternatively, a company that awards a raise in salary above the inflation rate could claim an income tax credit equal to the additional Social Security taxes it would pay on the increase.

  As an encouragement to early hiring the tax credit, which requires Congressional approval, would be available to employers on a quarterly basis. It would also be retroactive to the start of the year. The credits would be capped at $500,000 for each business. According to a source within the administration, one million businesses could be expected to take advantage of the credit, the great majority of them small companies.

  "Now's the perfect time for this kind of incentive because the economy is growing but businesses are still hesitant to start hiring again," Mr Obama said on a 29th January visit to Chesapeake Machine Co (Baltimore, Maryland), which makes heavy steel parts and industrial equipment and relies increasingly on defence contracting projects. The company laid off four workers last year but currently is looking to hire a machinist.

# Transatlantic Cable

***In brief . . .***

❉ Eight years after the 9/11 terrorist attacks in New York, and despite several directives from Congress, the US still has no reliable system in place for verifying that visitors from overseas have left the country.

The most recent available information, for 2008, indicates that 2.9 million visitors on temporary visas checked in but never officially checked out by the end of the year. Over all, immigration authorities have said, about 40% of the estimated 11 million illegal immigrants in the US came on legitimate visas and overstayed.

Since the attacks, immigration authorities, with more than $1 billion from Congress, have improved and expanded their systems for monitoring other nationals when they arrive. But no biometric inspection or systematic follow-up is in place to confirm their departure.

Recently there have been renewed calls in Congress for the Department of Homeland Security to perfect and activate a universal electronic exit monitoring system. The Christmas Day 2009 terrorist attempt to blow up an airliner over Detroit is certain to intensify this pressure.

## Monetary

### Russia turns to the Canadian dollar in a bid to lower its dependence on the US greenback

Russia's central bank announced on 20th January that it had started buying Canadian dollars and securities in a move to diversify its foreign exchange reserves.

As noted by Peter Garnham in the *Financial Times*, analysts said the action could be a precursor of greater diversification of emerging-market central bank assets away from the American dollar and into investments denominated in other commodity-linked currencies, such as the Australian dollar.

Ahead of the announcement, Russia's foreign exchange reserves were roughly split between euros and American dollars, the world's most widely held currency. (Specifically, the reserves stood at 47% US dollars; 41% euros; 10% pounds sterling; and 2% yen.)

Although the Bank of the Russian Federation did not specify how much of its reserves it was allocating to assets denominated in the Canadian dollar, analysts estimated that it could put up to 2%, or $9 billion, of its foreign exchange reserves into the currency.

Writing in the *Business Insider* [22nd January], Vincent Fernando observed that Russia's "direct snub" to both the euro and the greenback could, if other central banks follow suit, be good news for Canada's dollar. He noted unconfirmed reports by traders that other emerging-market central banks – including some in Asia that hold large foreign exchange reserves – had also been active in the foreign exchange market, buying both Canadian and Australian dollars.

Russia's foreign exchange reserves, the world's third largest, stood at $439 billion at the end of last year. These stockpiles have grown by 14% since the start of the rally on global asset markets in March 2009 as rising commodity prices have filled the coffers of mineral-rich Russia.

- China, which has more than US$700 billion in its foreign currency reserve, the world's largest, recently called for the creation of a new global currency to replace the US dollar. But John Greenwood of Canada's *Financial Post* points out that the greenback is still by far the reserve currency of choice, accounting for 64% of total central bank holdings, and that diversification out of it holds some perils.

  The worry, he wrote on 25th January, is that the trend toward diversification "could turn into a disorderly flight, with potentially devastating currency volatility especially for the smaller countries that get caught in the crossfire."

  Analysts consulted by Mr Greenwood said they believe this is the last thing Russia and China want, as it would devalue their US holdings. Apropos of Canada, Axel Merk, chief investment officer at Merk Mutual Funds in Palo Alto, California, noted that because of the small size of Canadian dollar issuance relative to other currencies, the nation doesn't come close to providing any kind of a solution for Russia and others looking to get away from US exposure.

  "Central banks are trying to diversify but it's very difficult because the US dollar is the deepest and most liquid market in the world," Mr Merk told the *Financial Post*. "Nevertheless they try, and Canada is one of the beneficiaries."

## Steel

- Global crude steel production dropped 8% in 2009, but analysts expect a rise of around 10% this year. The pace of growth will likely be faster in the developed world, which saw falls of over 30% in output last year. The hardest-hit region in terms of steel production was North America, where output dropped by almost 34%. The US total fell 36.4%, as compared with a 22.8% drop for Europe.

  Figures released 22nd January by the Brussels-based World Steel Association, whose members account for 85% of steel output, show production worldwide of 1.22 billion metric tons of crude steel in 2009. Once again China dominated the sector, with production up 13.5% for a record high of 567.8 million metric tons. This represents 46.5% of total world output for the year. Japan followed China as the world's second-largest producer, while Russia has taken over third place from the United States.

- US Steel (Pittsburgh), the largest of the domestic steel makers, reported improved results for the last quarter of 2009 as compared with the third quarter, attributed mainly to higher shipments and average realised prices, and better utilisation rates for the company's flat-rolled operations. The flat-rolled segment raised its capacity utilisation to 64% from the 58% rate of the third quarter.

# Transatlantic Cable

CEO John P Surma said the modest advance was driven, primarily, by the North American automotive and service centre markets, and by the return to profitability of the company's tubular operations, which generated $39 million in income for the quarter.

While the year as a whole was less rewarding for USS, it did chalk up $11 billion in total sales, surpassed only slightly by Nucor with $11.19 billion. USS pulled back on capital spending in 2009, investing $470 million instead of the $740 million projected for the year.

❉ Nucor (Charlotte, North Carolina) announced consolidated net earnings of $58.9 million for the fourth quarter of 2009, after three consecutive quarterly losses. Average price-per-ton of steel sold increased 4% from third-quarter 2009 but was down 35% from the fourth quarter of 2008. Total shipments were 4,638,000 tons in fourth-quarter 2009, a decrease of 9% from the third quarter but 8% higher than in fourth-quarter 2008. For the full year 2009, Nucor reported a consolidated net loss of $293.6 million, compared with net earnings of $1.83 billion for 2008.

Nucor's good news lay in its strong liquidity position: $2.24 billion in cash, cash equivalents, and short-term investments, plus an untapped $1.3 billion revolving credit facility that matures in November 2012. Pre-operating and start-up costs of new facilities increased from $128.6 million in 2008 to $160 million in 2009. These costs related mainly to the SBQ mill in Memphis, Tennessee; the Castrip(R) project in Blytheville, Arkansas; and a proposed iron-making facility and the galvanizing line in Decatur, Alabama.

The good news for Nucor's stockholders of record on 31st December 2009 was the announcement of a 2.9% increase in their cash dividend. Noting that this is its 147th consecutive quarterly dividend, Nucor said on 26th January that it expects an improvement of approximately 5% in steel mill shipments in first-quarter 2010, together with "significant increases" in both sales prices and scrap costs.

❉ The last quarter of 2009 also showed a mild uptick in US steel imports, suggesting nascent recovery after a year in which steel imports of 16.2 million tons totalled 49.3% less than the 32 million tons imported in 2008. According to preliminary government reports cited by the American Institute for International Steel, imports inched up to 1.4 million tons in December from 1.3 million tons in November. This represents a 1.3% increase as compared with a 32.5% decrease in the corresponding report for December 2008.

"Early in 2010, there are some signs that demand is improving," said David Phelps, president of AIIS. "But whether [this] is merely a restocking of inventories or reflects a systemic improvement in demand is unknown at this time."

As reported by Thomas L Gallagher in the *Journal of Commerce* [29th January], Mr Phelps cited the increase in imports from America's partners in the North American Free Trade Agreement (NAFTA) as "the positive element in the import data for December." Canada and Mexico, he said, react more quickly than offshore suppliers to demand conditions in the US market.

***Of related interest . . .***

- Leggett & Platt (Carthage, Missouri), a producer of drawn steel wire, reported fourth-quarter 2009 net profit of $35.2 million compared to a loss of $18 million for the same period of 2008.

  Revenue was $770 million, 13% lower than the $883 million posted in fourth-quarter 2008. For the full year 2009, net profit from operations was $111.8 million, up from $104.4 million in 2008. Revenue for the year was $3.06 billion, 25% lower than the $4.07 billion posted in 2008. Leggett attributed its higher profit, on lower sales, to a successful effort in cost reduction. The company projects sales of $2.9-3.3 billion this year.

- Demand from China is driving the nickel market, which seems set for price stability throughout 2010. "Nickel: Market Outlook to 2014," from London-based Roskill Information Services Ltd, ties this stability to a market surplus of around 75,000 tons this year and continuing to rise through 2012.

  The annual average nickel price is forecast at around $20,000 per ton for 2010, to rise to just over $22,000 per ton over the period through 2012.

  As to nickel consumption, Roskill forecasts a global increase of around 7% in 2010, after a three-year period of falling demand. The expected continued rise in demand for nickel will parallel a commensurate increase in demand for stainless steel, which typically has 5%-25% nickel content.

  Production of stainless is forecast to reach 27 million tons in 2010 (for an 8% increase year-on-year) and almost 30 million tons in 2011.

## Automotive

### After celebrating its Golden Anniversary in the United States, Toyota has fallen on hard times

Over its half-century in the US, Toyota Motor Corp earnestly pursued an ambition of becoming the number 1 car maker anywhere. It achieved that goal in 2008 by passing General Motors, world leader since 1931.

But the Japanese company has since suffered a breathtaking reversal of its American fortunes. On 28th January, a House committee scheduled hearings into a series of Toyota recalls that spread from the US to Europe and China and seriously damaged what had seemed an invulnerable reputation for quality and safety.

The prospective Congressional scrutiny into problems with the accelerator pedal on Toyota cars has prompted the recall of millions of vehicles around the world and a halt to production and sales in the US and Canada of eight models that could be affected by the malfunction.

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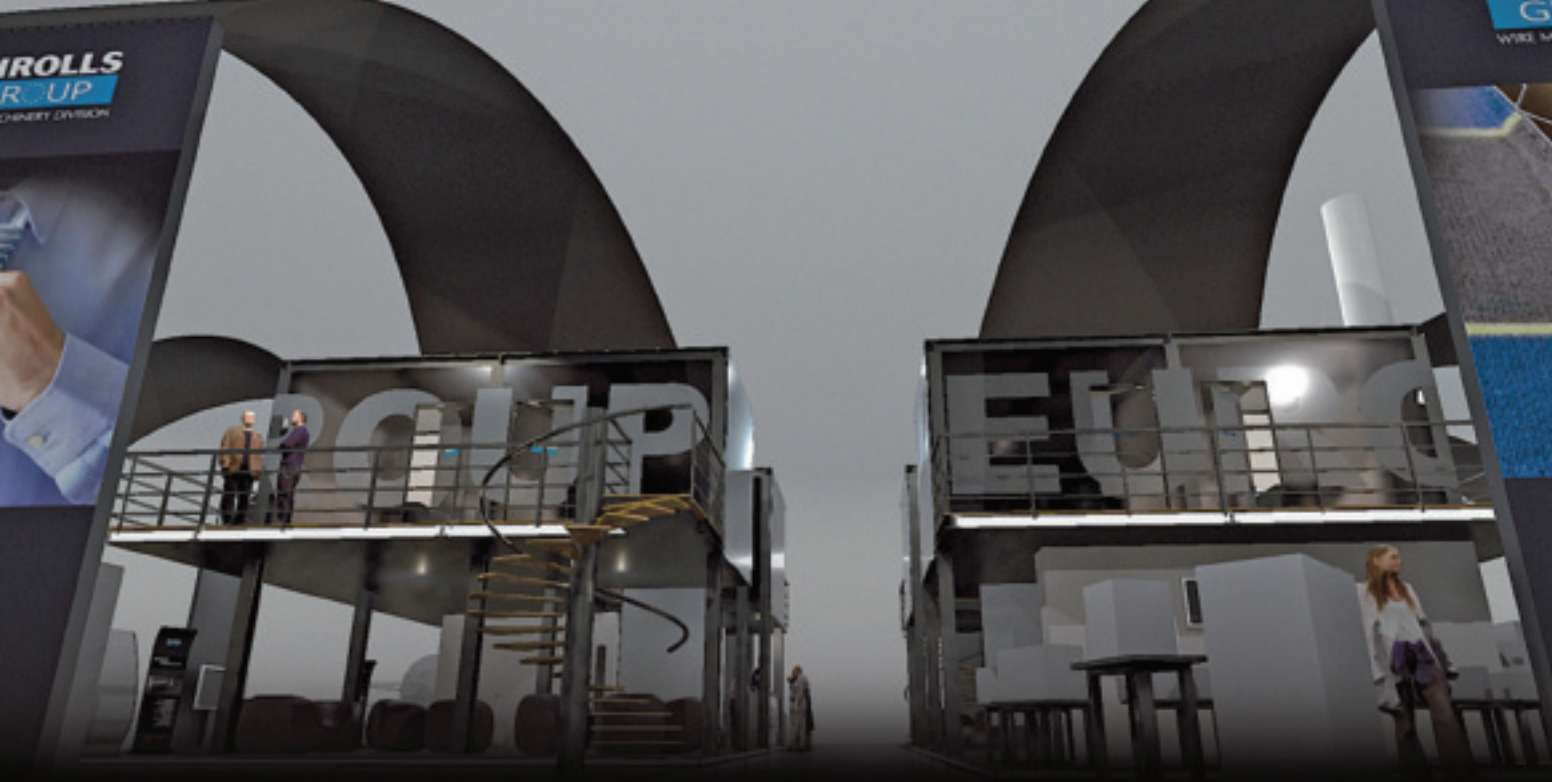

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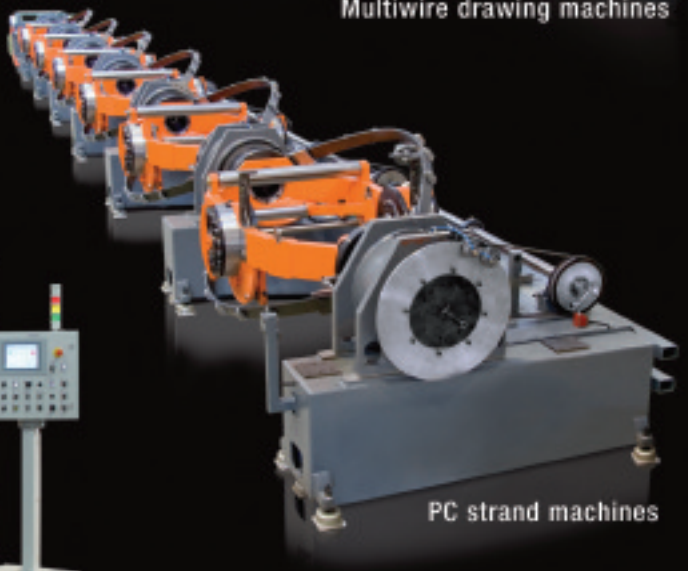

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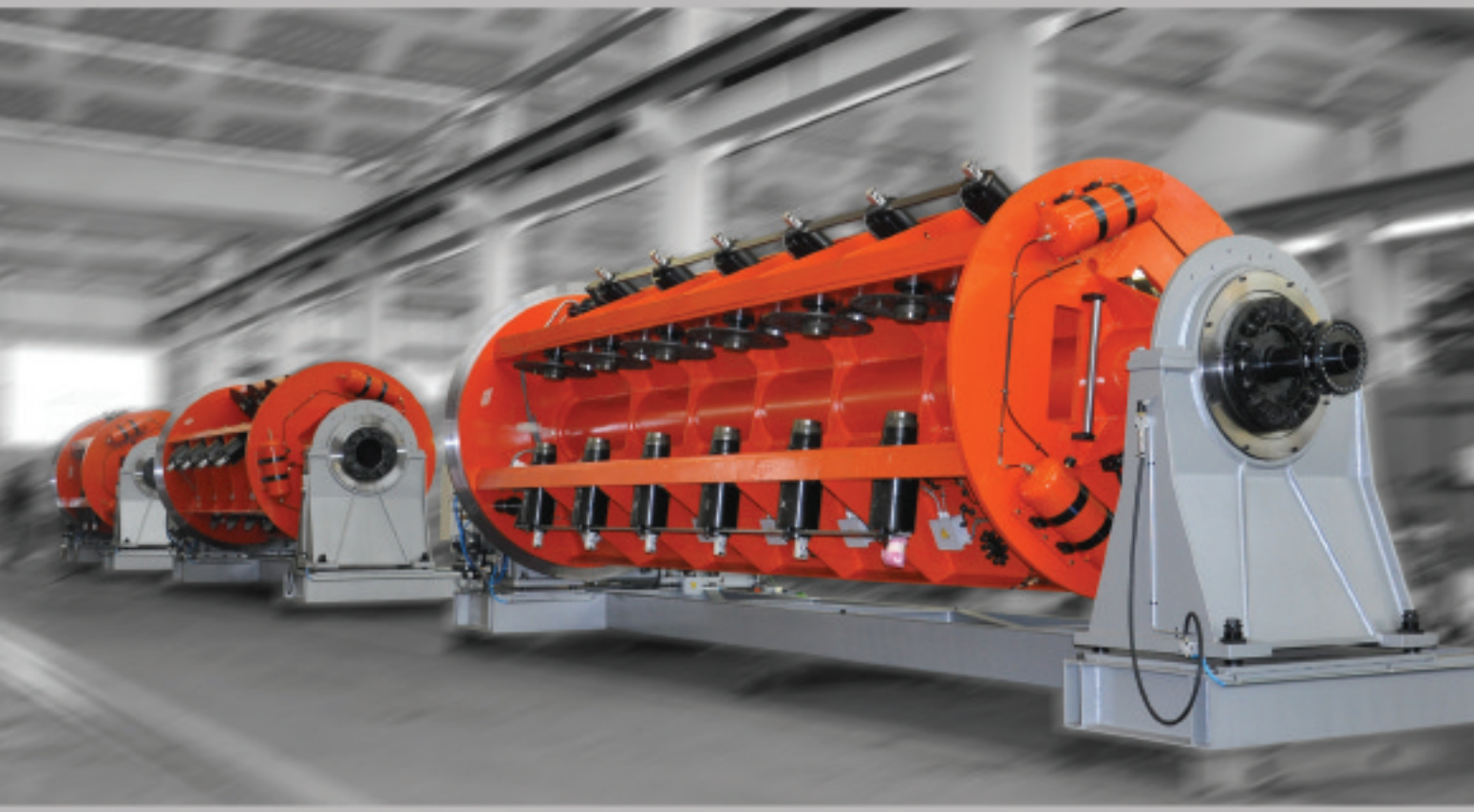

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The company also expanded a previous recall in which owners were told to remove the floor mats on their cars to avoid jamming the pedals.

In the view of Jake Fisher, a senior automotive engineer with *Consumer Reports*, the situation was the most critical Toyota has faced in the United States.

"There had been some cracks in their armour, but I don't think we've ever seen anything to this magnitude," Mr Fisher told the *New York Times*. "We've never seen multiple production lines shut down. If you go to a Toyota dealer right now, they can't sell you a Camry. They can't sell you a Corolla or a Highlander." ("US House Committee Plans Hearing on Toyota Recall," 29th January)

The House Energy and Commerce Committee was to hold a hearing on 25th February to examine complaints from Toyota drivers that the gas pedal sticks in the depressed position, causing the car to speed up uncontrollably.

Reporting from Detroit, the *Times*'s Micheline Maynard noted that, with the involvement of the law makers, Toyota now faced the most publicised investigation in the industry since the recall, in the year 2000, of Firestone tyres on some Ford models.

"The committee said sudden unintended acceleration in all Toyota vehicles had resulted in 19 deaths in the United States over the last decade," wrote Ms Maynard. "That is nearly twice the number of deaths associated with similar events in cars built by all other auto makers combined."

Toyota said it welcomed the opportunity to appear before the committee and pledged its full cooperation. The company said also that that it was working with the manufacturer of the accelerator pedals – CTS Corp (Elkhart, Indiana) – to develop and test modifications for the cars owned by Toyota's US customers.

❉ As to its clientele in Europe, Toyota said it had not yet, in late January, determined which models and how many vehicles might be affected by a recall there. But it added that it had already made necessary changes to its European production lines to obviate any need to curtail output.

In China, the Toyota recall includes about 75,000 RAV4 sport utility vehicles made in 2009-10, according to the website of the General Administration of Quality Supervision, Inspection, and Quarantine — the Chinese government's product safety watchdog.

"In addition," wrote Ms Maynard of the *Times*, "Ford Motor Company said [28th January] that it had stopped production of some commercial vehicles in China because they used the same accelerator pedals built by the supplier whose products led to Toyota's recall."

**Dorothy Fabian**
**USA Editor**

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# Why fibre optics ?

**by Dorothy Fabian**

The question produces two immediate answers: (1) fibre optic cables allow for faster and clearer transmission of signals; and (2) fibre optic cables can span greater distances, with all that that implies for more efficient connectivity.

A fuller response might make reference to the greater durability of fibre optic cables, their stronger resistance to tension, their lower price.

No need to ask: faster, clearer, greater than what? Stronger, cheaper than what? The implicit comparison is with copper cable, about which enthusiasts of optical fibre tend to be dismissive. They assert that copper wires are delicate and difficult to maintain; that the sole superiority, if any, of copper cable lies in its ease of termination; that, in any case, copper is in chronically short or at least uncertain supply.

Copper, say the fibre people, is a retrograde and wrong-headed choice for advanced telecom purposes.

The benefits of fibre optic cable are incontrovertible. More robust than copper wire to signal degradation, low-loss optical fibre allows for longer intervals between amplifiers and repeaters. Together with the fact that no further propulsive power is needed once the signal has been sent, this means a lower power requirement over-all. Fibre cables laid in parallel are not susceptible to crosstalk.

Because optical fibres are thinner and lighter-weight than copper wire, cable of the same diameter will accommodate more of them than if it were filled with copper wiring. And fibre is famously indifferent to the company it keeps, permitting installation of opportunity such as alongside rail beds and utility and power lines.

As to capacity, many optical networks can send 1 terabit/second (Tbit/s) of information. The theoretical maximum for optical fibres is 350Tbit/s. Advanced copper DSL (digital subscriber line) systems can send 50 megabits/second (Mbit/s) of information. The theoretical maximum for copper cables is 1 gigabit/second (Gbit/s).

Last, but scarcely least: in typical (long) lengths, optical fibre costs much less than equivalent measures of copper wire.

Why, then, if fibre is manifestly superior, does King Copper retain its prestige in the telecom industry?

For one thing, here, as in many other sectors, possession is still nine points of the law; and most telecom networks now in operation were built on metal wiring, mainly copper. Installing fibre optics into a network is an expensive proposition. At a very conservative estimate, it will cost a phone company $1,000 per subscriber for an FTTP (fibre-to-the-premises) installation.

Short-distance (box-to-box, even chip-to-chip) and relatively low-bandwidth applications do exist; in fact they are not uncommon. For these, electrical transmission (ie via copper) is preferred. Copper offers greater ease in the operation of transducers in linear mode; and, for custom-designed cables, the red metal's dual capability in electrical and signal conductance is a considerable plus.

Even the most confirmed proponent of fibre will likely concede that it is more difficult and expensive to splice than copper wire. And, at high optical strengths, fibre can be vulnerable to destructive fusion if the light should meet with even a minute imperfection. Fibre fuse detection circuity at the transmitter is an effective preventive device, but an additional expense.

Finally, as to the cost of materials, in smaller quantities copper is priced lower than fibre; as are transmitters and receivers for copper-based systems.

Optical fibre and copper are central to the development of the global telecommunications industry. Both are indispensable; their respective contributions to telecom infrastructure – incalculable.

Is one superior to the other?

Once upon a time, when asked for the distinction between the Major and the Minor Prophets, an unprepared but resourceful student answered, "Far be it from me to draw any comparison between these wonderful men."

▲ *The double-furnace casting line supplied to Vatan Kablo, Turkey*

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Upcast is described as a 'green' technology; only electricity, compressed air and cooling water are needed to run the process, and no harmful emissions are released. With direct environmental effects said to be 'practically nil' Upcast Oy has concentrated on the indirect effects, especially energy consumption, which also has an economic dimension. New developments with such twin-acting characteristics have been labelled GREENerCAST technology.

GREENerCAST developments include improved refractory materials to reduce heat losses, fast switching power transistors (FSPT) to lower energy consumption, and double loop inductors with a special channel design that enhances heat and mass flows and reduces cooling needs for the inductor.

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Yangzhou Qunye Electrical Machinery Factory is a developer and manufacturer of machine spools for cable and lines.

The company has over twenty years of experience and a technical team dedicated to product development and technical support for customers.

Qunye products are sold widely at home and exported to Europe, the USA, Australia, the Middle East and South-East Asia. Qunye continues to develop, to keep pace with future trends in the international wire and cable field.

Qunye product lines include the PND series double line high speed spools, PN series punching type machine spools, creel stand, plastic spools, PC, PL series spools and spool tools.

A range is available to suit wire, optical fibre cable, data communication cables, high voltage, middle and low voltage cables, all kinds of steel wire and steel cord. Non-standard products are available according to design and draft by clients.

All production is strictly in accordance with national and international standards, certificated by ISO9001, 2000.

**Yangzhou Qunye Electrical Machinery Factory – China**
**Fax**: +86 514 738 3456
**Email**: qunye@qunye.com.cn
**Website**: www.qunye.com.cn

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**Tel. +49 2543 93100 www.dornieden.de**

**EMA Indutec GmbH**
**D - 74909 Meckesheim Germany**
**Tel. +49 6226 7880 www.ema-indutec.com**

# New furnace technology

Agibi Progetti states that its new family of horizontal chamber furnaces for spring tempering allows energy saving with environmental compliance.

The Progetti patented No Smoke System totally eliminates fumes (they are converted into harmless air components) and does not need a chimney, even with very oiled springs. The system is also said to be very low maintenance. An automatic four-station basket loading system facilitates running the line overnight, when power costs are reduced.

The insulating material used for the furnace coating, developed by NASA researchers, maintains the temperature of the external panels at under 40°C and so saves energy. The inside ventilation conveyor system maintains even distribution of the inside temperature, even when loading the furnaces with four to eight baskets.

Temperature control is by high-accuracy microprocessors and by controlling the motors through frequency converters for adjusting the speed to the production requirements.

The tempering process is a key issue for spring manufacturing costs, but is also an ecological matter relating to air pollution. For this reason the No Smoke System is used in all spring tempering furnaces produced by Agibi Progetti.

**Agibi Progetti Srl – Italy**
**Fax**: +39 045 9230408
**Email**: info@agibiprogetti.it
**Website**: www.agibiprogetti.it

▲ *Furnace technology from Agibi*

# Bell annealer

Ebner has received an order from United Wire Factories Co, Riyadh, Saudi Arabia for a Hicon®N2 bell annealer facility. The scope of supply includes two Hicon N2 workbases, two heating bells, two cooling bells, a control centre and ancillary equipment.

The facility will be used to recrystallise bailing wire in a nitrogen process atmosphere and is scheduled to start production in the first quarter of 2011.

**Ebner Industrieofenbau GmbH – Austria**
**Fax**: +43 70 6868 1000
**Email**: sales@ebner.cc
**Website**: www.ebner.cc

▲ *All coils run automatically on the FC5 coiler*

# Feedback for the FC5

Kajote Oy, purchasers of the first installed FC5 coiler from Windak, has confirmed that the machine is proving its worth.

Peter Jokinen, development director of Kajote OY, states, "We are really happy with this versatile machine. It suits us well in our small factory with a wide assortment of different cables and cable types. Now we can also promote retailed coil sizes exactly to customer needs. Last week we fulfilled an order of mixed coil sizes of 5m, 10m, 15m, 20m, 30m and 200m, without any problems."

**Windak Inc – USA**
**Email**: info@windakusa.com
**Website**: www.windakusa.com

# Cross wire welding

A new T-Welder, or cross wire welder, system module is successfully producing cross welded frames used for filters, refrigerators, shelving, store fixtures, displays, oven and grill frames.

The T-Welder from AIM Inc complements the standard AFM 2Dx machines with a butt-welder and a servo transfer. The AFM 2Dx machine automatically produces wire frames, which get butt-welded and then transferred into the frame hopper of the T-Welder system. A separate wire feeding module straightens, feeds and cuts individual wire pieces for automatic cross welding into the frames, positioned automatically by a frame carriage.

All dimensions are programmable. A multi-axis multi-tasking servo controller controls production and allows the system to produce up to 700 T-welded frames per hour. Three phase DC mid-frequency welding controls provide efficient electric load and welding accuracy.

The T-Welding System is available to stand alone or as an addition to a welded frame production machine for a total self-controlling, automated, cross-wire welded frames production cell.

Two models are available, covering up to 1m x 1.9m (39"x 48") frames using wire of up to 10mm diameter.

**AIM Inc – USA**
**Fax**: +1 630 458 0730
**Email**: info@aimmachines.com
**Website**: www.aimmachines.com

# Bright annealing of shaped wire

A new Rad-Con 100% hydrogen annealing furnace system has been commissioned for Charter Wire's new facility in Menomonee Valley, Wisconsin.

Charter Wire moved its manufacturing facility to a new location last year, and called on Rad-Con Inc to replace old batch annealing capacity with 100% hydrogen annealing, the latest technology available.

Charter, a supplier of shaped steel bar and wire products, will utilise the Rad-Con annealing system primarily for recrystallise annealing of low-carbon drawn wire. The new system also gives Charter the capability to anneal alloy steels.

Rad-Con's FlexLoad™ plenum allows Charter to load a variety of coil packages. The system includes a rapid hydrogen cooling spray-water feature, and Rad-Con's AC/APEx™ atmosphere control for regulation of heating rates and atmosphere flows.

This system also includes Rad-Con's super-high convection (H2SHC™) technology for superior atmosphere circulation resulting in uniform material properties with low utility costs.

**Rad-Con Inc – USA**
**Fax**: +1 216 221 1135
**Email**: sales@rad-con.com
**Website**: www.rad-con.com

▲ *Rad-Con technology has been adopted at Charter Wire, Wisconsin*

# Wire pointing equipment

Friedrich Krollmann GmbH is a manufacturer of pointing machines and handling equipment of all types and sizes for wire, bars, rods, profiles and tubes.

The company's production programme includes roll-pointing machines, threading and pointing machines, point-milling machines, hydraulic tube-pointing-presses and scrap bundling machines.

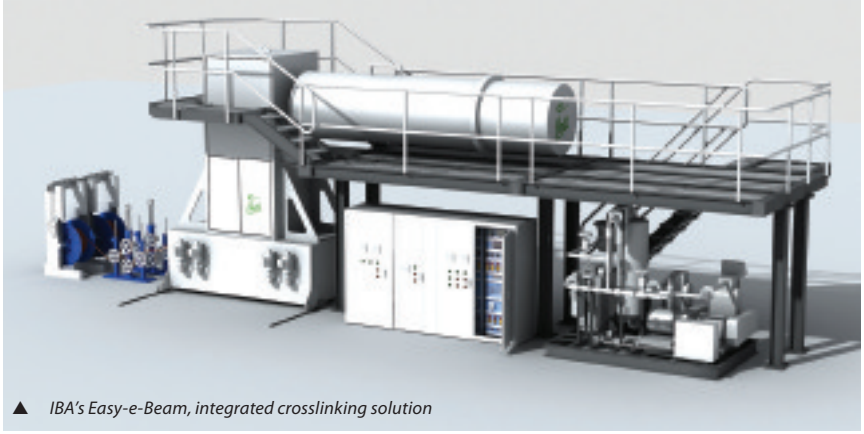
**Friedrich Krollmann GmbH & Co KG – Germany**
**Fax**: +49 2352 50822
**Email**: info@krollmann.de
**Website**: www.krollmann.de

# Crosslinking polymers for insulation

Ionizing energy, as provided by an accelerated electron beam (EB), is an efficient means of crosslinking polymers used for wire and cable jacketing. In this process, chemical bonds are formed between polymer molecule chains to produce a three-dimensional insoluble network.

This can be done without heat. In most instances ionization causes the abstraction of an atom of hydrogen from a polymer to produce active sites along a polymer chain that can bind to similar sites on adjacent chains without the use of crosslinking agents.

EB processing is said to be faster, more controllable and more economical than thermal and/or chemical crosslinking when used in the production of insulated wires and cables. EB crosslinked wire and cable insulation displays several beneficial properties. It will not melt and flow at elevated ambient temperatures, nor melt and flow should the conductor become heated due to an electrical short circuit. EB crosslinking reduces the risk of flame propagation should a fire occur in electrical equipment.



▲ *IBA's Easy-e-Beam, integrated crosslinking solution*

Tensile strength, especially at elevated temperatures, is increased, as are abrasion resistance, stress crack resistance and solvent resistance.

IBA recently developed a new solution for electron beam crosslinking, called Easy-e-Beam™. Easy-e-Beam is based on the Dynamitron® accelerator. The solution is self-shielded, allowing easy installation into an existing facility. Easy-e-Beam integrates the E-beam accelerator and the wire handling system, both managed by a single PLC-based control system. Wires and cables wound on reels are fed into the Easy-e-Beam and, after electron beam treatment, are rewound onto take-up reels. Easy-e-Beam can handle cross-sections up to 30mm$^2$ (60kcmil) and reach a line speed of up to 1,000m per minute.

**IBA Industrial – Belgium**
**Fax**: +32 1047 5992
**Website**: www.iba-industrial.com

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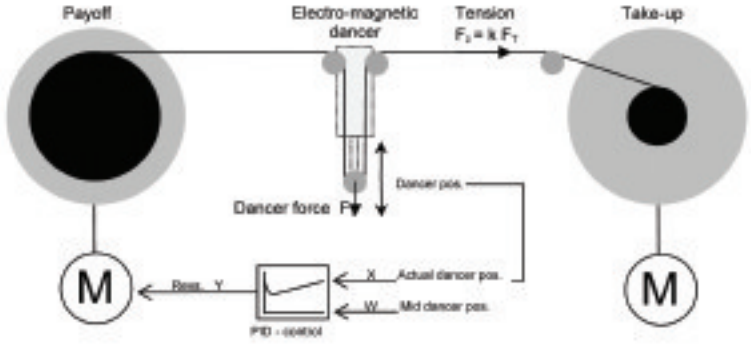
# New means to tension control

A new electromagnetic dancer unit, EDL50 from Supertek, is based on the proven dancer tension control method of actively regulating winding production processes.

The secret of the electro-magnetic dancer lies in the physics of the working force generation within the device, based on a patented Supertek electromagnetic technique. This electromagnetic principle allows high-resolution tension setting coupled with active disturbance compensation, while maintaining highly constant tension forces. The EDL50 dancer unit allows this operation independent of dancer arm positions and at highest production speeds.

This tension control system employs motor drives for the transport of product between stations; active spool drives instead of brake units. The function diagram shows a dancer controlled re-winder system with payoff and take-up. It is assumed that the take-up winds at a consistent speed. The payoff has to follow this speed to maintain the desired tension in the product. This is achieved by passing the product over a moving, force-loaded pulley (dancer) in such a manner as to have the pulley impose force on the product. The ensuing product tension has a fixed relationship to this force. In the diagram any relative acceleration of the payoff will lead to a sinking of the moving pulley in position. Inversely, any relative deceleration of the payoff will lead to a rising of the pulley.




▲ *Function diagram of dancer controlled winding system*

Conventional methods have technical limits, especially with tension control of sensitive products. Supertek's electro-magnetic dancer is capable of producing a constant, highly dynamic, dancer position-independent product tension. The electromagnetic dancer EDL50 allows analogue settable tensions from 0cN to 500cN with a resolution of 0.1cN.

The new electro-magnetic dancer can allow the fast, precise and problem-free processing of highly sensitive winding materials, providing new, efficient and economic production possibilities.

**Supertek GmbH – Germany**
**Email**: info@supertek.de **Website**: www.supertek.de

## Complete range of reels and drums

Boxy Group (including Boxy SpA, Italy, and Mossberg Reel LLC, USA) offers a complete range of steel reels and drums for the wire and cable industry, including:

- Fully machined reels for copper wire drawing
- Resistant reels for steel wire drawing
- One-way shipping reels
- Forged reels
- Heavy-duty reels and large cable drums

The company's production includes special equipment for reel handling, such as take-apart reels in a variety of types (hydraulic, mechanic, pneumatic), built-in or floor mounted tilting units, and mechanical reel and coil lifters.

**Boxy SpA – Italy**
**Fax**: +39 030 957244
**Email**: boxy@boxy.com
**Website**: www.boxy.com

## Keeping wire rod corrosion in line

A phosphatisation tank, manufactured by ICMI di Cisano Bergamasco (Bergamo), is said to offer a unique guarantee to protect wire rods against corrosion.

The tank contains phosphoric zinc salts and water, the purpose of which is the transformation of the surface of the wire rod, a surface that is covered with a protective microcrystalline layer of iron and zinc phosphates. With this method, the product is protected against corrosion caused by the presence of oxygen in the air. Phosphatisation always supports the binding of lubricant materials, such as oil, wax, polymers and others needed for subsequent processes.

Unlike the traditional process, by immersing the wire rod (wrapped in reels) in tanks, the method invented and patented by ICMI takes place in the line, unwinding the wire on a roll positioned in the phosphatisation tank. In this way the entire surface of the wire comes completely into contact with the phosphoric liquid, ensuring an even treatment. The immersion times of the wire vary, depending on its diameter, and are regulated by unwinding a certain number of turns on the roll.

▲ *Rod undergoing phosphatisation*

The phosphatisation tank enables the continuous treatment of the wire. The internal wire winding roll is built in such a way as to make the accumulation and running of the wire optimal on the roll, while the process solution is maintained at the correct temperature for the phosphatisation process. A tank is available for processing stainless steel wire, as is a larger tank for the treatment of wires with different diameters.

**ICMI Srl – Italy**
**Fax**: +39 035 787722
**Email**: info@icmiforniindustriali.com
**Website**: www.icmiforniindustriali.com

# Neptune 2 contract

SKET has won a contract to supply equipment for Kiswire's Neptune 2 project. What are believed to be the world's largest planetary closer and longest tubular strander are scheduled for delivery in Q4 2010. The machines will be used in the manufacture of deep-sea offshore ropes, among other products.

The model MKVS 1+8 x 2700 planetary closer is suitable for making 160mm diameter rope. The machine will be provided with a payoff and take-up capable of accommodating reels with a maximum capacity of 600 tonnes. Both the payoff and take-up reels have a flange diameter of 5,600mm and a traversing width of 10,000mm. The previous largest take-up made by SKET has a 400 tonnes winding capacity and is in operation at Bridon International.

▲ *SKET's previous largest take-up in operation at Bridon International*

The high-speed tubular strander, SRW 1+48x800 (32") type, will produce strands with a diameter of up to 55mm at a maximum line speed of 100m per minute. This line will also be capable of producing compacted strands. SKET's previous largest high-speed tubular strander, of the SRW 1+48x630 type, has been working successfully at the Kiswire Neptune 1 plant in Malaysia for over ten years.

The Neptune 2 project, an $80 million investment on a 20-acre site near the Johor-based Neptune 1 plant, will be completed in 2011.

**SKET Verseilmaschinenbau GmbH – Germany**
**Fax**: +49 391 4055 815
**Email**: info@sketvmb.de **Website**: www.sketvmb.de

# Cold forming solutions

Zwez-Chemie specialises in oil-free tribological systems and products to increase performance in cold forming from rod and wire .

Zwez believes that, by working closely with the client and depending on the initial situation, costs for tool and plant operation can be reduced by 20% and chemical product and disposal costs reduced by up to 60%.

Local Zwez technicians analyse the operational situation and a strategy is implemented and supported by both local technicians and Zwez headquarters.

**Zwez-Chemie – Germany** **Fax**: +49 2266 9001 33
**Email**: info@zwez.de **Website**: www.zwez.de


▲ *Sikora's upgraded X-Ray 6000*

# X-ray upgrade for measurement

In 2004 Sikora introduced its X-Ray 2000 series, for use in insulating and jacketing lines, to fulfil the industry's need for precise measurement of wall thickness, eccentricity, diameter and ovality. This year, Sikora has launched a technological upgrade of the X-Ray 2000, the new X-Ray 6000 series with improved precision, long operation time and efficiency.

X-Ray 6000 includes XLL-X-ray tubes (eXtra-Long-Life) and provides a selectable measuring rate of 1 to 10 or optional 1Hz to 100Hz. Moreover, it is designed to ensure highest accuracy under difficult climatic conditions.

X-Ray 6000 devices offer application-specific options for the measurement of RF-cables, specifically for the measurement of the radial foam quality.

In combination with the Ecocontrol 6000 display and control device, the measuring system provides the necessary information for optimum control of the production line in automatic mode.

**Sikora AG – Germany**
**Fax**: +49 421 489009 0
**Email**: sales@sikora.net
**Website**: www.sikora.net

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# Chinese producer selects Radyne

Radyne IHWT has successfully completed the supply, installation and commissioning of induction heating equipment for six tyre cord diffusion (TCD) lines in China, each capable of running 24 wires at 80DV for wire diameters in the range of 1.1mm to 2.2mm.

Delivered to a leading Chinese producer, each of the six lines included a pre-heat zone and a final heat zone, each supported by an IGBT power source, followed by two muffle temperature holding zones. The tyre cord diffusion process is carried out to prevent corrosion of wire within the tyre itself and to act as a lubricant for further wire diameter reductions in subsequent drawing operations.

▲ *Radyne's tyre cord diffusion (TCD) line, as supplied to a Chinese producer of tyre cord*

There are said to be many advantages and benefits associated with Radyne TCD systems, including high electrical efficiency and contact-less heating without the need to heat media such as sand.

The system is operator friendly and includes a control system with a Siemens HMI that is an integral part of the operator control desk and communicates with the Siemens Simatic series PLC using the Profibus DP protocol. This allows operator access to all machine parameters and controls in addition to providing diagnostic information.

Most importantly the Radyne TCD system ensures product consistency with perfect diffusion of both copper and zinc. Multi-wire heating at high DV can be achieved and it is also simple to change over from one wire diameter to another.

**Radyne IHWT – UK**
**Fax**: +44 1256 467224
**Email**: info@ihwtech.co.uk
**Website**: www.inductotherm-hwt.co.uk

## Customised vector motor

▲ *Vascat will customise to suit client requirements*

Vascat SA has recently supplied a customised asynchronous servomotor (15.7kW) series for driving an automatic coil and spool winding line. This custom design is based on the MAC-Q 160 series.

An important characteristic of the motor is its special hollow shaft, through which is operated the pneumatic actuator used in the coil-forming unit. As a result of the close collaboration between Vascat and the customer important dimension savings have been achieved and machine versatility has been substantially improved.

**Vascat SA – Spain**
**Fax**: +34 938 593 131
**Email**: vascat@vascat.es
**Website**: www.vascat.es

## Laser improvements

Sikora AG has further developed its Laser series 6000 and added three new variations, Laser 6020 XY, Laser 6040 XY and Laser 6080 XY.

All three new models offer 2,500 measurements per second, as well as including several practical improvements. The opening of the gauges is twice as large as the measuring range and ensures easy cable feed through. Directly integrated into the gauge head is a new, pluggable universal interface module for all connections, ensuring optimal protection against water, dirt or mechanical influences during production.

A specially developed over-voltage and over-current protection is serially integrated into the devices.

**Sikora AG – Germany**
**Fax**: +49 421 48900 90
**Email**: sales@sikora.net
**Website**: www.sikora.net

# 0% from Traxit

The much delayed European legislation, which will classify as reprotoxic all products containing borax and boron compounds above a certain level, will start to be effective from early 2010. This will progressively affect all areas with the adoption of the global unified classification and labelling regulations (GHS).

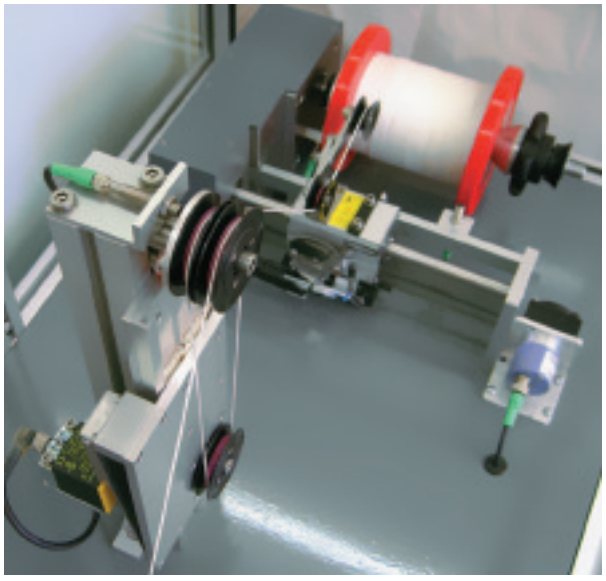
Traxit is already able to offer a full range of dry powder drawing lubricant products completely free of borax and all boron compounds.

These products are believed to offer the following improvements over some traditional boron containing products:

- Longer die life
- Higher drawing speeds
- Fewer wire breaks
- Reduced drawing temperatures
- Less moisture pick up with sodium-based lubricants

**Traxit International GmbH – Germany**
**Fax**: +49 2336 919101
**Email**: info@traxit.com
**Website**: www.traxit.com

## Uhing-AVS at Goodyear



▲ *A sample configuration of the Uhing AVS*

Warped metal spools require frequent adjustment of the traversing width if they are to be reused. This negatively affects the cost efficiency of the production process and staff productivity. An automatic winding width control developed by Joachim Uhing KG GmbH & Co prevents the formation of bulges and dents of wires wound in the flange area of spools and relieves staff from monitoring tasks.

A project the company is running in the Luxembourg plant of tyre manufacturer Goodyear Dunlop is demonstrating the efficient operation of the AVS.

Metal spools, on which Goodyear Dunlop winds the 1mm to 2mm thick steel tyre cord, are used in several locations of the Colmar-Berg plant. During their service life, some of the spools change their initial geometry considerably, bent flanges being the central issue. As a consequence, many of the traversing systems, even those equipped with sensors, failed to correct the winding width and required manual intervention from operators.

As staff needed to spend time monitoring the winding processes other, more productive, tasks were neglected. This made the plant management search for other traversing solutions.

Goodyear Dunlop approached Joachim Uhing KG GmbH & Co. Aiming to provide the tyre manufacturer with a smooth winding pattern in the reversing area of the traversing system known to be particularly critical, Uhing developed the automatic winding width control AVS.

Two sensors monitor the material's line speed and the spool speed. When a dent forms at the end of a stroke, the spool speed slightly increases in relation to the constant material speed. A third sensor identifies the position of the traversing system and reports the faulty stroke end to the controller that accordingly increases the material supply in the dent area by widening the traversing width at this stroke end until the flaw has been corrected.

In case of a bulge, the spool speed will decrease along with the traversing width and consequently the material supply. This results in an optimum pattern on the spool and ensures smooth unwinding later on.

Since it lacks optical sensors the Uhing AVS is extremely unsusceptible to soiling, and can be integrated into existing traversing systems as a complete system or in parts.

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

## Austech's solution

InnoVites BV has announced that Austech Wire and Cables (Austech) has selected InnoVites for Cable© as its ERP solution. InnoVites for Cable is the ERP software for the wire and cable industry using Microsoft Dynamics AX©.

InnoVites will deliver a complete industry solution including an integration to Cimteq Ltd's CableBuilder© software. Andrew Richmond, operations manager at Austech, commented: "At Austech we were looking for a business solution that addressed the special requirements that are typical to our industry, such as length and tolerance management, copper management and integration to our cable design software. We found InnoVites to deliver exactly this!"

InnoVites will work with local partner Eclipse Consulting to implement the solution for Austech.

**InnoVites BV – The Netherlands**
**Website**: www.innovites.com

# Ruggedised optical connector

Volex Group plc has launched a robust IP68 rated optical connector, a multi-fibre optical connector for use in harsh environment applications. The new connector is said to maintain excellent optical performance in a temperature range between 85ºC and –40ºC.

The Robust Optical Connector is a fibre-to-the-antenna (FTTA) connector designed for use on mobile telecoms cell-site masts, both for 3G and LTE (4G) networks. It connects into a remote radio head box (RRH) positioned close to the antenna arrays. The product has been created incorporating opto-mechanical design concepts that isolate internally floating optical components from the harsh external environment. This results in maximum optical performance independent of external effects.

Dr John Hannigan, engineering director, Volex Europe (part of the Volex Group), comments, "The Robust Optical Connector is particularly suitable for FTTA applications in mobile telephone networks and is available in custom lengths. It is easily installable in the field, whether at the top of a mobile phone tower or down at the radio base station. The versatility of the product also makes it equally suitable for industrial, security and broadcasting applications, or indeed other applications where IP68 protection is required with high optical performance."

The advantages of FTTA technology are both cost and environment-related, up to 50% less power consumption compared to traditional copper solutions, with no feeder loss. Within the install phases, its small size and lightweight properties in comparison to copper or RF cable links mean it can be carried to site and handled easily at height, resulting in a shorter installation time. Optical cable assemblies enable data transmission at high bandwidth over longer distances,

▲ *The new optical connector operates independently of external environmental effects*

without the effect of interference or data surges. This is a key factor, particularly in mobile communication.

Hannigan continues, "We are seeing typical insertion and return losses of less than 0.15dB and greater than 50dB, respectively, from the Robust Optical Connector when single mode optical fibres are used."

**Volex Group plc – UK**
**Website**: www.volex.com

## Specialists in irregular and custom PCD dies

Weilly Diamond Industrial from Taiwan has specialised in the production of shaped PCD dies for over 20 years. Using controlled die geometry and excellent polishing techniques, the company has a customer base across the US and Europe.

In addition to regular shaped dies, such as square, rectangle, hexagonal, triangle, oval and trapezoid, Weilly Diamond will manufacture irregular custom-shaped PCD from customer drawings, to suit individual requirements.

Thin rectangular PCD shaped dies are in growing demand for PV ribbon, which is an important component of solar cells.

The thinnest PCD flat dies measure 0.1mm x 2mm and smallest square dies measure 0.1mm x 0.1mm.

**Weilly Diamond Industrial Co Ltd – Taiwan**
**Fax**: +886 3470 7162
**Email**: weilly@ms5.hinet.net
**Website**: www.weilly.com.tw

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Email: jstl@vip.163.com

cellphone: 0086-13905264693

website: www.jsjintai.cn


# Cost effective yield control for extrusion applications

A simple, cost effective extrusion yield control system from Maguire Europe has enabled a leading international cable company to conserve raw material and ensure product consistency in a high-performance range of cables whose reliability is critical for fire safety.

Prysmian UK recently deployed the Maguire® LineMaster™ system on three production lines for its range of fire resistant cables. With support from Summit Systems, Maguire's distributor in the UK, Prysmian project manager Nicolas Chevaux supervised the installation of the LineMaster system at the company's facility in Eastleigh.

The LineMaster technology enables Prysmian to increase control over the ratio of the raw materials used in cable construction, control that is critical for balancing fire resistance with mechanical strength, according to Mr Chevaux. The system maintains the target ratio, in grams per metre, between the various raw materials at each stage of production and ensures that, in the finished cable, the weight of each compound per unit of length is constant.

▲ *Maguire loss-in-weight (LIW) hopper*

A basic job of the LineMaster system is to adjust for the many variables that influence the rate at which extruders consume raw material, such as the source of the material, storage conditions, density, particle geometry, die and heater conditions, screen packing, and fluctuations in electrical power. The system includes control software and a loss-in weight (LIW) hopper that gravity-feeds material into the processing machine.

This technology can be deployed as a stand-alone system or to work in concert with a blender such as the Maguire weigh scale blender.

**Prysmian UK – UK**
**Website**: www.prysmian.com

**Maguire Products Inc – USA**
**Website**: www.maguire.com

# Machine investment for larger drums

Borkener Kistenfabrik GmbH, a manufacturer of steel and wood drums with high bearing capacities, is to invest around €1,000,000 in 2010 to extend its existing stock of machinery.

In 2009 the company manufactured two steel drums for the production of special winding goods, each weighing 45 tons and able to bear a total weight of up to 450 tons. "The capacities required to produce even heavier, larger steel drums with a length of more than twelve metres will soon be available," said general manager Joachim Seibel.

It takes several months to plan, calculate and produce drums of this size. Joachim Seibel continued: "There have been no drums of this size and bearing capacity until now.

"The design work in particular is a huge challenge because they need to be taken apart completely to enable cheaper transport."

The company believes that requirements with regard to design, bearing capacity and production time will become even more stringent, especially for offshore applications.

Borkener Kistenfabrik GmbH was established in 1948. It has premises of 20,000m$^2$ with over 6,000m$^2$ of production space available for the manufacture of wood and steel packaging.

**Borkener Kistenfabrik GmbH – Germany**
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▲ *Borkener Kistenfabrik GmbH has manufactured drums since 1948*

# Cleaning and lubrication of wire

*Advertorial on behalf of Decalub*

The GPS/PDH system is a technical novelty that revolutionises the wire drawing process by in-line wire cleaning and wire dry coating, benefiting from the fully controlled four-way interaction between the pressure, temperature, lubricant viscosity and lubricant circulation speed. This interaction allows the use of standard solid or semi-solid products with simple formulations, resulting in significant cost savings in a range of 30% to 60%, and increased environmental benefits.

▲ *Wire cleaning and re-coating by GPS/PDH system*

Wire lubrication and re-coating: A full film lubricant coat, enabling frictionless drawing, is easily achieved in a dry application, increasing lubricant coat weight by about 57% in one intermediate draft with H/C wire drawn with a sodium lubricant. This method completely eliminates conventional wet pre-coating chemicals, performing a wear resistant hard coat for high-tensile wire, spring wire or cold heading wire through a light (nano-film) water soluble coat for plating wire.

Wire cleaning: The unit is installed in the last draft of a drawing machine operating with a semi-solid lubricant in a continuous IN and OUT motion. Using closed circuit pressure lubrication, self-generated by the unit, the system eliminates the wire tunnelling effect, enabling high-speed wire cleaning and polishing to provide a bright glossy wire finish in a single run.

The GPS/PDH unit is easy to install into the existing soapbox and can be operational within ten minutes. Unit dimensions: 90mm x 90mm x 200mm long (3.55" x 3.55" x 7.9" long).

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# Stainless steel wires for all purposes

Nevatia Steel & Alloys Pvt Limited, an ISO-9001 accredited company, and Government of India recognised export house was incorporated in 1988 to manufacture stainless steel wires. The company has added new facilities to increase its total capacity to 9,000mt per year.

The company manufactures special stainless steel wire for braiding, knitting and weaving applications, for cold heading, spring production and wires for general purposes. This year Nevatia has started production of its new MIG and TIG welding wire. Wire is made in a variety of grades, in sizes ranging from 0.1mm to 10mm diameter.

The company exports 90 per cent of its products to over 35 countries, which include Argentina, Australia, Austria, Canada, France, Germany, Italy, Korea, Poland, Spain, Turkey, UK and USA.

**Nevatia Steel & Alloys Pvt Ltd – India**
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**Website**: www.nevatiasteel.com

# CV lines for cable, worldwide


▲ *Maschinenbau Scholz building at Coesfield*

Maschinenbau Scholz is a specialist in the design and fabrication of CV lines for the continuous production of medium-voltage and high-voltage cables. More than 350 lines made by the German company are in operation, worldwide. The product range includes vertical lines, catenary lines, horizontal lines, pressurised reversing vessels, conversions and special designs. To make the lines fit for the future, it is often enough to only replace individual parts.

The potential for optimisation is often in the details. For this, Scholz can provide its customers with splice boxes, main sealings, pressurised reversing vessels and non-contact sag controls (cable position controls). With a replacement of only these components the production speed can be increased and a costly machine failure can be avoided.

When developing tailor-made solutions, Maschinenbau Scholz focuses on the latest EDP. With highly efficient software, the achievable production speeds can be precisely calculated and the required operating parameters can be determined, or another option for efficiency enhancement is the conversion of steam CV lines into dry curing lines.

Scholz offers a comprehensive after sales service, high quality components and constant quality control. Maschinenbau Scholz is holder of the DIN EN ISO 9001 certificate, and all pressure-retaining parts are made in accordance with the Pressure Equipment Directive 97/23/EG [PED] and international acceptance standards.

**Maschinenbau Scholz GmbH & Co KG – Germany**
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## New cones for the Syncro F13

CeramTec is offering complete wire drawing cones or large rings with a 483mm diameter. Made from advanced ceramics it is said that the cones can be used for wire drawing on CeramTec's Syncro F13 for greater cost-effectiveness in wire manufacturing.

The gentler finishing process using the advanced ceramic material, zirconium oxide, produces better process reliability, extended machine service life and improved quality of the finished wire product.

In cooperation with customers, technical product managers will optimise the manufacturing process. CeramTec has a test centre for this purpose, which can be used to determine the friction coefficient of drawing tools and wire. It also offers the possibility of working variably with parameters such as the addition of cooling lubricants, rotation of the tool shaft, wrap angle of the wire on the drawing tool, exchangeability ease of wires and drawing tools, as well as computer-aided analysis of test results. This enables basic research to be carried out in areas of slip and friction. The test centre can also be used to investigate customer-specific problems.

**CeramTec AG – Germany**
**Fax**: +49 7153 611 673
**Website**: www.ceramtec.com

# Modular rewinding lines offer extending possibilities

▲ *Rewinding line from PS Costruzioni*

PS has developed and improved the design and production of its rewinding lines for quality and reliability. The PS Costruzioni range of rewinding lines includes a basic line, model 600-1000, for 2mm to 15mm diameter cables and a middle model 1650 –1650, suitable for 3mm to 25mm diameter cables.

The largest model in the range, 2250-2250, is suitable for cables with a diameter of 8mm up to 60mm.

A standard line consists of a payoff unit, spark tester, metre counter and take-up unit. As with all PS machines, PS rewinding lines have a modular structure, making it possible to buy a basic model, and then extend the machine by adding additional units as the user's need arises.

Available additional units include:

- Spark tester, for defects on the cable insulation
- Lump detector, for dimensional defects such as knots, swellings and shrinkage
- Electric shears, capable of cutting cables of up to 35mm diameter
- Integrated ink jet cable marking device, printing directly onto cable at a maximum linear speed of 320m per minute
- Labelling machine, to print data such as reel length, cable type and bar codes onto an adhesive label

**Technical specifications**:

| Model | Cable diameter | Reel diameter | Linear speed |
|---|---|---|---|
| Rewinding line 600-1000 | 2 – 15mm | 600 – 1,000 | 400m/min |
| Rewinding line 1250-1250 | 3 – 20mm | 600 – 1,250 | 400m/min |
| Rewinding line 1650-1650 | 3 – 25mm | 800 – 1,650 | 400m/min |
| Rewinding line 2000-2000 | 5 – 45mm | 1,000–2,000 | 130m/min |
| Rewinding line 2250-2250 | 5 – 60mm | 1,000– 2,250 | 130m/min |

**PS Costruzioni Meccaniche Srl – Italy**
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**Email**: ps@pscostruzioni.com
**Website**: www.pscostruzioni.com

# 100K gantry systems for reels

Tulsa Power Inc has recently introduced its new line of 100K gantry systems. The units are offered in both payoff and take-up configurations. Reel capacities range from 2,175mm to 4,350mm flange diameter, reel widths to 4,572mm and maximum reel weights to 100,000lb. The entire structure offers easy loading and unloading of reels with true walk through capabilities. The telescoping super structure's portal design conforms to the size of reel, to minimise floor space requirements, and each system traverses on rails to offer material payout or take-up with no fleeting angle.

Electromechanical drives are utilised to allow for up/down and in/out manipulation of the main frame during reel load and unload sequences. Main drive systems are engineered to customers' specifications and are complemented with a full-colour operator touch screen interface, used to communicate parameters used by the operator in relation to the product being run, the reel being used, display status, position and fault alarms of the unit.

Tulsa Power Inc is among leading manufacturers of wire and cable handling equipment producing a broad offering of shafted and shaftless payoffs and take-ups, capstans, accumulators, re-spoolers, coilers, eccentric and concentric taping systems and measuring systems, and specialises in custom designed equipment to meet exacting customer requirements.

▲ *GTU–100A 144OD x 100W gantry system from Tulsa Power*

**Tulsa Power LLC – USA**
**Fax**: +1 918 584 3421 **Email**: sales@tulsapower.com **Website**: www.tulsapower.com

# Winders for sheathing lines

Rosendahl offers two models of winders for sheathing lines – floor-traversing and portal-traversing – named RWT and RWH respectively. These systems can handle reels with a flange diameter between 800mm and 4,000mm. Add-on equipment for detection of deviation, clamping, traversing, transport and cutting is also available.

Rosendahl's advanced portal-traversing winder for heavy reels, the RWH, is available for reels up to 20 tons with a maximum flange diameter of 4m. The traversing unit with the reel moves inside a stable steel frame. This floor-mounted frame does not require any special foundations.

The recently improved floor-traversing model RWT is designed for reel weights up to 12 tons. Special amendments have been made to reduce and optimise installation, maintenance and service work on the machinery. The modular drive is by individual AC motors with fixed, 2-step or 3-step gearboxes on any line configuration.

Rosendahl's portfolio of winders covers applications on standardised reel models as well as special reel designs for payoff and take-up of fibre optic cable or automated high-speed double-reelers.

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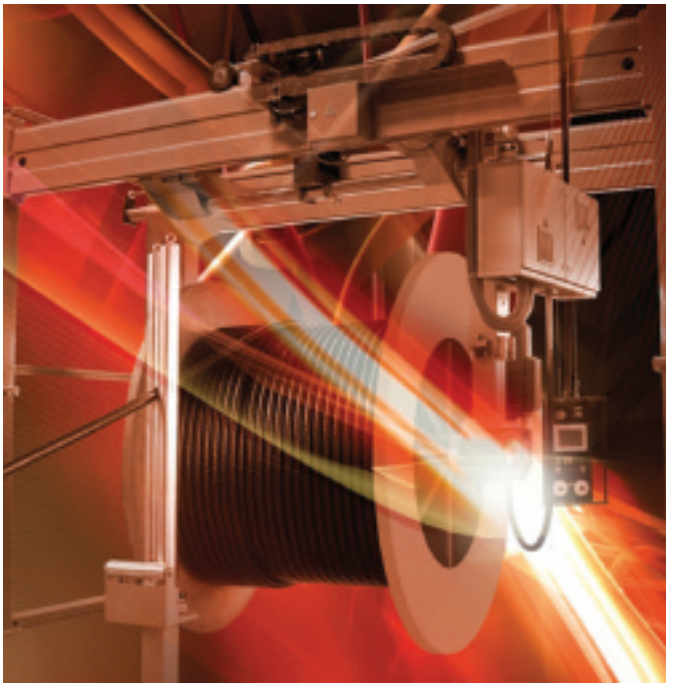
**Email**: office@rosendahlaustria.com
**Website**: www.rosendahlaustria.com



▲ *Rosendahl's model RWH for reels up to 20 tons. A floor-traversing version is also available*

# New batch blender series

Process Control Corporation has announced the second generation of its popular Guardian® series batch weigh blender. First introduced in 1999, the upgraded blender boasts a top to bottom electrical and mechanical redesign. The new colour touch screen operator interface is now standard and can be remote mounted up to 1,000 feet from the blender. The all-new control system features optimised blender control software for improved accuracy and increased total blender throughput.

