

Wires • Cables • Fibre Optics • Springs • Fasteners • Precision Parts

Wire & Cable



September 2017
US\$33*
www.read-wca.com

ASIA 线缆 月刊

Tailored plastic compound solutions
for the wire & cable markets.

For information call:
USA +1 888 540 9074
UK +44(0) 1664 882462
www.mexichemspecialtycompounds.com
msscquiries@mexichem.com

Mexichem Specialty Compounds

USA

Massachusetts
170 Pioneer Drive, Leominster
MA 10453 USA

North Carolina

9635 Industrial Drive, Pineville
NC 28134 USA

UK

Belar Way, Leicester Road Industrial Estate,
Melton Mowbray, Leicester
LE13 0DG England

Mexichem.
Specialty Compounds

Blachford



experience and innovation

Blachford is technology-driven. We understand customer needs and our robust R&D team creates solutions, such as our **Low Dust Lubricants**.

Blachford is a US company supplying the global wire industry with new technology products. Our customers represent **20 countries on 5 continents**.

Blachford delivers **rock-solid reliability** and **rigorous quality control**. We help reduce variability in manufacturing processes and improve products and profitability for our customers.



Please visit Blachford
at the 2017 wire Southeast Asia show,
Booth C11

Blachford – experience you can draw on.



www.blachford.com | Illinois 815.464.2100 | Ontario 905.823.3200



High speed building wire extrusion line



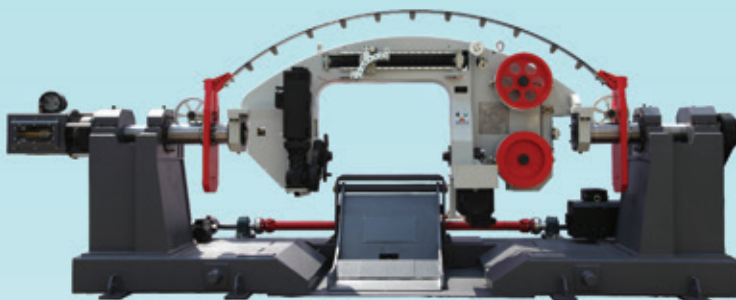
WSTZ-330 vertical double layer taping machine



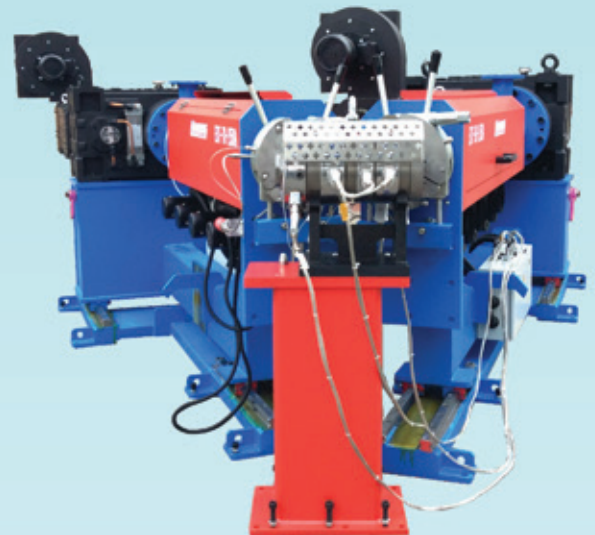
EXT High efficiency extrusion line



DJ-630-2500 B type single twister



SJ-1250D type- I double twist bunching machine



90+70mm double layer co-extrusion line

HANDING
CABLE MACHINERY

Jiangsu Handing Machinery Co.,Ltd.
E-mail: export@hdxljx.com www.hdxljx.com
Mobile: +86 13815079818



STAY CONNECTED

Increase efficiency by staying connected to your part production any time. Remotely monitor all AIM CNC benders with our **AccuTrack** technology platform while managing equipment utilization, uptime, idle time and many other production properties.

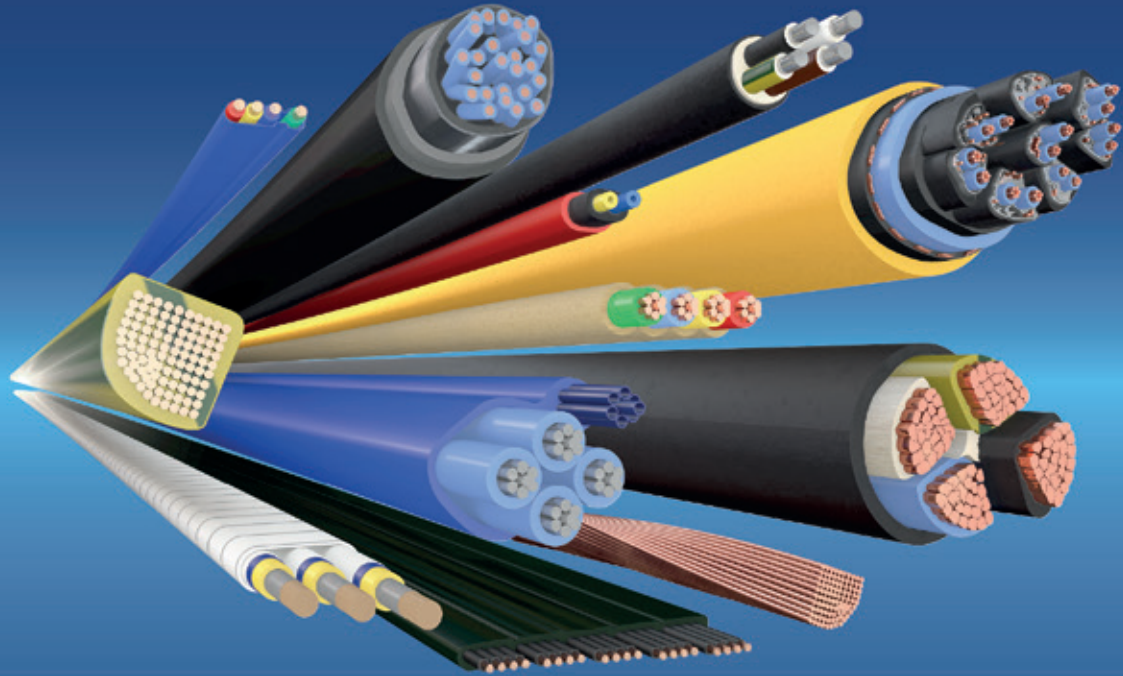
- Monitor problems with your bending operations
- Know your production setup times
- Get informed on What - Where and How Long
- Find your most productive shift
- Visual feedback of machine troubles
- Find production total wire weight per hour/day/week/month...
- Keep digital production logs

Increase efficiency with Real Time Remote Production Monitoring

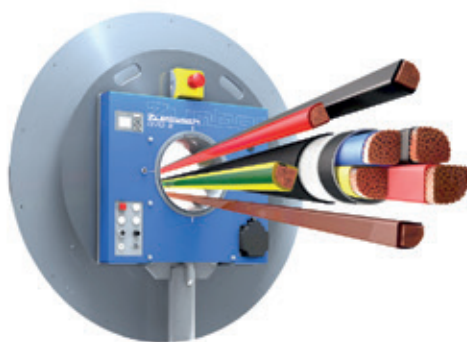


ADVANCED WIRE BENDING SOLUTIONS
MADE IN USA www.AIMmachines.com

True Measurement Of Any Non-Round Wire and Cable



For Your Quality Needs, Ask ZUMBACH – The Pioneer In Measuring, Monitoring, Inspection And Control Solutions.



Oscillating laser gauge



Profile measuring system

- Extreme precise measurement and monitoring before and / or after extrusion with oscillating laser gauges or profile measuring systems, based on laser light section technology.
- The result: true measurements, sustainable process optimization, supreme quality assurance and maximum material savings.

Zumbach
SWISS PRIME MEASURING SINCE 1957

ZUMBACH Electronics
sales@zumbach.ch
www.zumbach.com



Contents



58

80



Regulars

- 8** Industry News
48 行业新闻
- 58** Technology News
74 技术与产品
- 78** India Insight
78 印度透视
- 80** wire Southeast Asia 2017
- 96** Telecom News
98 通信新闻
- 100** From the Americas
104 来自美国的消息
- 119** Editorial Index
119 通讯目录
- 119** Advertisers Index
119 广告索引

Next Issue Getting Technical -

New stretch-bend-levelling line for very thin copper strips is energy efficient and operates with minimal tolerances

Technical Articles

- 107** TPV-Based Insulation for Medium Voltage Applications
By Andrea Galanti, Stefano Dossi and Andrea Magri of Mixer SpA, Ravenna, Italy, and Camillo Cardelli, iPool Srl, Pistoia, Italy
- 114** 中压应用的TPV绝缘
著: Andrea Galanti、Stefano Dossi和Andrea Magri (意大利拉文纳, Mixer SpA), 以及Camillo Cardelli (意大利皮斯托亚, iPool Srl)

Subscribe today!



Visit us
online at:

www.read-wca.com

Editor (编辑):..... David Bell
Features Editor – USA
(专栏编辑 – 美国):..... Dorothy Fabian
Editorial Assistant
(助理文字编辑):..... Christian Bradley
Design/Production (设计/制作):..... Julie Tomlin
Production (制作):..... Lisa Wright

Translation (翻译经理):..... TTC wetranslate Ltd
Linda Li

Advertising/Marketing:..... Jason Smith
(广告/营销):..... UK, ROW, USA, Canada
Giuliana Benedetto
Italy
Linda Li
中国

Advertisement Coordinator

(广告联络人):..... Liz Hughes
Accounts Manager (财务经理):..... Julie Case
Subscriptions (订阅)..... Julie Case
Publisher (发行人):..... Caroline Sullens
Founder (创办人):..... John C Hogg

Europe (欧洲)

Advertising/Marketing & Editorial

(广告、营销及编辑部)
46 Holly Walk, Leamington Spa
Warwickshire CV32 4HY, UK
Tel (电话):..... +44 1926 334137
Fax (传真):..... +44 1926 314755
Email (电子邮箱):..... wca@intras.co.uk
Website (网站):..... www.read-wca.com

USA (美国)

Editorial (广告/营销)

Intras USA – Doug Zirkle
Danbury Corporate Center, 107 Mill
Plain Road, Danbury, CT 06811, USA
Tel (电话):..... +1 203 794 0444
Email (电子邮箱):..... doug@intras.co.uk

This publication and its full contents of layout, text, images, and graphics is copyright protected. No part of this publication may be reproduced in any form or by any means, electronic or mechanical including photocopying, recording or any other storage or retrieval system without the publisher's written permission. The publisher, owners, agents, printers, editors and contributors cannot be held responsible for and hereby exclude all liability whatsoever for errors, omissions or the accuracy and claims printed or inferred in the editorial or advertisements published in this, previous or subsequent editions or for any damages, costs or losses caused thereby. Wire & Cable ASIA reserves the right to edit, reword and subedit all editorial submissions in accordance with editorial policy. Wire & Cable ASIA expressed graphically or by text is a registered name and style trademark of Intras Ltd, UK. All matters relating to this Disclaimer are governed by the laws of England.

《亚洲线缆》杂志所有图文受版权保护。未经书面授权不得全部或部分以任何方式转载。出版商、编写者、代理商、印刷商及投稿者对在本期、以前、以及将来刊登的稿件或广告准确性和提出的索赔不承担责任。英国 Intras Ltd 公司拥有《亚洲线缆》(Wire & Cable ASIA) 图像和文字注册商标。

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

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



© Intras Ltd ISSN 0218-3277



Encouraging prospects ahead at wire Southeast Asia

A special zone on fastener technology, seminars and a packed exhibition floor will all raise expectations at this year's wire Southeast Asia, being held in Bangkok, Thailand, from 19th to 21st September.

The region is becoming increasingly important with its infrastructure growth, including the ASEAN Power Grid at \$5.9bn, and the Singapore to Kuala Lumpur high speed rail link which is expected to start operations in 2026.

By 2020 the infrastructure spending in four countries – Thailand, Malaysia, Indonesia and the Philippines – is expected to hit \$524bn.

On the manufacturing front, should ASEAN implement the ASEAN Economic Community's integration strategy fully and be able to capture a larger share of global manufacturing, the region could gain US\$280–US\$625 billion in annual GDP by 2030 as stated in a recent report by the McKinsey Global Institute.

All this bodes well for the wire and cable industry in general, and many exhibitors and visitors in Bangkok will be positioning themselves for a slice of this business.

Our coverage starts on page 80 with our exhibitor listing and our extensive coverage of some of the exhibiting companies. Please also stop by our stand C34 to collect a free copy of *Wire & Cable ASIA* magazine.

David Bell
Editor



When and where

2017

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

2017

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

2017

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

2017

6-9 December:
Iran Wire –
exhibition –
Tehran,
Iran
Organisers:
Messe Düsseldorf GmbH
Fax: +49 211 4560 668
Email: info@iranwire.ir
Website:
www.iranwire.ir



○ A previous staging of wire China

Shanghai gears up for wire China 2018

AS one of Asia's most influential international trade platforms for the sector, wire China – the 8th All China International Wire and Cable Industry Trade Fair, and Tube China – the 8th All China International Tube and Pipe Industry Trade Fair, will return to the Shanghai New International Expo Center (SNIEC) from 26th to 29th September 2018.

Held concurrently again will be the Fastener Shanghai Special Zone.

The events will be organised by Messe Düsseldorf Shanghai, a subsidiary of Messe Düsseldorf in Germany, together with the Shanghai Electric Cable Research Institute (wire China) and the Metallurgical Council of China Council for the Promotion of International Trade Metallurgical Center for International Exchange and Cooperation (Tube China).

The exhibitors at wire China will present wire manufacturing and finishing machinery, process technology tools and auxiliary process technology materials as well as materials, special wires and cables, and measuring and control technology.

At Tube China, exhibitors will showcase the latest in tube manufacturing machinery, raw materials, tubes and accessories, process technology tools and auxiliaries and measuring and control technology as well as pipeline and OCTG technology, profiles and machinery.

Visitors at wire and Tube China will come from the following industries: wire, cable, tube, pipe, iron, steel and non-ferrous metals, automotive and aerospace supply as well as electrical,

construction and water and energy supply.

The last staging of wire and Tube China in 2016 ended successfully with a record 42,199 trade visitors from 94 countries and 1,645 exhibitors from 31 nations presenting the latest technology, machinery and products from the wire, cable, tube and pipe processing industries on over one million square feet of exhibit space.

In addition to the large number of local attendees, a growing number of overseas buyers attended the trade fairs. The majority of the overseas visitors came from South Korea, India, Taiwan, Japan, Russia, Malaysia, Iran, Thailand, the USA, Indonesia and Vietnam.

Messe Düsseldorf Shanghai – China
Website: www.wirechina.net



FULL SERVICE WITH ROSENDAHL

MEET US
THERE!



Don't leave your success to chance.

Rosendahl is here for you with individual solutions for your individual needs. Get premium service and support over your entire product life cycle.



www.rosendahlnextrom.com





WIRE & PLASTIC MACHINERY CORP.



SAMP 8 Wire Drawing Line



60mm Nokia/Niehoff Tandem Wire Insulating Line

WIRE DRAWING

Rod Breakdown

- WRD971 – **Niehoff** M-85 Rod Machine, 11 Die
- WRD980 – **Eurodraw** SA450.14.2, 2 Wire Rod Machine, 14 Die
- WRD824 – **Heinrich** MC-6063, 2 Wire Rod Machine, 13 Die
- WRD989 – **Syncro** 18T10, Tandem Rod Line, 11 Die
- WRD897 – **Bekaert** KDA, Tandem Rod Line, 9 Die
- WRD1027 – **Wire & Cable Tech.** CWF-13, Wire Rod Machine, 13 Die

Intermediate

- WRD1021 – **Niehoff** MT 200.4.2.2617/RDA 200.1.R.1400, Intermediate Tandem Drawing/Annealing Machine
- WRD1071 – **SAMP** TR/2-TP, Tandem Intermediate Wire Drawer/Annealer/Preheater
- WRD838 – **Niehoff** M30/VG30, Intermediate Wire Drawing/Annealing Machine (4)

MultiWire

- WRD678 – **SAMP** MLS/ST.14, MT8 (7+7), Multi-wire 14 Wire Drawing Line, 31 Dies, w/R12 Annealer
- WRD1031 – **Nextrom** AMW297, 7-Wire Fine Wire Drawing, Annealing and Spooling Line
- WRD932 – **Eurodraw** MMS100, 16-Wire Multi-wire Drawing Line w/Annealing Furnace (8)
- WRD831 – **SAMP** MT8.2.4.21, 8-Wire Multi Wire Drawing, Annealing and Spooling Line
- WRD942 – **SAMP** MT10.10.22/ R14.10.10 1250, 10-Wire Multi Wire Drawing Line w/Annealer
- WRD973 – **Heinrich** 8 Wire Multi Wire line w/Annealer, 800mm Static Coiler

Spooler/Drop Coiler

- WRD967 – **Niehoff** SPH801.1.G.E.A, 800mm Spooler
- WRD887 – **SAMP** AS/3-820, 820mm Drop Coiler,
- WRD995 – **Endex** ECC-30, 30" (762mm) Drop coiler,

EXTRUSION

Extruders/Lines

- EXP1313 – **Jennings** 8108, 2.5" (63.5mm) PTFE Ram Extrusion Line
- EXPL362 – 60mm **Nokia/Niehoff** Tandem Wire Insulating Line
- EXPL411 – **Rosendahl** Tandem Extrusion Line w/Niehoff MT200
- EXPL421 – **Davis Standard** 2" (50mm) 30:1 High Temp Extrusion Line
- EXP1237 – **Nextrom** NMB60-24D, 60 mm Extruder, 24:1 L/D
- EXP1167 – **Rosendahl** RE1-120-30, 120 mm Extruder, 30:1 L/D,
- EXP1189 – **Nextrom** NMB80-24D, 80mm, 24:1 Extruder

Payoffs

- PAY1221 – **Skaltek** A12P4K, 1.2m Portal Traversing Payoff, Drag Brake
- PAY2114 – **Skaltek** A164K, 1.6m Portal Traversing Payoff, Driven (5)
- PAY2090 – **Skaltek** A22-4K, 2.2m Portal Floor Traversing Payoff, Driven
- PAY2043 – **Skaltek** A26-4K, 2.6m Portal Floor Traversing Payoff w/ Upgraded Electronics
- PAY2049 – **Nokia Maillefer** AVR-3, 1.25m Portal Driven Payoff

Dual Takeups

- TKU1402 – **Maillefer** EKP50, 500mm Parallel Axis Dual Reel Takeup (10)
- TKU1440 – **Nokia Maillefer** EKP-63, 560mm Dual Parallel Axis Shaftless Takeup
- TKU1520 – **Nokia Maillefer** EKP-100-A2/160, 1m Dual Parallel Axis Shaftless Takeup (2)
- TKU1175 – **Nextrom** EKP-130, 1.3m Dual Parallel Axis Shaftless Takeup (3)

Caterpullers

- CAT597 – **Mali** VBA2/15/200AC, 2.6m Belt Caterpuller
- CAT612 – **Queins** 45-7239, 1.4m Belt Caterpuller
- CAT486 – **Gauder** 2.2m Belt Caterpuller
- CAT237 – **Nokia Maillefer** Chenile UA-8, 1.2m Belt Caterpuller
- CAT526 – **Johnson Metals** CAT9/208/4, 2.0m Belt Caterpuller

Equipment Sales | Equipment Purchasing | Reconditioning Services

Visit wireandplastic.com to view our complete inventory or contact us at

info@wireandplastic.com | TEL: +1.860.583.4646

Largest Selection of Second-Hand Wire, Cable & Optical Machinery in The World



630mm Cortinovis Planetary Line 6+18



Tensor SZ Cabling Line

ROTATING EQUIPMENT

Planetary

- CBR1290 – **Cortinovis** 630mm 6+18 Bay Planetary Cabling Line
- CBR1184 – **Stolberger** type 630mm 6+12+18 Bay Planetary Cabling Line
- CBR1141 – **Queins** (refurbished **Gauder**) 500mm 12+18 Planetary Cabling Line
- CBR1265 – **Watson** 600mm 12 Bay Planetary Cabling Line
- CBR935 – **Trafalgar/Northampton** 420mm 12+18 Bay Planetary Cabling Line
- CBR1064 – **Cecco** 1.6m 1+6 Single Bay Planetary Cabling Line
- CBR612 – **Northampton** 560mm 24 Bay Planetary Cabling Line
- CBR1143 – **Dimavag** 630mm 6 Bay Planetary Cabling Line
- CBR1285 – **Custom Built** 630mm 6 Bay Planetary Cabling Line

Drum Twist

- CBR1169 – **Brondel/MMC/Alind** 2.6m Drum Twist Line
- CBR1201 – **Cecco** 2.4m Drum Twist Line
- CBR1000 – **Caballe/Pourtier/Kalmar** 2.2m Drum Twister Line
- CBR1202 – **Cecco** 1.8m Drum Twister Line (3)

Double Twist

- CBR1216 – **Northampton** DTS-1800, 1.8m Double Twist Buncher
- CBR1226 – **Setic** 1.25m Double Twist Buncher (2)
- CBR1181 – **Northampton** 1.25m Double Twist Buncher (3)
- CBR953 – **Setic** 1m Double Twist Strander
- CBR1078 – **Frigeco** 800mm Double Twist Buncher
- CBR1286 – **Setic** 630mm Double Twist Twinner (7)
- CBR1088 – **Niehoff** 560mm Double Twist Buncher
- CBR1260 – **SAMP** 630mm Double Twist Buncher (5)

Single Twist

- CBR853 – **Cecco** 1m Single Twist Cabler
- CBR1144 – **Entwistle** SC-36, 36" Single Twist Cabler
- CBR1263 – **Dynamex** TPC-224, 30" Single Twist Cabler
- CBR989.2 – **TEC** 1000mm Single Twist Cabler

Tubular

- TBR196 – **Cecco** 800 mm 6+1 Tubular Strander
- TBR199 – **Bartell** 406mm 12W Tubular Strander
- TBR201 – **Bartell** 254mm 12W Tubular Strander
- TBR190 – **Krupp** 560mm 12W Tubular Strander

OPTICAL FIBER AND OTHER

Extrusion

- EXPL416 – **Viteck** Fiber Jacketing Line, 3.5"
- EXPL409 – **Nokia Mallefer** Loose Tube Extrusion Line, 45mm
- CBR1160 – **Pourtier** SZ Strander
- PAY1468 – **Nextrom** CMP 300mm 4 position Fiber Payoffs
- EXPL406 – **Nokia Mallefer** 120mm Loose Tube Jacketing Line

Cabling

- CBR1252 – **Tensor** SZ Cabling Line
- CBR1001 – **Nokia Mallefer** 12W Fiber Planetary Cabler
- CBR1171 – **Rosendahl** KVT12-500, 500mm 12 position Ribbon Payoff Strander
- CBR923 – **Pourtier** 1250mm Drum Twist Line for Slotted Core

Other

- TKU739 – **Hall** 300mm Buffered Dual Automatic Fiber Takeup
- PRN230 – **Nokia Mallefer** OFC 52-620, Fiber Coloring Line
- TPR374 – **USM** Triple Head Taping Line
- CLR302 – **Skaltek** R2 Coiling Line
- BIN085 – **Tensor** KS-200-18, 18 position Aramid Fiber Server
- CBR1275 – **Setic** 630mm 2 position DT Back Twist Payoff
- EXPL336 – **Kabelmetal** TIG Weld and Corrugator Line
- MSC2398 – **Tensor** TCOR-6, 6" Corrugator
- MSC1580 – **Weber and Scher** Rotating Corrugator Line

Interlock

- MSC2528 – **Kalmar** 75mm Interlock Armoring Machine
- MSC2487 – **Calmec** 50mm Interlock Armoring Line (2)
- MSC2488 – **Nextrom /Cecco** 50mm BX Interlock Armoring Line
- MSC2482 – **Cecco** 4" Interlock Armoring Machine with Belt Caterpuller
- MSC2372 – **Calmec** 20mm Interlock Armoring Line

**We want to purchase your surplus equipment!
We buy individual machines to complete plants for Cash.
See us at Wire Southeast Asia – Stand C10**



Change of date and venue for Iran Wire

THE Aria Group, owner and organiser of Iran Wire, has decided to move the event to the new state-of-the-art Exhibiran International exhibition centre in Tehran.

A total of 15 halls are being constructed, of which three have already been completed: A4, A5 and A6.

The relocation of Iran Wire to the new hall A6 results in a slight date change and the event will be held from 6th to 9th December 2017.

It is the only Iranian trade fair for wire, cables, pipes, tubes, profiles and accessories and an ideal platform for foreign companies to enter the Middle East markets.

Messe Düsseldorf is the exclusive overseas associate for Iran Wire 2017, responsible for all international exhibitor participations including a wide range of services such as registration and stand design.

The company is renowned as the organiser of the worldwide leading wire and tube trade fairs held in Düsseldorf, Germany, every two years and brings this expertise to Iran Wire. Exhibit space demand has been strong with 16,150ft² reserved so far, and hall A6 is almost fully booked.



○ Tehran will play host to Iran Wire in December

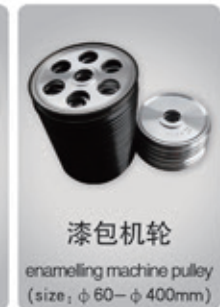
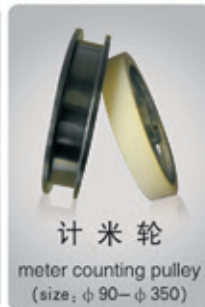
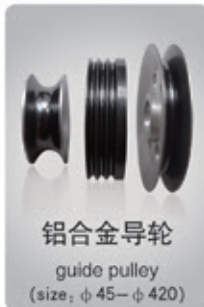
Messe Düsseldorf GmbH – Germany
Website: www.iranwire.ir



DONGGUAN NANYUE MOLD DIE CASTING CO.,LTD
(ISO 9001:2008 certificated)



- High productivity
- Fast delivery
- Competitive price
- Various and full range
- Provide custom service



Nanyue bring the revolution for pulleys making – MOLD CASTING

Add: No.6 Xinye South St., Xiagang VII, Chang'An Town, Dongguan, Guangdong P.R.China
Tel: 0086 769 82280680 85545645 88289387 Fax: 0086 769 85470197
Web: www.wirepulley.com Email: nanyue@wirepulley.com

+86 4008000127

Powering the future with Borlink™

As world leading providers of advanced energy solutions, Borouge and Borealis have an outstanding record in quality and reliability for the most challenging energy generation, transmission, distribution and communications applications.

In line with our position as strong partners to the industry with continued investments in innovation and capacity enhancement, we are pleased to announce the startup of an all-new XLPE compounding facility – a hallmark of the latest expansion phase of our world class plant in Abu Dhabi.

With an established 50-year track record in XLPE development driven by state-of-the-art Borlink™ technology, Borouge and Borealis remain committed to delivering value added solutions that power the future.



Prysmian invests €250m in its optical fibre and cable facilities

PRYSMIAN Group has inaugurated its new optical cable plant in Slatina, Romania.

The new Slatina plant is part of a three-year, €250 million investment plan aimed at improving the group's production capacity and capabilities worldwide, to meet the growing demand for optical cables for the deployment of new high-speed telecommunications networks.

"As a worldwide leading player in the industry, we are strongly committed to supporting governments and telecom operators in developing new broadband networks by continuing to invest in optical fibre and cable capacity, as well as in new technologies and know-how," said Philippe Vanhille, senior vice president telecom business at Prysmian Group.

"The digital transformation goes through the development of new broadband and ultra-broadband fibre optic telecommunication networks and only the fibre can provide the necessary speed and reliability. These strategic infrastructures must be based on a high quality and designed to provide high performance over time so as to be ready for the services of the future like 5G, smart cities, smart transportation, and smart homes."

Prysmian Group's telecom business reported sales of €1,164m in 2016, with adjusted EBITDA climbing to €163m, posting an increase of 22 per cent on 2015 and an improvement in margin to 14 per cent, from 12.1 per cent in 2015.

The group produced 35 million kilometres of optical fibre in 2016, and

has recently presented its record-breaking Flextube® cable with 2,112 fibres, the highest fibre count for a flexible micromodule-based cable to be installed to date.

This confirms its commitment in providing ultra-dense cable solutions that are extremely compact and much faster to install, enabling service providers to easily deploy record number of fibres in difficult or congested areas.

The group has recently been awarded a \$300 million optical cable supply agreement from Verizon Communications to support the company's USA network expansion around a next-generation fibre platform.

Prysmian Group – Italy
Website: www.prysmian.com



HEFEI SMARTER TECHNOLOGY GROUP CORP is affiliated to the state-owned central enterprise China National United Equipment Group Corp.

HEFEI SMARTER is now widely accepted as a leading manufacturer of wire and cable machinery in China.

Hefei Smarter has focused on research and innovation of wire and cable machinery, and is committed to meeting customized needs, supplying high quality products and providing strong technical support and perfect after-sales engineering service.

Hefei Smarter has started to develop several new innovations including JGT Concentric Stranding Machine, JSH Double Twister, and CYL Vertical Laying Up Machine with Steel Wire Armoring.

专业制造 真诚服务
Specialized Manufacture Warmhearted Service



CYL VERTICAL TYPE LAYING UP AND STEEL WIRE ARMORING MACHINE

The machine is used for laying up MV, HV or EHV subsea power cable, subsea electro-optic compound cable, umbilical cable, as well as armoring with steel wires.



电 / 线 / 电 / 纜 / 制 / 造 / 设 / 备

JGT CONCENTRIC STRANDER

- For compacting round or sector copper or aluminum conductors
- For making overhead conductors
- For stranding copper flexible conductors
- For cable screening
- For cable armoring



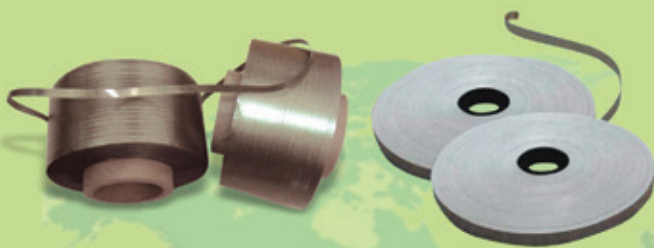
JSH BUNCHER

The machine is used for stranding copper and aluminum conductor. It also can be used for compacting the al-alloy round single wire into shaped wire, then stranding into al-alloy conductor with double pitch.

KAI CHENG MICA

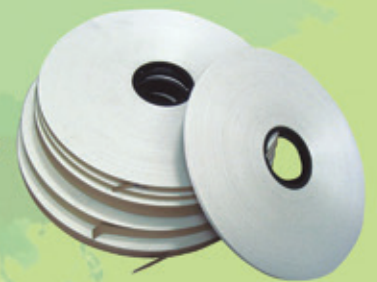
Shaoxing Kaicheng Mica Material Co., Ltd

Mica tape for electric wire and cable



Fire-resistant phlogopite mica tape

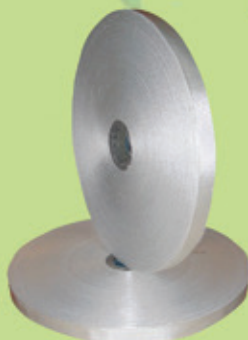
Fire-resistant synthetic mica tape



High temperature calcined mica tape



Polyester film tape (PET)



Fiberglass fire-retardant tape
(low smoke non-halogen type)

Add: No.4, East North Ring Road, Mashan Town, Shaoxing, Zhejiang, **China**

tel: +86-13706752282 +86-575-88047455 +86-575-88669555 +86-575-88669678

fax: +86-575-88173237 P.C.: 312085

E-mail: kc@zjsxxd.com kc@zjsxkc.com kc@zjsxkc.net

http: //www.sxkcym.com

REELS AND DRUMS

Metal reels for wire and cable. Process and transport.



REEL FOR DRAWING AND STRANDING



CABLE AND ROPE PROCESS REEL



CABLE AND ROPE PROCESS REEL



STRUCTURAL DRUM IN TUBULAR VERSION



MASSIVE REEL



REINFORCED DOUBLE FLANGE REEL

HANDLING EQUIPMENT

All the necessary accessories for reels and coils handling.



ROLLING SYSTEM FOR DRUMS



TAKE APART REEL FOR COIL'S PRODUCTION



TILTING UNIT FOR REELS AND COILS



TILTING DEVICE FOR REELS



AUTOMATIC LIFTER FOR REELS



AUTOMATIC LIFTER FOR COILS



Headquarters & Production plant:
GMP Slovakia s.r.o.,
Pribenik - Slovakia

Companies of the group:
GMP Reels India Private Ltd,
Nashik - India

sales@gmp-slovakia.com
www.gmp-slovakia.com



○ The new offices in Melbourne, Australia

Ideal Networks expands into Australia

IDEAL Networks, a manufacturer of data cable and network testers, has expanded into Australia, opening new premises in Melbourne to support its distributors, as well as data cable installers and network technicians.