Supply hoppers are designed as individual weldments, with no dividers, for improved cleanout; each hopper has one 90-degree side and no transition sections for improved material flow. The supply hopper assembly can be rotated 90 degrees for ease of installation. Redesigned and removable cartridge style dispensing gates are equally sized, so any ingredient can be dispensed from any hopper regardless of percentage. Optional dispensing gate restrictor plates are available for optimised performance for very low percentage ingredients.

All models offer dual-hinged access doors for weigh hopper/mixer access with quick release latches. A 3-phase mixer motor and starter come standard for sizes 5kg and larger. The base frame weldment has been redesigned for easier manufacturing and improved blender stability, and the mixing chamber scroll has been extended and welded for improved mixing and ease of cleanout.

The weigh hopper assembly has been redesigned featuring three-point mounting for easy installation and alignment, and with an optimised dual load cell mounting arrangement.

**Process Control Corporation – USA**
**Website**: www.process-control.com

▲ *Second generation Guardian batch weigh blender*

# Spring steels

Anbao (Qinhuangdao) Wire & Mesh Co Ltd, of China, is a manufacturer and exporter of spring steels in carbon steel, high carbon spring steel, alloy and stainless steel. The surface can be galvanized or phosphated (ungalvanized), and either heat-treated or oil tempered.

Anbao can provide non-mechanical spring wire (#45, #60, #70), mechanical spring wire (70# or 65MN), carbon spring wire, oil tempered and music spring wire, mainly as per Din17223-1, EN10270-1; ASTM A227, ASTM A228, ASTM A313; JIS G3521, JIS G3522 and JIS G4314.

Packing can be in coils or on formers, 5kg to 1,000kg depending on size.

**Anbao (Qinhuangdao) Wire & Mesh Co Ltd – China**
**Fax**: +86 335 3870760
**Website**: www.anbao.com

▲ *Spring steel wires from Anbao*

## Industrial mesh welding equipment

Ideal-Werk is among market leaders in the design and manufacture of industrial mesh welders and automatic production lines for the wire working industry.

Ideal mesh welding machines operate from automatically fed straightened, pre-cut wire from magazines. Designed to a modular system, Ideal mesh welders are versatile and flexible, with short changeover times for product changes. According to customer requirements, the machines can be equipped with double magazines, cropping units, cross wire slitting shears or unstacking devices. Typical products produced with this equipment include fencing mesh, wire shelves, display articles, animal cages, cable trays and supermarket trolleys.

In addition to the mesh welders, Ideal also supplies automatic production lines for the high volume manufacture of welded and shaped fencing mesh, refrigerator shelves, separating panels, dish washer baskets and other mass components from wire.

Ideal also offers NC jig welding machines, model Versaweld CSR, which are used for the flexible production of small and medium quantities of wire products within jig frames.

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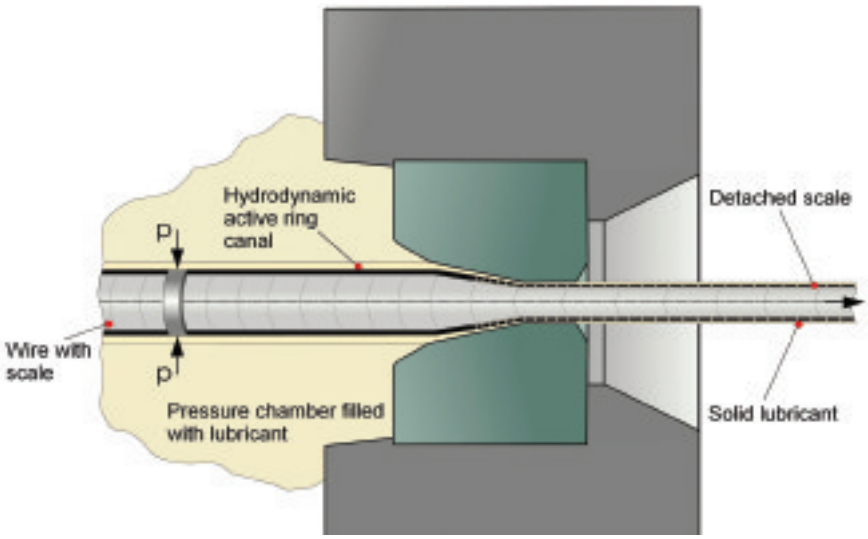
# Descaling of steel wire

Ecoform Umformtechnik has developed a new procedure for the mechanical descaling of steel wire. Its basis is a pressure lubricating system previously developed by Ecoform.

Steel wire, affected by mill scale, enters into a pressure chamber filled with lubricant. The steel wire, enclosed with lubricant, can be pulled with the drawing tool located at the end of the pressure chamber. This drawing simultaneously reduces the cross section and increases the surface. As the wire leaves the drawing tool the scale layer and the lubricant layer above it flake away from the wire surface.

The advantages of the system include:

- Surface and material are descaled without either deformations, local solidifications and microstructural transformations on the wire surface
- Faults arising during the drawing process are eliminated
- Blotchiness and bubbling of further surface finishing, for example electrolytic nickel or chromium coating, are prevented
- Product quality is improved, in comparison with alternative descaling procedures, due to the prevention of micro cracks in the wire surface
- Operation speeds are increased during the mechanical descaling




▲ *Diagram of the new descaling system from Ecoform*

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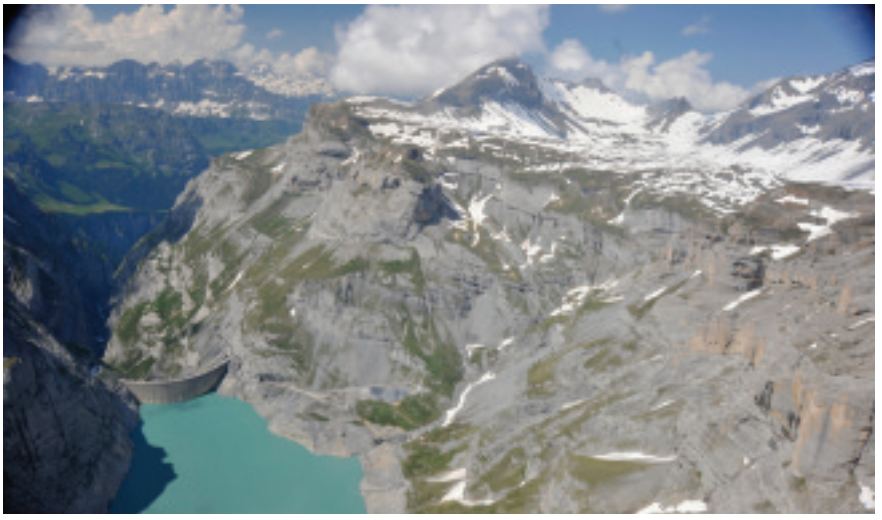
**Website**: www.ecoform.de

# EHV cables for hydropower plant

Nexans has been awarded the €13 million turnkey contract to supply extra high voltage (EHV) power cables for the new Kraftwerke Linth-Limmern pumped storage hydropower plant currently under construction in the Linthal Valley, eastern Switzerland. This contract covers the design, manufacture and supply, installation, connection and commissioning of about 30km of EHV cables.

Nexans will supply six 380 kV XLPE-insulated underground cables, each approximately 5km long, which corresponds to the length of the underground access tunnel in which they will be installed. Laid in parallel to connect the new plant to the EHV power transmission grid, these cables will comprise copper core conductors with a cross-section of 1,600mm$^2$.

The Limmern pumped-storage project will utilise the proximity of two existing water-holding reservoirs – the Muttsee and the Limmernsee Lakes – by building an underground pumped-storage plant between the two lakes.



▲ *The Limmern pumped-storage project in the Linthal Valley*

During the day, when power demand is at its peak, water will be released through the turbines to generate electric power. At night, the Limmern plant will pump back water "upstream", from Limmernsee into Muttsee. For these operations, the Limmern plant will be supplied with1,000 MW power through an underground access tunnel of about 5km long.

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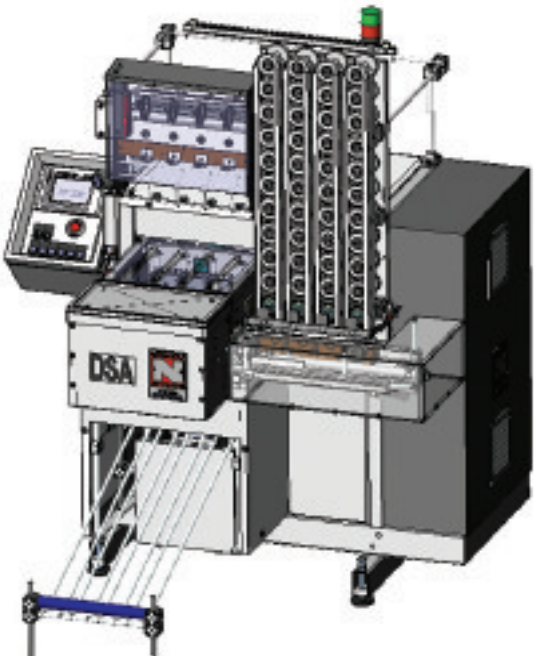
# RFID for spool management




▲ *Rewinding machine type DSA4 (system Hacoba) with integrated RFID read/write system*

Product variety and the need to record each step of a production process require reliable labelling of filled spools. Niehoff's most recent development is a system based on radio frequency identification (RFID) technology for automatic identification of braiding bobbins and NPS spools and helps with the administration of the products. The system will be demonstrated at wire 2010.

The Niehoff system was developed by Niehoff with the MES software company Advaris, the bobbin manufacturer Steintex and a team from Erlangen-Nuremberg University. It consists of spools with RFID transponders, a read/write unit integrated into the rewinding machine and mobile reading devices. The RFID transponders embedded into the spools can be easily and durably encoded with data, storing much more information than traditional barcode systems and which cannot be erased or become illegible.

The RFID system can be connected to a production data acquisition (PDA) system with a manufacturing execution system (MES). Furthermore, machine operators can be supplied with portable reading devices that can be equipped with a conventional barcode identification system as an option.

Data transmission to the host computer and subsequent data processing are achieved using MES software specifically developed by Niehoff's partner Advaris.

The new RFID system enables decentralised data storage beyond factory boundaries, tracking of single bobbins/spools and data documentation. When further processing the spools, a machine operator can compare the spool data with the order data and recognise whether a spool is suitable for the production process or not.

The described RFID system is also suitable for other production processes and packages, for example spooling automotive wires onto NPS spools and the subsequent manufacturing of harnesses. The spools of the Niehoff Package System (NPS) can be equipped with RFID transponders by Astroplast, the NPS spool manufacturer, during the fabrication of the spool.

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# Screen mesh

A new concept in wire mesh and screen technology is said to overcome the limitations of traditional mesh products based on a square or rectangle. New 3WF® (waved welded wire fabric) technology, developed from a physics theory by Ghattas Y Koussaifi and based on the research of two scientists, Gaspar Coriolis and Denys Fisher, offers a solution that the developer believes will "move the industry forward."

▲ The new welded wire mesh technique is said to offer countless possibilities in design

The attractive mesh designs produced using 3WF can be used as fences, screens, partitions and decorative items. The production process is based on an arithmetic equation that enables the design of an unlimited number of mesh patterns, produced from one continuous wire formed to shape and welded at intersection points, without cutting the wire during the production process.

3WF panels are ornamental but also rigid, providing security at a reasonable price. 3WF patterns or styles range from hand drawn designs to highly complex computer aided designs. The different patterns are grouped into families to suit any taste, purpose or customer need.

Using the 3WF concept each panel design can be made up of several segments, and for each segment there is an almost unlimited number of alternatives available. For example, a pattern divided into five segments, with 20 designs for each segment offers around 3 million mesh design alternatives. Every segment can have designs varying between curves (convex and concave), angles (obtuse, acute, and right) and straight lines (vertical and diagonal). Mesh can be produced to different specifications in terms of wire diameter, height length, mesh size and wire type (galvanized, black or stainless steel).

The 3WF patent covers concept, technology, machine and product, which gives solid protection and indicates the significance of this development. The patterns are registered industrial designs.

The 3WF concept, offering ornamental design and security at a relatively affordable price, can solve the conflict between cost and aesthetics when manufacturing security fencing.

**3WF – Waved Welded Wire Fabric – Lebanon**
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# Cables for Istanbul's rail link

Nexans has been awarded a €3.3 million contract by Alstom Transport (part of the AMD consortium) to supply specialised signalling and low voltage (LV) power cables for Istanbul's Marmaray trans-Bosphorus rail link.

The agreement covers the manufacture and supply of signalling cables as ZPAU, digicode and Eurobalise as well as low voltage power cables K25 compliant with French specifications and local specificities (including EMC and safety criteria).

The cables will be manufactured in Nexans factories until the end of 2010, and installed during 2010 and 2011.

The Marmaray rail link is currently one of the world's major transportation infrastructure projects. It is scheduled to enter service in 2013, when the 76.3km line will link Halkali, on the European bank of the Bosphorus (the Istanbul Strait), to the suburb of Gebze, on the Asian bank and will connect with Istanbul's urban transport network.

The link includes an immersed tube tunnel of 1.4 km accessed by a 10km bored tunnel. With a capacity of 75,000 passengers per hour in each direction, the new link is intended to considerably reduce traffic congestion in Turkey's biggest city.

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# Extending spool life

▲ *Appiani's range of spools and reels*

A Appiani produces a comprehensive range of reels and drums. The range includes TA100 spools and B-type for steel cord, hose wire and sawing wire, now produced with a new CN welding machine. These spools have class-A welding spots, as required in many fields including the automotive sector.

Appiani's new welding line has speeded up the manufacturing cycle, thus reducing the cost of the spools. The quality of the spools has also improved, showing less deformation during the winding cycle and longer operational life.

These spools are already in use by Bekaert, Michelin, ArcelorMittal and Bridgestone.

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# Chipless forming technology

Precision rolls for the chipless forming technique are more than just standard items. Reliability and service life depend on material, geometry and the accuracy of production. Therefore it is essential for the design of the rolls to find the ideal material constellation and geometry for every application.

Kämpfer Würz has considered the increased requirements of users of rolling tools and extended the manufacturing possibilities of roll machining by a considerable step.

A few years ago, users of rolling tools for precision roll technique had to use carbide rolls with a maximum diameter of 200mm. By investing in new grinding technology Kämpfer Würz is now able to machine cold rolls with carbide tipping up to 600mm diameter, and a maximum length of 2,500mm accurate to <2µmm.

For manufacturers of carbide rolls for large dimensions further adaptations are important to achieve an optimal composite between roll base body and carbide ring, by the precise internal grinding of these large carbides. Here accuracies of shape with a cylindrical form of <3µmm are essential.

▲ *Chipless forming technology from Kämpfer Würz Umformtechnik GmbH*

Modern CNC machines permit the machining of complex forms and geometries that allow large dimensioned profiles to be machined with the highest precision into large and heavy rolls.

Kämpfer Würz can produce roll barrels with convex or concave contours.

**Kämpfer Würz Umformtechnik GmbH – Germany**
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DRAHTMASCHINEN KOCH WIREMACHINERY

# Production line for wires up to 50mm Ø


## Horizontal bull blocks of model series KHZ

most suitable for the drawing of thick wire diameters, e.g. for the manufacture of:

- ball bearing steel wires
- cable armouring wires
- chain wires
- cold heading wires
- section wires
- spring wires
- stainless steel wires

Depending on the wire diameter range the bull blocks can be designed for a mechanical traction force between 10 to 50 tons.
The diameters of the drawing capstan are between 800 and 1200 mm.

**ERNST KOCH GmbH & Co. KG**

**www.koch-ihmert.de**

Visit us on our booth no. F22 / H39 in hall 10

wire Düsseldorf 12.-16. April 2010

# Mapré extruders from Gauder

▲ *Mapré multi-compound extruder*

Gauder sa has announced the addition of Mapré heavy duty equipment to its scope of sales, due to the lack of available and suitable secondhand extruders within the market.

Ranging from 38mm up to 150mm with L/D ratio 25, Mapré extruders will process high friction materials such as HFFR and LSF0H, as well as PVC, PE, XLPE, PA and PUR compounds. Said to be maintenance free, the extruders are described as offering "perfect melt homogenisation" and high linear output.

Mapré extruders are suitable for integration into existing insulation and sheathing lines or to be combined with new or secondhand machines, either from the customer's own workshop or selected from within the Gauder Group.

**Gauder sa – Belgium**
**Email**: sales.mapre@gaudergroup.com
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**Website**: www.gaudergroup.com



# British bending equipment

British company Pave Automation Ltd, a designer and developer of wire bending and forming equipment for over 35 years, offers a range of high performance single- and twin-head CNC machines. Ongoing investment in research and development enables Pave to produce technically advanced machines at highly competitive prices.

Panther X3, the company's flagship 13-axis wire bending machine, is designed for sequential forming of three-dimensional components of 1.5mm to 6mm (0.236") diameter and up to 3m in length. Described as user-friendly and easy to programme and operate – using a twin screen control console and animated three-dimensional touch screen icons – the Panther X3 offers carriage speeds of up to 80m per minute and ten programmable bending speeds, up to 0.05 seconds for 180º. Panther X3 incorporates Pave's patented 'Trueline' wire straightening system for reliable output of twist-free wire forms.


▲ *Panther X3 13-axis wire bending machine*

Pave's range also includes high-speed wire bending units such as the Huron. Robust and reliable, the compact Huron offers high output levels with reduced production costs on both short and long length products. Quick and easy to set up, the Huron incorporates user-friendly touch screen programming to minimise operator training and is equipped with Pave's front end wire stabiliser unit for accurate and twist-free finished wire products.

Ideal for production of extremely long surface length wire formed products, Pave's Zukron machine can produce simple or complex three-dimensional shapes in wire of up to 12mm diameter. Fast set up and changeover times, coupled with fully automated user-friendly CNC operation, are said to ensure economical production.

**Pave Automation Ltd – UK**
**Email**: pave@enterprise.net
**Fax**: +44 1733 563500
**Website**: www.pave-wire.com

# Flexibility for grating panels

A new model of GRG series has recently entered the CEMSA resistance welding machine family.

GRG-JR-1000 is a line for the production of heavy grating panels, welding longitudinal steel bearing bars of 6,000mm length, with steel cross wires of 4mm to 6mm diameter and 1,000mm length.

The welding process is automatic; loading of the longitudinal bars and cross wires and wire cropping is manual.

The machine is available in different versions depending upon the working speed, power availability from the factory network and the aesthetic results that customers require.

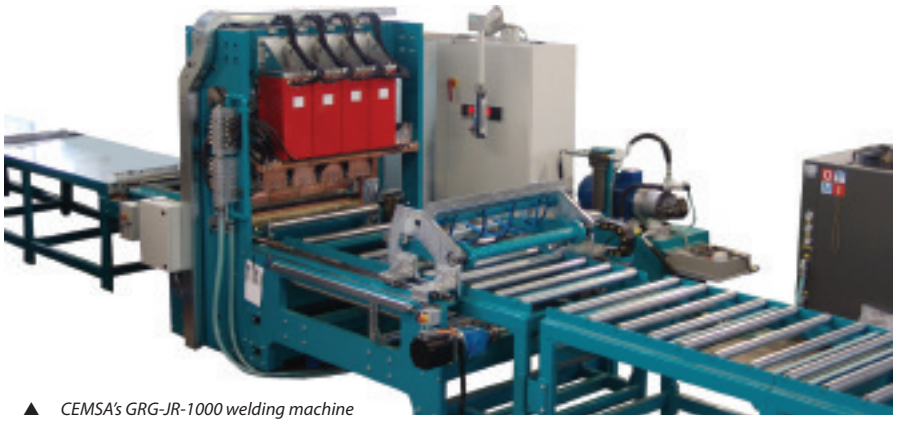
The installed power is therefore linked to the working solution ranging from 300kW, in case of electrical cascade, up to 1,500kW in the case of one-stroke welding (one wire at a time).

With the solution in electrical cascade, a multi-head scheme is used to achieve a productivity of 5-6 seconds for a cross wire of 1,000mm length and 5mm diameter (included one-step indexing).

The CN towing system allows choosing the distances of the cross wires whilst for different pitch of the longitudinal bars, changing the tooling (if not multiple) is necessary.

This system is chiefly targeted at medium and small companies, but big companies can also benefit from such a flexible system of production.

**CEMSA SpA – Italy**
**Fax**: +39 02 253 3307
**Email**: info@cemsa.it
**Website**: www.cemsa.it



▲ *CEMSA's GRG-JR-1000 welding machine*

# Cable and fibre marking

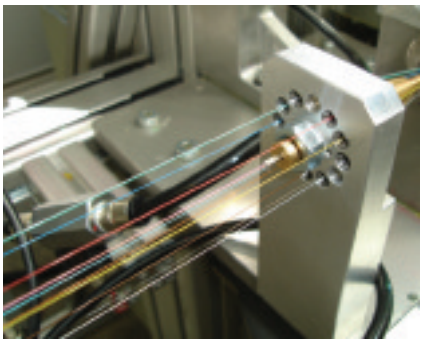
Medek & Schörner covers virtually the entire spectrum of machines for marking cables and coding optical fibres.

The cable marking machine range features:

- High quality gravure printers at speeds up to 1,200m/min, including an 'intelligent' ink pump system
- Water misting unit for the application of fine water dust for pre-cooling of the hot wire immediately after the extruder
- Embossing metre markers or hot foil sequential metre markers for accuracy of length measurement of cables
- High performance ring markers for marking telephone wires, switchboard wires, automotive and LAN cables
- Video system for monitoring the print quality of fast-running cable printing machines, allowing real-time inspection for poor quality or missing prints
- A laser marking system for cables

The capacity of any system can be significantly increased, quickly and easily, simply by exchanging individual components. New components from Medek & Schörner are always compatible – even if a system has already been in operation for many years.

Cable marking machines from Medek & Schörner can be easily maintained by the operating staff. High-speed optical fibre processing systems offer optical fibre colour coding up to 3,000m/min and ring marking of optical fibres.



▲ *Cable marking from Medek & Schörner*

**Medek & Schörner GmbH – Austria**
**Fax**: +43 1982 72 96
**Email**: m+s@medek.at
**Website**: www.medek.at

## Serving the copper bonding wire market

SOMA's focus on systems for fine wire drawing, annealing, measuring and rewinding is expanding to copper bonding wire. Copper is a viable replacement for gold bonding wire but intense price pressure in consumer electronics has driven solutions for copper bond wire in a growing number of chip applications. Copper bonding wire is forecast at 50% compound growth, replacing up to US$1 billion of gold wire over the next five years in the expanding semiconductor market.

Bare copper bonding wire (of around 20mm diameter) requires a fully annealed final condition, and has stringent criteria for surface quality and negligible oxidation. SOMA has standard and customised fine wire solutions for such copper applications.

Machine design technology, software and set-up are all critical to the high speed drawing of copper bonding wire, using wet or dry capstan designs depending on the diameter range. Process and production are monitored on-line, and machine software can be serviced remotely.

Copper bonding wire annealing and spooling are particularly challenging for negligible oxidation, maximum softness and surface quality preservation. High run-speed is critical for the best return on floor space and machine investment in any fine wire process step. SOMA's proven high-speed PC control systems and annealing oven designs are said to provide precise tension control, lowest oxidation and best wind quality.

**SOMA AG – Switzerland**
**Fax**: +41 44 938 9838
**Email**: info@somafinewire.ch
**Website**: www.somafinewire.ch



## Daloo range for 2010

Daloo, launched by the Gauder Group in 2008, is believed to be the first manufacturer in China with the support of European expertise and experience.

▲ *Manufactured in China with European expertise*

Daloo offers standard pay-offs and take-ups, rewinding lines, pulling caterpillars and rigid stranders.

The payoff and take-up range will be extended during 2010.

**Daloo Machines – China**
**Fax**: +86 519 8548 3557
**Email**: sales@daloo-machines.com
**Website**: www.daloo-machines.com

# Quenching system for steel wire

CPA Wire Technologies GmbH has developed a quenching system for steel wire production that offers an alternative to lead and fluidised bed systems.

The objective of patenting is to avoid the hard martensite structure and to achieve a ductile pearlite one. It is therefore necessary to quickly cool the wire from austenitisation temperature down to –550°C and to maintain this temperature for a few seconds.

There is a narrow temperature range for the desired pearlite transformation. The quenching system must be capable of accurately adjusting the quenching effect according to the product, especially regarding production speed and wire diameter. The quenching must be controllable and reproducible.

Traditionally, the quenching systems used in the steel wire industry are lead baths. These systems have disadvantages – not least as an environmental poison. Also, residues of lead will always adhere to the wire, which might require additional chemical cleaning, and heating and maintaining tons of lead at high temperature demands valuable energy.

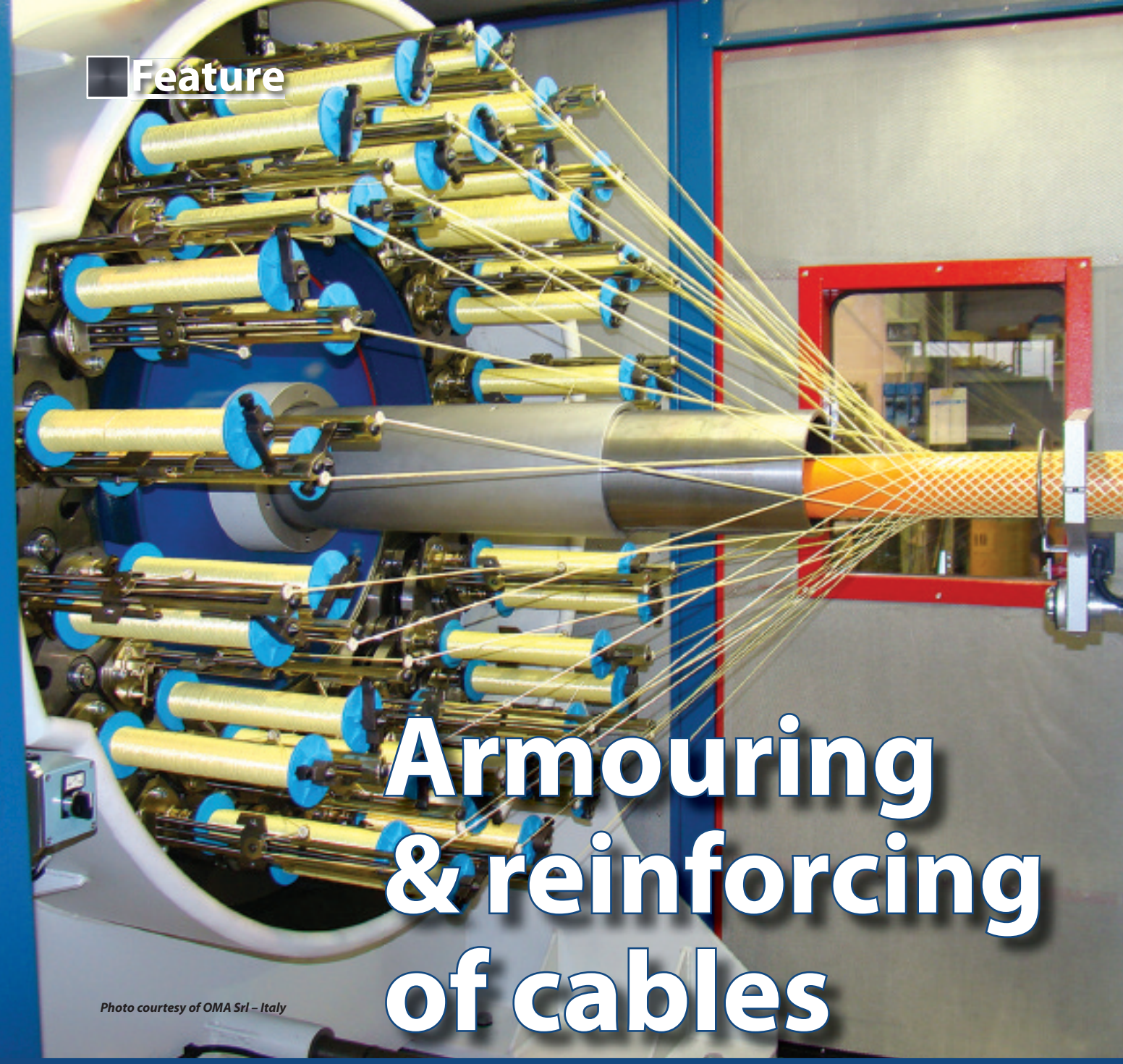
As an alternative to lead baths, fluidised bed systems have been introduced to the field. These systems make use of small solid particles impacting on the wire, which extract heat from the product by direct contact. Compared to lead baths these systems are environmentally acceptable and use less power but still have some disadvantages. They usually operate with sand of 100µm to 200µm particle size. Dust can enter the respiratory system and lead to irritations, and particle sizes below 5µm, which may be produced during operation due to abrasion and fragmentation, may reach the lung and cause severe health problems. From a technical point of view these systems only run a very narrow dimension range of wires at the same time, since it is not possible to adjust the bed individually to the wires.

To overcome these problems CPA has developed a water-based quenching system. The quenching fluid is a mixture of water and organic polymers – environmentally friendly and easy to handle – and because of the polymer properties the vapour film phase at the beginning of the quenching is very stable. Due to the comparably long lasting vapour film phase the quenching process is very controllable. Cooling down to the transformation temperature is finished before the uncontrollable boiling phase starts.

CPA's Convection Film Cooling and Soaking system is designed to run different wire dimensions at the same time, with the cooling section divided into individually adjustable sections according to the customer's request. The adjustment is done from outside the tank; no manipulation of running wires or in the quenchant is required.

The quenching section is directly connected to the soaking zone without leading the wires through the surrounding atmosphere. The soaking zone consists of two individually adjustable, electrically heated sections. It is possible to introduce a temperature gradient from the entrance to the exit in order to minimise wire temperature changes during the pearlite transformation.

**CPA Wire Technologies GmbH – Austria**
**Fax**: +43 316 46707
**Email**: office@cpa.at
**Website**: www.cpa.at

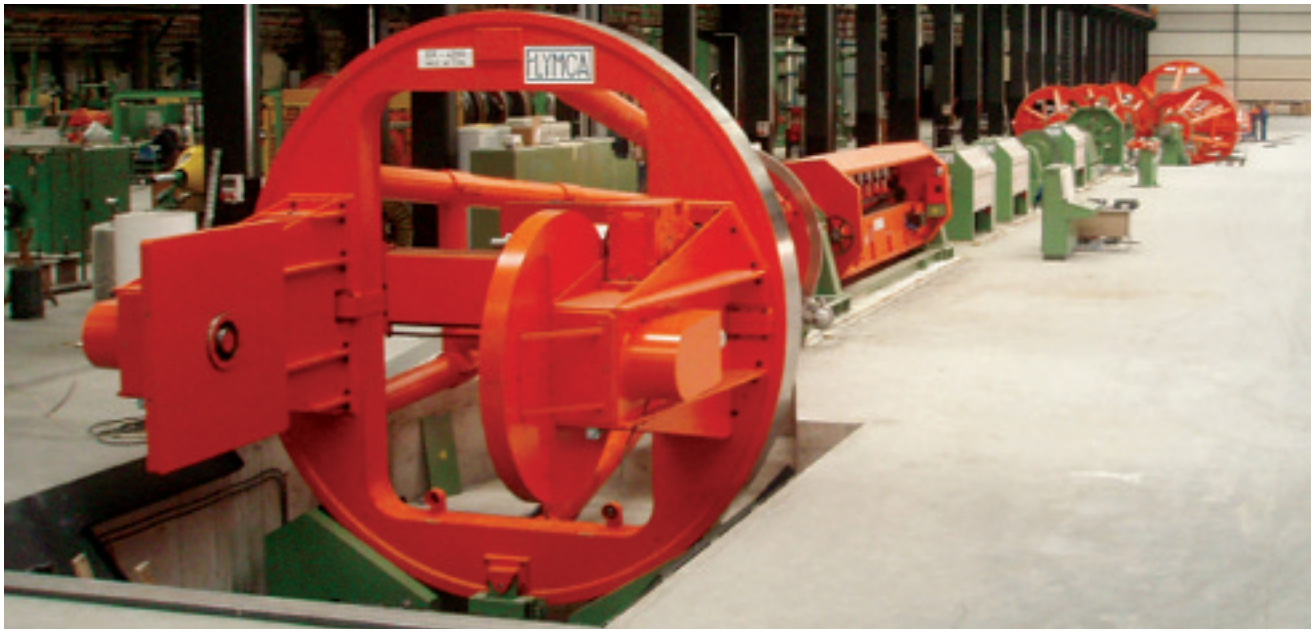


# Armouring & reinforcing of cables

*Photo courtesy of OMA Srl – Italy*

**The environments in which power cables must function are many, varied, and not infrequently very harsh. But however challenging an external or underground project, there is no hazard allowance for armoured and reinforced cables; no offset in the form of lowered transmission, distribution, or power requirement for the additional layer of protection that must be accommodated.**

**Within the insulated conductors that provide a high-strength safeguard for the core, an armoured cable is a robust and hard-wearing power cable with heavy responsibilities. To the companies whose products and services are profiled here, the effective mechanical protection and greater resistance to pulling loads provided by the armour are as much a part of the equipage of the cable as its fire, smoke, and toxin resistance.**




▲ *Drum twisting line for Milliken Cables and armouring with up to 120 galvanised steel wires*

# Using tapes and wires

Flymca and Flyro are involved in the field of armouring and reinforcing of power cables with many different types of equipment, depending on the purpose.

Armouring and reinforcing are used chiefly to protect cables against mechanical damage, such as pulling forces during the laying, or to protect against sharp stones, as well as a support of heavy cables for special purposes.

There are two types of armouring mainly used with power and communication cables: tape armouring (when radial stress is expected) and wire armouring (when axial stress is involved). Armouring is provided by either round or flat wires. Flat wires are used to reduce weight and particularly when special armouring is required.

Four types of machine are used for armouring. When armouring with tapes then longitudinal, concentric, or multi-pad tangential taping heads are used. For armouring with galvanised steel wires then either a planetary or cage strander (armouring wires in bobbins), a rigid strander (armouring wires in bobbins) or a drum twister (armouring wires from baskets) is used.

Flymca has long experience in building all these machines to meet customer specifications. The company can also construct heavy-duty machinery for the production of cables with very large diameters, as used for submarine and offshore platforms.

**Flymca – Spain**
**Email**: flymca@flymca.com
**Fax**: +34 942 55 9865
**Website**: www.flymca.ru





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- for carbon steel and stainless steel wire dry drawing

**LUBRIOL®** **OILS AND GREASES**
- for carbon steel and stainless steel wire wet drawing
- for copper wire drawing
- for cold heading, extrusion, vibrofinishing and other treatments

**FOSFIL®** **PHOSPHATING AGENTS**
- for wire rod and steel wires surface treatment

**STEELFOR®** **COATINGS AND CARRIERS**
- for wire rod and steel wires pre-drawing surface treatment

**ADDITIVE LM®** **SPECIAL COMPOUNDS**
- for copper coating, for galvanizing (charcoals)
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- rotating die-holders
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- helicoidal brushes ("Helix") and applicators ("Applilub")

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| | |
|---|---|
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| **ISO 14001:2004** | Environmental Management System |
| **OHSAS 18001:2007** | Occupational Health and Safety Management System |

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Via Moggio, 19 - 23808 Vercurago (Lc) Italy
Tel. +39 0341 420.444 - Fax +39 0341 422.386
E-mail: info@lubrimetal.com
Internet: www.lubrimetal.com

# Braiding for cable protection

Gladding Braided Products' harness braiding system provides a protective casing over a core set of wires. The core (hose, ground wire, fuel line or electrical harness, for example) is covered with a braided protective material. Gladding can supply the finished harness, the raw materials (textile coverings such as nylon, polyester, Nomex, Kevlar, fibreglass, PTFE or VN-4000S) and wire materials such as stainless steel, copper, bronze and aluminium, as well as the braiding machinery to apply the shield.

The diameter of the core wires or harness will determine the size of the braiding machine needed: a ¼" harness may use a 16-carrier machine, while a 1" diameter harness might require a 32-carrier machine.

Gladding supplies machines for all sizes, and with a machine purchase, Gladding provides training at its factory.

"The skill of the operator is of the utmost importance," explained Sparky Christakos, Gladding president.

**Gladding Braided Products – USA**
**Fax**: +1 315 653 4492
**Email**: info@gladdingbraid.com
**Website**: www.gladdingbraid.com

▼ *Gladding's braiding equipment for cable*

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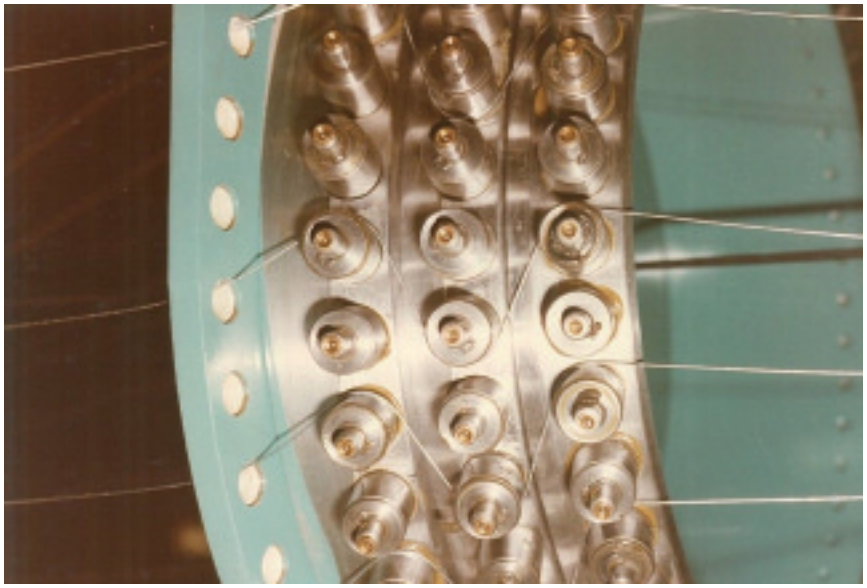
# Working with steel wire and tape



▲ *Armouring solutions from Gauder Group*

Pourtier and Setic, of the Gauder Group, have developed a range of machines for use in armouring lines.

A high-speed single twist machine for steel wire armouring can work with reels up to 2.5m. Based on the single twist concept, with 100% back twist payoff for the cable and accurate tension control with a load cell, this line is designed to double productivity compared to a conventional drum twister process. Model ST1600 will process cable up to 30mm, ST2000 up to 45mm, and ST2500 up to 60mm.

A new CAH steel taping line has also been developed with a production capacity said to be three to five times higher than that of a conventional tangential armouring head. This high output is mainly due to a high rotating speed (up to 600rpm) whatever the traverse spool weight in a concentric process, and because there are fewer line stops compared to a tangential armouring head (using a traverse spool instead of a pad).

**Pourtier Gauder Group – France**
**Fax**: +33 164 26 6110
**Email**: sales.pourtier@gaudergroup.com
**Website**: www.gaudergroup.com

**Setic Gauder Group – France**
**Fax**: +33 477 71 1085
**Email**: sales.setic@gaudergroup.com
**Website**: www.gaudergroup.com

# Producing strip for armouring

Swedish company Burseryds Bruk, a subsidiary of the US-based company Illinois Tool Works, manufactures and sells a wide range of steel products including packaging strap, hot dip galvanised strip and cold rolled strip.

The hot dip galvanised steel strip is specially produced for use in the manufacture of control umbilical cable, medium/high/extra high voltage and subsea cable.

The four-side coated strip offers extremely good protection against corrosion. The strip can be supplied in a range of designs and is produced to suit customer requirements regarding zinc coating, strip tolerances and coil size.

**Burseryds Bruk – Sweden**
**Fax**: +46 371 375 19
**Email**: pmy@burserydsbruk.se
**Website**: www.burserydsbruk.se

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GLOSER s.r.l.
Email: info@glnt.it

Agency in East Europe
PIP Machinery, Austria
Email: info@pip-Machinery.com

Agency in India
Beijing Holland Trading Co., Ltd.
Email: bjholland01@yahoo.com

# Applying continuous sheathing

Specifications for special application cables require either smooth or corrugated metallic outer conductors to assure crush resistance and high flexibility. The gas tight sheaths with helical or annular corrugations protect the cable against moisture, liquid and gases, and the metallic sheath acts as a grounding conductor.

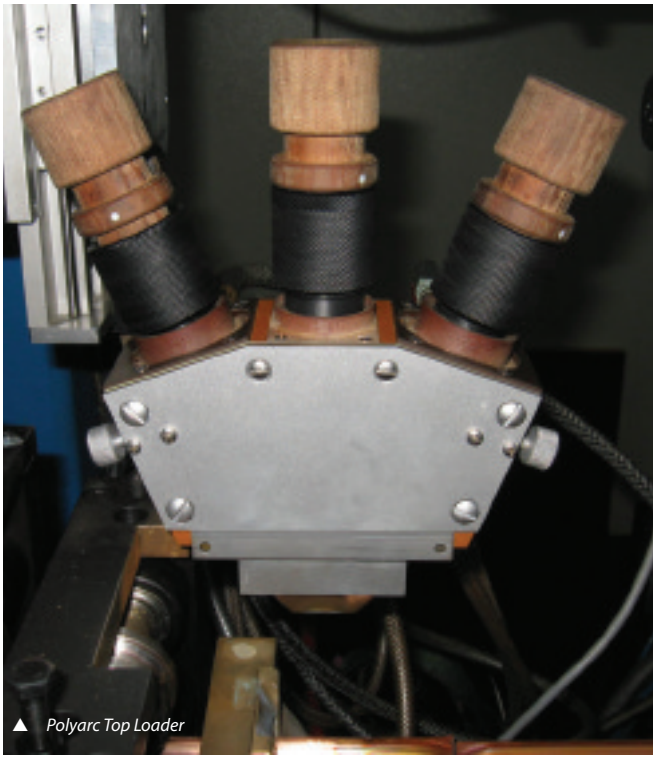
Nexans' UNIWEMA® process can be used to apply a continuous cable sheath for cable core diameters from 5mm to 200mm.

A metal strip is introduced into the machine and, in a single operation, the strip edges are formed around the cable core. The opposing strip edges are welded by laser or TIG welding. The standard UNIWEMA is equipped with a single electrode.

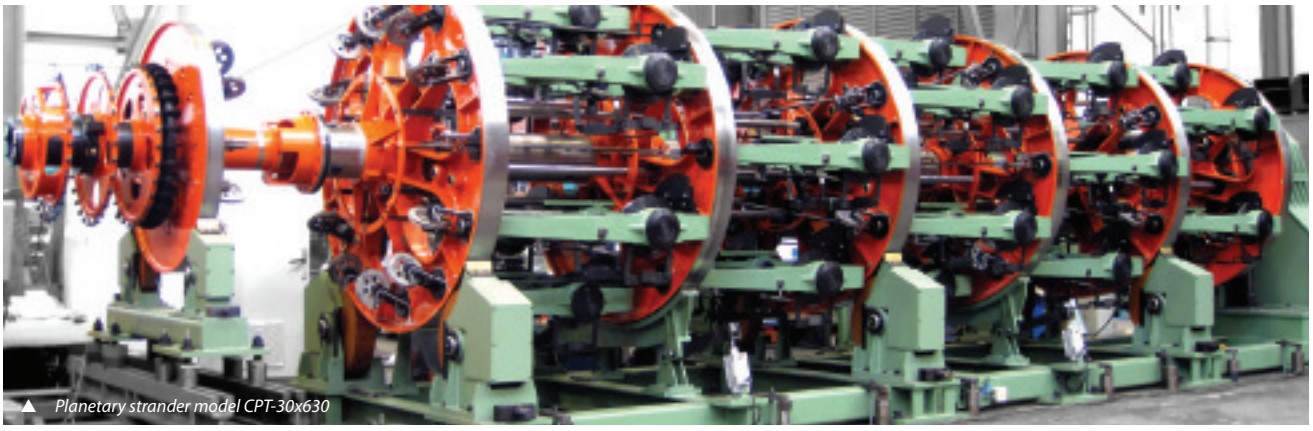
In case of applications where the maximum allowable welding current with one electrode is insufficient (for thicker strips, or if higher speeds are desired) the UNIWEMA can be operated with a 3-electrode welding torch system, the Polyarc welder.

A newly developed TIG welder, Polyarc Top Loader is available for thicker materials or higher welding speeds. The torch ensures an uninterrupted, uniform welded seam. Top Loader technology allows an easy exchange of the electrodes from the top of the torch holder.

**Nexans Deutschland GmbH – Germany**
**Email**: uniwema.tech@nexans.com
**Website**: www.nexans.de



▲ *Polyarc Top Loader*



▲ *Planetary strander model CPT-30x630*



# Armourings for cable

There are two ways of armouring cable, using either steel tapes with overlap or a layer of steel wires.

The method chosen will depend on the cable standard and the required reinforcing.

For steel tapes Caballé offers rotating eccentric steel taping heads with pads up to 800mm, and longitudinal shielding equipment with flat or corrugated steel tapes. There are also stranders specifically designed for applications involving steel wires.

For low tensile wires:

- Single twist stranders for take-up reels up to 2,000mm
- Drum twisters for take-up reels up to 4,000mm
- Rigid stranders for payoff bobbins typically 630mm

With the single twist stranders and drum twisters the steel wires can be supplied either from baskets (the preferred method) or from bobbins.

When armouring with high tensile steel wires a backtwist in the wire is essential, so it must be done with a planetary strander. Caballé offers a complete range of planetary stranders with the following features:

- Different cage compositions for bobbins typically of 630mm
- Variable backtwist
- Cast steel cradles for long machine life
- Mechanical brake with compensation for constant tension (or brake by AC motor)
- Special preforming heads

**CM Caballé, sa – Spain**
**Fax**: +34 93 399 00 08
**Email**: caballe@cmcaballe.es
**Website**: www.cmcaballe.es

# Steel range includes armouring wire

Anbao (Qinhuangdao) Wire & Mesh Co Ltd, of China offers armouring cable wire – heavily galvanised, soft wire in diameters from 0.87mm to 3.15mm. Coil weight is between 20kg and 1,000kg.

Standard and custom specifications can be supplied. Packing can be in normal or orbit coils, or on spools or pallets.

▲ *Soft armouring cable wire from Anbao*

**Anbao (Qinhuangdao) Wire & Mesh Co Ltd – China**
**Fax**: +86 335 3870760
**Website**: www.anbao.com

## Reinforcing cable with Alumoclad

Where aluminium and aluminium alloy conductors are used for the overhead transport of electrical energy, the weight of the cables demands a steel wire stiffener for support in the centre of the cable. The steel wires used for this purpose are aluminium- or zinc-coated. In particular, aluminium-coated steel wire, known as Alumoclad, is more resistant to corrosion and is preferred over zinc because of its higher conductivity.

GCR Eurodraw makes lines to draw down Alumoclad from the wire rod to the final required diameters, with conductivity and tensile stress that comply with the regulations in force in the different countries of the world.

The lines are able to draw the combination aluminium/steel at high speeds, while at the same time maintaining the original ratio between the thickness of the aluminium coating and the steel wire diameter.

Die cooling has been optimised for excellent dispersal of the heat produced during the drawing operation, and block cooling is such that the wire temperature is maintained within the required limits after every single drawing block. The die boxes have been expressly designed for this particular production.

Alumoclad drawing lines include payoffs and take-ups that are specific for the spools used by the user in the subsequent production processes.

**GCR Eurodraw SpA – Italy**
**Email**: gcr@gcrgroup.com
**Fax**: +39 02 9354 0452
**Website**: www.gcrgroup.com

# Armoured UG cables provide security of supply

Thousands of kilometres of cables run underground, at risk from rocks, drifting sands, termite nests and rat holes, to emerge in cities, towns and villages around the globe. These cables are depended on by billions of people. Hence, electricity performance security (EPS) requires a special design for underground cables.

Armouring is the most economical solution; it saves the cost of conduit and allows for investment in additional earthing.

Equipped with a series of advanced armouring lines, Minxing Cables offers the most common armouring types, including steel wire armour (SWA), steel tape armour (STA), aluminium wire armour (AWA) and aluminium tape armour (ATA). The maximum overall power cable diameter that strip armouring can cover is 130mm. The available width of the strips is from 15mm to 60mm. When using wire armouring, the maximum overall diameter of power cable is 100mm, and the diameter of armouring wires can be from 0.8mm to 5mm.

Production, quality control, training and purchasing at Minxing Cables are all ISO9001:2008 approved. Minxing Cables' engineers can design according to most international standards, such as IEC60502, VDE0271, BS5467 and UNE-EN 50267. Close attention is paid not only to mechanical safety, but also to electrical safety. For example, the armour of single-core cables for use on AC systems consists of non-magnetic material, unless a special construction is required.

**Dongguan Minxing Cables Co Ltd – China**
**Email**: doimas@chinamxc.com
**Fax**: +86 769 8207 3295
**Website**: www.chinamxc.com

# Braiding equipment

OMA Srl offers a wide range of braiding machines suitable for armouring or reinforcing cables, cable bundles and conduits. The materials typically braided include galvanised, brass-coated and stainless steel wires, and bronze and copper wires.

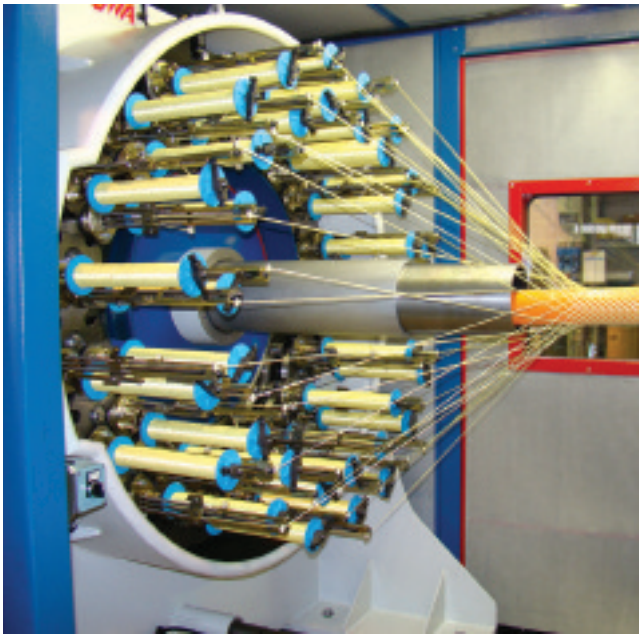
The outer sheave of braided wires gives the product abrasion resistance and mechanical protection but with good flexibility.

Textile yarns, such as high strength aramids, are often used for reinforcement particularly of undersea umbilicals. They are valuable where cables or bundles are subject to high pulling forces but need a high degree of flexing.

Braiding machines can be supplied in many different sizes, with either vertical or horizontal axis depending on the coverage and flexibility of the cables to be produced.

OMA also supplies the ancillary equipment required for braiding, such as bobbin winders, taping heads, payoffs and take-ups.

**OMA Srl – Italy**
**Email**: oma@omabraid.it
**Fax**: +39 039 608 4571
**Website**: www.omabraid.com



▲ *OMA 36/1-190 horizontal braider braiding umbilical cables with aramid fibres*

▲ BWE's SheathEx production line

# Continuous cable sheath

Smart AS Wire is BWE's system for producing aluminium-clad steel wire with improved efficiency and reduced waste.

Volumetric control has been used for many years to regulate the ratio of aluminium to steel wire. Smart AS Wire introduced a new mode of operation called Load Sensing, which supervises and continuously adjusts the volumetric ratio so that perfect cladding conditions are maintained while flash (aluminium leakage) is minimised.

To avoid the need for the operator to enter complex set-up information, the system is self-learning. For the first drum of a production run, the operator starts up in the normal way. After reaching thermal equilibrium at full running speed, the Smart Software indicates that it is ready to take over. The operator can now engage Load Sensing Mode to complete the run.

At the end of the run, the operator shuts down using the Auto Stop function. This allows cladding to continue much closer to the end of a drum of steel wire than previously possible and makes start up on the next drum easier because the shutdown is always clean.

Once the first drum of wire has been completed and the Smart Software has learnt the optimum process conditions, the operator can run off subsequent drums with the Auto Start function.

The Auto Start function does not just follow the operator's actions on the learning run, it also optimises them to bring the line up to speed in the shortest possible time so that waste is minimised.

**BWE Ltd – UK**
**Fax**: +44 1233 630670
**Email**: mail@bwe.co.uk
**Website**: www.conform.com


Image credit Messe Düsseldorf©

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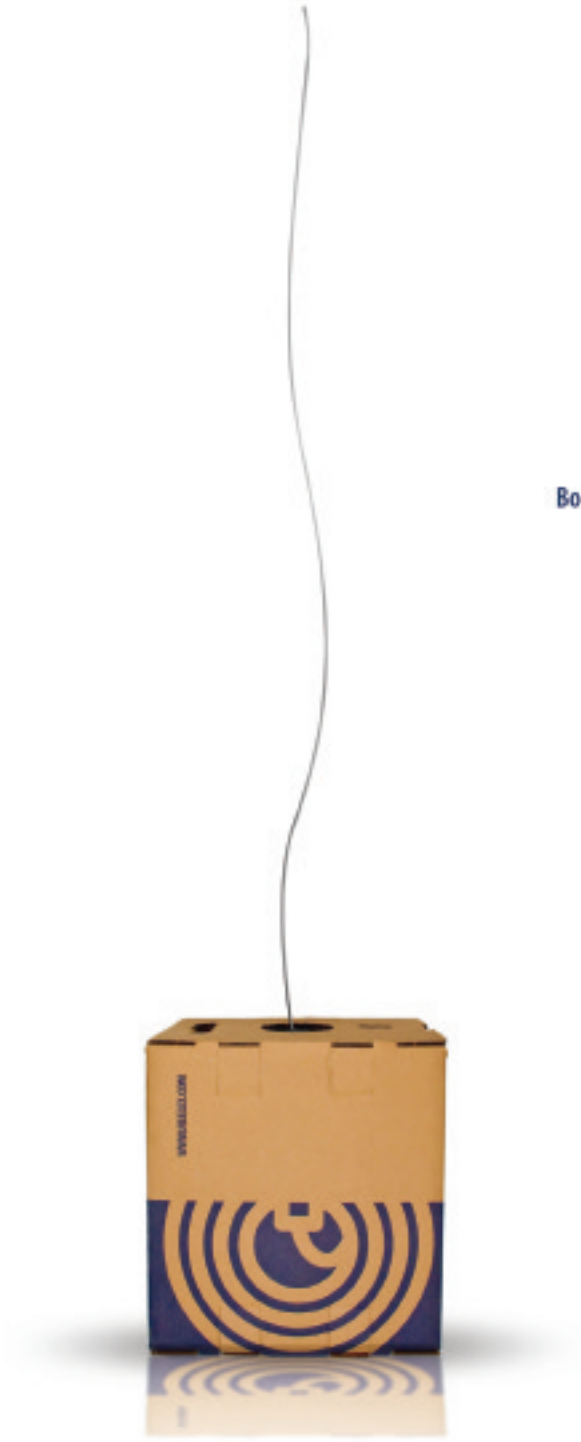

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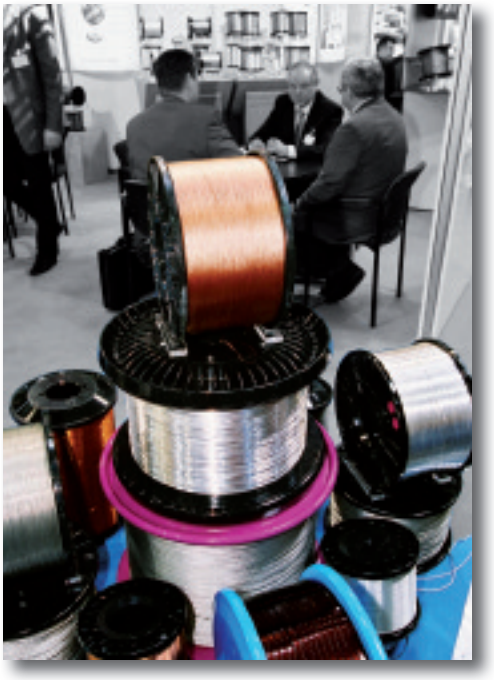
# The wait is over…

…the planning is complete, and on 12th April 2010 the Düsseldorf Fairground will open its doors to five days dedicated to the wire and cable industry. Nearly 1,200 exhibitors from at least 49 countries are booked into 52,000m² of hall space.

EuroWire asked Düsseldorf exhibitors to reveal what's new for 2010. The following pages show how they responded. Both wire and cable sectors are well represented, showing that the industry hasn't sat back and taken things easy since 2008. Despite, or perhaps because of, the difficult trading conditions of the last 18 months, manufacturers are coming back with new offerings to the market; cleaner, faster, cheaper solutions to make your business more productive.

From 12th to 16th April, wire Düsseldorf is the only place to be.

| | |
|---|---|
| **Show dates**: | Monday 12th April to Friday 16th April 2010 |
| **Show opening hours**: | Daily from 9am to 6pm |
| | Friday from 9am to 5pm |



**Organisers**: **Messe Düsseldorf GmbH – Germany**

**Fax**: +49 211 45 6087 7793
**Email**: wire@messe-duesseldorf.de
**Website**: www.wire.de

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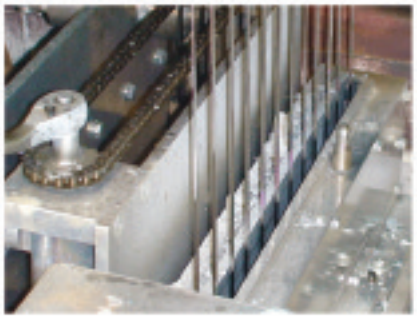
# INTERNATIONALLY RECOGNISED LEADERS IN GALVANISED WIRE TECHNOLOGY

QUANTUM™ EMW™ WIPING PROCESS

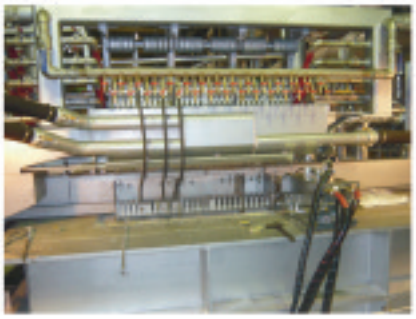
QUANTUM™ LCM™ 800

QUANTUM™ PROJECT MANAGEMENT



Cost and quality are the two most important aspects in today's highly competitive wire manufacturing environment. By installing Quantum EMW on existing galvanising lines, or designing EMW into a new line, there is usually a 25% saving on Zinc and Zinc alloy costs. At the cutting edge of technology, EMW is the most advanced wiping system available producing perfectly concentric galvanised wire. Easy to operate, safe and environmentally friendly there are over 30 EMW systems successfully operating worldwide.

PWT's in-depth knowledge of the wire manufacturing process has led to the development of state of the art lubricant conditioning technology. The LCM 800 is designed to guard against excessive die wear and maintain wire quality. Used lube has always been discarded but by reprocessing it the LCM 800 reduces operational costs. By emptying the die box and adding into the receiving hopper up to 60% of the lubricant can typically be re-used. The process is simple, safe, requires minimal operation and helps protect the environment.



PWT are internationally recognised as the leaders in process control of galvanised wire. In all aspects of galvanising technology the expertise of our Project Management Division will work alongside you making sure a first class job is produced, on time, first time. Our affiliation with world wide equipment suppliers guarantees quality products at competitive prices - all fully warranted with prompt after sales technical support. From pay off to take up, PWT are the partners of choice in the field of galvanised wire making.

PWT Limited • Unit 5 Number 1 Highbrook Drive • East Tamaki 2161 • New Zealand
PO Box 18 409 Glen Innes 1743 • PH:+64 9 271 5529 Fax: +64 9 271 5574



www.quantum-emw.com

## AESA Cortaillod
## Stand: 10B38

AESA Cortaillod, specialists in electric cable metrology, will be launching new testers at the show.

Lynx is a new manual RCKE tester combining design and efficiency. The man-machine interface is a touch screen, allowing the input of commands as well as the display of LF measurements acquired on pairs and quads at the intermediate test platform.

Puma is a new automatic RCKE tester with connecting frames for measuring LF parameters on pairs and quads, subassemblies and small cables at the final test platform.

Gaia is a test system designed to automatically measure the LF parameters on multi-pair cables, dielectric strength (high voltage) and insulation resistance. Phoenix DT is a compact model for the final inspection of xDSL cables. In a limited space it incorporates the technology of LF measurement and HF up to 40MHz.

CIQ 3.0 is complete and structured software for quality and production management in the electric cable and wire specific industry.

It offers data capture, networking, use, export to ERP and archiving.

**AESA SA – Switzerland**
**Fax**: +41 32 842 4865
**Website**: www.aesa.ch

## Agir Technologies
## Stand: 10A08-05

Agir Technologies will introduce its new IG range of six internal grinding machines, IG 80M, IG 80A, IG 100M, IG 100A, IG 125M and IG 125A, designed to simplify the work of the operator.

These grinding machines have been totally rethought in order to simplify the operator's work.

Built for reliability (hundreds of Agir machines are already operating on five continents), rigidity (tables in steel and cast-iron), precision (brushless motor and micron digital display), and machine management through programmable and digital OPLC.

Furthermore, on the IG 100A and IG 125A machines, the work-head angular motorisation, precise to 1/10 of degree, allows the OPLC to record the grinding steps of the first die (bearing length, working cone, entry cone) and to recall and apply the steps so that all the following dies will be worked exactly the same without any operator intervention or any adjustment (apart from the wheel wear compensation).

The IG 125A is streamlined and equipped with a cooling system to cool both the die and the grinding wheel.

Therefore the ground surface finish is finer, the life of the wheel is longer and above all, it allows the use of specific wheels that can polish tungsten carbide dies automatically.

**Agir Technologies – France**
**Fax**: +33 3 805 18136
**Email**: rivom@rivom.com
**Website**: www.agir-technologies.com

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BRITISH INNOVATION

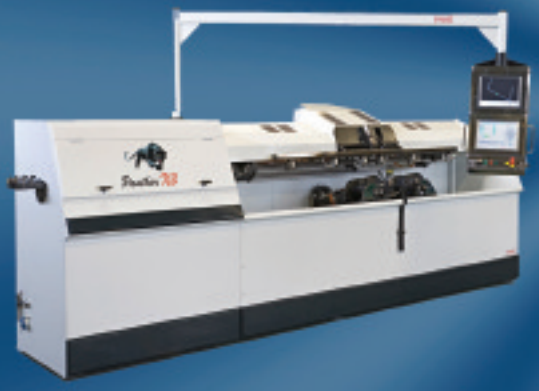
CONTINUED BRITISH
MANUFACTURE

# PAVE

wire Düsseldorf
HALL 12
STAND D17

## Pioneers in wire forming technology for over 35 years





Website: www.pave-wire.com
Email: pave@enterprise.net
Telephone: +44 (0) 1733 342519

## Ajex & Turner Wire Dies Co
## Stand: 11F02

Ajex's latest machine for the in-house polishing of tungsten carbide dies, the TCD-11 (horizontal type), will be the centrepiece of the stand. A vertical type, TCD-12, is also available.

▲ *New tungsten carbide die working machine, TCD-11*

Ajex's range of machines for poly-crystalline and diamond dies and an ultrasonic machine will also be on display.

**Ajex & Turner Wire Dies Co – India**
**Fax**: +91 11 239 40226
**Email**: ajex@ndf.vsnl.net.in
**Website**: www.ajexturner.com

## AWM
## Stand: 11A22

AWM will introduce its revolutionary Synthesis machine. Continuing the development of an integrated system of mesh welding and cage production all under one roof, the new Synthesis is suitable to automatically produce any type of cage using wire in coils.

Cages are produced by the automatic folding of sheet meshes; complex cages can be composed using several smaller elements.

▲ *Cage production using AWM technology*

The production is handled on a just-in-time basis using a newly designed software program that allows a total integration of the new system with the traditional working method.

AWM will show videos and pictures of the new line, and a visit to a working machine can be organised, upon request, after the show.

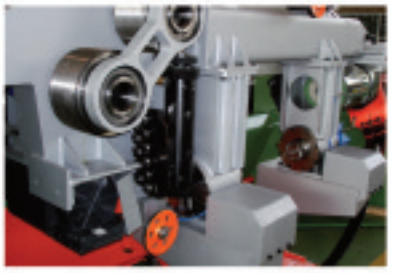
The company's wider portfolio, including cold rolling lines (coil-to-coil and coil-to-bar), straightening and cutting machines, all types of mesh welding lines, lattice girder machines and automatic mesh benders will also be on display.

**AWM SpA – Italy**
**Fax**: +39 0432 780350
**Email**: info@awm.it
**Website**: www.awm.it

## Bennett Mahler Ltd
## Stand: 16D16

Bennett Mahler Limited will exhibit the Maxicoil MC-25 servo driven spring coiling lathe for the first time in Europe.

# DOUBLE-TWIST STRANDING MACHINES



- DTU: with static pay-offs
- DTS: with rotary pay-off of core strand and static outer wire pay-offs
- DTA: (closing machine) with rotary pay-off of all strands
- Available in sizes from 255 mm up to 1250 mm
- Suitable for strands and ropes with diameters up to 12 mm
- Impressive rope quality at the highest performances.

**COME AND SEE US AT WIRE DUSSELDORF!**
**HALLE 11 STAND A66**

GCR EURODRAW

NOT ONLY A MACHINERY MANUFACTURER

GCR EURODRAW S.p.A.
Via Camillo Chiesa, 19/21 - 20010 Pogliano Milanese (MI), Italy
Tel. +39 02.93963.1 - Fax +39 02.93540452 - gcr@gcrgroup.com - www.gcrgroup.com

This machine can produce extremely accurate compression, tension and torsion springs in wire diameters from 5mm up to 25mm in spring steel material and in larger sizes in annealed wire.

▲ *Spring coiling equipment from Bennett Mahler*

A WHG-660 single end water cooled spring grinding machine for grinding of large wire diameter springs will also be exhibited together with the Bennett Ultragrind downfeed spring grinding machine, hand coiler and a rebuilt spring coiling machine.

**Bennett Mahler Ltd – UK**
**Fax**: +44 1527 591668
**Email**: sales@bennettmahler.com
**Website**: www.bennettmahler.com

## Beta Lasermike
## Stand: 11H58

New for 2010 is the CenterScan 2010. The CS2010 is designed to provide non-contact eccentricity measurement, scanning flaw detection and OD measurement of cables, all in one sensor.

**Beta LaserMike – USA**
**Fax**: +1 937 233 7284
**Email**: sales@betalasermike.com
**Website**: www.betalasermike.com

## Construcciones Mecánicas Caballé SA
## Stand: 11G65

Construcciones Mecánicas Caballé SA will show a new range of rigid stranders and drum twisters, redesigned and upgraded in collaboration with energy cable manufacturers for the production of:

# MONO-WIRE PLATING LINES

FOR HIGH SPEED PRODUCTION OF GALVANIZED, COPPER-PLATED, NICKEL-PLATED OR TIN-PLATED STEEL, BRASS OR COPPER WIRE

- Electro-galvanizing, nickel-plating, chemical coppering, tinning lines
- Wave slicing rectifiers for the highest accuracy in plating control
- Insoluble anodes electro-galvanizing technology with titanium cells
- Can be equipped with non-stop pay-offs and take-ups
- Single or twin mono-wire designs available
- Plating speeds up to 600 m/min with ultra compact units

COME AND SEE US AT WIRE DUSSELDORF!
HALLE 11 STAND A66

NOT ONLY
A MACHINERY
MANUFACTURER

GCR EURODRAW

GCR EURODRAW S.p.A.
Via Camillo Chiesa, 19/21 - 20010 Pogliano Milanese (MI), Italy
Tel. +39 02.93963.1 - Fax +39 02.93540452 - gcr@gcrgroup.com - www.gcrgroup.com

- Compacted conductors of copper and aluminium for LV, MV and HV insulated conductors
- Sector conductors (Milliken) of copper and aluminium for high and extra-high voltage insulated conductors
- Aluminium (AAAC, ACSR) aerial conductors with round or trapezoidal wires
- Screening with copper wires (single or multi-wire) for MV and HV conductors
- Armouring with galvanised steel wires

▲ *Drum twister for Milliken conductors up to 3,000mm*

With over 60 years of experience in the design and manufacture of rotating machinery for the production of power and telecommunication cables and steel ropes, CM Caballé provides the cable industry with a wide array of stranding, twinning, bunching and cabling machinery.

**Construcciones Mecánicas Caballé SA – Spain**
**Fax**: +34 93 399 0008
**Email**: caballe@cmcaballe.es
**Website**: www.cmcaballe.es

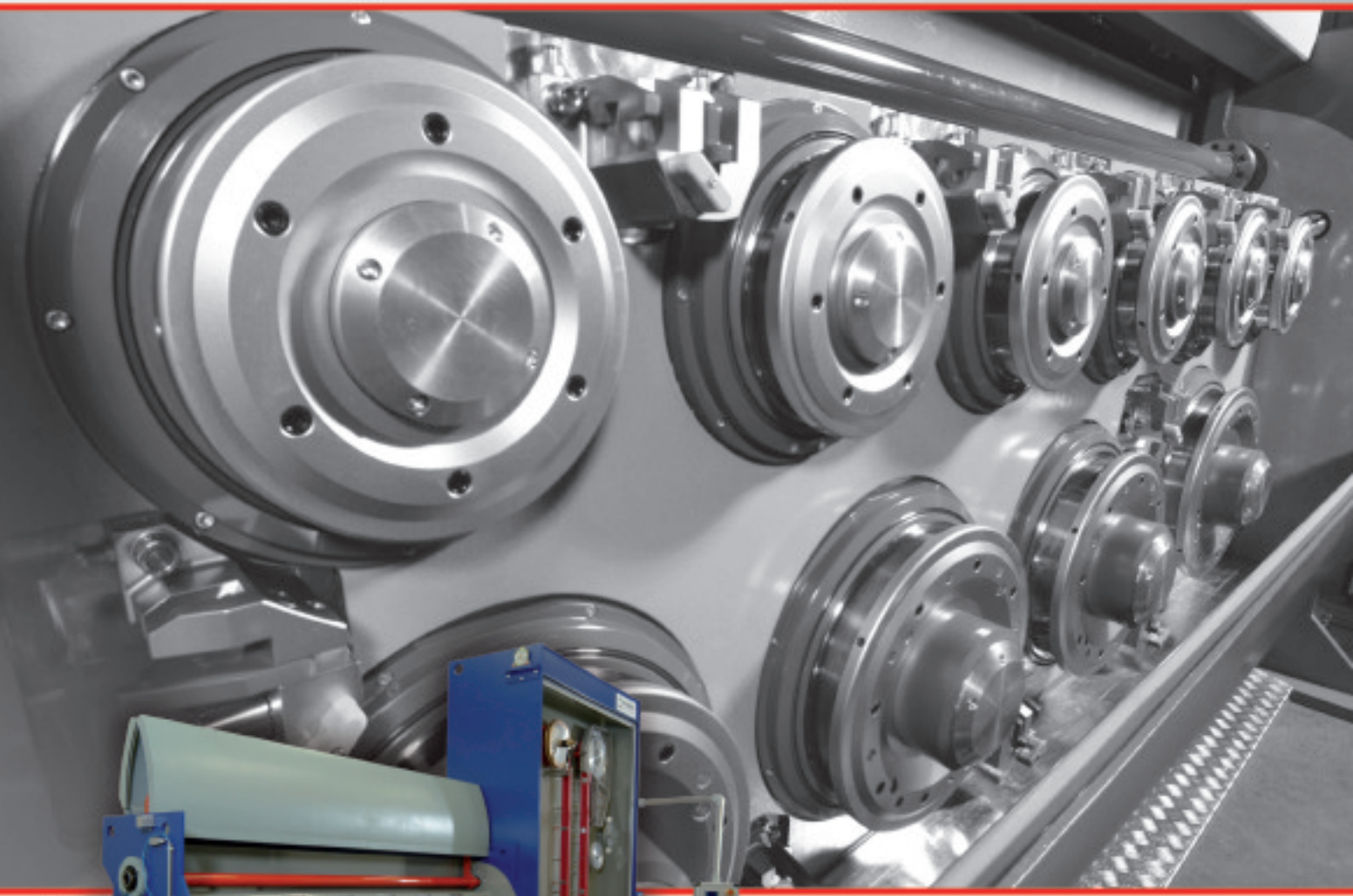
## Camfart Srl
## Stand: 16A16

Camfart will present its latest of range of products for coil spring end grinding. The new bonds developed by Camfart are specifically designed to exploit the cutting action of 3M Cubitron™ sintered abrasives.

The latest development is the E-bond family, E3, E4 and E5, which is based on an improved sintering system to optimally bond seeded gel abrasives. They are sufficiently friable to allow self-dressing of wheels but also very tough, holding 3M Cubitron grain longer than other bonds. The result is reduced heating and damage to steel during operation and this ensures higher quality springs in terms of geometry and consistency of deformation under load.

Camfart tested E5 bond with different spring manufacturers on different machines, grinding a wide variety of hardened carbon steel springs and inox springs. In downfeed grinding of carbon steel wire of 4mm–6mm diameter, the spark time is said to decrease by 30% and wheel life increase by 50%.


▲ *Grinding wheels from Camfart*



## EUROALPHA R1

**THE FIRST COMPACT ROD BREAKDOWN MACHINE PERFORMING LIMITED-SLIP OPERATIONS**

Individually motor-driven drawing capstans
a.c. servo-ventilated motors and vector inverter drives
EUROALPHA special algorithm for high-accuracy motors' synchronization

The state-of-the-art technology to:
**REDUCE CAPITAL INVESTMENTS**
for setting up your plants
**INCREASE THE ACTUAL PRODUCTIVITY**
of your drawing mills
**ENHANCE THE QUALITY**
of your wires
**LIMIT OPERATIONAL COSTS**
for running your plants

**suitable for**
**COPPER – ALUMINIUM – ALUMINIUM ALLOYS wires**

**Euroalpha S.r.l.**
Via Aldo Moro, 13 - 36060 Pianezze San Lorenzo (VI) - Italy
TEL. +39 0424 472084 - FAX +39 0424 72780
e-mail: sales@euroalpha.it

euroalpha
drawing machines

In crash grinding of AISI 302 springs 13mm – wire 2mm the springs per dressing increases from 6,000 to 12,000.

**Camfart Srl – Italy**
**Fax**: +39 0364 598986
**Email**: info@camfart.it
**Website**: www.camfart.it

## Cemsa SpA
## Stand: 16G23

Cemsa will present its latest resistance welding machine, the GRG series, for the production of heavy steel grating panels. These are normally 6,000mm long, with steel cross wires of between 4mm and 7mm, for a width of 1,000mm. The grating panels are used for road fencing, drain wells, air intakes, stairs and gangways, and in industrial installations, such as refineries, power stations and offshore applications.

The welding process of the GRG-JR-1000 welding machine is automatic, while loading is manual. The longitudinal bars are loaded onto the feeding table

▲ *GRG-JR-1000 welding machine*

and then, in a pilgrim-pitch magazine in a special housing, the cross wires are loaded. The magazine has a capacity of 20 cross wires, representing twenty strokes of the welding machine. The possibility of a higher automation level is also foreseen and can be obtained by the introduction of a vertical automatic magazine of higher capacity.

The machine is available in different configurations, depending on the transformer electrical power management. The electrical power is chosen according to the working speed, the power available from the factory network and the required aesthetic results.

The installed power is therefore linked to the working solution, ranging from 300Kw, in case of electrical cascade, up to 1,500Kw for one-stroke welding.

This system is mainly intended to meet the needs of medium and small companies, but also those of larger companies requiring a flexible system of production, able to move quickly from one model to another.

Unloading is completely automatic and this allows the user to foresee down-stream reworking operations, such us cutting, stacking, transport and galvanizing.

**Cemsa SpA – Italy**
**Fax**: +39 02 253 3307
**Email**: info@cemsa.it
**Website**: www.cemsa.it

## Cimteq
## Stand: 11D21

Cimteq will be unveiling the latest developments to CableBuilder at wire Düsseldorf.

The new release of the application incorporates many new productivity tools as well as the new CableBuilder Enterprise module. It is designed to enable the cable manufacturer to reduce waste, and increase profitability even more.

New CableBuilder supports all the requirements of cable design and quotation, as well as additional features such as enhanced drawings and documentation, an intuitive search engine and electrical calculation.

The CableBuilder Enterprise module is designed for collaboration and optimisation of a multi-plant manufacturing environment, and is described as "a step closer to the concept of design-once, manufacture anywhere." It includes features such as multi-plant manufacturing, and manufacturing optimisation through alternative routing and materials.

Cimteq believes well organised sales and technical teams to be a valuable asset to the cable manufacturer. Without good organisation, the cable manufacturer seriously inhibits their ability to produce good quality products and sell them at the best possible price. CableBuilder facilitates the communication and integration of these two important functions, as well as ensuring all instructions reaching the shop floor are accurate and up to date.

**Cimteq – UK**
**Fax**: +44 1978 667 005
**Email**: info@cimteq.com
**Website**: www.cimteq.com

## Clinton Instrument Company
## Stand: 9E38

The FL-20A cable fault locator is Clinton Instrument Company's newest tool for the wire and cable industry.

Cable rejected during the hi-pot test has always been an expensive problem for the manufacturer but, until now, finding opens and shorts with an analogue cable fault locator has required tedious meter and sensitivity adjustments as well as mathematical calculation once the test was completed.

The digital FL-20A automates cable fault detection, greatly reducing the time and training required to find these problems.

Opens, metallic shorts, or high voltage shorts between conductors or between conductor and shield are pinpointed quickly and with ease. ➢➢➢

▼ *The FL-20A cable fault locator*

The operator simply connects the FL-20A test probes to each end of the cable under test, enters the cable length and gauge size on the digital front panel display, and selects "Shorts" or "Opens" to begin the test. Within a few seconds, the unit calculates the distance of the fault site from each test probe and displays the location in feet or metres.

The failure can then be cut out or repaired and the remaining good product salvaged, resulting in savings for the producer.

The FL-20A cable fault locator, a compact 15" wide x 14" deep x 10" high, weighs only 30lb and is significantly smaller and lighter than its predecessors. It promises a great return on investment by salvaging expensive cable assemblies and lowering the costs associated with salvage.

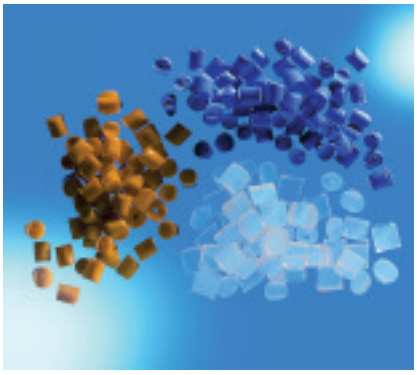
**Clinton Instrument Company – USA**
**Fax**: +1 860 669 3825
**Email**:
support@clintoninstrument.com
**Website**: www.clintoninstrument.com



## Colorant Chromatics Group
## Stand: 11J12

Colorant Chromatics Group and ElringKlinger Kunststofftechnik GmbH have entered into a cooperation to colour Moldflon® with masterbatches produced by Colorant Chromatics. As a result of the cooperation Colorant Chromatics has launched colour concentrates/masterbatches based on Moldflon.

The product range, called Moldflon MF 10010 masterbatch double strength, consists of ten colours and will provide the full range of colours for all Moldflon applications.



▲ *Moldflon granulates before processing*

ElringKlinger Kunststofftechnik GmbH introduced Moldflon in 2006 as the first melt-processable modified Polytetrafluoroethylene (PTFE). Holding a global exclusive license for marketing and producing ElringKlinger chose Colorant Chromatics AG as the partner for the colouration of it.

Moldflon MF 10010 masterbatch double strength is an addition to Colorant Chromatics' extensive melt-processable product line which includes colour concentrates and compounds for polymers including FEP, ETFE, PFA, PVdF, ECTFE, MFA, THV, PEEK and PES.

The colour concentrates are offered in various pigment strengths and resin viscosities to assure optimal performance in the end-use manufacturing process.

In addition to Colorant Chromatics' standard line of colours and compounds, the company offers special services such as colour matching, pre-colouring and custom compounding. The company also supplies a full range of pigment dispersions for PTFE extrusion, as well as printing and striping inks for FEP, ETFE, PFA, PVdF, PTFE, PEEK and polyimide.

# Leader in Rotating Machines for Power Cable

POURTIER
GAUDER GROUP
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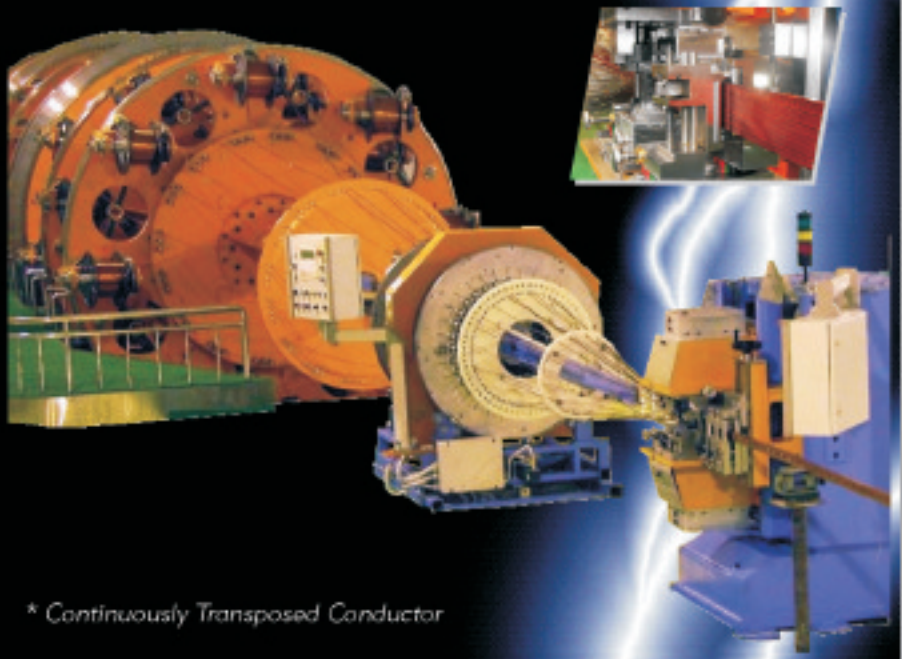
# The Integrated Solution for your Transformer Wires Production

## Fine taping or insulation of copper strips
**With POURTIER RHM 400-4-1M**

Accurate tape application on single or multiple copper strips

## Complete line for production of CTC *
**With POURTIER planetary strander and modern transposing head**



* Continuously Transposed Conductor


**POURTIER - Gauder Group**
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77506 Chelles Cedex - France
Tel. : +33 1 64 21 84 00
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sales.usa@gaudergroup.com

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**Gauder Group China**
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Fax : +86 519 8548 0096
sales.china@gaudergroup.com


10-E/38
wire
Düsseldorf

Wire 2010 • 12 - 16 April
Düsseldorf, Germany

Colorant Chromatics Group operates with facilities in Aland, Finland; Bethel, CT, USA; and Shanghai, China, and sales offices worldwide and is a wholly owned subsidiary of the ColorMatrix Group.

**Colorant Chromatics AG – Switzerland**
**Fax**: +41 417 410102
**Email**:
international@colorantchromatics.com
**Website**: www.colorantchromatics.com

## Compomec Cable Machinery Stand: 10C23

Compomec will introduce three new products for the fibre and cable industries.

The ComRIB includes traversing ComPo 35 unwinder, coating system, and the ComTu 55 single or automatic dual winder.

ComRIB technology meets the highest process requirements up to 24-fibre ribbons. High productivity is achieved with the traversing payoffs handling up to 200km fibre reels, and with the automatic dual take-up enabling a continuous ribboning process.

▲ *The ComRIB fibre ribboning line*

The ComFS 600 was developed to manage the folding of metallic tapes up to 600mm width.

New developments include an automatic tape edge steering system, as well as a special construction beneath the folding station to maintain tape feeding from any angle to the line, offering a range of layout solutions regarding floor space.

ComCOR is a compact package for metallic flat tape corrugations.

High quality corrugation rolls are made of specially treated material with optimum geometry, and the tape is guided automatically to the correct position.

**Compomec Cable Machinery – Finland**
**Fax**: +358 5 4761 877
**Email**: info@compomec.fi
**Website**: www.compomec.fi

## Condat Stand: 10D56

Condat will introduce new solutions in high tech and eco-friendly lubricants. The new Vicafil and Steelskin products are constantly reviewed and reformulated to ensure compliance with the latest health and safety regulations for chemicals (such as REACH or Biocides) as and when changes occur.

Regarding REACH legislation, Condat has a dedicated Products Regulatory

Affairs Department that participates with several European consortiums and allows Condat to anticipate the latest R&D developments.

Condat is always looking for safer substitutes for potentially dangerous raw materials.

As a result Vicafil SUMAC 3 is the new generation of sodium soap, developed and optimised from a technical, environmental and economical point of view.

To keep pace with new regulations on borax, Condat has redesigned its most famous lubricants and offers a new, larger choice of products for direct substitution: low (Vicafil TS 7853) or zero (Vicafil TS 7101) borax surface coatings and drawing powders.

An oil-based lubricants range now offers vegetable oil-based alternatives, whilst the soluble lubricants range now employs renewable raw materials.

**Condat – France**
**Fax**: +33 478 07 3539
**Website**:
www.condat-lubricants.com

## Condoroil Impianti srl
## Stand: 10E46

Condoroil will present its new lubro-coolant, Condorlube S 400.

Condorlube S 400 is aqueous-based, totally hydrosoluble, and free of mineral oils.

▼ *Condorlube S 400 is the latest product from Condoroil*

The solution, stable over time and with a high wetting power, has excellent anti-rust properties and it reduces the formation of lakes or sticky glues within the machine.

The product can be applied after thorough cleaning of the circuit with a bactericide detergent. Condorlube S 400 meets the sanitary and environmental requirements for operators who come into contact with it.

**Condoroil Impianti Srl – Italy**
**Fax**: +39 0332 94 5303
**Email**: info@condoroil.it
**Website**: www.condoroil.it

## Conductix Wamplfer Delachaux Group
## Stand: 10A08-03

Conductix Wamplfer, Delachaux group will have recently developed new products on show.

For fibre optics, a graphite induction furnace to draw up to 200mm performs, an automatic dual take-up using up to ➢➢➢

# Our road runs on wire

## Lucchini Wire Rod

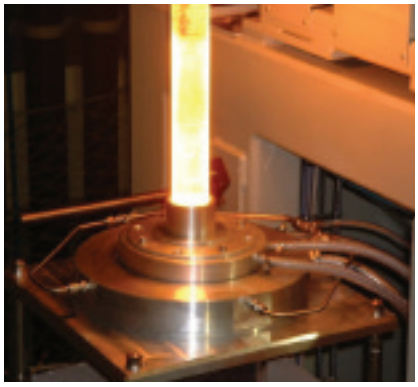
### Our quality steel in your daily life.

Everyday we count on our wire rod applications being safe.
That's why at Lucchini we give so much attention to the production of our wire rods. We know that we have to guarantee that these everyday products are durable, reliable, and, in turn, are making our lives better.
This attention to quality, which makes us a leader in the steel industry, guides us in every phase of our daily manufacturing operations.

**www.lucchini.com**

LUCCHINI
SeverStal

60kg spools at 2,500m per minute or 100kg spools at 2,000m per minute, and prooftesters running at 2,500m per minute with 60kg spools or 2,000m per minute with 100kg spools.



▲ *Ritekom draw tower from Conductix Wamplfer*

New for data & LAN telecommunication cables are a rotating capstan running at 600 tpm and a 4-stand longitudinal taping unit. These machines are dedicated to tape and strand 4 pairs.

**Conductix Wamplfer, Delachaux SA – France**
**Fax**: +33 479 455005
**Website**: www.conductix.com

## CTR Carbide Dies Ltd Stand: 15D25

CTR will announce its new design of ceramic tooling and dies available to manufacturers of airframe rivets and fasteners.

The new ceramic dies are designed to increase overall tool life with added piece/part productivity of around 15-20%, depending upon process conditions.

▼ *Ceramic tooling from CTR*

This may realise significant benefits in cost downs and reduced component piece/part cost with increased overall equipment efficiency.

CTR has ISO9001/ASEN9100 accreditation.

**CTR Carbide Dies Ltd – UK**
**Fax**: +44 121 773 9342
**Email**: info@ctr-uk.com
**Website**: www.ctr-uk.com

## DCM Industries Inc Stand: 9F09-02

DCM will introduce the new 3S-XLD cable measuring system. With DCM 3S solid state switching technology, the 3S-XLD offers the highest performance LAN cable testing system on the market.

The model 3S-XLD will test category 5, 6 and 7 cables for all of the standard testing parameters, including cross-talk, insertion loss, return loss, SRL, impedance and more.

The system is equipped with full 28-pair test fixtures for cat 5 and 6 cables and

WAI membership

**Your oldest friend in the business is in step with the next generation of wire professionals.**

# Are you?

At 80, WAI isn't old. It's mature. And it's set in its ways of developing services that suit today's upcoming leaders in the field.

Sure. Communication has changed. Our high standards have not. Like some of you, we've seen faxes give way to e-mails, instant messaging, and blogs. But they haven't invented a direction in wire and cable that we're not interested in learning about and sharing with the thousands of constituents in our international network.

WAI now offers:

- a series of live and archived educational webinars;
- electronic delivery of the industry leading *Wire Journal International* and twice monthly *WAI Connection*;
- instant chat customer support online for Interwire; and
- pdf files of the more than 5300 technical articles in our library.

So if you're still wondering what happened to the letter—Here are three to remember: **W A I.** Stop by The Wire Association International stand in Hall 11 # B25 at wire Düsseldorf and stop the clock on outmoded business methods. Or join our network today at: www.wirenet.org.

**We may not be ready to pass the torch but we're pleased to light the way.**

## Visit the Wire Association International stand in Hall 11 # B25 at wire Düsseldorf

The Wire Association International, Inc.

1570 Boston Post Road | P.O. Box 578 | Guilford, CT 06437-0578 | Telephone: (001) 203-453-2777 | Fax: (001) 203-453-8384 | Web site: www.wirenet.org

is available with interchangeable 4-pair fixtures for testing individually shielded cat 7 cables.

▲ *DCM's 2XLD console*

With the use of solid-state components, the new 3S switching system enables customers to obtain greater technical performance when testing twisted pair LAN cables, together with very high system reliability.

Additionally, the 3S-XLD provides a full 28 pair platform enabling a simpler cat 6A alien crosstalk test method.

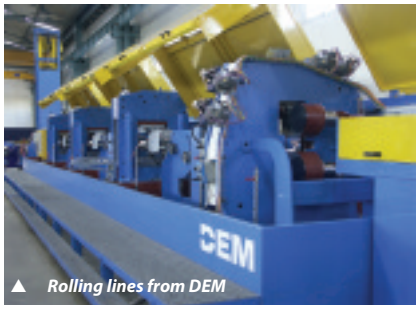
New orders for all DCM XLD cable testing systems will incorporate the new 3S solid state switching technology. Existing DCM Model CMS-2XLD users can easily and economically upgrade existing systems with the 3S technology.

**DCM Industries Inc – USA**
**Fax**: +1 510 670 7212
**Website**: www.dcmindustries.com

## DEM Costruzioni Speciali srl
## Stand: 11H27

DEM, an EVG and GCR Eurodraw company, specialises in cold rolling technology and will be presenting the following new solutions at wire Düsseldorf:

- Profile wire rolling stand to produce flat and special shaped wires with very close production tolerances in stainless steel, copper and low, medium and high carbon steels
- Calibrating H/V stand, which calibrates the upstream wire peeling lines
- A new concept in forming lines for flux cored wire production




▲ *Rolling lines from DEM*

DEM's range of micro rolling and cold rolling cassettes will also be on display.

**DEM Costruzioni Speciali Srl – Italy**
**Fax**: +39 0432 655484
**Email**: sales@demills.com
**Website**: www.demills.com

## Dexsen SA
## Stand: 12A12

On display will be Dexsen's new development for extrusion.

▲ *Extruder 90mm 25 L/D from Dexsen*

The robustly built and compact Extruder 90mm 25 L/D has a special screw design that produces a high linear output.

**Dexsen SA – Belgium**
**Fax**: +32 4369 3877
**Website**: www.dexsen.com

## Die Quip Corporation
## Stand: 9D06-01

Die Quip's new Die Saver line of die finishing machines for tungsten carbide wire drawing dies will be on show.

The line consists of four models capable of grinding or polishing dies in either manual or automatic cycles to suit any die shop's requirements.

All models feature a slant bed design, easier to use controls, and a lower cost, making it easier to refinish dies in-house.

Die Quip's die working machines are designed to produce tooling in-house to improve material delivery times, reduce tooling costs and provide productivity improvements by increasing die life through better design.

Die Quip uses sound machine designs, time tested work holding methods and build on a rigid platform to consistently make heavy cuts.

Die Quip offers extensive training programmes to teach operators how to run the machines, which tooling to choose and the different methods to make dies.

This is done with on-site training programmes, detailed manuals and Die Quip's exclusive Die Making Handbook.

**Die Quip Corporation – USA**
**Fax**: +1 412 835 6474
**Email**: diequip@diequip.com
**Website**: www.diequip.com



## Domeks Makine Ltd
## Stand: 10B32

Domeks has developed a new double-head coiling line for high speed coiling and spooling.

Quadromatik offers a wide range of coiling and spooling options. Flexible or multi-core round and flat cables from 1x1.5mm² up to 4x2.5mm² can be packed in coil or spool form. In coil mode, the coil outside diameter can be between 210mm and 400mm, and the height of the coil from 30mm up to 190mm.

In spool mode, the outside spool diameter can be between 140mm and 350mm and height of the spool from 40mm up to 250mm. Line speed is 500m per minute for coiling and 400m per minute for spooling.

Spools can be of cardboard, metal or plastic. 20-22 micron stretched polyethylene film is used for fixing the end of the cable or wrapping the spool.

Domeks' new palletiser unit can be used at the end of this line for either coil or spool, or both together. It uses 80x120 Euro or 110x110 pallets.

Domeks Makine has developed the high-speed Speedmatik 240 for coiling flexible single wire and rigid or multi-stranded insulated cables from 0.75mm² up to 6mm² cables.

Line speed is up to 700m per minute. Coil outside diameter can adjusted between 210mm up to 240mm, and coil height from 20mm up to 90mm. Standard polyethylene stretch film is used for fixing the end of the cable onto the coil. The film is 60mm wide, 20-22 micron thick and 800-1,000m long.

The palletiser and multi-coil packing unit also can be used (optionally) at the end of the line, using 80x120 Euro or 110x110 pallets.

**Domeks Makine – Turkey**
**Fax**: +90 216 364 3913
**Website**: www.domeksmakine.com

## Dow Wire & Cable
## Stand: 9A38

Dow Wire & Cable, a business unit of The Dow Chemical Company, is a global provider of products, technology, solutions and expertise for the power industry.

The company works with cable makers, utilities, municipalities, testing institutes and other organisations around the world to develop solutions and create mutual value that will sustain the industry for years to come.

Dow Wire & Cable will showcase Dow Inside, a new initiative that benefits cable manufacturers and utilities alike. Under the Dow Inside programme, selected cable manufacturers will have the opportunity to become licensees that will manufacture cables with Dow Wire & Cable materials according to high standards.

In exchange, Dow Wire & Cable will support cable manufacturers with forward-thinking technology, proven products, enhanced service and the strength of a creative and responsive supplier that can offer a competitive edge in a demanding industry.

Full information will be available on the website or the show stand.

**Dow Wire & Cable – USA**
**Website**: www.dowinside.com

## Easydur Italiana
## Stand: 10E10

Easydur will present its new automatic plant for 100 per cent control of spring production.

The innovation lies in the substitution of the traditional rotary table by bushes with pneumatic grips, which improve spring positioning.

This allows special tests, such as the testing of the chamfer on both sides or the measurement of the internal and external diameter. The customer can also use traditional pressing stations and a dynamometer.

Once testing is complete the operator can divide the springs into two or more categories, according to the set tolerances.

There will also be a wide range of measuring instruments on display, specifically for springs and metal wires.

**Easydur Italiana – Italy**
**Fax**: +39 0332 206710
**Email**: info@easydur.com
**Website**: www.easydur.com

## Eder Engineering GmbH
## Stand: 10A40 – 01+02

Eder-Austria has recently developed various die-workshop ancillary devices, which will be displayed at the Eder stand: ➢➢➢

VDSU – vacuum drawing die suction unit developed to clean die-bores of severe liquid dirt, such as drawing emulsions and other liquid working materials, by means of an integrated powerful suction pump system.

▲ *Eder's VDSU vacuum drawing die suction unit*

DEZ 2/080 – an electrically activated wire-pulling device for drawing measuring wires for the diameter control of drawing dies with round bores.

This auxiliary die-workshop unit has been designed to ease the pulling/drawing through of measuring wires in wire drawing dies of between 0.1mm and 4mm diameter. Larger diameters are possible.

ZTE – an electrically activated wire-pulling device for introduction and drawing of wires and measuring of elongations for a relevant controlling of drawing die sets with round bores.

**Eder Engineering GmbH – Austria**
**Fax**: +43 1367 494949
**Email**: office@eder-eng.com
**Website**: www.eder-eng.com

## Enkotec
## Stand: 15F26

Visitors will see Enkotec's new NL01 machine for long nails, capable of producing 1,000 nails per minute of 2.8mm to 4.2mm diameter and 75mm to 127mm length.

This is the latest model in Enkotec's NX01 series of high-capacity machines, designed according to a modular principle with a basic machine and six machine variants, all featuring a PLC control system and touch screen operator interface, which is easy to navigate and allows quick setup of nail parameters.

All the exhibited nail machine lines, including the MI01 for nails up to 90mm long and the NH01 for short nails, will include a newly designed wire payoff, type PD01, featuring machine-integrated controls and allowing a maximum coil weight of 2,000kg.

**Enkotec – Denmark**
**Fax**: +45 8658 4199
**Email**: sales@enkotec.dk
**Website**: www.enkotec.com

## Euroalpha Srl
## Stand: 12C67

Euroalpha is among leading manufacturers of drawing machines for non-ferrous wires using limited slip technology.

Due to the popularity of this technology Euroalpha has extended its range of limited slip drawing machines to "Compact" rod breakdown and Multiwire.

These are believed to be exclusive machines that exceed the technology of competing machines currently on the market and will be introduced at the show.

R1 is a rod breakdown machine with capstans arranged onto two superimposed rows. Total length is less than 5m, making this machine extremely compact to meet restricted space requirements.

Individual motor driving of each capstan, and a sophisticated SW algorithm to control the motors allows the R1 to operate with extremely limited slip between wire and capstans; said to be only 0.5% – 1.0%.

D3 is believed to be the first multi-wire drawing machine ever designed with individually motor-driven drawing capstans, and available up to 32-wires.

Additional drawing modules with capstans driven by high-precision gear transmission are incorporated into the frame for producing thinner wires.

The machine is designed to be a solution for cutting the negative effects of the slip, more consistent on the slower capstans and guaranteeing a rigid mechanical transmission to the faster capstans, drawing thinner sizes.

**April 12-16**

Reduced energy consumption, low maintenance, operational flexibility (the same drawing machine can produce a very wide range of finished wires), reduced wire breakings, low noise level, and other important benefits of limited slip technology are therefore also available on multi-wire drawing machines.

Euroalpha describes its B630-F "Four-Twist" bunching machine as "the most revolutionary equipment the company is presenting at wire."

▲ *Euroalpha bunching machine*

A patented dual-bow rotating group performs four twists for each revolution of the transmission shaft, while conventional bunchers perform only two.

Productivity is therefore doubled at the same rpm, and energy consumption can be reduced by running the machine at a lower rpm.

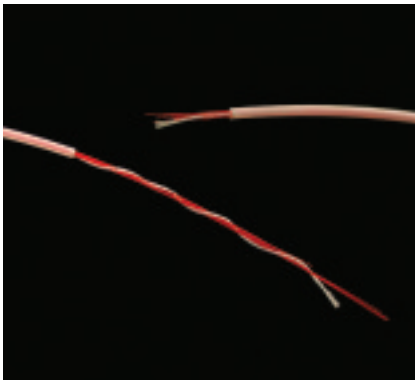
**Euroalpha Srl – Italy**
**Fax**: +39 0424 72780
**Email**: info@euroalpha.it
**Website**: www.euroalpha.it

## Fil-Tec Inc
## Stand: 9E52

Fil-Tec Inc will display its newest yarns, binders, blocking and filling products.

New water swellable binder and core yarns (for wrapping around the FRP) offer the advantages of very low dust, extending the life of bearings and other moving equipment parts, causing less downtime for maintenance related to SAP dust problems and providing a cleaner working environment for the operator.

Fil-Tec's new binder offers higher yield, so lower cost per kilometre of cable produced. It also produces a package that offers excellent integrity and balance, can run at 5,000rpm without unwanted vibration and provides more



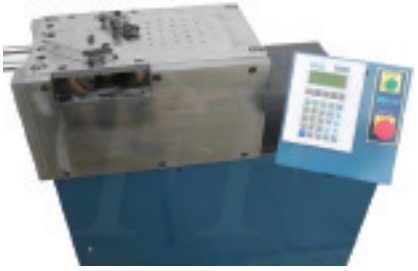
▲ *Fil-Tec yarn in typical appplication*

metres per package for longer runs without a break and a more efficient stranding process.

**Fil-Tec Inc – USA**
**Website**: www.fil-tec.com

## Fortuna Federn GmbH
## Stand: 16D19

New products from Fortuna Federn will include a 5-axis servo controlled WIM CNC lathe coiler for the production of all types of cylindrical springs and wire parts. WIM-12 CNC 5AX works with wire up to 12mm diameter, and WIM-20 CNC will handle up to 20mm diameter.



▲ *Fortuna Federn's new BEM-12 CNC machine*

BEM CNC is a new servo controlled machinery line for semi-automatic production of a wide range of bent parts. The BEM-12 CNC (up to 12mm diameter) machine will be seen at Düsseldorf for the very first time.

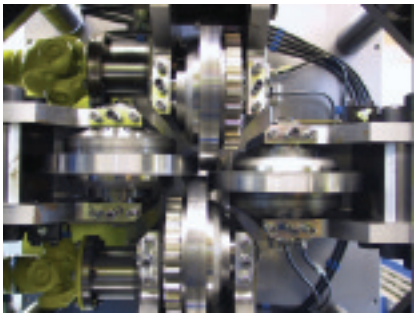
There will also be a new line of horizontal servo controlled spring end grinders suitable for grinding long compression springs.

Model GRM-10 for wire up to 10mm diameter will represent the range at the show.

**Fortuna Federn GmbH – Austria**
**Fax**: +43 3465 3704
**Email**: info@fortunafedern.com
**Website**: www.fortunafedern.com ➢➢➢

## Fuhr GmbH & Co KG
## Stand: 11A54

With the emergence of CTC (continuously transposed conductor) cables and hybrid motors, the required tolerances for the necessary rectangular copper wires have come down to ±0.005-0.01mm, which are said to be unachievable with traditional cold rolling technology.



▲ *Fuhr's Universal Turks Head*

Fuhr will be launching its latest wire rolling technology to enable the manufacture of rectangular copper wire with the lowest tolerances: a combination of Fuhr's Duo Rolling Mill (WSR type), the patented WST rolling mill and Fuhr's Universal Turks Head.

Another product with demanding specifications is photovoltaic ribbon.

This hot dip-tinned conductor strip (rectangular profile with a high width/thickness ratio) is installed in photovoltaic (PV) or solar panels, and is made of pure copper (99.99%) or OFC (oxygen-free copper).

With Fuhr's newly developed WSR-type rolling mills, high-precision flat copper wire can be produced with the following specifications:

- Maximum final width: 8mm
- Maximum final thickness: 0.4mm
- Width tolerance: ± 0.05mm
- Thickness tolerance: ±0.005mm
- Production speed: 300-600m per minute

**Fuhr GmbH – Germany**
**Fax**: +49 175 2200329
**Email**: mail@karl-fuhr.com
**Website**: www.karl-fuhr.com

## Gauder Group
## Stand: 10E38

Gauder Group's new concentric stranding line, COS 1200-2, has been designed with energy savings in mind.

Power consumption has been reduced: to strand 150mm² uses only 40kW of power for the complete line, or 36kW for 120mm².

This is thought to be far lower than using a conventional stranding line. It is the result of using regenerative power from the large and heavy built-in reels to produce electricity through a bus connection, so the reels become power generators.

A second means to reduce power use is by adapting equipment for lower energy consumption.

For example, high-speed double twist twinners or bunchers have been equipped with Gauder Group's new GreenBow, saving 30% energy use on bow motorisation.

▲ *Gauder Group's 'GreenBow'*

An advanced composite material and special aerodynamic design of the bow have been developed to minimise friction and loss and therefore to reduce the consumption of electricity.

Additional advantages are easy maintenance (it has a removable tube) and the fully closed design results in fewer bow crashes.

**Gauder Group – France**
**Fax**: +33 1 64 26 61 10
**Email**:
sales.pourtier@gaudergroup.com
**Website**: www.gaudergroup.com

**Bow Technology by Gauder Group – France**
**Fax**: +33 4 77 71 10 85
**Email**:
bowtechnology@gaudergroup.com
**Website**: www.bowtechnology.com

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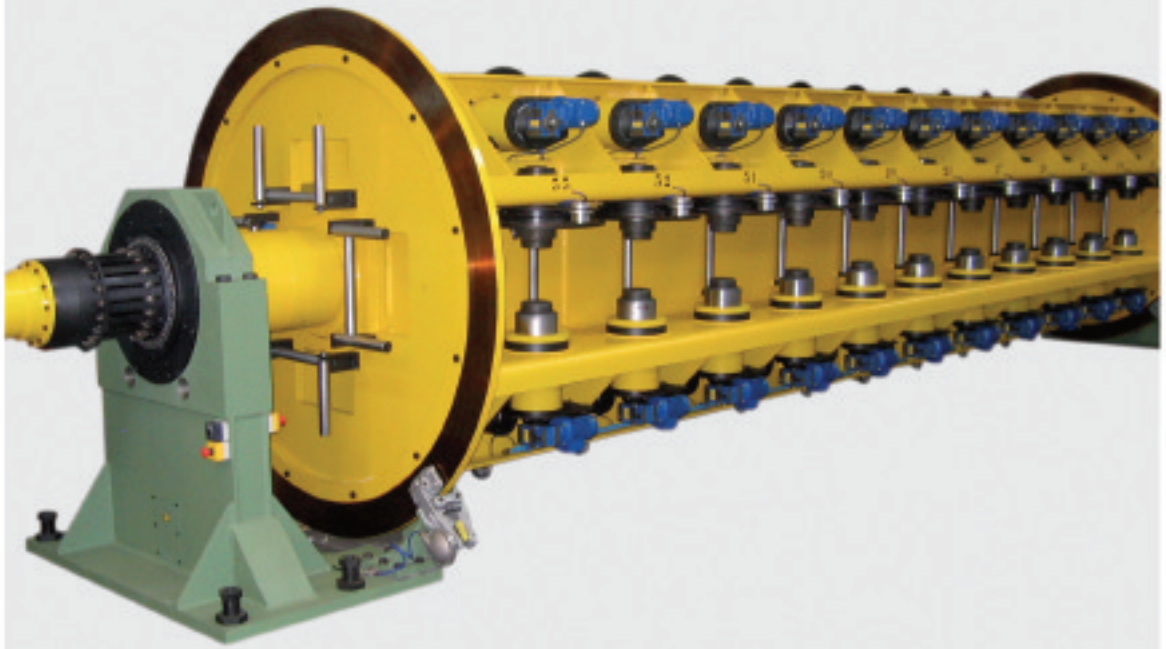
- Rigid Strander
- Drum Twister
- Single Twist Strander
- Bow Skip Strander
- Tubular Strander
- Planetary Strander
- SZ Strander

More than 60 years of experience combined with the use of the latest technologies allows Caballé to provide the most suitable equipment for each application maintaining its leadership position in the international market.



wire Düsseldorf
Stand 11G65
April 12-16, 2010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## GCR Eurodraw SpA/ Comapac Wire Machinery Stand: 11A66

GCR Eurodraw will be exhibiting a number of innovations offered by companies from within the group (GCR Eurodraw, Comapac Wire Machinery, DEM and SAMP brands).

▲ *GCR Eurodraw's TCD wet drawing lines*

GCR Eurodraw will be exhibiting three new models:

- A modular dry drawing machine, for fine-to-medium wires, equipped with a special transmission without reduction gears. This offers the advantage of fewer components and, therefore, of reduced maintenance. The blocks cooling system has been further developed using fluid mechanics, reducing the water consumption and increasing heat transfer
- A modular machine for descaling high carbon wire of medium-to-large diameter through a rotary double abrasive belt. It can be supplied in single or double grinding belt configuration. It forms the wire rod preparation line for dry drawing machines for the production of medium-to-large diameter wire. The line consists of a hydraulic descaling group, followed by a pre-straightening unit, a cleaning machine with an abrasive belt, a steam washing machine, followed by a boraxing unit and an induction drying unit
- A new double-twist cabling machine for steel ropes, equipped with payoffs for large diameter spools and with a sensor unwinding braking control. The machine is designed for the production of ropes of up to 36 wires

Comapac Wire Machinery will be exhibiting SAMP products and two new machine models, a double vertical spooler for the take-up of indented or smooth wire with a semi-automatic spool changeover and an automatic wire cut, and a new range of wet drawing machines for welding wire, offered with the brand GCR Eurodraw/SAMP.

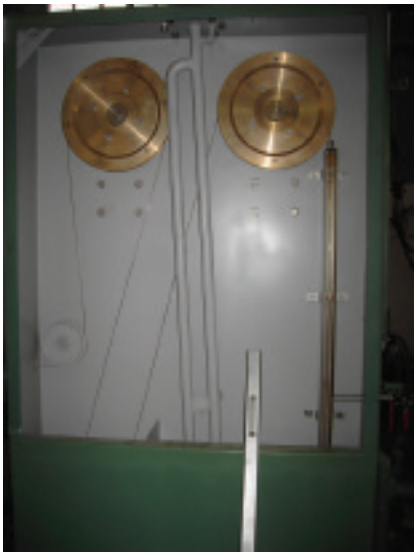
DEM will exhibit a range of rolling micro cassettes for the drawing of low-carbon wire, new specific micro cassettes for the production of flux-core wire, rolling cassettes for the production of indented wire and a range of products for the production of shaped wires.

**GCR Eurodraw SpA – Italy**
**Fax**: +39 02 9354 0452
**Email**: gcr@gcrgroup.com
**Website**: www.gcrgroup.com

## GER SA Stand: 9F60

GER SA has manufactured a newly designed continuous resistance annealer for copper wire, the 3000A model. This annealer can be combined with any make of rod breakdown machine, due to its self-contained design and motorisation.

It can be used to anneal copper wire in a diameter range from 1mm to 3.4mm, equipped with a 22kW AC motor with frequency control system.



▲ *The 3000A annealer from GER*

Another new annealer model, 220A, is also available for fine copper wire drawing machines.

It is also a standalone model with a 15KVA transformer, 120mm diameter contact pulley, wire diameter range of 0.15mm to 0.5mm, and a maximum speed of 30m per second.

This model is offered with either its own drive motor or driven from the drawing machine by a flat belt.

**GER SA – Belgium**
**Website**: www.ger.be

## H Folke Sandelin AB (HFSAB) Stand: 9E40

H Folke Sandelin introduces its latest modular design cable repair and recovery system, CRRS1.

The Cable Repair and Recovery System, CRRS1, has been specifically designed to assist cable manufacturers when a problem occurs during the normal cable manufacturing process.

The cable repair and recovery system will:

YOUR PERFECT PARTNER FOR THE YEARS AHEAD

# Still your no. 1 partner in nails!

# ENKOTEC world news!

**With the MI01 you will obtain:**

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- 1,000 nails per minute
- High production efficiency
- Long tooling life
- Environment friendly concept
- Clean nails – no tumbling

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- Remove an outer jacket of PE, PVC or HDPE without any damage to the cable layer below, thus enabling the outer jacket to be re-applied and the cable repaired
- Remove the metallic shield of the cable without damaging the moisture expansion tapes or any kind of cable layer below, thus allowing the re-application of the metallic sheath
- Remove triple layer XLPE insulation without damage to the expensive conductor and thus allow the conductor to be reused
- Handle cable diameters of 10mm to 180mm, sheath thickness of 1mm to 30mm and operate at speeds up to 20m per minute

The machine is designed to be an accurate and simple to use cable repair and recovery system.

Where faulty cable layers can be removed and re-applied, or a fast and easy way of breaking down the cable elements for a cost effective means of maximising scrap values.

▲ *Cable repair and recovery with CRRS1*

**H Folke Sandelin AB (HFSAB) – Sweden**
**Fax**: +46 141 203639
**Email**: hfsab@hfsab.com
**Website**: www.hfsab.com

## Holton Crest Ltd
## Stand: 11H39

Holton Crest will be announcing the commissioning of the first holton$^2$ generation production line. This is felt to be a major milestone for the company, arising from recent prominent equipment contracts.

Holton Crest lines are capable of producing shapes and profiles across a large range of product cross-sectional areas from reductions to expansions. The technical benefits of choosing the holton$^2$ series are said to include consistently high production rates under the most extreme extrusion pressures.

High dimensional precision, surface quality and cleanliness of the extruded product, with minimal scrap levels, offer the opportunity to manufacture complex 'application ready' solid and hollow profiles in a cost effective manner.

The HC4000 rotary extruder is centrally located in a complete line including feedstock handling and conditioning and product handling ancillaries.

There are two further new models incorporating what are believed to be unique features and capabilities, the HC1100 and HC2200.

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London, Ontario
(519) 659-3030
sales@AdvancedWireDie.com

Europe
Frankfurt, Germany
49-6192-25028
sales@FortekGmbh.com

▲ *Feed side of a Holton HC4000 extruder*

These high-performance models are wholly European-sourced and can be smoothly integrated with existing Holton products.

Also new from Holton Crest for 2010 are a cutting unit and run out table for processing up to 12m lengths of profile in a dual production configuration with a coiler from Holton's TU range. The cutting unit can operate with a draw bench or other downstream equipment.

**Holton Crest Ltd – UK**
**Fax**: +44 1202 681502
**Email**: info@holtoncrest.com
**Website**: www.holtoncrest.com

## Huestis Industrial
## Stand: 9F05-01

Huestis Industrial will be launching several new products at this year's wire Düsseldorf:

- Ceramic Air Miser – a new ceramic version of the standard Air Miser air wiper

  It has a full-bodied replaceable insert that mounts flush into the body and is held in place by stainless steel screws. The advantages of the new wiper are said to include extended useful life

  The new design eliminates the need for ceramic V-guides to keep the product centred in the air wiper, and the ceramic insert prevents damage to the conductor or to the air wiper body

  The new wiper will be available in the most popular sizes, and will utilise the same jet nozzle technology as other wipers in the Air Miser range, maximising drying power while minimising air usage

▲ *The new ceramic Air Miser*

- A new series of powered shaftless payoffs and take-ups. These units are rugged, with a small footprint, and will handle from a 12-inch up to a 36-inch package of a maximum of 2,500lb

# Precision rewinding lines for solid and tube wire

## No Twist Coiler

- Speed 40 m/s
- Special flyer design for high speed quality coiling
- Take drums of any type
- Minimum footprint - compact design
- Energy saving network
- NTC for SAW-wire available

## Semi Automatic Precision Layer Winder

- Speed 35 m/s
- Take wire baskets, plastic/fibre spools, coils
- Sevo drive motor operated traverse and dowel system
- Electrical control flange adjustment
- Ergonomically designed for easy operation
- Energy saving network
- Version for SAW-wire available

## Fully Automatic Precision Layer Winder

- Speed 35 m/s
- Take wire baskets, plastic/fibre spools
- Servo drive motor operated tooling for precision automatic running
- High efficiency, low maintenance
- Touch screen HMI
- Energy saving network

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wire Düsseldorf

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They will be available with multiple options in both pneumatic and hydraulic versions

- The Down Drafter bottom draining air wiper. This latest unit drains downwards, instead of to the rear, allowing multiple units to be ganged in line without the risk of liquid spraying back into the path of conductors that are already dried. It has nozzle jets at both ends for increased drying at higher speeds than are available on standard models

▲ *3D representation of the shaftless payoff and take-up*



▲ *Down Drafter bottom draining air wiper*

- A complete range of cold pressure welders and dies to suit all needs, from superfine wire to rod

▲ *Cold pressure welders from Huestis*

As with all products in the Huestis Industrial range, all new machines are backed by the Huestis warranty and its reputation for cost-effective production and long operating life.

**Huestis Industrial – USA**
**Fax**: +1 401 253 7350
**Email**: sales@huestis.com
**Website**: www.huestis.com

## Inhol BV/PTL
## Stand: 12A15

Inhol BV/PTL introduces a new range of irradiation cross-linkable compounds for rapid transport and solar cables. Solar compound (TuV 2Pfg 1169) is also available in a CV curable version.

A new range of laboratory equipment includes measurement systems for

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- Help protect nature

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*Visit us at wire Düsseldorf 2010, Stand 12E66*

hot set using a special oven equipped with an electronic camera. This hot set measurement system ensures that each test result is easily accessible in figures and image.

The image will give a clear picture of the sample before and after the test.

Inhol has also added the TVAB5420 abrasion test apparatus to its range. This test apparatus for electric wire has been designed to test the durability of cable insulation under extreme conditions and measures very specific durability variables.

**Inhol BV/PTL – The Netherlands**
**Fax**: +31 3560 33235
**Email**: office@inhol.com
**Website**: www.inhol.com

## Invimec Srl
## Stand: 17E32

Invimec will be introducing the 12-stand model EFFE2015i tandem rolling mill for reduction and wire shaping. Reduction range is from 16mm to 0.5mm diameter.

The machine features new single-drive technology with a single motor and drive for each stand, providing perfect tuning of every station and total control of the wire tension.

Any number of stands can be supplied, depending on material to be rolled and dimensions desired.

The standard output wire is octagonal with rounded edges; round, oval, half-round, profiled wire output can be optionally produced.

The opening-upgrade option is useful to insert/bypass any of the rolling stands, in order to get the maximum flexibility in terms of different combination of rolling passes.

The other model on show will be the ENNE150i rolling mill, multi-stand tandem for plate and strip products, with five stands. Reduction range for thickness is from 10mm to 0.3mm, width range is 10mm to 50mm.

The machine features the new single-drive technology (SD), with a single motor and drive for each stand

▲ *ENNE150i multi-stand rolling mill*

for optimum tuning of every station and total control on the rolling tension; any number of stands can be requested, depending on the material to be rolled and dimensions desired.

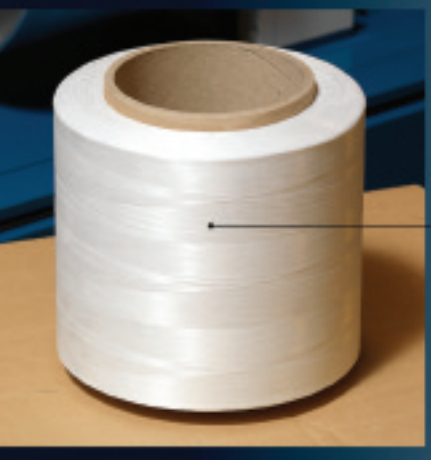
The CNC upgrade extends the flexibility of the machine: two motors and gearboxes are added to each stand, to give movement to the upper roll and set any stand to the desired position; also, any stand can be excluded from the program. This feature brings further flexibility in complete or partial reductions and to re-use the machine many times to achieve final thickness.

All Invimec machines are completely automatic, safety-compliant to all European and international laws, and easy to use.

Roblon

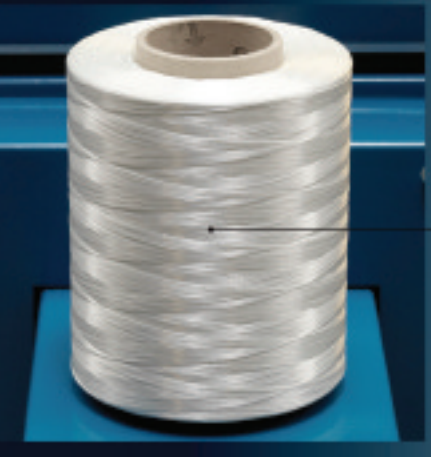
# How to reduce costs?

## *Increase productivity, of course*



*Ultra Low Shrinkage Polyester Binder Yarn*

- *Close to nil shrinkage*
- *Ideal for compact cables*
- *Water-blocking version*
- *Dual-end version*



*Light-Flex glass strength member*

- *Optimal flexibility*
- *Very light-weight*
- *Extremely wear-resistant*
- *Water-blocking version*

Roblon's fibre products and cable machinery are created in close co-operation with customers around the world.

Through dialogue, with open minds and with over half a century's expertise, Roblon continually develops new features and products.

**Each one is designed to meet the most stringent technical requirements.**

*And each one is designed to ensure that cable manufacturers can run their production more efficiently, yet at less cost.*

*Join the dialogue*

*Join Roblon at stand 9F41 at WIRE Düsseldorf*

Roblon A/S • PO box 120 • 9900 Frederikshavn • Denmark • Tel: +45 9620 3300 • Fax: +45 9620 3399 • info@roblon.com • www.roblon.com

With different settings stored into programs, any operator can quickly use the machine even without previous rolling skill.

**Invimec Srl – Italy**
**Fax**: +39 0444 536066
**Email**: info@invimec.com
**Website**: www.invimec.com

## Leyer & Kiwus Ultraschall- u Lasertechnik GmbH Stand: 10F25

Leyer & Kiwus will demonstrate new machines for diamond die manufacturing and refurbishing shops.

The new ultrasonic polishing machine, type Ultra 400P is equipped with a high-power processor controlled ultrasonic generator, which enables fast and reliable diamond die polishing in the diameter size range from 0.1mm up to 20mm.

For ultrasonic die shaping the company will demonstrate the new Ultra 300G, a high-power ultrasonic processing machine with integrated needle grinding device.

▲ *Ultrasonic polishing machine, Ultra 400P*

Profiled diamond dies in sizes of 0.15mm x 0.15mm up to 20mm x 20mm can now be drilled in natural diamond or polycrystalline diamond using an optional system which can be attached to the new Universal die laser drilling system.

Additional functions, such as diamond cutting and die casing engraving, are included.

**Leyer & Kiwus Ultraschall- u Lasertechnik GmbH – Germany**
**Fax**: +49 241 513202
**Email**: info@leyer-kiwus.de
**Website**: www.leyer-kiwus.de

## Lubrimetal SpA Stand: 10G62

For many years Lubrimetal has limited the use of boron compounds in its formulations.

To replace lubricants that contain borax, Lubrimetal has now developed a new series of 100% borax-free sodium lubricants.