The new facility includes a product warehouse, alongside the customer services and finance departments and the sales support team.

There is also a training centre, offering distributors and customers the opportunity to receive expert guidance on making efficient use of Ideal Networks' range of data cable testers, certifiers and network testers.

The site will also ensure that installers and technicians across the country have access to local support for test, calibration and warranty repairs.

In addition, a new Ideal Networks website is launching to make it easier for data cable installers, network technicians and IT managers in Australia to search for products and view extensive product information.

The website www.idealnetworks.net/au/en will feature full details about the data cable testers, network testers and telecoms testers available, including animations that show how customers can troubleshoot more easily and provide proof of performance to their clients.

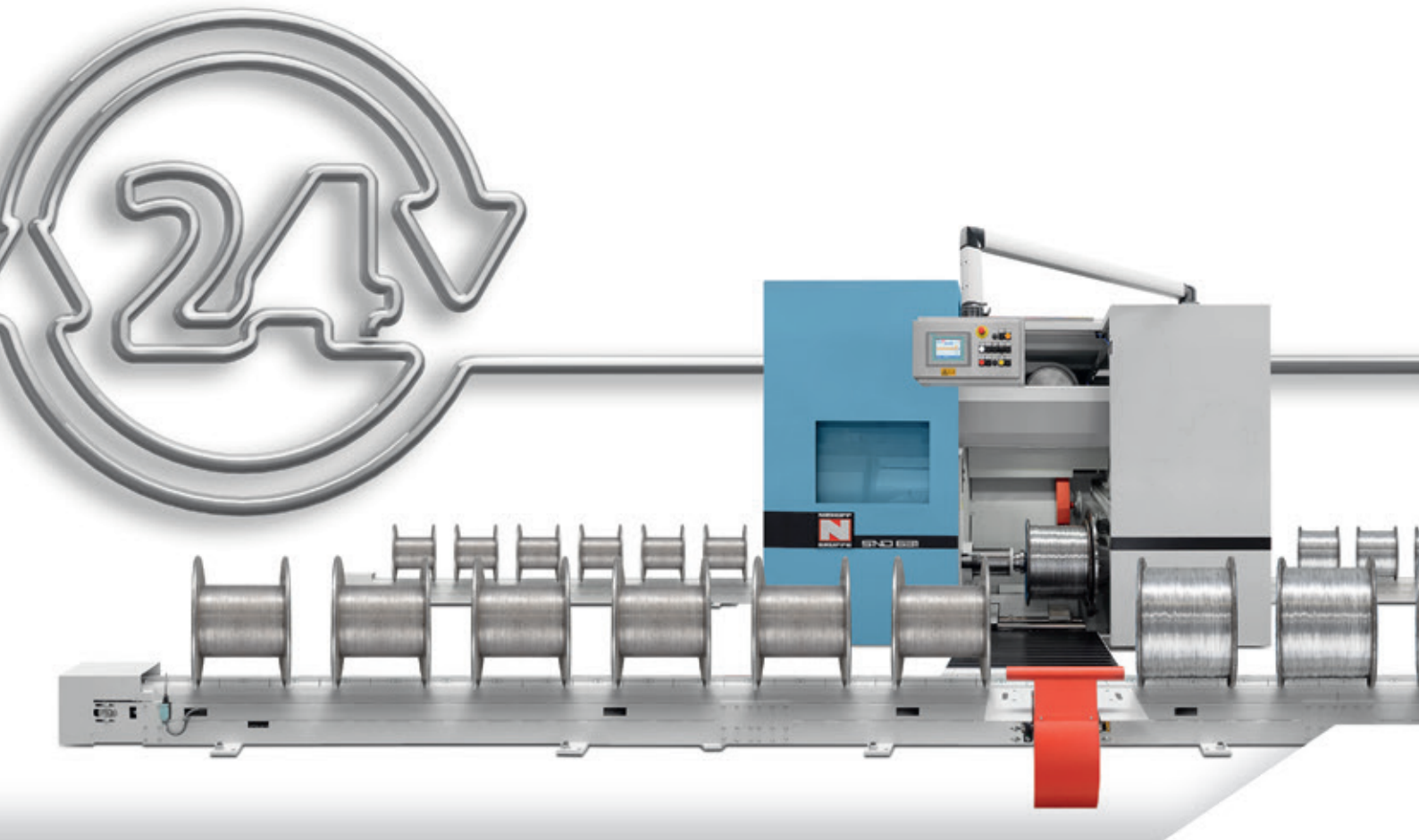
Visitors to the website will also be able to benefit from support resources, such as product manuals, white papers, application notes, and all the latest news and social media updates from Ideal.

"This is the first time that Ideal Industries Inc has invested in premises in Australia," said Martin Van Os, group vice-president/general manager for Ideal Industries Asia Pacific.

Ideal Networks – USA

Website: www.idealnetworks.net

Continuous operation, high precision, and ease of operation and handling – the NIEHOFF fully automatic SND double spoolers



Our new generation of double spoolers, the SND 631 and the SND 801, feature highly reliable fully automatic wire changeover and spool changes. Thanks to reduced changeover times and minimized maintenance downtime your line will record higher production uptime and is continuously in operation – at production speeds of up to 40 m/s. Maintenance-free and energy-efficient three-phase-current drives complete the concept – your line works with maximum efficiency, productivity, and reliability. Automatic changeover success rates exceed 99% at a highly repeatable and accurate wire length on the spools. The unit is designed for a wider wire range, aiming for even larger diameters than its predecessor, and is perfectly suitable for operation with aluminum and copper and their alloys. This new double spooler meets the strictest and most challenging requirements with great flexibility.

NIEHOFF combines outstanding expertise along your entire value chain with customer proximity and reliable service, for the entire life cycle of your investment. It is exactly this combination that will make the crucial difference, so you can concentrate on what is most important to you: your decisive competitive advantage.

Expertise, Customer Driven, Service – in Good Hands with NIEHOFF

Maschinenfabrik NIEHOFF GmbH & Co. KG
Walter-Niehoff-Strasse 2, 91126 Schwabach, Germany
Phone +49 9122 977-0/Fax +49 9122 977-155
info@niehoff.de

www.niehoff.de

NIEHOFF

GRUPPE

‘One-stop shop’ portfolio of reliable, high performance solutions

GLOBAL connectivity leader and innovator Huber+Suhner showcased its ‘one-stop shop’ portfolio of reliable, high performance solutions specifically designed for ease of use and system integration at this year’s International Microwave Symposium (IMS), in Honolulu, Hawaii.

On display was the company’s new line of high-end test assemblies: Sucoflex 500. When it comes to test and measurement, the Sucoflex 500V series guarantees a high level of satisfaction.

It offers the phase and amplitude stability with flexure, movement, temperature (<50ppm) and tensile stress.

Sucoflex 500V guarantees accurate measurements with longer calibration intervals.

Huber+Suhner has recently extended its assemblies portfolio with the Sucoflex 500S series offering low insertion loss, outstanding return loss and excellent phase stability, making it the recommended assembly for high performance, high quality applications.

Displayed alongside these products was the new NEX10 connector interface, a miniature low PIM coaxial connector for small cells applications, and the Microbend L – which provides the best loss performance in a small form factor cable solution. Performance combines flexibility with the unique bend-to-end feature.

Huber+Suhner’s phase invariant over temperature (CT) cable, offering less than 300ppm phase change over the complete temperature range (-50 to +125°C), is now also available in hand-formable and semi-rigid assembly styles, completing the existing Minibend CT series.

Additionally, the company displayed its wide portfolio of multicoax solutions, from MXP and MXPM, the high performing push on solutions for test and measurement, to customised SMPM ganged solutions and the VITA-67, all offered with the bend-to-end cable for a user-friendly experience.

Huber+Suhner – Switzerland
Website: www.hubersuhner.com

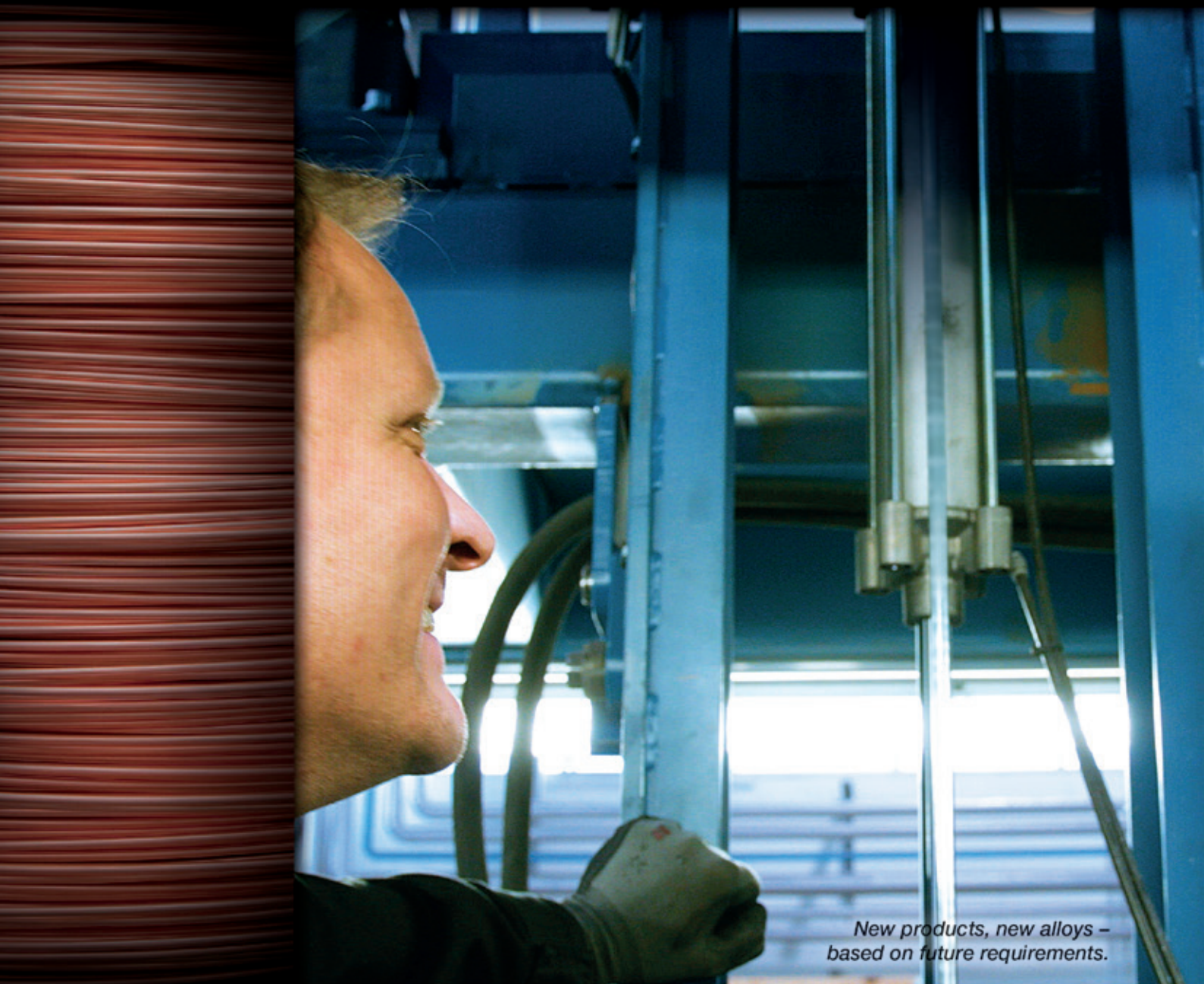


AUTOMATIC COIL AND SPOOL WINDING LINES
www.pscm.it

SINCE **1960**

The Original UPCAST®

UPCAST® is the leading supplier of upward continuous casting technology for a wide range of non-ferrous applications.



*New products, new alloys –
based on future requirements.*



We focus on designing, developing, supplying and servicing the UPCAST® process so that you can focus on what is most important – your winning products.

Wherever. Better.

UPCAST OY, PORI, FINLAND
www.upcast.com

Visit us at
 in Bangkok, Thailand
September 19–20 2017
Stand #K17



Death of J William Scher

JOSEPH William Scher – a highly respected and instrumental figure in the wire and cable industry – has died aged 82 after a brief illness.

A father and grandfather, 'Bill' joined Weber & Scher Mfg Co Inc in 1957. Prior to this he received a Bachelor of Art Degree in Engineering from Dartmouth College in New Hampshire, USA.

Directly thereafter, he secured his Masters of Science Degree in Mechanical Engineering from the Thayer School at Dartmouth. He went on to become a licensed professional engineer in the state of New Jersey.

After his studies, Mr Scher joined Weber & Scher where he was immediately responsible for the sole operation of the company.

In the 1940s, Weber & Scher, working closely with Western Electric, developed a line of metal tape handling, corrugating and forming equipment for producing what was referred to back then as the 'Stalpeth' and 'Alpeth' sheath constructions, which were utilised in the production of copper telephone cable.

Mr Scher advanced this technology by adapting and standardising the equipment such that it could be utilised in

the diverse manufacturing environments of independent cable manufacturers within the USA. This technology continues to be widely used today in the worldwide production of optical fibre cables, copper telephone cables, power cables, etc.

In addition to operating a successful company, he took on the role of consultant to the wire and cable industry.

The extent of these consulting services extended to the complete development of cable manufacturing facilities. Shortly after, he pursued the initiative of introducing the full range of equipment manufactured by Weber & Scher to established and newly emerging markets throughout the world, including the Far East, Central Europe, Eastern Europe, and the Middle East.

In 2007, Mr Scher was awarded the WCTI Technical Achievement Award for his 50 plus years of involvement in the wire and cable industry. He was also a member of the American Society of Mechanical Engineers for many years.

He is survived by his wife of 62 years, Joan; sons Douglas and Gregory; and six grandchildren.

Weber & Scher Mfg Co Inc – USA
Website: www.webscher.com



Professional Wire Drawing Machine Manufacturer
**WIRE DRAWING
MACHINES**

Multi-wires Intermediate/Fine Wire Drawing
Machine with Annealing Series
DT100-8-22/Z DT100-8-18



GUANBIAO ELECTRICAL MACHINERY CO.,LTD.

Add:Sanma Industry Area Chigang Humen Town Dongguan City Guangdong Province
Tel:+86-769-85253982 / 85253803 Fax:+86-769-85198360
E-mail:info@guanbiao.com market@guanbiao.com

www.guanbiao.com

WORLD LEADER IN TC TOOLS & MACHINES THE REVOLUTION IN TC DIE MANUFACTURING

Automatic vertical grinding
machines for TC dies from
1.5 to 10 mm



CDC-A

WITH AUTOMATIC CONTROL
OF THE DIE DIAMETER

Polishing lathes with chucks
from 80 to 250 mm



MP2

Internal grinding machines for
TC dies from 0.80 to 100 mm



IG80

OUR KNOW-HOW FOR YOUR EFFICIENCY SINCE 1870

FOR MORE INFORMATION
tél. +33 (0) 3 80 51 81 31
F-21220 Gevrey-Chambertin - FRANCE

NEW WEB SITE !
www.agir-technologies.com
contact@agir-technologies.com



Tehran, 6-9 December 2017

Iran | www.iranwire-expo.com



IRAN WIRE

Supported by
wire
Düsseldorf

Messe Düsseldorf GmbH
P.O. Box 101500 • 40001 Düsseldorf • Germany
Tel. +49 (0) 211/45 60-91 • Fax +49 (0) 211/45 60-688
www.messe-duesseldorf.de

Messe Düsseldorf

Three key elements to a groundbreaking solution

MICROSOFT and Tenova – a Techint Group company headquartered in Castellanza, Italy – announced their collaboration on the occasion of SPS Italy – the fair trade dedicated to the world of industrial automation.

The companies presented the characteristics of the groundbreaking Tenova solution that is based on three key elements – sensors/actuators, decentralised intelligence, and supplier-customer interaction – with the objective to improve business productivity in the steel and manufacturing sectors.

Thanks to this system with multiple integrated sensors and actuators, plant machines will be enabled to manage the specific productive process as well as to provide the operators or AI algorithms with specific information on their own conditions – detected autonomously – through dedicated measurements and reporting with respect to specific events.

Decentralised intelligence, by evaluating the information derived from sensors, will elaborate in real time the possible behavioural scenarios, providing functions of monitoring and predictive maintenance. The system may also make available the opportunity to reset specific configurations automatically or to modify functioning parameters to achieve the optimal configuration of the plant.

A service portfolio of high added value, thanks to the network connection of the machines, will allow users to capitalise the data from machines and plants to optimise production, to guarantee prompt remote assistance and minimise downtime.

Through the partnership with Microsoft, Tenova will be able to provide even more efficient and innovative metals production plants, compliant with the strict regulations on safety and environmental sustainability.

The system will be realised thanks to three factors: the possibility to connect the plant machines (involved in each productivity phase) to Azure cloud platform; the high computational power; and the application of provisional algorithms – based on machine learning technologies – available on the cloud platform.

The advantages of this Industry 4.0 solution are numerous and measurable. The system will allow an increase in the overall equipment effectiveness (OEE) index, reduce energy consumption, get valuable remote assistance by Tenova specialists to lower maintenance costs and downtime, guarantee flexibility in order management according to customers' business plans and equipment conditions, and control the plant more effectively through a comprehensive overview of single components.

Tenova – Italy
Website: www.tenova.com

Wire & Cable

ASIA 线缆

Advertise and be seen at...

- WIRE DÜSSELDORF
■ CABWIRE
Düsseldorf, Germany
- AMI CABLES
Cologne, Germany
- EUROBLECH
Hanover, Germany
- WIRE RUSSIA
Moscow, Russia
- MADE IN STEEL
Milan, Italy
- LAMIERA
Bologna, Italy
- TEL
Istanbul, Turkey
- WIRE CHINA
Shanghai, China
- GUANGZHOU WIRE FAIR
Guangzhou, China
- WIRE SOUTHEAST ASIA
Bangkok, Thailand
- INDOMETAL
Jakarta, Indonesia
- WIRE INDIA
Mumbai, India
- TOLEXPO
Paris, France
- WIRE SOUTH AMERICA
São Paulo, Brazil
- IWCS
Orlando, FL, USA
- INTERWIRE
Atlanta, GA, USA
- WIRE EXPO
Nashville, TN, USA
- STAINLESS STEEL WORLD
Maastricht, The Netherlands

It's time to book your advertising for our forthcoming show issues



www.read-wca.com

46 Holly Walk, Leamington Spa, Warwickshire CV32 4HY, UK

CONTACT INTERNATIONAL SALES: Tel: +44 (0)1926 334137 - wca@intras.co.uk



Photograph courtesy of
Jiangsu Handling Machinery Co Ltd

RSB deal with China

MAANSHAN Iron & Steel Co Ltd (Masteel) has placed an order with Friedrich Kocks for a reducing and sizing block (RSB®) 370++/4 in 5.0 design with SCS® (Size-Control-System), 4D EAGLE (light section measuring gauge) and Thermo-Mechanical-Rolling (TMR) process.

Masteel is one of the largest iron and steel enterprises in Mainland China, headquartered in Maanshan, Anhui Province.

The state-owned company was founded in 1958 and in 1993 was split into Magang (Group) Holding Company and Maanshan Iron & Steel Company Limited.

With an annual steel production of around 19m tonnes, Masteel is ranked among the 15 biggest steel producing companies in the world.

The Kocks three-roll RSB® 5.0 with four stand positions will be installed as core equipment in the new 400,000t/a SBQ mill, finishing straight bars for automotive, aerospace and mechanical engineering applications within a dimension range of Ø16–100mm at a maximum speed of 18m/s.

The RSB 5.0 will be located behind a continuous roughing and intermediate mill consisting of 22 stands in H/V

arrangement and is designed for temperature-controlled rolling at low temperatures.

At the core of the future-orientated RSB® is the real-time closed-loop control system SCS, which further improves the rolled tolerances and simplifies the operation due to automated optimisation of the roll gap settings and motor rpms.

The Kocks 4D EAGLE measuring gauge is a perfect complement to the SCS. It integrates the newest technologies and meets the highest requirements of most modern rolling mills for full process transparency.

The Thermo-Mechanical-Rolling (TMR) process, including the Kocks Process Simulator (KPS) and the appropriate automation package, completes the scope of supply.

The KPS in combination with its advanced automation system ensures a precise temperature control of the bars and an optimal adjusted cooling process at any time, which assures subsequently desired material properties of the final product.

Friedrich Kocks & Co GmbH – Germany
Website: www.kocks.de

FUHR
ROLLING MILLS

WORLD-CLASS
WIRE ROLLING MACHINES

PRODUCTIVITY
MADE IN GERMANY

www.fuhr-wire.com

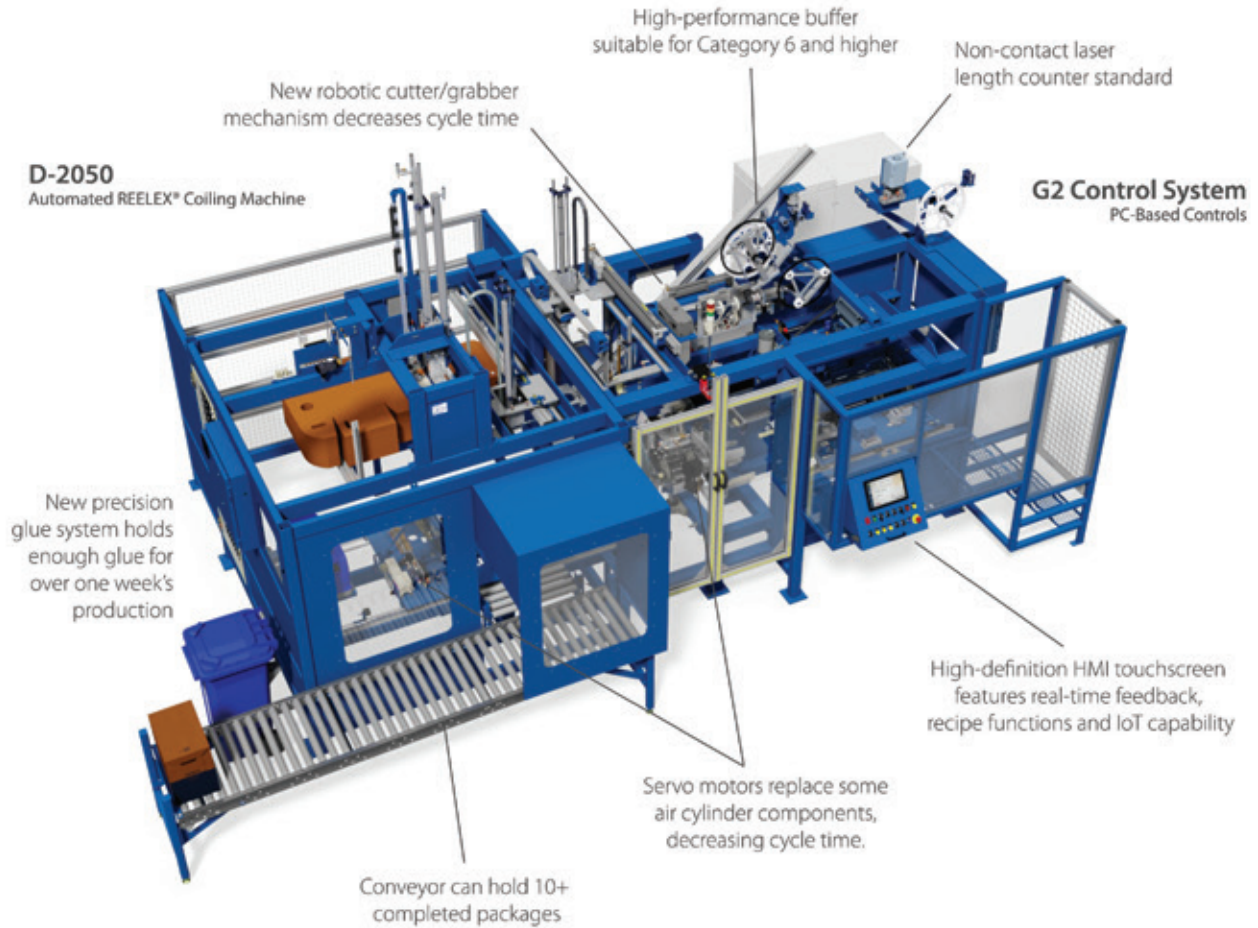
Please visit us at
Wire Southeast Asia 2017
Booth F19

Please visit us at
Wire South America 2017
Hall 5 - Booth 736

wire
Southwest Asia

wire
South America

Wire goes in. **REELEX**[®] comes out.



Introducing the **D-2050** fully-automated REELEX packaging machine.



Cable compliant at Leoni

LEONI, a European supplier of cables and cable systems to the automotive sector and other industries, now offers a comprehensive range of cables for applications compliant with the EU Construction Products Regulation 305/2011.

All cables intended for permanent installation in construction works have CE marking and a declaration of performance. Depending on the building or fire risk, Leoni can offer a range of products with the appropriate fire performance class.

On 1 July 2017, the transition period ended for energy cables, control cables and communication cables intended for permanent installation in construction works such as buildings or tunnels. From this date onwards, these cables must be manufactured and evaluated in accordance with the harmonised European standard hEN 50575, and labelled with a CE mark pursuant to the EU Construction Products Regulation 305/2011.

In addition, a 'declaration of performance' must be prepared on the basis of assessments and classifications carried out by an accredited and notified testing body. A key element of the CE marking and declaration of performance prescribed by the regulation is the specification of the fire rating.

Leoni now offers a wide range of low fire-hazard cables with reduced flame propagation and heat production with the simultaneously low release of corrosive gases and smoke in accordance with the regulation. The product range includes Betaflam® brand energy cables, FieldLink® brand bus cables, and MegaLine®, GigaLine® and FiberConnect® brand communication cables, as well as a large number of customer-specific product solutions.

For buildings with very high safety requirements, such as hospitals, low fire-hazard cables with a B2ca s1 d1 a1 rating are envisaged.

For buildings with high safety requirements, such as schools, low fire-hazard cables with a Cca s1 d1 a1 rating should be used. For normal fire risks, cables with a Dca s2 d2 a1 rating are adequate.

The declaration of performance including the fire rating of each Leoni product can be viewed on the company website at www.leoni.com/de/baupvo. Alternatively, a QR code on the CE label enables direct access to and archiving of the declaration of performance.

Leoni AG – Germany
Website: www.leoni.com

嘉 CH JIA JIUN STEEL CO., LTD

Main products: Spring Steel Wire, Stainless Steel Wire, Galvanized Steel Wire, Prestressed Concrete Steel Wire and Bicycle Cable.

Our steel wire products, with no pickling during annealing, are more rust-resistant and can make finished spring products with better stability.

Our products have a good reputation in the oil-seal springs and precision springs field.

Please visit our website for more information.

JIA JIUN STEEL CO., LTD
NO 88, Tian Wei Li, Tai Bao City, Jia Yi Xian, Taichung, R.O.C.
TEL: +886-5-3612468
FAX: +886-5-3612467
E-mail: h3612@ms38.hinet.net
Website: <http://www.jiajun.com.tw/>

UKAS
UKAS
UKAS

WEILLY DIAMOND INDUSTRIAL CO., LTD.

Shaped PCD Dies Regular and Irregular
Shaped dies - How small can it be?

Thickness **the thinnest 0.10x2.0mm** for PV ribbon
Square **ultra-fine 0.10x0.10mm**
Irregular **any shape you want**

Other main product
ND and PCD wire drawing dies
Tinning dies
Nipple for plastic coating of wire
Compacting or bunching dies
Others

wire
Southeast Asia

See you at booth : E38

Hexagon
4.96

Oval
Rectangle
Triangle

Square
Thinness
Ultra-fine Irregular
0.10 mm
0.10 mm
2.0 mm
0.256mm

www.weilly.com.tw
weilly@ms5.hinet.net



Lämneå Bruk AB
A passion for service.

State-of-the-Art Wire Drawing Technology



Advanced Customization

Suitable for low to high carbon as well as welding wire and stainless steel wire
Depending on your individual needs

The flexible machine set-up allows

starting on, finishing on or bypassing any block

Superior Block Cooling Effect

Blocks with v-grooves create a double cooling effect from in-and outside the box to prevent overheating and enabling superior cooling



The NEW Standard for Spring Wire Coiling

Lämneå Bruks No Twist Coiler (NTC) for **Spring Wire** sets a new standard for **bedding and seating wire coiling**

Twist-free and straight wire

No need for additional straighteners

Constant back tension

Proven beneficial in producing springs of consistent and even quality while reducing wire consumption at the same time

Increased coiling speed

Efficient and fast wire coiling for high quality results

Advanced PLC control system

Highest user friendliness and easy to operate



**MEET US AT wire SEA in Bangkok
BOOTH # G17**



○ Steam lines, superheater tubes and exhaust systems in reciprocating engines and gas turbines are classic applications for Ugitech's UGI 4550. Photograph courtesy of Ugitech – [istockphoto_annavaczi](#)



ANBAO
STEEL WIRES

Galvanized wire, Redrawn wire, Stainless steel wire, Copper coated wire
Bright wire etc. on kinds of spools, such as DIN125, DIN160, DIN200
DIN250, BB20, BB25, MP100 etc.



ANBAO QINHUANGDAO INTERNATIONAL CORP.

Add: No.33 Qinhuangxi Street, Qinhuangdao, P.R.China, 066000

Tel: +86-335-3893600

Fax: +86-335-3870760

Email: anbao@anbao.net

Website: www.anbao.net

Ugitech's lead

SAFE transport of hot gases and vapours at temperatures of up to 850°C – this is a problem facing many manufacturers of components for the process industry. The smart choice for the solution is austenitic stainless steel 1.4550/347H.

To meet the increasing demand, Ugitech has added UGI® 4550 to its broad stainless portfolio, and is one of only three suppliers in Europe. Steam lines, superheater tubes and exhaust systems in reciprocating engines and gas turbines are classic applications for Ugitech's UGI 4550. The addition of Niobium makes the finished steel grades a well-adapted solution for temperature ranges between 425°C and 850°C.

Compared to most austenitic materials, UGI 4550 inhibits the formation of chromium carbide precipitates at the grain boundaries and thus stops intergranular corrosion.

The stainless product is optimum for parts for which treatment of the material after welding is not feasible, such as expansion joints and equipment for chemical processing at high temperatures. UGI 4550 is also readily formed at room temperature and is very easy to weld.

This means no hot cracking after welding. Good creep resistance (resilience against temperature-dependent deformation) and resistance to atmospheric corrosion and oxidation at high temperatures further increase process reliability.

Ugitech SA – France

Website: www.ugitech.com

YOUR PERFECT PARTNER FOR THE YEARS AHEAD

Your no. 1 partner in nails

High-efficient in-line solutions



INTERNATIONAL
WIRE & CABLE TRADE FAIR
FOR SOUTHEAST ASIA

Visit ENKOTEC at booth
E27 Wire Southeast Asia 2017 or
contact us for more information!

www.enkotec.com

ENKOTEC is the world-leading supplier of high-performance machinery for nail production. With more than 35 years of experience, we have in-depth understanding of your market and the challenges you face.





Please visit us
at our booth: G38

PASSED ISO9001:2008 AND CE CERTIFICATE
REELS&SPOOLS MANUFACTURER
YANGZHOU HAVET MACHINERY CO.,LTD.
http://www.havet-china.com
Contact us: havet@havet-china.com
havet_china@163.com



ADWANTEK TECHNOLOGIES CO.,LTD

High Frequency Inductive Preheater

Capacitance Monitor ADM Series Infrared Diameter Gauge

Spark Tester EPS-1 Talcum Powder Coating Machine

ADD:3rd floor, 2nf Zhongjian Building,18 Yanshan Road, Nanshan, Shenzhen, China
Tel:+86(755)-26420391;+86(0)13682385045
Fax:+86(755)-26420390
Email:sales@adwantek.com
Web:www.adwantek.com

GKD: a sought-after problem-solver for challenging processes

THE innovative process belt solutions of GKD – Gebr Kufferath AG – received a great reception at the Techtexil trade fair in Frankfurt, Germany.

The model of a double-belt dryer with upper and lower belt proved to be a real eye-catcher at the leading trade fair for technical textiles and non-wovens. Plant manufacturers and users were particularly interested in V-crimp type belts for textile washing equipment as well as belts made of glass hybrid fabric with PFA coating. Because GKD is well known as a committed and competent problem solver in the field of process belt technology, many visitors discussed concrete, application-specific challenges directly with the experts.

Attention-grabbing models and exhibits guided visitors at the GKD stand straight to the right contact person. This enabled long waiting times to be avoided despite the large numbers of visitors and provided plenty of starting points for discussing detailed questions on products or individual specifications. University representatives as well as technicians and developers were keen to make the most of this intensive specialist exchange.

Woven dryer belts with non-stick coating now combine proven characteristics such as high lateral stability, optimum flatness, excellent running properties and robustness with even more process stability through easy product release. As such, they raise the productivity of critical drying processes while maintaining the same level of product quality and reducing downtimes and cleaning costs.

Self-tracking V-crimp type belts made of stainless steel are resistant to corrosion and aggressive lyes. The special design also ensures process reliability even when the bearing weight is uneven. This makes them particularly well-suited for challenging washing and bleaching processes for fibres and textiles.

With its innovative glass hybrid fabric, GKD meets demands that are normally

mutually exclusive with energy-saving lightweight mesh and robust lateral stability. Glass strands in the warp direction coated with PFA lend this mesh structure a lower weight, while stainless steel weft wires guarantee reliable lateral stability.

At the same time, the high-quality PFA coating of the strands minimises both adhesion and soiling. Depending on customer wishes, the new mesh type is available in magnetic or non-magnetic form for use in single-belt and double-belt dryers.

Renowned non-woven manufacturers are already enjoying significantly optimised processes thanks to the Conductive® 7690 forming belt from GKD. This belt's special monofilaments safely dissipate the electrostatic charges that typically arise in such processes.

Gebr Kufferath AG – Germany
Website: www.gkd.com

Bangkok bound!

Wire & Plastic Machinery is a large reseller of second-hand wire, cable, and optical fibre manufacturing equipment for wire drawing, stranding, bunching, cabling, braiding, extrusion and other cable making needs.

The company will be exhibiting at this year's wire Southeast Asia in Bangkok, Thailand, at Stand C10.

Machines are offered as individual components to complete lines and can be delivered immediately from eight USA locations or completely reconditioned by an in-house engineering team. Wire & Plastic Machinery has a comprehensive range of over 30,000 machines in stock for all aspects of non-ferrous wire and cable production.

Wire & Plastic Machinery Corp – USA
Website: www.wireandplastic.com

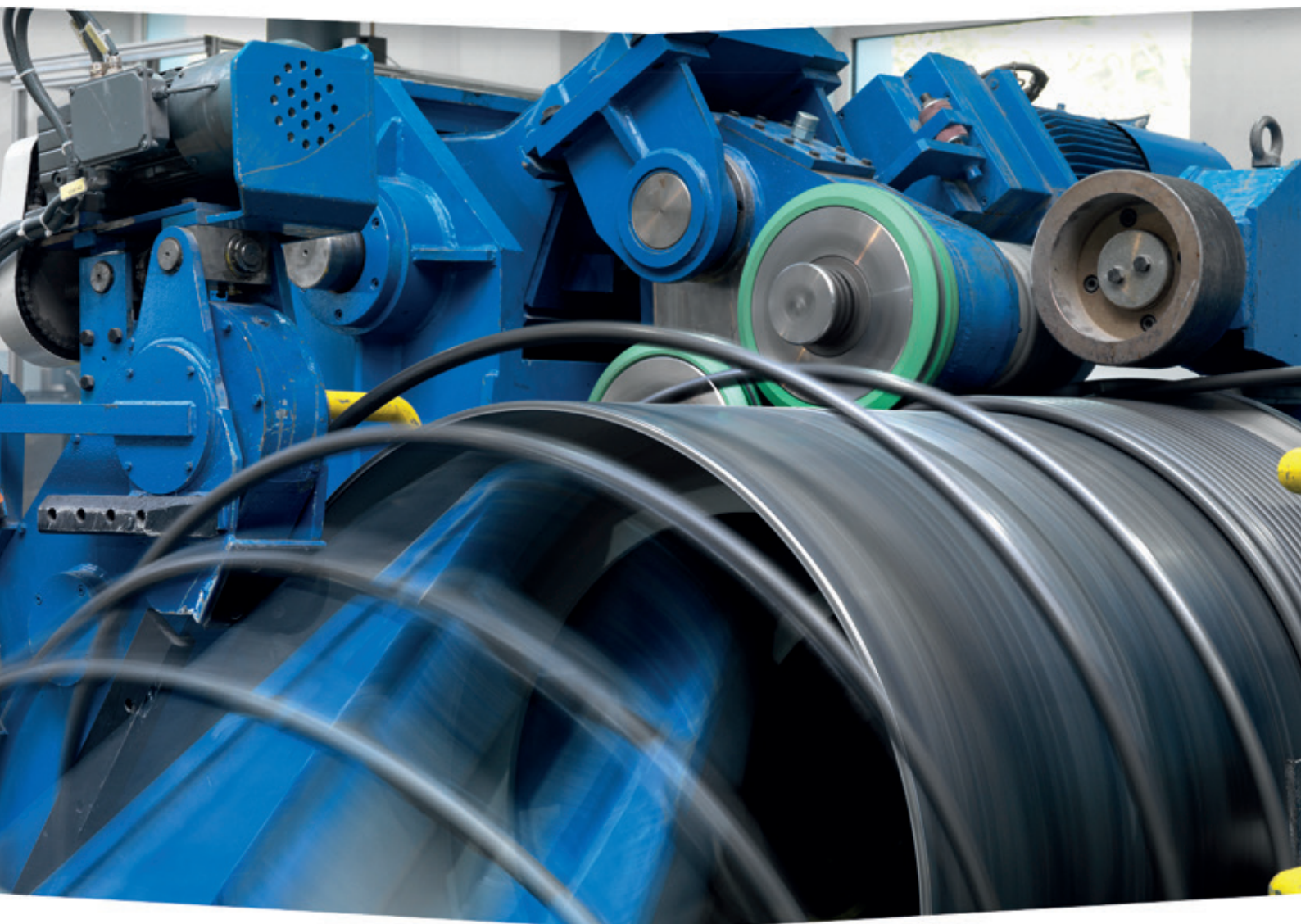
Wire Engineering Excellence

A machine line for the manufacturing of wire is a considerable investment. It should support your processes perfectly over the long term. You can place your trust in the quality of our consultation, products and service. We realise projects for our customers with the highest levels of expertise. We put emphasis on customer proximity, fairness and reliability. And we have been doing so for more than 90 years.



World-class performance

Cold heading wire, stainless steel wire, spring steel wire, bright wire, ball bearing wire – when it comes to the manufacture and processing of medium and large diameter wire, KOCH single-block drawing systems are among the world's most capable machines.



Good mood at Russian quartet of metal trade fairs

wire Russia, Tube Russia, Metallurgy Russia and Litmash Russia were held jointly again in Moscow in June 2017.

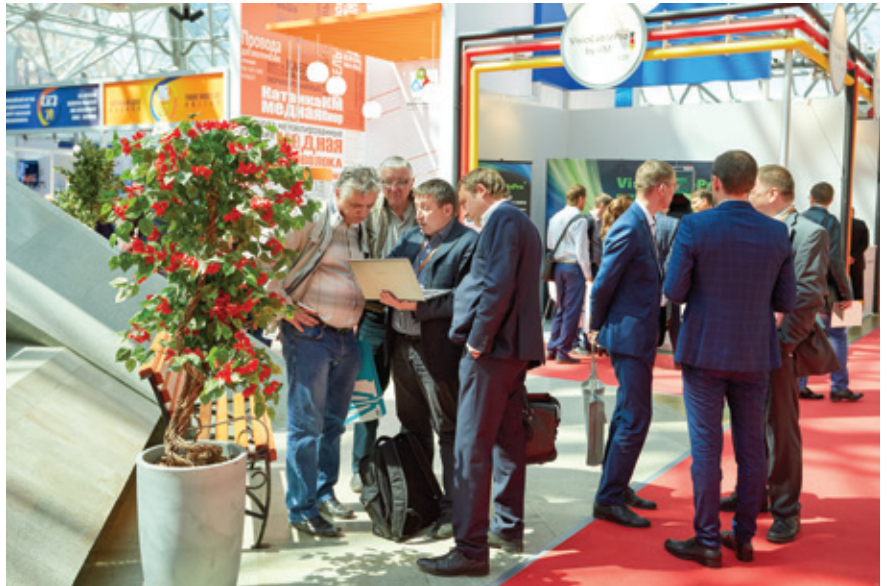
The four trade fairs took place in one venue, creating ideal synergies for exhibitors and visitors as well as short routes between stands and a compact presentation.

As before, the Expo Centre in Moscow hosted a joint presentation of four technology trade fairs: wire Russia, the international wire and cable fair; Tube Russia, the international pipe and tube fair; Metallurgy Russia, the international metallurgical technology processes and metal products fair; and Litmash Russia, the international foundry fair.

The regional trade fairs were organised by Messe Düsseldorf GmbH, Messe Düsseldorf Moscow – in partnership with the Russian joint-stock company VNIIPK for wire Russia, and Metal Expo for the other three, Tube Russia, Metallurgy Russia and Litmash Russia.

In all, around 400 companies presented technical innovations from their industries, covering an exhibition space of 5,545m².

As well as Russian exhibitors, many international companies were represented in Moscow, showcasing their products and services to the



○ Exhibitors and visitors alike, above and below left, at this year's wire Russia

Russian and Eastern European markets.

Throughout the world, good business is being generated by an increasing global demand, the international expansion of glass fibre networks and the prospect of the World Cup in Russia.

This is benefiting not only the Russian construction industry, but also international companies that are

involved in building Russia's many stadiums and which are working on infrastructure projects.

Wire, cables, tubes, metal and foundry products are needed for the stadiums, and the forthcoming World Cup is therefore having a major positive impact on the exhibiting industries.

Tube Russia, Metallurgy Russia and Litmash Russia were attended by 4,200 trade visitors, primarily from Russia and its neighbouring countries. wire Russia attracted 2,720 visitors who spent four days finding out industry news, refreshing contacts and initiating business deals. Exhibitors rated their conversations at the stands as highly positive, and many are expecting good follow-up business as a result.

Visitors mainly came from Russia, other CIS regions and neighbouring European countries.

Further details of all four trade fairs can be found on the relevant websites:

- www.wire-russia.com
- www.tube-russia.com
- www.metallurgy-russia.com
- www.litmash-russia.com

Messe Düsseldorf GmbH – Germany
Website: www.wire-russia.com





First Class Stranding

with all the advances associated with the name SKET



MVD Type Vertical Laying-up Machine

The most economical solution for making very long submarine cable



19 – 21 September 2017
Bangkok, Thailand
BITEC (Bangkok International Trade & Exhibition Centre)
Booth No. H19 Please visit us!



3 – 5 October 2017
São Paulo, Brazil
Imigrantes Exhibition Centre
Hall 5, Booth No. 631
Please visit us!

SKET THE ADDRESS in the wire rope and cable industries

SKET Verseilmaschinenbau GmbH • Schönebecker Straße 82-84 • 39104 Magdeburg • Germany
Phone: + 49 (0) 391 40558-0 • Fax: + 49 (0) 391 40558-15 • info@SKETVMB.de • www.SKETVMB.de

Wire & Cable Guangzhou's highest attendance in years

WIRE & Cable Guangzhou 2017 concluded with a record-breaking number of visitors. Jointly organised by Guangzhou Guangya Messe Frankfurt Co Ltd, China Southern Power Grid Media Co Ltd and Guangzhou BoYou Exhibition Service Co Ltd, the fair ran from 9th to 11th June at the China Import and Export Fair Complex in Guangzhou, which welcomed 220 exhibitors and attracted 22,642 professional buyers from 42 countries and regions.

The three-day event spanned 20,000m² of exhibition space and presented an extensive display of South China's latest products and innovations in wires and cables, manufacturing machinery and related materials and accessories.

Some of the leading brands in attendance included Futong Group, Shenzhen Bendakang Cables Holding, Zhejiang Wanma Cable, Shandong Yanggu Cable Group, Shenzhen SDG Information, Asian Electric Appliances & Cables Technology, Qingdao Hanhe Cable, Guangdong Rihong Cable, Suzhou Zhihong Cable Materia and many more.

Emeka Hu, general manager of Guangzhou Guangya Messe Frankfurt Co Ltd, said: "Every year, we strive to enrich the experience for our participants by creating a professional and internationalised exhibition.

"We are grateful for the audience's support and are committed to create a more comprehensive platform for the industry. I am very pleased with the results of the 2017 show and I believe it has contributed to increased information exchange among industry peers."

Jiang Zhuoxun, project manager from Zhejiang Wanma Cable Co Ltd, said: "During the fair we have received an overwhelming response not only from Chinese visitors, but also from buyers on a global scale. Companies from Southeast Asia as well as India came to our booth for quotations, and some even placed orders. Wire & Cable Guangzhou is an important platform to promote high-end products domestically and internationally."

The wide variety of products on offer

highlighted industry innovations coming out of South China, and met the diverse demands of buyers from around the world. Matthias Muller, general manager of Johann Leimbach Ltd from Germany, came to China for the first time searching for business opportunities.

He said: "Our goal was to find domestic cable manufacturers and business partners who have the capacity for manufacturing the high quality cables that our company is known for. Fortunately, here at the fair, I was able to network with a number of cable manufacturers who seemed interested in our business proposal."

Apart from the exhibition, the Wire and Cable Asia Forum continued to be a highlight at Wire & Cable Guangzhou. The two-day forum offered 17 high-profile seminars which focused on timely standard and certification procedures for USB adaptors, as well as future development on new energy vehicle charging modules.

Wire & Cable Guangzhou – China
Website: www.wire-cable-china.com

Going green around the globe

Prysmian Group has formed a partnership with the *Energy Observer*, the world's first catamaran powered solely by renewable sources, at the Paris Air Show.

Energy Observer and CEA Liten, the research institute that developed the project, have chosen Prysmian as the official supplier of cables which, through a high level of performance, reliability and light weight, provide energy generated from renewable sources to the vessel's motor.

The catamaran, 31m long and 12.8m wide, is powered solely by renewable energy, drawing on 130m² of solar panels, two vertical wind turbines and a sophisticated system that desalinates water, transforming it into hydrogen through electrolysis.

The *Energy Observer*, which set out on 14th April 2017 from the Port of Saint Malo (France), is currently committed to a six-year trip around the world during which it will travel to 101 ports in 50 countries.

The goal of the project is to share with the world a concept of electrical power not in conflict with nature. It will be a long journey, but also an opportunity to engage in dialogue and build consensus about new solutions for a cleaner future.

Prysmian Group – Italy

Website: www.prysmian.com

Colombia fair

ANDINAFAIRS SAS is a wire and tube event hosted in Barranquilla, Colombia. Its organisers have ten years of experience in fairs and exhibitions based in Latin America.

There are a number of companies working with cables, wires, tubes and valves in the local area, making it possible to create a successful commercial fair.

The AndinaTube & Wire 2017 show will be highly focused and aims to be a direct and effective way for those attending to find a complete variety of products. It will cater for those working in manufacturing, importing, wholesaling or retailing wires, cables, tubes and valves.

AndinaTube & Wire Colombia 2017
Website: www.andinatubewire.com

COMPETENCE AND INNOVATION

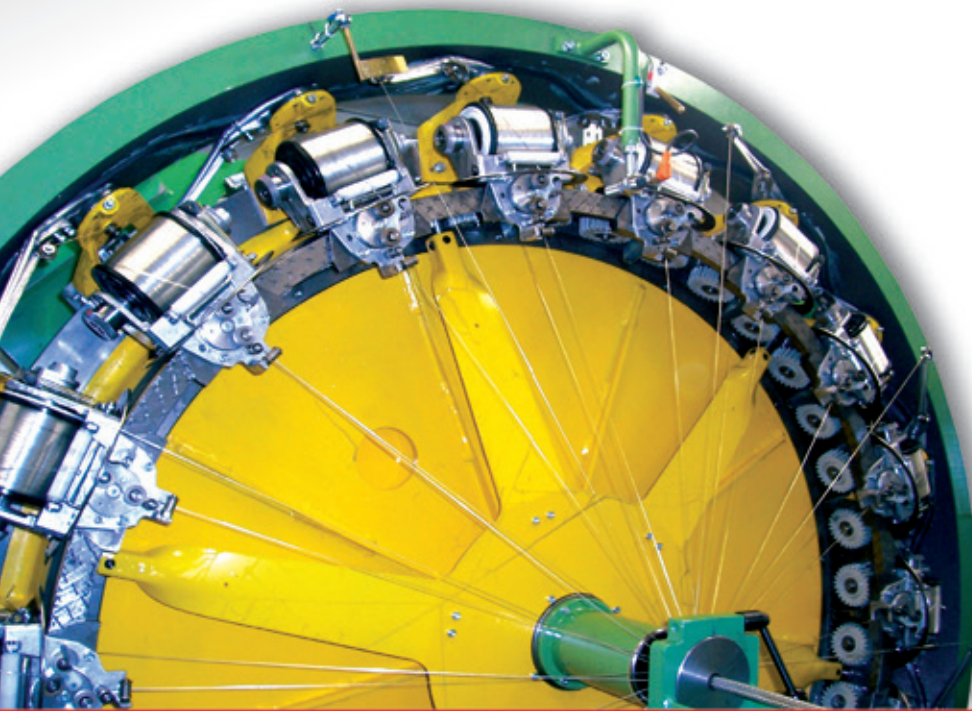
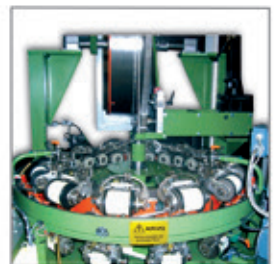
More than 100 years experience in building Braiding, Spiraling and Winding Machines

Our Scope of Performance:

- Vertical and Horizontal Braiding Machines for a wide range of applications
- Vertical Spiraling Machines up to 24 Carriers and Horizontal Spiraling Machines up to 36 carriers
- Fully Automatic and Semi-Automatic Winders

Additionally Longitudinal Taper, Concentric Taper, Payoffs and Takeups, Empty Bobbin Detectors Integrated or sold independently.

Reliable supplier and partner!



Spirka Schnellflechter GmbH

Spirka Schnellflechter GmbH
Wilhelminenhofstraße 76/77
12459 Berlin, Germany
Phone: +49 (0) 30 549918-0
Fax: +49 (0) 30 549918-45
E-Mail: info@spirka-schnellflechter.com
Internet: www.spirka-schnellflechter.com



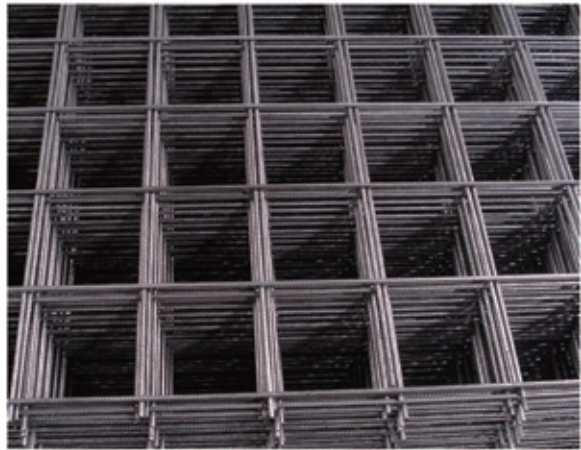
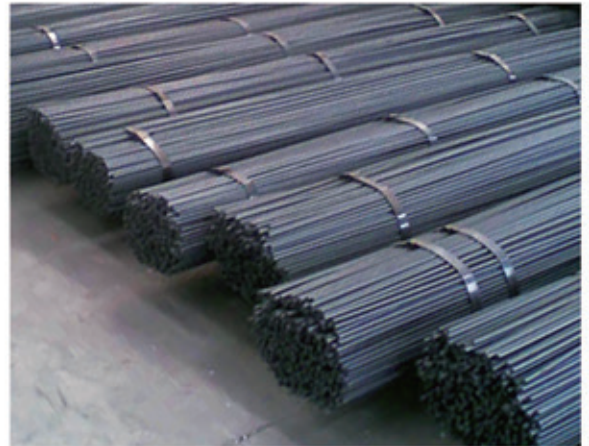
Wardwell Braiding Co.
1211 High Street
Central Falls, Rhode Island 02863, USA
Phone: ++1-401 724 8800
Fax: ++1-401 723 2690
E-Mail: sales@wardwell.com
Internet: www.wardwell.com



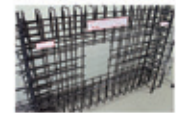
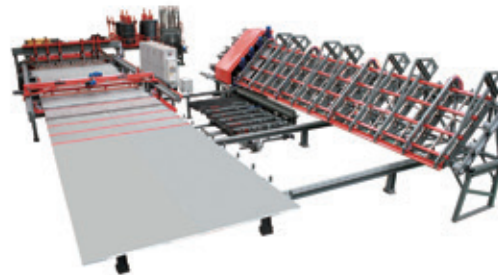
STIRRUP BENDER



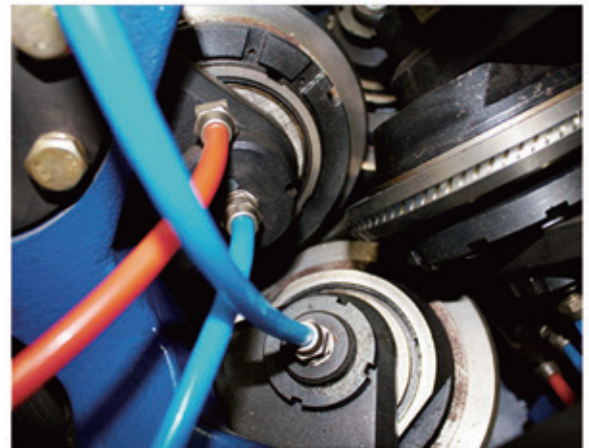
WIRE STRAIGHTENING AND CUTTING MACHINE



WIRE MESH WELDING MACHINE



WIRE COLD ROLLING MACHINE



New Factory 270,000 m²

TJK MACHINERY (Tianjin) CO.,LTD.
 Lugang Wuwei Rd., Lulugang Logistics Industrial Park,
 Beichen Dist., Tianjin, China 300408
 Tel: +86-22-26993766 Fax: +86-22-26997888
 www.tjkmachinery.com yunjian.gao@tjkmachinery.com

New app to help find the perfect alloy

ALLOY Wire International (AWI) has launched a new app to help its global customer base find the right material for their applications.

The company has spent the last four months developing an interactive database of all of its materials, their properties and their applications, and this is now available on computers, mobile phones and tablets.

The web-based app, which has been developed by technical experts, allows users to search for the type of wire they need by industry sector (eg aerospace, oil and gas and nuclear) or by application solution, such as high strength, sub-zero temperature, heat, corrosion and water resistance.

"We've got over 60 different nickel alloys in stock at any one time and we need to make sure our clients get the material that best suits their manufacturing requirements. The app

will help them do just that," explained Mark Venables, managing director.

"It also provides a whole host of information on each alloy. This includes a brief description, key features and profile options, with an easy enquiry form readily available to log your interest."

He continued: "The initial feedback has been very positive and customers have said the process is easy and has helped them make important decisions on material selection that they might not have chosen without it."

AWI, which makes round, flat, shaped profile and electrical resistance wire, is planning to translate the 'Wire Finder' app into a range of other languages to support its export drive.

This has seen the company supply into more than 52 countries, with the

latest destinations to request AWI wire being the Dominican Republic, Nepal, Peru and Oman.

"About 50 per cent of our sales go overseas and this is a figure we believe will increase as we look to increase the number of international staff and the exhibitions we attend," added Mr Venables.

"The world is a lot smaller place these days and, thanks to our stockholding and manufacturing capabilities, we can produce wire and have it with clients – in any location across the globe – within three weeks."

To download the new app, go to www.alloywire.com and click on 'Visit the app'. You can then add it to the home screen on your iOS or Android device.

Alloy Wire International – UK
Website: www.alloywire.com

**A NEW KIND OF PACKAGING...
FROM DeWAL**

NO MORE BREAKAGE.

NO MORE TANGLES.

PAY OUT NARROW PTFE FILM WITH SOLID PACK®

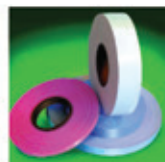
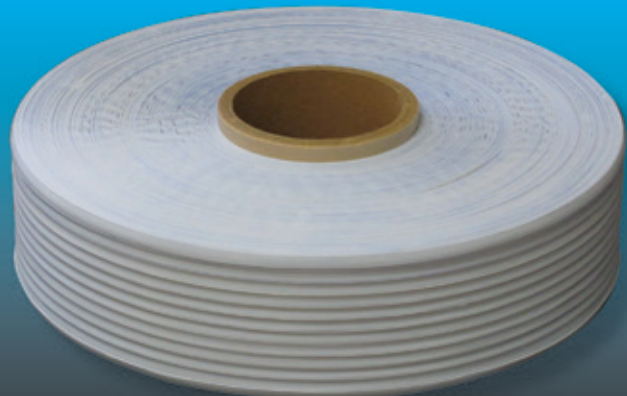
Solid Pack® greatly reduces tangles and breakage in skived, unsintered and low density PTFE films.

A new and exclusive packaging method, Solid Pack® allows film to unwind not transversely but unidirectionally in columns. Solid Pack® is a stable put-up, resulting in a spool becoming narrower without softening at the sides. Because tension does not fluctuate, even unsintered PTFE resists stretching.

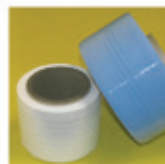
Solid Pack® is for PTFE film from 1/32" to 3/4", in 1/32" increments. DeWAL PTFE film can be as thin as 0.001".

Custom packages are manufactured at DeWAL's Narragansett, RI, facilities in widths up to 12" and diameters also up to 12". Packages can be with or without sideboards. Film lengths can be as much as 20,000 ft.

Besides new Solid Packs, DeWAL offers traditional flat pad packages in standard and custom configurations. For all your options, call DeWAL today.



Flat Pad Packaging



Solid Pack®



Part of **ROGERS CORPORATION**

15 Ray Trainor Drive | Narragansett, RI 02882
www.dewal.com | usa1@rogerscorporation.com
800-366-8356
(International: 001-401-789-9736)



○ Troester's headquarters have been in Hanover-Wülfel since 1892

125 years of excellence in extrusion

INNOVATIVE know-how, state-of-the-art research and development, the highest level of precision and reliability – that is what Troester stands for. The family-run company celebrates its 125th anniversary this year.

The extrusion specialist from Hanover-Wülfel, Germany, manufactures precision machines and complex units for repeated extrusion of tyre components, the manufacture of high-grade rubber goods or medium to extra high-voltage cables – always at the highest level.

“We proudly look back at our long history,” said managing partner Dr Peter Schmidt.

“But we also look forward. Together with our partners and clients, we look forward to continuing Troester’s success story over the upcoming years and to facing the challenges in an ever-changing economy.”

Troester has a long history in mechanical engineering. Engineer Paul Troester spontaneously founded his own company on 4th July 1892, after his colleagues of Eisenwerk Wülfel dismissed his ideas. Toward the end of the 19th century, the region around Hanover had developed into a hub for the rubber-processing industry.

The background was the increasing demand for rubber products and

rubber tyres for the burgeoning automobile industry. Paul Troester wanted to manufacture the required machines on site, instead of importing them from abroad, which was quite cumbersome. The idea to found the Troester plant was born.

Clients around the world appreciate solutions from a single source

125 years later, the company has long since developed into one of the market leaders for technical rubber sheets, tyre components, profile and hose systems plus cable machines and cable systems.

Export plays a major role: Troester yields 90 per cent of its revenue abroad.

Last year, the Troester group generated sales of over €120m and has over 600 employees at its main plant in Germany and the subsidiaries and representative offices in the USA, China, Switzerland and Russia. In 2011, the Troester Group was joined by Swiss company X-Compound, a specialist for plastics processing and a manufacturer of continual kneaders.

“We now offer our clients a total package of planning and concept, production and installation as well as on-site maintenance,” added Dr Schmidt. The big names in the tyre and rubber industry as well as major cable manufacturers are among the extrusion specialist’s clients.



○ Managing partner Dr Peter Schmidt, left, and Bernd Pielsticker, managing director

Successful through difficult times

Before the First World War broke out, Troester had established itself as a manufacturer of special machines for the rubber-processing industry. The company was economically well positioned; however, it was faced with new challenges during the war and post-war turmoil. The good times returned in 1924, with Carl Bredemeyer, who took the destiny of the company into his hands.

As part of the Buna programme, Troester experienced an economic high point in the 1930s. The company profited from the development of synthetic rubber and thermoplastics. The equipment manufacturer conquered new business sectors, for instance with extruders for PVC processing.

Yet the Second World War brought difficult times. By 1945, the plant in Wülfel had virtually been completely destroyed by two air strikes. However, currency reform, the lifting of seizure by British military authorities and the Marshall Plan ensured that relations were soon normalised. The reconstruction of the destroyed facilities



○ With the new 3,200m² production hall, capacities and factory logistics are ready for the future

began, and Troester presented itself to the public for the first time in 1947, on order of the British-organised ‘Export Trade Fair Hannover’, the predecessor of what later became the ‘Hanover Fair’.

Employee know-how is the best capital

Over the years, the company has developed from a classic equipment

manufacturer to a system provider, accountable for comprehensive electronics, controlling and automation of state-of-the-art units, in addition to manufacturing. Among other things, the company is based on in-depth research and development work, which has always been a top priority at Troester. The company spends about two per cent of its revenue on these areas. Key competencies and special know-how stay in the company.

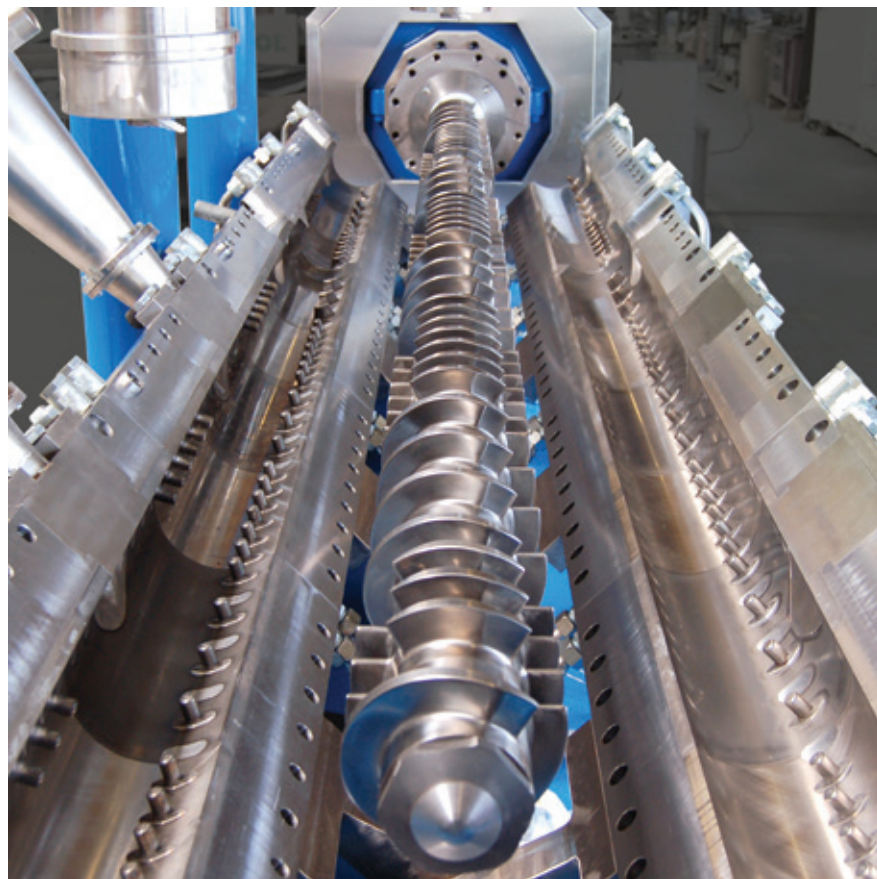
“Courage and tireless commitment are characteristics that have shaped Troester since its founding,” added Dr Schmidt, who took over managing the company from his father in 2003. “The workers and staff feel like they are part of a family.”

On average, each employee has been in the company for about 16 years, while many are celebrating their 25th and even 40th anniversaries.

Equipped for the future

The company is committed to its location in Germany. As part of restructuring and optimisation of production conditions at the Wülfel plant, a new production hall with a surface area of 3,200m² was constructed in 2016. A second construction phase with several buildings follows this year, which will expand the factory premises in Hannover to over 25,000m² – about 15,300m² of which is production space – thereby positioning Troester’s capacities and plant logistics for the future. New investments are already in planning to equip the company for the challenges of digitisation and Industry 4.0.