**COME AND SEE LEADING TECHNOLOGY MADE IN AUSTRIA**

# WIRE DÜSSELDORF 2010

## Düsseldorf, 13. – 15. April 2010

Messe Düsseldorf GmbH Stands Nr. 10A40-01 – 10A40-10, 10A46-01 – 10A46-11

The following Austrian enterprises will display their leading products for the wire industry

| | | |
|---|---|---|
| 10A46-10 | **BEMA ING. J. BEIN MASCHINENBAU GESMBH** | www.bema.at |
| 10A40-09 | **BOEHLERIT GMBH & CO.KG** | www.boehlerit.com |
| 10A46-11 | **DUNST GMBH** | www.dunst.cc |
| 10A40-06 | **EBNER - INDUSTRIEOFENBAU GES.M.B.H** | www.ebner.cc |
| 10A40-02 | **EDER ENGINEERING GMBH** | www.eder-eng.com |
| 10A40-05 | **GEBAUER & GRILLER** | www.griller.at |
| 10A46-08 | **ISOVOLTA AG** | www.isovolta.com |
| 10A46-06 | **JOH. PENGG AG** | www.wire-pengg.com |
| 10A46-07 | **KAPPA STEEL GMBH** | www.gk4steel.com |
| 10A40-04 | **LENZING PLASTICS GMBH** | www.lenzing.com |
| 10A46-02 | **LUMPI - BERNDORF DRAHT- UND SEILWERK GMBH** | www.lumpi-berndorf.at |
| 10A40-03 | **MAG MASCHINEN UND APPARTEMENTBAU AG** | www.mag.at |
| 10A40-10 | **MALI GMBH** | www.mali.at |
| 10A46-01 | **MEDEK & SCHÖRNER GMBH** | www.medek.at |
| 10A46-09 | **MTT - MACHINERY TECHNOLOGY TRADING GMBH** | www.mtt.or.at |
| 10A46-04 | **PLASMAIT GMBH** | www.plasmait.com |
| 10A46-05 | **UNITEK MASCHINENBAU UND HANDELSGE.M.B.H** | www.unitek.at |
| 10A40-01 | **VÖDKMA/AWCMA** | www.awcma.com |
| 10A40-07 | **VOESTALPINE AUSTRIA DRAHT GMBH** | www.voestalpine.com |

For further information on Austrian exhibitors or any sourcing enquiries address to
Austrian Embassy – Commercial Section
Außenhandelsstelle Berlin (federführend) E berlin@austriantrade.org
Außenhandelsstelle Frankfurt/Main E frankfurt@austriantrade.org
Außenhandelsstelle München E muenchen@austriantrade.org

**ADVANTAGEAUSTRIA.ORG**

In addition to the well-known LUBRIFIL VA 7001, the new LUBRIFIL VA 7090, LUBRIFIL VA 7081 and LUBRIFIL VA 5001 are designed for drawing high carbon steel (steel cord, springs, PC wire and strand), stainless steel (all applications) and for welding wires production.

As an alternative to the use of borax in pre-drawing treatments (borax coating), Lubrimetal has also successfully tested two new borax-free salt carriers called STEELFOR ITS/21 (for all carbon steel grades) and STEELFOR 7030 (for stainless steel).

These salts are also suitable for both in-line and batch treatments.

A new generation of emulsifiable lubricant will also be on display: LUBRIOL CU 55 and CU 550.

Also on display will be the new LUBRIOL ALM 90, offering low viscosity and high lubricity for aluminium applications.

**Lubrimetal SpA – Italy**
**Fax**: +39 0341 422386
**Email**: info@lubrimetal.com
**Website**: www.lubrimetal.com

## M&M Metal Wire Co Ltd Stand: 11G26

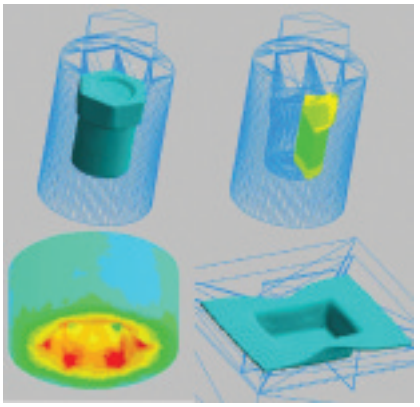
M & M is among leading suppliers of both low carbon and high carbon wire and wire products, including wire for armouring cable, ACSR conductor core, fencing wire, stitching wire and other galvanised and annealed wire products.

All the traditional wire types will be on show, together with a new product for 2010 – double twisted binding wire in small coils, easier and more efficient for the construction site.

**M&M Metal Wire Co Ltd – China**
**Fax**: +86 10 8492 8449
**Email**: meshmaster@163.com
**Website**: www.china-ironwire.com

## Metal Forming Systems Inc Stand: 15F21

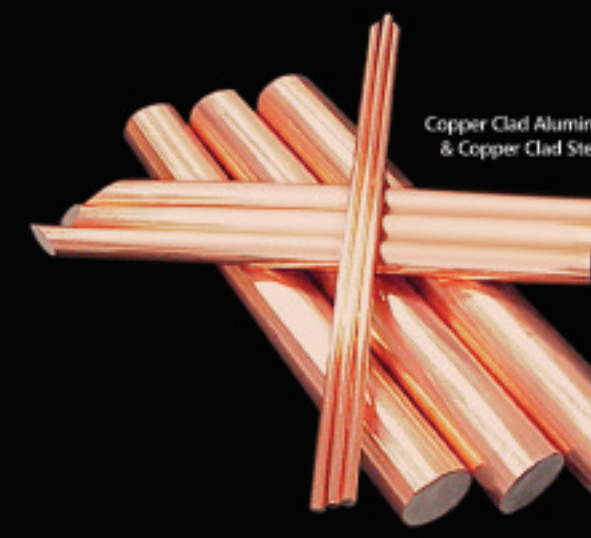
Metal Forming Systems Inc develops and supplies forming design and simulation software (NAGFORM, NAGSIM.2d and NAGSIM.3D) to help users advance quickly from part print to manufacturing process. Through these products, users can design the part progressions (using NAGFORM) and test tooling (using NAGSIM.2D/NAGSIM.3D) before investing in resources.



▲ *Typical images from Nagform*

Metal Forming Systems continually upgrades and improves its software and will be introducing new versions of NAGFORM and NAGSIM at wire Düsseldorf.

CommScope
BIMETALS




# global manufacturer, local supplier

CommScope's BiMetals division offers the wire industry's highest level of service and quality copper clad aluminum and copper clad steel products worldwide. Backed by strong R&D, CommScope combines technical expertise and global manufacturing capabilities to deliver industry-leading solutions to customers around the world.

- Global presence – CommScope, Inc. has manufacturing operations on five continents serving more than 130 countries
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International Wire and Cable
Trade Fair Stand # 10A07

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NAGFORM version 1.3 will now include the NAGFORM SolidWorks toolbar. Using this toolbar, users can generate 3D 'SolidWorks' drawings of all NAGFORM models and sequence designs.

NAGSIM.3D version 1.2 will offer an enhanced and upgraded volume mesher and improved presentation of results.

It can now be used in applications such as sheet metal and wire draw tool stress analysis, and will have the capability of simulating the elastic deformation of tools.

Temperature analysis of parts and tools will also be included in NAGSIM.3d version 1.2.

**Metal Forming Systems Inc – USA**
**Fax**: +1 734 981 4438
**Email**: gaurav@nagform.com
**Website**: www.nagform.com

## Neptco JV LLC
## Stand: 9E41

Neptco will introduce its new H resin formulation Flexline® product.

This glass-based flexible strength element, impregnated with Neptco's new proprietary resin, is said to provide 1,500% water uptake, by weight, in fresh water and 300% water uptake in brackish water.

The product allows cable manufacturers to use a single product to provide tensile strength and complete water blocking capability within a single cable design that can be sold into both standard and marine environments.

**Neptco Inc – USA**
**Fax**: +1 401 722 6378
**Website**: www.neptco.com

## Newtech Srl
## Stand: 9B75

Newtech is currently working in partnership with Turin Polytechnic University on a fluid dynamics research project, and with a Romanian Research Institute on catalysis. The targets are to optimise heat exchange on equipment thus reducing electrical consumption and on the other to reduce polluting emissions.

▲ *Vertical enamelling plant from Newtech*

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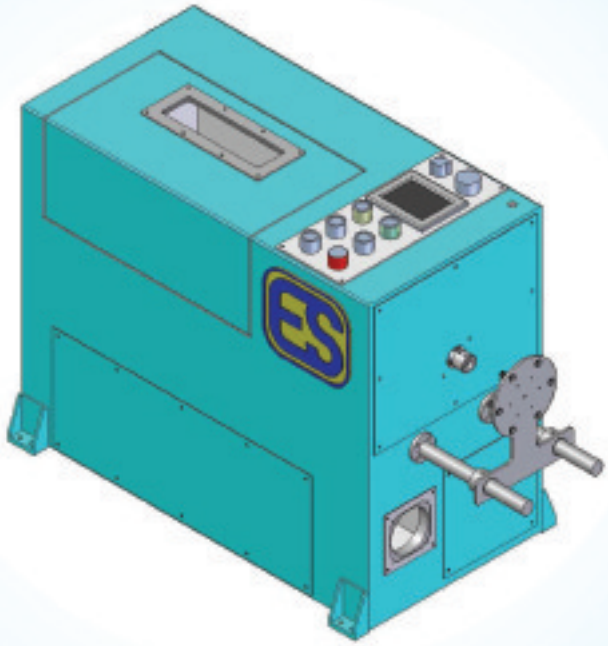
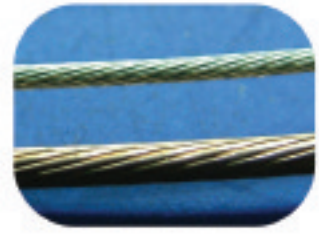




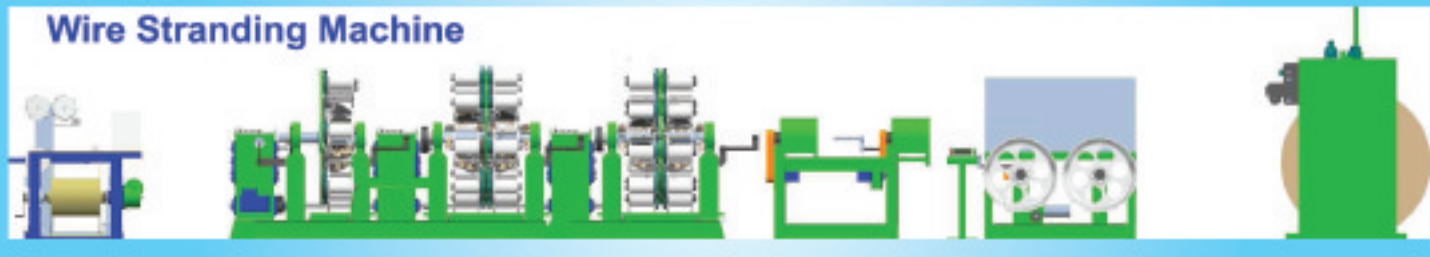
- Automobil Cable
- Telecom Cable
- LAN Cable
- Datacom Cable
- Control Cable
- Others....

# wire
Dusseldorf

April 12-16, 2010
Dusseldorf, Germany

**Booth no.**
**11 C06-05**

Wire Stranding Machine



The first results of this research programme will be presented at the wire Düsseldorf Exhibition during a symposium to be held in the afternoon of 15th April 2010 at the CCD (Congress Center Düsseldorf).

Newtech will also show the plans for a new plant, into which the company will move during summer 2010.

Newtech is active in the field of wire enamelling and insulating machines. Its range of enamelling machines covers all sizes of round magnet wires from 0.09mm to 1.2mm for horizontal equipment, and from 0.7mm to 5mm for vertical equipment, as well as square and rectangular from 4mm² to 64mm² in both aluminium and copper.

**Newtech Srl – Italy**
**Fax**: +39 0536 813 081
**Email**: info@newtechsrl.com
**Website**: www.newtechsrl.com

## Maschinenfabrik Niehoff GmbH & Co KG
## Stand: 10C18

Energy efficiency is the current catch phrase in the wire and cable industry.

At wire 2010 Maschinenfabrik Niehoff GmbH & Co KG will present the results of a thorough development in the energy efficiency of its products.

All exhibits will feature Niehoff's new, state-of-the-art drives with optimised components that ensure considerable energy savings.

Moreover, the use of raw materials and working materials is reduced, which in turn reduces operational and material costs.

The exhibits correspond to the current safety regulations of the machinery directive RL 2006/42/EG and feature a brand new and functionally optimised design. Some of the machines shown are completely new constructions.

The equipment to be displayed includes the new MSM 224 drawing machine with RI 250 induction annealer for the intermediate wire range; an MMH 50 multiwire drawing machine with RM 121 continuous annealer; two double-twist bunchers (D 401 with ARH 630 payoff, and a D 1001 model); a DSA rewinding machine; a BMV 16 rotary

▲ *MSM 224 wire drawing machine for the intermediate wire range*

braiding machine, and a DSI 631 double twist strander with ARD 630 D double twist back twist payoff and ALB 600 longitudinal tape payoff.

Last but not least there will be a newly developed RFID system on display, specifically designed for the management of braiding spools and NPS spools.

**Maschinenfabrik Niehoff GmbH – Germany**
**Fax**: +49 9122 977 155
**Email**: info@niehoff.de
**Website**: www.niehoff.de

**Niehoff Endex North America – USA**
**Fax**: +1 856 467 0584
**Email**: sales@niehoffendex.com
**Website**: www.niehoff-usa.com

## OM Lesmo Group
## Stand: 11A28

The highlight on the stand will be the new design of single twist machine, MTO 1250, able to hold the standard bobbin with 80mm bore by use of 2 pintles. Also on show will be a film of the first ever aluminium strand Unilay 61 wire (1,000mcm/500mm²) produced on the DTO 2500.

The programme includes other types of rotating machine in common sizes, as well as the related payoffs and taping heads.

OM Lesmo Group maintains subsidiaries in Germany (Lesmo Machinery Germany GmbH) and distribution in North America (Lesmo Machinery America, Inc). Recently, OM Lesmo has undertaken strategic alliances and acquisitions, opened an office in the USA and changed its brand logo.

**OM Lesmo Group – Italy**
**Fax**: +39 039 6981148
**Email**: info@omlesmo.com
**Website**: www.omlesmo.com

## Otomec Srl
## Stand: 11B28

The OTO'FF line mod.1W Ecoplater is a new reel-to-reel and reel-to-basket electroplating system for ferrous and non-ferrous wires, with a fully integrated electronic control system for wire tension, thickness and temperature. Physical properties of the chemical and rinse water are monitored by sensors and recorded.

The unit has a compact design, made from acid resistant materials. It can run at speeds between 60mt to 180mt per minute, and is designed for small and large scale of special wire and cable manufacturers.

It has been engineered to be compatible with a range of plating requirements: wire sizes from 0.4mm up to 2.6mm, for base material of copper, brass, steel, aluminium, copper clad and alloys, to be plated with silver, tin, nickel and zinc.

Also to be presented is the new OTO'FF line mod.1W Picoplater, for the electro plating with silver, gold or nickel of capillary wires of 0.08mm to 0.3mm diameter.

**Otomec Srl – Italy**
**Fax**: +39 0341 660249
**Email**: info@otomec.it
**Website**: www.otomec.it

## Pan Chemicals SpA
## Stand: 9B05

With the application of the new REACH directives, the R & D department of Pan Chemicals has focussed on new products that are completely safe for the operator and the environment. The most evident consequence for the wire industry is the elimination of borax in the formulation of drawing lubricants and coatings. Most sodium lubricants and coatings contain a significant quantity of borax and many drawing processes are based on the borax coating.

Pan Chemicals will be introducing the Panlube S 1500 sodium lubricants. These products are free of borax, nitrites, phosphates, carbonates and chlorides. They are safe and ecologically friendly, and suitable for the high speed drawing of high carbon steel wire, steel cord wire and stainless steel wire.

There will also be new pre-coatings on show such as the Pancover 4700 series, designed to meet the most stringent demands in drawing carbon and stainless steel wires.

**Pan Chemicals SpA – Italy**
**Fax**: +39 035 977 288
**Email**: info@panchemical.com
**Website**: www.panchemical.com

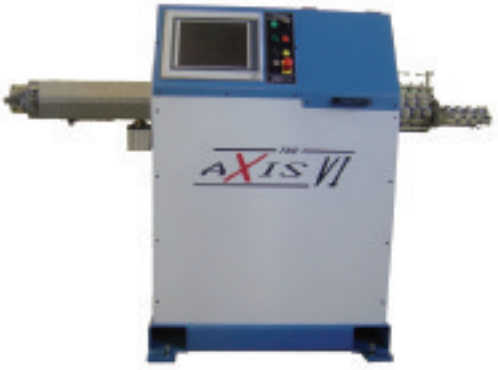
▼ *Pan Chemicals' Panlube S 1500 and Pancover 4700*

## Pave Automation Ltd
## Stand 12D17

British manufacturer Pave Automation Ltd will exhibit a new version of its best-selling small Axis V1 wire-bending unit.

The Axis V1 Mark 2 now incorporates Pave's advanced new operating systems technology featuring user-friendly touch screen graphics to minimise operator training. The machine is also equipped with a new bending head offering up to eight different radii. Simple and cost effective to operate, the Axis V1 Mark 2 has a capacity of up to 6.35mm (1/4") diameter.

▼ *The Axis V1 Mark 2 will be introduced at Düsseldorf*




Pave's product range includes single- and twin-head wire forming centres for a wide variety of applications.

All machines are designed in-house and manufactured to stringent quality standards at the company's facility in England.

**Pave Automation Ltd – UK**
**Fax**: +44 1733 563500
**Email**: pave@enterprise.net
**Website**: www.pave-wire.com

## Pressure Welding Machines
## Stand: 9B41

Designer and manufacturer PWM will be on stand 9B41 to exhibit its full range of high performance cold pressure welding machines, including an upgraded version of the powerful P1500 model for joining large rod sections.

▲ *PWM's P1500 rod welder*

The largest machine in PWM's range, the P1500 has a capacity of 15mm to 25mm (0.59" to 0.984") diameter copper and 15mm to 30mm (1.181") aluminium.

The machine's new upgraded hydraulic operating system is designed to provide a quieter, smoother weld operation and minimise oil usage, and the P1500 also incorporates a new user-friendly operator keypad.

Developed to weld large rod sections quickly and cost effectively, the P1500 produces strong consistent welds

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- **Alu-Zinc Coated Wire**
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- **Industrial Spring Wire**

Available in ranges of specifications for various applications such as High Tensile Fencing, Rope, Razor wire, Barbed wire, Vineyard, Greenhouse, Fastener, Spring, Hose, Chain etc. Other applications such as Cable Armoring, ACSR, Chain Link Fence, Gabions, Welded Mesh, Construction etc.

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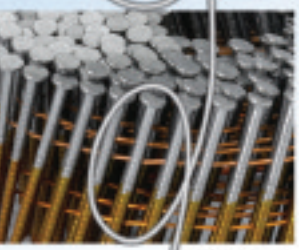
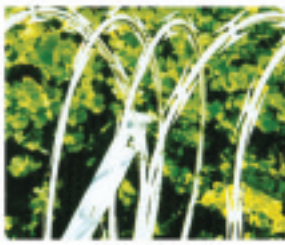
|---|---|---|---|
| **Diameter** | 2.5 to 7.0mm | 1.5 to 6.0mm | 1.5 to 5.0mm |
| **Tensile Strength** | 400 to 650 N/mm$^2$ | 650 to 895 N/mm$^2$ | Above 895 N/mm$^2$ |
| **Zinc Coating** | 60 to 700 g/m$^2$ | 60 to 610 g/m$^2$ | 60 to 500 g/m$^2$ |


Nail Wire


Rope Wire


Farming


High Tensile Fence


Razor Wire

**Millennium Steel & Wire (L.L.C.)**
DUBAI, U.A.E. TEL. +971 4 885 7728 EMAIL info@mswme.com

every time, minimising downtime and materials wastage.

Power consumption is limited to the hydraulic pump motor, making the P1500 very energy efficient and economical to operate.

No set up time is involved and the weld cycle takes only minutes with automatic de-flashing on completion.

PWM's EP500 rod welder will also be on show. This electro/pneumatic model has a capacity of 5mm to 12.5mm (0.197" to 0.492") copper and 5mm to 15mm (0.59") aluminium.

PWM's versatile trolley-mounted cold welders can be wheeled quickly to the work area, saving time and effort.

Portable models include the air/hydraulic HP100 and HP200 machines, capable of welding wire up to 6.5mm (0.256") diameter; and the pneumatic P101 for wire from 1mm to 5mm (0.04" to 0.197").

PWM will also exhibit its manual cold welders with capacities ranging from 0.1mm (0.0039") up to 3.6mm (0.141") copper and 5mm (0.197") aluminium.

The range includes lightweight, hand-held machines, ideal for welding fine wire in confined spaces; durable bench-mounted welders and a bench/trolley-mounted model, the best-selling M101.

PWM manufactures industry standard dies for wire sizes between 0.08mm (0.0039") and 6.35mm (0.257").

All PWM dies are individually hand-made to the tightest possible tolerances by skilled craftsmen in PWM's own UK workshops.

Dies can also be manufactured to suit round or profile wires and rods according to customers' specifications.

**PWM Ltd – UK**
**Fax**: +44 1233 820591
**Email**: pwm@btinternet.com
**Website**: www.pwmltd.co.uk

## PS Costruzioni
## Stand: 10B21

The philosophy of PS engineering is one of continuous development and a continual search for improvement.

▲ *A coiling machine from PS Costruzioni*

The following improvements in the PS 470/16 automatic coiling line, working with a cable range of 2x1mm² up to a maximum of 4x6mm² NYM, have been established and will be illustrated at wire Düsseldorf.

15% increase in linear speed compared to previous PS 470/16. Now 3.35 coils per minute, 100 metres long of 5x2.5 NYM cable (20,000 metres per hour).

Less maintenance; a result of removing the mechanical transmission and installing the main motor in axis with the winding plates.

The linear speed of the double head automatic spooling line, PS200/6-B, has been increased by 25%.

At 36,500m per hour the line will produce four spools, of 152m long, per minute. The machine works with a cable range of 16AWG up to a maximum of 10AWG.

**PS Costruzioni Meccaniche Srl – Italy**
**Fax**: +39 03968 98769
**Email**: ps@pscostruzioni.com
**Website**: www.pscostruzioni.com

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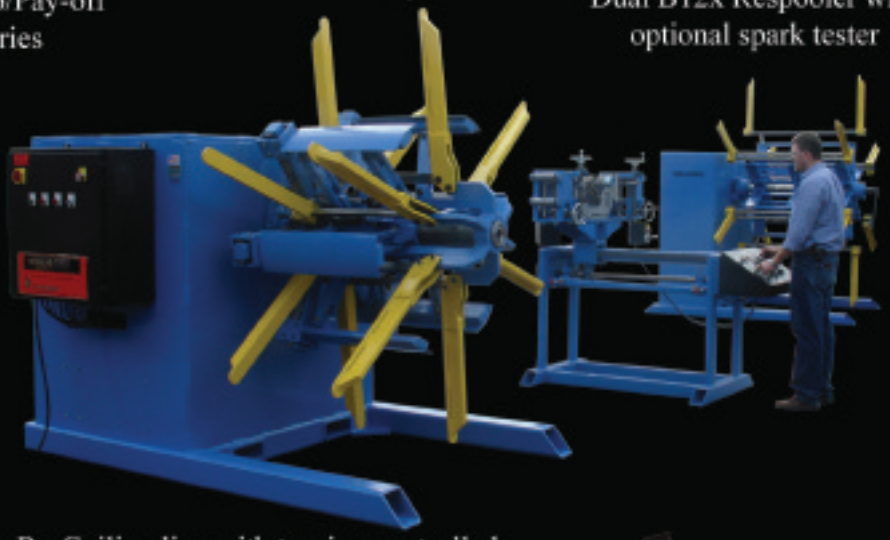
FM Shaftless Take-up/Pay-off Series

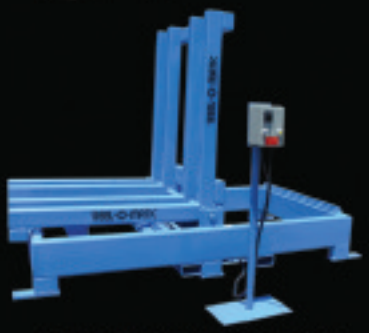
Dual B12x Respooler with optional spark tester

HJ/CVS Coiling Machinery



Re-Coiling line with tension controlled payout and automatic levelwind

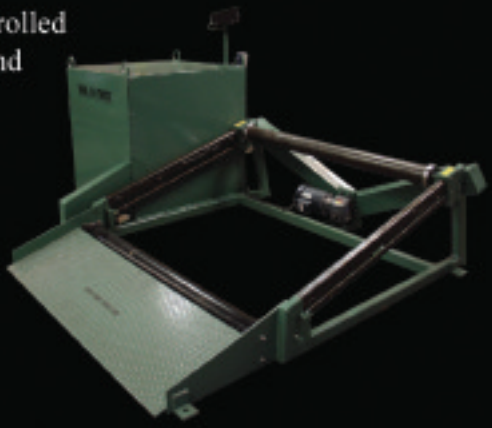
HSS High Speed Spooling/Coiling Machinery



10,000 lbs Reel Upender

BRT Non-Powered Turntable

Reel Jacks



Rim Drive (RD) Shaftless Spooling Machinery

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## Rad-Con Inc
## Stand: 9D06-03

Rad-Con will introduce its Super-High Convection™ drive-in box annealing furnace for electrical cables.

Both aluminium and copper cables on reels can be annealed.

Ranging in capacity from 100 tons per month to 2,000 tons per month, Rad-Con's drive-in furnaces are designed for electrical cables and are said to feature the highest convection rates available with a flow pattern optimised for reels.

The higher convection rates offer more uniform material properties, faster anneal cycles and lower energy consumption.

**Rad-Con Inc – USA**
**Fax**: +1 216 221 1135
**Email**: sales@rad-con.com
**Website**: www.rad-con.com

## Rautomead Ltd
## Stand: 10E56

Rautomead has over thirty years experience of graphite furnace technology.

In parallel with advances in the properties of materials available, Rautomead seeks to be innovative in this specialised field and to find new applications wherever possible.

Rautomead will introduce new SQ continuous casting technology for oxygen free copper wire rod production.

SQ technology provides the capability to produce oxygen free copper wire rod with a superior surface quality, reducing the characteristic pulse mark effect to the absolute minimum.

SQ quality wire rod is particularly suited for the subsequent manufacture of enamelled wires and superfine wires and will eliminate the need for a shaving operation.

Producers with a need for such high quality CuOF wire rod may specify SQ technology to be supplied as part of a complete new casting machine system. The SQ technology may also be ordered and retrofitted onto existing Rautomead RS model upward vertical continuous casting installations.

▲ *Rautomead's RS 3000*

SQ technology features a new, advanced, casting die/cooler design and a sophisticated precision casting control system.

Rautomead will also be promoting its full range of continuous casting systems.

**Rautomead Ltd – UK**
**Fax**: +44 1382 622941
**Email**: sales@rautomead.com
**Website**: www.rautomead.com

## Reel-O-Matic Inc
## Stand: 9F05-04

Reel-O-Matic, Inc, manufacturer of reeling and coiling machinery and linear measuring devices for wire, cable, wire rope, nylon rope and other flexible materials, will be showing new Reel-O-Matic calibrated and certified linear measurement testing cables.

▲ *New test cables from Reel-O-Matic*

The Reel-O-Matic test cables will be available from stock in standard lengths of 50ft and 100ft as well as 25m, 50m and 100m.

These certified test cables are made from high strength and durable nylon coated galvanized steel wire rope that eliminates stretching.

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They are visibly marked at start and stopping points and are shipped with a certificate of calibration documentation.

**Reel-O-Matic Inc – USA**
**Fax**: +1 405 672 7200
**Email**: sales@reelomatic.com
**Website**: www.reelomatic.com

## Ridgway Machines Ltd
## Stand: 11C24

Ridgway Machines will introduce three new products this year, based on Ridgway's twin servo technology. Constant tape tension is now achieved over the entire tape pad life. Even at high speeds, delicate tapes and large tape packages are now accurately controlled.

▲ *The VLM6 vertical taping machine from Ridgway*

The MB270 horizontal taping machine accommodates large cross-wound tape packages weighing up to 30kg. Using 8mm wide mica tape, this machine is capable of producing product at 17m per minute for 24 hours, without stopping for a tape pad change.

The TGL100 glass fibre twin taping line incorporates four Ridgway glass taping bays and associated control systems. Offering a complete package, this joint development with Gloser/Newtec of Italy also provides state of the art oven technology featured in the line.

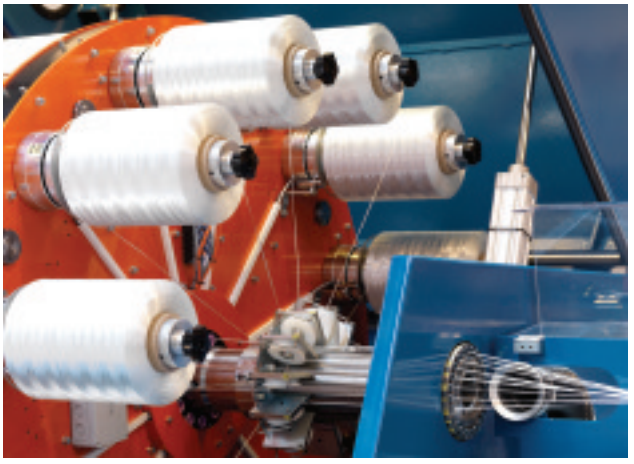


The VLM6 vertical taping machine incorporates multipurpose taping heads that can utilise both flat pad and cross-wound tape packages.

**Ridgway Machines Ltd – UK**
**Fax**: +44 116 235 3057
**Website**: www.ridgwayeng.com

## Roblon A/S
## Stand: 9F41

Roblon will be introducing a new coated glass strength member, Light-flex, for reinforcement of optical fibre cables. The new Light-flex yarn offers extremely light weight and high wear resistance properties due to its special formulation impregnation. Light-flex can be stranded around the cable centre or inserted longitudinally as a strength member and it has successfully been tested up to 300rpm in Roblon high speed servers.



▲ *Light-flex yarn from Roblon*

The Light-flex yarn is also available in a WB version, offering three key features to the cable producer – strength member, high wearability in production and a WB solution to protect the cable from water penetration.

Due to the low metre weights, Light-flex and WB Light-flex are very competitive glass strength members. Consequently, they are of interest for users seeking a flexible, wear resistant and price competitive glass strength member. Another important feature of both Light-flex yarns is that it is possible to splice any leftover material, eliminating the risk of scrap material.

**Roblon A/S – Denmark**
**Fax**: +45 9620 3399
**Email**: info@roblon.com
**Website**: www.roblon.com

## Rockford Manufacturing Group Inc (RMG)
## Stand: 15E41

RMG's new, patent pending Automatch uncoiler is designed to improve blank length and volume requirements for high precision cold heading machines.

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▲ *Automatch uncoiler from Rockford*

**Rockford Manufacturing Group Inc (RMG) – USA**
**Fax**: +1 815 624 7254
**Email**: rmgfelm@rmgfelm.com
**Website**: www.rmgfelm.com

## Rosendahl Maschinen GmbH
## Stand: 9A74

Rosendahl will be exhibiting a new, enlarged crosshead series. The Rosendahl crosshead series applies to the requirements of different types of cables and can suit any extrusion line. The enlarged series comprises crossheads for cables up to 110mm in core diameter for different application areas.

The challenge in distributor design is to find the optimum dimensions of the distributor to attain a balanced flow at the exit.

Rosendahl's distributor concept is said to guarantee homogeneous material flow, independent of the processed materials or the output.

This optimised material flow provides high centricity and allows a reduction in average wall thickness, therefore reducing manufacturing costs.

Rosendahl has conducted mechanical calculations and rheological analysis of the crosshead series using the latest finite element simulation programmes.

The simulation can also compute pressure, temperature rise, velocity, and stress and strain rate distributions over the entire simulation domain. Especially when designing the distributor, it is important to adapt the distributor's channels to the flow path of the melt.

▲ *The Rosendahl crosshead series*

To offer a broad material spectra, Rosendahl researched with university institutes on a wide range of materials for the cable industry and now offers a material database that includes standard as well as special material (foamed material blends, LSOH, XLPE).

**Rosendahl Maschinen GmbH – Austria**
**Fax**: +43 3113 5100 59
**Email**: office@rosendahlaustria.com
**Website**: www.rosendahlaustria.com

# Tradition and Innovation

Suzuki Garphyttan is proud of nearly 100 years as the leading supplier of advanced spring wire for valve springs to the automotive industry. Thanks to this and our capacity to continuously develop and improve our products to meet the increasing demands set by our customers, we have succeeded in retaining our strong position. The combination of tradition and innovation is the foundation of our continued market-leading position. This is what we strive to uphold, every day.

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Tel. +44 19 295 100. www.suzuki-garphyttan.com

## Hans Schmidt & Co GmbH Stand: 9B22

Schmidt will be displaying new tension meters for use in production monitoring, quality control, automation and process engineering applications.

Series DTMB-V1 is a new version of the electronic handheld tension meter DT series.

▼ *Handheld DTMB-V1 tension meter*

It has a tension range up to 50daN, with special guide rollers for cables and wires with a diameter larger than 6mm.

There will also be new features to the TS series to facilitate digital signal processing. The advantage of digital signal processing is the easy installation of the connecting cables, up to 1,000m, independence of electronic noise and direct connection to computers in order to control or storage data in the production process. Up to 32 tension sensors can be connected to a single PC to continuously display, store and analyse tension readings.

**Hans Schmidt & Co GmbH – Germany**
**Fax**: +49 8638 4825
**Email**: info@hans-schmidt.com
**Website**: www.hans-schmidt.com

## SIF MDC – Italy Stand: 9C76

SIF MDC, this year celebrating 20 years in the industry, will exhibit some of its latest developments for laboratory and production applications, designed to provide reliability, low maintenance and high performance. SIF's new vertical test chamber complies with IEC 60332-3-10 to test for vertical flame spread of vertically mounted bunched cables.

The chamber, made according the project indications described in EN 50399, introduces systems that guarantee operator safety.

A piezoelectric system interrupts gas feeding in case of flame extinguish. A pivoting mechanism allows easy moving of the burners while inserting and extracting the ladder, while a patented system allows the automatic removal or insertion of the ladder, ensuring the safety of the operator and a fast test setting operation.

The test apparatus can be equipped with some important options, such as prearrangement of the test chamber for fire fighting systems or for the inserting of thermocouples for test temperature survey.

SIF will also present a new safety test chamber for fire resistance tests in accordance with IEC 60331.

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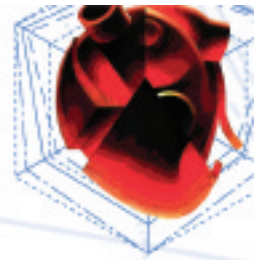

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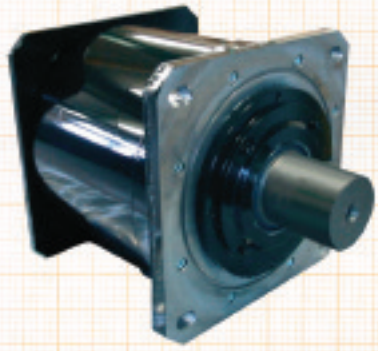

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▲ *SIF's new vertical test chamber*

The new design permits easy regulation of flow meters, and a special hood has been designed to facilitate the elimination of smoke.

The fifth generation of spark tester STM is equipped with a new Profibus interface to allow the supervisor of the line to set up system parameters from a database.

**SIF MDC – Italy**
**Fax**: +39 035 4559358
**Email**: info@sifmdc.com
**Website**: www.sifmdc.com

## Sikora AG
## Stand: 9A41

A highlight on the stand will be the new X-Ray 6000 series for the measurement of the diameter, wall thickness, eccentricity and ovality at insulating and jacketing lines. The X-Ray 6000 includes XLL-X-ray tubes (eXtra-Long-Life tubes) and provides a selectable measuring rate of 1 to 10 Hz or optional 1 to 100 Hz.

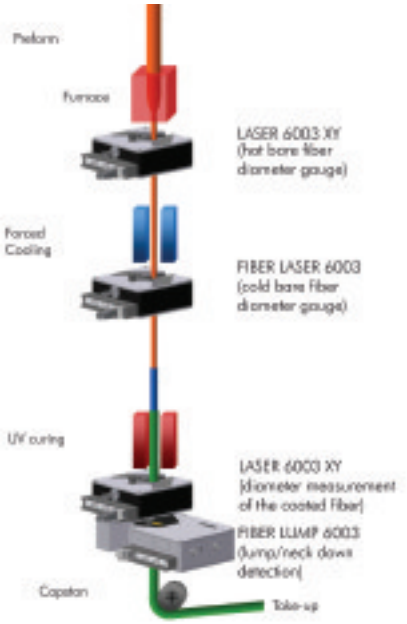
Sikora will display its sophisticated new equipment for optical fibre measurement in the drawing tower. The Fiber Laser 6003 measures the diameter of optical fibres with an accuracy of ±0.05 micrometres while providing information on the ovality, fibre position, spinning and vibration frequency and amplitude.


▲ *Length 6000 reliably calculates the length of cables*

Also present on the stand will be the Length 6000, for non-contact online measurement of wires and cables. The product image and its movement are defined and thus the speed and the produced length can be calculated. The technology of the Length 6000 is based on an optical measuring principle.

In combination with two laser diodes, two image sensors are positioned next to each other. In sequence the cable passes both image sensors. The time that the product takes to move from the first to the second sensor is measured.

Even with reflective surfaces the high-resolution image sensors determine their unique structure by means of the diffraction analysis (patent is pending for this technology).




▲ *Draw tower with Sikora's fibre diameter gauge heads and a lump detector*

Sikora will be introducing the second generation of its successful diameter Laser gauge heads. The new Laser Series 6000 includes a number of technological innovations, one being a measuring rate of 2.5 kHz.

**Sikora AG – Germany**
**Fax**: +49 421 489009 0
**Email**: sales@sikora.net
**Website**: www.sikora.net

## Southwire Company (SCR Technologies) Stand: 9F13-01

Southwire SCR Technologies will introduce the IRIS 5000 infrared inspection system. IRIS 5000 detects porosity during the continuous casting of copper bar. The system uses an infrared camera to measure surface temperature as the copper bar exits the casting wheel and after-cooler.

A statistical algorithm using the temperature profile from the IR camera has been developed. Evaluation of the statistical algorithm leads to the detection of voids of less than 1/8th of an inch diameter. This patent pending technology allows the user to characterise the size and frequency of the void in real time.

Existing non-destructive inspection technology is capable of detecting only surface defects, while the IRIS 5000 detects voids in the centre of the cast bar. This allows the user of IRIS 5000 to grade rod with confidence that the wire drawer will not encounter wire breaks due to poor input metal or inappropriate casting practices.

**Southwire Company – USA**
**Fax**: +1 770 838 6600
**Email**: scrsales@southwire.com
**Website**: www.southwire.com

## Taymer International Inc Stand: 9D06-04

Pinholes, neck-downs, bulges, blemishes can be detected using Taymer International Inc's newly developed SI4200. Taymer latest inspection system can detect all jacket defects with a single system, saving floor space and cost. The system provides 360 degrees of coverage of the wire at line speeds up to 200m/min.

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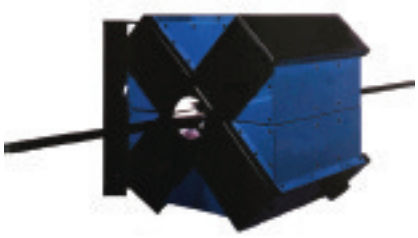

▲ *Taymer's SI4200 for quality assurance*

The SI4200 surface defect detection system consists of multiple cameras to capture high-speed real time images of cable surfaces. The system software can determine the size and type of a wide range of surface defects; even defects as small as 0.6mm will be detected.

Digital images are enhanced, magnified and displayed on a remote monitor, enabling the operator to verify the defect. This allows operators to distinguish between real and fake defects (such as a water droplet), or to detect surface blemishes, surface discolouring or scratches.

A record of the defect type, size and location can be saved to a database. Operators can pinpoint the defect locations after production is completed.

The system will easily integrate with existing lines and works with all types of cable including armoured, jacketed, bare wires, and convoluted profiles.

Taymer's surface defect detection system can ensure that problems are discovered before defective products are sent to customers.

**Taymer International Inc – Canada**
**Fax**: +1 905 479 2636
**Email**: info@taymer.com
**Website**: www.taymer.com

## Tecno Impianti Srl
## Stand: 15G12

Tecno Impianti designs and manufactures cold rolling lines for the construction industry and wire drawing machinery for the fasteners industry.

The company will be exhibiting its newly designed cold rolling line for smooth and ribbed wire, for finished wire diameters from 3.5mm to 8mm, equipped with rolling/profiling cassettes.

All Tecno Impianti cold rolling lines are equipped with AC motors and variable-speed drives, and are supplied with an uncoiler with two tilting arms, descaling machine and lubricant dispenser.

Many different lines and configurations, with horizontal or vertical bull blocks, with one or two passes, different systems for the wire take-up and horizontal spoolers or single and double vertical spoolers are available.

For the fasteners industry, the company will exhibit new models in the SKP series.

These are wiredrawing machines utilised for calibrating wire in-line with cold heading machines.

**Tecno Impianti Srl – Italy**
**Fax**: +39 0341 604289
**Email**: info@tecnoimpianti-italy.com
**Website**: www.tecnoimpianti-italy.com

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## Tecnosider
## Stand: 11A62

Tecnosider has designed a new series of pulling in dogs, named TEK, for easier and better wire drawing.

The guiding principle, as with existing Tecnosider pulling in dogs, is to produce an extremely tough instrument, given the heavy duty working conditions under which they are normally used.

Special new features of the new model include:

- Versatility and ease of use: designed for working on both the left and the right hand side
- Both pincers open simultaneously and easily when the lever is operated. The clamps are both fitted with special guides
- Quick and easy replacement of clamps
- The wire inserted in the clamps runs inside the pincer and when necessary can come out of the rear of the pincer through a specially drilled guide. This makes it possible to insert a length of wire long enough to tighten the clamps on a perfectly intact part of the wire. This is important because it prevents working on the part that the sharpener has worked on which, being very fragile, can easily break and cause the operation to be repeated and production time lost

▲ *TEK from Tecnosider*

TEK pulling in dogs are available in two sizes, TEK 15 for 1.2mm to 5.5mm wires, and TEK 28 for 2.7mm to 8mm wires.

**Tecnosider – Italy**
**Fax**: +39 02 545 5832
**Email**: tkt@tktgroup.it
**Website**: www.tktgroup.it

## Tecnovo Srl
## Stand: 11A62

New products have been developed to keep pace with changes in rod quality and process methods.

Tecnolubre FM/262S is a calcium-based soap designed to draw low carbon content wire for welding ($CO_2$).

The new lubricant was developed to meet requirements for high-speed drawing of wire rods with very smooth surfaces, which generally creates serious problems for lubricant adhesion on the first pass and consequently compromises die life and the quality of the finished wire.

This new product is recommended in all cases where a very thick film of lubricant is desired which will guarantee excellent subsequent wet wiredrawing, without compromising later electrocoating treatment.

Tecnolubre FM/909 is a sodium-based soap specially formulated to comply with new regulations limiting the use of borax.

The product is recommended for drawing high carbon content wires for the production of springs and PC wire to provide high-speed wire drawing with the final wire surface free from black carbon residues.

Emulsifiable Sintek FL lubricants are formulated to generate emulsions that are easy to filter and so do not need to be modified for production plant and cycles currently employed.

The SINTEK FL series consists exclusively of compounds of animal and vegetable origin. They are consequently completely free of mineral oils and are entirely biodegradable.

**Tecnovo Srl – Italy**
**Fax**: +39 02 545 5832
**Email**: tkt@tktgroup.it
**Website**: www.tktgroup.it

## China TJK Machinery Beijing Co Ltd Stand: 11H25

The new CNC stirrup bender from TJK Machinery features one horizontal straightening unit and one vertical straightening unit (patented technology) combined with four traction rolls, driven by servo motor. This is said to ensure the most accurate straightening effects.

▲ *2D bending with TJK's new stirrup bender*

The material feeding system has two payoffs with brakes, suitable for single and double strand, and a buffer unit to reduce resistance and instability during the process of de-coiling.

The patented bending and cutting system (patented technology) has a bending arm driven by servomotor.

It can protrude or draw back while bending different angles, and when the cutting system receives the signal it will synchronously finish cutting work.

The control system is CNC with a malfunction alarm, PLC and servomotor. The new stirrup bender will edit any 2D shapes with a maximum 50 angles.

The database can store over 500 shapes. Different shapes can be processed continuously, with no need to stop processing while adjusting the bending angle.

**China TJK Machinery Beijing Co Ltd – China**
**Fax**: +86 10 8492 8449
**Email**: info@beijingmaster.com
**Website**: www.mm-tjk.com

## Joachim Uhing KG GmbH & Co Stand: 11B40

Uhing will be displaying its new AVS traversing width controller that, without using interference prone optical sensors, automatically produces cylindrical winding even in the reversing area operation.

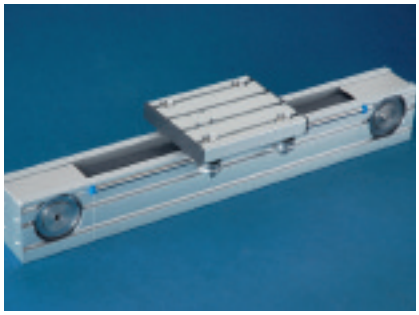
The traversing system used is the Uhing rolling ring drive with pneumatically controlled reversing triggered by a controller. As soon as the AVS detects a dent or bulge in the reversal area, the controller will correct the flaw by adapting the traversing width.

The result is an optimally cylindrically wound coil that can be further processed without problems.

The AVS traversing width controller stores parameters for up to ten different coil types, and can be used for coils with straight or conical flanges and cylindrical or conical cores.

Uhing will also be showcasing the newly developed sizes ELIII 35 and 40 of the Easylock fast action clamping system that allows high torques to be transferred to coils and foil rolls on plain shafts.

Users can now choose from lighter and more ergonomic clamping modules in the 10mm–40mm diameter range. A U-clip clamping element allows for easy securing of coils on plain shafts with diameters from 8mm to 22mm.



▲ *Uhing's AZ 1040 timing belt drive*

A new development in the rolling ring drive sector, Uhing will present the revised RG 3-20-2 MCRF, now with the same design as the RG 15-2 and the RG 30-2.

Also active in timing belt drives, Uhing has launched the AZ 1040, the successor to the AZ 2004 timing belt drive, introduced in 1991.

The AZ 1040 has an undivided profile with integrated carriage guide.

This design allows for a greater free stroke in comparison to its predecessor. Mounting and integration possibilities are enhanced by integrated headpieces made of the same profile, and the T-slot principle is used for fastening of attachments.

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

## Welding Wire Machineries Srl Stand: 11J39

WWM Srl, a developer of new wet drawing processes, will introduce its latest wet drawing machine model TB.7/N-S with zero slipping.

Knowing well the advantages but also the disadvantages of the wet drawing process, WWM has designed and manufactured a new wet drawing line said to include the benefits of both the wet and dry drawing machine.

With this new line WWM hopes to ensure higher efficiency for the user, with lower production costs and higher product ➢➢➢

quality. It is also a simpler machine that can be operated by people without experience.

The new wet drawing machine TB.7/N-S guarantees zero slipping, with all cones individually motorised and with a special wire speed control system. All dies are rotating and the cones are dipped into the lubricant. Deep lubrication and a good cooling of the material maintain higher working speeds than available with a dry drawing machine.

**Welding Wire Machineries Srl – Italy**
**Fax**: +39 049 9500682
**Email**: salesdept@wwmsrl.com
**Website**: www.wwmsrl.com

## Whitelegg Machines Ltd Stand: 11G28

Whitelegg Machines will introduce the following new technology:

**New CFM 2D**
The all new version of the CFM 2D wire forming machine with automatic butt welding features a new wire bending head, new cutting mechanism and new Allform™ software.

▲ *The new Whitelegg CFM 2D wire and spring forming machine*

The machine design changes have been introduced to increase productivity, reduce changeover/setting times and improve the quality of the final product.

**HIT-8-CNC 5-axis spring coiling machine**
Based on the popular 2-axis version, which has been sold since 1996, this new 5-axis version has servo motors driving the feed, pitch slide, cutter slide, horizontal pitch and diameter control. The spring program is generated automatically, and uses templates for different spring types such as parallel, conical and biconical.

The machine includes vertical and rotating cut-off for both coiling directions as standard. It works with wire diameters of 0.1mm to 0.8mm and will produce up to 800 springs per minute.

**RFM-10T spring generating machine**
A versatile cam-based machine suitable for the production of all types of springs and wireforms.

It covers a wire range of 0.4mm to 1mm, and includes wire and rotating quill units as standard.

**Whitelegg Machines Ltd – UK**
**Fax**: +44 1293 538 910
**Email**: sales@whitelegg.com
**Website**: www.whitelegg.com

## Windak AB Stand: 9B56

Windak specialises in automatic packaging solutions for the wire and cable industry and has offices in Sweden,

USA, Australia and Estonia. Windak will be displaying its latest automatic coiler FC-5 and automatic reeler, AR24.

The FC-5 coiler is a versatile and user-friendly fully automatic coiler. It can hold the coil together with stretch wrap, a binder material or strap, making it a multi-purpose coiling machine. It can handle a wide range of cables from 3mm to 25mm diameter and coil size up to 480mm (19").

The AR24 is a new dual-head fully automatic reeler developed for automatic packaging of cable and wire products onto spools and reels between 300mm (12") and 600mm (24") in overall diameter.

It can be run in in-line and off-line applications, and loads and unloads reels automatically. It will also stretch wrap the spool to contain the cut end.

AR24 requires minimal floor space, and when combined with the integrated palletiser makes a complete automatic spooling line.

Windak will also show a large range of pay-off, take-up and rewind solutions, with complete ranges from 500mm to 5,000mm reel diameter. A new integrated take-up cable guide provides the operator with a hands-free tool for accurate winding control in complete safety.

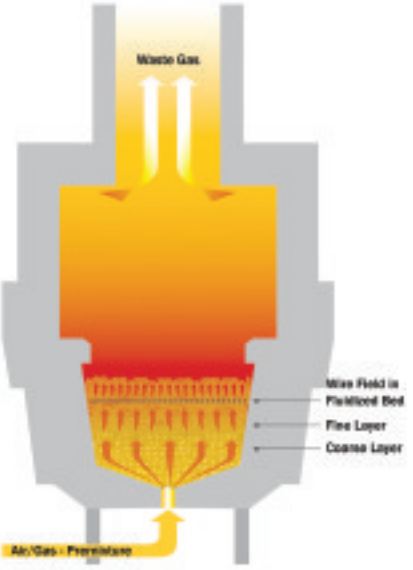
**Windak AB – Sweden**
**Fax**: +46 858 03 8955
**Email**: info@windak.se
**Website**: www.windak.se

## Wire Körner
## Stand: 9B37

Wire Körner will launch a new generation of fluidised bed furnaces that eliminate the need for distributor tiles or distribution pipes.

The new furnaces distinguish themselves by low energy consumption as well as low investment and maintenance costs. Pre-mixing of the combustion gas outside the furnace guarantees uniform temperature distribution and reduced emissions.

The new, patent-pending furnaces dispense with distributor elements as typically used in conventional designs.




▲ *The new generation of fluidised bed furnaces for wire eliminate the need for distributor tiles or distribution pipes*

This eliminates a number of components that were previously considered indispensible, such as complex and expensive distributor tiles, perforated distribution pipes or stand-by blowers.

The absence of the distributor equipment is said to markedly reduce flow resistance inside the furnace. Hence the required blower capacity can be lower than that of competing designs by about 20 per cent.

Additionally, the new design no longer requires a stand-by blower in the event of a power failure to provide cooling air to cool the steel structures.

As the combustion gas is premixed outside the furnace, the new design achieves a uniform fuel/air mixing ratio throughout the fluidised bed and an homogeneous temperature distribution over the width and length. This results in higher combustion efficiency and lower emissions of unburned hydrocarbons.

**Wire Körner GmbH – Germany**
**Fax**: +49 2331 800 688
**Email**: info@wirekoerner.com
**Website**: www.wirekoerner.com

## WTM Srl
## Stand: 11E77

WTM will display its new high-speed horizontal taping line for flat wires.

The line will be equipped with a new caterpillar combined with a capstan pulling drum with two taping heads in the wrapping section. The configuration allows synchronisation and control of the tape and a specifically designed vision system allows overlapping of the two heads.

The first head lays the tape edge-to-edge, completely covering the cable, while the second head, synchronised with the first, lays the tape in the middle to provide a full covering of the conductor.

To control and adjust the position of the second tape, a high frequency camera captures images, and detects in real time the displacement of the second tape compared with the first.

This generates a feedback signal that adjusts the speed of the second head and, consequently, the position of the second tape compared to the first, obtaining a perfect and constant mutual displacement.

This line will be presented with two different taping heads. The first head is suitable for large dimensioned cross-wound spools up to 300mm diameter or 130mm height and up to 12kg in weight. It maintains a constant production speed of 2,500rpm.

Two motors, synchronised by a high sensitivity electronic dancer, provide direct tape tension control for the most sensitive materials.

The second head, suitable for medium sized cross-wound spools, will be provided with a new electronically driven friction that continuously adjusts the tension of the tape by means of an electro-mechanical dancer. Both heads give the operator the possibility of adjusting the tension of the tape while the machine is working. New models of payoff and take-up units complete the line.

WTM will also display its new high performance single-twisting machine, for small and medium flexible cables, with the option of using DIN bobbins of 630mm diameter up to 1,000mm. ➤➤➤

This line can be equipped with WTM high-speed concentric back-twist payoff feeders, coupled with in-line tapers and/or other control devices.

**WTM Srl – Italy**
**Fax**: +39 049 8705599
**Email**: info@wtmachinery.com
**Website**: www.wtmachinery.com

## Yield Management Corporation
## Stand: 9F13-04

Yield Management Corporation will release a new product for detecting wire breaks in stranding and cabling machines.

The system monitors individual spool rotation using optical sensors mounted outside the machine's rotation, and detects a non-rotating spool in less than 1.5m of product travel, stopping the machine before the broken wire reaches the next section.

The broken wire can be repaired, preserving the finished product and reducing costly scrap. This method of detection has been proven to be fail-safe in all applications and significantly improves productivity and product quality.

The product can be custom configured for most planetary and rigid frame and planetary cabling machinery and utilises a Siemens hardware platform and HMI.

The HMI provides the operator interface for initial set-up and continuous monitoring. The operator selects which spools are expected to run and enters the product lay for each machine section.

Once configured, no other inputs are required. When the machine starts, the system continuously monitors each spool and is unaffected by machine speed.

The system does not rely on slip rings or expensive radio frequency transducers and is said to be simple to maintain and operate as a result.

Most existing wire break detection systems monitor the collecting die. Repairing a wire break after it has passed the forming die takes longer and is more difficult. The YMC system monitors spool rotation and detects wire breaks, often before the wire end reaches the collecting die. Stopping the machine before the collecting die makes the cable repair more efficient, improving product quality and productivity.

▲ *Typical placement of wire break detection monitors*

Manufacturers of power cables or underground cables who require minimum continuous lengths report the greatest cost savings.

Other users include those who strand non-conductive materials such as glass fibre where conventional wire break detections systems fail.

**Yield Management Corp – USA**
**Fax**: +1 413 283 7778
**Email**:
sales@yieldmanagementcorp.com
**Website**:
www.yieldmanagementcorp.com

## Zumbach Electronic AG
## Stand: 11D43

Zumbach will present many new developments and products.

The following is a summary of the most important:

Sensors:

- New laser based diameter gauges for small cables and wires. Besides the complete line of ODAC® laser diameter gauges, new models with special laser beam geometry, fault detection function and high scan rate will be exhibited
- New measuring gauge for large dimensions using HLF technology
- 3-axis laser diameter gauges with incorporated fault detection
- New, compact 3-axis fault detectors
- The advanced ODEX® concentricity and diameter gauge for wire extrusion. Fully non-contact, based on magnetic and laser technology
- Ultrasonic wall thickness scanners with quick and easy adaptation to cable diameters and space-saving integration

**April 12-16**


▲ *RAYEX® D measuring Unit*

Data acquisition, processing and display units (processors):

- A new, economic and compact data acquisition, processing and display unit, and a full programme of USYS processors, ranging from a low-cost basic model up to the high-end multi-sensor processor/controller. All USYS processors are designed to be user-friendly, safe, stable and flexible for extension and upgrading

New systems for measuring, process monitoring and control will be on display, including:

- RAYEX® D series: an x-ray measuring and control system for CV lines, for wall thickness (3 layers), eccentricity and diameter/ovality for CV lines. It features software for easy operation, powerful control functions and data acquisition
- Wallmaster/UMAC® – Diacal systems: ultrasonic wall thickness and eccentricity systems for cable jackets and Diacal option for fully automatic calibration and control
- Cellmaster®, Jacketmaster and Multiline systems for extrusion and wire drawing, based on the proven USYS line

**Zumbach Electronic AG – Switzerland**
**Fax**: +41 32 356 0430
**Website**: www.zumbach.com

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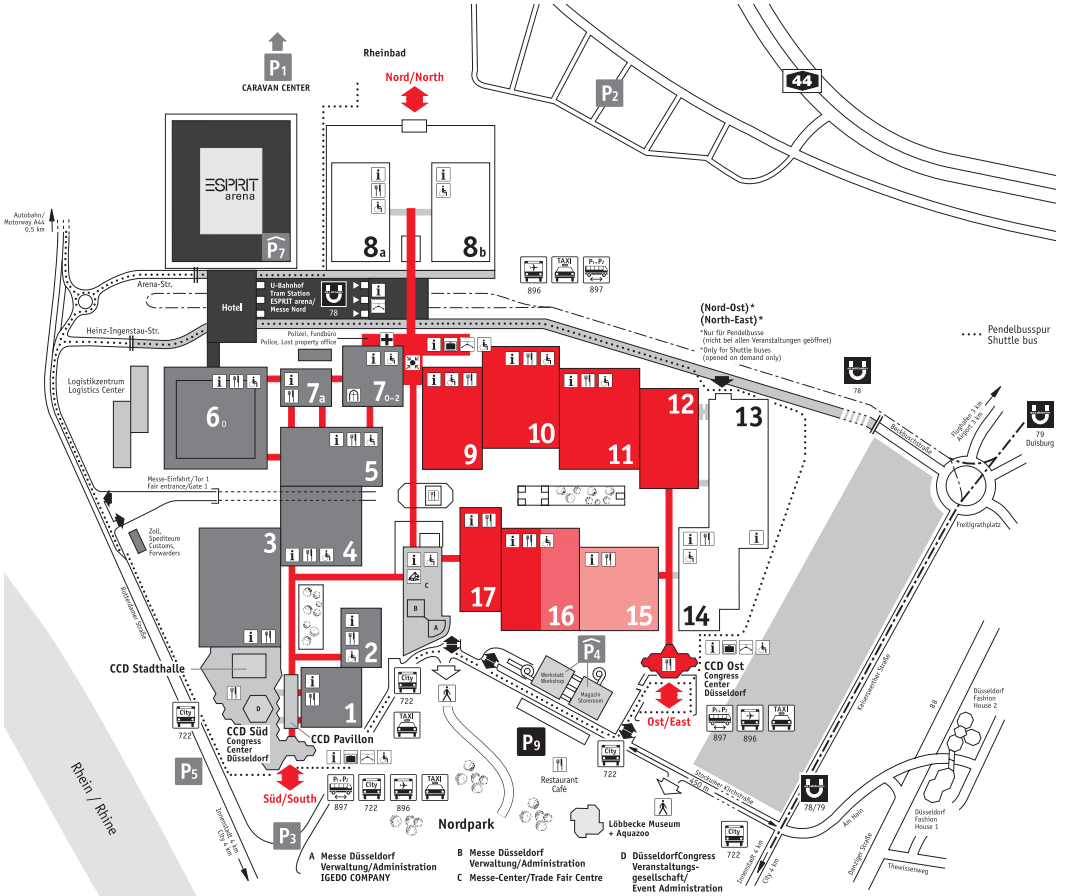

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# Use of high performance elastomers in cables for offshore platforms in Arctic regions

Manuel La Rosa and Andreas Roos, Lanxess Deutschland GmbH Technical Rubber Products, Leverkusen, Germany


## Abstract

Sakhalin Island and the Shtokman gas field in the Barents Sea are among the regions with the most challenging operating environment in the world. Offshore platforms for these regions must meet tough standards, especially regarding cables for control panels and instrumentation. High flexibility at low temperatures (-50°C), outstanding oil resistance, flame retardant and non-corrosive properties are just a few of the requirements.

Ethylene vinyl acetate (copolymers) EVM (Levapren®) and hydrogenated nitrile butadiene rubber HNBR (Therban®) are well suited for meeting these challenges. Their halogen-free character, good oil resistance, ozone and UV light resistance, combined with good mechanical performance in a wide temperature range (–40°C to 175°C) make this material ideal for cables used in offshore platforms in Arctic regions.

This paper presents several compounds based on blends of HNBR and EVM, tested according to international standards such as IEEE 1580, NEK 606 and BS 6883. Resistance to aggressive fluids, such as oil and water-based drilling muds, has been tested. Mechanical property performance was tested at –50°C.


## 1 Introduction

### 1.1 The Arctic challenge

**Oil exploration and production in the Arctic region**

Russia, Canada, Norway and the USA are among countries looking to explore and develop hydrocarbon resources in the Arctic region. Melting of the ice cap of the North Pole is anticipated in fifty years, making navigation and oil exploration and production possible in the Arctic sea. The challenges of this endeavour are numerous: remote offshore locations, harsh environmental conditions and a fragile geo-political arena.

Typical examples of the harsh Arctic environment are the Shtokman and Barents Sea fields (*Figure 1*). This project anticipates an annual production of 70 billion cubic metres of natural gas and 0.6 million tonnes of gas condensate, comparable to the annual gas output of Norway, one of the largest European gas suppliers[1]. Located 550km offshore, the field cannot be reached by helicopter from continental bases. Freezing winds, very low temperatures and six months of winter darkness add to the challenges of developing this field[2].

To drill in deeper water required ice-strengthened drill ships, including a revolutionary, eight-sided vessel. Other innovations were airstrips built of thickened ice, new icebreaker designs, ice-breaking supply boats, and floating dry-docks for servicing the other ships on site. Without these developments, exploration and production in the Arctic would not be possible[3].