Troester GmbH & Co KG – Germany
Website: www.troester.de



○ The continuous kneaders from X-Compound have a wide range of applications – including gentle processing of cable compounds



Issued to Mario Frigerio S.p.A



power of

Best practice made perfect. Only MFL Group brings together the power of three. We build machines for wire drawing *and* stranding/cabling *and* extruding. So our leading brands can create state-of-the-art solutions for machines, or lines, or plants that help you produce the world's finest wire, conductor, rope, and cable — both ferrous and nonferrous. The products and processes that we perfect for you • Provide maintenance-free uptime • Deliver greater throughput • Last longer • Are supported by more advanced service • Operate more efficiently • And ensure maximum profitability for your business. Our complementary brands combine financial dependability, 100+ years of industry commitment, and unmatched knowledge and experience. Plus a unique dedication to continuous improvement and service means we set our goals higher every day!



MFL GROUP
Best practice *made perfect*

mflgroup.com

Corporate Headquarters: Mario Frigerio S.p.A.,
Viale Lombardia Snc, 23847 Molteno (LC), Italy,
Tel: +39.031.5488.100 E-mail: service@mflgroup.com



MARIO FRIGERIO



FRIGECO



om **LESMO**

Death of Edward Trimpert Sr

DAVIS-Standard lost a loyal employee and friend on 9th June with the death of Edward Trimpert Sr, after complications from a heart attack. He will be fondly remembered and missed by all who knew him. He spent the majority of his 20-year career as a plastics engineer with Davis-Standard, starting with Egan John Brown Plastics (now Davis-Standard) in 1983.



○ Edward Trimpert Sr

Most recently, he worked as an international sales engineer in the sheet group covering Asia and Latin America. He was known as a hard worker and talented engineer, using his skills to grow the company.

“Sheet extrusion was Ed’s passion,” said Steve DeAngelis, Davis-Standard vice president, sheet and foam.

“He was dedicated, a problem solver and an outstanding teacher, which endeared him to customers and colleagues alike. His absence will impact all who knew him.”

In addition to his outstanding work on the job, Mr Trimpert was an avid sports fan. He loved the Yankees and Cowboys, and was very involved in coaching his children’s sports teams. He is survived by his wife Theresa and two children, Nikki and Eddie Jr.

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

Responding to customer requests

Involved in the fields of tungsten carbide tools since 1870 and machinery, the French company Agir Technologies provides solutions and advice to a variety of requests from customers.

The investments made in the company, such as a wire cutting EDM with two-wire spool of 0.03mm, a five-axis CNC machine to cut the electrodes,

and new CAD/CAM software, allow Agir to widen its range of high precision and quality tools. Agir is specialised in the production of tungsten carbide tools for wire and cable manufacturing and other wire transformation.


Agir Technologies – France
Website: www.agir-technologies.com

Measurement 测量仪器

Full in line quality certification 在线质量 保证


Fine wire diameter measurement 线径测量

Laser Diffraction Sensors 激光衍射测径仪: LDS
0,005 to 2mm, high accuracy 高精度
选项: 旋转支架, 标签打印机, 实验室应用




Optical fiber drawing lines 全套高精度光纤拉丝生产线测试仪

Full set of high performance measurement instruments



Cables, rods, tubes, 电缆、棒材、管材

Laser Projection Sensors: LPS
高速外径测量
鼓包 / 凹凸检测, 外形检查




Data recording & display, quality reports...

赛飒仪器数据管理
« CIM » PC software
电脑软件



Ahead together

CERSA-MCI
MEASUREMENT AND CONTROL INSTRUMENTS





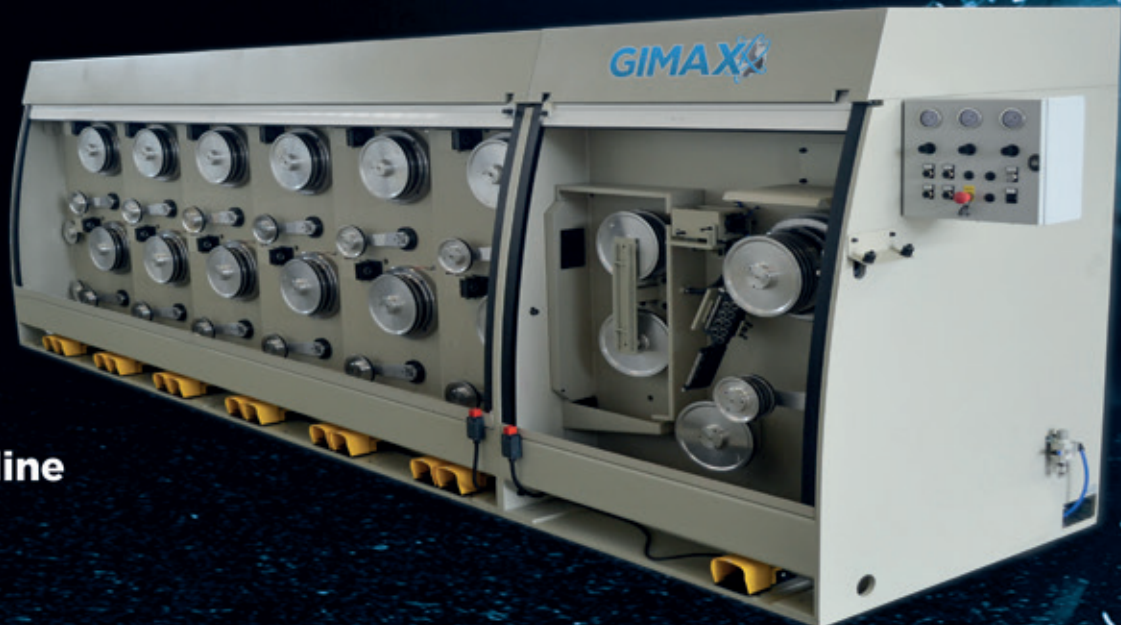
DIFFERENT DESIGNS FOR DIFFERENT WIRES



TRD-WD-H
Rod breakdown line

SPECIFIC DESIGN FOR ALUMINIUM WIRE

- Big energy saving compared to a slip type drawing machine
- Reduced die and capstan wear
- Fixed or rotating dies
- Rotating die speed varies in proportion to line speed
- Each block can be bypassed
- Synchronization by means of dancer arm



TRS
Redraw line

Remote service for support in real time

FAST, competent and reliable support for customers all over the world – Sikora meets these requirements with the Smart Assistance Manager (SAM). For customers this means significantly more efficient support and, therefore, optimised service processes.

Sikora's Smart Assistance Manager is a 13.3" tablet, optimised for the rough industrial environment.

The Smart Assistance Manager allows a direct connection with a Sikora support engineer to receive instructions for all maintenance, support and diagnosis tasks via the integrated video chat feature (5 MP camera).

In real time the Sikora support engineer gets direct access to the Sikora device for immediate diagnosis.



○ Sikora's Smart Assistance Manager

In the same way, software updates are installed.

The assignment of the Smart Assistance Manager starts with the installation of the measuring device.

With the SAM, the customer transmits via video-stream the environmental conditions as well as the line layout to Sikora. The Sikora support assists, for example with information on the best possible positioning of the equipment.

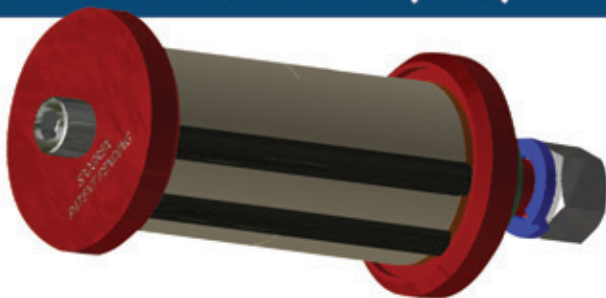
Due to diverse connection possibilities, such as USB 3.0, RJ 45 Ethernet, Bluetooth 4.0 and the LTE/UMTS module, as well as various application possibilities, the Smart Assistance Manager is an important tool for modern production lines, for example to support maintenance and diagnosis tasks, as well as every Smart Factory in the era of Industry 4.0.

The individually designed licence module always guarantees the most current version of the diagnosis software for a live session for fault detection or as an offline diagnosis system for all Sikora measuring, control, inspection, analysis and sorting systems.

Sikora AG – Germany
Website: www.sikora.net

Sjogren Industries Introduces Two New Innovations for the Wire Industry

STATIC DANCER ROLL (SDR)



Sjogren, where Swedish ingenuity meets American opportunity. Sjogren continues its 90 year tradition of innovating in the wire and cable industry with two, new, game-changing products.

Introducing the **Static Dancer Roll (SDR)**, a non-rotating, bearing-less guide, and the **PB Series**, a pivot-bar design for simple, precise opening for straighteners.

PB SERIES



These Sjogren innovations provide years of functionality, increasing productivity and reducing costs.

Sjogren Industries. Innovating since 1927

Providing wire tooling equipment since 1927, Made in U.S.A.
982 Southbridge St. • Worcester, MA 01610 USA • Tel +1-508-987-3206 • www.sjogren.com



INDUCTION HAS GOT MANY ADVANTAGES...



green energy

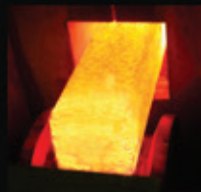
... ATE'S **EXTRA** ADVANTAGE!

ATE induction heating systems and equipments for the heat-treatment of wires, bars, pipes, strips and special applications.

www.ate.it



ATE Applicazioni
Termo Elettroniche srl
Via Soastene 4
36040 Brendola (VI) ITALY
Ph. +39[0]444.601455
Fax +39[0]444.406434



CableBuilder gives Southwire the edge

SOUTHWIRE, one of North America's largest wire and cable producers, is integrating CableBuilder, the cable manufacturing software system by Cimteq, to all its plants in North America, transforming the efficiency, cohesiveness and productivity of its business.

The new fully integrated system will drive Southwire to realise its goal of a fully streamlined system linking all plants together through common data and specifications.

Following on from the successful implementation of CableBuilder to over a quarter of its plants, Southwire has scheduled CableBuilder to be rolled out to its remaining plants by the end of 2018.

With Southwire's key strategic goals to build organisational capability, drive operational excellence and accelerate growth, the company requires internal

systems in place that will allow it to perform at its maximum potential.

Dwayne Johnson, director, specifications and standards, Southwire, said "CableBuilder software is a strategic investment for us at Southwire. Its use as a product data management system is essential for our ERP's operation. CableBuilder software also offers us the flexibility to continuously improve our designs and our business processes."

With over 20 plants across North America, consistency is imperative in order for the company's SAP system to function effectively. CableBuilder is intuitive and flexible and can be adapted to any ERP system. CableBuilder integrates into SAP, delivering concise information, enabling the system to match production to exact order requirements, reducing scrap and rework.

Furthermore, CableBuilder has allowed Southwire to take the automation process one step further by transforming activities that would traditionally be managed by a design engineer into automated processes within the system, for example, selection of materials and specification validation.

CableBuilder's unique function enables Southwire to utilise the principle of designing a product once and then rolling it out to multiple plants to the exact same specification of that original design. CableBuilder allows Southwire to optimise production and reduce costs, especially with regards to transportation. Any updates to a product are automatically implemented across all plants.

Southwire Company LLC – USA
Website: www.southwire.com

Cimteq Ltd – UK
Website: www.cimteq.com

wire
Southeast Asia

Visit us at Booth H25

Visit us also at
Wire South America
October 3-5, 2017
São Paulo / Brazil
Booth 535, Hall 5

INNOVATIONS FOR THE CABLE INDUSTRY

125
EXCELLENCE SINCE 1892

ELECTRICITY IS LIFE

Power Cables are best made on TROESTER Lines

With the expansion of electricity networks, people all over the world use electricity to bring more light into their lives as well as increased joy, comfort and security.

Power cables that have been produced, using TROESTER systems, for high-quality, medium-voltage (MV), high-voltage (HV) and extremely-high-voltage (EHV) cables offer cable manufacturers significant cost benefits in production as well as TROESTER's outstanding level of quality. This ensures that energy consumers around the world can enjoy the highest level of supply security.

www.troester.de

TROESTER
EXCELLENCE IN EXTRUSION.

INVENTIONS AND MUCH MORE



→ CCR LINES

Aluminium CCR Rod Lines
Aluminium Alloy CCR Rod Lines
Copper CCR Rod Lines
Copper Rod from 100% Scrap

→ WMD

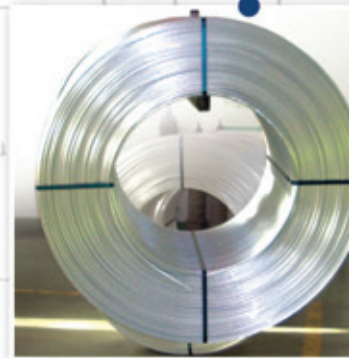
Wire Machinery Division (RTM-OTT)
Drawing Lines for HC-LC-Stainless
Steel-AS Wire
PC Strand Lines
PC Wire Lines
Steel Ropes Lines

→ INGOT CASTERS

Wheel & Belt
Track & Belt

→ PROPERZI MICROROLLING®

Microrolling



www.properzi.com · hq@properzi.it

HEADQUARTERS

Continuus-Properzi S.p.A.
Via Emilia Km 310,
26858 Sordio (LO), Italy
Phone: +39. 02. 988 49 21
Fax: +39. 02. 981 03 58
hq@properzi.it

FRANCE DIVISION

Properzi France
Parc d'activité du Vert Galant
78 Avenue du Château
27745 Saint Ouen l'Aumône, France
Phone: +33. 1. 34 32 34 80
Fax: +33. 1. 34 32 34 89
info@properzi.fr

USA BRANCH

Properzi International, Inc.
909 Ridgebrook Road
Suite # 102
Sparks, Maryland 21152, USA
Phone: +1. 443. 212. 4320
Fax: +1. 866. 905. 4320
info@properzi.us

The wire, cable and wire-processing industries and wire 2018

WIRE and wire-based products – ie cables, springs, screws and bolts – can be found almost everywhere. No technical systems could function without them, and neither would there be any technical progress.

As the demands on technical systems are growing, the performance of such components is gradually being stretched further and further. Wire products must provide reliable service even under the most challenging conditions. They are used, for example, in automotive engineering – an industry that drives innovation.

A modern car has nearly 1,000 springs, and their reliable operation has a major impact on safety and passenger comfort. Springs are often expected to perform at the highest level, eg in the valves which they cause to close in a combustion engine.

Situated within a four-stroke engine, a valve spring must cope with up to ten billion movements throughout a mileage of 120,000 (200,000 kilometres). In addition to mechanical strain, a valve spring must also withstand extreme heat, hot gases and substantial temperature fluctuations. If a spring breaks, it is likely to cause severe engine damage.

Other important wire products are screws and bolts, as so many components are connected in this way. A modern vehicle has over 1,000 screw fittings and bolted connections, of which 250 to 300 can be found inside the engine. It's a place where up to 150 different types of screws and bolts are in use. All of them must have very narrowly defined tolerances in terms of physical properties, and they must also be convenient to insert and assemble, so that automated processing can largely proceed undisturbed.

Metal mesh, too, plays a major role. Made either from stainless steel wire or from certain non-ferrous metals, it is used, among other things, for filtering exhaust gas from combustion engines,

thus helping to reduce carbon monoxide and particulate emissions.

In an exhaust gas recirculation system such a filter ensures that particles from the combustion process or from the particulate trap cannot reach the turbocharger or engine, where this would have negative consequences. The stainless steel wire in a metal mesh has a thickness of only 35µm, so that it is thinner than a human hair. Moreover, it can bear temperatures of 800°C and more.

One of the most complex, most expensive and heaviest components in a modern vehicle is its on-board electrical system, once referred to as wiring harness. This is where the cables are assembled – cables which supply the ever increasing electrical and electronic components of a vehicle with power, while others transmit electronic signals.

The VW Beetle, built around 1950, was equipped with a handy wiring harness that weighed no more than a few kilograms and whose cables had a total length of about 80 metres, with just over 70 electrical components connected to them. By contrast, today's on-board electrical systems comprise up to 4,000 cables, with a length of up to 3.7 miles (6km) and up to 60kg in weight. Electric and hybrid vehicles are especially demanding on the cable harness and the cables.

Information about state-of-the-art manufacturing technology, developments and trends in the wire, cable and wire-processing industries can be obtained every two years at wire – the leading international trade fair of the wire and cable industry and an event which has been held in Düsseldorf, Germany, for over 30 years.

wire 2016 put a major focus on "Industry 4.0", and so it will be exciting to see how things are developing and what kind of results will be presented at wire 2018, from 16th to 20th April.

wire 2018 – Germany
Website: www.wire.de

SUPERMAC®
SUPERMAC INDUSTRIES (INDIA) LTD
AN ISO 9001 CERTIFIED COMPANY

PIONEERING INNOVATIVE TECHNOLOGIES AND SYSTEMS
FOR CABLE INDUSTRIES.

OUR PRODUCT RANGE

- Insulation Line and Sheathing Line for House Wiring & Control Cables
- Insulation Line and Sheathing Line for Power Cables
- Triple Extrusion Line for SIDPLAS (XLPE) Cable
- CCV Line for LV/MV Power Cables upto 132 KVA
- Extruders
- Cross-Head
- Haul-Off Caterpillar
- Capstan
- Take-up and Pay-Off

HEAD OFFICE
A-29, Naraina Industrial Area, Phase-1, New Delhi-110028, India
Phone: + 91-11-25896041, 25896042 | Fax No: + 91-11-25798674
E-mail: office@supermacindia.com | Website: www.supermacindia.com

GST REELS
World Reel Solutions
For Wire & Cable Processing and Delivery

PLASTIC SPOOLS

STEEL REELS

MANUFACTURING
Comsuc Technology Development Ltd
Tel: +86 21 5109 5938
Fax: +86 21 5169 3758
Email: sales@comsuctech.com
Web: www.comsuctech.com



○ 先期推出的中国线缆展

上海正在紧锣密鼓地筹备2018年中国国际线缆及线材展览会

作为亚洲业界最具影响力的国际贸易平台之一，第8届中国国际线缆及线材展览会(wire China)，暨第8届中国国际管材展览会(Tube China)将于2018年9月26日到29日期间，在上海新国际博览中心(SNIEC)举办。

再度同时举办的还有上海紧固件与技术展。活动将由德国杜塞尔多夫展览的分公司——杜塞尔多夫展览(上海)有限公司携手上海电缆研究所(wire China)，以及中国国际贸易促进委员会冶金行业分会冶金工业国际交流合作中心(Tube China)共同主办。wire China的参展商将展示线材制造及精加工机械、加工技术工具、辅助加工技

术材料，以及材料、特种电线电缆及测量和控制技术。

在Tube China，参展商将展示最新的管道制造机械、原材料、管道及配件、加工技术工具及辅助、测量和控制技术，以及管道和石油管材技术、型材和机械。

两个展会的参观者将来自下列行业：电线、电缆、管道、管材、铸铁、炼钢、有色金属、汽车和航空航天供应，以及电气、建筑、水和能源供应。

最近的2016年wire与Tube China展会成功落幕，吸引了来自94个国家的42199

名贸易参观者，以及来自31个国家的1645家参展商，在超过100万平方英尺的场地中展示来自电线、电缆、管道和管材加工行业的最新技术、机械和产品。

除了大量的本地与会者以外，越来越多的海外买家也加入到交易展中。

外国参观者主要来自韩国、印度、中国台湾、日本、俄罗斯、马来西亚、伊朗、泰国、美国、印度尼西亚和越南。

Messe Düsseldorf Shanghai – 中国
网址: www.wirechina.net



YDCE

PTFE Coaxial taping machine

RBJ-Z series driven taping machine (vertical, horizontal)

RBJ-Z型主动放带绕包机 (立式, 卧式)

is the special equipment for producing communication cable, control cable, aircraft cable etc. This machine is specially suitable for small-tension, easily-stretching tape material, and it has the function of displaying tension change through the tension sensor.



10% up of speed for the braiding machine

GSB-1A: 165r.p.m.

GSB-2: 110r.p.m.

Please contact us for more details about our machines:

- GSB series high speed braider
GSB 系列高速编织机
- GSB-Z series heavy braider
GSB-Z 系列重型编织机
- WGSB series horizontal heavy braider
WGSB 系列重型卧式编织机
- LRBJ series vertical taping machine
LRBJ 系列立式绕包机
- WRBJ series horizontal taping machine line
WRBJ 系列卧式绕包机生产线
- Extruding line
挤出机生产线
- Pay-off and take-up
各类收放线架



第一艘环球航行的氢动力船 “Energy Observer”号上的绿色环保

日前，在巴黎国际航空航天展上，Prysmian集团宣布与“Energy Observer”号达成合作伙伴关系。“Energy Observer”号采用复合型双体船结构，是全球首艘绿色能源船。Energy Observer号和开发该项目的研究机构CEA Liten选择Prysmian作为正式电缆供应商，通过高性能、高可靠性及轻量化的电缆把可再生能源发电供应给船只的电机。

“Energy Observer”号长31米，宽12.8米，完全由可再生能源供电，装载130平米的太阳能电池板、两台风力涡轮机和用于电解水的电解设备。

“Energy Observer”号于2017年4月14日从法国圣马洛出发，现在正开始长达6年的环球航行，将途径50个国家的101个港口。该项目的目标是与世界分享能源与自然并不冲突的概念。这将会是一次漫长的旅程，但也是一次对话机会，为更清洁未来的新解决办法达成共识。

Prysmian航空航天业务总经理Alain Jeanguillaume在公布与“Energy Observer”正式合作的巴黎航展Salon du Bourget (Salon International de l’Aéronautique et de l’Espace, Paris, France)表示：“我们非常自豪能参与Energy Observer项目，并贡献我们的专业知识和技术。在装备零排放电动太阳能飞机Solar Impulse后，这一合作伙伴关系让我们再次参与到一个雄心勃勃且极具吸引力的项目中，使我们继续朝着所承诺的清洁能源道路前进。”

近来，Prysmian宣布成为Solar Impulse的技术合作伙伴。2015年和2016年，这架太阳能飞机在不使用燃料的情况下下环游世界。Prysmian制造的150千米特殊航空电缆将把这架革命性飞机的机翼上集成的17000个太阳能电池的可再生能源传输给四台电机。

Prysmian Group – 意大利
网址: www.prysmian.com

GKD: 广受欢迎的高难度加工问题解决者

GKD—Gebr. Kufferath AG公司的创新型加工带解决方案在德国法兰克福的Techtextil展会上获得了高度好评。这款配备上网带和下网带的双带干燥机在这场领先的产业用纺织品及非织造布展会上引起广泛关注。

工厂制造商和用户对纺织洗涤设备的V-crimp型网带，以及由玻璃混合织物和PFA涂层制成的网带特别感兴趣。由于GKD是加工网带技术业界众所周知的可靠问题解决者，许多参观者在现场直接与专家讨论特定于应用的具体挑战。

引人注目的模型和展品将GKD展台的参观者直接引向最合适的联络人。因此，尽管来访者众多，现场还是避免了长时间的等待，并为产品和个别规格的细节化问题提供了许多探讨基础。大学代表、技术人员和开发人员都致力于充分利用好这次高密度的专业交流。

机织干燥带与不粘涂层现在结合了高横向稳定性、优化平整度、良好运行性能和鲁棒性等优良性能，在便利的产品发布过程中提供更高的加工稳定性。因此，它们能够在提高关键干燥加工生产率的同时保持一致的产品质量水平，并减少停机时间和清洁费用。自跟踪式V-crimp型网带采用耐腐蚀和侵蚀性碱液的不锈钢制成。特殊的设计即使在轴承重量不均匀的时候也能保证加工的可靠性。这使它们特别适合高难度的纤维制品和纺织品洗涤及漂白加工。

凭借其创新的玻璃混合织物，GKD可以同时满足节能轻质网眼和强大的横向稳定性要求，而这两者通常是互相排斥的。经向上涂有PFA的玻璃纤维让这种网状结构的重量较轻，而不锈钢纤维线则保证了可靠的横向稳定性。同时，绞线上的高品质PFA涂层也使附着力和污染最小化。根据客户的意愿，新网眼类型可采取磁性或非磁性形式，用于单网带和双网带干燥机。归功于GKD的Conductive® 7690成型带，多家著名无纺布制造商已享受到明显优化的加工流程。网带的特种单丝可以安全地消除此类加工中经常会出现的静电电荷。

运行方向上的粗带结构保证了高水平牵引力和均匀的网状结构，以及随后的优化无纺布移除。抓力的提高使机器能够更快达到所需的生产速度，而不需要更换网带时费时的粗化处理。但这种网带类型最令用户印象深刻的地方，还在于其出色的清洁性能。污垢会直接脱落，或者只需轻松地去除。更高的生产速度意味着系统将承受更严重的磨损和污染。由于网带属性已根据特定工艺进行调整，GKD提供的创新加工带解决方案可以减少停机时间，并大幅提高生产率作为回报。凭借跨部门的工艺知识，以及定制化网眼结构领域数十年的开发和制造经验，GKD正可谓广受欢迎的问题解决者。

Gebr. Kufferath AG – 德国
网址: www.gkd.com

新拉丝润滑层

你想要卓越的拉丝性能和成形属性吗？那么Staku Anlagenbau的E-molyphos就是你的答案。

这是一种新型的拉丝用润滑层，也是通过电解流程实现的不锈钢及钛材料合金的温冷成型工艺。

在E-molyphos的帮助下，已剥电线的拉丝不再会产生表面缺陷，并且提供均匀的金属结构，完美适用于涂层。多方结合之下，这种准备充足的材料将实现独特的线材质量。

E-molyphos可以取代昂贵的传统高性能润滑油和石墨润滑剂。

高抗化学性材料的温冷成型的核心问题，就是在摩擦对象之间创造完美的摩擦条件。一种传统转化涂层由于材料表面的本质而几乎不可能做到化学涂层。而电解工艺能够做到这一点。

分析整个系统和环境的需求后将获得以下特性：

- 成型压力阻力 > 300 kN
- 高温500°C以上低摩擦系数μ平均
- 润滑剂与材料表面之间高附着力
- 高环境相容性（绿色涂层）、资源保护
- 避免浪费材料和低能耗
- 线上流程阶段之间的曝光时间短

E-molyphos是一套润滑系统，满足一次喷涂的所有电解涂层要求。在这个过程中，高性能固体润滑剂沉积在一个矩阵组件中，也对润滑有所帮助。

E-molyphos是Staku开发的e-phos工艺的后续改进，该工艺已在全球各地的多项应用中成功运用。

与传统磷化相比，这种电解工艺的好处在于：

- 喷涂温度只有45°C，而非80°C
- 几乎不会产生残渣
- 由于钙的替换而减少33%的锌
- 由于致密和微晶层而减少40%的化学消耗
- 与常规工艺的7分钟相比，涂层时间只需三秒
- 电解过程中使用DC，因此不会产生有毒活化化学品
- 高粘接力避免成形时的剪切
- 不产生废酸，拖延洗涤的应用可使废水减少约40%
- 无需用肥皂、石灰或类似产品进行最后处理
- 最低的运作成本

Staku Anlagenbau GmbH – 德国
网址: www.staku-gmbh.de

Ideal Networks向澳大利亚扩张

数据电缆和网络测试器制造商Ideal Networks现已将业务扩展到澳大利亚，在墨尔本开设新的办事处，以支持其分销商、数据电缆安装人员和网络技术人员。

新设施包括一个产品仓库、客户服务和财务部门，以及销售支持团队。他们还设立了培训中心，为经销商和客户提供专业指导，帮助他们高效地利用Ideal Networks的各类数据电缆、测试仪、验证器和网络测试器。

该站点还将确保全国各地的安装人员和技术人员能够获得测试、校准和保修维修的本地支持。

此外，Ideal Networks还发布了全新的网站，让澳大利亚的数据电缆安装人员、网络技术人员和IT管理人员能够更方便地搜索产品，以及查看大量的产品信息。

网站www.idealnetworks.net/au/en将包含可用的数据电缆测试仪、网络测试器和电信测试器的全部细节信息，包括教

客户如何更加方便地排除故障，以及向其客户提供性能证明的动画。

网站访问者还可以获得支持资源，例如产品手册、白皮书、应用指南，以及所有来自Ideal的最新消息和社交媒体更新。

Ideal Industries亚太地区集团副总裁兼总经理Martin Van Os表示：“这是Ideal Industries公司第一次在澳大利亚设立办事处。”凭借丰富的国际业务经验，Van Os先生于2016年接受任命，帮助领导公司在全球不同市场的长期增长战略。

他继续说道：“我们始终在为使用我们的产品和服务的客户努力进行简化，并提高便利性。

通过建立新的办事处和推出易于使用的网站将业务

扩展到澳大利亚之后，我们现在能够高效地满足这个国家的电缆安装人员和IT网络技术人员的产品需求，同时提供优质的客户服务。”

Ideal Networks – 美国
网址: www.idealnetworks.net



○ 位于澳大利亚墨尔本的新办公室

Edward Trimpert Sr辞世

6月9日，Davis-Standard失去了一名忠诚的员工和朋友——Edward Trimpert Sr因心脏病并发症离世。所有认识他的人将永远铭记和怀念他。从1983年加入Egan John Brown Plastics（现在的Davis-Standard）以来，他在20年职业生涯的大部分时间中主要担任Davis-Standard的塑料工程师。最近，他在亚洲和拉美地区的板材小组中担任国际销售工程师。他是一名勤奋的员工和才华横溢的工程师，用他多才多艺的技能帮助公司发展并服务客户。



○ Edward Trimpert Sr

Davis-Standard板材和泡沫副总裁Steve DeAngelis表示：“片材挤出是Ed的激情所在。他是一名敬业的解决问题家，也是一位优秀的导师，受到客户和同事的一致喜爱。他的离开会令所有认识他的人感到悲伤。”除了杰出的工作者以外，Trimpert先生还是一名狂热的体育迷。他喜欢洋基队和牛仔队，并且非常热衷于训练他孩子们的运动队。他过世后留下了妻子Theresa和两个孩子Nikki及Eddie Jr。

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

RSB与中国开展贸易

马鞍山钢铁有限公司（马钢）已向 Friedrich Kocks 订购一套 5.0 款减定径机组（RSB和®）370++/4，带有SCS®（尺寸控制系统）、4D EAGLE（小型型钢测量仪）和热机械轧制（TMR）程序。

马钢是中国内地最大的钢铁企业，其总部设在安徽省马鞍山。这家国有独资公司成立于1958年，并于1993年改组为马钢（集团）控股公司和马鞍山钢铁有限公司。马钢的钢材年产量约为1900万吨，是全球钢铁产量排名前15的钢铁生产企业。

Kocks的四机架位三辊减定径机组RSB 5.0将作为核心设备安装在全新的400,000吨/年产量SBQ轧厂中，为汽车业、航空航天和机械工程应用制造直径范围Ø16–100毫米的直杆，最高速度可达18米/秒。

RSB 5.0将被放置在连续式粗轧机组和中轧机后方，包括22个H/V型排列的机架，专为低温温控轧制而设计。

面向未来型RSB®的核心是实时闭环控制系统SCS，借助辊缝设置和电机转速的自动优化，可以进一步改善轧制公差并简化操作。

Kocks 4D EAGLE测量仪是SCS的完美补充。它集成了最新的技术，可满足大多数现代轧厂对全过程透明的最高要求。

热机械轧制（TMR）程序包含Kocks程序模拟器（KPS），以及相应的自动化包装，使整个供货范围更为完整。

结合先进的自动化系统，KPS确保了精确的钢条温度控制，并可在任何时候对冷却程序进行最优化调整，从而确保获得最终产品所需的材料性能。

上线调试预计将在2018年年中进行。

Friedrich Kocks & Co GmbH – 德国
网址: www.kocks.de

俄罗斯金属展览会四重奏景况良好

2017年6月，wire Russia、Tube Russia、Metallurgy Russia以及Litmash Russia再次同时于莫斯科举办。

四个展览会在同一地点举行，为参展商和参观者创造了理想的同场效应，并缩短了看台和紧凑展示之间的路线。

和之前一样，莫斯科世博中心担当此次俄罗斯国际线缆及线材展（wire Russia）、俄罗斯国际管材及管道展览会（Tube Russia）、俄罗斯国际金属加工和金属产品展会（Metallurgy Russia）以及俄罗斯国际铸造展览会（Litmash Russia）这四场技术贸易展览会的联合展示场馆。

这场地区贸易展览会分别由德国杜塞尔多夫展会公司、杜塞尔多夫展览（莫斯科）有限公司携手俄罗斯合资企业VNIIEP共同主办wire Russia，携手俄罗斯金属博览会共同主办另外三个展会。

总计共有约400家来自各行各业的公司展示了他们的技术创新，展厅总面积达5545平米。除了俄罗斯参展商以外，许多国际公司也派出代表前往莫斯科，向俄罗斯和东欧市场展示他们的产品和服务。



○ 上图和左下图，今年俄罗斯展的展商和参观者

全球日益增长的需求、玻璃纤维网络的国际扩张，以及俄罗斯世界杯的优良前景正在为全球带来良好的业务氛围。

这不仅有利于俄罗斯的建筑业，也有利于参与建造俄罗斯的一些体育场，以及从事基础设施项目建设的国际公司。体育场需要电线、电缆、管道、金属和铸造产品，因此，即将举办的世界杯对展览业产生了重要的积极影响。

Tube Russia、Metallurgy Russia和Litmash Russia接待了4200名专业观众，主要来自俄罗斯和邻近国家。wire Russia吸引了2,720名参观者，在为期4天的展会中探索行业新闻、更新联系人并开拓业务交易。参展商认为他们在展台上的沟通非常积极，很多人都期待着后续的好生意。观众主要来自俄罗斯、其他独联体地区和邻近的欧洲国家。

更多关于这4场展览的信息，可参见相关网站：www.wire-russia.com、www.tube-russia.com、www.metallurgy-russia.com和www.litmash-russia.com

Messe Düsseldorf GmbH – 德国
网址：www.wire-russia.com



“一站式”可靠且高性能的解决方案产品系列

在今年于夏威夷檀香山召开的国际微波研讨会（IMS）上，全球连接的领导者和创新者Huber+Suhner展示了专为易于使用和系统集成设计的“一站式”可靠且高性能的解决方案产品系列。

公司展出了其全新的高端测试组件系列：Sucoflex 500。在测试和测量领域，Sucoflex 500V系列代表着最高水准的满意度。

它提供相位和振幅稳定性，以及弯曲、移动、温度（<50ppm）和拉伸应力。

Sucoflex 500V可以确保较长校准间隔的精确测量。Huber+Suhner最近将其组件产品范围扩大至Sucoflex 500S系

列，提供低插入损耗、出色的回波损耗和优秀的相位稳定性，使之成为高性能、高品质应用的推荐组件。

将与这些产品同场展示的是新款NEX10连接器接口——一款面向小型电池应用的微型PIM同轴连接器；以及Microbend L——为小型电缆解决方案提供最佳的损耗损失。

其性能将卓越的灵活性独特的弯到底功能结合在一起。

Huber+Suhner不受温度影响的相位恒定（CT）电缆在整个温度范围（-50°C到+125°C）内实现小于300ppm的相变，现在还推出手工成型和半刚性组装

方式，使现有的Minibend CT系列更为完整。

此外，公司还展示了大量多同轴解决方案产品，从测试和测量的高性能推进解决方案MXP和MXPM，到定制化SMPM联动解决方案和VITA-67，全都搭配弯到底电缆以提供良好的用户体验。

Huber+Suhner在开发和生产面向全球市场的顶级射频及无线产品方面拥有丰富的经验，以及非常全面的产品组合，满足通信、工业和交通运输部门对于数据和能量传输组件的不同要求。

Huber+Suhner – 瑞士
网址：www.hubersuhner.com

J William Scher离世

倍受尊敬的电线电缆业界要人Joseph William Scher因病去世，享年82岁。

已成为一名父亲和祖父的“比尔”于1957年加入Weber & Scher制造有限公司。在此之前，他获得了美国新罕布什尔州达特茅斯学院的工程学学士学位。

不久之后，他便获得了达特茅斯塞耶学院的机械工程硕士学位。后来，他成为了新泽西州的注册专业工程师。

学位研读结束后，Scher先生加入Weber & Scher，并立即全权负责公司经营。上世纪40年代，Weber & Scher与西部电气密切合作，开发了一系列

金属带处理、起皱和成型设备，以生产当时被称为“斯塔尔卑斯”和“阿尔卑斯”的护层结构，用于铜电话电缆的生产。Scher先生通过调整和标准化设备改进这项技术，使其可用于美国独立电缆制造商的各种不同制造环境。时至今日，这项技术仍在全球范围内的光纤电缆、铜电话电缆、电力电缆等生产中得到广泛应用。

除了经营一家成功的企业之外，他还担任电线电缆行业的顾问。最初几年，Scher先生曾为秘鲁利马的Indeco Peruana、委内瑞拉拉伦西亚的Accevenca，以及美国纽约的ITT等公司提供咨询服务。

这些咨询服务的范围逐渐扩大到电缆制造设施的全面发展。不久之后，他开始致力于在全球成熟和新兴市场引入全套Weber & Scher设备的计划，包括远东、欧洲中部、欧洲东部及中东。

2007年，Scher先生被授予WCTI技术成就奖，以表彰他对电线电缆行业长达50多年的贡献。他还是美国机械工程师学会的资深成员。

他过世后留下了62岁的妻子Joan、两个儿子Douglas和Gregory，以及六名孙辈。

Weber & Scher Mfg Co Inc – 美国
网址: www.webscher.com

电缆标准

Leoni是一家面向汽车及其他行业的欧洲电缆及电缆系统供应商，现提供一系列适用于欧盟建筑产品法规305/2011的电缆应用。所有用于建筑工程永久性安装的电缆都具备CE标志和性能声明。根据建筑物或火灾风险，Leoni可以提供一系列具备相应防火性能等级的产品。

2017年7月1日，用于建筑或隧道等施工工程永久性安装的能源电缆、控制电缆和通信电缆的过渡期结束。从即日起，这些电缆必须按照欧洲协调标准hEN 50575进行制造和评估，并依据欧盟建筑产品法规305/2011贴上CE标志。

此外，还必须根据官方认可和公正的测试机构进行的评估及分类出具“性能声明”。法规规定的CE标志和性能声明的一个关键要素就是防火等级说明。

Leoni现提供一系列低火灾风险电缆，按照法规减缓火焰的传播和热量生产，同时释放更少的腐蚀性气体和烟雾。

产品范围包括Betaflam®牌能源电缆、FieldLink®牌总线电缆、MegaLine®、GigaLine®和FiberConnect®牌通信电缆，以及大量客户特定的产品解决方案。

对于医院等安全要求非常高的建筑，必须选择具备B2ca s1 d1 a1评级的低火灾危害性电缆。对于学校等安全要求较高的建筑，应选择具备Cca s1 d1 a1评级的低火灾危害性电缆。对于普通的火灾风险，可选择Dca s2 d2 a1评级的电缆。

性能声明，包括所有Leoni产品的防火等级均可在公司官网www.leoni.com/de/baupvo查看。通过CE标签上的二维码也可以直接访问和下载性能声明。

Leoni AG – 德国
网址: www.leoni.com

伊朗国际线缆线材展的举办日期和地点变更

伊朗国际线缆线材展的业主及组织者Aria集团决定将展会移至德黑兰最为先进的新伊朗展览中心举行。该中心总计建造了15个展厅，其中三个已经完成：A4、A5和A6。

伊朗国际线缆线材展搬迁至新展厅A6造成日期出现微调，活动现在将于2017年12月6日到9日举办。

这是伊朗唯一的电线、电缆、管道、管材、型材和配件贸易展，也是外国公司进入中东市场的理想平台。

德国杜塞尔多夫展会公司是2017年伊朗国际线缆线材展的独家海外伙伴，负责所有国际参展商的相关事宜，包括登记和展台设计等各类服务。

该公司以组织全球知名的缆线和管道展览会，也就是每两年在德国杜塞尔多夫举办的国际展览而闻名。现在，他们将把自己的专业知识带给伊朗国际线缆线材展。

展览空间一直需求旺盛，目前为止已有16150平方英尺的面积被预订，A6展厅已几乎全满。

Messe Düsseldorf GmbH – 德国
网址: www.iranwire.ir



○ 德黑兰将在12月举办伊朗线缆展

CableBuilder集成SAP, 增加Southwire的优势

北美洲最大的电线电缆生产商之一Southwire正在将Cimteq出品的电缆制造软件系统CableBuilder集成到其位于北美的工厂中, 转化其业务的效率、凝聚力和生产力。完全集成的新系统将推动Southwire实现目标, 通过通用数据和规范将所有工厂连接起来, 形成一套彻底简化的系统。成功在四分之一以上的工厂中实现Cablebuilder之后, Southwire计划于2018年底在所有剩余工厂中实现Cablebuilder。鉴于Southwire建立组织性能力、推动卓越运营及加速增长的重要战略目标, 公司需要就位能够使其发挥全部潜力的内部系统。

Southwire的规范与标准总监Dwayne Johnson表示: “CableBuilder软件是我们Southwire的一项战略性投资。将其作为产品数据管理系统使用对我们ERP运作至关重要。CableBuilder软件还为我们提供了灵活性, 从而不断改进我们的设计和我们的业务流程。”

Cimteq的首席执行官Ali Shehab补充道: “选择一套满足Southwire要求的系统时, CableBuilder成为了理所当然的选择。从第一次演示开始, 这款软件可以为Southwire带来的好处就显而易见。经过在其总部进行的紧张实现期, 以及在我们经验丰富的实现顾问的支持下, Southwire如今正在全面铺开

CableBuilder, 这代表着他们对于这款软件的信心。”

对于在北美洲拥有超过20家工厂的公司来说, 一致性是其SAP系统高效运行的必要条件。CableBuilder直观且灵活, 可以适应任何ERP系统。将Cablebuilder集成到SAP, 可以提供简洁的信息, 使系统能够将生产与精准的订单要求相匹配, 减少浪费和返工。

此外, CableBuilder还允许Southwire进一步发展自动化流程, 将传统上由设计工程师管理的活动转化为系统内的自动化流程, 例如材料的选择和规范的验证。

CableBuilder的独特功能使Southwire能够利用将设计某个产品时的一次性原理推广到多个工厂, 从而实现与原设计完全相同的规格。Cablebuilder让Southwire能够优化其生产并降低成本, 尤其在运输方面。产品的任何更新都可以在所有工厂中自动实现, 节省大量设计工程的时间。

Southwire Company LLC – 美国
网址: www.southwire.com

Cimteq Ltd – 英国
网址: www.cimteq.com

AWI推出全新的应用程序, 帮助找到完美的合金

Alloy Wire International (AWI) 推出了一款全新的app程序, 帮助其全球客户寻找最适合其应用的材料。

公司花费了4个月的时间开发出一款交互式数据库, 包含他们所有材料、性能和应用, 并在台式机、手机和平板电脑上推出。

这款基于Web的应用程序由专业技术人员开发, 允许用户按照行业部门(例如航空航天、石油和天然气、原子能), 或应用解决方案(例如高强度、零下温度、耐热、耐腐蚀和耐水性)搜索他们所需的线材类型。公司总经理Mark Venables解释说: “我们随时都保留着60多种不同的镍合金库存, 我们必须确保我们的客户获得最适合他们的制造要求的材料。这款app将帮助他们做到这一点。”

它还提供了每种合金的全部信息, 包括简短的描述、关键特性和形状选项, 还有简单的查询表格, 随时可以记录你的兴趣。”

他继续说道: “初期反馈非常积极, 顾客们表示应用程序非常简单, 并且能够帮助他们在材料选择时做出重要决定, 如果没有它, 他们可能不会这样选择。”

AWI制造圆形、扁平、异形和电阻线缆, 他们正计划将“Wire Finder” app翻译为各种其他语言, 以支持其出口策略。

公司已向全球52个国家供应产品, 最近一批订购AWI线材的地方是多米尼加共和国、尼泊尔、秘鲁和阿曼。

Venables先生补充道: “我们的销售额大约50%来自海外, 我们相信这个数字还会继续提高, 因为我们想要增加国际员工和参加展览的数量。”

这些年来, 世界已经越变越小。凭借我们的库存和制造能力, 我们可以在三个星期内生产出线缆, 并送到全球任意角落的客户手中。”

app的下载极其容易, 只需前往www.alloywire.com, 并点击“Visit the app”即可。然后你就可以把它添加到你的iOS或Android设备的主屏幕上。

Alloy Wire International – 英国
网址: www.alloywire.com

实时远程支持服务

快速、优质且可靠地支持世界各地的客户——凭借智能辅助管理器(SAM), Sikora能够满足这些要求。对客户来说, 这意味着更加高效的支持, 并因此优化了服务流程。

Sikora的智能协助管理器是一台13.3英寸的平板电脑, 专为严苛的工业环境而优化。智能协助管理器可以与一名Sikora支持工程师直接连接, 通过集成的视频聊天功能(500万像素摄像头)接受所有维护、支持和诊断任务的指示。实时Sikora支持工程师可以直接访问设备, 实现即刻诊断。软件更新也通过同样的方式安装。

智能协助管理器的工作从测量设备的安装开始。借助SAM, 客户可以将环境条件及线路布局通过视频流传送给Sikora。Sikora支持协助, 例如设备最佳位置等信息。



○ Sikora的智能协助管理器

借助多种多样的连接方式, 例如USB 3.0、RJ 45以太网、蓝牙4.0和LTE/UMTS模块, 以及各种应用可能性, 智能协助管理器是现代生产线的重要工具, 例如支持维护和诊断任务, 以及工业4.0时代的所有智能工厂。

单独设计的许可证模块总能保证诊断软件为最新版本, 用于故障检测的实时对话, 或作为所有Sikora测量、控制、检查、分析和分拣系统的离线诊断系统。

Sikora AG – 德国
网址: www.sikora.net

电线、电缆和线材加工行业及2018年全球线缆线材展

电线及基于线材的产品，即电缆、弹簧、螺丝和螺栓几乎无处不在。没有技术系统可以脱离它们运行，也不会出现任何技术进步。

随着对技术系统的需求不断增长，此类组件的性能也逐步得到扩展。即使在最具挑战性的条件下，线缆产品也必须提供可靠的服务。例如用于汽车工程——这是一个推动线材行业不断创新的行业。

现代汽车拥有近1000个弹簧，它们的可靠操作对安全性和乘客舒适度具有重大影响。弹簧通常需要最高水准的性能，例如用在内燃机阀门的关上。

配置在四冲程发动机中时，阀门弹簧必须在12万英里（20万公里）的里程内执行多达100亿个动作。除了机械压力外，阀门弹簧还必须承受极端热量、热气体和大幅温度波动。如果弹簧断裂，很可能会造成严重的发动机损坏。

螺钉和螺栓也是非常重要的线材产品，因为许多部件都靠它们连接。一辆现代

汽车有1000多个螺丝配件和螺栓连接，其中250至300个存在于发动机内。发动机最多可用到150种不同类型的螺钉和螺栓。所有这些零件的物理属性的公差都非常小，同时必须便于插入和装配，以便自动化加工可以基本不受干扰。

金属网也起着重要的作用。它由不锈钢丝或某些有色金属制成，其中一个用途是过滤来自内燃机的废气，从而帮助减少一氧化碳和颗粒的排放。

在废气再循环系统中，这种过滤器可以确保来自燃烧过程或颗粒收集器的颗粒无法到达涡轮增压器或发动机中，否则会产生不良后果。金属网里的不锈钢丝厚度只有35微米，比人类的头发还细。此外，它可以承受800°C以上的高温。

现代汽车中最复杂、最昂贵也最沉重的部件之一，就是车载电气系统，以前曾被称为电线束。

这里是电缆汇集的地方，包括为越来越多的汽车电气和电子部件供电，以及其他传输电子信号的电缆。

一辆制造于1950年左右的大众甲壳虫汽车，配备了重量不超过几公斤的便利型电线束，其电缆总长约80米，连接着约70多个电气元件。相比之下，当今的车载电气系统包含4000多条电缆，其长度可达3.7英里（6公里），重量可达60公斤。

电动和混合动力汽车对电线束和电缆的要求特别高。有些电缆的电压高达1000伏，并且必须承受比旧款更强的电流和更高的温度。

电线、电缆和缆线加工行业的先进制造技术信息、发展和趋势相关信息，每两年就可以从领先的国际电缆电线行业展——wire全球线缆线材展上获得。这个展会已在德国杜塞尔多夫举办了30多年。

2016年wire全球线缆线材展将主要重点放在“工业4.0”上，所以到2018年的4月16日至20日，行业的发展情况和结果无疑令人期待。

wire 2018 – 德国
网址: www.wire.de

Ugitech引领欧洲最前沿

对于850°C高温下的热气体和蒸气安全运输，奥氏体不锈钢1.4550/347h是许多加工工业的组件制造商最聪明的选择。

为满足日益增长的需求，Ugitech丰富的不锈钢产品组合中新增了UGI® 4550，成为全欧洲仅有三家的供应商之一。

蒸汽管道、过热器管以及往复式发动机和燃气涡轮机的排气系统是Ugitech的UGI 4550的经典应用。铌的加入使成品钢成为适应性良好的解决方案，面向425°C到850°C之间的温度范围。

与大多数奥氏体材料相比，UGI 4550抑制了晶界析出碳化铬的形成，从而防止晶间腐蚀。这款不锈钢产品最适合那些无法在焊接进行材料处理的部件，例如伸缩缝，以及高温化学处理的设备。UGI 4550还可在室温下成型，并且非常容易焊接。

这意味着焊接后不会出现热裂纹。良好的抗蠕变性（抗温度相关变形的能力）以及大气腐蚀和高温氧化抗性进一步提高了加工的可靠性。

Ugitech 提供各种尺寸的 UGI 4550: 涵盖直径130毫米到直径16微米的超

细钢筋。这款钢制品将依据所需的机械性能经过退火或冷拉。与其他竞争对手不同，Ugitech的最小订货量是1吨拉制钢筋，拉制钢丝的起订量则更低。Ugitech总是能够迅速发货，

因为他们的钢铁厂装备了40吨的熔炼炉。

Ugitech SA – 法国
网址: www.ugitech.com

蒸汽管道、过热器管以及往复式发动机和燃气涡轮机的排气系统是Ugitech的UGI 4550的经典应用。照片来自Ugitech – ©istockphoto_annavaczi



125年的卓越挤压加工经验

创新的技术、先进的研发、最高水准的精度和可靠性——这就是Troester所代表的含义。今年，这个家族企业迎来了第125个周年纪念。这家来自德国汉诺威乌尔菲尔的挤压加工专家为反复挤压的轮胎组件、高级橡胶制品，或中压到超高压电缆的生产制造精密机械和复杂的单元，并且永远提供顶级品质。“回顾悠久的历史，我们感到无比自豪。”管理合伙人Peter Schmidt博士说道，

“但我们也展望未来。携手合作伙伴和客户，我们期待将Troester的成功故事延续到未来，迎接日新月异的经济挑战。”

Troester在机械工程领域拥有悠久的历史。当他的想法被Eisenwerk Wülfel的同事们否决之后，工程师Paul Troester在1892年7月4日创立了自己的公司。时至19世纪末期，汉诺威周边地区已经发展成为橡胶加工行业的枢纽。鉴于汽车工业的兴起，橡胶制品和橡胶轮胎的需求日益增长。Paul Troester想在本地生产所需的机器，而不是从国外进口，因为后者非常麻烦。于是，建立Troester工厂的想法就此诞生。



○ X-Compound的连续混炼机拥有广泛的应用，包括电缆材料的温和处理



○ 3,200平米的新生产车间将帮助工厂产能和厂内物流更好地面向未来



○ Troester公司总部自1892年以来始终坐落于汉诺威乌尔菲尔

全世界的客户都喜欢一站式解决方案

125年后，公司早已成为技术橡胶板、轮胎部件、轮廓和软管系统，以及电缆机和电缆系统的市场领导者之一。出口发挥着主要作用：Troester 90%的收入来自国外。去年，Troester集团的销售总额达到1.2亿欧元，其位于德国的总厂拥有600多名员工，分支机构和代表处遍及美国、中国、瑞士和俄罗斯。2011年，塑料加工和连续混炼机制造专家、瑞士公司X-Compound加入Troester集团。

Schmidt博士补充说道：“我们现在为客户提供全套计划和概念、生产和安装以及现场维护。”时至今日，轮胎橡胶行业的大腕，以及主要电缆制造商都是这家挤压加工专家的客户。

成功度过困难时期

第一次世界大战爆发之前，Troester已成为橡胶加工行业的专用设备制造商。公司的经济状况良好，但在战争和战后动乱期间却面临着新的挑战。直到1924年，Carl Bredemeyer接管公司的命运，光景才终于好起来。作为Buna计划的一部分，Troester在上世纪30年代经历了一波经济高峰。公司从合成橡胶和热塑性塑料的发展中大获裨益。这家设备制造商征服了新的业务领域，例如PVC挤压加工机。

然而，第二次世界大战再次带来困难时期。1945年后，位于乌尔菲尔的工厂几乎被两次空袭完全摧毁。但是，货币改革、英国军事当局的扣押解除，以及马歇尔计划使国际关系很快恢复正常。遭到破坏的设施开始重建，而Troester也在1947年，由英国组织的“汉诺威出口贸易展会”，也就是后来家喻户晓的“汉诺威贸易展”上首次与公众见面。



○ 管理合伙人Peter Schmidt博士(左)、董事总经理兼工程师Bernd Pielsticker(右)

员工技术是最好的资本

多年来，公司已从一个典型的设备制造商发展成为系统供应商，除了制造业外，还涉足综合电子、控制以及先进设备的自动化。此外，公司还非常重视深入的研究和开发，这也一直是Troester的顶级要务。公司将百分之二左右的收入用于这些方面。关键技能和特殊技术从不离开公司。“勇气和不懈的承诺是Troester自成立以来始终如一的特点。”于2003年从他父亲手中接过公司的Schmidt博士补充道，“工人和雇员们都觉得他们都是大家族的一份子。”

平均而言，每位员工都在公司工作了16年左右，并且许多人都将迎接他们的第25个，甚至第40个周年纪念。

蓄力未来

公司非常重视其位于德国的总部。作为乌尔菲尔工厂重建和生产条件优化的一部分，一座占地3,200平米的生产车间于2016年竣工。2017年开工的几栋二期工程建筑将使汉诺威工厂的面积扩展到25000平米以上，其中约15300平米是生产空间，从而帮助Troester的产能和厂内物流更好地面向未来。新的投资已经规划就绪，帮助公司迎接“数字化”和“工业4.0”的挑战。

Troester GmbH & Co KG – 德国
网址: www.troester.de

历年展会参观者人数新高

2017年广州国际电线电缆及附件展览会在创纪录的访客人数中落下帷幕。展览由广州光亚法兰克福展览有限公司、南网传媒及广州博优会展服务有限公司联合主办，于6月9日到11日在广州的中国进出口商品交易会展馆隆重举行，共进驻220家参展商，吸引了来自42个国家的22642名专业买家。

为期三天的活动在2万平方米的展览空间内举办，展示中国华南地区电线电缆行业、机械制造以及相关材料和配件领域的最新产品及创新。

出席今年展会的一部分领先品牌包括富通集团、深圳奔达康实业电缆控股、浙江万马电缆、山东阳谷电缆集团、深圳特发信息、亚洲电器及电缆技术、青岛汉缆、广东日鸿电缆、苏州志宏电缆材料等等。

广州光亚法兰克福展览有限公司总经理胡忠顺表示：“我们每年都努力打造专业的国家化展览，旨在丰富参与者的体验。

我们感谢观众的支持，并致力于为业界创造更加全面的平台。我对2017年展览

的结果非常满意，我相信它促进了业界同行之间的信息交流。”

今年参展人数的大幅增加令许多参展商称赞，这届展会在与来自世界各地的新买家会面方面卓有成效。

浙江万马电缆股份有限公司的项目经理Jiang Zhuoxun先生表示：“在展会期间，我们不仅受到来自中国观众的欢迎，而且也获得了全球买家的热烈反响。来自东南亚和印度的公司来到我们的展位索取报价，有的甚至直接下了订单。广州国际电线电缆及附件展览会是向国内外推广高端产品的重要平台。”

展出的大量各类产品彰显了中国华南地区的产业创新，满足世界各地买家的不同需求。德国Johann Leimbach公司总经理第一次来到中国寻找商机。他表示：“我们的目标是找到中国国内的电缆制造商和业务合作伙伴，需要能够制造我们公司赖以成名的高品质电缆。幸运的是，我在展会上与许多对我们的商业提案感兴趣的电缆制造商建立了联系。”

除了展览以外，亚洲线缆高峰论坛依然

是广州国际电线电缆及附件展览会的亮点之一。为期两天的论坛包含17场高层研讨会，关注USB适配器的及时标准和认证程序，以及新能源汽车充电模块的未来发展。

来自江苏恒通新能源智能控制技术有限公司的连接器产品经理，著名发言人Li Xin先生对论坛表达高度赞扬：“这是一个特别的场合，来自各行各业的参与者可以齐聚一堂开展讨论。我很高兴能够与大家分享我对新能源汽车充电桩发展的知识，这将成为下一个流行趋势。”

论坛与会者还包括电缆科技有限公司的总经理助理Peng Shengfu先生。彭先生认为论坛为他的业务提供了丰富的信息：“讨论关注了一些USB适配器的最新标准，这是最能令我们厂家受益的内容，因为我们现在对最新的市场需求有了基本的了解。”

下一届广州国际电线电缆及附件展览会将于2018年6月在广州的中国进出口商品交易会展馆举办。

Wire & Cable Guangzhou – 中国
网址: www.wire-cable-china.com

Prysmian向其全球光纤光缆设施投资2.5亿欧元

Prysmian集团欧洲最大规模的光缆厂于罗马尼亚的斯拉蒂纳落成。斯拉蒂纳新工厂是一项为期三年、价值2.5亿欧元的投资计划的一部分，旨在提高集团在全球范围内的生产容量和能力，以满足新高速电信网络的部署对光缆日益增长的需求。Prysmian集团电信业务高级副总裁Philippe Vanhille表示：“作为全球领先的业界成员，我们通过持续投资光纤光缆的生产能力，以及新的技术和知识，致力于支持政府和电信运营商发展新的宽带网络。

数字化转型贯穿于新宽带和超宽带光纤通信网的发展，只有光纤才能提供必要的速度和可靠性。

这些战略性基础设施必须以高质量为基础，并能够长期提供高性能，从而为未来的服务做好准备，例如5G、智慧城市、智能交通和智能家庭。”

Prysmian集团首席运营官Andrea Pirondini表示：“卓越的运营是奠定竞争能力的关键，尤其是在光纤和电缆这样活跃而复杂的市场中。我们的投资涉及意大利、法国、荷兰、朝鲜和南美的现有光线光缆设施，以及罗马尼亚斯拉蒂纳、斯洛伐克共和国普雷绍夫，以及墨西哥杜兰戈的新工厂。”

Prysmian集团电信业务在2016年的销售额报告为11.64亿欧元，调整的息税折旧摊销前利润攀升至1.63亿欧元，较2015年涨幅22%，利润率从2015年的12.1%增至14%。

集团在2016年生产了3500万公里的光纤，并在最近推出了破纪录的Flextube®光缆，拥有2112条纤维，是迄今为止所安装的纤维数量最多的柔性微模光缆。这也证实了公司提供超密度电缆解决方案的承诺，不但极其紧凑且安装速度更快，使服务提供商能够轻松地或在困难或

拥挤区域内部署创纪录数量的光纤。在过去的几周内，集团与Verizon通信公司达成了价值3亿美元的光缆供应协议，支持该公司以下一代光纤平台为核心，旨在加快5G服务部署的美国网络扩展。

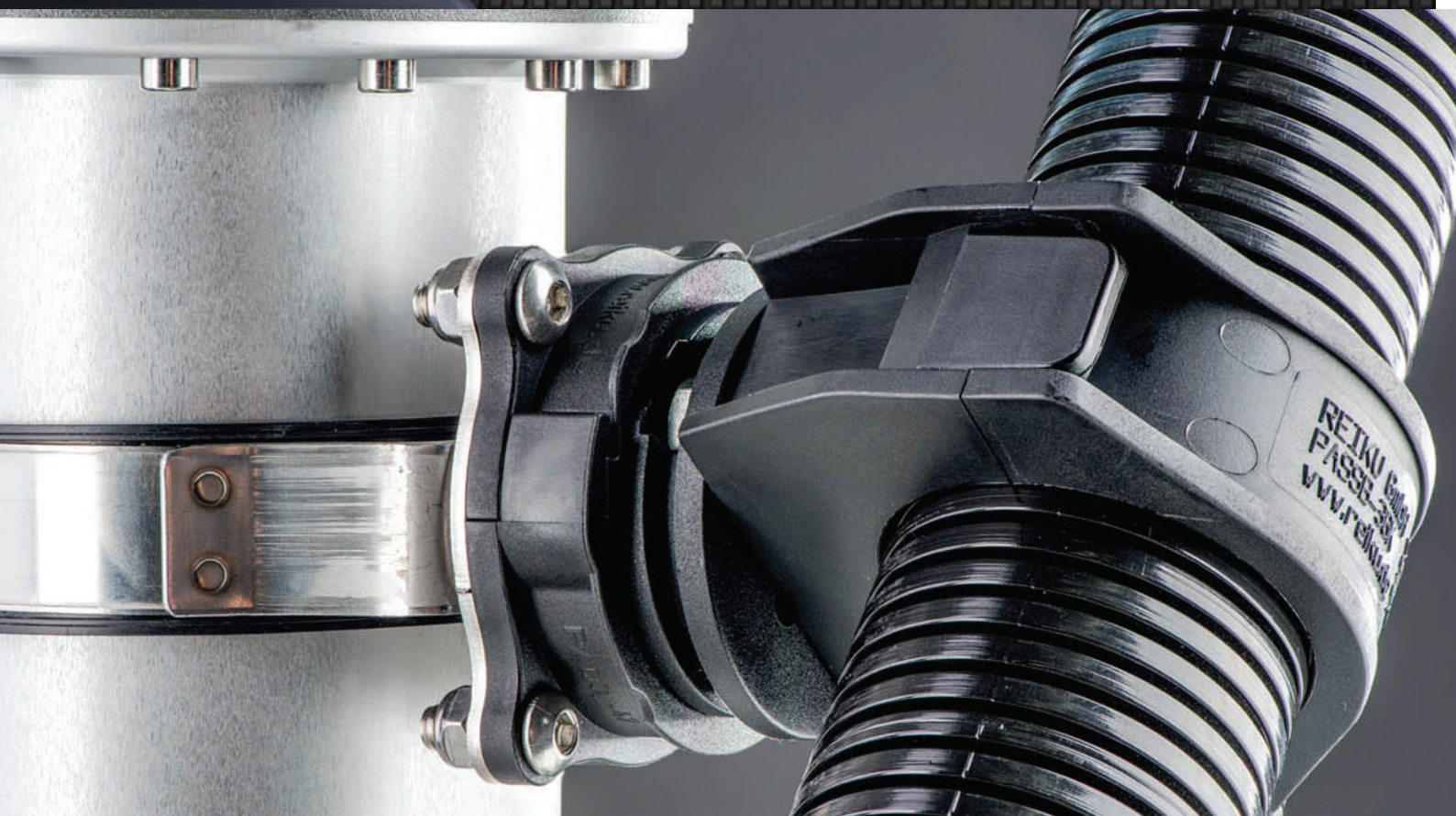
Vanhille补充说道：“我们参与过的项目遍布世界各地，并将我们无可争议的产品质量、我们的经验和创新承诺带给我们所有的工厂。”

Prysmian Group – 意大利
网址: www.prysmian.com

回应客户的需求

法国公司Agir Technologies自1870年起涉足碳化钨刀具领域，并拥有数十年的机械经验，不断为客户的各类需求提供解决方案和建议。公司投资的项目，例如0.03毫米二线阀芯的线切割火花机、切割电极用的五轴数控机床，以及新的CAD/CAM软件，让Agir进一步扩大了其高精度和高品质工具的范围。Agir专门电线电缆制造和其他线材改造所需的碳化钨刀具，包括拉丝模（圆形、异形、压力）、拉丝模和插头、电缆挤压工具，校正工具，导丝、焊条工具和电镀线等等。归功于其多种多样的软件，公司能够计算任何圆形线缆和异形线缆的任何拉丝站。

Agir Technologies – 法国 网址: www.agir-technologies.com



○ Two new Reiku fastening systems designed for different load levels for quickly and reliably fixing cable protection systems to smooth, round robot arms without screw, flange or stop faces, as are typical of cobots. Photograph courtesy of Reiku

Easy-fit solutions

IN day-to-day practice, cables and lines are often fastened in a somewhat makeshift manner with cable ties to the round, smooth arms of 'cobots' (robots which collaborate with humans without additional protection).