▼ **Figure 1**: *Platforms operate under extreme conditions in the Arctic*

**Cable standards for oil platforms**

NEK 606 is the international industry standard for the offshore oil and gas, ship and marine industries. These cables are Det Norske Veritas (DNV) certified to be in accordance with ISO 9001 and 14001. The construction of NEK 606 cables for offshore platforms is similar to other standards such as BS 6883 and IEEE 1580 type P[4].

### 1.2 High performance elastomers for cables used in cold climate

#### 1.2.1 Levapren® ethylene vinyl acetate copolymers (EVM)

Ethylene vinyl acetate copolymers with a content of 40% to 90% vinyl acetate (VA) are known as rubber-like materials.

The saturated backbone of the polymer chain gives EVM excellent ozone and weather resistance. They also exhibit high temperature resistance up to 175°C and the increase of VA content from 40% to 90% allows a significant improvement of the already very good oil resistance[5].

#### 1.2.2 Therban® hydrogenated nitrile butadiene rubber (HNBR)

HNBR is a nearly ideal polymer to deliver the performance criteria required in Arctic environments. Its outstanding property profile is due to the saturated polymer backbone in combination with highly polar and inert ACN side group.

All this provides the necessary properties to withstand severe ozone and UV weathering, to maintain flexibility at low temperatures, to resist the attack of highly polar fluids and oils, resist high temperatures (up to 150°C) and maintain mechanical properties performance[6].

The low temperature and oil resistance properties of Therban® grades are strongly linked to the acrylonitrile (ACN)

| Properties | Units | Requirements |
|---|---|---|
| Tensile strength | [MPa] | 11±2 |
| Elongation at break | [%] | 200±15 |
| Hardness | Shore A | 75±5 |
| Tear strength | [N/mm] | 4-6 |
| Cold bending test | [ºC] | @-40ºC No Cracks |
| Limiting oxygen index (LOI) | [%] | 32 |
| Hot air ageing | [%] | TS/EB ±30 |
| Immersion in | [MPa]/[%] | TS/EB ±40 V: 15 |
| Immersion in oil based mud | [MPa]/[%] | TS/EB ±30 W/V: 30 |
| Immersion in water based mud | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Immersion in Ester based mud | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Mooney | ML | 40=60 |
| Vertical flame test | [cm] | 20cm |

▲ **Table 1**: *Main properties described in standards for offshore cable compounds*

content which covers a range between approximately 20% and 50%. In an homologous series of HNBR polymers there is no strict linear correlation between the glass transition temperature (Tg) and the ACN content, mainly because the glass process is also influenced by the crystallisation of ethylene sequences of more than 8-12 $CH_2$ groups.

Copolymers with less than 37% acrylonitrile content are partly crystalline at low temperatures[7].

# 2 Experimentation

## 2.1 Cable compounds for offshore platforms in Arctic regions

*Table 2* shows the formulations of compounds prepared with HNBR grade (ACN = 21 %, RDB= 0,9 %; ML1+4/100°C = 72±4 MU); EVM grades (VA content = 50±5 % and 70±5 %; ML1+4100°C= 27±4 and 27±4 MU).

# 3 Results and discussion

## 3.1 Mechanical properties

The main properties were measured according to the standards described in NEK 606 specification. Compound 5, prepared with EVM 70% VA, shows the lowest tensile strength value of all compounds. This is borderline and not desirable since some margin for the variation of properties after ageing and immersion is required. TS values of the other four compounds are comparable and in the same range (11 MPa).

Compound 1 shows robust stress-strain properties with a high elongation at break and the lowest hardness, shore A, of the whole study (*Table 3*).

Compounds 2 and 3, based on blends of polymers, show similar TS values but EB values up to 100% lower than HNBR-based compounds.

Hardness and moduli values are higher when compared to compound 1. If a comparison is made between 2 and 3 an increased crosslinking density (higher hardness) and higher moduli (M50 and M100) can be observed on compound 3, which was prepared with Silquest RC-1.

Compounds 4 and 5 are difficult to compare since filler and plasticiser content are not the same. Initially a compound with the same amount of filler and plasticiser as the other formulations showed very poor stress-strain properties (6.4 MPa and 290% EB) as well as low hardness and tear strength. For this reason an optimisation via increase of filler and reduction of plasticiser (30 parts per hundred of rubber (phr) more ATH and 5 phr less DOS) was conducted.

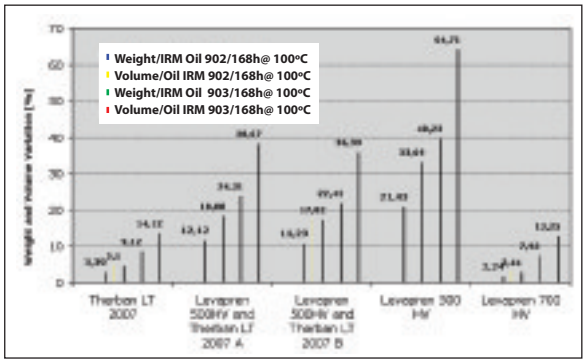
Fischer et al[8] found a correlation between the VA content and the crosslinking density for Levapren® compounds prepared under the same conditions (constant peroxide and other additives content). This could explain the poor stress-strain properties found in the initial compound 5.

▼ **Table 2**: *Formulations based on EVM and HNBR special elastomers*

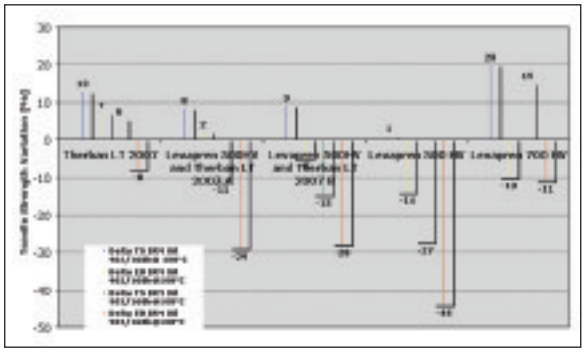
| Composition | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| THERBAN® LT 2007 (HNBR (ACN= 21%) | 100 | 50 | 50 | | |
| LEVAPREN® 500 HV (EVM (VA=50%) | | 50 | 50 | 100 | |
| LEVAPREN® 700 HV (EVM (VA=70%) | | | | | |
| APYRAL® 120 E (ATH BET= 12 m²/g) | 80 | 80 | 80 | 80 | 100 |
| APYRAL® SM 200 (ATH BET= 22 m²/g) | 60 | 60 | 60 | 60 | 70 |
| ZINC BORATE | 10 | 10 | 10 | 10 | 10 |
| SILQUEST® RC-1 SILANE | | | 2 | | |
| GENIOSIL® XL 33 | 2 | 2 | | 2 | 2 |
| EDENOL® 888 (DOS) | 10 | 10 | 10 | 10 | 10 |
| DIPLAST® TM 8-10/ST (TOTM) | 10 | 10 | 10 | 10 | 5 |
| RHENOFIT DDA-70 | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 |
| STABAXOL® P-Powder (PCD) | 1 | 1 | 1 | 1 | 1 |
| MAGLITE® DE (MgO) | 3 | 3 | 3 | 3 | 3 |
| ZINC STEARATE | 1 | 1 | 1 | 1 | 1 |
| CALCIUM STEARATE | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| EDENOR® C 18 98-100 | 1 | 1 | 1 | 1 | 1 |
| CORAX® N 550/30 (Carbon Black) | 5 | 5 | 5 | 5 | 5 |
| RHENOFIT® TRIM/S | 2 | 2 | 2 | 2 | 2 |
| PERKADOX® 14-40 B-PD | 6,5 | 6,5 | 6,5 | 6,5 | 6,5 |
| Total | 294,4 | 294,4 | 294,40 | 294,40 | 319,40 |
| Density | 1,453 | 1,468 | 1,560 | 1,484 | 1,609 |

▼ **Table 3**: *Mechanical properties for developed compounds*

| Mechanical properties | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Tensile Strength (MPa) | 11,1 | 11,0 | 11,7 | 11,5 | 8,5 |
| Elongation at Break (%) | 384 | 270 | 236 | 251 | 265 |
| M 50 (MPa) | 1,8 | 2,5 | 3,1 | 2,8 | 3,0 |
| M 100 (MPa) | 4,0 | 5,9 | 7,3 | 6,4 | 6,2 |
| Hardness Shore A at 23° | 65 | 69 | 76 | 73 | 76 |
| Tear Strength ASTM D-470 | 6,4 | 3,2 | 3,2 | 4,1 | 3,9 |




▲ **Figure 2**: *Variation of volume and weight after immersion in oil IRM 902 and 903 for 168 hours at 100°C*



▲ **Figure 3**: *Variation of tensile strength properties after immersion in oil IRM 902 and 903 for 168 hours at 100°C*

### 3.2 Media Resistance

#### 3.2.1 IRM oil 902 and 903

Oil resistance is closely related to the polarity of an elastomer. The polarity of EVM elastomers is determined by the vinyl acetate content and for HNBR elastomers by the acrylonitrile content[5]. The measurement of properties and volume change after immersion in oil confirms this effect (*Figures 2* and *3*).

Compounds based on EVM 70% VA content and HNBR LT displayed the lowest swelling and variation of tensile strength property performance. This could be attributed to the high polarity generated by a high content of VA in the EVM polymer (70%) whilst in the case of the HNBR material, the polarity is inherent in the high dipole-dipole effect of the ACN group which, despite the low content in Therban LT 2007, is sufficient to provide the necessary oil resistance demanded for these compounds.

The biggest variation of tensile properties can be observed in compounds based on EVM 50% VA content.

The polarity of this compound is only good enough to withstand immersion in oil IRM 902 but not oil IRM 903 which is more aggressive and polar than 902. EVM 70% VA content compounds showed comparable oil resistance to HNBR based compound (*Figures 2* and *3*).

#### 3.2.2 Water-based and oil-based drilling muds

**Water-based systems**

Divalent cations such as calcium and magnesium, added to a freshwater drilling mud, inhibit clay formation and shale swelling. High levels of soluble calcium are used to control sloughing shale and hole enlargement, and to prevent equipment damage.

Calcium-treated muds resist salt and anhydrite contamination but are susceptible to gelation and solidification at high temperatures[9].

**Oil-based systems**

These are based on water-in-oil emulsions, typically with calcium chloride brine as the emulsified phase and oil as the continuous phase. They may contain up to 50% brine in the liquid phase. Invert emulsion muds are a 'relaxed' emulsion, with lower electrical stabilities and higher fluid-loss values[9]. The effect on weight, volume and variation of tensile properties can be observed in *Figures 4* and *5*. Compounds based on Therban LT 2007 and Levapren 700 HV displayed the best performance and retention of properties. It is important to select materials with a high degree of polarity as polarity of the compounds plays a key role in oil resistance performance.

In the case of compounds based on polymer blends, there seems to be some synergy between HNBR and EVM polymers – if extreme physical performance is demanded EVM can be blended with HNBR. This contributes to the reduction of overall compound cost and improves processing while maintaining heat and oil resistance. Blends of HNBR and EVM have been previously developed to meet very demanding specifications, especially in military naval technology specifications, NES 518 (Def-Stand 61-31 part 12) and VG 95218[10].

### 3.3 Low temperature properties

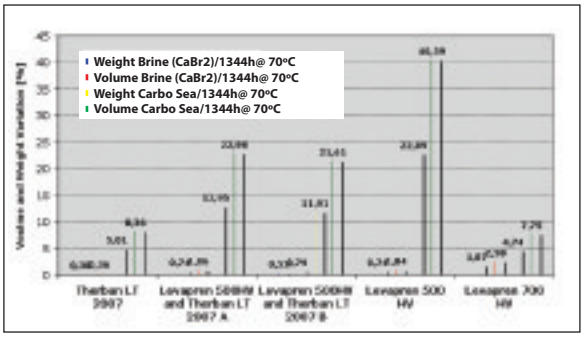
The flexibility of cables for offshore platforms in Arctic regions is fundamental to ensure the maximum efficiency (minimum downtime and maintenance) of oil and gas production and refining tasks of these installations. Extremely low temperatures (–40°C and –50°C) are common in this kind of environment and therefore it is important to use materials with a low glass transition temperature that ensures mobility of polymer chains at lower energy levels. The mobility of polymer segments in a wide operating temperature range reduces the crystallisation risk and the hardening effect on the polymer. This can be expected in fixed cables for platforms located in regions with harsh environments.

The tensile strength (elongation at break) of these compounds has been measured at –40°C and –50°C, as can be observed in *Figure 6*. Therban® LT 2007 based compound undoubtedly shows the best performance at –40°C and –50°C (highest elongation at break) followed by the compound based on Therban® LT 2007 and Levapren® 500 HV (prepared with Geniosil® XL 33), a combination of plasticisers (TOTM and DOS) and a combination of different specific surface (BET) aluminium trihydroxides (Apyral® 120E and SM 200).

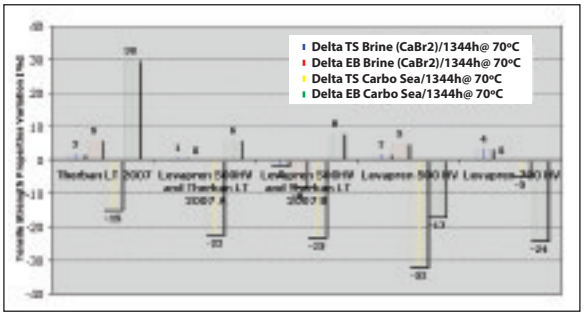
**Effect of coupling agents**

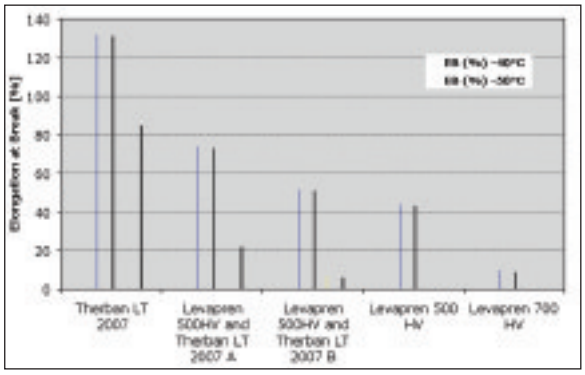
The high reactivity of an alpha-silane, such as Geniosil® XL 33, may have contributed to improve the level of polymer and filler interaction and in this way ensure a good balance of mechanical properties and lower crosslinking density. Alpha-silanes are inherently more reactive than standard silanes; this means a higher level of hydrophobation of the ATH could have

▼ **Figure 4**: *Weight and volume variation after immersion in brine and Carbo Sea drilling mud for 1,344 hours at 70°C*

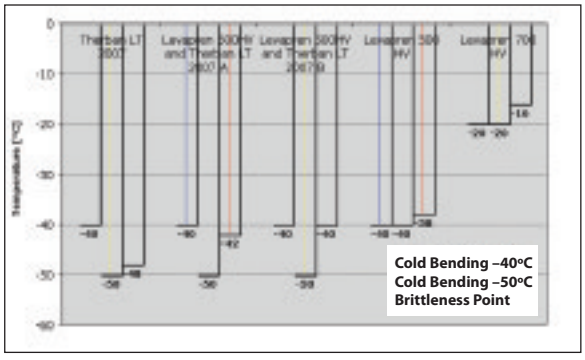



▼ **Figure 5**: *Variation of tensile strength properties after immersion in brine and Carbo Sea drilling mud for 1,344 hours at 70°C*






▲ **Figure 6**: *Elongation at break of cable compounds measured at –40°C and –50°C*




▲ **Figure 7**: *Cold bending measured at –40 °C and –50°C and brittleness point*

taken place even when the specific surface filler used is not high enough to ensure a hydrophobation.

**Effect of plasticiser**

The combination of 10 phr of Di-n-octyl sebacate (DOS) and (Tris (2-ethylhexyl) trimellitate) TOTM plasticiser provided the cold flexibility necessary for low temperatures. TOTM plasticisers are normally used in applications where low volatility is of supreme importance. These applications include wire and cable insulation and automotive interiors. TOTM has unique low migration properties and extraction resistance properties[11].

DOS is an excellent cold-resistant plasticiser with a high impact on glass transition temperature but a higher volatility compared to TOTM. Both plasticisers are suitable for EVM copolymers, ethyl cellulose and synthetic rubber and especially suitable for cold-resistant wires and cables or artificial leathers. These low temperature properties are determined by molecular structure.

Cold bending at –40°C and –50°C and brittleness point was measured for all developed compounds. Only the compound prepared with Levapren® 700HV did not meet cold bending at –40°C. Only compounds based on Therban® LT 2007 and on blends of this polymer with Levapren® 500HV met the bending at –40°C and –50°C, making them suitable for installations operating at such low temperatures (*Figure 7*). The low Tg of the HNBR grade and the plasticising effect of DOS and TOTM enable the production of compounds with this degree of flexibility. Compounds prepared with Levapren® 700HV did not perform as well at low temperatures as those prepared with Levapren® 500HV. This is due to the higher Tg of the EVM 70% VA content material, when compared to the EVM 50% VA content grade (–17°C against –28°C), and because the compounding of the Levapren® 700HV based formulation was made using only 15 phr of plasticiser, instead of 20 phr as used in other compounds.

Measurements at low temperatures for a compound prepared with 20 phr of plasticiser were conducted in previous studies where mechanical properties, such as tensile strength, were rather low.

A high amount of plasticisers in sole EVM 70% VA content compounds has a negative effect on the overall mechanical properties profile.

### 3.4 Flame retardant properties

The combination of ATH fillers (Apyral® with BET= 12 and 20 $m^2/g$) was present in all compounds and could have contributed the good mechanical properties as well as good limiting oxygen index (LOI) values. Limiting oxygen index for compounds was conducted according to ASTM D 2863; all compounds displayed values of LOI higher than 34%.

A compound based on Levapren 700 HV displayed an exceptionally high LOI value of 46%; this may be explained by the following:

1. High VA content EVM polymers (70%) and their synergy with ATH fillers
2. Lower amount of plasticiser and higher amount of ATH

Different particle size ATH fillers combined with zinc borate provide a very compact and stable char in the case of fire.

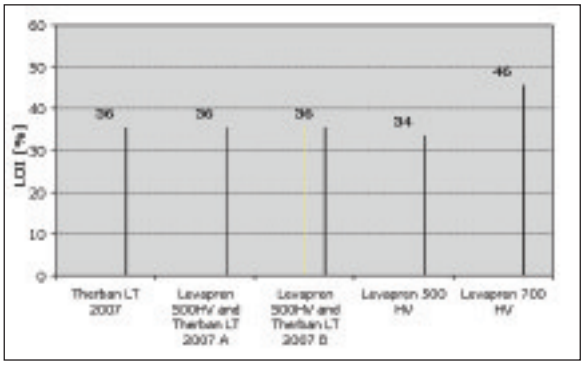
Meisenheimer[12] described the synergistic effect of EVM polymers and ATH in 1991, explaining that LOI for Levapren FRNC cable compounds experiences an increase at constant loading of 190 phr or more on grades with VA content higher than 65% wt. Furthermore internal studies conducted with Geniosil® XL 33 described an interesting effect on the LOI of compounds prepared with Levapren® 700 HV and 190 phr ATH (BET=12 $m^2/g$). An increase of the silane content up to 3 phr correlated with an increase of the LOI.

### 3.5 Hot air ageing properties

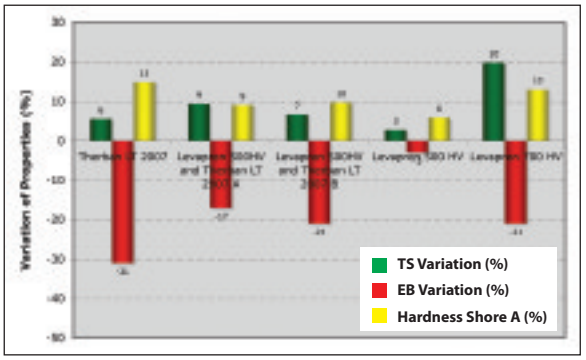
According to the NEK 606 specification, a hot air ageing test must be conducted for 168 hours at 120°C on compounds intended for cable jacketing. To push the limits of developed compounds a more severe test was carried out for 168 hours, 336 hours and 672 hours at 135°C. The values of variation of properties after ageing are reported in *Figures 9* and *10*. After 336 hours the first effects of ageing are observed in developed compounds, especially on elongation at break of compounds based on Therban® LT 2007, Therban® LT 2007 and Levapren® 500 HV B (*Figure 9*).

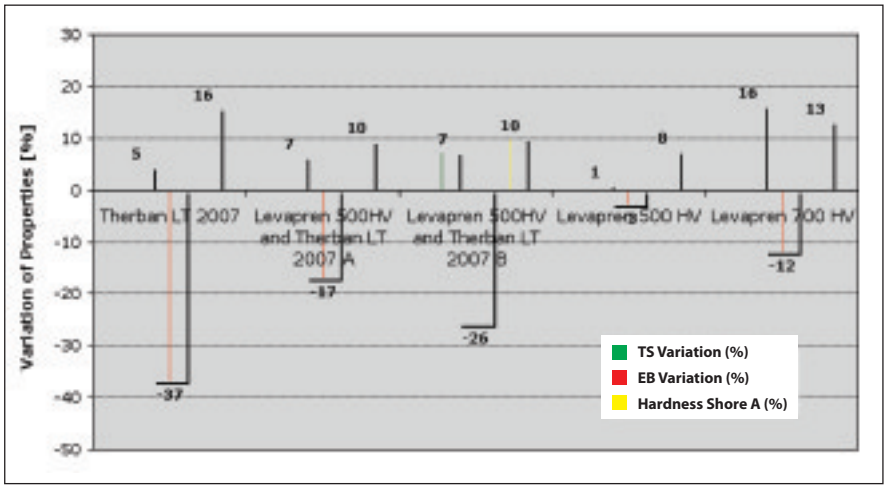
When compared with ageing after 336 hours, retention of properties for developed compounds after 672 hours is good; only minor changes in the variation of properties can be observed, especially for Levapren® 500HV based compounds (*Figure 10*). This could be adjusted via an optimisation of heat stabilisation package based on Stabaxol® P and Rhenofit® DDA-70.

▼ **Figure 8**: *Limiting oxygen index for developed compounds according to ASTM D 2863*




▼ **Figure 9**: *Hot air ageing test for 336 hours at 135°C*






▲ **Figure 10**: *Hot air ageing test for 672 hours at 135 °C*

For the effects of this study, hot air ageing resistance meets the requirements of cable standards.

An increase of the operating temperature for cables in offshore platforms could mean an improvement in the overall cable design for panel and instrumentation, using less copper conductor and therefore reducing total cable costs.

## 4 Conclusions

- Levapren 700 HV is a suitable polymer-based compound for oil and mud resistance HFFR cables, though not quite suitable for cables with low temperature resistance typical of Arctic environments (–40°C and –50°C)
- Blends of HNBR and EVM were proved to provide a good compromise of oil and mud resistance properties and hot air ageing properties, though with insufficient low temperature properties performance (low elongation at break at –40°C and –50°C and cold bending at –50°C)
- Therban® LT 2007 provided an outstanding performance in measurements conducted at low temperatures (down to –50°C) typical of Arctic regions. An excellent balance of mechanical, oil and mud resistance, and flame retardant properties was observed in compounds prepared with this material however, with a rather poor performance in the hot air ageing test
- The high polarity of HNBR materials combined with EVM polymers brings cable compound solutions to the oil and gas market with relatively good cost–performance advantages
- The development of high performance cable compounds required the use of special additives such as alpha silanes and fine particle sized flame retardant fillers
- A combination of plasticisers with different characteristics and high specific surface filler ensured the compliance of requirements for low temperature flexibility and cold bending at –40°C and –50°C ■

## 5 References


[1] http://www.gazprom.com/eng/Arcticles/Arcticle21712.shtml
[2] http://www.upstreamonline.com/incoming/Arcticle132282.ece
[3] A D McCracken, T P Poulton, E Macey, J M Monro Gray and G S Nowlan, "Arctic oil and gas" Popular Geoscience http://www.gac.ca, 2007
[4] http://www.nek606.net/
[5] E Rohde "Ethylene vinyl acetate elastomers: applications and opportunities for industrial rubber goods" 141st Meeting of the Rubber Division American Chemical Society, Proceedings (1992)
[6] D Achten "Next generation HNBR grades: new materials for oilfield applications" Oilfield Engineering and Polymers (2006)
[7] H Magg "The structure of Therban® (HNBR) and the impact of the low temperature characteristics of elastomeric materials" 3° Werkstoffkongress, Loeben Graz (2005)
[8] C Fischer, C Wrana, J Ismeier, F Taschner, "Crosslink architecture of EVM based vulcanisates and its influence on technologically relevant properties" German Rubber Conference Proceedings, July 3–6, Nuremberg, 2006
[9] World Oil Fluids 2007 "Drilling completion and workover fluids" Gulf Publishing Co, PO Box 2608, Houston, TX 77252 USA (2007)
[10] M La Rosa, C Wrana, D Achten "Electron beam curing of EVM and HNBR for cable compounds" 55th IWCS Conference (2006)
[11] http://www.eastman.com/NR/rdonlyres/17704C03–05BD–448F–8221–2F39C01E7191/0/L167.pdf
[12] H Meisenheimer, "Low smoke, non–corrosive fire retardant cable jacket based on HNBR and EVM" Jicable'91 June 24–28, Versailles, 1991



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## Reifenkordhersteller trifft seine Wahl

▲ *Reifenkorddiffusion (TCD)-Anlage von Radyne*

Radyne IHWT hat die Lieferung, Installation und Inbetriebnahme von Ausrüstungen für die induktive Erwärmung von sechs Reifenkord-Diffusion (TCD)-Anlagen in China erfolgreich abgeschlossen, die jeweils 24 Drähte bei 80DV mit Drahtdurchmessern im Bereich von 1,1mm bis 2,2mm herstellen.

Diese sechs Anlagen werden einem führenden chinesischen Hersteller geliefert und schließen einen Vorwärmebereich sowie einen Endwärmebereich ein, die je mit einer IGBT-Energiequelle ausgestattet werden, gefolgt von zwei Muffelofen-Temperaturhaltezonen.

Das Reifenkord-Diffusionsverfahren wird durchgeführt um Korrosion am Draht innerhalb desselben Reifens zu vermeiden und um als Schmiermittel für weitere Drahtdurchmesserverringerungen in darauf folgenden Drahtziehverfahren zu wirken.

Zahlreiche Vorteile sind mit den Radyne TCD-Systemen verbunden, wie z. B. ein hoher elektrischer Wirkungsgrad und das kontaktlose Erwärmen ohne dass dabei Material, wie z. B. Sand, erwärmt werden muß.

Das System ist benutzerfreundlich und umfaßt ein Steuersystem mit einer Siemens HMI, bzw. einem integrierten Bestandteil des Bedienungspults, und kommuniziert mit der SPS der Siemens Simatic Baureihen mit Einsatz des Profibus DP-Protokolls. Somit hat der Bediener Zugang zu allen Maschinenparametern und -steuerungen, zusätzlich zu den diagnostischen Informationen.

Das wichtigste ist das TCD-System von Radyne eine Produktgleichmäßigkeit sichert mit einer perfekten Diffusion sowohl von Kupfer wie von Zink.

Mehrdrahterwärmung bei hohen DV kann erzielt werden und außerdem ist auch der Wechsel von einem Drahtdurchmesser zum anderen einfach.

**Radyne IHWT – UK**
**Fax**: +44 1256 467224
**Email**: info@ihwtech.co.uk
**Website**: www.inductotherm-hwt.co.uk

# Arbeitsgruppe für China

Fushi Copperweld, Inc hat bekannt gegeben, daß das Tochterunternehmen, Fushi International (Dalian) Bimetallic Cable Co Ltd von der National Standardization Administration of China dazu ernannt wurde die allererste Arbeitsgruppe für Verbundleiter in China zu bilden und zu organisieren.

National Standardization Administration (SAC) wurde im April 2001 gegründet und ist vom Staatsrat der Volksrepublik China bevollmächtigt, die im Land geltenden Gesetze und Bestimmungen bei der Produktstandardisierung zu entwerfen, zu formulieren und umzusetzen.

Nach dessen Bildung, wird die Arbeitsgruppe die erste Behörde sein, die in China Standards für Verbundleiter festlegt. Der Arbeitsgruppe, die zahlreiche namhafte Industriefachleute, Branchenführer und Industrieunternehmen zusammenbringen wird, wird die Aufgabe der Formulierung eines landesweiten Standards für Verbundleiterdrähte innerhalb der Telekommunikations-, Elektrizitäts-, Automobil-, Eisenbahn- und Industriebranche sowie der öffentlichen Dienste und anderen Hochfrequenzsignal- und Stromübertragungsbereichen, anvertraut.

Im Jahre 2007 hat das Unternehmen, zusammen mit dem Number 23 Research Institute of China Electronics and Technology Group und anderen Industriefachleuten, einen nationalen Standard für kupferplattierten Aluminiumdraht (CCA) formuliert.

**Fushi Copperweld Inc – China**
**Website**: www.fushicopperweld.com

## Madem in Rumänien

▲ *Die Eröffnungszeremonie bei Madem Romania*

Das neuste Fertigungswerk der Madem Gruppe, Madem Romania genannt, begann offiziell den Betrieb in Bistrita-Nasaud, Rumänien. Daran nahmen verschiedene örtliche Offizielle, Kunden, Lieferanten und Freunde teil.

Anwesend war der Präsident der Madem Gruppe, Gino Mazzoccato, der geschäftsführende Direktor Rafael Romagna, begleitet von Ovidiu Cretu, Bürgermeister von Bistrita-Nasaud und Vitor Gobbato, brasilianischer Botschafter in Rumänien.

Madem Romania beliefert bereits örtliche Kunden und wird im Laufe des Jahres 2010 den Kundendienst in andere Länder Osteuropas ausweiten.

**Madem Reels - Brasilien** **Fax**: +55 54 3462 5900
**Email**: madem@madem.com.br
**Website**: www.mademreels.com

# Neptune 2-Auftrag

▲ *Bei Bridon International im Einsatz stehender Aufwickler von SKET*

SKET erhielt von Kiswire den Auftrag für die Lieferung von Ausrüstungen für das Projekt Neptune 2. Die Lieferung von dem was als weltweit größte Korbverseilmaschine und als längste jemals gelieferte Schnellverseilmaschine betrachtet wird, ist für das vierte Quartal 2010 geplant. Diese beiden Maschinen sind unter anderen für die Produktion von Tiefsee-Offshore-Seilen vorgesehen.

Die Korbverseilmaschine vom Typ MKVS 1+8 x2700 eignet sich für die Herstellung von Seilen mit einem Durchmesser von 160mm. Zur Maschine gehören ein Ablauf und Aufwickler für Spulen mit einer maximalen Aufnahmefähigkeit von 600 Tonnen. Sowohl die Ablauf- als auch Aufwickelspulen haben einen Flanschdurchmesser von 5600mm und eine Verlegebreite von 10.000mm.

Der bisher größte von SKET gefertigte Aufwickler mit einer Kapazität von 400 Tonne ist bei Bridon International im Einsatz.

Auf der Schnellverseilmaschine vom Typ SRW 1+48x800 (32") sollen Litzen mit einem Durchmesser bis 55mm bei einer maximalen Lineargeschwindigkeit von 100m/min gefertigt werden.

Die Linie ist auch für die Herstellung von verdichteten Litzen geeignet.

Die bisher größte von SKET gelieferte Rohrmaschine des Typs SRW 1+48x630 arbeitet seit mehr als zehn Jahren erfolgreich bei Kiswire im Werk Neptune 1 in Malaysia.

Bei dem Projekt Neptune 2 handelt es sich um eine 80 Millionen US-Dollar Investition, die 2011 auf einer Fläche von 20 ha in der Nähe des Werkes Neptune 1 bei Johor realisiert werden soll.

**SKET Verseilmaschinenbau GmbH – Deutschland**
**Fax**: +49 391 4055 815
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**Website**: www.sketvmb.de

# Wardwell-Verkauf

SKET Verseilmaschinenbau Magdeburg GmbH hat die Tätigkeiten von Wardwell erworben.

SKET hatte zuvor die Tätigkeiten von Wardwell Europe erworben und war auch der Höchstanbieter für die Tätigkeiten des Flechtmaschinenherstellers in der Versteigerung am 14. Dezember 2009.

Ein Sprecher des deutschen Herstellers und Mitglied der WILMS Gruppe bestätigte den Erwerb sowie die Pläne den Betrieb am gleichen Standort am 4. Januar 2010 von neuen zu starten.

"Wir freuen uns die Marke Wardwell und dessen Produkte unserem Programm hinzuzufügen und unseren Kunden weitere Optionen anzubieten.

"Wardwell beliefert die Draht- und Kabelindustrie seit 98 Jahren mit Flechtausrüstungen und verfügt über viele wichtige und treue Kunden," fügte die Quelle hinzu.

Das neue Unternehmen wird anfangs über eine geringere Arbeitnehmerschaft verfügen und einen neuen Namen tragen: Stolberger Incorporated DBA Wardwell Braiding Co.

**Stolberger Incorporated DBA Wardwell Braiding Co – USA**
**Email**: jtomaz@wardwell.com

# Erfolgreiche FTTH-Konferenz

Die Eröffnungskonferenz der Fibre-to-the-Home im Nahost, die in Amman vom 10. bis 11. November 2009 stattfand, wurde als großer Erfolg verkündet.

Das Konferenzprogramm bot eine Reihe von Präsentationen auf höchster Ebene an, die die wichtigsten Aspekte der FTTH-Netzwerke deckten. Darunter waren technische Sitzungen, in denen die neusten Lösungen für Installation und Betrieb von FTTH präsentiert wurden.

Fallstudien aus Nahost, Europa und Asien warfen einen Einblick in den täglichen Betrieb der FTTH-Netzwerke. In einem speziellen Workshop wurde außerdem das Geschäftsszenario für FTTH betrachtet.

Über 260 Delegierte trafen sich zur Amman Grand Hyatt Zara Expo, wo 14 Aussteller führende Technologien präsentierten. Das ist ein weiterer Beweis des zunehmenden Interesses für Fibre-to-the-Home im Nahost.

Alle Analysten, die bei der Konferenz sprachen, haben bestätigt, dass ein großes Potential für die Aufnahme lokaler FTTH besteht, was zum nachhaltigen wirtschaftlichen Wachstum der Region beitragen wird.

Die nächste FTTH-Konferenz in Nahost wird im Laufe des Jahres 2010 stattfinden.

**FTTH Council Europe – Belgien**
**Email**: info@ftthcouncil.eu
**Website**: www.ftthcouncil.eu

# Neue Internetseite

OM Lesmo Group hat eine neue schnellere, benutzerfreundlichere Website lanciert, um die Kunden über die Produktentwicklungen informiert zu halten, technische Informationen zu liefern und seine Kunden mit den Tochterunternehmen zu verbinden, die die verschiedenen europäischen Maschinen- und Produktherstellern für die weltweite Draht- und Kabelindustrie darstellen.

Die neue Website wird in ihrem laufenden Format für eine Probezeit bis zumindest den ersten Quartal 2010 zur Verfügung stehen. Während dieser Zeit werden Erweiterungen auf der Grundlage der Vorschläge und Empfehlungen aufgenommen.

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# Einsatz von Hochleistungselastomeren in Kabeln für Offshore-Plattformen in den arktischen Regionen

Manuel La Rosa und Andreas Roos, Lanxess Deutschland GmbH Technical Rubber Products, Leverkusen, Deutschland


## Übersicht

Die Insel Sakhalin und das Gasfeld Shtokman in der Barentssee gehören weltweit zu den Gebieten mit dem schwierigsten Arbeitsumfeld. Offshore-Plattformen für diese Gebiete müssen sehr strenge Normen erfüllen, insbesondere im Hinblick auf Kabel für Bedienerpulte und Instrumentierungen. Hohe Flexibilität bei niedrigen Temperaturen (-50°C), außerordentliche Ölbeständigkeit, flammwidrige und korrosionssichere Eigenschaften sind lediglich einige der Anforderungen.

Ethylen-Vinylacetat (Copolymere) EVM (Levapren®) und hydriertem Nitrilkautschuk HNBR (Therban®) eignen sich ideal zur Erfüllung dieser Herausforderungen. Ihre Halogenfreiheit, gute Ölbeständigkeit, Ozon- und UV-Lichtbeständigkeit, kombiniert mit einer guten mechanischen Leistung in einem weiten Temperaturbereich (von –40°C bis 175°C) machen aus diesem Material einen idealen Werkstoff für den Einsatz von Kabeln in Offshore-Plattformen in den arktischen Gebieten. In diesem Artikel werden verschiedene Compounds vorgestellt, die auf HNBR- und EVM-Mischungen basieren und entsprechend internationaler Normen, wie z. B. IEEE 1580, NEK 606 und BS 6883 geprüft wurden. Dabei wurde die Widerstandsfähigkeit gegen aggressive Medien, wie z. B. Öl und wässrige Bohrschlämme, getestet. Mechanische Leistungseigenschaften wurden bei –50°C geprüft.


## 1 Einleitung

### 1.1 Die arktische Herausforderung

**Ölbohrung und -produktion in den arktischen Gebieten**

Russland, Kanada, Norwegen und die USA gehören zu den Ländern, die Kohlenwasserstoffvorkommen im arktischen Gebiet erforschen und entwickeln wollen. Es wird angenommen, das die Eiskappe am Nordpol in 50 Jahren schmilzt, dadurch wird die Navigation und die Ölbohrung und -produktion im arktischen Meer ermöglicht. Die Schwierigkeinten die dieses Unternehmen mit sich bringt sind vielfältig: entlegene Offshore-Standorte raue Umwelteinflüsse und ein kritischer geopolitischer Schauplatz. Typische Beispiele der rauen arktischen Umwelt sind die Ölfelder Shtokman und jene in der Barentssee (*Bild 1*).

Dieses Projekt sieht eine Jahresproduktion von 70 Milliarden Kubikmeter Erdgas und 0,6 Millionen Tonnen Gaskondensat vor, was mit der jährlichen Gasproduktion in Norwegen vergleichbar ist, d.h. einer der wichtigsten europäischen Gaslieferanten[1]. 550km vor der Küste gelegen, kann dieses Gebiet nicht per Hubschrauber von den Festlandbasen aus erreicht werden. Eiskalte Winde, sehr niedrige Temperaturen und sechs Monate lange Winterfinsternis gehören zu den Schwierigkeiten in der Entwicklung dieses Gebietes[2].

Um im Tiefwasser zu bohren sind verstärkt-eisresistente Bohrschiffe erforderlich, einschließlich eines revolutionären achtseitigen Boots. Weitere Innovationen waren die mit verdicktem Eis gebauten Landepisten, neue Eisbrecher-Designs, Eisbrecher-Versorgungsboote und schwimmende Trockendocks für die Wartung der anderen Schiffe Vorort. Ohne diese Entwicklungen wäre die Bohrung und Produktion in der Arktis nicht möglich[3].

▼ **Bild 1**: *Plattformen funktionieren unter extremen Bedingungen in der Arktis*

**Kabelstandards für Ölplattformen**

NEK 606 ist der internationale Industrie-standard für die Öl- und -Gasindustrie sowie Marine- und Schiffbauindustrie im Bereich Offshore. Diese Kabel sind nach Det Norske Veritas (DNV) entsprechend ISO 9001 und 14001 zertifiziert.

Der Aufbau der NEK 606 Kabel für Offshore-Plattformen ist anderen Normen ähnlich, wie z. B. BS 6883 und IEEE 1580 Typ P[4].

### 1.1 Hochleistungselastomere für in kaltem Klima eingesetzte Kabel

#### 1.2.1 Levapren® Ethylen-Vinylacetat-Copolymere (EVM)

Ethylen-Vinylacetat-Copolymere mit einem Gehalt von 40% bis 90% Vinylacetat (VA) sind als gummi-ähnliche Materialien bekannt. Die gesättigte Grundstruktur der Polymerkette bietet EVM eine hervorragende Ozon- und Wetterbeständigkeit.

Außerdem zeigen sie auch eine hohe Temperaturbeständigkeit bis zu 175°C und die Steigerung des VA-Gehalts von 40% bis 90% ermöglicht eine wichtige Verbesserung der bereits sehr guten Ölbeständigkeit[5].

#### 1.2.2 Therban® hydrierter Nitrilkautschuk (HNBR)

HNBR ist ein fast ideales Polymer, um die in arktischen Umgebungen erforderlichen Leistungskriterien zu erbringen.

Sein außergewöhnliches Eigenschaftsprofil wird durch die gesättigte Grundstruktur des Polymers, in Kombination mit einer hochpolaren und inerten ACN (Acrylnitril) -Seitengruppe hervorgerufen.

| Eigenschaften | Einheiten | Anforderungen |
|---|---|---|
| Zugfestigkeit | [MPa] | 11±2 |
| Bruchdehnung | [%] | 200±15 |
| Härte | Shore A | 75±5 |
| Reißfestigkeit | [N/mm] | 4-6 |
| Kaltbiegeprüfung | [°C] | @-40°C Ohne Risse |
| Sauerstoffgrenzwerte (LOI) | [%] | 32 |
| Vieillissement à l'air chaud | [%] | TS/EB ±30 |
| Heißluftalterung | [MPa]/[%] | TS/EB ±40 V: 15 |
| Eintauchen in ölbasiertem Schlamm | [MPa]/[%] | TS/EB ±30 W/V: 30 |
| Eintauchen in wasserbasiertem Schlamm | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Eintauchen in Ester-basiertem Schlamm | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Mooney | ML | 40=60 |
| Vertikaler Flammtest | [cm] | 20cm |

▲ **Tabelle 1**: *In den Normen für Offshore-Kabelmischungen beschriebene Haupteigenschaften*

| Zusammensetzung | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| THERBAN® LT 2007 (HNBR (ACN= 21%) | 100 | 50 | 50 | | |
| LEVAPREN® 500 HV (EVM (VA=50%) | | 50 | 50 | 100 | |
| LEVAPREN® 700 HV (EVM (VA=70%) | | | | | |
| APYRAL® 120 E (ATH BET= 12 m²/g) | 80 | 80 | 80 | 80 | 100 |
| APYRAL® SM 200 (ATH BET= 22 m²/g) | 60 | 60 | 60 | 60 | 70 |
| ZINKBORAT | 10 | 10 | 10 | 10 | 10 |
| SILQUEST® RC-1 SILAN | | | 2 | | |
| GENIOSIL® XL 33 | 2 | 2 | | 2 | 2 |
| EDENOL® 888 (DOS) | 10 | 10 | 10 | 10 | 10 |
| DIPLAST® TM 8-10/ST (TOTM) | 10 | 10 | 10 | 10 | 5 |
| RHENOFIT DDA-70 | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 |
| STABAXOL® P-Pulver (PCD) | 1 | 1 | 1 | 1 | 1 |
| MAGLITE® DE (MgO) | 3 | 3 | 3 | 3 | 3 |
| ZINKSTEARAT | 1 | 1 | 1 | 1 | 1 |
| KALZIUMSTEARAT | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| EDENOR® C 18 98-100 | 1 | 1 | 1 | 1 | 1 |
| CORAX® N 550/30 (Ruß) | 5 | 5 | 5 | 5 | 5 |
| RHENOFIT® TRIM/S | 2 | 2 | 2 | 2 | 2 |
| PERKADOX® 14-40 B-PD | 6,5 | 6,5 | 6,5 | 6,5 | 6,5 |
| Insgesamt | 294,4 | 294,4 | 294,40 | 294,40 | 319,40 |
| Dichte | 1,453 | 1,468 | 1,560 | 1,484 | 1,609 |

▲ **Tabelle 2**: *Mischungen basierend auf EVM- und HNBR-Sonderelastomere*

▼ **Tabelle 3**: *Mechanische Eigenschaften für entwickelte Compounds*

| Mechanische Eigenschaften | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Zugfestigkeit (MPa) | 11,1 | 11,0 | 11,7 | 11,5 | 8,5 |
| Bruchdehnung (%) | 384 | 270 | 236 | 251 | 265 |
| M 50 (MPa) | 1,8 | 2,5 | 3,1 | 2,8 | 3,0 |
| M 100 (MPa) | 4,0 | 5,9 | 7,3 | 6,4 | 6,2 |
| Shorehärte A bei 23° | 65 | 69 | 76 | 73 | 76 |
| Reißfestigkeit ASTM D-470 | 6,4 | 3,2 | 3,2 | 4,1 | 3,9 |

All dies gewährt die erforderlichen Eigenschaften, um den strengen Ozen- und UV-Verwitterungen zu widerstehen, um bei niedrigen Temperaturen die Flexibilität zu erhalten, um den Angriff von hochpolaren Medien und Ölen sowie hohen Temperaturen (bis zu 150°C) zu widerstehen und mechanische Eigenschaften zu erhalten[6]. Die Eigenschaften bei niedrigen Temperaturen und jene der Ölbeständigkeit der Therban® -Klassen sind eng mit dem ACN-Gehalt verbunden, der einen Bereich zwischen ca. 20% und 50% abdeckt. In einer homologen Reihe von HNBR-Polymeren besteht keine strikt lineare Korrelation zwischen der Glasübergangstemperatur (Tg) und dem ACN-Gehalt, hauptsächlich weil das Glasverfahren ebenfalls durch die Kristallisation der Ethylenreihen von über 8-12 $CH_2$-Gruppen beeinflußt wird. Copolymere mit einem Acrylnitril-Gehalt unter 37% sind bei niedrigen Temperaturen teilweise kristallin[7].

# 2 Versuch

### 2.1 Kabelcompounds für Offshore-Plattformen in arktischen Regionen

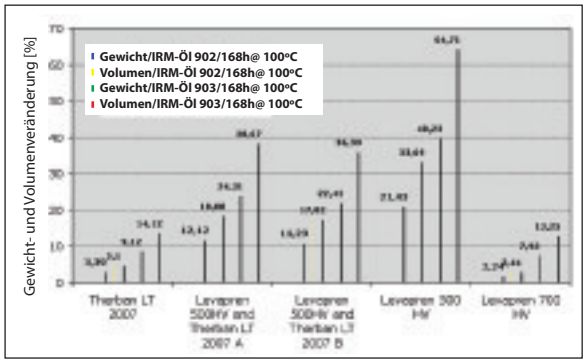
*Tabelle 2* zeigt die Mischungen der Compounds, die mit HNBR-Klasse (ACN = 21%, RDB= 0,9%; ML1+4/100°C = 72±4 MU); EVM-Klassen (VA-Gehalt = 50±5 % und 70±5 %; ML1+4100°C= 27±4 und 27±4 MU) vorbereitet werden.

# 3 Ergebnisse und Diskussion

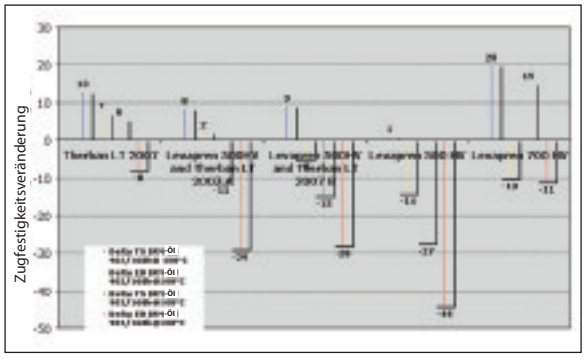
### 3.1 Mechanische Eigenschaften

Die Haupteigenschaften wurden entsprechend der in der Spezifikation NEK 606 beschriebenen Normen gemessen. Compound 5, das mit EVM 70% VA vorbereitet wurde, zeigt den niedrigsten Zugfestigkeitswert aller Compounds. Diese Grenzwerte sind nicht wünschenswert, da eine gewisse Spanne für die Eigenschaftsveränderung nach der Alterung und dem Eintauchen erforderlich ist. Die Zugfestigkeitswerte (TS-Werte) der anderen vier Compounds sind vergleichbar und im gleichen Bereich (11 MPa). Compound 1 zeigt robuste Spannungs-Dehnungs-Eigenschaften mit einer hohen Bruchdehnung und der niedrigsten Härte, Shore A, der ganzen Studie (*Tabelle 3*).

Compounds 2 und 3, basierend auf Polymermischungen, zeigen ähnliche TS-Werte jedoch Bruchdehnungswerte (EB-Werte) bis zu 100% niedriger als jene der HNBR-basierenden Compounds. Härte- und Modulenwerte liegen höher, wenn sie mit dem Compound 1 verglichen werden. Vergleicht man zwischen 2 und 3, so ist eine erhöhte Vernetzungsdichte (höhere Härte), sowie höhere Module (M50 und M100) beim Compound 3 ersichtlicht, das mit Silquest RC-1 vorbereitet wurde.




▲ **Bild 2**: *Volumen- und Gewichtsveränderung nach dem Eintauchen im Öl IRM 902 und 903 für 168 Stunden bei 100°C*




▲ **Bild 3**: *Veränderung der Zugfestigkeitseigenschaften nach dem Eintauchen im Öl IRM 902 und 903 für 168 Stunden bei 100°C*

Compounds 4 und 5 sind schwer vergleichbar, da der Füllmittel- und der Weichmachergehalt nicht gleich sind. Anfänglich zeigte ein Compound mit dem gleichen Anteil an Füllmittel und Weichmacher wie jenes anderer Mischungen sehr niedrige Spannungs-Dehnungs-Eigenschaften (6,4 MPa und 290% EB) sowie niedrige Härte und Reißfestigkeit.

Aus diesem Grund wurde eine Optimierung durch die Erhöhung des Füllmittels und die Senkung des Weichmachers (30 Teile pro Hundert von Kautschuk (phr) mehr ATH und 5 phr weniger Weichmacher DOS) durchgeführt. Fischer u. a. [8] fanden eine Korrelation zwischen dem VA-Gehalt und der Vernetzungsdichte für Levapren® -Compounds, die unter den gleichen Bedienungen vorbereitet wurden (konstanter Peroxid- und andere Additiven-Gehalt).

Das könnte die niedrigen Spannungs-Dehnungs-Eigenschaften erklären, die im anfänglichen Compound 5 erforscht wurden.

### 3.2 Medienbeständigkeit

#### 3.2.1 Öl IRM 902 und 903

Die Ölbeständigkeit ist eng mit der Polarität eines Elastomers verbunden. Die Polarität der EVM-Elastomere wird anhand des Vinylacetat-Gehalts und für HNBR-Elastomere anhand des Acrylnitril-Gehalts bestimmt[5]. Die Messung der Eigenschaften und die Volumenveränderung nach dem Eintauchen im Öl bestätigt diese Wirkung (*Bild 2* und *3*). Compounds basierend auf EVM 70% VA-Gehalt und HNBR LT zeigten die niedrigste Quellung und Veränderung der Zugfestigkeit-Leistungseigenschaft. Dies könnte der hohen Polarität zugeschrieben werden, die durch einen hohen Gehalt an VA im EVM-Polymer (70%) erzeugt wurde, während im Fall des HNBR-Materials die Polarität der hohen Dipol-Dipol-Wirkung der ACN-Gruppe innewohnt, die trotz des niedrigen Gehalts im Therban LT 2007 ausreicht, um die geforderte Ölbeständigkeit zu bieten, die für diese Compounds verlangt wird.

Die größte Veränderung der Zugeigenschaften kann in Compounds basierend auf EVM 50% VA-Gehalt beobachtet werden. Die Polarität dieses Compounds ist nur gut genug, um dem Eintauchen im Öl IRM 902, jedoch nicht im Öl IRM 903 zu widerstehen, das aggressiver und polarer als das 902 ist.

Die Compounds mit EVM 70% VA-Gehalt zeigten eine vergleichbare Ölbeständigkeit gegenüber dem HNBR basiertem Compound (*Bild 2* und *3*).

Die Wirkung auf Gewicht, Volumen und Veränderung der Zugeigenschaften ist in *Bild 4* und *5* ersichtlich.

Compounds, basierend auf Therban LT 2007 und Levapren 700 HV, zeigten die beste Leistung und Beibehaltung der Eigenschaften.

Es ist wichtig, Materialien mit einem hohen Polaritätsgrad auszuwählen, da die Polarität der Compounds eine Schlüsselrolle bei der Ölbeständigkeitsleistung spielt.

Im Falle von Compounds, basierend auf Polymermischungen, scheint eine gewisse Synergie zwischen HNBR- und EVM-Polymeren zu bestehen – falls eine extreme physikalische Leistung erforderlich ist, kann EVM mit HNBR vermischt werden. Dies trägt dazu bei, die gesamten Kosten für das Compound zu reduzieren und verbessert die Verarbeitung, während die Wärme- und Ölbeständigkeit erhalten bleiben.

HNBR- und EVM-Mischungen wurden zuvor entwickelt, um sehr anspruchsvollen Spezifikationen gerecht zu werden, insbesondere in den Spezifikationen der Militär-Marinetechnologie, NES 518 (Def-Stand 61-31 Teil 12) und VG 95218[10].

### 3.3 Niedertemperatureigenschaften

Die Flexibilität der Kabel für Offshore-Plattformen in den arktischen Regionen ist von fundamentaler Bedeutung, um die höchste Effizienz (minimale Ausfallzeiten und Wartung) bei der Öl- und Gasproduktion und bei Raffinierungstätigkeiten dieser Einrichtungen zu sichern. Extrem niedrige Temperaturen (–40°C und –50°C) sind in dieser Umgebung gängig und daher ist

#### 3.2.2 Wasser- und ölbasierte Bohrschlämme

**Wasserbasierte Systeme**

Zweiwertige Kationen wie z. B. Kalzium und Magnesium, die Süßwasser-Bohrschlamm hinzugefügt werden, hindern die Lehmbildung und Quellung von Schiefer.

Große Mengen von löslichem Kalzium werden eingesetzt, um sich ablösenden Schiefer und die Bohrlocherweiterung zu prüfen sowie Schäden an den Ausrüstungen zu verhindern.

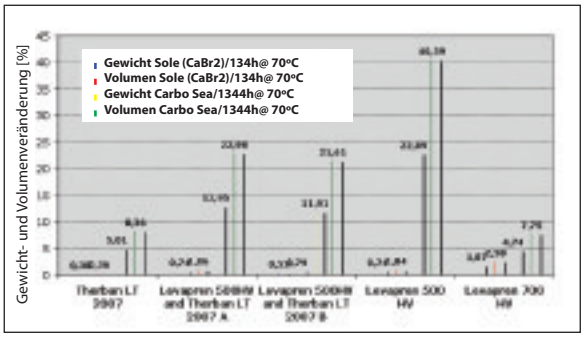
Kalziumbehandelte Schlämme widerstehen Salz und Anhydritverunreinigungen, sind jedoch empfindlich gegenüber Erstarrung und Erhärtung bei hohen Temperaturen[9].

**Ölbasierte Systeme**

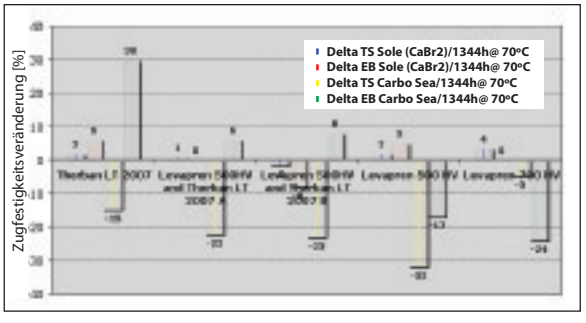
Diese Systeme basieren auf Wasser-in-Öl-Emulsionen,inder Regel mit Kalziumchloridsole als emulgierte Phase und Öl als kontinuierliche Phase.

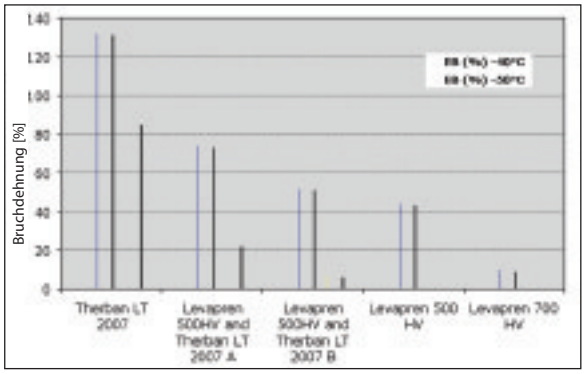
Sie können bis zu 50% Sole in der flüssigen Phase beinhalten. Invertemulsion- Schlämme sind eine "entspannte" Emulsion, mit niedrigeren elektrischen Stabilitäten und höheren Werten der Flüssigkeitsverluste[9].

▼ **Bild 4**: *Gewichts- und Volumenveränderung nach dem Eintauchen in Sole und Carbo Sea Bohrschlamm für 1.344 Stunden bei 70°C*

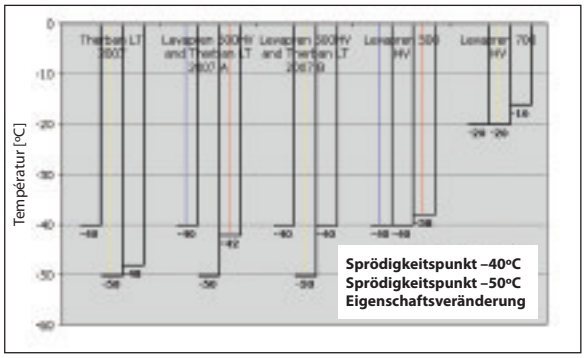



▼ **Bild 5**: *Veränderung der Zugfestigkeitseigenschaften nach dem Eintauchen in Sole und Carbo Sea Bohrschlamm für 1.344 Stunden bei 70°C*






▲ **Bild 6**: *Bruchdehnung von bei –40 °C und –50°C gemessener Kabelcompounds*




▲ **Bild 7**: *Kaltbiegung, bei –40 °C und –50°C gemessen und Sprödigkeitspunkt*

es wichtig, Materialien mit einer niedrigen Glasübergangstemperatur einzusetzen, die die Beweglichkeit der Polymerketten bei niedrigeren Energieniveaus sichert. Die Beweglichkeit der Polymersegmente in einem weiten Betriebstemperaturbereich reduziert die Gefahr der Kristallisation und die Härtewirkung des Polymers. Dies kann bei festen Kabeln für Plattformen erwartet werden, die in Regionen mit rauen Umgebungen verlegt werden.

Die Zugfestigkeit (Bruchdehnung) dieser Compounds wurden bei –40°C und –50°C gemessen, wie aus Bild 6 ersichtlich. Therban® LT 2007 basiertes Compound zeigt zweifellos die beste Leistung bei –40°C und –50°C (höchste Bruchdehnung) gefolgt vom Compound basierend auf Therban® LT 2007 und Levapren® 500 HV (mit Geniosil® XL 33 vorbereitet), eine Kombination von Weichmacher (TOTM und DOS) und eine Kombination verschiedener spezifischer Oberflächen (BET) Aluminium-Trihydroxide (Apyral® 120E und SM 200).

**Wirkung der Haftvermittler**

Die hohe Reaktivität eines Alpha-Silan, wie z. B. Geniosil® XL 33, könnte dazu beigetragen haben, den Grad der Wechselwirkung zwischen Polymer und Füllstoff verbessert zu haben und so ein gutes Gleichgewicht der mechanischen Eigenschaften und eine niedrigere Vernetzungsdichte. Alpha-Silane sind inhärent reaktiver als Standardsilane; das bedeutet, daß ein höheres Niveau an Hydrophobierung des ATH erfolgen könnte, selbst wenn der spezielle eingesetzte Oberflächenfüllstoff nicht hoch genug ist, um eine Hydrophobierung zu sichern.

**Wirkung der Weichmacher**

Die Kombination von 10 phr von Di-n-octyl Sebacat (DOS) und (Trio (2-Ethylhexyl) Trimellitat) TOTM-Weichmacher bietet die Kälteflexibilität, die für niedrige Temperaturen erforderlich ist.

TOTM-Weichmacher werden in der Regel für Anwendungen eingesetzt, wo die niedrige Volatilität von höchster Wichtigkeit ist.

Diese Anwendungen schließen die Draht- und Kabelisolierung sowie die Isolierung der Fahrzeuginnenbereiche ein. TOTM weist einzigartige niedrige Migrationseigenschaften sowie Extraktionswiderstandseigenschaften auf[11].

DOS ist ein hervorragender kaltbeständiger Weichmacher mit einer großen Auswirkung auf die Glasübergangstemperatur, aber mit einer höheren Volatilität im Vergleich zu TOTM. Beide Weichmacher eigenen sich für EVM-Copolymere, Ethylcellulose und synthetischen Kautschuk und sind besonders für kaltbeständige Drähte und Kabel oder Kunstleder geeignet. Diese Niedertemperatureigenschaften werden durch die Molekularstruktur bestimmt. Kaltbiegung bei –40°C und –50°C und der Sprödigkeitspunkt wurde für alle entwickelten Compounds gemessen.

Nur das mit Levapren® 700HV vorbereitete Compound erfüllte nicht die Kaltbiegung bei –40°C. Lediglich die Compounds basierend auf Therban® LT 2007 und auf Mischungen dieses Polymers mit Levapren® 500HV erfüllten die Biegung bei –40°C und –50°C, also Compounds, die sich für Installationen bei derartigen Niedrigtemperaturen eignen (*Bild 7*).

Der niedrige $T_g$ der HNBR-Klasse und die Weichmacher-Wirkung von DOS und TOTM ermöglichen die Produktion von Compounds mit diesem Flexibilitätsgrad. Die mit Levapren® 700HV vorbereiteten Compounds wirkten nicht so gut bei Niedrigtemperaturen wie jene die mit Levapren® 500HV vorbereiteten wurden. Das hängt mit dem höheren $T_g$ des Materials des EVM 70% VA-Gehalt zusammen, im Vergleich zum EVM 50% VA-Gehaltsgrad (–17°C gegenüber –28°C), und weil die Zusammensetzung der Levapren® 700HV basierenden Formulierung lediglich mit 15 phr Weichmacher durchgeführt wurde, statt 20 phr, die bei anderen Compounds benutzt werden. Messungen bei Niedrigtemperaturen für ein Compound, das mit 20 phr Weichmacher vorbereitet wurde, wurden in vorherigen Studien durchgeführt, wo die mechanischen Eigenschaften, wie z. B. Zugfestigkeit, ziemlich niedrig waren. Ein hoher Anteil an Weichmacher einzig im Compound mit EVM 70% VA-Gehalt hat eine negative Auswirkung auf das gesamte Profil der mechanischen Eigenschaften.

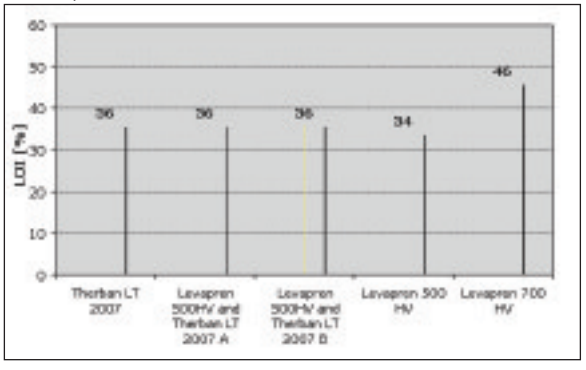
### 3.4 Flammwidrige Eigenschaften

Die Kombination von ATH-Füllstoffen (Apyral® mit BET= 12 und 20 m²/g) war in allen Compounds vorhanden und könnte zu guten mechanischen Eigenschaften beigetragen haben sowie zu den guten Sauerstoffgrenzwerten (LOI). Sauerstoffgrenzwerte für Compounds wurden entsprechend ASTM D 2863 ermittelt; alle Compounds zeigten höhere LOI-Werte als 34%. Ein auf Levapren 700 HV basiertes Compound zeigte einen außergewöhnlich hohen LOI-Wert von 46%; dies wird nachfolgend erklärt:

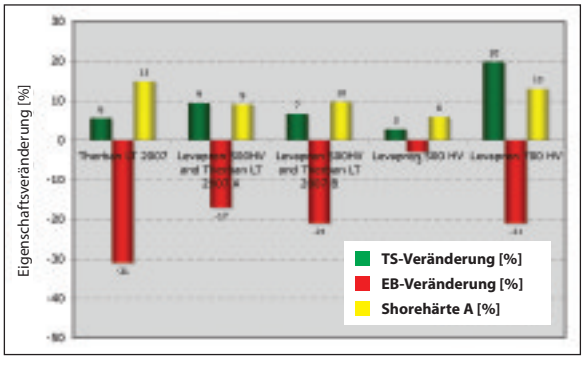
1) EVM-Polymere mit hohem VA-Gehalt (70%) und deren Synergie mit ATH-Füllstoffen
2) Niedriger Anteil an Weichmachern und höher Anteil an ATH

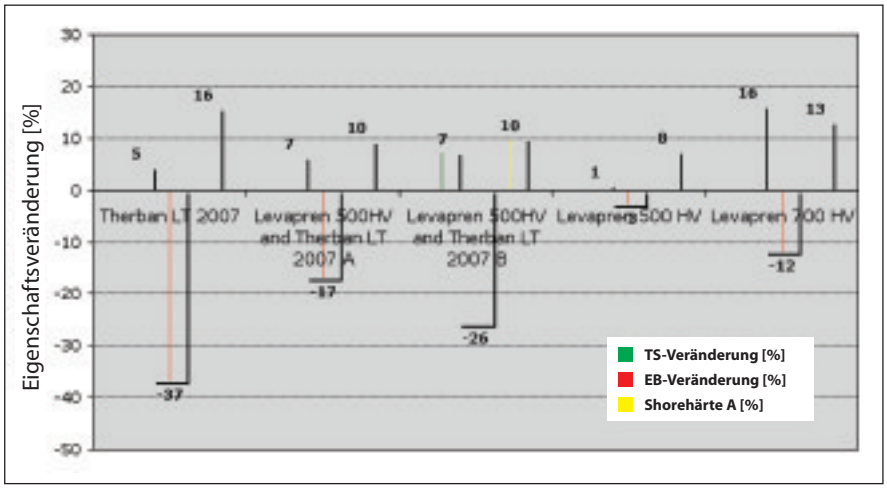
ATH-Füllstoffe mit verschiedenen Teilchengrößen verbunden mit Zinkborat bieten eine sehr kompakte und stabile Verkohlung im Brandfall.

▼ **Bild 8**: *Sauerstoffgrenzwert für entsprechend ASTM D 2863 entwickelte Compounds*




▼ **Bild 9**: *Prüfung der Heißluftalterung für 336 Stunden bei 135°C*






▲ **Bild 10**: *Prüfung der Heißluftalterung für 672 Stunden bei 135 °C*

Meisenheimer[12] beschreibt die synergetische Wirkung der EVM-Polymere und ATH in 1991 und erklärt, daß LOI für Levapren FRNC-Kabelcompounds eine Erhöhung beim konstanten Laden von 190 phr oder darüber hinaus bei Klassen mit VA-Gehalt über 65% wt erlebt. Außerdem beschrieben innerbetriebliche Studien, die mit Geniosil® XL 33 durchgeführt wurden, eine interessante Wirkung auf den LOI der Compounds, die mit Levapren® 700 HV und 190 phr ATH (BET=12 $m^2/g$) vorbereitet wurden. Eine Erhöhung des Silangehalts bis zu 3 phr in Korrelation mit einer Steigerung des LOI.

### 3.5 Eigenschaften der Heißluftalterung

Entsprechend der Spezifikation NEK 606, ist eine Prüfung der Heißluftalterung für 168 Stunden bei 120°C bei Compounds durchzuführen, die für die Kabelummantelung bestimmt sind. Um die Grenzen der entwickelten Compounds weiter hinaus zu schieben, wurde eine strengere Prüfung für 168 Stunden, 336 Stunden und 672 Stunden bei 135°C durchgeführt. Die Werte der Veränderung der Eigenschaften nach der Alterung sind in *Bild 9* und *10* dargestellt. Nach 336 Stunden werden die ersten Wirkungen der Alterung in den entwickelten Compounds beobachtet, insbesondere bei der Bruchdehnung der Compounds basierend auf Therban® LT 2007, Therban® LT 2007 und Levapren® 500 HV B (*Bild 9*).

Im Vergleich zur Alterung nach 336 Stunden, ist die Beibehaltung der Eigenschaften für die entwickelten Compounds nach 672 Stunden gut; nur geringfügige Änderungen bei der Veränderung der Eigenschaften konnten beobachtet werden, insbesondere für Levapren® 500HV basierte Compounds (*Bild 10*). Dies könnte durch eine Optimierung des Wärmestabilisierungspaket basierend auf Stabaxol® P und Rhenofit® DDA-70 angepaßt werden. Entsprechend der Auswirkungen dieser Studie, erfüllt die Beständigkeit der Heißluftalterung die Anforderungen der Kabelnormen. Eine Steigerung der Betriebstemperatur für Kabel in Offshore-Plattformen könnte eine Verbesserung im gesamten Kabelaufbau für Pulte und Instrumentierung darstellen, mit einem geringen Einsatz von Kupferleitern und demzufolge mit einer Einsparung der gesamten Kabelkosten.

## 4 Schlussfolgerung

- Levapren 700 HV ist ein geeignetes polymerbasiertes Compound für öl- und schlammbeständige HFFR-Kabel, obwohl es sich für Kabel mit Niedrigtemperaturbeständigkeit nicht so gut eignet, die in arktischen Umgebungen typisch sind (–40°C und –50°C)
- Mischungen von HNBR und EVM zeigten einen guten Kompromiss für öl- und schlammbeständige Eigenschaften sowie für Heißluftalterung-Eigenschaften, selbst bei nicht ausreichenden Niedrigtemperatur-Leistungseigenschaften (niedrige Bruchdehnung bei –40°C und –50°C und Kaltbiegung bei –50°C)
- Therban® LT 2007 bietet eine hervorragende Leistung in Bezug auf Messungen, die bei Niedrigtemperaturen durchgeführt wurden (unter –50°C), die in arktischen Regionen typisch sind. Ein hervorragendes Gleichgewicht von mechanischer Beständigkeit sowie Öl- und Schlammbeständigkeit und flammwidrige Eigenschaften wurde in Compounds beobachtet, die mit diesem Material vorbereitet wurden, allerdings mit einer ziemlich niedrigen Leistung was die Prüfung der Heißluftalterung betrifft
- Die Hochpolarität von HNBR-Materialien im Kombination mit EVM-Polymeren bietet Kabelcompoundlösungen für den Öl- und Gasmarkt mit ziemlich guten Kosten–Leistungsvorteilen
- Die Entwicklung von Hochleistung-Kabelcompounds fordert den Einsatz von Sonderadditiven, wie z. B. Alpha-Silanen und flammwidrige, fein-strukturierte Füllstoffe
- Eine Kombination von Weichmacher mit unterschiedlichen Eigenschaften und hohem spezifischem Oberflächen-Füllstoff sichert die Erfüllung der Anforderungen für Niedrigtemperatur-Flexibilität und Kaltbiegung bei –40°C und –50°C ■

## 5 Literatur


[1] http://www.gazprom.com/eng/Arcticles/Arcticle21712.shtml
[2] http://www.upstreamonline.com/incoming/Arcticle132282.ece
[3] A D McCracken, T P Poulton, E Macey, J M Monro Gray and G S Nowlan, "Arctic oil and gas" Popular Geoscience http://www.gac.ca, 2007
[4] http://www.nek606.net/
[5] E Rohde "Ethylene vinyl acetate elastomers: applications and opportunities for industrial rubber goods" 141st Meeting of the Rubber Division American Chemical Society, Proceedings (1992)
[6] D Achten "Next generation HNBR grades: new materials for oilfield applications" Oilfield Engineering and Polymers (2006)
[7] H Magg "The structure of Therban® (HNBR) and the impact of the low temperature characteristics of elastomeric materials" 3° Werkstoffkongress, Loeben Graz (2005)
[8] C Fischer, C Wrana, J Ismeier, F Taschner, "Crosslink architecture of EVM based vulcanisates and its influence on technologically relevant properties" German Rubber Conference Proceedings, July 3–6, Nuremberg, 2006
[9] World Oil Fluids 2007 "Drilling completion and workover fluids" Gulf Publishing Co, PO Box 2608, Houston, TX 77252 USA (2007)
[10] M La Rosa, C Wrana, D Achten "Electron beam curing of EVM and HNBR for cable compounds" 55th IWCS Conference (2006)
[11] http://www.eastman.com/NR/rdonlyres/17704C03–05BD–448F–8221–2F39C01E7191/0/L167.pdf
[12] H Meisenheimer, "Low smoke, non–corrosive fire retardant cable jacket based on HNBR and EVM" Jicable'91 June 24–28, Versailles, 1991



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# Производитель шинного корда сделал свой выбор

Компания «Рэдайн индактотерм хитинг эндуэлдингтекнолоджис» (RadyneIHWT) успешно завершила работы по поставке, монтажу и пуску в эксплуатацию оборудования индукционного нагрева для шести линий обработки шинного корда методом диффузии (TCD) на предприятии в Китае. Каждая линия может с высокой скоростью обрабатывать 24 проволочных нити диаметром от 1,1 до 2,2 мм.

▼ *Линия диффузионной обработки шинного корда TCD производства компании «Рэдайн»*

Каждая из этих шести линий, поставленных ведущему китайскому производителю, укомплектована камерами предварительного и окончательного нагрева, обеспеченными отдельными источниками питания на основе биполярных транзисторов с изолированным затвором (IGBT), а также двумя камерами с постоянной температурой в подмуфельном пространстве. Процесс диффузионной обработки шинного корда предназначен для предотвращения коррозии внутри самой шины и для создания смазочной среды для дальнейшего обжима проволоки по диаметру при последующем волочении.

Существует целый ряд преимуществ и выгод, связанных с установками TCD компании «Рэдайн», таких как высокий электрический коэффициент полезного действия и бесконтактная термическая обработка, при которой нет необходимости нагревать рабочую среду, например, песок. Установки удобны в управлении и включают в себя систему управления с устройством интерфейса оператора производства компании «Сименс» (Siemens), которое интегрировано в пульт управления оператора и подключается к программируемому контроллеру серии «Симатик» компании «Сименс» с использованием протокола ДПУ «Профибус» (Profibus DP). Благодаря этому оператор имеет доступ ко всем параметрам и устройствам управления установки, а также получает данные ее диагностики.

Более того, установка TCD компании «Рэдайн» обеспечивает соответствие структуры материала изделия условиям идеальной диффузии как меди, так и цинка. Предусмотрена возможность скоростной многониточной термической обработки, при этом переход с одного диаметра проволоки на другой не представляет сложности.

**Radyne IHWT – Великобритания**
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www.inductotherm-hwt.co.uk

## Рабочая группа для китайского рынка

Компания «Фуши копперуэлд, инк» (Fushi Copperweld, Inc) объявила о том, что Национальное управление стандартизации Китая (National Standardization Administration of China) поручило ее дочернему предприятию «Фуши интернэшнл (Далянь) байметэллик кейбл ко лтд» (Fushi International (Dalian) Bimetallic Cable Co Ltd) сформировать первую в Китае рабочую группу по композиционным проводниковым материалам. Национальное управление стандартизации (SAC), созданное в апреле 2001 года, наделено Государственным советом Китайской Народной Республики полномочиями по разработке, подготовке и реализации законодательных и нормативных актов в области стандартизации продукции.

Созданная таким образом рабочая группа станет первой на территории Китая организацией, занимающейся стандартизацией композиционных проводниковых материалов. Рабочая группа, в которую войдут известные в отрасли эксперты, ведущие специалисты и предприятия, будет иметь своей задачей разработку общегосударственных стандартов на кабельно-проводниковые изделия из композиционных материалов для телекоммуникационной, электротехнической, автомобильной, железнодорожной отраслей, промышленного производства, коммунального хозяйства, а также других сфер применения, связанных с передачей высокочастотных сигналов и электроэнергии.

В 2007 году компания, совместно с китайским Научно-исследовательским институтом №23 Китайского комитета по электронным средствам и технологиям (China Electronics and Technology Group) и другими отраслевыми специалистами, разработала национальный стандарт на проволоку из плакированного медью алюминия (CCA). Предложенный национальный стандарт официально утвержден Национальным комитетом по стандартизации и теперь ожидает внедрения в промышленном масштабе.

**Fushi Copperweld Inc – Китай**
**Web-страница**: www.fushicopperweld.com

## Новый сайт компании

Группа компаний «ОМ лесмо груп» (OM Lesmo Group) открыла новый, более удобный Web-сайт для ознакомления заказчиков с новыми разработками, технической информацией и для облегчения их связи с филиалами, представляющими европейских производителей различного оборудования и товаров для международного рынка проволочно-кабельной продукции.

Пока Web-сайт находится в процессе разработки, однако, разместив его, «ОМ лесмо груп» приглашает пользователей к участию в его дальнейшем усовершенствовании. Новый Web-сайт будет существовать в своем текущем пробном формате, по меньшей мере, весь первый квартал 2010 года, в течение которого будет проведена его оптимизация с учетом поступивших предложений и рекомендаций.

**OM Lesmo Group – Италия**
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info@omlesmo.com
**Web-страница**: www.omlesmo.com

# «Мадем» в Румынии

▲ *Церемония торжественного открытия предприятия «Мадем Румыния»*

Новое производственное предприятие группы компаний «Мадем груп» (Madem Group) – «Мадем Румыния» (Madem Romania), официально начало работу в уезде Бистрица-Нэсэуд (Румыния). На церемонии открытия присутствовали ряд официальных лиц, заказчики, поставщики и партнеры.

Среди присутствующих были президент «Мадем груп» г-н Джино Мацоккато (Gino Mazzoccato), административный директор г-н Рафаэль Романья (Rafael Romagna) в сопровождении префекта Бистрицы-Нэсэуд г-на Овидиу Крету (Ovidiu Cretu), а также посол Бразилии в Румынии г-н Витор Гоббато (Vitor Gobbato).

«Мадем Румыния» занимается поставками для местных заказчиков и в течение 2010 года планирует расширить сферу своей деятельности, перенеся ее в другие страны Восточной Европы.

«Со стратегической точки зрения, предприятие «Мадем Румыния» расположено в одном из наиболее перспективных регионов, который обладает возобновляемыми запасами лесных ресурсов и большим контингентом заказчиков, в числе которых мелкие и средние производители и поставщики кабельной продукции и с которыми у «Мадем Румыния» сформировались взаимовыгодные партнерские отношения».

«Сегодня мы вместе с нашими партнерами испытываем чувство гордости за то, что являемся участниками Восточно-европейского рынка, предоставляя услуги нашим заказчикам и в то же время постоянно стремясь повысить качество используемых нами технологий», – говорит Кристиан Утейрал (Cristian Outeiral), генеральный директор «Мадем Румыния».

**Madem Reels – Бразилия**
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**Web-страница**: www.mademreels.com

# Контракт на поставку отжигательной колпаковой печи

В августе 2009 года фирма «Эбнер» (Ebner) получила от компании «Юнайтед уайр фэкториз ко.» (United Wire Factories Co.) из г. Эр-Рияда (Саудовская Аравия) заказ на поставку отжигательной колпаковой печи Hicon®N2.

В объем поставки входят два стенда отжига Hicon N2, два нагревательных колпака, два охлаждающих колпака, пост управления и вспомогательное оборудование.

Установка будет использоваться для рекристаллизационного отжига вязальной проволоки в защитной атмосфере азота.

При эффективном диаметре подмуфельного пространства 3450 мм и высоте загрузочной камеры 4400 мм общий вес загружаемой садки на каждом стенде может составлять до 48 т.

Пуск установки в эксплуатацию запланирован на первый квартал 2011 года.

**Ebner Industrieofenbau GesmbH – Австрия**
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# Контракт «Нептун-2»

▲ *Приемное устройство производства компании «СКЕТ», эксплуатируемое на предприятии «Брайдон интернэшнл»*

Компания «СКЕТ» (SKET) получила подряд на поставку оборудования для проекта «Нептун-2» фирмы «Кисуайр» (Kiswire). Поставка клетьевой планетарной крутильной машины и скруточной машины сигарного типа, которые считаются самыми большими в мире, намечена на четвертый квартал 2010 года. Машины будут использоваться в производстве канатов для глубоководных морских работ, а также другой продукции.

Клетьевая планетарная крутильная машина модели MKVS 1+8 x 2700 пригодна для производства канатов диаметром 160 мм. Машина будет поставлена в комплекте с отдающим и приемным устройствами, которые могут размещать барабаны максимальной канатоемкостью до 600 тонн. Диаметр фланца как отдающего, так и приемного барабана составляет 5600 мм, а ширина перемещения траверсы – 10000 мм.

Самое мощное приемное устройство из ранее выпущенных компанией «СКЕТ» может наматывать канаты весом до 400 тонн и эксплуатируется на предприятии «Брайдон интернэшнл» (Bridon International).

Высокоскоростная скруточная машина сигарного типа SRW 1+48x800 (32") будет использоваться для производства канатных стренгов диаметром до 55 мм при максимальной производительности линии, составляющей 100 м/мин. Кроме того, на линии можно будет изготавливать уплотненные стренги.

Выпущенная ранее компанией «СКЕТ» самая большая и высокопроизводительная скруточная машина сигарного типа SRW 1+48x630 уже более десяти лет успешно эксплуатируется на предприятии «Нептун-1» фирмы «Кисуайр» в Малайзии.

Строительство завода «Нептун-2» стоимостью 80 млн. долларов, расположенного на участке в 20 акров по соседству с предприятием «Нептун-1» в султанате Джохор, будет завершено в 2011 году.

**SKET Verseilmaschinenbau GmbH – Германия**
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# Успех конференции по технологиям FTTH

Как сообщается, в Аммане с 10 по 11 ноября 2009 года с большим успехом прошла учредительная Конференция стран Ближнего Востока по вопросам развития технологий «волокно до дома» (FTTH).

Двухдневная конференция проходила под патронажем министра информационных и коммуникационных технологий Иордании, доктора технических наук, почетного профессора Басема Аль-Русана (Basem Al Rousan), который выступил на ее открытии с приветственной речью, принял участие в пресс-конференции и осмотрел выставочный зал.

Д-р Машур Абу-Дака (Mashour Abu Daka), министр связи и информационных технологий Палестины, выступил с основным докладом, в котором представил статистические данные, свидетельствующие о росте спроса на услуги высокоскоростного доступа в Интернет.

В рамках программы конференции прошел ряд презентаций для руководства, осветивших важнейшие аспекты организации сетей FTTH, включая технические семинары, на которых были представлены последние решения по развертыванию и эксплуатации сетей FTTH. Отчеты по изучению ситуации на Ближнем Востоке, в Европе и Азии дали представление о повседневной практике эксплуатации сетей FTTH, а специальный практический семинар был посвящен обсуждению экономической модели их организации.

Следующая Конференция стран Ближнего Востока по вопросам развития технологий «волокно до дома» состоится в 2010 году.

**FTTH Council Europe – Бельгия**
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**Web-страница**: www.ftthcouncil.eu

# Продажа «Уордуэлл»

«СКЕТ ферзайльмашиненбау Магдебург ГмбХ» (SKET Verseilmaschinenbau Magdeburg GmbH) приобрела активы компании «Уордуэлл» (Wardwell). Ранее «СКЕТ» уже приобрела активы европейского подразделения «Уордуэлл Юроп» и на состоявшемся 14 декабря 2009 года аукционе предложила самую высокую цену за активы этого производителя оплеточных станков.

Представитель немецкого производителя, входящего в состав «ВИЛМС группе» (WILMS Gruppe), подтвердил факт приобретения компании, а также планы по возобновлению деятельности на том же предприятии с 4 января 2010 года.

На начальном этапе штат сотрудников новой компании будет меньше. Компания будет носить новое название – «Штолбергер инкорпорейтед Ди-би-эй Уордуэлл брэйдинг ко» (Stolberger Incorporated DBA Wardwell Braiding Co).

**Stolberger Incorporated DBA Wardwell Braiding Co – США**
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# Использование высококачественных эластомеров в кабелях для морских платформ в Арктических регионах

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## Аннотация

Остров Сахалин и Штокмановское газовое месторождение в Баренцевом море относятся к числу регионов мира с наиболее сложными условиями эксплуатации. Морские платформы, предназначенные для работы в этих регионах, должны соответствовать самым жестким стандартам, в особенности в части требований, предъявляемых к кабелям для щитов управления и контрольно-измерительных приборов. Высокая степень гибкости при низких температурах (–50 °C), исключительные показатели маслостойкости, огнестойкости и устойчивости к воздействию коррозии – это лишь некоторые из таких требований.

Сополимер этилена и винилацетата (СЭВ) Levapren® и гидрированный бутадиен-нитрильный каучук (ГБНК) Therban® прекрасно подходят для того, чтобы решить эти задачи. Отсутствие в них галогенов, высокая маслостойкость, устойчивость к озоновому и ультрафиолетовому излучению в сочетании с хорошими физико-механическими и эксплуатационными свойствами в широком диапазоне температур (от –40 °C до 175 °C) делают эти материалы идеальным выбором при производстве кабелей, используемых на морских платформах в Арктических регионах.

В настоящей работе рассмотрено несколько компаундов на основе смесей из ГБНК и СЭВ, которые были испытаны в соответствии с международными стандартами, такими как ИИЭЭ 1580, НЭК 606 и БС 6883.

Проверены характеристики стойкости к воздействию агрессивных флюидов, например, буровых растворов на углеводородной и водяной основе. Стабильность механических свойств испытывалась при –50 °C.

## 1. Введение

### 1.1 Вызов Арктики

**Разведка и добыча нефти в Арктическом регионе**

Россия, Канада, Норвегия и США входят в число стран, которые ставят своей целью проведение разведки и разработки углеводородных ресурсов в Арктическом регионе. Согласно прогнозам, через пятьдесят лет шапка полярного льда растает, что сделает возможным осуществление навигации, а также разведки и добычи нефти в водах Арктики.

Планы эти сопряжены с многочисленными трудностями: это – и удаленность площадок морских работ, и суровые природные условия, и неустойчивость геополитической обстановки.

Штокмановское месторождение и месторождения в Баренцевом море являются типичными примерами суровых условий Арктики (см. рис. 1). В рамках данного проекта предполагается ежегодно добывать 70 млрд. куб. м природного газа и 0,6 млн. тонн газоконденсата, что сопоставимо с годовыми объемами добычи газа в Норвегии, которая является одним из крупнейших европейских поставщиков газа[1].

▼ **Рис. 1.** *Эксплуатация платформ в экстремальных условиях Арктики*

Попасть на вертолете на месторождение, которое расположено в 550 км от берега, с баз на материке нельзя.

Дополнительными факторами, осложняющими задачу разработки этого месторождения, являются леденящие ветры, крайне низкие температуры и шесть месяцев полярной ночи [2].

Для бурения на более глубоководных участках требовались плавучие буровые основания с ледовыми подкреплениями, включая суда принципиально новой конструкции, с корпусом восьмиугольной формы.

В числе других инноваций – взлетно-посадочные полосы из тяжелого льда, ледоколы новой конструкции, суда обеспечения ледокольного типа, а также плавучие сухие доки для технического обслуживания остальных судов на месте проведения работ. Без этих новых разработок разведка и добыча в Арктике были бы невозможны [3].

**Стандарты на кабели для нефтепромысловых платформ**

НЭК 606 является международным отраслевым стандартом, регламентирующим производство кабельной продукции для работ на морских нефтегазовых месторождениях, судостроения и судоходства.

Кабели для этих работ прошли сертификацию Норвежского классификационного общества Det Norske Veritas (DNV) на соответствие требованиям стандартов ИСО 9001 и ИСО 14001. Производство соответствующих стандарту НЭК 606 кабелей для морских платформ осуществляется аналогично другим стандартам, таким как БС 6883 и ИИЭЭ 1580 (тип Р). [4]

| Свойства | Ед. изм. | Требования |
|---|---|---|
| Прочность на растяжение | [MPa] | 11±2 |
| Относительное удлинение при разрыве | [%] | 200±15 |
| Твердость | Shore A | 75±5 |
| Прочность на раздирh | [N/mm] | 4-6 |
| Испытание на изгиб в холодном состоянии | [ºC] | @-40ºC Отсутствие трещин |
| Предельный кислородный индекс (ПКИ) | [%] | 32 |
| Старение в среде горячего воздуха | [%] | TS/EB ±30 |
| Погружение в | [MPa]/[%] | TS/EB ±40 V: 15 |
| Погружение в буровой раствор на углеводородной основе | [MPa]/[%] | TS/EB ±30 W/V: 30 |
| Погружение в буровой раствор на водяной основе | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Погружение в буровой раствор на основе сложного эфира | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Вязкость по Муни | ML | 40=60 |
| Испытание на распространение пламени в вертикальной плоскости | [cm] | 20cm |

▲ **Таблица 1**: *Основные характеристики, описанные в стандартах на компаунды для морских кабелей*

### 1.2 Высококачественные эластомеры для кабелей, эксплуатируемых в условиях холодного климата

#### 1.2.1 Сополимеры этилена и винилацетата (СЭВ) из серии каучука Levapren®

Сополимеры этилена и винилацетата с содержанием винилацетата (ВА) от 40 до 90 % относятся к каучукоподобным материалам. Насыщенная основная цепь полимера обеспечивает высокую устойчивость СЭВ к озоновым и атмосферным воздействиям.

Они также демонстрируют хорошую термостойкость в диапазоне температур до 175 °C, а увеличение содержания ВА с 40 % до 90 % обеспечивает существенное повышение и без того очень высокого уровня маслостойкости [5].

#### 1.2.2 Гидрированный бутадиен-нитрильный каучук (ГБНК) Therban®

ГБНК является почти идеальным полимером, обеспечивающим эксплуатационные показатели, которые требуются в условиях Арктики. Присущий ему превосходный набор свойств обусловлен наличием насыщенной основной цепи полимера в сочетании с высокополярной и инертной боковой группой акрилонитрильных звеньев. Благодаря этому обеспечиваются необходимые свойства, позволяющие выдерживать сильное озоновое и ультрафиолетовое излучение, сохранять эластичность при низких температурах, проявлять устойчивость к воздействию высокополярных жидкостей, масел и высоких температур (до 150 °C) и демонстрировать хорошие механические свойства [6]. Уровень морозоустойчивости и маслостойкости каучуков марки Therban® в значительной степени зависит от содержания акрилонитрила (АН), которое может примерно составлять от 20 % до 50 %.

В гомологическом ряду полимерных материалов на основе ГБНК не существует прямой линейной корреляции между температурой стеклования (Tg) и содержанием АН, что обусловлено, главным образом, тем, что на процесс стеклования также влияет степень кристалличности этиленовых последовательностей более чем 8-12 $CH_2$-групп. Сополимеры с содержанием акрилонитрила менее 37 % при низких температурах имеют частично кристаллическую структуру [7].

## 2. Экспериментальные исследования

### 2.1 Кабельные компаунды, предназначенные для морских платформ в Арктических регионах

В таблице 2 представлен состав компаундов, приготовленных на основе марки ГБНК (АН = 21 %, ОДС = 0,9 %; вязкость по Муни МБ (1+4) при 100 °C = 72±4 усл. ед.); марок СЭВ (содержание ВА = 50±5 % и 70±5 %; вязкость по Муни МБ (1+4) при 100 °C = 27±4 и 27±4 усл. ед.).

▼ **Таблица 2**: *Композиции на основе специальных эластомеров СЭВ и ГБНК*

| Состав | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| THERBAN® LT 2007 (HNBR (ACN= 21%) | 100 | 50 | 50 | | |
| LEVAPREN® 500 HV (EVM (VA=50%) | | 50 | 50 | 100 | |
| LEVAPREN® 700 HV (EVM (VA=70%) | | | | | |
| APYRAL® 120 E (ATH BET= 12 $m^2/g$) | 80 | 80 | 80 | 80 | 100 |
| APYRAL® SM 200 (ATH BET= 22 $m^2/g$) | 60 | 60 | 60 | 60 | 70 |
| Борат цинка | 10 | 10 | 10 | 10 | 10 |
| SILQUEST® RC-1 Силан | | | 2 | | |
| GENIOSIL® XL 33 | 2 | 2 | | 2 | 2 |
| EDENOL® 888 (DOS) | 10 | 10 | 10 | 10 | 10 |
| DIPLAST® TM 8-10/ST (TOTM) | 10 | 10 | 10 | 10 | 5 |
| RHENOFIT DDA-70 | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 |
| STABAXOL® P, порошкообразный (PCD) | 1 | 1 | 1 | 1 | 1 |
| MAGLITE® DE (MgO) | 3 | 3 | 3 | 3 | 3 |
| Стеарат цинка | 1 | 1 | 1 | 1 | 1 |
| Стеарат кальция | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| EDENOR® C 18 98-100 | 1 | 1 | 1 | 1 | 1 |
| CORAX® N 550/30 (Технический углерод) | 5 | 5 | 5 | 5 | 5 |
| RHENOFIT® TRIM/S | 2 | 2 | 2 | 2 | 2 |
| PERKADOX® 14-40 B-PD | 6,5 | 6,5 | 6,5 | 6,5 | 6,5 |
| Итого | 294,4 | 294,4 | 294,40 | 294,40 | 319,40 |
| Плотность | 1,453 | 1,468 | 1,560 | 1,484 | 1,609 |

## 3. Результаты и их обсуждение

### 3.1 Физико-механические свойства

Основные свойства определялись в соответствии с требованиями, описанными в спецификации стандарта НЭК 606. Компаунд №5, приготовленный на основе СЭВ с 70-процентным содержанием ВА, демонстрирует самую низкую из всех компаундов величину прочности при растяжении. Это – предельное значение, которое нежелательно, поскольку для учета изменения свойств после испытаний старением и погружением в масло требуется некоторый запас по значениям. Значения прочности на растяжение для остальных четырех компаундов соизмеримы друг с другом и находятся в одном диапазоне (11 МПа). Компаунд №1 демонстрирует устойчивые деформационно-прочностные свойства с высоким относительным удлинением при разрыве и самой низкой твердостью по Шору «А» из всех объектов исследования (см. таблицу 3).

Компаунды №2 и №3, изготовленные на основе полимерных смесей, демонстрируют аналогичные значения прочности на растяжение, но более низкие (до 100 %), чем у компаундов на основе ГБНК, значения относительного удлинения при разрыве. По сравнению с компаундом №1 значения твердости и модулей упругости выше. Если проводить сравнение между компаундами №2 и №3, то в компаунде №3, который был изготовлен на основе Silquest RC-1, отмечается увеличение плотности поперечных связей (более высокая твердость) и модулей упругости (M50 и M100).

Компаунды №4 и №5 трудно сравнивать, так как содержание наполнителей и пластификаторов в них отличается. Изначально компаунд с тем же содержанием наполнителей и пластификаторов, что и в других составах, демонстрировал очень низкие деформационно-прочностные свойства (6,4 МПа, относительное удлинение при разрыве – 290 %), а также малую твердость и прочность на раздир. По этой причине была проведена оптимизация состава за счет увеличения количества наполнителя и уменьшения количества пластификатора (на 30 весовых частей на сто частей компаунда (вес. ч.) больше ГОА (гидроокиси алюминия) и на 5 весовых частей меньше ДОС (диоктилсебацината)). Фишер с соавторами [8] выявили корреляцию между содержанием ВА и плотностью поперечных связей для компаундов на основе Levapren®, приготовленных в тех же условиях

| Физико-механические свойства | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Прочность на растяжение (MPa) | 11,1 | 11,0 | 11,7 | 11,5 | 8,5 |
| Относительное удлинение при разрыве (%) | 384 | 270 | 236 | 251 | 265 |
| M 50 (MPa) | 1,8 | 2,5 | 3,1 | 2,8 | 3,0 |
| M 100 (MPa) | 4,0 | 5,9 | 7,3 | 6,4 | 6,2 |
| Твердость по Шору «А» при 23° | 65 | 69 | 76 | 73 | 76 |
| Прочность на раздиph ASTM D-470 | 6,4 | 3,2 | 3,2 | 4,1 | 3,9 |

▲ **Таблица 3**: *Физико-механические свойства разработанных компаундов*

(при постоянном уровне содержания пероксидов и других добавок). Это могло бы объяснить низкие деформационно-прочностные свойства, обнаруженные в первоначальном компаунде №5.

### 3.2 Стойкость к воздействию рабочей среды

#### 3.2.1 Масло IRM 902 и 903

Маслостойкость тесно связана с полярностью эластомера. Полярность эластомеров на основе СЭВ определяется содержанием винилацетата, а полярность эластомеров на основе ГБНК – содержанием акрилонитрила [5]. Количественное определение изменения свойств и объема после погружения в масло подтверждает данный эффект (см. рис. 2 и 3). Компаунды на основе СЭВ с 70-процентным содержанием ВА и ГБНК серии LT продемонстрировали самые низкие значения набухания и изменения прочности при растяжении. Это можно было бы приписать высокой полярности, обусловленной большим содержанием ВА в полимерном материале на основе СЭВ (70 %), тогда как в случае с материалом на основе ГБНК полярность присуща диполь-дипольному взаимодействию АН группы, которая, несмотря на низкое содержание в Therban LT 2007, имеет достаточную концентрацию для обеспечения уровня маслостойкости, требуемого для этих компаундов.

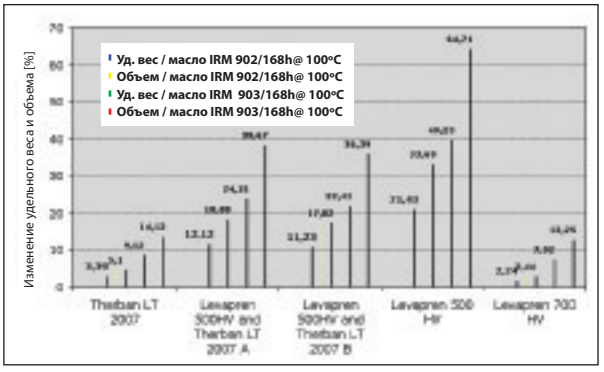
Самое большое изменение механических свойств при растяжении может наблюдаться в компаундах на основе СЭВ с 50-процентным содержанием ВА. Степень поляризации данного компаунда достаточна только для того, чтобы обеспечить стойкость при погружении в масло IRM 902, но не в масло IRM 903, которое обладает большей коррозионной агрессивностью и полярностью, чем IRM 902. Компаунды на основе СЭВ с 70-процентным содержанием ВА продемонстрировали маслостойкость на уровне, сопоставимом с маслостойкостью компаунда на основе ГБНК (см. рис. 2 и 3).

#### 3.2.2 Буровые растворы на водяной и углеводородной основе

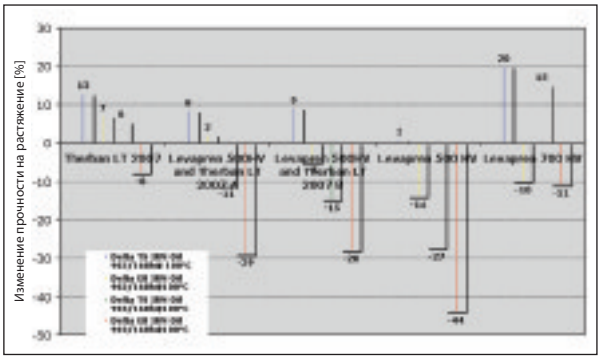
**Композиции на водяной основе**

Двухвалентные катионы, такие как катионы кальция и магния, добавленные в буровой раствор на основе пресной

▼ **Рис. 2.** *Изменение объема и удельного веса после погружения в масло IRM 902 и 903 на 168 часов при 100 °C*




▼ **Рис. 3.** *Изменение прочностных свойств при растяжении после погружения в масло IRM 902 и 903 на 168 часов при 100 °C*

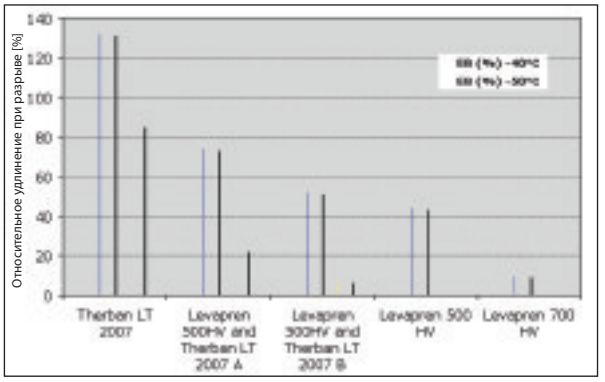


воды, ингибируют процессы образования глинных минералов и набухания сланцев. Растворы с высоким содержанием растворимого кальция используются для стабилизации осыпания сланцев и кавернообразования в стволе скважины и для предупреждения повреждения оборудования. Обработанные кальцием буровые растворы обладают стойкостью к минерализации и ангидритизации, однако подвержены гелеобразованию и отверждению при высоких температурах [9].

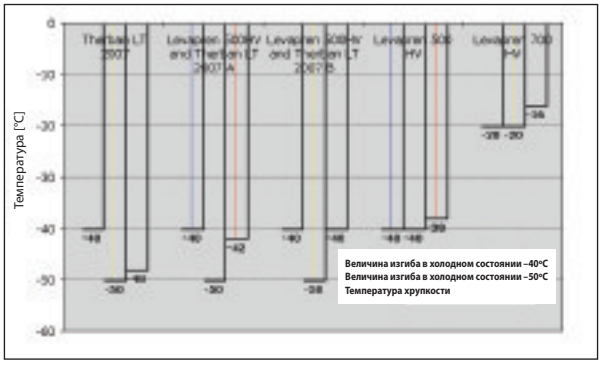
### Композиции на углеводородной основе

Эти композиции приготовлены на основе водонефтяных эмульсий, в которых рассол хлористого кальция обычно является эмульгированной средой, а нефть – дисперсионной средой. Они могут содержать до 50 % рассола в жидкой фазе. Инвертно-эмульсионные буровые растворы представляют собой «свободные» эмульсионные системы, характеризующиеся пониженной электрической стабильностью и более высокими показателями водоотдачи [9]. Влияние на удельный вес, объем и изменение механических свойств при растяжении можно увидеть на рис. 4 и 5. Компаунды на основе Therban LT 2007 и Levapren 700 HV продемонстрировали наилучшие эксплуатационные качества и устойчивость свойств. Необходимо выбирать материалы с высокой степенью полярности, поскольку полярность компаундов играет важную роль в обеспечении показателей маслостойкости.

В случае компаундов, изготовленных на основе полимерных смесей, между полимерными материалами на основе ГБНК и СЭВ, судя по всему, существует некоторая степень взаимного усиления: при необходимости получения предельных физических и эксплуатационных параметров СЭВ можно смешать с ГБНК. Это способствует снижению общей стоимости изготовления компаунда и позволяет улучшить технологические параметры, одновременно сохраняя показатели тепло- и маслостойкости. Ранее смеси из ГБНК и СЭВ разрабатывались при необходимости выполнения очень жестких технических условий и, в частности, спецификаций для военно-морских технологий NES 518 (Def-Stand 61-31, часть 12) и VG 95218 [10].




▲ **Рис. 6.** *Относительное удлинение кабельных компаундов при разрыве, измеренное при –40 °C и –50 °C*




▲ **Рис. 7.** *Величина изгиба в холодном состоянии, измеренная при –40 °C и –50 °C, и температура хрупкости*

### 3.3 Свойства при низких температурах

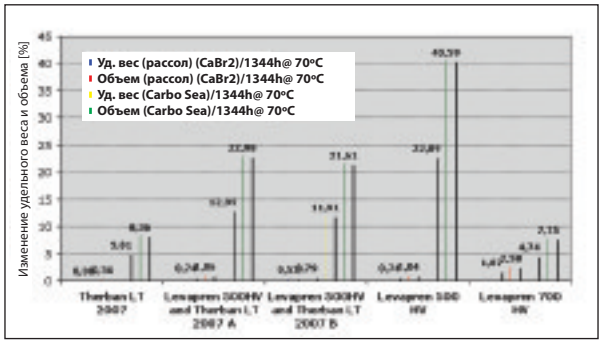
Гибкость кабелей для морских платформ в Арктических регионах является непременным условием для обеспечения максимальной производительности (при минимальном времени вынужденного простоя и технического обслуживания) добычи и переработки нефти и газа на этих объектах. Экстремально низкие температуры (–40 °C и –50 °C) – обычное явление для данного типа климата, и поэтому необходимо использовать материалы с низкой температурой стеклования, обеспечивающей подвижность полимерных цепей на более низких энергетических уровнях. Подвижность сегментов полимерной цепи в широком диапазоне рабочих температур снижает риск кристаллизации и эффект отверждения полимера, возникновения которых можно ожидать в кабелях фиксированной проводки на платформах, расположенных в регионах с суровыми климатическими условиями.

Измерение прочности при растяжении (относительного удлинения при разрыве) этих компаундов проводилось при температурах –40 °C и –50 °C (см. результаты измерений на рис. 6). Компаунд на основе Therban® LT 2007 демонстрирует, несомненно, самые высокие эксплуатационные показатели при –40 °C и –50 °C (лучшее значение относительного удлинения при разрыве), за ним следуют компаунд на основе Therban® LT 2007 и Levapren® 500 HV (приготовленный с добавлением Geniosil® XL 33), смесь пластификаторов (ТОТМ и ДОС) и смесь тригидрооксидов алюминия (марок Apyral® 120E и SM 200) с различной удельной поверхностью (измеренной методом БЭТ).

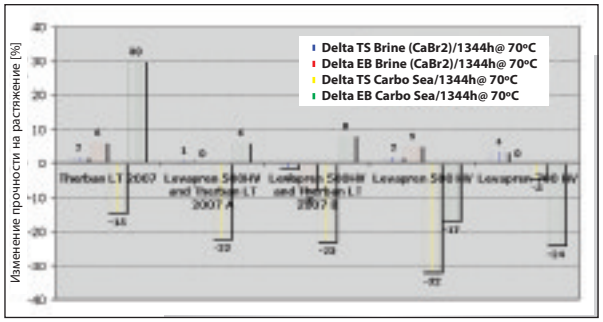
### Влияние сшивающих агентов

Высокая химическая активность такого альфа-силана, как Geniosil® XL 33, могла способствовать повышению уровня взаимодействия полимера и наполнителя и таким образом обеспечить разумный баланс физико-механических свойств и более низкой плотности поперечных связей. По своей сути альфа-силаны обладают большей химической активностью, чем стандартные типы силанов, а это значит, что повышение степени гидрофобности ГОА могло произойти даже в том случае, когда удельная поверхность используемого наполнителя недостаточно развита, чтобы обеспечить гидрофобные свойства.

▼ **Рис. 4.** *Изменение удельного веса и объема после погружения в рассол и буровой раствор Carbo Sea на 1344 часа при 70 °C*




▼ **Рис. 5.** *Изменение прочности при растяжении после погружения в рассол и буровой раствор Carbo Sea на 1344 часа при 70 °C*



**Влияние пластификатора**

Комбинация из 10 весовых частей пластификаторов ДОС (ди-n-октилсебацината) и ТОТМ (трис- (2-этилгексил) тримеллитата) на сто частей компаунда обеспечила необходимую гибкость при низких температурах. Пластификаторы ТОТМ обычно используются в тех случаях, когда особую важность имеет низкий показатель летучести, в том числе при производстве изоляции для кабельно-проводниковой продукции и материалов для отделки салонов автомобилей. ТОТМ отличается исключительно низким процентом миграции и стойкостью к экстрагированию [11]. ДОС представляет собой пластификатор с отличными показателями морозоустойчивости, в большой степени влияющий на температуру стеклования, но отличающийся более высокой летучестью по сравнению с ТОТМ. Оба пластификатора пригодны для применения в сополимерах этилена и винилацетата, этилцеллюлозе, синтетическом каучуке и особенно для производства морозоустойчивой кабельно-проводниковой продукции и искусственной кожи. Уровень морозоустойчивости определяется молекулярной структурой.

Параметры изгиба в холодном состоянии при –40 °C и –50 °C и температура хрупкости измерялись для всех разработанных компаундов. Только компаунд, приготовленный с использованием Levapren® 700HV, не прошел испытания на изгиб в холодном состоянии при температуре –40 °C. При этом только компаунды на основе Therban® LT 2007 и на смесях этого полимера с Levapren® 500HV прошли испытания на изгиб при –40 °C и –50 °C, благодаря чему они пригодны для применения на объектах, эксплуатируемых при таких низких температурах (см. рис. 7).

Низкая температура стеклования Tg марки ГБНК и пластифицирующее действие ДОС и ТОТМ обеспечивают производство компаундов с такой степенью гибкости. Компаунды, приготовленные с использованием Levapren® 700HV, не проявили таких же хороших эксплуатационных свойств при низких температурах, как компаунды, приготовленные на основе Levapren® 500HV. Это обусловлено более высокой температурой стеклования Tg у материала на основе СЭВ с 70-процентным содержанием ВА по сравнению с материалом на основе СЭВ с 50-процентным содержанием ВА (–17 °C и –28 °C соответственно), а также тем, что при приготовлении композиции на основе Levapren® 700HV пластификатор использовался в количестве всего 15 весовых частей вместо 20 весовых частей, использовавшихся в других компаундах. Измерения при низких температурах для компаунда, приготовленного с добавлением 20 весовых частей пластификатора, проводились в предыдущих исследованиях, когда физико-механические свойства, такие как прочность при растяжении, были достаточно низкими. Высокое содержание пластификаторов в компаундах для подошв на основе СЭВ с 70-процентным содержанием ВА отрицательно сказывается на общем наборе физико-механических свойств.

### 3.4 Огнеупорные свойства

Во всех компаундах использовалось сочетание наполнителей на основе ГОА (Apyral® с удельной поверхностью (измеренной методом БЭТ) 12 и 20 м²/г), которое могло обусловить хорошие физико-механические свойства, а также высокие значения предельного кислородного индекса (ПКИ). Предельный кислородный индекс компаундов определялся в соответствии со стандартом ASTM D 2863; при этом все компаунды продемонстрировали значения ПКИ, превышающие 34 % (см. рис. 12). Компаунд на основе Levapren 700 HV продемонстрировал исключительно высокий ПКИ, составивший 46 %, что можно объяснить следующим:

1. наличием полимерных материалов на основе СЭВ с высоким содержанием ВА (70 %) и их взаимодействием с наполнителями на основе ГОА;
2. пониженным содержанием пластификатора и повышенным содержанием ГОА.

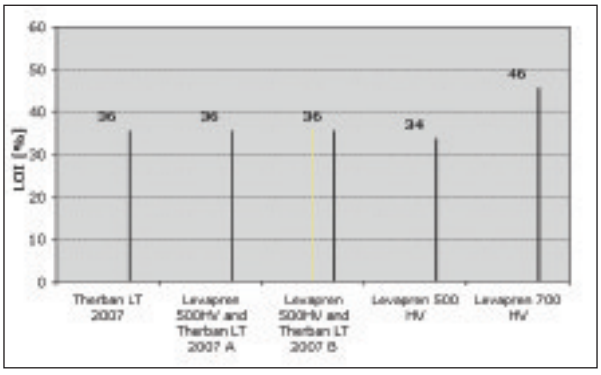
Наполнители на основе ГОА с различной степенью дисперсности в сочетании с боратом цинка обеспечивают в случае пожара образование кокса с весьма компактной и стабильной структурой.

Майзенхаймер [12] описал синергетическое действие полимерных материалов на основе СЭВ и наполнителей на основе ГОА в 1991 г., объяснив, что ПКИ не поддерживающих горения, коррозионно-стойких кабельных компаундов на основе Levapren увеличивается при постоянной концентрации на уровне от 190 весовых частей на сто частей полимера для марок с содержанием ВА, превышающем 65 % (вес.). Кроме того, изучение внутренней структуры материала с Geniosil® XL 33 выявило интересный эффект, оказываемый на ПКИ компаундов, приготовленных с использованием Levapren® 700 HV и 190 весовых частей ГОА (с измеренной методом БЭТ удельной поверхностью, составившей 12 м²/г). Увеличение содержания силана до 3 весовых частей на сто частей компаунда коррелировало с ростом ПКИ.

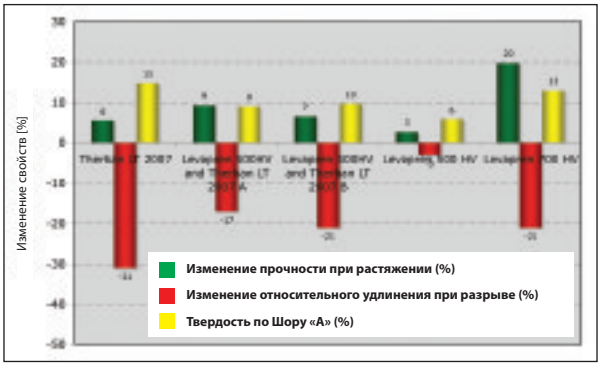
### 3.5 Сопротивление старению в среде горячего воздуха

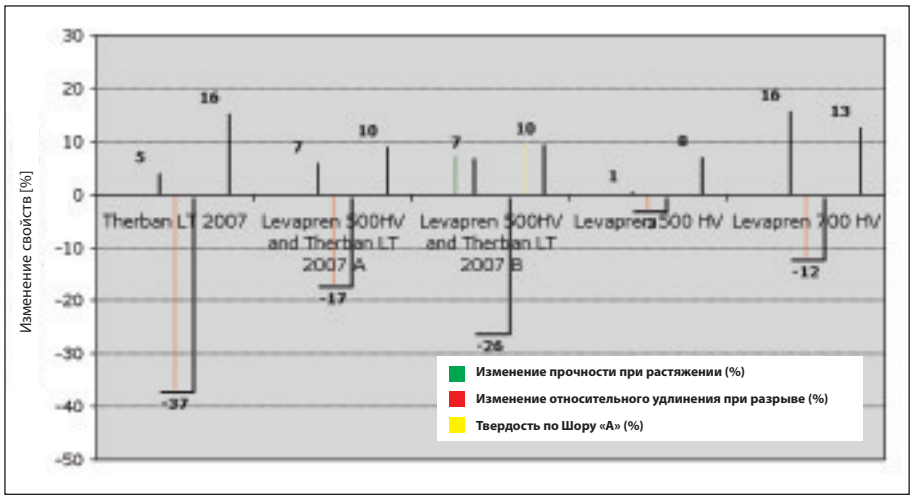
Согласно спецификации стандарта НЭК 606 испытание на старение в среде горячего воздуха для компаундов, предназначенных для кабельных оболочек, должно проводиться в течение 168 часов при 120 °C. С целью расширения диапазона предельных значений для разработанных компаундов были проведены более жесткие испытания продолжительностью в 168, 336 и 672 часа при температуре 135 °C. Значения изменений свойств после старения приведены на рис. 9 и 10. По истечении 336 часов в разработанных компаундах наблюдаются первые эффекты старения, в особенности сказывающиеся на величине относительного удлинения при разрыве у компаундов на основе Therban® LT 2007, Therban® LT 2007 и Levapren® 500 HV B (см. рис. 9).

▼ **Рис. 8.** *Значения предельного кислородного индекса для разработанных компаундов, измеренные согласно ASTM D 2863*




▼ **Рис. 9.** *Испытание на старение в среде горячего воздуха в течение 336 часов при 135 °C*






▲ **Рис. 10.** *Испытание на старение в среде горячего воздуха в течение 672 часов при 135 °C*

По сравнению с результатами старения по истечении 336 часов свойства разработанных компаундов спустя 672 часа в достаточной мере сохраняются; при этом можно отметить лишь незначительные отличия в уровне изменения свойств, в особенности у компаундов на основе Levapren® 500HV (см. рис. 10).

Это можно было бы скорректировать путем оптимизации характеристик термостабилизирующих присадок на основе Stabaxol® P и Rhenofit® DDA-70. Для целей настоящего исследования устанавливается, что характеристики сопротивления старению в среде горячего воздуха соответствуют требованиям стандартов на кабельные изделия. Увеличение диапазона рабочих температур для кабелей на морских платформах могло бы подразумевать усовершенствование общей конструкции кабелей для щитов управления и контрольно-измерительных приборов с использованием меньшего количества медных проводников, за счет чего были бы снижены общие затраты на производство кабельных изделий.

## 4 Выводы

- Levapren 700 HV представляет собой полимерный компаунд, пригодный для использования при производстве стойких к воздействию масел и буровых растворов, не содержащих галогенов и не поддерживающих горения кабельных изделий, но не вполне пригодный для кабелей, которые должны обладать устойчивостью к воздействию низких температур, типичных для условий Арктики (–40 °C и –50 °C).
- Подтверждено, что смеси на основе ГБНК и СЭВ предлагают хорошее компромиссное решение между стойкостью к воздействию масел и буровых растворов и сопротивлением старению в среде горячего воздуха, хотя и не отличаются достаточно высокими эксплуатационными характеристиками при воздействии низких температур (низкие значения относительного удлинения при разрыве при температурах –40 °C и –50 °C и изгиба в холодном состоянии при –50 °C).
- Therban® LT 2007 продемонстрировал исключительные эксплуатационные характеристики в ходе замеров, проводившихся при низких температурах (до –50 °C), типичных для Арктических регионов. В компаундах, приготовленных с использованием этого материала, наблюдался прекрасный баланс физико-механических свойств, устойчивости к воздействию масел и буровых растворов, а также огнестойкости, однако показатели при испытаниях на старение в среде горячего воздуха оказались довольно низкими.
- Высокая полярность материалов на основе ГБНК в сочетании с полимерными материалами на основе СЭВ дает возможность предложить нефтегазовому рынку кабельные компаунды, выгодно отличающиеся относительно высокой экономической эффективностью.
- Для разработки кабельных компаундов с высокими эксплуатационными характеристиками потребовалось использование специальных добавок, таких как альфа-силаны и тонкодисперсные, не поддерживающие горения наполнители.
- Сочетание пластификаторов с различными характеристиками и наполнителя с высокой удельной поверхностью обеспечило соблюдение требований к гибкости при низких температурах и изгибу в холодном состоянии при –40 °C и –50 °C. ■

## 5 Справочная литература


[1] http://www.gazprom.com/eng/Arcticles/Arcticle21712.shtml

[2] http://www.upstreamonline.com/incoming/Arcticle132282.ece

[3] A.D. McCracken, T.P. Poulton, E. Macey, J.M. Monro Gray and G.S. Nowlan, *"Arctic oil and gas"* Popular Geoscience http://www.gac.ca, 2007.

[4] http://www.nek606.net/

[5] E Rohde *"Ethylene vinyl acetate elastomers: applications and opportunities for industrial rubber goods"* 141st Meeting of the Rubber Division American Chemical Society, Proceedings (1992).

[6] D Achten *"Next generation HNBR grades: new materials for oilfield applications"* Oilfield Engineering and Polymers (2006).

[7] H Magg *"The structure of Therban (HNBR) and the impact of the low temperature characteristics of elastomeric materials"* 3° Werkstoffkongress, Loeben Graz (2005).

[8] C Fischer, C Wrana, J Ismeier, F Taschner, *"Crosslink architecture of EVM based vulcanisates and its influence on technologically relevant properties"* German Rubber Conference Proceedings, July 3–6, Nuremberg, 2006.

[9] World Oil Fluids 2007 "Drilling completion and workover fluids" Gulf Publishing Co, PO Box 2608, Houston, TX 77252 USA (2007).

[10] M La Rosa, C Wrana, D Achten "Electron beam curing of EVM and HNBR for cable compounds" 55th IWCS Conference (2006).

[11] http://www.eastman.com/NR/rdonlyres/17704C03-05BD-448F-8221-2F39C01E7191/0/L167.pdf

[12] H. Meisenheimer, *"Low smoke, non–corrosive fire retardant cable jacket based on HNBR and EVM"* Jicable'91 June 24–28, Versailles, 1991.



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## Choix d'un fabricant de câbles pour pneus

▲ *Ligne de diffusion Tyre Cord (TDC) de Radyne*

La société Radyne IHWT a complété avec succès la fourniture, l'installation et la mise en marche des équipements de chauffage par induction pour six nouvelles lignes de diffusion de câbles pour pneumatique (TCD ou Tyre Cord Diffusion) en Chine, chacune avec une capacité de 24 fils à 80DV et avec des diamètres de 1,1mm à 2,2mm.

Chacune des six lignes, fournies à un producteur chinois principal, comprend une zone de préchauffage et une zone de chauffage finale, équipées avec une source d'énergie IGBT, et suivies de deux zones de maintien de la température au moyen d'un four à moufle.

Le processus de diffusion tyre cord évite la corrosion du fil à l'intérieur du pneu et fait fonction de lubrifiant en facilitant la réduction du diamètre du fil dans les opérations de tréfilage successives.

Les systèmes de diffusion de tyre cord de Radyne offrent de nombreux avantages et bénéfices tels qu'un rendement électrique élevé et le chauffage sans contact, en évitant ainsi de chauffer les matériaux comme le sable.

Le système est facile à utiliser et comprend un système de contrôle avec interface HMI Siemens intégrée dans le tableau de commande de l'opérateur et communiquant avec l'API série Siemens Simatic au moyen du protocole Profibus DP. Cela permet à l'opérateur d'accéder à la totalité des paramètres de la machine et aux commandes et fournit également des informations diagnostiques.

Et, plus important encore, le système de diffusion tyre cord de Radyne assure une cohérence productive grâce à une parfaite diffusion du cuivre et du zinc.

On peut chauffer plusieurs fils avec DV élevé et passer aisément d'un diamètre de fil à l'autre.

**Radyne Ltd – Royaume-Uni**
**Fax**: +44 1256 467224
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**Website**: www.inductotherm-hwt.co.uk

## Groupe de travail en Chine

Fushi Copperweld, Inc. a annoncé que la filiale de la société, Fushi International (Dalian) Bimetallic Cable Co Ltd, a été nommée pour former et organiser le premier groupe de travail en Chine sur les conducteurs composites par l'Institut National de Normalisation chinois (SAC). Le SAC, créé en avril 2001, a été autorisé par le Conseil d'État de la République Populaire de Chine pour rédiger, formuler et appliquer les lois et les règlements de l'état concernant la normalisation des produits.

Après la formation, le groupe de travail sera le premier organisme de réglementation chinois en ce qui concerne les conducteurs composites. Le groupe de travail qui réunira de nombreux experts, leaders et entreprises connus dans le secteur industriel, sera chargé de formuler une norme à niveau national pour les fils conducteurs composites utilisés dans les secteurs des télécommunications, de l'électricité, de l'automobile, du chemin de fer, de l'industrie et des services publics ainsi que dans d'autres secteurs de transmission de puissance et de signaux haute fréquence.

En 2007, la société, en collaboration avec Number 23 Research Institute of China Electronics and Technology Group et avec d'autres experts du secteur, a mis au point une norme nationale pour le fil d'aluminium revêtu de cuivre (CCA).

**Fushi Copperweld Inc – Chine**
**Website**: www.fushicopperweld.com

## Conférence couronnée de succès sur les systèmes FTTH

La conférence d'ouverture du Moyen Orient sur les fibres jusqu'à domicile (FTTH), qui s'est tenue à Amman le 10 et le 11 novembre 2009, a remporté un grand succès.

La conférence de deux jours s'est déroulée sous le parrainage du ministre jordanien des technologies de l'information et des communications Eng Basem Al Rousan, qui a tenu le discours d'ouverture, a participé à une conférence de presse et a visité la salle d'exposition.

Le ministre palestinien des télécommunications et de la technologie des informations M. Mashour Abu Daka, a tenu un discours programmatique illustrant des statistiques qui démontrent la demande croissante d'Internet haute vitesse.

Le programme de la conférence offrait une série de présentations de haut niveau concernant des aspects importants des réseaux FTTH.

Outre 260 délégués se sont réunis à l'Exposition AmmanGrand Hyatt Zara Expo où 14 exposants ont présenté leurs technologies d'avant-garde, ce qui confirme encore une fois que l'intérêt pour les fibres jusqu'à domicile (Fibre-to-the-Home) est en train d'augmenter dans la région du Moyen Orient.

La prochaine conférence moyen-orientale sur les réseaux FTTH se tiendra au cours de l'année 2010.

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**Website**: www.ftthcouncil.eu

# Contrat pour le projet Neptune 2

▲ *Enrouleur réalisé par SKET en fonction dans les établissements de Bridon International*

La société SKET a remporté un contrat pour la fourniture d'équipements pour le projet Neptune 2 de Kiswire. Le quatrième trimestre 2010, on assistera à la livraison de ceux qui sont considérés la plus grande assembleuse à cage et la plus longue câbleuse tubulaire jamais fournies. Les machines seront utilisées, entre autres, pour la fabrication de câbles sous-marins offshore.

L'assembleuse à cage modèle MKVS 1+8 x 2700 est conçue pour la fabrication de câbles d'un diamètre de 160mm. La machine sera équipée d'un dispositif de déroulement et d'enroulement pour le logement de dévidoirs de la capacité maximale de 600 tonnes. Les dérouleurs et les enrouleurs présentent un diamètre de 5 600mm et une largeur de trancanage de 10 000mm.