Two new Reiku multi-purpose fastening systems designed for different load levels now combine rapid, uncomplicated fitting with further advantages including very high slip resistance and gentle, virtually wear-free fixing of the cable protection.

With high reliability over a wide temperature range from -40°C to +80°C (with transient exposure up to 100°C), both systems help to ensure lasting, trouble-free cobot operation because they largely prevent downtime due to damage to the cable protection and consequently to the wiring itself.

The new LSDFB series is suitable for slow to moderate cobot movement

velocities under low load. Fastening is by means of a hook and loop strap which encircles the robot's arm.

Available in two sizes, the LSDFB series can be used for arm diameters from 54 to 110mm and corrugated tubing diameters from NW 17 to NW 29. The associated polyamide (PA) rotary plate means the cable protector can be guided as desired using the Reiku gripping clamps made from the same grade of polymer.

The other new series, MESUB, is designed for the higher dynamic and mechanical loads typical of industrial and palletising robots, and combines a stainless steel clamp with pivot bolt screw fastening and a friction-enhancing rubber profile.

Available in six variants, it is suitable for robot arm diameters of 54 to 108mm and for fitting all Reiku gripping clamp variants, from NW 17 to NW 90, to the integral general purpose bracket.

A special adapter plate allows Reiku rotary flanges to be used under the gripping clamps.

The cobot market is growing in leaps and bounds and analysts estimate it will be worth \$3bn by 2020.

As Johann Kasper, product manager for robot cable guides at Reiku, explains: "Because many of these systems need to supply compressed air, hydraulic oil, control signals, etc, separately to the working heads, they have lines arranged on the outside of the robot arm.

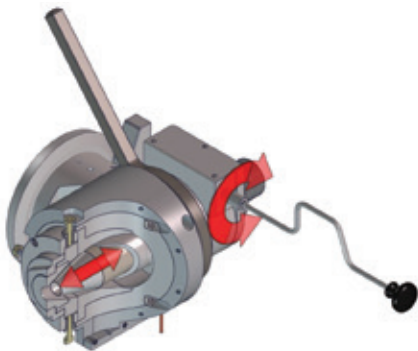
"Reiku customers can relax, though, because our cable protection conduits and the new fastening systems specifically developed for cobots minimise unscheduled system downtime."

Reiku GmbH Kabelschutzsysteme – Germany
Website: www.reiku.de

New 500 Series rubber/silicone extrusion crosshead

GUILL Tool has introduced the new 500 Series crosshead with MAGS gum space adjustment. The 500 Series is designed specifically for the flow characteristics and unique processing challenges of elastomeric compounds.

One of the key features on this crosshead design is the mechanically assisted gum space (MAGS) adjustment system. This new method of gum space adjustment allows the operator to make an effortless adjustment from a single point using a common socket wrench.



○ Guill 500 Series crosshead with Mechanically Assisted Gum Space (MAGS) adjustment specially designed for the flow characteristics of elastomeric compounds

There is no more need to struggle with multiple nuts and bolts in order to adjust gum space, which leads to faster adjustments. The visual indicator on the core tube allows the operator to see how far the gum space has been moved, making adjustments more accurate and repeatable.

The hardware-free and patented cam lock design of the 500 Series means no time is wasted unbolting and re-securing fasteners for disassembly and reassembly. Only half of a rotation of the cam nut is required to loosen and automatically extract the deflector from the head body, which is another time saver. Also, with no undercuts on the deflector, there are no material hang-ups when extracting the deflector, allowing faster and easier cleaning and changeover.

The 500 Series also features the latest centre-stage concentricity adjustment

system that significantly reduces pressure on the tooling, allowing easier and more precise concentricity adjustments without loosening the face bolts. Easy-out inserts for the adjusting bolts also allow simple

replacement of locked or damaged adjusting bolts, which further saves on repair and downtime.

Guill Tool & Engineering – USA
Website: www.guill.com



QUNYE ELECTRICAL CO.,LTD.
Qunye Spool Expert
Comparable Trustable ISO9001:2008

Jiangsu Qunye Electrical co., Ltd. is a specialized spools manufacturer. We have highlevel workshops and office , first class equipment line and complete inspection facilities, advanced management and quality control system to fulfill all cutomers' requirements. We manufacture all kinds of metal and plastic spools and win a good market both at home and abroad. Looking forward to cooperating with you.




Fax: +86-514-87383456
Tel: +86-514-87381010 87381188
Web: www.qunye.com.cn
E-mail: qunye@qunyeglobe.com qunye@qunye.com.cn

The new IntelliTHERM from Proton Products

Proton Products launched its new IntelliTHERM HTG400 handheld wire temperature gauge at Interwire 2017 in Atlanta, Georgia, USA. This instrument is suitable for use on all bare wire types and comprises a special bimetallic wheel construction with integrated electronics for precise, responsive measurement performance. It provides high-precision wire temperature measurement of better than $\pm 0.5^{\circ}\text{C}$, up to 400°C (752°F).

This instrument requires the user to simply touch the wire on the exit from the preheater to get an accurate wire temperature reading. The temperature can be shown in either Centigrade or Fahrenheit using a single push button and the results are viewed on an easy-to-read LCD display with an LED backlight screen for clarity.

The gauge is fully portable and is supplied with an integrated battery that provides more than 1,000 measurements from a full charge. The bare wire measurement diameter range covers from 0.3mm to 10mm (0.018" to 0.393") and can measure line speeds up to 2,000m/min.

Preheating the conductor is essential to eliminate 'thermal shock' between a cold (ambient temperature) wire and a relatively hot material flowing from the extruder.

Proton Products – USA

Website: www.protonproducts.com



○ The new HTG400 handheld wire temperature gauge from Proton Products

Kabelschlepp's simple and flexible solution

WITH the easy guide system, Tsubaki Kabelschlepp has developed a new channel system for guiding cable carriers as a simple and flexible solution for standard cranes which is also suitable for other areas of application. On workshop cranes with cable carriers, for example, this omits loose festoon loops.

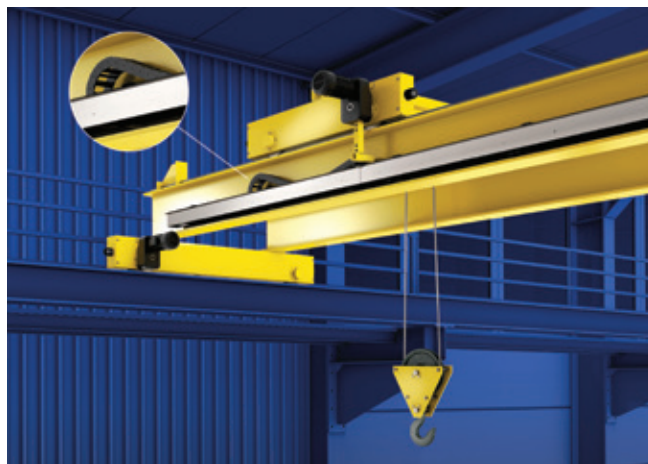
The requirements for modern crane systems are becoming ever more complex. "The focus is on a long service life and uninterrupted availability at maximum load," said Peter Sebastian Pütz, head of crane business at Tsubaki Kabelschlepp.

Easy guide system is a standardised guide system for cable carriers which is suitable for trolley power supply and extended travel lengths of cranes, but also for other applications involving complete cranes and crane sets as well as smaller process cranes.

Easy guide system features a space-saving design as well as simple and fast installation with few components. The guide channel is available galvanised or as a stainless-steel version. It can not only be installed vertically, but – in contrast to comparable systems – also horizontally, and remains flexibly adjustable even after installation.

The optional roof serves as a climbing protection, weather protection and mechanical protection. It also prevents the cable carrier from falling out or knocking. This means it has optimum guiding in a variety of different positions, including lying on its side.

The system channel requires no complicated steel structure and is suitable for all I-beams and box girders. Mounting



○ Easy guide system is a flexible, easy-to-install cable carrier system for standard cranes

holes for the cable carrier and cable ducts are provided every 850mm. Tsubaki Kabelschlepp offers the same installation bracket for different channel sizes or cable carrier types. Permanently installed cables can easily be mounted behind the channel, directly on the bracket, so that no additional cable conduits are necessary, saving time and effort during installation. The system requires only one installer and can be installed on the fly.

The easy guide system is not only applicable for cranes, but also for other areas of application.

Tsubaki Kabelschlepp GmbH – Germany

Website: www.kabelschlepp.de

LEADING PARTNER IN THE WORLD OF METALS

SMS group is your leading partner in the world of metals. As a family-owned business headquartered in Germany, quality and innovation are in our DNA. Fast and flexible, we develop individual and modular solutions – whether it's the design of a new plant, **Modernization, Digitalization, or Life Cycle Services**. In close **Collaboration** with you, we help you ensure your success. Let's add value along the entire value chain, together.

Leading partner in the world of metals



SMS  **group**
www.sms-group.com

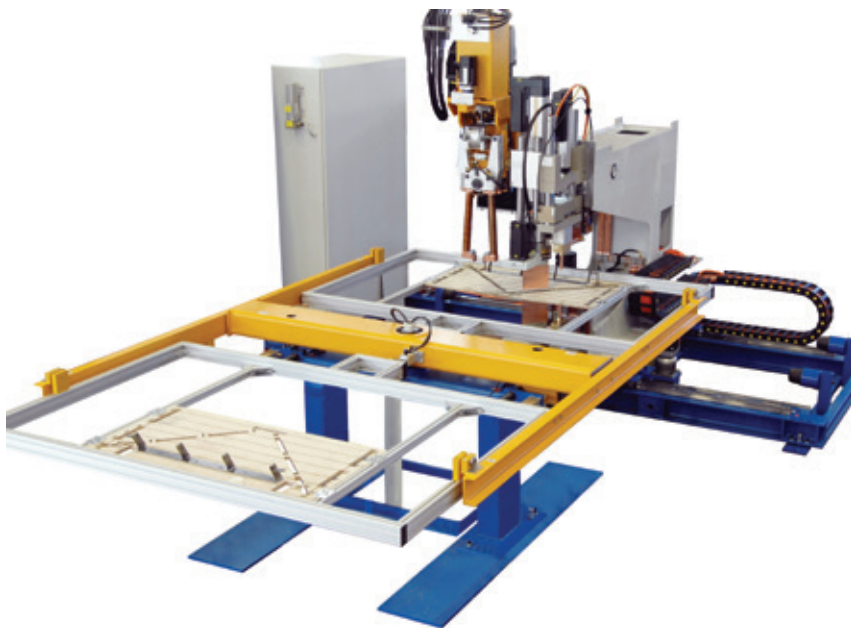
Welding two- or three- dimensional wire products in a single operation

With the new Posiweld system, Schlatter offers a flexible CNC welding cell for the economical production of wire products in small to medium batch sizes.

The rotating turntable design allows a single operator to load/unload the work holding fixture while the machine is operating.

Thanks to the flexibility and variability of this machine it can be used in all different kinds of welding applications.

Products include point of purchase displays, shopping cart components, three-dimensional wire baskets and fan guards as well as all types of white goods applications.



Schlatter Industries AG – Switzerland

Website: www.schlattergroup.com

○ *The new Posiweld system from Schlatter*

Three metals and tandem extrusion

HV power cables can be designed in many different ways, depending on their field of application.

Rosendahl has placed its focus on metal sheathed cables with subsequent jacketing, all in one line.

These types of HV power cables are used for indoor as well as outdoor, direct buried or conduit installations. Other special applications that can be considered are submarine power cables, such as dynamic cables for floating platforms with a corrugated copper sheath, or power cables for renewable energy, such as export cables for offshore wind farms and cables for photovoltaic power plants.

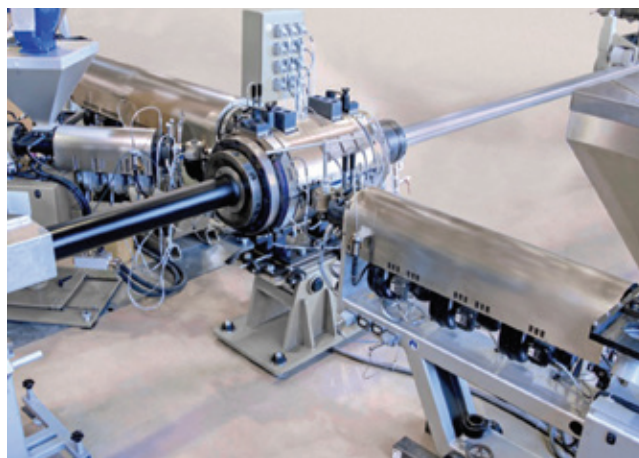
Metal sheathed cables require high precision technology for the production process. Manufacturers need to be flexible in their production, as well as efficient, and with the corresponding performance.

Metal tape forming, welding and the subsequent jacketing process can be done inline in a tandem process. At the same time, the production speed as well as the product's quality are maintained at a constantly high level.

High productivity is provided by the continuous welding solution, which supports long product lengths and smooth production.

The Rosendahl RH-W metal tape forming and welding line is designed to process aluminium, copper and stainless steel on the same line. The line concept is successfully applied at known references worldwide.

It is flexible in processing different metals as well as in its entire production process.



○ *Rosendahl RH-W metal tape forming and welding line with tandem extrusion*

This is due to the fact that each of the production steps can be adjusted to a manufacturer's needs, eg either inline or offline, smooth or corrugated. The options are manifold.

Depending on the product diameter, ranging from 40mm to maximum 200mm, the line runs at speeds of up to 15m/min.

The tools are easy to change and the line's performance can be tracked by the RIO line control system. This system reports and analyses the process and output.

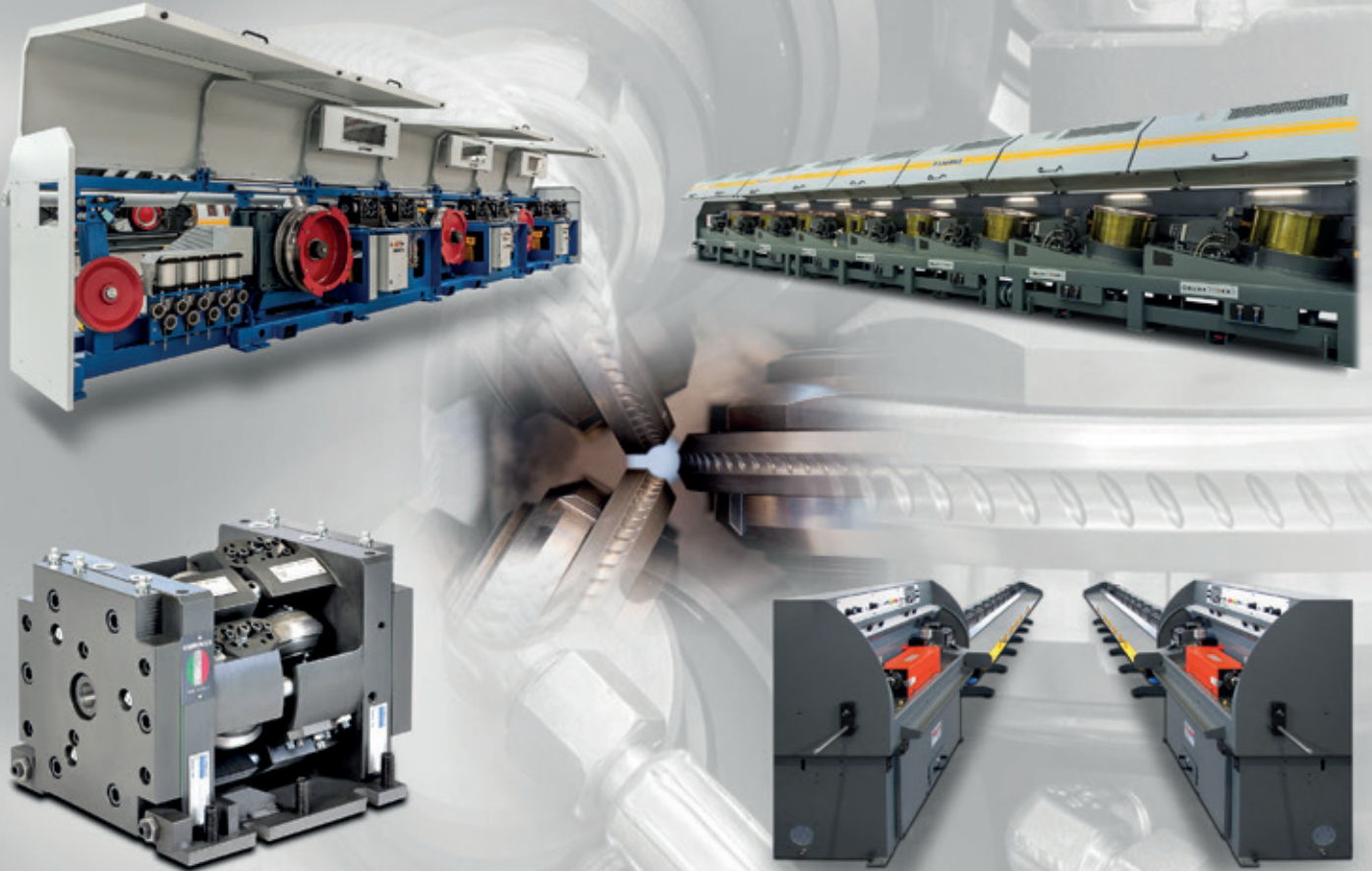
It is an all-in-one solution with many benefits for the final product.

RosendahlNextrom – Austria

Website: www.rosendahlnextrom.com

EUROLLS

THE RIGHT SOLUTION TO ALL YOUR WIRE NEEDS.

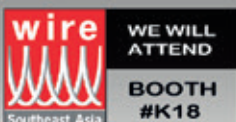


Construction and Industrial sectors

- Cold rolling lines for production of ribbed/smooth reinforcement steel
- Stretching lines for production of high ductility/high resistance reinforcement steel
- Lattice girder lines
- Steel fiber production machines
- Multipass Dry Drawing/Rolling wire production lines
- Multipass Wet Drawing wire production lines
- Production lines for welding wires and electrodes
- LRPC wire, LRPC strand, bead wire, steel cord and wire rope equipment
- Rod and wire treatment and preparation plants
- Rolls and Rolling cassettes

Vitari processing lines

- Straightening and cutting machines
- Chamfering and embossing machines
- Chain bending, welding and calibrating machines
- Chain link fencing machines
- Hexagonal wire netting roll and gabion machines
- Barbed wire machines
- Nail making machines
- Dress-hangers machines



SEE US AT...



wire Southeast Asia
Stand No. - C34

Bangkok, Thailand
19th - 21st September 2017
www.wire-southeastasia.com

...AND PICK UP
YOUR FREE
MAGAZINES
AND CDS



LEADING MAGAZINES

for the wire and
cable industries



www.read-eurowire.com



www.read-wca.com

Clean galvanising solutions

MHD (magneto-hydro-dynamic) galvanising technology is claimed to be the only eco-friendly galvanising process on the market today.

SunWyre offers economical and environmentally friendly galvanising solutions for rod, wire, rebar, pipe and tubing.

SunWyre's modern process is for high or low carbon steel wire rods or wire, 4 to 16mm diameter, moving at speeds from 1.7 to 5m/sec automatically and continuously through galvanising and drawing, non-stop.

The skilful integration of continuous rod pay-off, blast cleaning, induction heating, MHD galvanising, quenching, wire drawing and coiling or spooling, all managed by touch-screen PC, provides an efficient continuous process for galvanised wire manufacturing.

SunWyre's proprietary MHD process offers the following advantages:

- It is energy efficient
- Energy costs to maintain only one ton of zinc, instead of 50 or more, are lower than traditional wire galvanising
- 7kW or less will maintain the pot temperature when the system is idle
- Non-polluting
- Uses no acid or flux
- Requires no waste water treatment system
- Emits no toxic fumes
- Creates no hazardous by-products
- Offers lower operating costs than traditional hot dip galvanising
- Fewer man-hours are required to operate the process
- Low nitrogen consumption compared to conventional gas wipe methods

The SunWyre MHD process offers an innovative approach to the production of galvanised and galvanized steel wire.

SunWyre Inc – USA
Website: www.sunwyre.com



○ MHD power supply, coils and cooling system

Discover a faster way to fix wire breaks



Visit us at booth C22



World leader in cold weld technology

See our precision-engineered machines in action at www.pwmltd.co.uk.
 Or speak to one of our experts on +44 (0) 1233 820847.

Pressure Welding Machines Ltd
 Tel: +44 (0) 1233 820847
 Email: pwm@btinternet.com

M10 hand-held manual cold weld...

MADE IN THE UK

New PWM welders and dies available only from PWM or its authorised distributors.

Annealer for flat stainless steel wires and profiles

PLASMAIT GmbH from Austria is seeing an increasing demand for its high-output plasma heat treatment lines for stainless steel products.

The next deployment of its PlasmaAnnealer will take place at wire Southeast Asia.

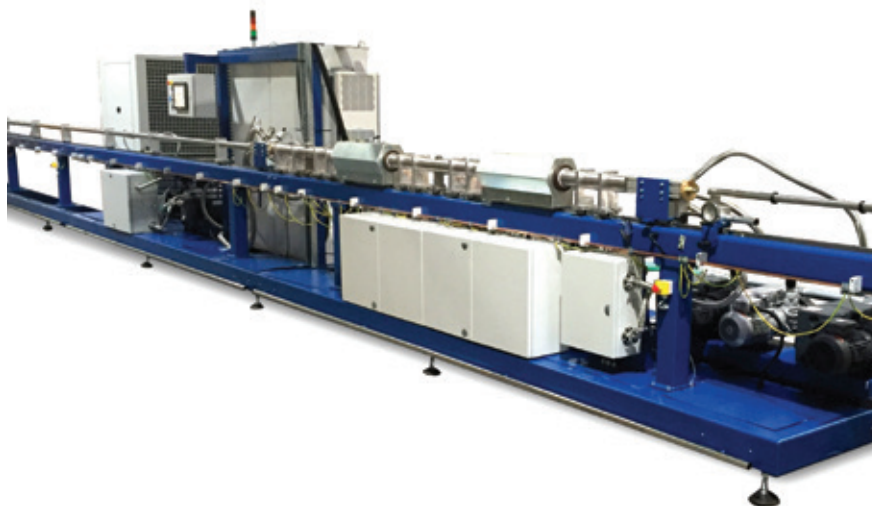
Plasmait sold a 30kW plasma annealer to a renowned stainless steel wire producer, who wants to replace its traditional tube furnace for production of flat ferritic and austenitic product with widths up to 30mm.

The HPA30 plasma annealer with output capacity of 100kg per hour will allow the manufacturer to halve the energy cost per kilogram of output whilst allowing for a considerable cost saving in terms of peak power consumption.

Much lower power connection requirements of the plasma annealer also means cheaper cabling installation for connecting power.

The new, compact, single-line production will have the same output as the old multi-line furnace and will take about one third of the shop floor space.

Single-line production will also reduce material manipulation and limit the investment into the associated



○ The PlasmaAnnealer HPA60 from Plasmait

take-ups, payoffs and transport system.

A typical plasma annealer installation for stainless steel applications can substitute around ten traditional lines on a conventional strand furnace.

PlasmaAnnealer allows accurate heat input and hence more uniform recrystallisation, which is reflected in homogeneous grain size in the longitudinal and transversal direction. The HPA30 annealer also features an extended tempering zone to allow for

extended dwell time or slow cooling, which is necessary for selected ferritic grades of stainless steel.

Processed material does not touch the plasma chamber when at high temperature, which reduces the risk of surface scratching. This is different to the conventional strand furnace where tubes remain in contact with the furnace guiding supports during the maximum elevated temperatures.

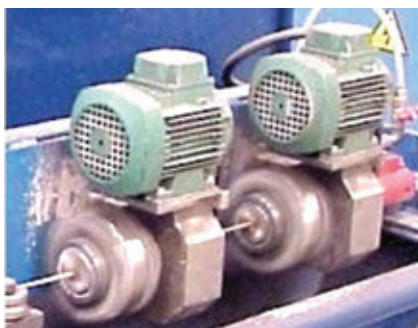
Plasmait GmbH – Austria
Website: www.plasmait.com

Rod rust removal – dry, green and clean

Wire rod rust is no longer an alarming phenomenon, since the introduction of the Smooth-Brush (SB) wire rod green and dry cleaning system.

Installed in-line after a simple rod reverse bending descaler, the SB system removes excess rod scale and rust, converting over 95 per cent of rod scale into useful micro-abrading pads, providing efficiency and simplicity in rod dry cleaning applications, H/C and L/C, including 0.98% C.

Continuously liberated rod scale provides, in-line, an extremely receptive about 5-micron size texture enabling powder lubricant to be chemically and mechanically interlocked to the rod surface, forming



○ Rod and wire cleaning by SB brushing system

a hard and consistent anti-wear and anti-friction conversion coating that is found to perform comparably to or better than zinc phosphate.

This achieves in-line direct drawing from mechanically descaled uncoated

bare rod, at virtually zero energy consumption and zero maintenance cost, in a totally green and dry application.

The SB rod cleaning is used in demanding wire drawing applications, including spring wire, plating wire, galvanised wire, PC strand wire, Al clad wire, cold-heading wire, CO₂ welding wire, etc.

The SB dry cleaning system replaces costly operations in wire rod cleaning processes, (including acid and other aggressive wet chemicals), generating substantial cost savings, environmental benefits and improvement of productivity.

Decalub – France
Website: www.decalub.com



HENRICH
GERMANY

Drawing ahead. Since 1960.

Wire connects us all!
Greater speed. Greater precision. Henrich.



HENRICH Wire-Drawing Technology worldwide in performance

Experience and know-how, developed for decades, certify HENRICH Maschinenfabrik among leading suppliers of international cable- and wire industry. More than 3.000 Wire-Drawing units are well established worldwide. HENRICH product range covers entire drawing-lines and single-action machines for conductor cable, installation- and special cable, telecommunication cable, trolley- and enamelled wire. The production range is completed by cooling- and cleaning devices for drawing- and cooling solution, drawing tools and pay-off devices.

The complete program is available at www.henrich.net

HENRICH designs, manufactures, supplies and installs custom-made and on demand.

Go, count on us!



19-21 September 2017
Bangkok, Thailand
BITEC (Bangkok International
Trade & Exhibition Centre)
Please visit us!
Booth No H20

Henrich Maschinenfabrik GmbH
Rehbergring 17, 35745 Herborn, Germany
Phone: +49 (0) 2772 506-0
Fax: +49 (0) 2772 506-196
E-Mail: henrich-gmbh@henrich.net
Internet: www.henrich.net



Quality inspection on aluminium wires courtesy of CMS

For aluminium wire inspection, Contrôle Mesure Systèmes (CMS) has developed an eddy current system, allowing detection of defects such as cracks and holes at high speed (1,500-2,000m/min, for example, depending of the diameter range to inspect). During the process, aluminium billets are transformed by lamination.

Then, the wire is guided and passes through an eddy current system composed of a support coil mounted in a support table with guide rollers assuring a good entrance of the product.

A special encircling coil, located in the support, allows the detection of cracks at the surface of the product. Eddy current testing is performed by Zet@ premium instrument dual channels.

When a defect or an inclusion is detected, the system activates a line shutdown, marker, visual alarm, saw or some other outputs.

An encoder installed on the line allows



○ The eddy current system from CMS

precise location of defects in a customised report.

Contrôle Mesure Systèmes – France
Website: www.cmseddyscan.com

New series from AIM

AUTOMATED Industrial Machinery Inc (AIM) has released a new stand-alone product for wire welding.

The new high precision butt welder “BW series” consists of butt welders from 40 to 150 KVA (for up to 16mm or 5/8”) with AC or mid frequency inverter models featuring:

- Fully automatic welding control with multiple schedule capability
- Heavy duty/high precision guides providing accurate and repeatable alignment
- Adjustable clamp and tip force (pneumatic control)
- Weld head can be ordered at 90° or 0° (front forward or top down welding)
- Adjustable upset position with mechanical counters
- Fully adjustable and easily accessible clamp adjustment for precise clamp alignment
- Available magnetic guides

Depending on customer needs, the welders can be supplied with various options, including robot loading, handheld programming unit pendant, AGI argon gas for stainless welding, and consumable weld inserts made with Elkonite (copper tungsten/tungsten and molybdenum).

The BW welder series offer high precision and robust construction for consistent and quality welds with minimal maintenance in any environment. Welding integration is made easy for automated cells, with simple robot integration offering the most consistent quality welds at all times.

Power savings can be accomplished with the mid frequency DC models with a balanced three-phase electrical load.



○ One of the new BW series butt welders from AIM

AIM Inc – USA

Website: www.aimmachines.com

The Wire Drawing Standard



Paramount Die is the leading designer and manufacturer of wire drawing inserts and tooling systems for the wire drawing industry. For more than 45 years we have been delivering the global wire drawing market with dies and wire drawing solutions that optimize wire drawing operations.

Why Use Paramount Die?

Productivity - Maximize die performance by increasing machine utilization and decreasing production cost.

Speed - Achieve drawing speeds up to 45% faster than conventional cased dies.

Efficiency - Dramatically lower material and shipping costs.

Consistency - Highly efficient and automated production equipment allows us to provide premium quality solutions at a competitive price.



Visit us at Booth H15



PARAMOUNT DIE
DRAWING SYSTEMS FOR THE WIRE INDUSTRY

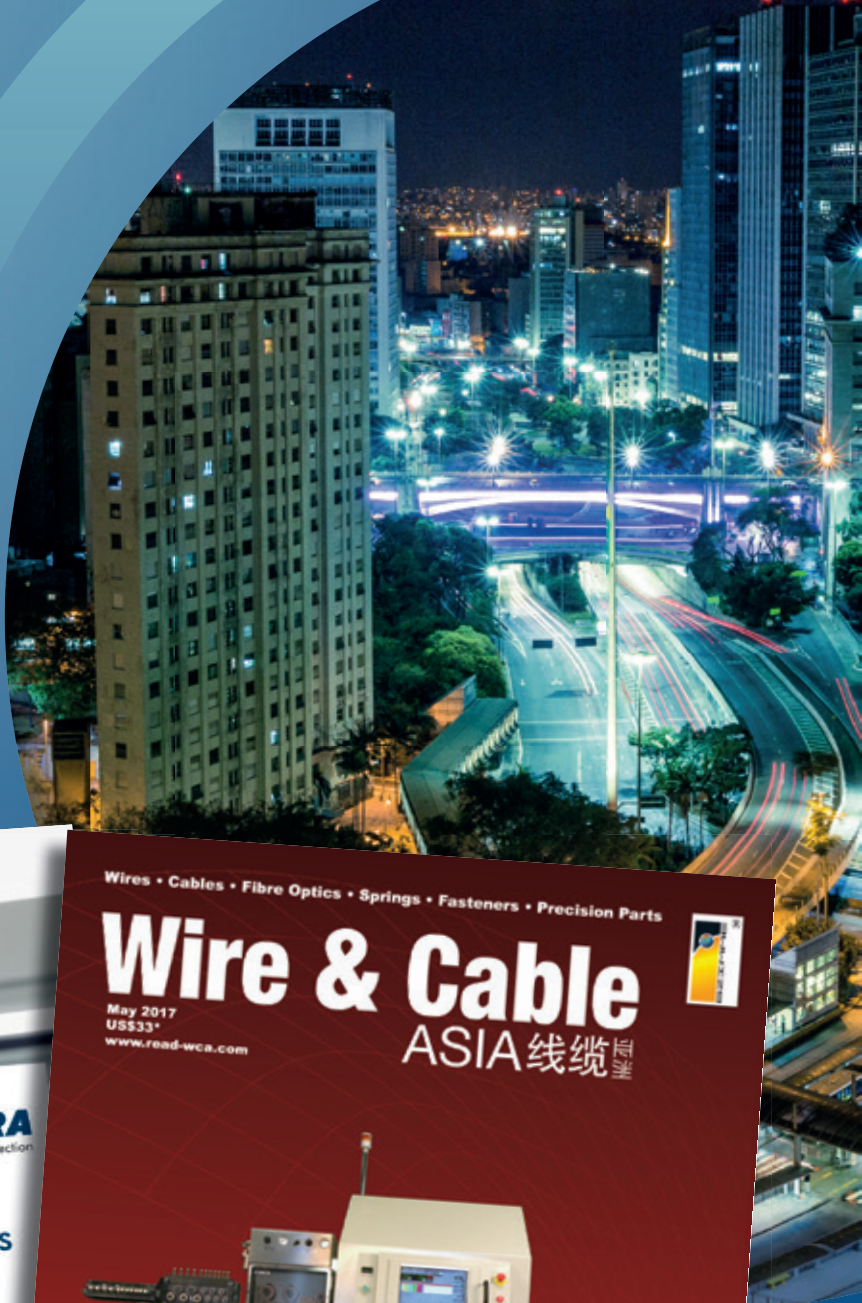
paradie.com

SEE US AT...



São Paulo, Brazil
3rd - 5th October 2017
www.wire-south-america.com

...AND PICK UP
YOUR **FREE**
MAGAZINES
AND CDS



May 2017 - US\$33*
www.read-eurowire.com

euro wire
The International Magazine for the Wire & Cable Industries

SIKORA
Technology To Perfection

Quality in its high-end form.

With passion, we develop future-oriented wiring and control devices for quality control of wires and cables, such as the LASER 6000 for online diameter measurement, integrated loop detection, A high-end technology using non-contact CCD laser sensor technology combined with pulse-driven laser sources that ensures reliable data and line control, for optimal quality and productivity.

Visit us from May 8-11, 2017 at Intertec, Atlanta, GA Booth 730

www.sikora.net/laser

Wires • Cables • Fibre Optics • Springs • Fasteners • Precision Parts

Wire & Cable
ASIA 线缆

May 2017
US\$33*
www.read-wca.com

AIM Inc
25TH
ANNIVERSARY

Synchro AFM 3D8 S

3D SYNCHRO SERIES

FORMING OUR FUTURE WITH YOURS

www.AIMMACHINES.COM



LEADING MAGAZINES

for the wire and
cable industries



www.read-eurowire.com



www.read-wca.com

New lubrication layer for wire drawing



○ The Staku Anlagenbau plant

DO you want superior drawability and forming characteristics? Then E-molyphos from Staku Anlagenbau is the answer.

This is in the form of a new lubrication layer for wire drawing as well as warm and cold forming of alloy made of stainless steel and titanium material by applying an electrolytic process.

Draw peeled wires have no more surface defects and deliver a homogeneous metal structure which will be perfect for coating with E-molyphos. Together, this prepared material results in a unique wire quality.

E-molyphos replaces expensive conventional high performance oils and graphite lubricant.

The central issue in warm and cold forming of chemically highly resistant material is the creation of perfect tribological conditions between the friction partners.

A chemical coating in the way of the usual conversion coating is almost impossible due to the inherent surfaces of the material. The electrolytic process can do the job.

When analysing the requirements of the whole system and the environment it will result in the following profile:

- Resistance of forming pressure >300 kN
- Low friction coefficient μ even at elevated temperatures above 500°C
- High adhesion between lubricant and material surface
- High environmental compatibility (green coating), resource-conservative
- Avoiding waste materials and low energy consumption
- Short exposure time at phase to phase inline processes

E-molyphos is a lubrication system which matches all named requirements by electrolytic coating in one single bath. In this process a highly performing solid lubricant is deposited within a matrix of components which also contribute to the lubrication.

E-molyphos is the consequent improvement of the e-phos process developed by Staku and which is successfully working in numerous applications worldwide.

Staku Anlagenbau GmbH – Germany
Website: www.staku-gmbh.de



OPTIMAL GRINDING OF SPRING ENDS

Europe's leading manufacturer of grinding wheels for the spring industry offers economical problem solutions.

- » safe production
- » increased profitability
- » shorter grinding times



THELEICO Schleiftechnik GmbH & Co. KG
Lagerstraße 3-5 | 59872 Meschede, Germany

☎ +49 (0) 291/99 01-0
☎ +49 (0) 291/99 01-28

info@theleico.de
www.theleico.de



3rd

2017世界光纤光缆大会 World Optical Fibre & Cable 2017

翡翠赞助商/
Hosted by

YOFC 长飞

2017年11月1日-3日 中国 武汉
1-3 November 2017 • Hilton Wuhan, China

The premier international event for the optical fibre and cable supply chain

CRU's 3rd World Optical Fibre & Cable Conference returns to Wuhan, China, bringing together the world's leaders in the production of preform, optical fibre and communication cable to meet and negotiate deals with consumers and services providers from across the supply chain.

Already established as the industry's leading event, **World Optical Fibre & Cable 2017** offers you unrivalled access to senior decision-makers from the world's largest fibre optic cable manufacturers, with three full days of networking opportunities.

700
attendees
expected!

EVENT HIGHLIGHTS

700+ ATTENDEES
EXPECTED



40+ SPEAKERS



3 FULL DAYS OF
NETWORKING



SITE VISIT

TO SEE CHINESE FIBRE & CABLE MANUFACTURING FIRST-HAND

The conference will explore:

- **Supply and demand updates** from the world's largest preform, optical fibre and communication cable producers
- **The latest insights on government programmes and economic data from China** and other key markets
- **5G and FTTH roll out** - telecom operators talk about plans for **international infrastructure modernisation**
- **Smart homes, cars and cities** - discussion of cable implications of increasingly data-heavy lifestyles
- **Data centres and submarine cable projects** - industry trends in major consumption fields
- **Communication cable design and raw material developments** - new designs and supply dynamics
- **Manufacturing process improvements** - taking advantage of **increased control**, automation and efficiency

Gold sponsors



Silver sponsors



Media partners



Book now for this essential event www.worldopticalfibreconference.com

#CRUopticalfibre

Gimax drawing equipment

GIMAX has redesigned its wet drawing equipment, and the traditional 'submerged' drawing tank has evolved into the TRS range of non-slip wet drawing units with independently driven vertical capstans, combining most of the benefits of a dry drawing line with a wet one. The result is an example of the advanced technology available in wire drawing.

The TRS is a 'spray'-type wet drawbench, where the lubricant is sprayed onto the die and die box and onto the capstan. This range is suitable for both ferrous and non-ferrous wires, and its reduced footprint and easily accessible parts and components not only offer cost savings in terms of floor space and labour (operation and maintenance), but are also an important aid in decreasing downtime and consequently increasing productivity.

High productivity and a better final wire quality coupled with features such as



○ *Gimax – helping decrease downtime and increase productivity*

perfect alignment of wire between die and capstan as well as low energy consumption due to electronic control of motor and line operation go to ensure one of the most advanced drawing solutions available on the market.

The main features are:

- Reduced die and capstan wear
- Mechanical line speed reaches 33 metres/second
- Fixed or rotating dies
- Rotating die speed varies in proportion to line speed
- Each block can be bypassed

- Synchronisation by means of dancer arm
- Input wire diameter starts at 2mm (steel wire) or 3mm with aluminium wire

With 38 years' experience in welding wire machinery and with the specific experience of Gimax engineers in the production of wire, consequently with an excellent knowledge of the entire process of wire manufacturing, the redesign also led to the introduction of a range of TRD dry drawing equipment, available with vertically or horizontally mounted capstans – non-slip (with independently driven capstans), tilted horizontal capstans, rotating dies, water-cooled capstans, etc.

The capstan diameter can vary from 300 to 1,200mm depending on the application and diameter of wire, and can reach a line speed of 35 metres/second.

Gimax Srl – Italy
Website: www.gimaxgroup.com

ultimat

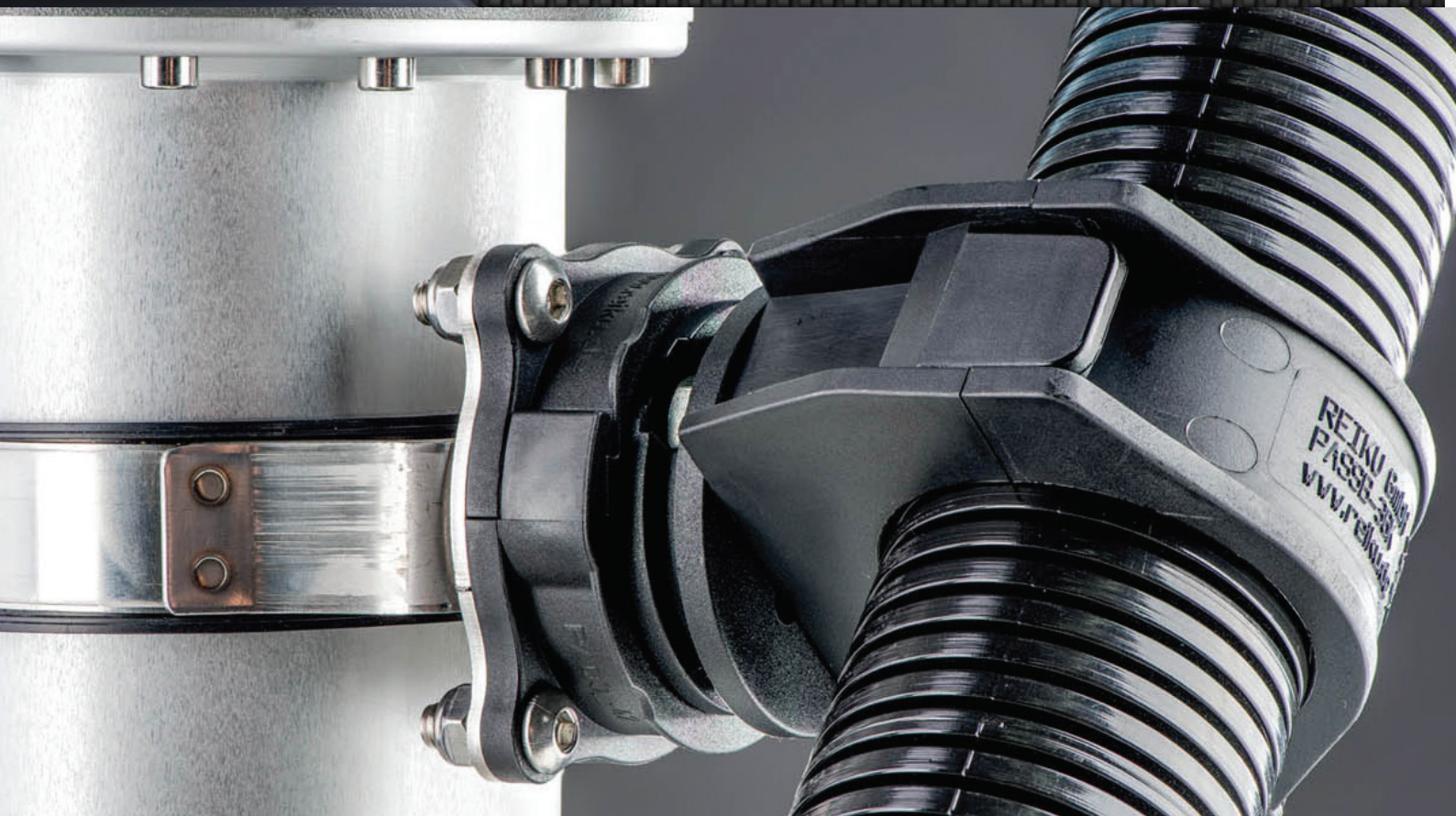
WIRE FORMING & WELDING MACHINES

- AUTOMATIC - STRAIGHTENING - FORMING - WELDING -

- 2D Wire Forming & Welding Machines, suitable for POP Displays, Shelving, Household goods and many more
- Automatic Lines for the production of shelving and air filter frames direct from coil
- Automatic Ring Forming & Welding machines
- High Quality Burr-Free welds in mild and stainless steel
- Medium frequency and TIG welding options available
- Suited for prototypes to low or high volume production runs
- Versions available for strip or profiled wire
- Automatic Unloading of finished parts
- Square Clean-cut wire ends
- Unrivalled service support
- 2 year parts warranty



Ultimate Automation Ltd, 23 Star Road Industrial Estate, Partridge Green, West Sussex, RH13 8RA, U.K.
Tel: +44 (0) 1403 710043 Fax: +44 (0) 1403 588084 Email: sales@ultimat.com www.ultimat.com



○ 两款全新Reiku紧固系统的特殊夹具专为不同的负载水平设计，快速且可靠地将电缆保护系统固定在圆滑的机器人手臂上，而不需要螺丝、法兰或停机，例如典型的合作机器人。照片来自Reiku

易于安装的紧固 解决方案

在日常操作中，电缆和线路往往采取将电缆扎在“合作机器人”（无需额外防护即可与人类合作的机器人）圆滑手臂上的将就型固定方式。

现有两款全新的Reiku多用途紧固系统，专为不同的负载水平设计，将简单快速的安装与更显著的优势结合在一起，包括极高的抗滑性，以及温和且几乎无磨损的电缆保护安装。

凭借极高的可靠性和 -40°C 到 $+80^{\circ}\text{C}$ （短暂暴露高达 100°C ）的宽广温度范围，两个系统都能够帮助确保持久无故障的合作机器人操作，因为它们在很大程度上防止了由于电缆保护受损，以及后续的电缆本身受损所引起的停机。

新LSDFB系列适用于低负载下的慢速到中速合作机器人移动速度。紧固通过环绕在机器人手臂上的钩环实现。LSDFB可选两个尺寸，可用于54毫米到110毫米的手臂直径，以及NW 17到NW 29的波纹管直径。相关的聚酰胺（PA）转板是指电缆保护器可以使用由同级聚合物制作的Reiku抓夹按需要进行引导。

另一个新系列MESUB是专为高动态和机械化负载而设计的，例如典型的工业和搬运机器人，结合了不锈钢夹具和枢轴螺栓紧固件，以及抗摩擦型橡胶轮廓。

它拥有六个变种，适用于54毫米到108毫米的机器人手臂直径，并且适用于NW 17到NW 90，到集成通用支架的所有Reiku抓夹变种。特殊的衬板让抓夹底部可以使

用Reiku旋转法兰。合作机器人市场正在经历跨越式增长，分析家估计，到2020年，市场价值将达到30亿美元。

Reiku的机器人导线板产品经理Johann Kasper解释道：“由于许多系统需要在主体之外单独提供压缩空气、液压油、控制信号等等，所以需要在机器人手臂外面布线。”

但Reiku客户可以放心，因为我们的电缆保护管和新紧固系统是专门为合作机器人开发的，旨在减少计划外的系统停机时间。”

Reiku GmbH Kabelschutzsysteme
- 德国
网址: www.reiku.de

简单灵活的解决方案

凭借简单导向系统, Tsubaki Kabelschlepp开发出了全新的导向电缆托架渠道系统, 作为面向标准起重机的简单灵活的解决方案, 但也适用于其他应用领域。例如在配备电缆托架的车间起重机上, 该系统可以省去悬杆环。现代起重机系统的要求越来越复杂。Tsubaki Kabelschlepp的起重机业务主管 Peter Sebastian Pütz表示: “关键在于较长的使用寿命, 以及满负载的不间断运行。”

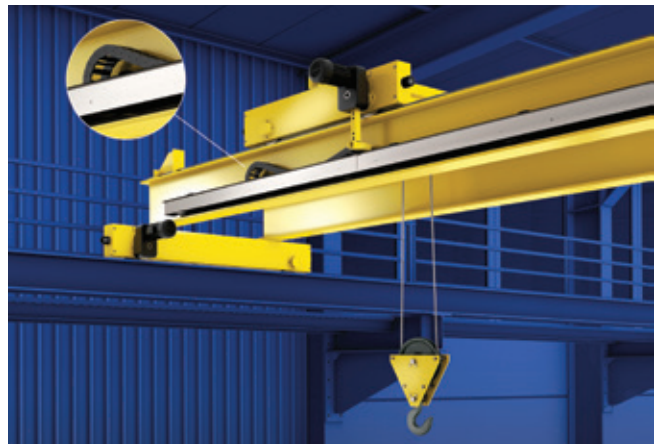
为了新渠道系统的开发, 我们特别关注了标准起重机的要求。”

简单导向系统是电缆托架的标准化导向系统, 是推车供电和延长起重机移动距离的理想选择, 但也适用于其他涉及完整的起重机、起重机组以及小型加工起重机的应用。

简单导向系统的设计节省空间, 并且组件较少, 安装简单快捷。导向渠道可选镀锌或不锈钢版本。与同类系统相比, 它不仅可以垂直安装, 也可以水平安装, 并且在安装后依然保持灵活的可调节性。

可选顶盖起到攀爬保护、天气保护和机械保护的作用。它还可以防止电缆托架脱落或冲撞。这意味着它可以在各种不同的位置上提供最佳导向, 包括侧躺。

该系统渠道不需要复杂的钢结构, 并且适用于所有工字梁和箱梁。每850毫米提供电缆托架和电缆管道的安装孔。Tsubaki Kabelschlepp为不同的渠道尺寸或电缆托架类型提供相同的安装支架。永久安装的电缆可以轻松安装在渠道后方, 直接安装在支架上, 这样就不需要额外的电缆管道, 可以节约安装过程的



○ 简单导向系统是一种灵活且易于安装的标准起重机电缆托架系统

时间和精力。该系统只需要一名安装人员, 并且在运行中安装。简单导向系统不仅适用于起重机, 也适用于其它领域的应用。

Pütz补充道: “无论是长距离移动、纵向、横向还是角落作业, 我们的系统渠道可以满足严苛环境下的各种不同要求。”

例如, 它可以结合铝制组合式起重机系统使用; 用于内部物流系统、涂料系统、堆垛机系统以及污水处理厂; 在爆炸性环境中作为供电轨的替代品; 用于灌溉系统、高速摄像机、闸门施工或升降装置。

Tsubaki Kabelschlepp GmbH – 德国

网址: www.kabelschlepp.de

用于扁平型不锈钢电线和轮廓的退火炉

奥地利Plasmait公司发现用于不锈钢制品的高产出等离子体热处理生产线需求不断增加。

公司下一个等离子退火炉将部署在东南亚地区。Plasmait将30kW等离子退火炉卖给想要替换其传统管式炉的某知名不锈钢丝生产商, 用于生产宽度达30毫米的铁素体和奥氏体扁平产品。

使用输出容量为每小时100 kg的HPA30等离子体退火炉, 制造商每公斤产出的能源成本将可以减半, 同时在峰值功耗方面可以节省可观的成本。等离子体退火炉的电源连接要求更低, 这也意味着电源连接布线安装更加便宜。

与旧式多线管式炉相比, 全新紧凑型单线生产具有相同产出, 且占用的车间场地大约只有原先的三分之一。单线生产还可减少材料处理, 并限制相关联的拉紧、回馈和运输系统投资。用于不锈钢应用的典型等离子体退火炉装置可以替代传统链炉上大约10条生产线。

等离子体退火炉允许精确的热输入, 因此可以实现更均匀的重结晶, 这也反映在纵向和横向均匀分布的晶粒尺寸。HPA30退火炉还扩展了回火区域, 允许延长驻留时

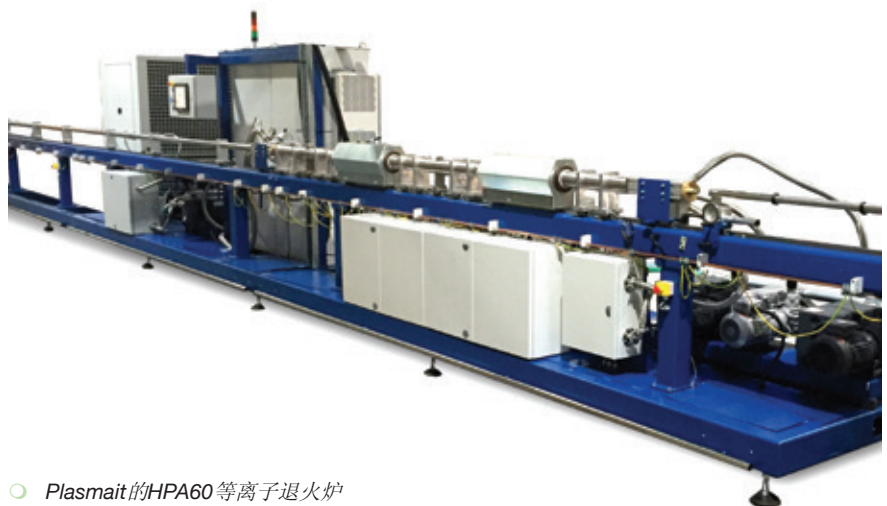
间或延缓冷却, 这对于所选择的不锈钢铁素体等级非常必要。

新款退火炉结合了高速光亮退火和高级无划痕表面抛光的优势。加工材料在高温时不会接触等离子体处理室, 从而减少了表面划伤的风险。这不同于在升温期间仍使管子保持接触锅炉引导支架的传统链炉, 此时表面最容易受到损伤。

等离子体退火的独有特征之一是热量在低压惰性气体中传导, 这需要真空装置和准确的材料引导。真空系统的优点在于吹扫气体 (通常是氢气或天然气) 在低压时提供, 从而降低吹扫气体的总体消耗。

Plasmait GmbH – 奥地利

网址: www.plasmait.com



○ Plasmait的HPA60等离子退火炉

新500系列橡胶/硅胶十字挤出头

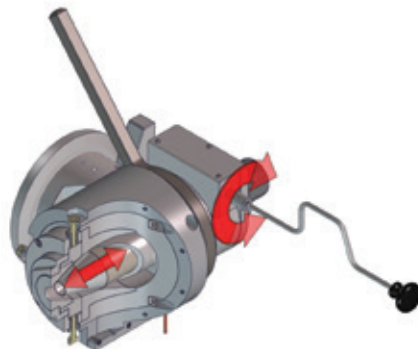
Guill Tool推出全新500系列十字挤出头，具有MAGS胶体厚度调整功能。500系列设计的目标是为了满足弹性化合物的流动特性和独特的加工挑战。

Guill这一全新十字头设计的重要特征之一，就是它可以通过机械方式辅助胶体厚度(MAGS)调整系统。有了这种全新胶体厚度调整方法，操作员就可以使用普通的套筒扳钳在一个位置进行轻松操作。

无需处理各种螺栓和螺母来调整胶体厚度，因此可加快调整速度。通过芯管上的目测指示器，操作员可以了解胶体厚度移动的距离，让调整更加准确并可重复操作。

500系列采用无硬件专利偏心夹设计，不需要通过拧松和拧紧加固器进行拆卸和安装，节省大量时间。拧松加固器时，凸轮螺母只需拧动一半的距离，导向器即可从挤出头体上抽出，进一步节省操作时间。此外，由于导向板上没有底切，因此在抽出导向板时不会出现材料外挂的现象，可实现更快速、更简单的清洁和更换。

500系列还配备了最先进的中心位置同心性调整系统，可以大幅减少对模具的压力，实现更简单、更精准的同心性调整，同时不会导致表面螺栓松脱。调整螺丝的嵌件可轻松简单地替换锁死或破损调整螺丝，进一步节省维修时间，缩短停工时间。



○ Guill 500系列MAGS调节挤出头，专为弹性化合物的流动特质而设计

这一橡胶/硅胶十字挤出头的另一个特点是铸铝液态给料冷却套管。如果出现设备阻塞，用户可以断开冷却套管，与传统的集成式冷却系统相比，这一设计同样节省了停工时间。500系列是目前大多数NRM设备的插入式替换件。但它也可以用于任何其它设计和布局的基础设备和生产线。

全新设计的液体流入通道，可以减少材料在挤出过程中的剪切操作和所产生的热量。这一设计可以降低挤出头的压力，让材料能够更平衡均匀地流过挤出头。

Guill Tool & Engineering – 美国
网址: www.guill.com

线材除锈: 干燥、绿色、清洁

自从引入Smooth-Brush (SB)线材绿色干燥清洁系统以来，线材除锈已不再成为令人担忧的工作。SB系统安装在简单的线材反复弯曲除锈机之后，可以去除多余的线材氧化铁皮和锈，将95%以上的氧化铁皮转化为有用的微腐蚀垫，为线材干燥清理应用、H/C和L/C，包括0.98%C提供极高的效率和便利性。

连续清理线材氧化铁皮为线上运行提供了极其令人满意的约5微米的尺寸纹理，使润滑粉可以通过化学和机械的方式与线材表面联锁，形成坚硬且一致化的耐磨转化涂层，其效果相当于或优于磷酸锌。这实现了机械除垢的未涂层裸线材的在线直接冲压，几乎零能耗和零维护成本，并且属于完全绿色和干燥的应用。

SB线材清理用于要求最为严格的线材冲压应用中，包括弹簧线、镀线、镀锌线、PC钢绞线、Al复合线材、冷锻钢丝，CO₂焊丝等等。

SB干燥清理系统可取代最昂贵的线材清理工艺(包括酸和其他刺激性湿化学品)，实现大量成本节约、环境效益以及生产力的提高。

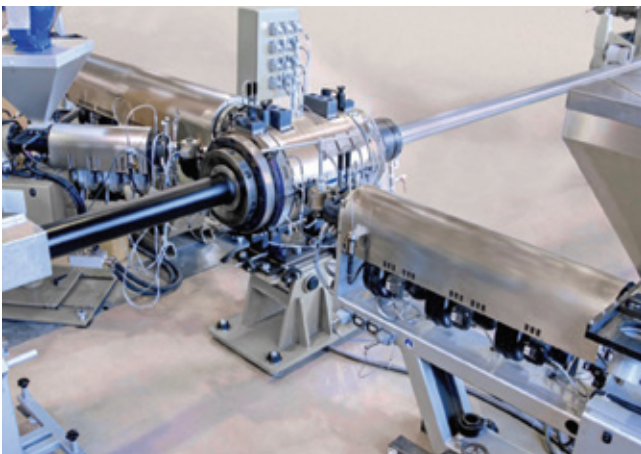
Decalub – 法国
网址: www.decalub.com

三金属和串联挤压

高压电力电缆可以有多种不同的设计，具体取决于应用领域。Rosendahl把重点放在金属护套电缆及后续护套上。并将所有程序集中在一条生产线上。

此类高压电力电缆既可用于室内，也可用于室外、直埋或管道安装。其他特殊应用还有海底电力电缆，例如浮动平台的波纹铜护

○ Rosendahl RH-W金属带成型和焊接线路，带串联挤压



套动态电缆，或者可再生能源电力电缆，例如海上风电场的输出电缆，以及光伏电站的电缆。

金属护套电缆在生产过程中需要高精度技术。制造商需要在生产过程中保持灵活性。高效、灵活且具有相应的性能。

金属带成型、焊接和后续护套程序可以通过串联程序在线上实现。同时，生产速度和产品质量都保持在较高的水平。连续焊接解决方案尤其提供了高生产率，支持长产品长度和平滑生产。

Rosendahl RH-W金属带成型和焊接线经过专门设计，可以在同一条线上处理铝、铜和不锈钢。这条生产线是最先进的概念产品，并在世界各地拥有知名的成功应用案例。

它在处理不同金属以及整个生产过程中都非常灵活。这是因为每个生产步骤都可以依据制造商的需要进行调节，例如线上或线下，光滑或波纹。选择多种多样。

根据40毫米到最大200毫米的产品直径，生产线的最高运行速度可达15米/分钟。工具都易于更换，并且线路性能可以通过RIO线路控制系统进行跟踪。这套系统可以报告和分析程序及输出。

这是一款综合性的解决方案，并且对最终产品大有好处。

RosendahlNextrom – 奥地利
网址: www.rosendahlnextrom.com

Proton的新InteliTHERM

Proton Products在美国乔治亚州亚特兰大的2017年Interwire展会上推出了他们的新款InteliTHERM HTG400手持线缆测温仪。这款仪器适用于所有裸线类型，由一个特殊的双金属轮式结构和集成电子设备组成，具备精确、灵敏的测量性能。它提供高精度的线温测量，范围从±0.5°C到400°C (752°F)。

用户只需简单地触碰预热器输出端的线缆，即可获得准确的线缆温度读数。通过一个按键即可用摄氏或华氏显示温度，测量结果显示在便于阅读的LCD显示屏上，并带有LED背光以提高清晰度。

该仪器完全可便携，并配备集成电池，充满电后可以进行1000多次测量。裸线测量直径范围涵盖0.3毫米到10毫米 (0.018英寸到0.393英寸)，并且可以测量最高速度2000米/分钟的缆线。为消除冷（环境温度）缆线和挤压中相对较热的材料流之间的“热冲击”，预热导体必不可少。

将导体预热到和挤压出的绝缘材料相同的温度，可以消除导致针孔和火花故障的空隙，有助于确保成品的正确粘附和电气性能。

Proton Products – 美国
网址: www.protonproducts.com



Proton Products 的新款HTG400手持线缆测温仪



CMS的涡流系统

铝线质量检验

针对铝线的检查，控制测量系统 (CMS) 已经开发出一套涡流系统，可以在高速时（速度高达1500-2000米/分钟，具体取决于受检查线材的直径范围）检测裂纹和孔洞等缺陷。在此过程中，铝坯将接受层压处理。然后，线缆将按照引导穿过一个涡流系统，该系统由安装在支撑台上的支撑线圈和导向辊组成，保证了产品的顺利进入。支撑台上的特殊的环境线圈可以检

测产品表面的裂纹。涡流测试由Zet@高级双通道仪器进行。当检测到缺陷或杂质时，系统会激活生产线停机、标记器、可视化报警、电锯或其他行动。线路上安装的编码器可以在定制化报告中精确定位缺陷。

Contrôle Mesure Systèmes – 法国
网址: www.cmseddyscan.com

清洁电镀解决方案

MHD (磁流体) 电镀技术是当今市场上唯一的环保电镀工艺。SunWyre为棒材、线材、钢筋、管材和管道提供最经济环保的电镀解决方案。

SunWyre的现代工艺面向高或低碳钢线材或钢丝，直径为4到16毫米，移动速度为1.7到5.0米/秒，自动连续通过镀锌和冲压，中途不停。

连续的钢材放线、喷砂清理、感应加热、MHD电镀、淬火、冲压、收卷或绕线圈的巧妙集成都由触摸屏电脑进行管理，为镀锌线材生产提供高效的连续工艺。

SunWyre专有的MHD工艺提供以下不同于传统热浸镀锌的优势：

- 能源效率高

- 能源成本仅需维持一吨锌，而不是50吨及以上，较传统钢丝镀锌更低
- 系统空闲时只需7kw或以下功率来维持锅内温度
- 无污染
- 不使用酸或助焊剂
- 不需要废水处理系统
- 无有毒烟雾
- 不产生有害的副产品
- 实现比传统热浸镀锌更低的运行成本
- 操作流程所需的工时较少
- 与传统气体擦拭方法相比消耗更少的氮气

SunWyre的MHD工艺提供创新的镀锌钢丝生产方法。

该工艺生产出的线材具有优良的成形性和耐腐蚀性，无污染且节能。资本和运营成本低于传统的热浸镀锌。

SunWyre Inc – 美国
网址: www.sunwyre.com



MHD供电、线圈和冷却系统

India Insight



Cities are getting smarter...

ON the second anniversary of the Smart Cities Mission, Sterlite Technologies has revealed its selection for the implementation of Smart City solutions in Kakinada, Andhra Pradesh, India.

Kakinada is among 20 cities in the first phase of the Smart City mission. As part of the project, Sterlite Technologies will design, build and manage the Kakinada Smart City for the next six years.

Highlighting the technology layer of this project, Shri S Aleem Basha, commissioner, Kakinada Municipal Corporation, said: "Our strategic aim for Kakinada is to improve mobility, improve situational awareness, enhance public safety and security, and introduce data-driven decision making. Aligning with this vision, Sterlite Tech will bring smarter network technologies to this high-tech Smart City project."

Shri Sujay Arun J, CEO, Kakinada Smart City Corporation Ltd, said: "As part of the Kakinada Smart City project, we

have envisaged several pan-city and area-based development initiatives, with a focus on both infrastructure and ICT advancements across the city and at strategic locations."

Sterlite Technologies will deliver various Smart City-related ICT solutions, including a command control centre, CCTV surveillance, Wi-Fi, automatic number plate recognition, face detection, and waste and disaster management.

Sterlite Technologies – India

Website: www.sterlitetech.com

Tell us YOUR news. . .

To submit news for the India Insight section free of charge, email david@intras.co.uk or call direct on +44 1926 334137.

Solar development

Azure Power, an independent solar power producer in India, has announced its commissioning of a 100MW solar power plant in Andhra Pradesh. The project was auctioned by NTPC, the largest power utility of the government of India.

The Azure Power plant is located in Kurnool Ultra Mega Solar Park, which has a total capacity of 1,000MW.

The park is under development by the Solar Park Implementation Agency (SPIA) and Andhra Pradesh Solar Power Corporation Ltd (APSPCL).

Azure Power – India
Website: www.azurepower.com

Raising the bar production

The bar mill at the IISCO steel plant at Burnpur recorded its highest ever single day's production on 3rd July 2017. The mill produced 2,495 tons of 20mm TMT bars in FE 500D EQR grade. The mill had previously peaked at 2,431 tons in January this year.

Since its commissioning in 2015, the bar mill, with a top production speed of 40m per second and an annual production capacity of 0.9 million tons, has produced TMT bars in 8 to 40mm sizes. The bars are thermo-mechanically treated to make them resistant to earthquakes.