L'enrouleur plus grand jamais réalisé par SKET, avait une capacité d'enroulement de 400 tonnes et est actuellement en fonction auprès des établissements de Bridon International.

La câbleuse tubulaire haute vitesse, du type SRW 1+48x800 (32"), est conçue pour la production de torons jusqu'à 55mm de diamètre à une vitesse maximale de la ligne de 100m par minute.

Cette ligne est également indiquée pour la production de torons compacts.

La plus grande câbleuse tubulaire jamais réalisée par SKET du type SRW 1+48x630, est en fonction avec succès dans l'installation Neptune 1 de Kiswire en Malaisie depuis plus de dix ans.

Le projet Neptune 2, qui a entraîné un investissement de 80 millions de dollars américains sur un site de 20 acres près de l'installation Nepture 1 de Johor, sera achevé en 2011.

**SKET Verseilmaschinenbau GmbH – Allemagne**
**Fax**: +49 391 4055 815
**Email**: info@sketvmb.de
**Website**: www.sketvmb.de

## Contrat pour four de recuit à cloche

En août 2009, la société Ebner a remporté une commande de United Wire Factories Co, Riyadh, Arabie Saoudite pour la fourniture d'une installation de recuit avec four à cloche Hicon®N2.

L'étendue de la fourniture comprend deux bases de recuit Hicon N2, deux cloches de chauffage, deux cloches de refroidissement, une installation de distribution et les relatifs équipements auxiliaires.

L'installation sera utilisée pour le recuit de recristallisation du fil de fer d'emballage en atmosphère d'azote. Avec un diamètre utile de la chambre de recuit de 3 450mm et une hauteur utile de charge de 4 400mm, chaque base de recuit présente une capacité maximale de charge nette arrivant jusqu'à 48 tonnes.

L'activité productive de l'installation devrait débuter le premier trimestre 2011.

**Ebner Industrieofenbau GesmbH – Autriche**
**Email**: sales@ebner.cc
**Website**: www.ebner.cc

## Le Groupe Madem en Roumanie

Le nouvel établissement de production du Groupe Madem, appelé Madem Romania, a inauguré officiellement l'activité dans le district Bistrita Nasaud, en présence de nombreux fonctionnaires locaux, de clients, de fournisseurs et d'amis.

À la cérémonie ont été également présents le président du Groupe Madem Gino Mazzoccato, le directeur administratif Rafael Romagna, accompagné par le gouverneur du district Bistrita Nasaud, Ovidiu Cretu, et par l'ambassadeur brésilien en Roumanie Vitor Gobbato.

Actuellement fournisseur de clients locaux, Madem Romania étendra ses services à d'autres pays de l'Europe de l'Est au cours de l'année 2010.

Madem Romania est stratégiquement située dans une région clé pourvue de ressources de bois renouvelables et d'un portefeuille de clients consolidé composé de petites et moyennes entreprises spécialisées dans la production e dans la fourniture de câbles avec lesquelles Madem Romania a formé des sociétés d'avantage mutuel.

"Aujourd'hui, avec nos partenaires, nous sommes fiers de faire partie du marché de l'Europe orientale, au service de nos clients, dans l'effort constant d'améliorer la qualité de nos processus", a déclaré Cristian Outeiral, directeur général de Madem Romania.

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**Website**: www.mademreels.com

## Nouveau site web

Le Groupe OM Lesmo a réalisé un nouveau site web plus rapide et plus facile à utiliser pour tenir ses clients informés en ce qui concerne les développements de ses produits, pour offrir des informations techniques et pour se connecter aux filiales qui représentent différents fabricants de machines européens et de produits pour l'industrie du fil et du câble de par le monde.

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# Utilisation d'élastomères haute performance dans les câbles conçus pour plate-formes offshore dans les régions arctiques

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## Résumé

L'île de Sakhalin et le champ pétrolier de Shtokman en mer de Barents sont parmi les régions potentiellement les plus intéressantes du point de vue de l'exploitation des ressources environnementales au niveau mondial.

Dans ces régions, les plates-formes offshore doivent répondre à des exigences extrêmement rigoureuses, surtout en ce qui concerne les câbles pour panneaux de contrôle et pour instruments. Une flexibilité élevée aux basses températures (-50°C), une résistance exceptionnelle à l'huile, et des propriétés ignifuges et de résistance à la corrosion ne sont que quelques-unes parmi les caractéristiques requises.

L'éthylène-acétate de vinyle EVM (copolymères) (Levapren®) et le caoutchouc nitrile hydrogéné HNBR (Therban®) sont des produits particulièrement indiqués pour relever ce genre de défis.

L'absence d'halogènes, une bonne résistance à l'huile, la résistance à l'ozone et aux rayons UV, associées à des performances mécaniques satisfaisantes dans une ample gamme de températures (de –40°C à 175°C) en font un matériau idéal pour les câbles utilisés dans les plates-formes offshore installées dans les régions arctiques.

Le présent article illustre de nombreux composés à base de mélanges de HNBR et EVM, essayés conformément aux normes internationales telles que IEEE 1580, NEK 606 et BS 6883.

La résistance aux fluides agressifs comme l'huile et les boues de forage à base d'eau a été également essayée, et les performances des propriétés mécaniques ont été essayées à –50°C.


## 1 Introduction

### 1.1 Le défi arctique

**Exploration et production de pétrole dans la région arctique**

La Russie, le Canada, la Norvège et les États-Unis sont parmi les pays engagés dans l'exploration et dans le développement des ressources d'hydrocarbures dans la région arctique. La fonte de la calotte glaciaire du pôle Nord est prévue dans les 50 prochaines années, ce qui rendra possible la navigation ainsi que l'exploration et l'extraction du pétrole dans la mer arctique. Les défis liés à cette opération sont nombreux: installation à distance de sites offshore, des conditions environnementales extrêmement rigoureuses et un scénario géopolitique délicat.

Des exemples typiques des rigoureuses conditions environnementales de la région arctique sont les champs pétroliers de Shtokman et de la mer de Barents (*Figure 1*). Ce projet prévoit une production annuelle de 70 000 millions de mètres cubes de gaz naturel et de 0,6 millions de tonnes de gaz à condensat, comparable à la production annuelle de gaz de la Norvège, l'un des principaux fournisseurs de gaz européens[1].

▼ **Figure 1**: *Plates-formes en service dans des conditions extrêmes dans la région arctique*

Situé à 550km au large, ce gisement pétrolifère ne peut pas être atteint par hélicoptère des bases continentales. Des vents glacés, des températures extrêmement basses et six mois d'obscurité hivernale rendent encore plus difficile le développement de ce champ pétrolier[2].

Le forage en eaux profondes exige l'utilisation de navires de forage équipés d'une structure avec des dispositifs de protection contre la glace ainsi que le révolutionnaire navire à huit côtés. D'autres innovations consistent en la réalisation de pistes d'atterrissage de glace épaissie, de nouvelles conceptions de bateaux brise-glace, des navires ravitailleurs brise-glace et des cales sèches flottantes pour l'entretien d'autres navires sur le site. Sans ces développements, l'exploration et la production dans la région arctique ne seraient pas possible[3].

**Normes pour les câbles des plates-formes pétrolières**

La norme NEK 606 représente le standard industriel international pour l'industrie pétrolière et du gaz offshore, ainsi que et pour les secteurs de la construction navale e maritime. Les câbles en question sont pourvus de certification ISO 9001 et 14001 délivrée par Det Norske Veritas (DNV). La structure des câbles NEK 606 pour les plates-formes pétrolières offshore est similaire à d'autres normes telles que BS 6883 et IEEE 1580 type P[4].

### 1.2 Élastomères à performances élevées pour câbles utilisés dans des climats rigides

#### 1.2.1 Copolymères d'acétate de vinyle-éthylène Levapren® (EVM)

Les copolymères d'acétate de vinyle-éthylène caractérisés par une teneur en acétate de vinyle (VA) de 40% à 90% sont connus comme des matériaux caoutchouteux.

| Propriétés | Unités | Spécifications |
|---|---|---|
| Résistance à la traction | [MPa] | 11±2 |
| Allongement à rupture | [%] | 200±15 |
| Dureté | Shore A | 75±5 |
| Résistance à la déchirure | [N/mm] | 4-6 |
| Essai de pliage à froid | [°C] | @-40°C Sans criques |
| Indice limite d'oxygène (LOI | [%] | 32 |
| Vieillissement à l'air chaud | [%] | TS/EB ±30 |
| Immersion en | [MPa]/[%] | TS/EB ±40 V: 15 |
| Immersion dans la boue à base d'huile | [MPa]/[%] | TS/EB ±30 W/V: 30 |
| Immersion dans la boue à base d'eau | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Immersion dans la boue à base d'ester | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Mooney | ML | 40=60 |
| Essai vertical d'inflammabilité | [cm] | 20cm |

▲ **Tableau 1**: *Propriétés principales décrites dans les normes relatives aux composées pour câbles offshore*

La structure principale saturée de la chaîne polymérique offre une excellente résistance EVM à l'ozone et aux agents atmosphériques. Ils présentent également une résistance à des températures élevées jusqu'à 175°C et une augmentation de la teneur en VA de 40% à 90% permet une amélioration considérable de la résistance déjà optimale à l'huile[5].

#### 1.2.2 Caoutchouc nitrilique hydrogéné Therban® (HNBR)

Le HNBR représente un polymère quasi idéal en ce qui concerne les critères de performance requis dans les environnements arctiques. Les excellentes propriétés de ce polymère résulte de la combinaison de la structure principale saturée avec un groupe latéral d'acrylnitril (ACN) inerte et hautement polaire. Cette association fournit les propriétés nécessaires à supporter la forte corrosion atmosphérique causée par l'ozone et par les rayons UV, à maintenir la flexibilité aux basses températures, à résister aux fluides et aux huiles hautement polaires, à résister aux températures élevées (jusqu'à 150°C) et à maintenir les performances des propriétés mécaniques[6].

Les propriétés de résistance aux basses températures et à l'huile des produits Therban® sont étroitement liées à la teneur en acrylnitril (ACN) couvrant une gamme allant de 20% à 50% environ.

Dans une série homologue de polymères HNBR il n'y a pas une relation étroite entre la température de transition vitreuse ($T_g$) et la teneur d'acrylonitrile (ACN), le processus vitreux étant également influencé par la cristallisation des séquences d'éthylène de plus de 8-12 groupes de $CH_2$. Les copolymères caractérisés par une teneur en acrylonitrile inférieure à 37% sont partiellement cristallins aux basses températures[7].

## 2 Expérimentation

### 2.1 Composés pour câbles pour plates-formes offshore dans les régions arctiques

Le *tableau 2* illustre les formules des composés préparés avec un type de HNBR (ACN = 21%, RDB= 0,9%; ML1+4/100°C = 72±4 MU) et des types de EVM (teneur VA = 50±5 % et 70±5 % ; ML1+4100°C= 27±4 et 27±4 MU).

## 3 Résultats et discussion

### 3.1 Propriétés mécaniques

Les propriétés principales ont été mesurées en conformité avec les normes décrites dans la spécification NEK 606. Le composé 5, préparé avec le polymère EVM contenant 70% de VA, présente la valeur de résistance à la traction mineure parmi la totalité des composés. Il s'agit d'une valeur limite et non souhaitable, une certaine marge pour la variation des propriétés étant requise à la suite du vieillissement et de l'immersion. Les valeurs de résistance à la traction des quatre composés supplémentaires sont comparables et sont comprises dans la même gamme (11 MPa). Le composé 1 présente des propriétés robustes de contrainte-déformation avec une valeur d'allongement de rupture élevée et une dureté mineure (Shore A), de la totalité de l'étude (*Tableau 3*).

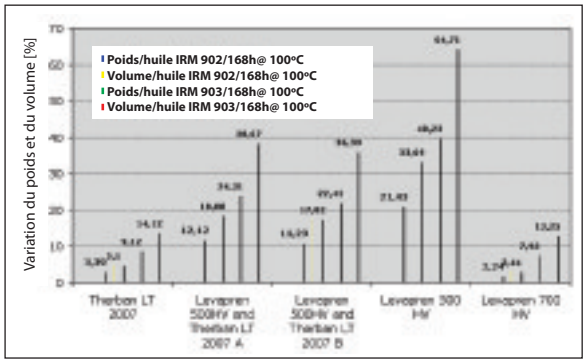
Les composés 2 et 3, à base de mélanges de polymères, présentent des valeurs de résistance à la traction (TS) similaires, mais les valeurs d'allongement de rupture (EB)

▼ **Tableau 2**: *Formulations à base de EVM et élastomères spécifiques de HNBR*

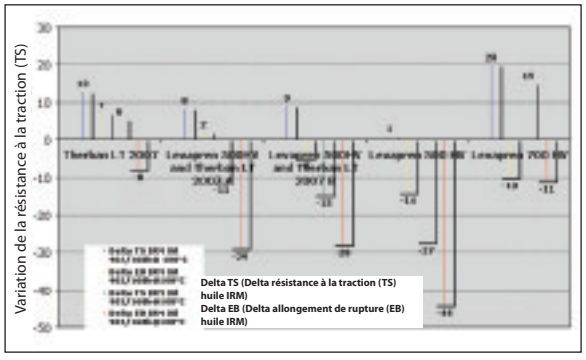
| Composition | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| THERBAN® LT 2007 (HNBR (ACN= 21%) | 100 | 50 | 50 | | |
| LEVAPREN® 500 HV (EVM (VA=50%) | | 50 | 50 | 100 | |
| LEVAPREN® 700 HV (EVM (VA=70%) | | | | | |
| APYRAL® 120 E (ATH BET= 12 $m^2/g$) | 80 | 80 | 80 | 80 | 100 |
| APYRAL® SM 200 (ATH BET= 22 $m^2/g$) | 60 | 60 | 60 | 60 | 70 |
| BORATE DE ZINC | 10 | 10 | 10 | 10 | 10 |
| SILQUEST® RC-1 SILANE | | | 2 | | |
| GENIOSIL® XL 33 | 2 | 2 | | 2 | 2 |
| EDENOL® 888 (DOS) | 10 | 10 | 10 | 10 | 10 |
| DIPLAST® TM 8-10/ST (TOTM) | 10 | 10 | 10 | 10 | 5 |
| RHENOFIT DDA-70 | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 |
| STABAXOL® Poudre-P (PCD) | 1 | 1 | 1 | 1 | 1 |
| MAGLITE® DE (MgO) | 3 | 3 | 3 | 3 | 3 |
| STÉARATE DE ZINC | 1 | 1 | 1 | 1 | 1 |
| STÉARATE DE CALCIUM | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| EDENOR® C 18 98-100 | 1 | 1 | 1 | 1 | 1 |
| CORAX® N 550/30 (Noir de Carbone) | 5 | 5 | 5 | 5 | 5 |
| RHENOFIT® TRIM/S | 2 | 2 | 2 | 2 | 2 |
| PERKADOX® 14-40 B-PD | 6,5 | 6,5 | 6,5 | 6,5 | 6,5 |
| Total | 294,4 | 294,4 | 294,40 | 294,40 | 319,40 |
| Densité | 1,453 | 1,468 | 1,560 | 1,484 | 1,609 |

▼ **Tableau 3**: *Propriétés mécaniques des composés développés*

| Propriétés mécaniques | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Résistance à la traction (MPa) | 11,1 | 11,0 | 11,7 | 11,5 | 8,5 |
| Allongement à rupture (%) | 384 | 270 | 236 | 251 | 265 |
| M 50 (MPa) | 1,8 | 2,5 | 3,1 | 2,8 | 3,0 |
| M 100 (MPa) | 4,0 | 5,9 | 7,3 | 6,4 | 6,2 |
| Dureté Shore A at 23° | 65 | 69 | 76 | 73 | 76 |
| Résistance à la déchirure ASTM D-470 | 6,4 | 3,2 | 3,2 | 4,1 | 3,9 |




▲ **Figure 2**: *Variation du volume et du poids à la suite d'immersion dans l'huile IRM 902 et 903 pour 168 heures à 100°C*




▲ **Figure 3**: *Variation des propriétés de résistance à la traction à la suite d'immersion dans l'huile IRM 902 et 903 pour 168 heures à 100°C*

jusqu'à 100% sont inférieures par rapport aux composés à base de HNBR. Les valeurs de dureté et des modules sont supérieures lorsque comparées au composé 1. En effectuant une comparaison entre le composé 2 et le composé 3, une majeure densité de réticulation peut être appréciée (dureté supérieure) et des modules supérieurs (M50 et M100) dans le composé 3, préparé avec Silquest RC-1.

Par contre, une comparaison entre le composé 4 et le composé 5 est difficile, le contenu de matériau de remplissage et de plastifiant n'étant pas égal. Initialement, un composé avec la même quantité de matériau de remplissage et de plastifiant comme les autres formulations présentait des propriétés de contrainte-déformation très faibles (6,4 MPa et 290% EB) ainsi qu'une dureté et une résistance à la déchirure réduites. Pour cette raison, une optimisation a été réalisée en augmentant la quantité du matériau de bourrage et en réduisant le plastifiant (30 parties pour cent de caoutchouc (phr) plus de ATH et 5phr et moins de plastifiant DOS). Fischer et al [8] ont découvert une corrélation entre la teneur en VA et la densité de réticulation des composés Levapren® préparés dans les mêmes conditions (teneur constante de peroxyde et d'autres additifs), ce qui pourrait expliquer les faibles propriétés de contrainte-déformation relevées dans le composé 5 initial.

### 3.2 Résistance des fluides

#### 3.2.1 Huile IRM 902 et 903

La résistance à l'huile est étroitement liée à la polarité d'un élastomère. La polarité des élastomères EVM dépend de la teneur en acétate de vinyle et pour les élastomères HNBR, de la teneur en acrylonitrile[5]. La mesure de la variation des propriétés et du volume à la suite d'immersion dans l'huile confirme cet effet (*Figure 2* et *3*). Les composés à base de polymère EVM avec une teneur en VA de 70% et à base de HNBR LT, ont montré la dilatation et la variation des performances des propriétés de résistance à la traction les plus basses. Ce phénomène pourrait être attribué à la polarité élevée générée par une haute teneur en VA dans le polymère EVM (70%), alors que dans le cas du matériau HNBR, la polarité est intrinsèque dans l'effet dipôle-dipôle sur le groupe ACN qui, malgré la faible teneur en Therban LT 2007, suffit pour fournir la résistance nécessaire à l'huile requise pour ce genre de composés. Les variations des propriétés de résistance à la traction les plus significatives peuvent être remarquées dans les composés à base de polymère contenant 50% de VA. La polarité de ce composé est simplement suffisante à supporter l'immersion dans l'huile IRM 902, mais pas dans l'huile IRM 903, cette dernière étant plus agressive et polaire par rapport à l'huile 902. Les composés de polymères avec une teneur en VA de 70% ont montré une résistance à l'huile comparable à celle des composés à base de HNBR (*Figure 2* et *3*).

#### 3.2.2 Boues de forage à base d'eau et d'huile

**Systèmes à base d'eau**

Les cations divalents tels que le calcium et le magnésium, ajoutés à la boue de forage à base d'eau douce, inhibent la formation d'argile et la dilatation d'argile litée. Des niveaux élevés de calcium soluble sont utilisés pour contrôler l'argile exfoliante et la dilatation du trou et pour prévenir des dommages éventuels aux équipements. Les boues traitées avec le calcium résistent au sel et à la contamination d'anhydrite, mais elles sont susceptibles de congélation et de solidification à des températures élevées[9].

**Systèmes à base d'huile**

Il s'agit de systèmes à base d'émulsions d'eau dans l'huile, généralement composées de saumure de chlorure de calcium (phase émulsionnée) et huile (phase continue), pouvant contenir jusqu'à 50% de saumure dans la phase liquide. Les boues à émulsion inverse sont des émulsions "relâchées" caractérisée par une stabilité électrique inférieure et des valeurs de perte de fluide supérieures.

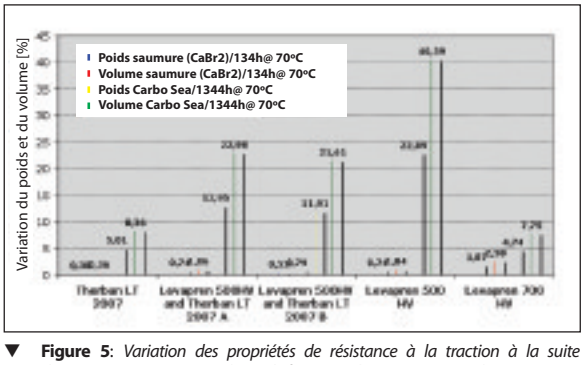
Les *Figures 4* et *5* illustrent l'effet sur le poids, sur le volume et sur la variation des propriétés de résistance à la traction. Les composés à base de Therban LT 2007 et Levapren 700 HV ont démontré les meilleures performances et de maintenir les propriétés. Il est important de sélectionner les matériaux avec un niveau de polarité élevé puisque la polarité des composés joue un rôle essentiel dans les performances de résistance à l'huile.

Dans le cas de composés à base de mélanges de polymères, il semble qu'il existe une synergie entre les polymères HNBR et l'EVM. Cela contribue à réduire le coût global du composé et à améliorer le processus sans influencer la résistance à la chaleur et à l'huile. Dans le passé des mélanges de HNBR et EVM ont été développés pour satisfaire des spécifications très rigoureuses, surtout dans le secteur de la technologie navale militaire [NES 518 (Def-Stand 61-31 partie 12) et VG 95218[10].

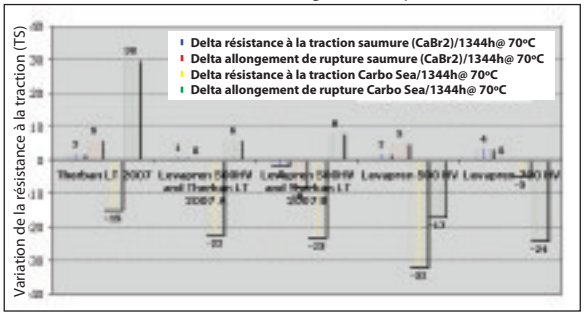
### 3.3 Propriétés aux basses températures

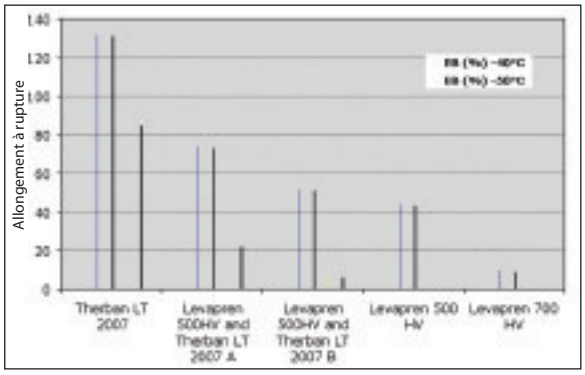
La flexibilité des câbles conçus pour les plates-formes offshore dans les régions arctiques est essentielle afin de garantir l'efficacité maximale (interruption et entretien minimum) de la production de pétrole et de gaz et des opérations de raffinage de ces installations. Les températures très basses (–40°C et –50°C) sont communes dans ce type d'environnement. Il est donc essentiel d'utiliser des matériaux caractérisés par une température de transition vitreuse assurant la mobilité des chaînes polymériques à des niveaux d'énergie inférieurs. La mobilité des

▼ **Figure 4**: *Variation de poids et volume à la suite d'immersion en saumure et boue de forage à base de Carbo Sea pour 1 344 heures à 70°C*

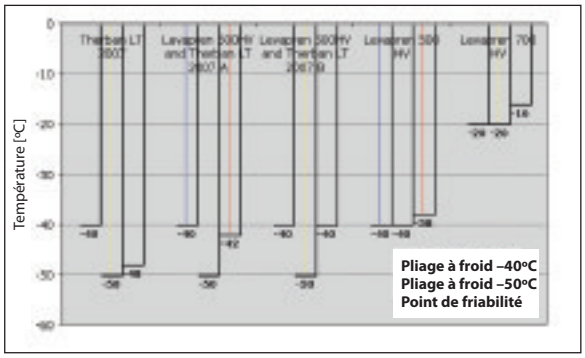



▼ **Figure 5**: *Variation des propriétés de résistance à la traction à la suite d'immersion en saumure et boue de forage Carbo Sea pour 1 344 heures à 70°C*






▲ **Figure 6**: *Allongement de rupture des composés de câbles mesurés à –40 °C et –50°C*




▲ **Figure 7**: *Pliage à froid mesuré à –40 °C et –50°C et point de friabilité*

segments polymériques dans une ample gamme de températures réduit le risque de cristallisation et l'effet de durcissement sur le polymère, prévisible dans les câbles fixes pour les plates-formes installées dans des régions caractérisées par des conditions environnementales difficiles.

Comme l'on peut remarquer à la *Figure 6*, la résistance à la traction (allongement de rupture) de ces composés a été remarquée à –40°C et –50°C. Sans aucun doute, le composé à base de Therban® LT 2007 présente les meilleures performances à –40°C et –50°C (allongement de rupture supérieur) suivi par le composé à base de Therban® LT 2007 et Levapren® 500 HV (préparé avec Geniosil® XL 33), une combinaison de plastifiants (TOTM et DOS) et une combinaison de différents trihydroxides spécifiques pour surfaces (BET) et d'aluminium Apyral® 120E et SM 200).

**Effets des agents de pontage**

La réactivité élevée d'un alpha-silane, tel que le Geniosil® XL 33, peut avoir contribué à améliorer le niveau d'interaction entre les polymères et le matériau de bourrage, en assurant ainsi un équilibre satisfaisant des propriétés mécaniques et une densité de réticulation inférieure. Les alpha-silanes sont intrinsèquement plus réactifs des silanes standard; cela entraîne un niveau d'hydrophobation supérieur de l'ATH même lorsque le matériau de bourrage spécifique pour surfaces utilisé ne suffit pas pour assurer l'hydrophobation.

**Effet du plastifiant**

La combinaison de 10phr de Di-n-octyl de sebacate (DOS) e du plastifiant TOTM (Tris (2-ethylhexyl) trimellitate) a fourni la flexibilité à froid nécessaire pour les basses températures. En général, les plastifiants TOTM sont utilisés dans des applications où la volatilité réduite revêt une importance fondamentale. Ces applications comprennent l'isolement de fils et de câbles et des intérieurs des voitures. Le TOTM présente des propriétés exceptionnelles de migration réduite et de résistance à l'extraction[11]. Le DOS est un plastifiant excellent, résistant au froid qui présente un impact élevé sur la température de transition vitreuse, mais une volatilité élevée par rapport au TOTM. Les deux plastifiants sont indiqués pour les copolymères EVM, éthylcellulose et caoutchouc synthétique et spécifiquement conçus pour les fils et les câbles résistants au froid ou pour les cuirs artificiels. Ces propriétés de résistance aux basses températures sont déterminées par la structure moléculaire.

Le pliage à froid à –40°C et –50°C est le point de friabilité ont été mesurés pour tous les composés développés. Seul le composé préparé avec Levapren® 700HV n'était pas conforme aux exigences de pliage à froid à –40°C. Et seuls les composés à base de Therban® LT 2007 et de mélanges de ce polymère avec Levapren® 500HV étaient conformes aux caractéristiques de pliage à –40°C et –50°C, ce qui en fait des matériaux indiqués pour des installations fonctionnant à ces basses températures (*Figure 7*).

Cette basse valeur de température de transition vitreuse ($T_g$) du HNBR et l'effet plastifiant du DOS et du TOTM permettent une production de composés avec ce degré de flexibilité. Les composés préparés avec Levapren® 700HV n'ont pas été aussi performants à des températures réduites que ceux préparés avec Levapren® 500HV.

Cela est dû à la valeur supérieure de $T_g$ du matériau avec un polymère contenant 70% de VA, lorsque comparé au matériau avec un polymère contenant 50% de VA (–17°C par rapport à –28°C), et du fait que la composition des formulations à base de Levapren® 700HV a été réalisée en n'utilisant que 15phr de plastifiant au lieu de 20phr comme dans les autres composés. Les mesures aux basses températures pour un composé préparé avec 20phr de plastifiant ont été effectuées lors d'études précédentes où des propriétés mécaniques telles que la résistance à la traction étaient plutôt faibles. Une quantité élevée de plastifiants dans des composés exclusifs de polymères contenant 70% de VA a un effet négatif sur le profil global des propriétés mécaniques.

### 3.4 Propriété ignifuges

Tous les composés présentaient une combinaison du matériau de bourrage ATH (Apyral® avec BET= 12 et 20$m^2$/g) qui pourrait avoir contribué à offrir des propriétés mécaniques et des valeurs de l'indice limite d'oxygène (LOI) satisfaisantes. L'indice limite d'oxygène pour les composés a été réalisé conformément à la norme ASTM D 2863; la totalité des composés a montré des valeurs LOI supérieurs à 34%.

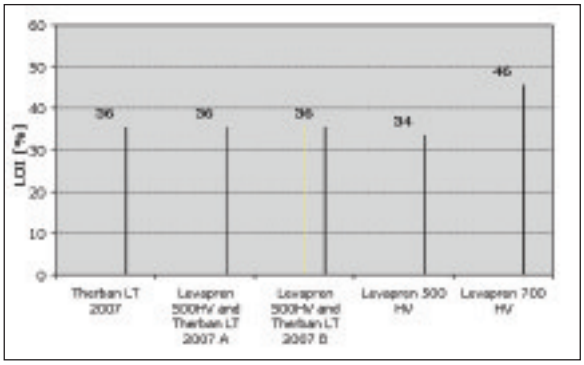
Un composé à base de Levapren 700 HV a présenté une valeur LOI exceptionnellement élevée (46%), ce qui peut dépendre de ce qui suit:

1 Des polymères EVM avec une haute teneur en VA (70% et leur synergie avec les matériaux de bourrage ATH
2 Une quantité de plastifiants inférieure et une valeur de ATH supérieure

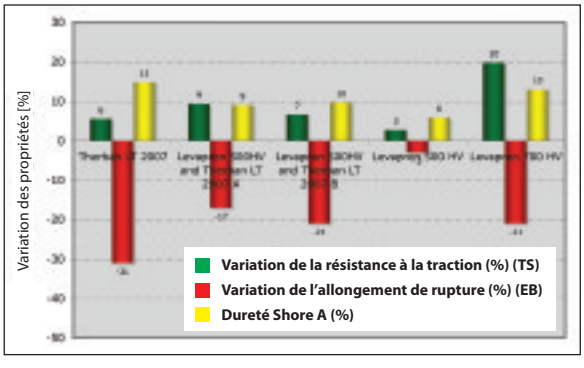
Des matériaux de bourrage ATH avec des particules de dimensions différentes, combinées avec le borate de zinc, fournissent un résidu charbonneux très compact et stable en cas d'incendie.

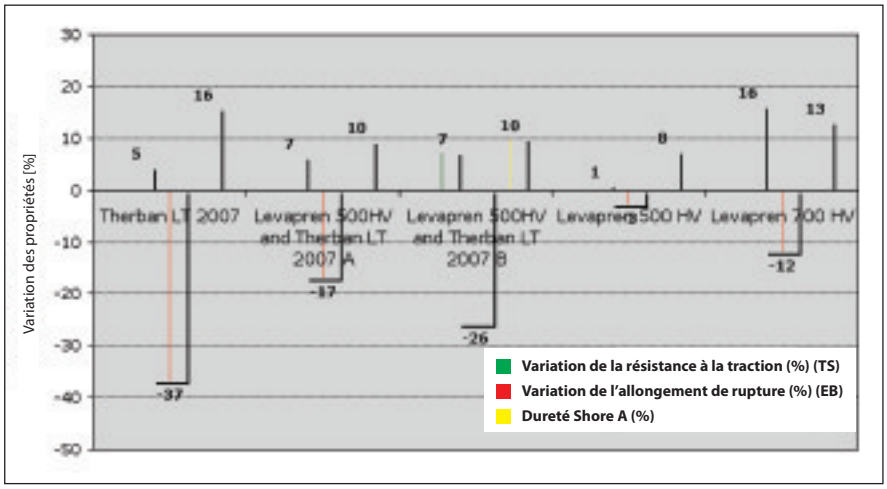
En 1991, Meisenheimer[12] décrivit l'effet synergique des polymères EVM et ATH, en

▼ **Figure 8**: *Indice limite d'oxygène pour les composés développés conformément à la norme ASTM D 2863*




▼ **Figure 9**: *Essai de vieillissement à l'air chaud pour 336 heures à 135°C*






▲ **Figure 10**: *Essai de vieillissement à l'air chaud pour 672 heures à 135 °C*

expliquant que l'indice limite d'oxygène pour les composés pour câbles FRNC de Levapren présentait une augmentation, sous charge constante, de 190phr ou plus dans des composés avec une teneur en VA supérieure à 65%wt.

En outre, des études internes supplémentaires menées avec le Geniosil® XL 33, décrivirent un effet intéressant sur le LOI dans des composés préparés avec Levapren® 700HV et 190phr ATH (BET=12m$^2$/g). Une augmentation de la teneur en silane jusqu'à 3phr correspondait à une augmentation du LOI.

### 3.5 Propriétés de vieillissement à l'air chaud

D'après la spécification NEK 606, un essai de vieillissement à l'air chaud doit être effectué pendant 168 heures à 120°C sur des composés conçus pour le revêtement des câbles. Pour forcer les limites des composés développés, un essai rigoureux a été effectué pendant 168 heures, 336 heures et 672 heures à 135°C. Les valeurs de variation des propriétés après vieillissement, sont représentées aux *Figures 9* et *10*. Après 336 heures, l'on peut remarquer les premiers effets du vieillissement dans les composés développés, notamment sur l'allongement à rupture des composés à base de Therban® LT 2007, Therban® LT 2007 et Levapren® 500 HV B (*Figure 9*).

En effectuant la comparaison avec le vieillissement après 336 heures, les composés développés maintiennent bien leurs propriétés après 672 heures; on ne peut apprécier que de faibles changements des variations des propriétés, notamment pour les composés à base de Levapren® 500HV (*Figure 10*).

Les propriétés peuvent être ajustées en optimisant le paquet de stabilisation de la chaleur à base de Stabaxol® P et Rhenofit®DDA-70. Aux fins de la présente étude, la résistance au vieillissement à l'air chaud répond aux exigences des normes sur les câbles. Une augmentation de la température d'exploitation pour les câbles installés sur les plates-formes offshore pourrait entraîner une amélioration dans la conception globale des câbles pour panneaux et instruments, en réduisant l'utilisation de conducteurs en cuivre et par conséquent les coûts totaux des câbles.

## 4 Conclusions

- Levapren 700 HV est un composé à base de polymères indiqué pour les câbles HFFR résistant à l'huile et à la boue, bien que guère indiqués pour des câbles caractérisés par une résistance aux basses températures typiques des environnements arctiques (–40°C et –50°C)
- Il a été démontré que les mélanges de HNBR et EVM offrent un compromis satisfaisant entre les propriétés de résistance à l'huile et à la boue et la résistance au vieillissement à l'air chaud, malgré les performances insuffisantes aux basses températures (faible allongement de rupture à –40°C et –50°C et pliage à froid à –50°C)
- Le Therban® LT 2007 a fourni des performances excellentes dans les mesures effectuées aux basses températures (jusqu'à –50°C) typiques des régions arctiques. On a remarqué un excellent équilibre de résistance mécanique à l'huile et à la boue et des propriétés ignifuges dans les composés préparés avec ce matériau, cependant avec des performances plutôt faibles dans l'essai de vieillissement à l'air chaud
- La polarité élevée des matériaux HNBR combinées avec les polymères EVM, offre au marché du pétrole et du gaz des solutions de composés pour câbles avec un rapport coût-performances relativement satisfaisant
- Le développement de composés pour câbles hautes performances, exige l'utilisation d'additifs spécifiques tels que les alpha-silanes et les matériaux de bourrage ignifuges composés de particules très fines
- Une combinaison de plastifiants avec des caractéristiques différentes et un matériau de bourrage pour surfaces hautement spécifique ont garanti la conformité des spécifications de flexibilité aux basses températures et le pliage à froid à –40°C et –50°C ■

## 5 Références bibliographiques


[1] http://www.gazprom.com/eng/Arcticles/Arcticle21712.shtml
[2] http://www.upstreamonline.com/incoming/Arcticle132282.ece
[3] A D McCracken, T P Poulton, E Macey, J M Monro Gray and G S Nowlan, *"Arctic oil and gas"* Popular Geoscience http://www.gac.ca, 2007
[4] http://www.nek606.net/
[5] E Rohde *"Ethylene vinyl acetate elastomers: applications and opportunities for industrial rubber goods"* 141st Meeting of the Rubber Division American Chemical Society, Proceedings (1992)
[6] D Achten *"Next generation HNBR grades: new materials for oilfield applications"* Oilfield Engineering and Polymers (2006)
[7] H Magg *"The structure of Therban® (HNBR) and the impact of the low temperature characteristics of elastomeric materials"* 3° Werkstoffkongress, Loeben Graz (2005)
[8] C Fischer, C Wrana, J Ismeier, F Taschner, *"Crosslink architecture of EVM based vulcanisates and its influence on technologically relevant properties"* German Rubber Conference Proceedings, July 3–6, Nuremberg, 2006
[9] World Oil Fluids 2007 "Drilling completion and workover fluids" Gulf Publishing Co, PO Box 2608, Houston, TX 77252 USA (2007)
[10] M La Rosa, C Wrana, D Achten "Electron beam curing of EVM and HNBR for cable compounds" 55th IWCS Conference (2006)
[11] http://www.eastman.com/NR/rdonlyres/17704C03–05BD–448F–8221–2F39C01E7191/0/L167.pdf
[12] H Meisenheimer, *"Low smoke, non–corrosive fire retardant cable jacket based on HNBR and EVM"* Jicable'91 June 24–28, Versailles, 1991



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## Scelta di un fabbricante di tortiglie per pneumatici

La società Radyne IHWT ha completato con successo la fornitura, l'installazione e il collaudo degli equipaggiamenti di riscaldamento a induzione di sei linee di diffusione dei fili per tortiglie destinate all'industria dei pneumatici (TCD - Tyre Cord Diffusion) in Cina, ognuna con una capacità di 24 fili a 80DV e diametri da 1,1mm a 2,2mm.

Ciascuna delle 6 linee, fornite ad un importante produttore cinese, comprende un'area di preriscaldamento ed un'area di riscaldamento finale, equipaggiate con una sorgente di alimentazione IGBT, e seguite da due zone di mantenimento della temperatura mediante forno a muffola. Il processo di diffusione tyre cord previene la corrosione del filo all'interno dello pneumatico e funge da lubrificante facilitando la riduzione del diametro del filo nelle successive operazioni di trafilatura.

I sistemi di diffusione tyre cord di Radyne offrono numerosi vantaggi e benefici, quali un elevato rendimento elettrico e il riscaldamento senza contatto, evitando di riscaldare i materiali come la sabbia. Il sistema è di facile utilizzo e comprende un sistema di controllo con interfaccia Siemens HMI integrata nel pannello di comando dell'operatore e comunicante con il PLC serie Siemens Simatic mediante protocollo Profibus DP. Ciò consente all'operatore l'accesso a tutti i parametri e comandi della macchina e fornisce inoltre informazioni diagnostiche.

E, cosa ancora più importante, il sistema di diffusione tyre cord di Radyne assicura coerenza produttiva grazie ad una perfetta diffusione del rame e dello zinco. È possibile riscaldare più fili a DV elevato ed è facile passare da un diametro ad un altro.

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## Il Gruppo Madem atterra in Romania

Il nuovissimo stabilimento produttivo del Gruppo Madem, denominato Madem Romania, ha inaugurato ufficialmente l'attività nel distretto Bistrita Nasaud, alla presenza di numerosi funzionari locali, clienti, fornitori ed amici. Alla cerimonia hanno inoltre presenziato il presidente del Gruppo Madem Gino Mazzoccato, il direttore amministrativo Rafael Romagna, accompagnato dal governatore del distretto Bistrita Nasaud, Ovidiu Cretu, e dall'ambasciatore brasiliano in Romania Vitor Gobbato.

Madem Romania è già fornitore di clienti locali e durante il 2010 incrementerà il servizio ad altri paesi dell'Europa dell'est.

"Madem Romania è ubicata strategicamente in una regione chiave provvista di riserve di legname rinnovabili e di una clientela consolidata costituita da piccole e medie imprese produttrici e fornitrici di cavi con le quali Madem Romania ha formato delle società di reciproco vantaggio.

"Oggi siamo fieri di fare parte del mercato dell'Europa orientale, al servizio dei nostri clienti, nello sforzo costante di migliorare la qualità dei nostri processi", ha dichiarato Cristian Outeiral, direttore generale di Madem Romania.

▲ *La cerimonia d'inaugurazione presso Madem Romania*

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## Gruppo di lavoro in Cina

Fushi Copperweld, Inc. ha annunciato che la filiale della società, Fushi International (Dalian) Bimetallic Cable Co Ltd, è stata designata per formare ed organizzare il primo gruppo di lavoro in Cina sui conduttori compositi dall'Istituto Nazionale di Normalizzazione cinese (SAC). Il SAC, fondato nell'aprile 2001, è stato autorizzato dal Consiglio di Stato della Repubblica Popolare Cinese per redigere, formulare e applicare le leggi ed i regolamenti statali per la normalizzazione dei prodotti.

Dopo la formazione, il gruppo di lavoro sarà il primo organo di regolamentazione cinese sui conduttori compositi. Il gruppo di lavoro che riunirà numerosi esperti, leader e aziende noti nel settore industriale, sarà incaricato di formulare una norma a livello nazionale per i fili conduttori compositi utilizzati nei settori delle telecomunicazioni, dell'elettricità, automobilistico, ferroviario, industriale e dei servizi pubblici nonché in altri campi di trasmissione di potenza e segnali ad alta frequenza.

Nel 2007, la società, assieme al Number 23 Research Institute of China Electronics and Technology Group ed altri esperti del settore, ha elaborato una norma nazionale per il filo di alluminio rivestito di rame (CCA). La norma nazionale proposta per il CCA è stata formalmente approvata dal Comitato Nazionale delle norme ed è in attesa dell'applicazione a livello industriale.

**Fushi Copperweld Inc – Cina**
**Website**: www.fushicopperweld.com

## Vendita di Wardwell

La società SKET Verseilmaschinenbau Magdeburg GmbH ha acquisito le attività di Wardwell. SKET aveva precedentemente acquisito le attività di Wardwell Europe ed è stato inoltre il maggiore offerente per le attività del fabbricante di trecciatrici all'asta del 14 dicembre scorso.

Un portavoce del fabbricante tedesco e membro del gruppo WILMS ha confermato l'acquisizione e i propri piani di riavviare l'attività sullo stesso sito il 4 gennaio 2010.

La nuova società disporrà inizialmente di una forza lavoro inferiore ed avrà una nuova ragione sociale, Stolberger Incorporated DBA Wardwell Braiding Co.

**Stolberger Incorporated DBA Wardwell Braiding Co – Stati Uniti**
**Email**: jtomaz@wardwell.com

## Contratto per il Progetto Neptune 2

▲ *Avvolgitore realizzato da SKET in funzione negli stabilimenti di Bridon International*

La società SKET si è aggiudicata un contratto per la fornitura di equipaggiamenti per il progetto Neptune 2 da Kiswire. Nel quarto trimestre 2010 si assisterà alla consegna di quelli che sono considerati la più grande cordatrice planetaria e la più lunga trefolatrice tubolare che siano mai state fornite. Le macchine saranno utilizzate per la fabbricazione, fra l'altro, di cavi sottomarini offshore.

La cordatrice planetaria modello MKVS 1+8 x 2700 è progettata per la fabbricazione di cavi del diametro di 160mm. La macchina sarà equipaggiata con un dispositivo di svolgimento e avvolgimento per aspi con una capacità di alloggiamento massima di 600 tonnellate. Entrambi gli aspi di svolgimento e di avvolgimento presentano un diametro di 5.600mm ed una larghezza di distribuzione di 10.000mm. L'avvolgitore più grande in assoluto finora realizzato da SKET con una capacità di avvolgimento di 400 tonnellate, è in funzione presso gli impianti di Bridon International.

La trefolatrice tubolare ad alta velocità, del tipo SRW 1+48x800 (32"), è progettata per la produzione di trefoli fino a 55mm di diametro ad una velocità massima della linea di 100m il minuto. Questa linea è inoltre indicata per la produzione di trefoli compatti. La cordatrice tubolare più grande finora realizzata da SKET del tipo SRW 1+48x630, sta funzionando con successo nello stabilimento Neptune 1 di Kiswire in Malesia da oltre dieci anni.

Il progetto Neptune 2, che ha comportato un investimento di 80 milioni di dollari americani su un sito di 20 acri vicino allo stabilimento Nepture 1 di Johor, sarà completato nel 2011.

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## Nuovo sito web

Il Gruppo OM Lesmo ha realizzato un nuovo sito web più veloce e di più facile utilizzo per tenere informati i clienti sugli sviluppi dei propri prodotti, offrire informazioni tecniche e consentire il collegamento alle filiali che rappresentano vari fabbricanti europei di macchine e prodotti per l'industria del cavo e del filo a livello mondiale.

Il sito web è ancora in corso di sviluppo ma, rendendolo disponibile sin d'ora, il Gruppo OM Lesmo invita gli utenti a contribuire a svilupparlo ulteriormente. Il nuovo sito web sarà disponibile nel suo formato attuale per un periodo di prova, almeno fino al primo trimestre del 2010.

Durante questo periodo saranno apportati dei perfezionamenti sulla base dei suggerimenti e delle raccomandazioni degli utenti.

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## Conferenza riuscita sui sistemi FTTH

La conferenza inaugurale del Medio Oriente sulle fibre fino a domicilio (FTTH), tenutasi ad Amman il 10 e l'11 novembre 2009 ha registrato un gran successo.

La conferenza di due giorni si è svolta sotto il patrocinio del ministro giordano delle tecnologie delle informazioni e delle comunicazioni Eng Basem Al Rousan, che ha tenuto il discorso di apertura, ha partecipato ad una conferenza stampa e ha visitato la sala esposizioni.

Il dr. Mashour Abu Daka, ministro palestinese delle telecomunicazioni e della tecnologia delle informazioni ha tenuto un discorso programmatico, rivelando statistiche che dimostrano la crescente richiesta di Internet ad alta velocità.

Il programma della conferenza offriva una serie di presentazioni di alto livello che riguardavano importanti aspetti delle reti FTTH. Queste comprendevano sessioni tecniche in cui sono state presentate le più recenti soluzioni d'installazione e gestione delle reti FTTH.

Sono stati illustrati studi di casi in Medio Oriente, Europa e Asia che hanno fornito un approfondimento sul funzionamento quotidiano delle reti FTTH. Si è tenuto infine un workshop specifico in cui è stato discusso un caso commerciale dei sistemi FTTH.

Oltre 260 delegati si sono riuniti ad Amman Grand Hyatt Zara Expo dove 14 espositori hanno presentato le loro tecnologie d'avanguardia. Questa è un'ulteriore conferma che l'interesse per le fibre fino a domicilio (Fibre-to-the-Home) sta crescendo nella regione del Medio Oriente.

Gli analisti presenti alla conferenza hanno confermato che esiste un forte potenziale di richiesta locale di reti FTTH, che contribuirà alla crescita economica sostenibile della regione.

La prossima conferenza mediorientale sulle reti FTTH si terrà nel corso del 2010.

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# Utilizzo di elastomeri ad alte prestazioni in cavi per piattaforme offshore nelle regioni artiche

Manuel La Rosa e Andreas Roos, Lanxess Deutschland GmbH Technical Rubber Products, Leverkusen, Germania


## Riassunto

L'isola di Sakhalin e il campo metanifero di Shtokman nel mare di Barents sono fra le regioni potenzialmente più interessanti dal punto di vista dello sfruttamento delle risorse ambientali a livello mondiale. In queste regioni, le piattaforme offshore devono soddisfare requisiti estremamente rigorosi, soprattutto per quanto riguarda i cavi per pannelli di controllo e per strumentazioni. Un'elevata flessibilità a basse temperature (-50°C), un'eccezionale resistenza all'olio, e proprietà ignifughe e di resistenza alla corrosione sono solo alcune fra le caratteristiche richieste.

L'acetato di vinile-etilene EVM (copolimeri) (Levapren®) e la gomma nitrilica idrogenata HNBR (Therban®) sono prodotti ideali per raccogliere questo genere di sfide. L'assenza di alogeni, una buona resistenza all'olio, la resistenza all'ozono e ai raggi UV, associate a buone prestazioni meccaniche in un ampio spettro di temperature (da –40°C a 175°C) rendono questo materiale ideale per i cavi utilizzati nelle piattaforme offshore installate nelle regioni artiche.

Il presente articolo illustra vari composti a base di miscele di HNBR ed EVM, testati secondo standard internazionali quali IEEE 1580, NEK 606 e BS 6883. E' stata inoltre testata la resistenza a fluidi aggressivi come l'olio ed i fanghi di perforazione a base acquosa, nonché le prestazioni delle proprietà meccaniche a –50°C.


## Introduzione

### 1.1 La sfida artica

**Esplorazione e produzione di petrolio nella regione artica**

La Russia, il Canada, la Norvegia e gli Stati Uniti sono alcuni dei paesi impegnati nell'esplorazione e nello sviluppo delle risorse di idrocarburi nella regione artica. Lo scioglimento della calotta glaciale del Polo Nord è previsto nell'arco dei prossimi 50 anni, rendendo così possibile la navigazione, l'esplorazione e l'estrazione del petrolio nel mare artico. Le sfide collegate a questa operazione sono numerose: l'installazione remota di siti offshore, delle rigorosissime condizioni ambientali ed un fragile scenario geopolitico.

I giacimenti petroliferi di Shtokman e del mare di Barents sono tipici esempi delle estreme condizioni ambientali della regione artica (*Figura 1*).

Questo progetto prevede una produzione annua di 70.000 milioni di metri cubi di gas naturale e di 0,6 milioni di tonnellate di condensato di gas, paragonabile alla produzione annua di gas della Norvegia, uno dei maggiori produttori di gas europei.[1] Ubicato a 550km dalla costa, questo giacimento petrolifero non può essere raggiunto con l'elicottero dalle basi continentali. Venti gelidi, temperature estremamente basse e sei mesi di oscurità invernale rendono ancora più difficile lo sviluppo di questo giacimento[2].

La perforazione in acque profonde richiede l'utilizzo di navi per trivellazioni dotate di una struttura con dispositivi di protezione contro il ghiaccio nonché una rivoluzionaria imbarcazione a otto lati. Altre innovazioni sono rappresentate dalla realizzazione di piste d'atterraggio di ghiaccio ispessito, nuove concezioni di rompighiaccio, navi di rifornimento rompighiaccio, e bacini di carenaggio galleggianti per la manutenzione di altre imbarcazioni in loco.

▼ **Figura 1**: *Piattaforme in funzione in condizioni estreme nella regione artica*

Senza questi sviluppi, l'esplorazione e la produzione nella regione artica non sarebbe possibile[3].

**Norme per cavi di piattaforme petrolifere**

La norma NEK 606 è lo standard industriale internazionale per l'industria del petrolio e del gas, per l'industria navale e delle attività marittime offshore. I cavi in questione sono provvisti di certificazione ISO 9001 e 14001 rilasciata da Det Norske Veritas (DNV). La struttura dei cavi NEK 606 per le piattaforme petrolifere offshore è simile ad altri standard quali BS 6883 e IEEE 1580 tipo P[4].

### 1.2 Elastomeri ad elevate prestazioni per cavi utilizzati in climi rigidi

#### 1.2.1 Copolimeri di acetato di vinile-etilene Levapren® (EVM)

I copolimeri di acetato di vinile-etilene che presentano un contenuto dal 40% al 90% di acetato di vinile (VA) sono conosciuti come materiali in simil gomma.

La struttura principale saturata della catena polimerica offre agli EVM un'eccellente resistenza all'ozono e agli agenti atmosferici.

Essi presentano inoltre una resistenza a temperature elevate fino a 175°C ed un aumento del contenuto di VA dal 40% al 90% consente un notevole miglioramento della già ottima resistenza all'olio[5].

| Proprietá | Unitá | Requisiti |
|---|---|---|
| Resistenza alla trazione | [MPa] | 11±2 |
| Allungamento a rottura | [%] | 200±15 |
| Durezza | Shore A | 75±5 |
| Resistenza alla lacerazione | [N/mm] | 4-6 |
| Prova di piegatura a freddo | [°C] | @-40°C Senza crepe |
| Indice limite di ossigeno (LOI) | [%] | 32 |
| Invecchiamento in aria calda | [%] | TS/EB ±30 |
| Immersione in | [MPa]/[%] | TS/EB ±40 V: 15 |
| Immersione in fango a base oleosa | [MPa]/[%] | TS/EB ±30 W/V: 30 |
| Immersione in fango a base acquosa | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Immersione in fango a base di estere | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Mooney | ML | 40=60 |
| Prova con fiamma verticale | [cm] | 20cm |

▲ **Tabella 1**: *Proprietà principali descritte nelle norme relative ai composti per cavi offshore*

#### 1.2.2 Gomma nitrilica idrogenata (HNBR) Therban®

L'HNBR rappresenta un polimero quasi ideale per quanto riguarda i criteri di prestazione richiesti dagli ambienti artici. Le eccellenti proprietà di questo polimero sono dovute alla combinazione della struttura principale saturata con un gruppo laterale di acrilnitrile (ACN) altamente polare ed inerte.

Tale associazione fornisce le proprietà necessarie a resistere alla forte corrosione atmosferica causata dall'ozono e dai raggi UV, a mantenere la flessibilità a basse temperature, a resistere a fluidi ed olii altamente polari, a resistere ad elevate temperature (fino a 150°C) e a mantenere le proprietà meccaniche[6].

Le proprietà di resistenza alle basse temperature e all'olio dei prodotti Therban® sono strettamente legate al contenuto di acrilnitrile (ACN) che copre una gamma dal 20% al 50% circa.

In una serie omologa di polimeri HNBR non vi è una stretta correlazione lineare fra la temperatura di transizione vetrosa ($T_g$) ed il contenuto di acrilnitrile (ACN), principalmente perché il processo vetroso è altresì influenzato dalla cristallizzazione di sequenze di etilene di oltre 8-12 gruppi di $CH_2$. I copolimeri che presentano un contenuto di acrilnitrile inferiore al 37% sono parzialmente cristallini a basse temperature[7].

## 2 Sperimentazione

### 2.1 Composti per cavi per piattaforme offshore nelle regioni artiche

La *Tabella 2* illustra le formule dei composti preparati con un tipo di HNBR (ACN = 21%, RDB= 0,9%; ML1+4/100°C = 72±4 MU) e tipi di EVM (contenuto VA = 50±5 % e 70±5 % ; ML1+4100°C= 27±4 e 27±4 MU).

## Risultati e discussione

### 3.1 Proprietà meccaniche

Le principali proprietà sono state misurate in conformità alle norme descritte nella specifica NEK 606. Il composto 5, preparato con il polimero EVM contenente il 70% di VA, presenta il valore di resistenza alla trazione più basso di tutti i composti. Si tratta di un valore limite e non auspicabile essendo richiesto un certo margine per la variazione delle proprietà in seguito all'invecchiamento e all'immersione. I valori di resistenza alla trazione (TS) degli altri quattro composti sono comparabili e sono compresi nella stessa gamma (11MPa). Il composto 1 presenta ottime proprietà di tensione-deformazione con un elevato valore di allungamento a rottura e la minore durezza (Shore A) dell'intero studio (*Tabella 3*).

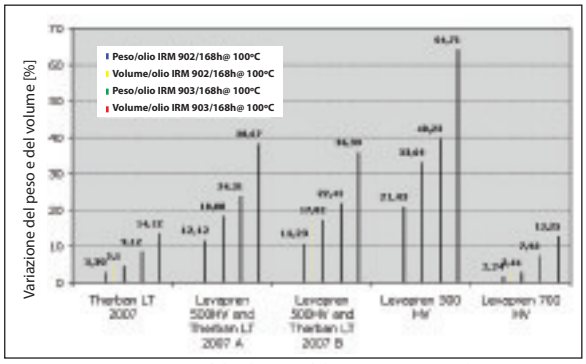
I composti 2 e 3, a base di miscele di polimeri, presentano valori di resistenza alla trazione (TS) simili ma i valori di

▼ **Tabella 2**: *Formulazioni a base di EVM ed elastomeri speciali di HNBR*

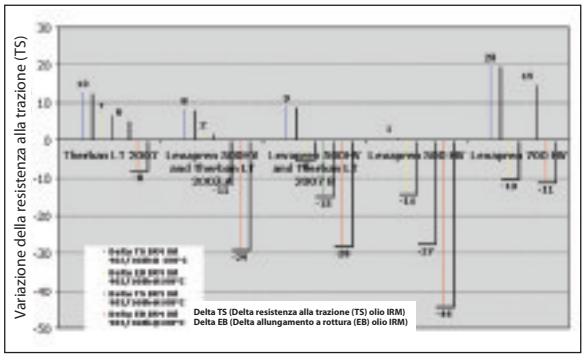
| Composizione | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| THERBAN® LT 2007 (HNBR (ACN= 21%) | 100 | 50 | 50 | | |
| LEVAPREN® 500 HV (EVM (VA=50%) | | 50 | 50 | 100 | |
| LEVAPREN® 700 HV (EVM (VA=70%) | | | | | |
| APYRAL® 120 E (ATH BET= 12 $m^2/g$) | 80 | 80 | 80 | 80 | 100 |
| APYRAL® SM 200 (ATH BET= 22 $m^2/g$) | 60 | 60 | 60 | 60 | 70 |
| BORATO di ZINCO | 10 | 10 | 10 | 10 | 10 |
| SILQUEST® RC-1 SILANO | | | 2 | | |
| GENIOSIL® XL 33 | 2 | 2 | | 2 | 2 |
| EDENOL® 888 (DOS) | 10 | 10 | 10 | 10 | 10 |
| DIPLAST® TM 8-10/ST (TOTM) | 10 | 10 | 10 | 10 | 5 |
| RHENOFIT DDA-70 | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 |
| STABAXOL® Poudre-P (PCD) | 1 | 1 | 1 | 1 | 1 |
| MAGLITE® DE (MgO) | 3 | 3 | 3 | 3 | 3 |
| STEARATO di ZINCO | 1 | 1 | 1 | 1 | 1 |
| STEARATO di CALCIO | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| EDENOR® C 18 98-100 | 1 | 1 | 1 | 1 | 1 |
| CORAX® N 550/30 (Nerofumo Carbone) | 5 | 5 | 5 | 5 | 5 |
| RHENOFIT® TRIM/S | 2 | 2 | 2 | 2 | 2 |
| PERKADOX® 14-40 B-PD | 6,5 | 6,5 | 6,5 | 6,5 | 6,5 |
| Totale | 294,4 | 294,4 | 294,40 | 294,40 | 319,40 |
| Densitá | 1,453 | 1,468 | 1,560 | 1,484 | 1,609 |

▼ **Tabella 3**: *Proprietà meccaniche dei composti sviluppati*

| Proprietá meccaniche | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Resistenza alla trazione (MPa) | 11,1 | 11,0 | 11,7 | 11,5 | 8,5 |
| Allungamento a rottura (%) | 384 | 270 | 236 | 251 | 265 |
| M 50 (MPa) | 1,8 | 2,5 | 3,1 | 2,8 | 3,0 |
| M 100 (MPa) | 4,0 | 5,9 | 7,3 | 6,4 | 6,2 |
| Durezza Shore A a 23° | 65 | 69 | 76 | 73 | 76 |
| Resistenza alla lacerazione ASTM D-470 | 6,4 | 3,2 | 3,2 | 4,1 | 3,9 |




▲ **Figura 2**: *Variazione del volume e del peso in seguito ad immersione in olio IRM 902 e 903 per 168 ore a 100°C*




▲ **Figura 3**: *Variazione delle proprietà di resistenza alla trazione in seguito ad immersione in olio IRM 902 e 903 per 168 ore a 100°C*

allungamento a rottura (EB) fino al 100% sono inferiori rispetto ai composti a base di HNBR. I valori di durezza e dei moduli sono superiori se comparati con il composto 1. Effettuando una comparazione fra il composto 2 e il composto 3, è possibile apprezzare una maggiore densità di reticolazione (durezza superiore) e moduli superiori (M50 ed M100) nel composto 3, preparato con Silquest RC-1.

Risulta invece difficile una comparazione fra il composto 4 e il composto 5 poiché il contenuto di filler ed il contenuto di plastificante non sono uguali. Inizialmente, un composto con la stessa quantità di filler e plastificante come anche le altre formulazioni presentava proprietà di tensione-deformazione molto scarse (6,4 MPa e 290% di allungamento a rottura) e valori di durezza e resistenza alla lacerazione ridotti. Per questa ragione è stata effettuata un'ottimizzazione aumentando la quantità di filler e riducendo il plastificante (30 parti per cento di gomma (phr) più ATH e 5phr meno di plastificante DOS). Fischer et al [8] hanno scoperto una correlazione fra il contenuto di VA e la densità di reticolazione dei composti Levapren® preparati nelle stesse condizioni (contenuto costante di perossido e di altri additivi). Questo potrebbe spiegare le scarse proprietà di tensione-deformazione riscontrate nel composto 5 iniziale.

### 3.2 Resistenza dei fluidi

#### 3.2.1 Olio IRM 902 e 903

La resistenza all'olio è strettamente collegata alla polarità di un elastomero. La polarità degli elastomeri EVM è determinata dal contenuto di acetato di vinile e per gli elastomeri HNBR dal contenuto di acrilnitrile[5]. La misurazione della variazione delle proprietà e del volume in seguito all'immersione in olio conferma tale effetto (*Figure 2* e *3*).

I composti a base di polimero EVM con un contenuto di VA del 70% e a base di HNBR LT hanno esibito la minore dilatazione e la minore variazione di resistenza alla trazione. Questo fenomeno potrebbe essere attribuito all'alta polarità generata da un elevato contenuto di VA nel polimero EVM (70%), mentre nel caso del materiale HNBR, la polarità è intrinseca nel forte effetto dipolo-dipolo sul gruppo ACN che, malgrado la sua bassa concentrazione nel Therban LT 2007, è sufficiente a fornire la necessaria resistenza all'olio richiesta per tali composti.

Le variazioni delle proprietà di resistenza alla trazione più significative si possono osservare in composti a base di polimero EVM contenente il 50% di VA. La polarità di questo composto è sufficiente solo a sopportare l'immersione nell'olio IRM 902, ma non nell'olio IRM 903 che è più aggressivo e polare rispetto al 902.

I composti di polimeri EVM con contenuto di VA del 70% hanno esibito una resistenza all'olio comparabile a quella dei composti a base di HNBR (*Figure 2* e *3*).

#### 3.2.2 Fanghi di perforazione a base acquosa e oleosa

**Sistemi a base acquosa**

I cationi bivalenti quali il calcio ed il magnesio, aggiunti al fango di perforazione a base di acqua fresca, inibiscono la formazione di argilla e la dilatazione di argilla scistosa. Per controllare l'argilla scistosa squamosa e la dilatazione del foro e per prevenire danni alle attrezzature vengono utili zzate grandi quantità di calcio solubile. I fanghi trattati con il calcio resistono al sale e alla contaminazione di anidrite ma sono suscettibili di congelamento e solidificazione ad alte temperature[9].

**Sistemi a base di olio**

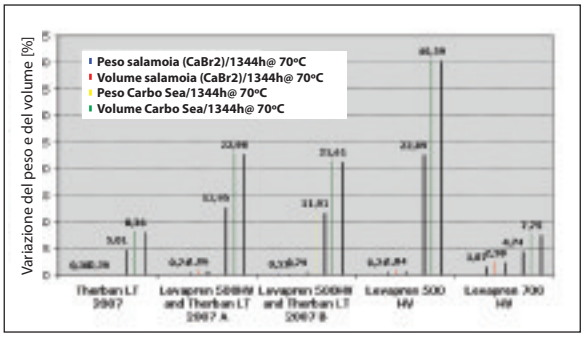
Si tratta di sistemi basati su emulsioni idro-oleose, generalmente composte di salamoia di cloruro di calcio (fase emulsionata) e olio (fase continua), che possono contenere fino al 50% di salamoia nella fase liquida. I fanghi a emulsione inversa sono emulsioni "rilassate" che presentano una stabilità elettrica inferiore e valori di perdita di fluido superiori.

Nelle *Figure 4* e *5* si può osservare l'effetto sul peso, il volume e la variazione delle proprietà di resistenza alla trazione. I composti a base di Therban LT 2007 e Levapren 700 HV hanno evidenziato le migliori prestazioni e mantenimento delle proprietà. È importante selezionare i materiali con un livello di polarità elevato poiché la polarità dei composti gioca un ruolo fondamentale nelle prestazioni di resistenza all'olio. Nel caso di composti a base di miscele di polimeri, sembra che esista una sinergia fra i polimeri HNBR ed EVM (qualora siano richieste prestazioni fisiche estreme, il polimero EVM può essere miscelato con il HNBR). Ciò contribuisce a ridurre il costo complessivo del composto e a migliorare la lavorazione senza influenzare la resistenza al calore e all'olio. In passato le miscele di HNBR e EVM erano state sviluppate per soddisfare specifiche molto esigenti, specialmente nel settore della tecnologia militare navale [NES 518 (Def-Stand 61-31 parte 12) e VG 95218[10].

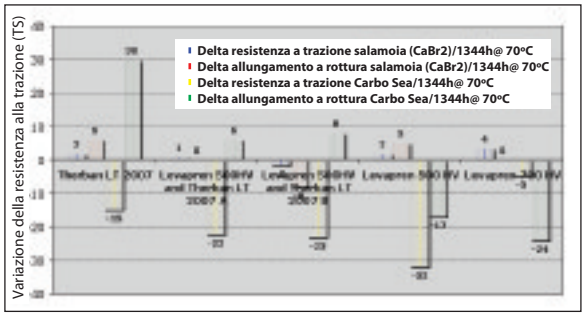
### 3.3 Proprietà a basse temperature

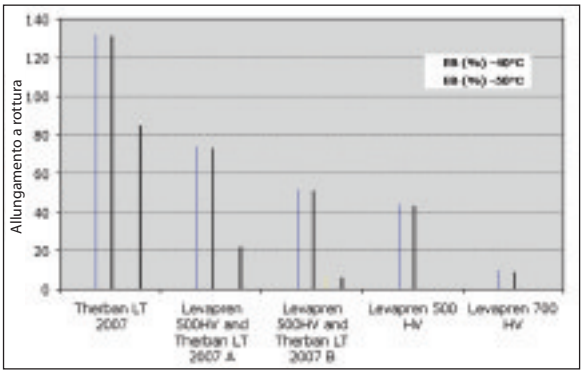
La flessibilità dei cavi per piattaforme offshore nelle regioni artiche è fondamentale per assicurare la massima efficienza (interruzione e manutenzione

▼ **Figura 4**: *Variazione di peso e volume in seguito ad immersione in salamoia e fango di perforazione a base di Carbo Sea per 1.344 ore a 70°C*

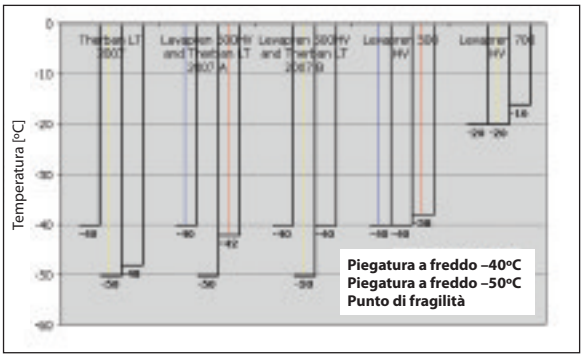



▼ **Figura 5**: *Variazione delle proprietà di resistenza a trazione in seguito ad immersione in salamoia e fango di perforazione a base di Carbo Sea per 1.344 ore a 70°C*






▲ **Figura 6**: *Allungamento a rottura di composti di cavi misurati a –40 °C e –50°C*




▲ **Figura 7**: *Curvatura a freddo misurata a –40 °C e –50°C e punto di fragilità*

minime) della produzione di petrolio e gas e delle operazioni di raffinazione di queste installazioni. Le temperature estreme (–40°C e –50°C) sono comuni in questo tipo di ambiente. É quindi importante utilizzare materiali caratterizzati da una bassa temperatura di transizione vetrosa che assicuri la mobilità delle catene polimeriche a livelli di energia più bassi. La mobilità dei segmenti polimerici entro un'ampia gamma di temperature riduce il rischio di cristallizzazione e l'effetto indurente sul polimero, prevedibile in cavi fissi per piattaforme installate in regioni caratterizzate da condizioni ambientali difficili.

Come è possibile osservare sulla *Figura 6*, la resistenza alla trazione (allungamento a rottura) di questi composti è stata misurata a –40°C e –50°C. Il composto a base di Therban® LT 2007 presenta indubbiamente le migliori prestazioni a –40°C e –50°C (maggiore allungamento a rottura) seguito dal composto a base di Therban® LT 2007 e Levapren® 500 HV (preparato con il Geniosil® XL 33), una combinazione di plastificanti (TOTM e DOS) e una combinazione di diversi triidrossidi specifici per superfici (BET) e di alluminio (Apyral® 120E and SM 200).

**Effetti degli agenti di accoppiamento**

L'elevata reattività di un alfa-silano, come il Geniosil® XL 33, può aver contribuito a migliorare il livello di interazione fra i polimeri ed il filler assicurando così un buon equilibrio delle proprietà meccaniche ed una minore densità di reticolazione. Gli alfa-silani sono intrinsecamente più reattivi dei silani standard; ciò significa che può essersi prodotto un livello superiore di idrofobizzazione dell'ATH anche quando il filler specifico per superfici utilizzato non è tale da assicurare l'idrofobizzazione.

**Effetto del plastificante**

La combinazione di 10phr di Dioctil sebacato (DOS) e plastificante TOTM (Tris (2-etilesil) trimellitato) ha fornito la flessibilità a freddo necessaria per le basse temperature. Normalmente, i plastificanti a base di TOTM vengono utilizzati in applicazioni in cui la ridotta volatilità è di importanza fondamentale. Queste applicazioni includono l'isolamento di fili e cavi e di interni di automobili. Il TOTM presenta eccezionali proprietà di bassa migrazione e resistenza all'estrazione[11]. Il DOS è un eccellente plastificante resistente al freddo con un elevato impatto sulla temperatura di transizione vetrosa, ma con una volatilità superiore al TOTM. Entrambi i plastificanti sono indicati per copolimeri EVM, etilcellulosa e gomma sintetica e particolarmente adatti a fili e cavi resistenti al freddo o per pelli artificiali. Queste proprietà di resistenza alle basse temperature sono determinate dalla struttura molecolare.

La curvatura a freddo a –40°C e –50°C e il punto di fragilità sono stati misurati per tutti i composti sviluppati. Solo il composto preparato con Levapren® 700HV non ha soddisfatto i requisiti di curvatura a freddo a –40°C.

E solo i composti a base di Therban® LT 2007 e di miscele di questo polimero con Levapren® 500HV hanno soddisfatto i requisiti di curvatura a –40°C e –50°C, rendendoli adatti ad impianti che funzionano a temperature così basse (*Figura 7*).

Il basso valore di temperatura di transizione vetrosa ($T_g$) del HNBR e l'effetto plastificante del DOS e del TOTM consentono la produzione di composti con questo grado di flessibilità.

Le prestazioni dei composti preparati con Levapren® 700HV non si sono dimostrate altrettanto soddisfacenti a basse temperature come quelli preparati con Levapren® 500HV. Ciò è dovuto al valore superiore di $T_g$ del materiale con polimero EVM contenente il 70% di VA se comparato al materiale con polimero EVM contenente il 50% di VA (–17°C rispetto a –28°C), e anche perché la composizione delle formulazioni a base di Levapren® 700HV è stata realizzata utilizzando solo 15phr di plastificante anziché 20phr come in altri composti.

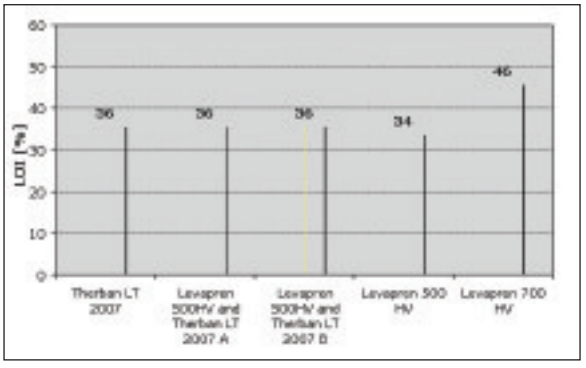
Le misurazioni a basse temperature per un composto preparato con 20phr di plastificante sono state condotte in studi precedenti in cui proprietà meccaniche quali la resistenza alla trazione sono risultate piuttosto scarse. Un'elevata quantità di plastificanti in composti esclusivi di polimeri EVM contenenti 70% di VA ha un effetto negativo sul profilo globale delle proprietà meccaniche.

### 3.4 Proprietà ignifughe

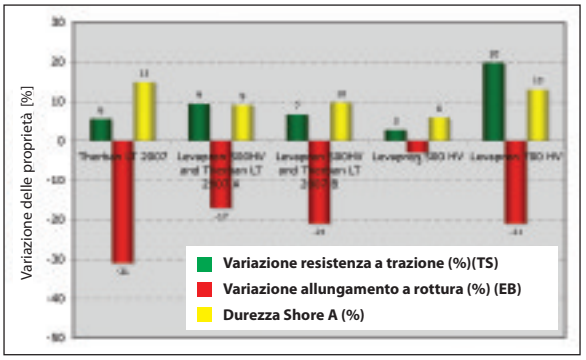
Tutti i composti presentavano una combinazione di filler ATH (Apyral® con BET= 12 e 20 $m^2/g$) che potrebbe aver contribuito ad offrire proprietà meccaniche e valori dell'indice limite di ossigeno (LOI) soddisfacenti.

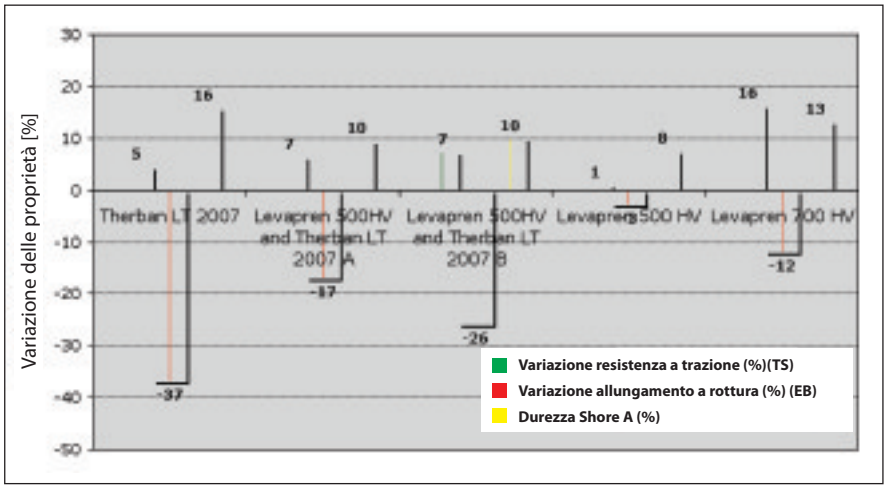
L'indice limite di ossigeno per i composti è stato realizzato conformemente alla norma ASTM D 2863; tutti i composti hanno esibito valori LOI superiori al 34%. Un composto a base di Levapren 700 HV ha evidenziato un

▼ **Figura 8**: *Indice limite di ossigeno per composti sviluppati conformemente alla norma ASTM D 2863*




▼ **Figura 9**: *Prova di invecchiamento in aria calda per 336 ore a 135°C*






▲ **Figura 10**: *Prova di invecchiamento in aria calda per 672 ore a 135 °C*

valore LOI eccezionalmente elevato (46%) il che può dipendere da:

1 Presenza di polimeri EVM con elevato contenuto di VA (70%) e la loro sinergia con i filler ATH
2 Bassa quantità di plastificanti e valore superiore di ATH

I filler ATH con particelle di diverse dimensioni, combinati con borato di zinco, forniscono un residuo di carbonizzazione molto compatto e stabile in caso di incendio. Nel 1991 Meisenheimer[12] descrisse l'effetto sinergico dei polimeri EVM e ATH, spiegando che l'indice limite di ossigeno per i composti per cavi FRNC di Levapren presenta un aumento, sotto carico costante, di 190phr o più in composti con contenuto di VA superiore a 65% wt. Inoltre, altri studi interni realizzati con il Geniosil® XL 33 rilevarono un effetto interessante sul LOI in composti preparati con Levapren® 700HV e 190phr ATH (BET=12m²/g). Un aumento del contenuto di silano fino a 3phr corrispondeva ad un aumento dell'indice limite di ossigeno (LOI).

### 3.5 Proprietà di invecchiamento in aria calda

Secondo la specifica NEK 606 è necessario effettuare un test di invecchiamento in aria calda per 168 ore a 120°C su composti destinati al rivestimento di cavi.

Per forzare i limiti dei composti sviluppati, è stato eseguito un test rigoroso per 168 ore, 336 ore e 672 ore a 135°C. I valori di variazione delle proprietà in seguito all'invecchiamento sono riportati sulle *Figure 9* e *10*.

Dopo 336 ore, si osservano i primi effetti dell'invecchiamento nei composti sviluppati, specialmente sull'allungamento a rottura di composti a base di Therban® LT 2007, Therban® LT 2007 e Levapren® 500 HV B (*Figura 9*). Dalla comparazione con l'invecchiamento dopo 336 ore, i composti sviluppati mantengono bene le loro proprietà dopo 672 ore; sono apprezzabili solo lievi cambiamenti delle variazioni delle proprietà, specialmente per i composti a base di Levapren® 500HV (*Figura 10*). Le proprietà possono essere regolate ottimizzando il pacchetto di stabilizzazione del calore a base di Stabaxol® P and Rhenofit® DDA-70.

Ai fini del presente studio, la resistenza all'invecchiamento in aria calda soddisfa i requisiti delle norme sui cavi.

Un aumento della temperatura di esercizio dei cavi installati su piattaforme offshore potrebbe comportare un miglioramento nella concezione globale del cavo per pannelli e strumentazioni, utilizzando meno conduttori di rame e quindi riducendo i costi complessivi dei cavi.

## 4 Conclusioni

- Levapren 700 HV è un composto a base di polimeri indicato per cavi HFFR resistenti all'olio e al fango, sebbene non molto indicati per cavi con resistenza a basse temperature tipici degli ambienti artici (–40°C e –50°C)
- È stato dimostrato che miscele di HNBR ed EVM offrono un buon compromesso fra le proprietà di resistenza all'olio e al fango e la resistenza all'invecchiamento in aria calda, sebbene con prestazioni insufficienti a bassa temperatura (scarso allungamento a rottura a –40°C e –50°C e curvatura a freddo a –50°C)
- Il Therban® LT 2007 ha fornito prestazioni eccellenti nelle misurazioni effettuate alle basse temperature (fino a –50°C) tipiche delle regioni artiche. Nei composti preparati con questo materiale è stato osservato un eccellente equilibrio fra le proprietà meccaniche, la resistenza all'olio e al fango e le proprietà ignifughe; tuttavia, con prestazioni piuttosto scarse nella prova di invecchiamento in aria calda
- L'elevata polarità dei materiali HNBR combinati con i polimeri EVM offre al mercato del petrolio e del gas soluzioni di composti per cavi con un rapporto costo-prestazione relativamente soddisfacente
- Lo sviluppo di composti per cavi ad elevate prestazioni richiede l'utilizzo di additivi speciali quali gli alfa silani e i filler ignifughi composti di particelle finissime
- Una combinazione di plastificanti con diverse caratteristiche ed un filler per superfici altamente specifico hanno garantito la conformità dei requisiti di flessibilità alle basse temperature e la curvatura a freddo a –40°C e –50°C ■

## 5 Riferimenti bibliografici


[1] http://www.gazprom.com/eng/Arcticles/Arcticle21712.shtml
[2] http://www.upstreamonline.com/incoming/Arcticle132282.ece
[3] A D McCracken, T P Poulton, E Macey, J M Monro Gray and G S Nowlan, *"Arctic oil and gas"* Popular Geoscience http://www.gac.ca, 2007
[4] http://www.nek606.net/
[5] E Rohde *"Ethylene vinyl acetate elastomers: applications and opportunities for industrial rubber goods"* 141st Meeting of the Rubber Division American Chemical Society, Proceedings (1992)
[6] D Achten *"Next generation HNBR grades: new materials for oilfield applications"* Oilfield Engineering and Polymers (2006)
[7] H Magg *"The structure of Therban® (HNBR) and the impact of the low temperature characteristics of elastomeric materials"* 3° Werkstoffkongress, Loeben Graz (2005)
[8] C Fischer, C Wrana, J Ismeier, F Taschner, *"Crosslink architecture of EVM based vulcanisates and its influence on technologically relevant properties"* German Rubber Conference Proceedings, July 3–6, Nuremberg, 2006
[9] World Oil Fluids 2007 "Drilling completion and workover fluids" Gulf Publishing Co, PO Box 2608, Houston, TX 77252 USA (2007)
[10] M La Rosa, C Wrana, D Achten "Electron beam curing of EVM and HNBR for cable compounds" 55th IWCS Conference (2006)
[11] http://www.eastman.com/NR/rdonlyres/17704C03–05BD–448F–8221–2F39C01E7191/0/L167.pdf
[12] H Meisenheimer, *"Low smoke, non–corrosive fire retardant cable jacket based on HNBR and EVM"* Jicable'91 June 24–28, Versailles, 1991



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# Éxito de la conferencia sobre FTTH

La conferencia de inauguración de Medio Oriente sobre fibra hasta el hogar (FTTH), celebrada en Amman el 10 y 11 de noviembre de 2009, cosechó un gran éxito.

La conferencia de dos días fue celebrada con el patrocinio del ministro de telecomunicaciones jordano Basem Al Rousan, quien dio el discurso de apertura, participó en una conferencia de prensa y visitó la sala de exposiciones.

Mashour Abu Daka, ministro de telecomunicaciones y tecnología de la información palestino, dio un discurso de apertura, revelando datos estadísticos que indicaban la creciente demanda de Internet a alta velocidad.

El programa de la conferencia incluía una serie de presentaciones de alto nivel sobre importantes aspectos de las redes FTTH. Contaba, además, con sesiones técnicas donde se presentaron las últimas soluciones para el despliegue y funcionamiento de FTTH. Se ilustró el funcionario cotidiano de las redes FTTH a través de casos en Medio Oriente, Europa y Asia.

Y en un seminario especial se trató el caso comercial de las redes FTTH.

Más de 260 delegados se dieron cita en la Amman Grand Hyatt Zara Expo, donde 14 expositores presentaron las tecnologías de vanguardia. Esto es un indicio más de que el interés por la fibra hasta el hogar está creciendo en Medio Oriente.

Todos los analistas que expusieron en la conferencia corroboraron el fuerte potencial de la demanda local de FTTH, que contribuiría al crecimiento económico sostenible de la zona.

La próxima conferencia sobre FTTH en Medio Oriente será celebrada en 2010.

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# Página web nueva

El Grupo OM Lesmo ha implementado una nueva página web más rápida y fácil de usar con el fin de mantener a sus clientes informados sobre el desarrollo de sus productos, ofrecer información técnica y contener enlaces a subsidiarias que representen a varios fabricantes europeos de máquinas y productos para el sector internacional del hilo y del cable.

La página web todavía está en fase de preparación pero, anunciándola ahora, el grupo OM Lesmo invita a los usuarios a contribuir a su renovación.

La nueva página estará disponible en su formato actual durante un tiempo de prueba, al menos durante el primer trimestre de 2010; en este tiempo se aportarán mejoras en función de las sugerencias y recomendaciones de los usuarios.

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**Email**: info@omlesmo.com
**Website**: www.omlesmo.com

# Contrato para poner en marcha el proyecto Neptuno 2

SKET se ha adjudicado un contrato de suministro de equipos para el proyecto Neptuno 2 de Kiswire. En el cuarto trimestre de 2010 se hará entrega de lo que se considera la mayor cerradora planetaria y la cableadora tubular más larga del mundo. Las máquinas serán usadas para fabricar cables submarinos de alta mar, entre otros productos.

La cerradora planetaria modelo MKVS 1+8 x 2700 está diseñada para fabricar cables de 160mm de diámetro. La máquina estará equipada con un enrollador y desenrollador para carretes de 600 toneladas de capacidad máxima. Tanto los carretes de desenrollado como los de enrollado tienen una brida de 5.600mm de diámetro y un ancho de distribución de 10.000mm.

El anterior mayor enrollador de SKET tenía una capacidad de bobinado de 400 toneladas y actualmente está en marcha en las instalaciones de Bridon International.

▲ *Enrollador de SKET en marcha en las instalaciones de Bridon International*

La cableadora tubular de alta velocidad, de tipo SRW 1+48x800 (32"), producirá cables trenzados de hasta 55mm de diámetro a una velocidad máxima de línea de 100m/min. Esta línea también podrá producir cables trenzados compactos. La anterior mayor cableadora tubular de alta velocidad de SKET, de tipo SRW 1+48x630, lleva más de diez años funcionando satisfactoriamente en la planta Neptuno 1 de Kiswire en Malasia.

El proyecto Neptuno 2, que ha supuesto una inversión de 80 millones de dólares en una extensión de 20 acres, algo más de 81.000m2, cercana a la planta Neptuno 1 de Johor, estará terminado para 2011.

**SKET Verseilmaschinenbau GmbH – Alemania**
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# Grupo de trabajo en China

Fushi Copperweld Inc. ha anunciado que la subsidiaria de la compañía, Fushi International (Dalian) Bimetallic Cable Co Ltd., ha sido designada para formar y organizar el primer grupo de trabajo sobre conductores compuestos de China por la Administración de Normalización de China (SAC). La SAC, fundada en abril de 2001, está autorizada por el Consejo de Estado de la República Popular China para redactar, formular y aplicar leyes y normas estatales para normalización de productos.

Tras un ciclo formativo, el grupo de trabajo será el primer organismo regulatorio chino para conductores compuestos. El grupo de trabajo, que reunirá a una serie de expertos, líderes y empresas conocidos del sector industrial, estará encargado de elaborar una norma de carácter nacional para los hilos conductores compuestos utilizados en el campo de las telecomunicaciones, electricidad, automoción, ferrocarriles, industrial y servicios, además de otros campos de transmisión de potencia y señales de alta frecuencia.

En 2007 la compañía, junto con el CETC-23 (Instituto de Investigación nº 23 de la corporación China Electronic Science and Technology Group) y otros expertos del sector industrial, elaboró una norma nacional para el hilo de aluminio revestido de cobre. La norma nacional propuesta para el hilo de aluminio revestido de cobre ha sido aprobada oficialmente por el Comité de Normas Nacional y está en espera de su aplicación en ámbito industrial.

**Fushi Copperweld Inc – China**
**Website**: www.fushicopperweld.com

## Elección de un productor de hilo para neumáticos

Radyne IHWT ha completado satisfactoriamente el suministro, instalación y puesta en marcha del equipo de calentamiento por inducción de seis líneas de difusión de hilos para neumáticos TCD (Tyre Cord Diffusion) en China, cada una con capacidad para 24 hilos a 80DV para diámetros comprendidos entre 1,1mm y 2,2mm.

Cada línea, instalada en la planta de un productor líder chino, comprendía una zona de precalentamiento y una de calentamiento final, equipadas las dos con una fuente de alimentación IGBT (transistor bipolar de puerta aislada) y seguidas por dos zonas de mantenimiento de temperatura mediante horno de mufla. El proceso de difusión de hilos para neumáticos evita la corrosión del hilo dentro del neumático y actúa como lubricante en la fase de reducción de diámetro del hilo en las operaciones de estirado siguientes.

Los sistemas de difusión de hilos para neumáticos de Radyne ofrecen numerosas ventajas y beneficios, como la elevada eficiencia eléctrica y el calentamiento sin contacto que evita tener que calentar materiales como la arena. El sistema es fácil de usar e incluye un sistema de control con interfaz Siemens integrado en el tablero de mando del operador y en comunicación con el PLC serie Simatic de Siemens mediante protocolo Profibus DP.

Y lo más importante, el sistema de difusión de hilos para neumáticos de Radyne garantiza coherencia productiva gracias a la perfecta difusión del cobre y del zinc. Es posible calentar varios hilos con DV elevado y es fácil pasar de un diámetro a otro.

**Radyne IHWT – Reino Unido**
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# Venta de Wardwell

SKET Verseilmaschinenbau Magdeburg GmbH ha comprado los bienes de Wardwell. Anteriormente, SKET había comprado los bienes de Wardwell Europe y fue también el mejor postor de los bienes del fabricante de máquinas trenzadoras en la subasta del 14 de diciembre de 2009.

Un portavoz del fabricante alemán y miembro del Grupo WILMS confirmó la adquisición y sus planes de reiniciar las operaciones en el mismo lugar el 4 de enero de 2010. La nueva compañía tendrá una plantilla más reducida al principio, y un nombre nuevo, Stolberger Incorporated DBA Wardwell Braiding Co.

**Stolberger Incorporated DBA Wardwell Braiding Co – Estados Unidos**
**Email**: jtomaz@wardwell.com

# Grupo Madem en Rumania

La planta productiva más reciente del Grupo Madem, llamada Madem Romania, inauguró oficialmente sus actividades en el distrito rumano de Bistrita Nasaud, ceremonia a la que asistieron varios funcionarios locales, clientes, proveedores y amigos.

A la ceremonia acudieron el presidente del Grupo Madem, Gino Mazzoccato, el director administrativo, Rafael Romagna, acompañados del gobernador del distrito de Bistrita Nasaud, Ovidiu Cretu, y del embajador brasileño en Rumania, Vitor Gobbato.

Madem Romania ofrecerá suministro a los clientes locales y durante el 2010 ampliará el servicio a otros países de Europa del este.

"Madem Romania está situada estratégicamente en una zona clave provista de reservas madereras renovables y con una considerable base de clientes constituida por fabricantes y proveedores de pequeña a mediana entidad, con los que Madem Romania ha formado asociaciones de beneficio recíproco.

Hoy en día, junto con nuestros partners, estamos orgullosos de formar parte del mercado de Europa del este, prestando servicio a nuestros clientes y procurando, al mismo tiempo, mejorar la calidad de nuestros procesos", declaró Cristian Outeiral, director general de Madem Romania.

▲ *Ceremonia de inauguración en Madem Romania*

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# Uso de elastómeros de altas prestaciones en cables para plataformas de alta mar en las regiones árticas

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## Resumen

La isla de Sakhalin y los campos petrolíferos de Shtokman en el Mar de Barents son unas de las regiones con el ambiente operativo más desafiante del mundo. Las plataformas petrolíferas de estas zonas deben cumplir normas rigurosas, especialmente las relacionadas con cables de paneles de control e instrumentos. Propiedades como la alta flexibilidad a baja temperatura (-50°C), excelente resistencia al aceite, retardo de llama y resistencia a la corrosión son solamente algunos de los requisitos.

El caucho de etileno-acetato de vinilo EVM (copolímeros) (Levapren®) y el caucho de nitrilo-butadieno hidrogenado HNBR (Therban) son ideales para cumplir estos retos. Estos materiales, sin halógenos, con una buena resistencia al aceite, resistentes al ozono y a la luz UV, y con buenas prestaciones mecánicas en un amplio campo de temperaturas (de –40°C a 175°C), resultan ideales para los cables de plataformas en alta mar de las regiones árticas.

Este estudio presenta varios compuestos, cuya base está constituida por mezclas de HNBR y EVM, que han sido probados según normas internacionales como las IEEE 1580, NEK 606 y BS 6883. Se ha probado su resistencia a fluidos agresivos como los lodos de perforación a base de aceite o agua, y sus propiedades mecánicas a –50°C.


## 1 Introdución

### 1.1 El desafío ártico

**La exploración y producción de petróleo en el Ártico**

Rusia, Canadá, Noruega y Estados Unidos son algunos de los países que están tratando de explorar y desarrollar los recursos de hidrocarburos en el Ártico. La fusión de la capa de hielo del Polo Norte está prevista en un plazo de 50 años, permitiendo la navegación y la exploración petrolera en el Mar Ártico. Los retos que supone esta operación son numerosos: sitios remotos en alta mar, condiciones ambientales extremas y situación geopolítica frágil.

Los yacimientos petrolíferos de Shtokman y del Mar de Barents son ejemplos típicos de este duro ambiente ártico (*figura 1*). Este proyecto prevé una producción anual de 70.000 millones de metros cúbicos de gas natural y 0,6 millones de toneladas de condensado de gas, comparables a la producción anual de gas de Noruega, uno de los principales proveedores de gas europeos[1].

Los yacimientos se encuentran a 550km de la costa y no es posible llegar a las plataformas en helicóptero. Vientos gélidos, temperaturas bajísimas y seis meses de oscuridad en invierno son otros factores que hacen difícil el desarrollo de este yacimiento[2].

Para realizar perforaciones en aguas profundas ha sido necesario utilizar naves de perforación reforzadas para resistir al hielo e incluso un revolucionario barco de ocho caras. Entre otras innovaciones implantadas se pueden citar aeródromos de hielo espeso, nuevos diseños de barcos rompehielos, barcos rompehielos de abastecimiento y diques secos flotantes para el mantenimiento de otros buques directamente en el sitio. Sin estos avances, la exploración y producción en el Mar Ártico no sería posible[3].

▼ **Figura 1**: *Plataformas trabajando en condiciones extremas en el Mar Ártico*

**Normas para cables de plataformas petrolíferas**

NEK 606 es la norma industrial internacional para la industria del petróleo y gas, instalaciones en buques y estructuras marinas en alta mar. Estos cables son certificados ISO 9001 y 14001 por Det Norske Veritas (DNV).

La fabricación de cables de acuerdo con la norma NEK 606 para plataformas de alta mar es similar a las establecida en otras normas como la BS 6883 y IEEE 1580 tipo P[4].

### 1.1 Elastómeros de altas prestaciones para cables usados en climas fríos

#### 1.2.1 Copolímeros de etileno-acetato de vinilo (EVM) Levapren

Los copolímeros de etileno-acetato de vinilo con contenido de entre un 40% y un 90% de acetato de vinilo (VA) son conocidos como cauchos sintéticos. La cadena polimérica principal saturada da a los elastómeros EVM una excelente resistencia al ozono y a las condiciones climáticas.

También son resistentes a temperaturas elevadas de hasta 175°C y el aumento de su concentración de acetato de vinilo, que oscila entre el 40% y el 90%, mejora significativamente sus ya muy buenas características de resistencia al aceite[5].

#### 1.2.2 Caucho de nitrilo-butadieno hidrogenado (HNBR) Therban

El HNBR es un polímero prácticamente ideal para ofrecer las prestaciones requeridas en los ambientes árticos. Sus notables propiedades se deben a su cadena polimérica principal saturada, además de a una cadena lateral de acrilonitrilo (ACN) altamente polar e inerte.

Todo esto ofrece las propiedades requeridas para soportar el fuerte deterioro debido al ozono y los rayos UV, mantener la flexibilidad a baja temperatura, resistir el ataque de fluidos y aceites altamente polares, resistir a temperaturas elevadas (de hasta 150°C) y mantener sus propiedades mecánicas[6].

| Propiedades | Unidades | Requisitos |
|---|---|---|
| Resistencia a la tracción | [MPa] | 11±2 |
| Alargamiento a la rotura | [%] | 200±15 |
| Dureza | Shore A | 75±5 |
| Resistencia al desgarro | [N/mm] | 4-6 |
| Prueba de doblado en frío | [ºC] | @-40ºC Sin grietas |
| Índice limite de oxygeno (LOI) | [%] | 32 |
| Envejecimiento en aire caliente | [%] | TS/EB ±30 |
| Immersión en | [MPa]/[%] | TS/EB ±40 V: 15 |
| Inmersión en lodo a base de aceite | [MPa]/[%] | TS/EB ±30 W/V: 30 |
| Inmersión en lodo a base de agua | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Inmersión en lodo a base de éster | [MPa]/[%] | TS/EB ±25 W/V: 20/15 |
| Mooney | ML | 40=60 |
| Prueba de llama vertical | [cm] | 20cm |

**Tabla 1**: *Propiedades principales descritas en normas para compuestos de cables en alta mar*

La resistencia a las bajas temperaturas y al aceite de las calidades Therban® está estrictamente relacionada con el contenido de acrilonitrilo (ACN), que va aproximadamente de un 20% a un 50%.

En una serie homóloga de polímeros HNBR no hay una correlación estrictamente lineal entre la temperatura de transición vítrea ($T_g$) y el contenido de ACN, básicamente porque el proceso de vitrificación se ve influenciado también por la cristalización de secuencias etilénicas de más de 8-12 grupos de $CH_2$.

Los copolímeros con contenido inferior al 37% de acrilonitrilo son parcialmente cristalinos a baja temperatura [7].

# 2 Experimentación

## 2.1 Compuestos para cables de plataformas en altamar de las regiones árticas

La *Tabla 2* muestra formulaciones de compuestos preparados con un tipo de HNBR (ACN = 21%, RDB= 0,9%; ML1+4/100°C = 72±4 MU) y tipos de EVM (contenido de VA = 50±5 % y 70±5 % ; ML1+4100°C= 27±4 y 27±4 MU).

# 3 Resultados y discusión

## 3.1 Propiedades mecánicas

Las propiedades principales han sido analizadas según las normas descritas en la especificación NEK 606. El compuesto 5, preparado con EVM con 70% de VA, da el valor más bajo de resistencia a la tracción de todos los compuestos. Este valor se encuentra en el límite y es mejor evitarlo, porque se necesita un cierto margen para la variación de las propiedades después del envejecimiento e inmersión. Los valores de resistencia a la tracción de los otros cuatro compuestos son similares y están en el mismo rango (11MPa).

El compuesto 1 muestra buenas propiedades de resistencia a esfuerzo-deformación con un valor de alargamiento a la rotura alto y el valor de dureza más bajo, shore A, de todo el estudio (*tabla 3*).

Los compuestos 2 y 3, a base de mezclas de polímeros, muestran valores de resistencia a la tracción similares, pero valores de alargamiento a la rotura de hasta un 100% más bajos que los compuestos a base de HNBR. Los valores de dureza y de los módulos son más elevados respecto al compuesto 1. Si se comparan los compuestos 2 y 3, se puede notar mayor densidad de entrecruzamiento (mayor dureza) y módulos más altos (M50 y M100) respecto al compuesto 3, que ha sido preparado con Silquest RC-1.

Los compuestos 4 y 5 son difíciles de comparar, dado que el contenido de rellenador y plastificante no son iguales. Inicialmente, un compuesto con la misma cantidad de rellenador y plastificante como en las otras formulaciones, había mostrado una resistencia a esfuerzo-deformación muy baja (6.4 MPa y un 290% de alargamiento a la rotura), además de valores de dureza y de resistencia al desgarro bajos.

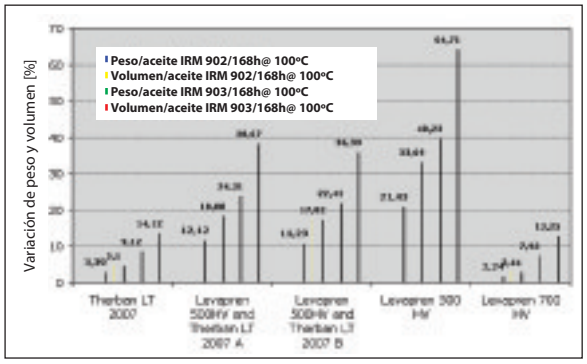
Por esta razón se han optimizado los compuestos aumentando la cantidad de rellenador y reduciendo la de plastificante (30 partes por cien (phr) de caucho ATH más y 5 phr menos de plastificante DOS).

▼ **Tabla 2**: *Formulaciones con base de elastómeros EVM y HNBR especiales*

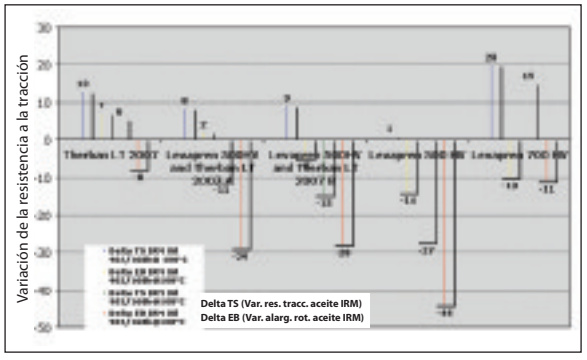
| Composición | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| THERBAN® LT 2007 (HNBR (ACN= 21%) | 100 | 50 | 50 | | |
| LEVAPREN® 500 HV (EVM (VA=50%) | | 50 | 50 | 100 | |
| LEVAPREN® 700 HV (EVM (VA=70%) | | | | | |
| APYRAL® 120 E (ATH BET= 12 $m^2/g$) | 80 | 80 | 80 | 80 | 100 |
| APYRAL® SM 200 (ATH BET= 22 $m^2/g$) | 60 | 60 | 60 | 60 | 70 |
| BORATO DE CINC | 10 | 10 | 10 | 10 | 10 |
| SILQUEST® RC-1 SILANO | | | 2 | | |
| GENIOSIL® XL 33 | 2 | 2 | | 2 | 2 |
| EDENOL® 888 (DOS) | 10 | 10 | 10 | 10 | 10 |
| DIPLAST® TM 8-10/ST (TOTM) | 10 | 10 | 10 | 10 | 5 |
| RHENOFIT DDA-70 | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 |
| STABAXOL® P-Polvo (PCD) | 1 | 1 | 1 | 1 | 1 |
| MAGLITE® DE (MgO) | 3 | 3 | 3 | 3 | 3 |
| ESTEARATO DE CINC | 1 | 1 | 1 | 1 | 1 |
| ESTEARATO DE CALCIO | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| EDENOR® C 18 98-100 | 1 | 1 | 1 | 1 | 1 |
| CORAX® N 550/30 (Negro de Carbón) | 5 | 5 | 5 | 5 | 5 |
| RHENOFIT® TRIM/S | 2 | 2 | 2 | 2 | 2 |
| PERKADOX® 14-40 B-PD | 6,5 | 6,5 | 6,5 | 6,5 | 6,5 |
| Total | 294,4 | 294,4 | 294,40 | 294,40 | 319,40 |
| Densidad | 1,453 | 1,468 | 1,560 | 1,484 | 1,609 |

▼ **Tabla 3**: *Propiedades mecánicas de los compuestos desarrollados*

| Propiedades mecánicas | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Resistencia a la tracción (MPa) | 11,1 | 11,0 | 11,7 | 11,5 | 8,5 |
| Alargamiento a la rotura (%) | 384 | 270 | 236 | 251 | 265 |
| M 50 (MPa) | 1,8 | 2,5 | 3,1 | 2,8 | 3,0 |
| M 100 (MPa) | 4,0 | 5,9 | 7,3 | 6,4 | 6,2 |
| Dureza Shore A at 23° | 65 | 69 | 76 | 73 | 76 |
| Resistencia al desgarro ASTM D-470 | 6,4 | 3,2 | 3,2 | 4,1 | 3,9 |




▲ **Figura 2**: *Variación de volumen y peso después de inmersión en aceite IRM 902 y 903 durante 168 horas a 100°C*




▲ **Figura 3**: *Variación de las propiedades de resistencia a la tracción después de inmersión en aceite IRM 902 y 903 durante 168 horas a 100°C*

Fischer et al. [8] ha encontrado una correlación entre el contenido de VA y la densidad de entrecruzamiento de los compuestos de Levapren® preparados en condiciones iguales (contenido constante de peróxido y otros aditivos). Esto podría explicar la baja resistencia a esfuerzo-deformación del compuesto 5 inicial.

### 3.2 Resistencias a los medios

#### 3.2.1 Aceite IRM 902 y 903

La resistencia al aceite está estrictamente relacionada con la polaridad de un elastómero. La polaridad de los elastómeros EVM está determinada por el contenido de acetato de vinilo y, para los elastómeros HNBR, por el contenido de acrilonitrilo[5]. El análisis de las propiedades y el cambio de volumen después de la inmersión en aceite confirman este efecto (*figuras 2* y *3*).

Los compuestos cuya base está constituida por un contenido de EVM con un 70% de VA y HNBR LT presentan el menor aumento de volumen y la menor variación de resistencia a la tracción. Esto puede deberse a la alta polaridad generada por el alto contenido de VA en el polímero EVM (70%), mientras que en el caso del HNBR, la polaridad depende del elevado efecto dipolo-dipolo del grupo de ACN que, a pesar de su baja concentración en el Therban LT 2007, es suficiente para proveer la resistencia al aceite requerida por estos compuestos.

La mayor variación de las propiedades de resistencia a la tracción tiene lugar en compuestos con contenido de EVM con un 50% de VA.

La polaridad de este compuesto es suficiente sólo para soportar la inmersión en aceite IRM 902 y no en aceite IRM 903, que es más agresivo y polar que el 902. Los compuestos con contenido de EVM con un 70% de VA muestran una resistencia al aceite similar a la de los compuestos a base de HNBR (*figuras 2* y *3*).

#### 3.2.2 Lodos de perforación a base de agua y aceite

**Sistemas a base de agua**

Los cationes divalentes como el calcio y el magnesio, agregados a lodos de perforación a base de agua, inhiben la formación de arcilla y el aumento de volumen del esquisto. Para tener bajo control el desprendimiento del esquisto y el ensanchamiento del agujero perforado, y para evitar daños a los equipos, se usan grandes cantidades de calcio soluble. Los lodos tratados con calcio resisten a la sal y a la contaminación de anhídridos, pero tienden a gelificarse y solidificarse a temperaturas elevadas[9].

**Sistemas a base de aceite**

Estos sistemas se basan en emulsiones de agua en aceite, normalmente con salmuera de cloruro de calcio como fase emulsionada y aceite como fase continua.

Pueden contener hasta un 50% de salmuera en fase líquida. Los lodos de emulsión inversa son una emulsión "relajada", con estabilidad eléctrica más baja y valores de pérdida de fluido más altos [9].

El efecto sobre el peso, el volumen y la variación de las propiedades de resistencia a la tracción se pueden ver en las *figuras 4* y *5*. Los compuestos a base de Therban LT 2007 y Levapren 700 HV muestran las mejores prestaciones y mantienen sus propiedades. Es importante seleccionar materiales con alto grado de polaridad porque la polaridad de los compuestos desempeña un papel clave en las prestaciones de resistencia al aceite.

En el caso de los compuestos a base de mezclas de polímeros, parece existir una sinergia entre los polímeros HNBR y EVM (si se requieren prestaciones físicas extremas, se puede mezclar el EVM con el HMBR). Esto ayuda a bajar el coste total del compuesto y a mejorar su elaboración sin afectar a su resistencia al calor y al aceite. Las mezclas de HNBR y EVM fueron desarrolladas para cumplir especificaciones muy estrictas, especialmente las especificaciones para tecnología naval militar, NES 518 (Def-Stand 61-31 parte 12) y VG 95218[10].

### 3.3 Propiedades a baja temperatura

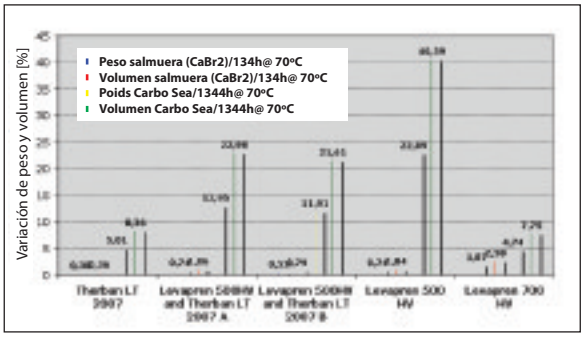
La flexibilidad de los cables para plataformas en alta mar de las regiones árticas es fundamental para asegurar la máxima eficiencia (paradas y mantenimiento mínimos) de la producción de petróleo y gas y de las operaciones de refinación de estas instalaciones.

Las temperaturas extremas (–40°C y –50°C) son algo corriente en este tipo de ambiente y, por lo tanto, es importante usar materiales de temperatura de transición vítrea baja que asegure la movilidad de las cadenas poliméricas a niveles de energía más bajos.

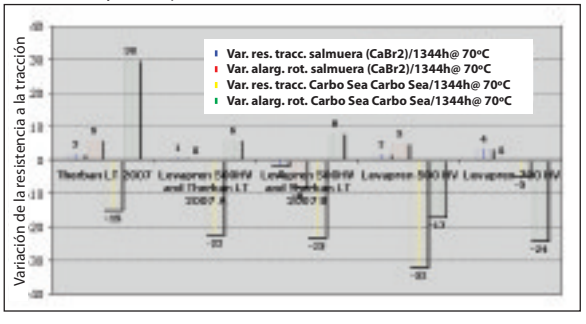
La movilidad de los segmentos poliméricos en una amplia gama de temperaturas operativas reduce el riesgo de cristalización y el efecto del endurecimiento sobre el polímero que se puede esperar en cables fijos de plataformas ubicadas en regiones climáticas duras.

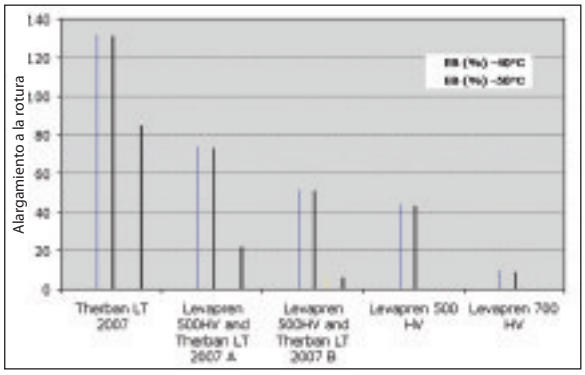
La resistencia a la tracción (alargamiento a la rotura) de estos compuestos ha sido medida a –40°C y –50°C, como se puede ver en la figura 6. El compuestos a base de Therban® LT 2007 muestra, sin duda, las mejores prestaciones a –40°C y –50°C (el valor de alargamiento a la rotura más alto) seguido por el compuesto a base de Therban® LT 2007 y Levapren® 500 HV (preparado con Geniosil® XL 33), una combinación de plastificantes (TOTM y DOS) y una combinación de distintos trihidratos de alumina con una superficie BET específica (Apyral® 120E y SM 200).

▼ **Figura 4**: *Variación de peso y volumen después de inmersión en salmuera y lodo de perforación a base de Carbo Sea durante 1.344 horas a 70°C*

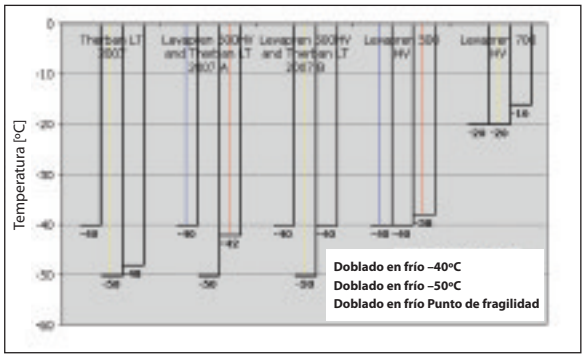



▼ **Figura 5**: *Variación de la resistencia a la tracción después de inmersión en salmuera y lodo de perforación a base de Carbo Sea durante 1.344 horas a 70°C*






▲ **Figura 6**: *Alargamiento a la rotura de compuestos para cables medido a –40 °C y –50°C*




▲ **Figura 7**: *Doblado en frío medido a –40 °C y –50°C y punto de fragilidad*

**Efecto de los agentes de acoplamiento**

La alta reactividad de un alfa-silano, como el Geniosil® XL 33, puede haber contribuido a mejorar el nivel de interacción entre el polímero y el rellenador, asegurando un buen equilibrio de las propiedades mecánicas y una menor densidad de entrecruzamiento.

Los alfa-silanos son intrínsecamente más reactivos que los silanos estándares; esto significa que puede producirse un nivel más alto de hidrofobización del ATH incluso cuando la cantidad de rellenador de superficie específica usada no es suficiente para asegurar la hidrofobización.

**Efecto del plastificante**

La combinación de 10phr de plastificante de sebacato de di-n-octilo (DOS) y plastificante tri 2 etil hexil trimelitato (TOTM) ofrece la flexibilidad en frío requerida a baja temperatura. Normalmente, los plastificantes a base de TOTM se usan en aplicaciones donde la baja volatilidad es de capital importancia. Estas aplicaciones incluyen el aislamiento de alambre y cable y el interior de vehículos. El TOTM tiene propiedades únicas de baja migración y resistencia a la extracción[11].

El DOS es un excelente plastificante resistente al frío de alto impacto en la temperatura de transición vítrea, pero de volatilidad más alta que el TOTM. Ambos plastificantes son indicados para copolímeros EVM, etil celulosa y caucho sintético, en particular para alambres y cables resistentes al frío o para pieles artificiales. Estas propiedades de resistencia a baja temperatura son determinadas por la estructura molecular.

Se ha analizado el doblado en frío a –40°C y –50°C y el punto de fragilidad de todos los compuestos desarrollados.

Solamente el compuesto preparado con Levapren® 700HV no ha soportado el doblado en frío A –40°C. Sólo los compuestos a base de Therban® LT 2007 y mezclas de este polímero con Levapren® 500HV han resistido al doblado en frío a –40°C y –50°C, lo que los hace aptos para instalaciones que funcionan a temperaturas tan bajas (*figura 7*).

La baja temperatura de transición vítrea (Tg) del HNBR y el efecto plastificante del DOS y del TOTM permiten producir compuestos de flexibilidad tan elevada. Los compuestos preparados con Levapren® 700HV no dan tan buenos resultados a baja temperatura como los compuestos preparados con Levapren® 500HV.

Esto se debe a la temperatura de transición vítrea ($T_g$) del EVM con un 70% de VA, que es más elevada que la del EVM con un 50% de VA (–17°C frente a –28°C), y a que el compuesto de la formulación a base de Levapren® 700HV ha sido creado usando sólo 15phr de plastificante en lugar de 20phr, como en otros compuestos. Las medidas a baja temperatura de un compuesto preparado con 20phr de plastificante han sido realizadas en estudios anteriores donde se observó que las propiedades mecánicas, como la resistencia a la tracción, eran bastante bajas. Una alta cantidad de plastificantes exclusivamente en compuestos EVM con un 70% de VA tiene un efecto negativo en todas las propiedades mecánicas del material.

### 3.4 Propiedades retardantes de la llama

Todos los compuestos contenían una combinación de rellenadores ATH (Apyral® con BET= 12 y 20 m²/g) que podía haber contribuido a las buenas propiedades mecánicas y a los buenos valores del índice de límite de oxígeno (LOI).

El índice de límite oxígeno de los compuestos fue medido según la norma ASTM D 2863; todos los compuestos dieron valores LOI superiores al 34%.

Un compuesto a base de Levapren 700 HV dió un valor LOI excepcionalmente alto, correspondiente a un 46%; esto puede ser debido a:

1) la presencia de polímeros EVM con alto contenido de VA (70%) y la sinergia con los rellenadores de ATH
2) una cantidad inferior de plastificante y mayor de ATH

Los rellenadores de ATH con partículas de varios tamaños, combinados con borato de cinc, dejan un residuo carbonoso muy compacto y estable en caso de incendio.

Meisenheimer[12] describió el efecto sinérgico de los polímeros EVM y del ATH en 1991, explicando que el LOI de los compuestos para cables FRNC de Levapren experimenta un aumento, bajo una carga constante, de 190phr o más en compuestos con contenido de VA superior al 65% wt.

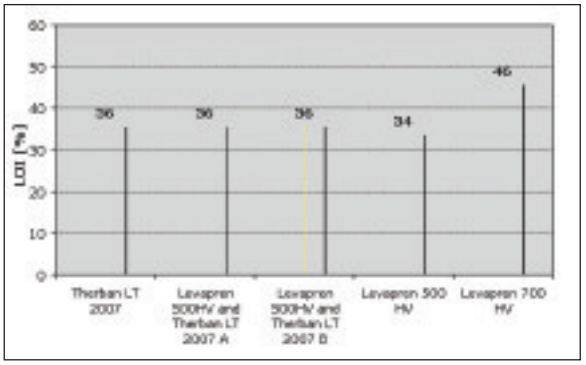
Otros estudios internos realizados con el Geniosil® XL 33 revelaron un efecto interesante sobre el LOI de los compuestos preparados con Levapren® 700 HV y 190phr de ATH (BET=12 m²/g). Un aumento del contenido de silano de hasta 3phr correspondía a un aumento del índice de límite de oxígeno (LOI).

### 3.5 Propiedades de envejecimiento en aire caliente

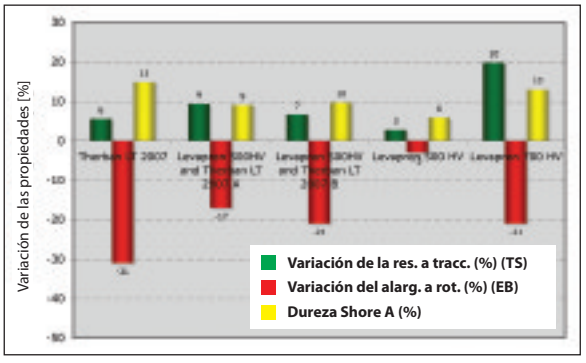
Según la especificación NEK 606, es necesario efectuar una prueba de envejecimiento en aire caliente durante 168 horas a 120°C en los compuestos que se piensa utilizar para la cubierta de cables.

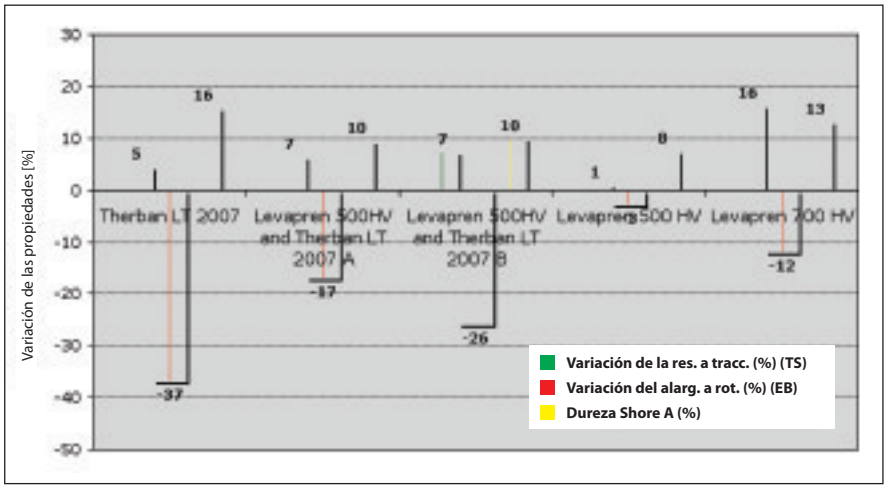
Para desafiar los límites de los compuestos desarrollados, se ha realizado una prueba más dura durante 168 horas, 336 horas y 672

▼ **Figura 8**: *Índice de límite de oxígeno de los compuestos desarrollados según la norma ASTM D 2863*




▼ **Figura 9**: *Prueba de envejecimiento en aire caliente durante 336 horas a 135°C*






▲ **Figura 10**: *Prueba de envejecimiento en aire caliente durante 672 horas a 135 °C*

horas a 135°C. La variación de las propiedades después del envejecimiento está ilustrada en las *figuras 9* y *10*.

Después de 336 horas se han observado los primeros efectos del envejecimiento en los compuestos desarrollados, especialmente en lo referente al alargamiento a la rotura de compuestos a base de Therban® LT 2007, Therban® LT 2007 y Levapren® 500 HV B (*figura 9*).

Respecto al envejecimiento después de 336 horas, los compuestos desarrollados mantienen bien sus propiedades después de 672 horas; se observan sólo ligeras variaciones en las propiedades, especialmente en los compuestos a base de Levapren® 500HV.

Las propiedades pueden ser ajustadas optimizando el paquete de estabilización del calor a base de Stabaxol® P y Rhenofit® DDA-70. Para el objeto de este estudio, la resistencia al envejecimiento en aire caliente cumple los requisitos de los estándares para cables. Un aumento de la temperatura operativa de los cables de plataformas en alta mar puede significar una mejora del diseño general de los cables para paneles e instrumentos, usando menos conductores de cobre y, por consiguiente, reduciendo el coste total de los cables.

# 4 Conclusiones

- El Levapren 700 HV es un compuesto a base de polímeros indicado para cables HFFR resistentes al aceite y a los lodos, pero no muy adecuado para cables que requieren una resistencia a temperaturas bajas como las del Ártico (–40°C y –50°C)
- Las mezclas de HNBR y EVM se han revelado un buen compromiso entre resistencia al aceite y a los lodos y resistencia al envejecimiento en aire caliente, pero con prestaciones a baja temperatura insuficientes (bajo índice de alargamiento a la rotura a –40°C y –50°C y doblado en frío a –50°C)
- El Therban® LT 2007 da resultados excepcionales en pruebas realizadas a las bajas temperaturas (hasta –50°C) típicas de las regiones árticas. En compuestos preparados con este material se ha observado un excelente equilibrio entre las propiedades mecánicas, la resistencia al aceite y a los lodos y el retardo de llama, pero con prestaciones modestas en la prueba de envejecimiento en aire caliente
- La alta polaridad de los materiales de HNBR combinados con polímeros EVM permite ofrecer al mercado del petróleo y del gas compuestos para cables con una relación rendimiento-precio relativamente buena
- El desarrollo de compuestos para cables de altas prestaciones requiere el uso de aditivos especiales como los alfa silanos y los rellenadores retardantes de llama de partículas minúsculas
- Combinando plastificantes de características distintas con un rellenador de superficie específica alta se asegura el cumplimiento de los requisitos de flexibilidad a baja temperatura y doblado en frío a –40°C y –50°C ■

# 5 Referencias


[1] http://www.gazprom.com/eng/Arcticles/Arcticle21712.shtml
[2] http://www.upstreamonline.com/incoming/Arcticle132282.ece
[3] A D McCracken, T P Poulton, E Macey, J M Monro Gray and G S Nowlan, "Arctic oil and gas" Popular Geoscience http://www.gac.ca, 2007
[4] http://www.nek606.net/
[5] E Rohde "Ethylene vinyl acetate elastomers: applications and opportunities for industrial rubber goods" 141st Meeting of the Rubber Division American Chemical Society, Proceedings (1992)
[6] D Achten "Next generation HNBR grades: new materials for oilfield applications" Oilfield Engineering and Polymers (2006)
[7] H Magg "The structure of Therban® (HNBR) and the impact of the low temperature characteristics of elastomeric materials" 3° Werkstoffkongress, Loeben Graz (2005)
[8] C Fischer, C Wrana, J Ismeier, F Taschner, "Crosslink architecture of EVM based vulcanisates and its influence on technologically relevant properties" German Rubber Conference Proceedings, July 3–6, Nuremberg, 2006
[9] World Oil Fluids 2007 "Drilling completion and workover fluids" Gulf Publishing Co, PO Box 2608, Houston, TX 77252 USA (2007)
[10] M La Rosa, C Wrana, D Achten "Electron beam curing of EVM and HNBR for cable compounds" 55th IWCS Conference (2006)
[11] http://www.eastman.com/NR/rdonlyres/17704C03–05BD–448F–8221–2F39C01E7191/0/L167.pdf
[12] H Meisenheimer, "Low smoke, non–corrosive fire retardant cable jacket based on HNBR and EVM" Jicable'91 June 24–28, Versailles, 1991



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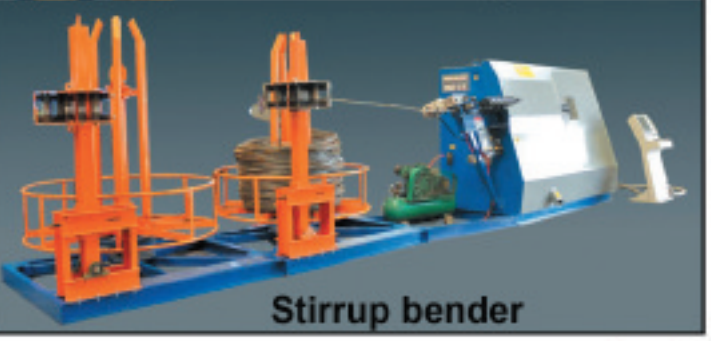

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