TMT bars produced from the mill are currently distributed in the north east regions, West Bengal, Orissa, Punjab and Andhra Pradesh.

IISCO chief executive officer Rajesh Kumar Rathi said that in June the plant had recorded its highest monthly dispatch of 280 blooms and produced 5,300 tons of 5.6mm to 6mm wire rod coils. The monthly saleable steel production of the plant also touched its best ever mark of 139,279 tons in the same month.

IISCO Steel Plant – India
Website: www.sail.co.in

India's village connection scheme

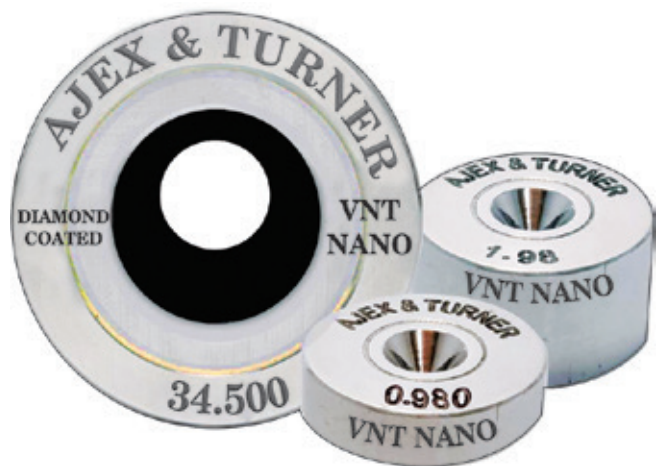
Ravi Shankar Prasad, the Indian government's union minister for electronics, IT and law and justice, has stated that by mid-2018 around 150,000 gram panchayats (local governing bodies) will be connected under a national optical fibre network programme. Of the targeted 250,000 gram panchayats to be connected under the BharatNet programme, around 100,000 have been connected.

Speaking at a meeting organised by the Indian Chamber of Commerce (ICC), the minister said that the BharatNet project has seen better optical fibre connectivity during the Narendra Modi-led NDA regime.

In three years it has covered 210,000km, compared to the 358km previously covered since its announcement in 2011. The scheme will see the launch of telemedicine, education and skills training through digital technology in connected villages.

Bharat Broadband Network Ltd – India
Website: www.bbnl.nic.in

VNT nano dies – keep production running



○ Nano die technology from Ajex and Turner

Ajex & Turner will be showing its range of upgraded products at this year's wire Southeast Asia, being staged in Bangkok, Thailand, from 19th to 21st September. The company's stand is A25.

Produced in a modern facility, and using VNT technology, the company's VNT nano dies demonstrate an optimal balance of mechanical properties making for a tough die surface, low friction, no wear ring and wire breakage and metal saving with economical prices.

Ajex & Turner also manufactures trapezoidal wire drawing dies and sector shaped conductor dies to meet customer requirements in all aspects. It is capable of serving customers with any special tooling like shape drawing dies (trolley, oval, trapezoidal, rectangular, square, triangle, sector, etc) and sector shaped compacting dies for bunching and stranding lines.

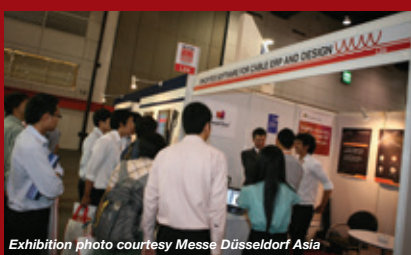
The company also makes wire dies in PCD/TC/pressure/split/shape with extrusion tools, buncher bows and spiral brushes. Its research and development team is continuously engaged in finding solutions for optimal resource utilisation to enhance wire and cable production.

Ajex and Turner Wire Dies – India
Website: www.ajexturner.com



wire Southeast Asia returns to the Bangkok Trade & Exhibition Centre (BITEC), Bangkok, Thailand from 19th to 21st September with its 12th edition.

Held biennially, the opportune and strategic staging of the specialist trade fair comes amidst encouraging prospects expected for the wire, cable, tube and pipe industries, especially on the back of a thriving infrastructure and manufacturing landscape in Southeast Asia.



Exhibition photo courtesy Messe Düsseldorf Asia

According to the Asian Development Bank (ADB), it estimates that through to 2020, energy and transport sectors will form 62.6 per cent of the total ASEAN infrastructure investment needs. This is in tandem with Goldman Sachs' projection on infrastructure spending in power and transport of four ASEAN countries (Thailand, Malaysia, Indonesia and The Philippines), which will amount to US\$524 billion come 2020.

Another major ASEAN infrastructure initiative is the ASEAN Power Grid (APG) which will see an investment requirement of US\$5.9 billion, as well as the Singapore to Kuala Lumpur high-speed rail which will span 350km and is expected to start operations in 2026. On the manufacturing

front, should ASEAN implement the ASEAN Economic Community's integration strategy fully and be able to capture a larger share of global manufacturing, the region could gain US\$280–US\$625 billion in annual GDP by 2030, as stated in a recent report by the McKinsey Global Institute.

Set against this infrastructure growth, alongside the expansion of the automobile, new energy, high-speed rail, urban transport, aerospace, petrochemical, infrastructure construction and other application industries, these have brought about new opportunities for the fastener industry.

Reflecting such global trends, a special zone on fastener technology will make its debut at wire Southeast Asia 2017.



September 19-21/2017

wire Southeast Asia

SUPPORTED by prominent industry partners, wire and Tube Southeast Asia 2017 will simultaneously present technology highlights from the synergistic wire and tube industries, and will be the focal platform to insights of the industries' latest developments and an arena for face-to-face meetings in forging business linkages and partnerships.

The dynamic line-up at wire and Tube Southeast Asia 2017 will feature an all-encompassing range of innovative machinery in wire, cable, tube and pipe manufacturing, processing and finishing, fastener technology, new processes in measuring, control and test engineering and specialist areas, as well as new and upgraded tools and auxiliary materials, augmented by a series of conferences and seminars.



Bangkok, 19-21 September 2017

Thailand | www.wire-southeastasia.com

International Wire and Cable Trade Fair

Alphabetical list of Exhibitors

Company	Stand
ACIMAF Italian Wire Machinery Manufacturers Association	D19
Advance Industry Media Plus Co Ltd	K43
Aeroel Srl	D12
AESA SA	A41
Ajex & Turner Wire Dies Co	A25
ALMT Corp	A01
Anbao Qinhuangdao International Corp	G35A
Anhui Giant Machinery Equipment Co Ltd	B07
Anhui Prius Electrotechnical Machinery Co Ltd	C38
August Strecker GmbH & Co KG	H27
Austrian Federal Economic Chamber – Advantage Austria	E12
Baicheng Fujia Technology Co Ltd	B10
Baloffet	E22
Bansal Wire Industries Limited	C48
Beijing Conet Science Technology Co Ltd	K35
Beijing Yitian Mica Technology Co Ltd	B14
Beta Control Systems, Inc	C06
Beta LaserMike Products	H35
Blachford Corporation	C11
Böllinghaus Steel GmbH	D33
Bongard Trading GmbH & Co KG	F11
Bright Engineering	TBA
Britix Wire Rope Ind Corp	J39
Bühler Redex GmbH	G33
BWE Ltd	C25
CADmethods Ltd	A41
Candor Sweden AB	G17
Carl Bechem GmbH	H33
Changzhou Riyue Machine Co Ltd	E41
Changzhou Zhilin Plastic Co Ltd	C40
Cheng I Drawing Machinery Co Ltd	F35
Cheng I Wire Machinery Co Ltd	F36
China Fastener Info	J42
Comsuc Technology Development Ltd	B16
Condat Lubricants	E20
Conoptica AS	G41
Continuus-Properzi SpA	D14
CSG Wiremachinery Solutions GmbH	H28
Dalian Pro-Sun Metal Products Co Ltd	A09
Danyang Litong Cable Technology Co Ltd	G40
DEM SpA	D22
Dong Guan Shi Gong Ye Su Jiao Bao Zhuang Zhi Pin Co Ltd	B17
Dong Viet Non-Ferrous Metal & Plastic JSC	E26
Dongguan Kao-Meng Machinery Co Ltd	B42
Dongguan Tianxin Cable Equipment Co Ltd	B48
EB Tech Co Ltd	Z30
Ebner Industrieofenbau GmbH	E11
Eder Engineering GmbH	E13
EJP Maschinen GmbH	F04
Enkotec A/S	E27
Enshiang Machinery Enterprise Co Ltd	F36
Ernst Koch GmbH & Co KG	F25
Esteves Group (Shanghai) Diamond Dies Co Ltd	G01
Eurobend GmbH	F03
Eurolls SpA	K18
Excel Craft Private Limited	A31
F&E International Inc	C06
Fastener Technology International (FTI)	C09
Flymca & Flyro	H09
FMS Force Measuring Systems AG	D36
Focus Mechanic Co Ltd	A33
Fort Wayne Wire Die Inc	C13
Fuhr GmbH & Co KG	F19
Gansu Kaimeite Materials Science And Technology Co Ltd	B13
Gauder & Co SA	E33
Glory Mica	E42
Golden Spot Industry Inc	F39
Golden Technologies Wire And Cable Equipment Co Ltd	H01
Gongyi Hengxing Hardware Co Ltd	Z18
Goodcomer Co Ltd	E39
Gotex SA	H42
Green World Publication Co Ltd	J44
Guangdong Hongkai Optical Equipment Technology Co Ltd	B43
Guangzhou Ciyuan Machinery Manufacturing Co Ltd	G35
Gwo Lian Machinery Ind Co Ltd	C28
GYMCO Ltd	B29
H Folke Sandelin AB	G33
Han Dok Special Metals Company	TBA
Hangzhou Xingguan Machinery Co Ltd	B44
Hangzhou Dongxing Telecommunication Material Co Ltd	D43
Hangzhou Jincheng Industry Co Ltd	B08
Hanil Machinery	Z30
Hebei Hexing Cable Machinery Co Ltd	B18
Hebei Jiaoyang Wire Mesh Machine Co Ltd	B30
Hefei Smarter	C36
Hejian Baohong Electrical Machinery Co Ltd	Z12
Heng Fei Cable Co Ltd	B26
Henrich Maschinenfabrik GmbH	H20
Hipo Electric Science & Technology Co Ltd	B25
HJ Polymer China Co Ltd	B21
HMP Heinrich Müller Maschinenfabrik GmbH	H26
Hyuksan Profile Co Ltd	C42
Ideal-Werk C+E Jungeblodt GmbH + Co KG	F05
iiM AG	F01
International Metalworking News For Asia	K45
International Wire & Machinery Association Ltd	C19
INTRAS Limited	C34
Ito-Sin (Deyang) Wire & Cable Equipment Co Ltd	G10
Jagular Industry Ltd	E35
Jia Jiun Steel Co Ltd	E37
Jiangsu Changfeng Cable Co Ltd	B09
Jiangsu Handing Machinery Co Ltd	B02
Jiangsu Qunye Electrical Co Ltd	C33
Jiangsu Shenlong Metal Products Co Ltd	B45
Jiangsu Silver & Tin Thread Hi-Temp Wire And Cables Co Ltd	D47
Jiangsu Xinda Tech Limited	B13
Jiangxi Longtai New Material Co Ltd	B20
Jiangyin Kangrui Molding Technology Co Ltd	L39
Jiangyin Keyu Electric Co Ltd	B31
Jingtie Machinery (Dongguan) Co Ltd	G09
JV Engineering & Conveyors Pvt Ltd	H37



Alphabetical list of Exhibitors

Knipex-Werk C Gustav Putsch KG.....	F12	Sinoeader Industries Group Co Ltd.....	B15
Lamnea Bruk AB	G17	Sinoholding Group	C41
Lantor	D38	Sinosteel Zhengzhou Research Institute	
LAP Laser Application Asia Pacific Pte Ltd.....	E25	Of Steel Wire Products Co Ltd	B41
Lech-Stahlwerke GmbH.....	H34	SKET Verseilmaschinenbau GmbH.....	H19
Lifeline Technologies	A27	Smart Trade Publications Co Ltd	J46
Loi Thermprocess GmbH	F21	Staku-Anlagenbau GmbH	D40
Lubrimetal SpA.....	D10	Stolberger KMB Maschinenfabrik GmbH.....	F20
M+E Macchine+Engineering Srl.....	D25	Sungmin Instruments	A35
Maillefer Extrusion Oy	G02	Suzhou Forever Import & Export Co Ltd	G05
Mali GmbH	E14	Suzhou Listrong Mechanical & Electrical Co Ltd	B01
Mario Frigerio SpA.....	D01	Swiss Profile (M) Sdn Bhd.....	M19
Maschinenfabrik Bock GmbH & Co KG.....	D28	SYMCO Ltd	B27
Maschinenfabrik Niehoff GmbH & Co KG.....	G33	T Fukase And Co Ltd	D35
Medek & Schörner GmbH	E09	Taiwan Linkigi Metal Co Ltd	J40
Merck KGAA.....	F22	Taiwan Metal Industry Association	F37
Metalube Ltd	C21	Taizhou Hongze	
Micro Products Company	C02	Stainless Steel Wire Rope Co, Ltd	G37
Nano-Diamond America, Inc.....	C27	Tatung (Thailand) Co Ltd	D41
Nantong Lili Hardware Products Co Ltd	B11	Taymax Wire Rope Industry Corp Co Ltd.....	J39
Nine Delong Machinery (Kunshan) Co Ltd	C37	Tecnovo – Koner.....	TBA
Numalliance.....	E19	Tianjin Zhaohong Metal Product Co Ltd	K36A
Ostrich Cable Import & Export Co Ltd	B38	Tien Chen Diamond Industry Co Ltd.....	F40
Outokumpu.....	D33	TJ Solution Co Ltd	D37
Pan Chemicals SpA.....	D11	TKT Group SpA	D20
Pioneer Machinery Co Ltd.....	E40	Toho International Inc	H15
PolyOne Corporation.....	A21	Tongling Jingda Rea Special Enameled Wire Co Ltd	B36
Pressure Welding Machines Ltd.....	C22	Tongling Xingang Plastic Products Co Ltd.....	B35
Promostar Srl	D26	Traxit International GmbH	G25
Proton Products International Ltd	D27	Troester GmbH & Co KG.....	H25
Queins Machines GmbH	F20	Tulip 3P Media Private Limited.....	TBA
Rad-Con Inc	C01	Unigel (UK) Limited.....	A13
Rautomead Limited.....	J33	Unigel Compounds Sdn Bhd	A13
Reber Systematic GmbH + Co KG.....	H33	Upcast Oy	K17
Renqiu Ruiming Cable Drum Co Ltd.....	B05	Verband Der Österreichischen Draht- Und	
RichardsApex Australasia	C14	Kabelmaschinen-Hersteller VÖDKM, AWCMA.....	E13
Roblon A/S	D28	Voge Composites Inc LLC.....	J34
Rosendahl Nextrom GmbH	E01	Wafios AG.....	F33
RSD Technik GmbH	F06	WCISA Wire And Cable Industry	
Sampat Heavy Engineering Ltd.....	D39	Suppliers Association.....	C09
Sampsistemi Srl	D24	Weilly Diamond Industrial Co Ltd	E38
SAS Engineering And Planning Srl.....	D13	Wire & Cable Technology International (WCTI).....	C09
SCG Performance Chemicals Co Ltd	A17	Wire & Plastic Machinery Corp.....	C10
Schlatter Industries AG	A19	Wire Forming Technology International (WFTI).....	C09
Schnell SpA.....	D20	Wire World.....	Z36
Shanghai Dielec Electrotechnics Co Ltd	F44	Witechs GmbH	F26
Shanghai Hosn Machinery Technology Co Ltd	H01	Woywood Kunststoffmaschinen GmbH & Co	F02
Shanghai Kechen Wire & Cable Machinery Co Ltd.....	G12	Wuxi Changxin Technology Co Ltd	B19
Shanghai Resources Industrial & Trading Co Ltd.....	G14	Wuxi High Rate Machinery Co Limited	A37
Shanghai Shineworld Group Co Ltd.....	E44	Wuxi Pingsheng Science & Technology Co Ltd	G36
Shanghai Weiye OFC Equipment Co Ltd	C39	Yangzhou Havet Machinery Co Ltd.....	G38
Shanghai Yajue Machinery Manufacturing Co Ltd	F42	Yangzhou Tengfei Electric Cable	
Shanghai Yupin		And Appliance Materials Co Ltd.....	G15
Communication Technology Co Ltd.....	G03	Yueyang Xinte Thermal Energy.....	B22
Shantou Senyang Wire & Cable Materials Co Ltd.....	C35	Zhejiang Harbor Technology Co Ltd	F41
Shaoxing Kaicheng Mica Material Co Ltd	B06	Zhejiang Taihu Yuanda New Material Co Ltd	B37
Shengzhou Chuangyu Import And Export Co Ltd.....	Z06	Zhejiang Tenglong Stainless Steel Products Co Ltd	G16
Shenzhen SKZ Mechanic Technology Co Ltd.....	K38	Zhejiang Wanma Macromolecule Material Co Ltd	G39
Shenzhen Xinchanglong		Zhejiang Wansheng Yunhe Steel Cable Co Ltd	B33
New Material Technology Co Ltd	G36A	Zhengzhou Hongliang Cable Co Ltd.....	B23
Sikora AG	F13	Zhengzhou IW Diamond Co Ltd.....	G07



Bangkok, 19-21 September 2017

Thailand | www.wire-southeastasia.com

International Wire and Cable Trade Fair



**Beta LaserMike
(an NDC Technologies brand)**

Stand: H35

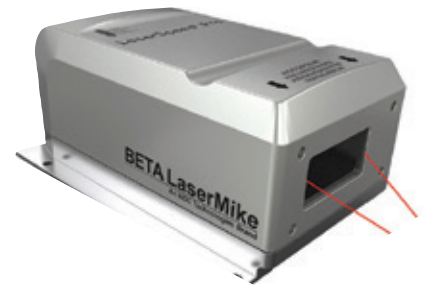
The Beta LaserMike product group from NDC Technologies will be exhibiting the latest gauging and control system solution for cable extrusion lines.

“We will be demonstrating a cable extrusion line measurement and control system with Beta LaserMike gauges in place measuring diameter and ovality, wall thickness and concentricity, product faults (lump and neckdowns), length and speed and other dimensional properties,” said Jay Luis, global marketing communications manager at NDC Technologies.

“We want to show that by implementing highly accurate gauging along the critical points in the cable extrusion process, manufacturers can significantly improve product quality, increase productivity and realise manufacturing savings to successfully grow their business.”

Featured precision measurement products on display will include:

- The latest InControl™ process visualisation and control system – easy to set up, simple to configure and effortless to use, it gives cable makers precise and efficient control of production processes to drive quality manufacturing. Optional OPC UA server module offers flexible, central control
- AccuScan 6000 Series gauge – the industry’s only four-axis, laser-scanning diameter gauge with high ovality and flaw-detection accuracy, and fast scan rate
- New LaserSpeed® Pro gauge – the non-contact length and speed gauge with ±0.03 per cent accuracy and expanded connectivity consistent with Industry 4.0. Over 8,000 gauges installed worldwide
- New UltraScan Pro – the latest wall thickness and concentricity gauge that also meets Industry 4.0 connectivity and includes an expanded feature set such as faster processing and measurement capabilities, high-speed tolerance checking, multi-layer measurements, enhanced connectivity via web server and other advances



○ New UltraScan Pro from Beta LaserMike

A range of other measurement solutions from the Beta LaserMike product portfolio will also be on display.

**Beta LaserMike
(An NDC Technologies brand) – USA**
Website: www.betalasermike.com



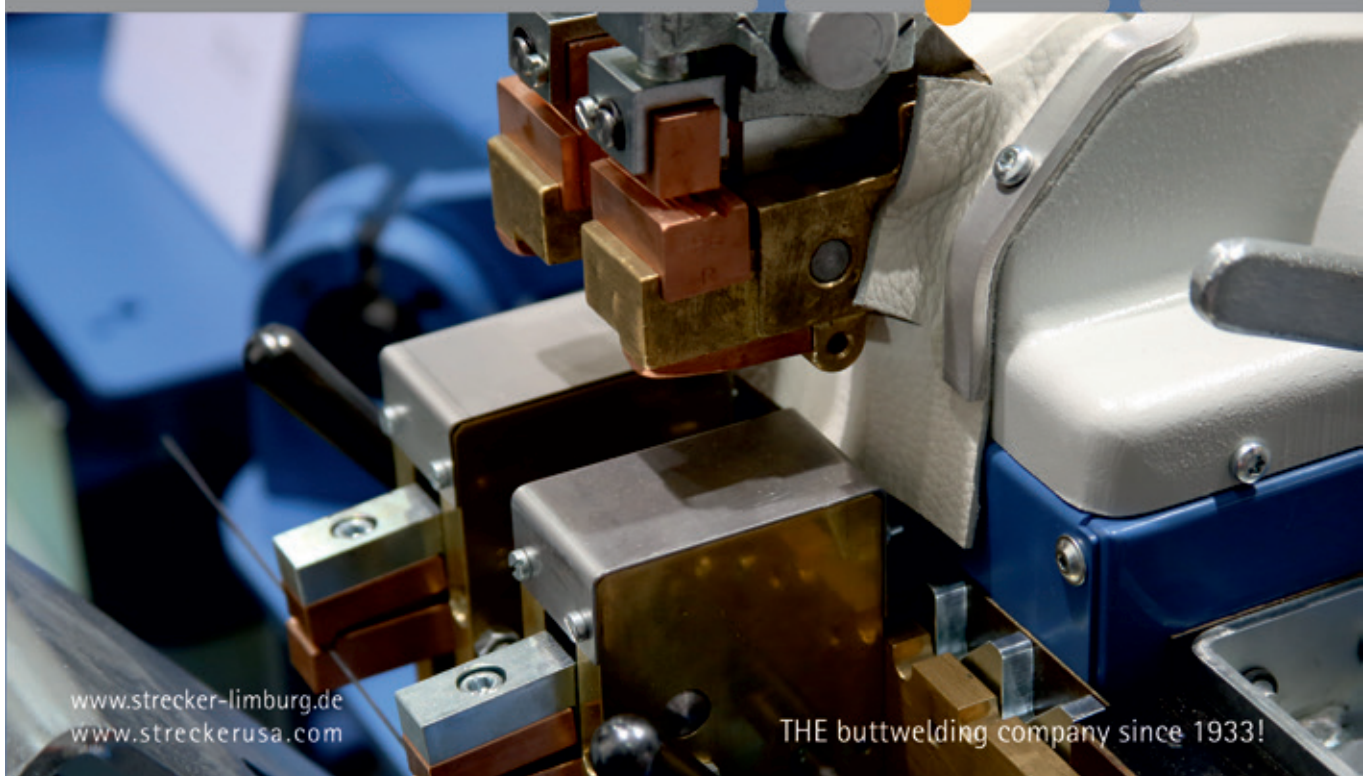
**BWE
Stand: C25**

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

Wire Southeast Asia
September 19-26, 2017
Bangkok, Thailand
booth H 27

Innovation meets Tradition

STRECKER

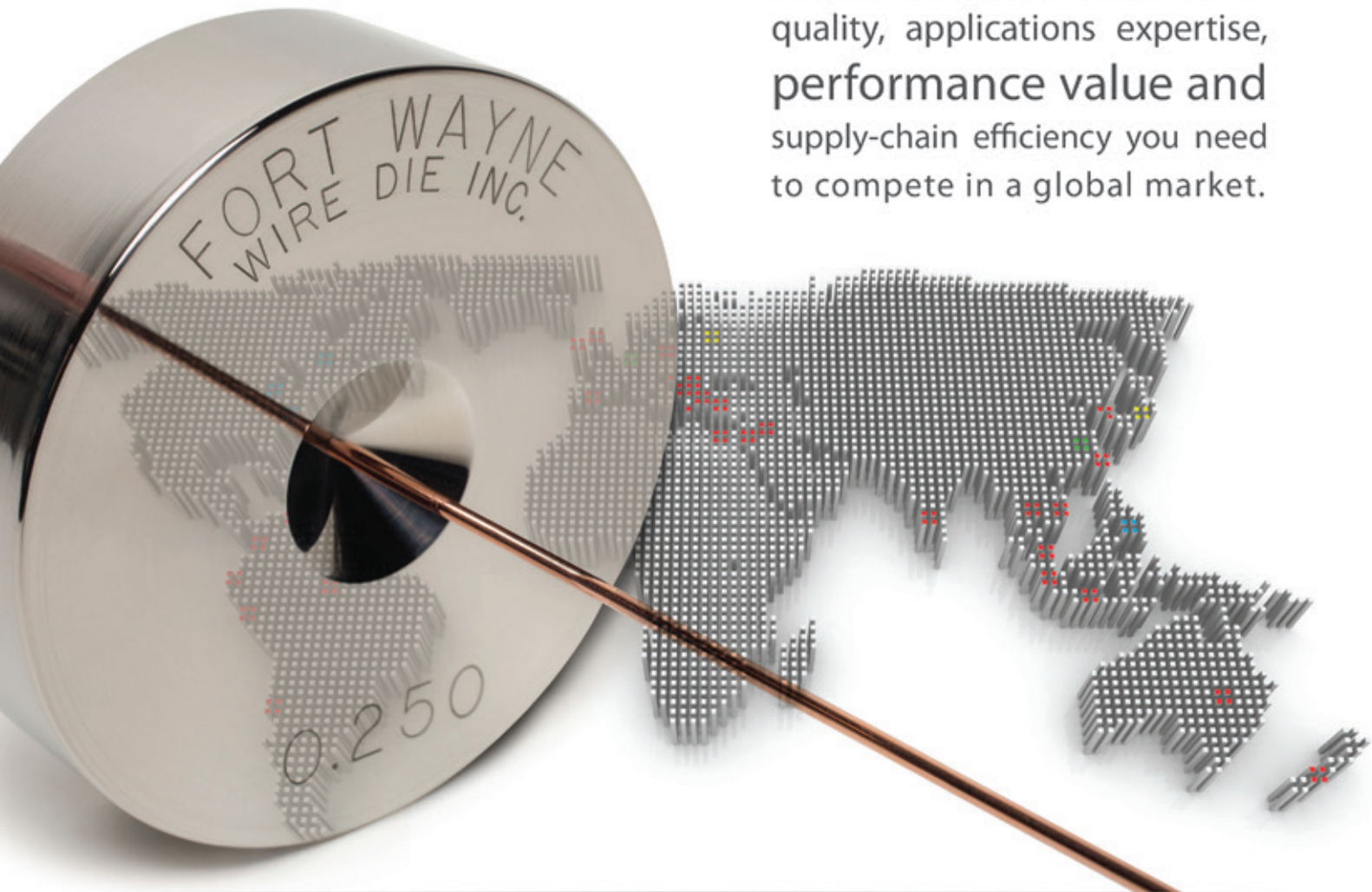


www.strecker-limburg.de
www.streckerusa.com

THE butt welding company since 1933!

Great Wire Begins with

the one die supplier that can provide the consistent quality, applications expertise, performance value and supply-chain efficiency you need to compete in a global market.



One source serving six continents with the same:

- Single-crystal diamond dies
- Poly-Di® polycrystalline diamond dies
- Custom wire-production tooling services
- Innovative die engineering
- Technical support and training
- Die reconditioning
- Custom die inventory management



Fort Wayne Wire Die

Your Total-Value Solution.
Worldwide.

See us at
WIRE ASIA Stand C13

www.fwwd.com

Latest *Blue Book* edition
FREE when you call.



Indiana, USA | Corporate +1 (260) 747-1681 • sales@fwwd.com | North Carolina, USA +1 (828) 894-8257 • sales@WayneWireDie.com
Shanghai, China, Asia +86-21-6164-9156 • sales@fwwdshanghai.com | Philippines, Asia +63-43-405-5555 • sales@fwwdasia.com
Ontario, Canada +1 (519) 659-3030 • sales@AdvancedWireDie.com | Germany, Europe +49-6192-25028 • sales@FortekGmbh.com



○ *BWE – specialist in continuous extrusion machines*

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

BWE's SheathEx™ technology is fast becoming the new alternative to seamless aluminium sheathing of high voltage cables. The SheathEx process provides a continuous (no stop marks), reliable (no weld) and cost-effective (cheap materials, low energy, etc) method of sheathing high voltage power cables.

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

A new Conklad machine has been added to the range, enabling small and delicate cores to be sheathed from one aluminium feedstock rod instead of two. The machine will reduce capital and running costs for applications such as AS wire, OPGW, sheathed composite cores, reinforced aluminium wire and solid aluminium conductor (SAC).

BWE continues to manufacture and supply a complete range of cold welders and dies for a fast and reliable solution to welding non-ferrous materials from fine wire to round rod.

BWE Ltd – UK

Website: www.bwe.co.uk



**Cable Services and Systems
Stand: E33**

With a wealth of long and successful experience, the C2S services and bows

division of the Gauder Group acts as an overall efficiency booster to restore wire and cable production line productivity and product quality, whatever the brand of the equipment.

C2S is being assigned spare parts and high technology bows (including the exclusive and patented "GreenBow2" enabling energy savings), upgrades and maintenance projects as well as transfer and restart operations of complete lines, for all brands. The team of 55+ technicians includes former Lesmo and Cortinovis engineers.

Cable Services and Systems – Belgium

Website:

www.cable-services-systems.com



**Candor Sweden AB
Stand: G17**

Candor was founded in 1946 and is specialised in wire cleaning and plating plants and as a supplier of chemicals for various applications.

The company will present the latest developments of the Copperjet, a high speed copper coating plant, chemical or electrolytic, for high quality welding wires. The plant will copper coat the wire at high speeds up to 25-30m/s with best possible cleaning and coating quality.



○ *Latest developments will be on display from Candor*

A modular design makes it possible to satisfy a wide range of quality demands and applications for CO₂, MIG, FCW and SAW welding wires, and also stainless steel welding wires with ultrasonic or electrolytic cleaning. The Copperjet is available with optional Candojet HW hot water spray pre-cleaning, high current density spray pickling, and Copperjet copper coating, with looping of the wire or straight wire pass line with Copperjet

technology. Candor will also present its technology for wire plating plants for both ferrous and non-ferrous wires.

The company offers single- and multi-wire cleaning and plating lines for ferrous and non-ferrous wires for various applications such as:

- Welding wire cleaning and copper coating
- Ultrasonic and electrolytic wire cleaning for round and shaped wires
- Candojet HW – hot water wire cleaning for round and shaped wires
- Single- and multi-wire electrolytic plating plants for wires such as tinning, coppering, nickel plating, silver plating and galvanising for all sorts of wire materials

Candor Sweden AB – Sweden

Website: www.candorsweden.com



**Condat
Stand: H46**

With 160 years of expertise, Condat's lubricant range is recognised worldwide in the wire drawing market (mechanical and electrical wire). The Vicafil and Steelskin range gathers together a wide choice of wire drawing soaps, surface treatment, neat and soluble oils and degreasing products. Nowadays, to increase productivity, wire drawing machines feature more and more drafts and elevated drawing speed. To satisfy these challenges, Condat has developed a new wire drawing lubricant: Vicafil Senja.

Launched in February 2017, Vicafil Senja gives the following key benefits:

- HSE-friendly solution: low borax level, no nitrites
- High performance: its specific formulation offers added shear and temperature resistance

Vicafil Senja offers an optimal adherent lubricant film all through the most demanding drawing lines in terms of speed and number of drafts. It has encountered great success on steelcord process, phosphated PC wire and welding wires. For example, on PC wire, coupled with Vicafil TN 1548 for the first draft, Vicafil Senja allows a higher drawing speed (on phosphate/soaped rod).

Together with Vicafil Sumac (low borax) and Santale 6 (borax-free soap), Condat can now offer a tailored solution for the most demanding applications. For aluminium wire drawing, Vicafil's TFA neat oils range is designed to offer both low residues and extended operating life.



○ More than 160 years' experience at Condat

A specific additives package increases their lubricating performance.

For the drawing of bare copper wires, Vicafil TCU offers concentrated soluble lubricants: highly lubricating and reducing wire breakage, these solubles keep the machine clean, reduce foaming and increase the emulsion stability.

Condat – France

Website: www.condat.fr

producers looking for an attractive alternative between new machines made in Europe (with higher cost) and second-hand machines. Its rigid stranders, drum twisters, taping lines, rewinding lines, pay-offs and take-ups as well as pulling caterpillars for the production of power and communication cables are designed and made in China following Gauder Group proven methods and strict quality criteria: systematic quality control all along the process, main and critical components ordered from well-known companies and support from local agents.

Daloo – China

Website: www.daloo-machines.com



**Enkotec
Stand: E27**

Enkotec staff will be ready to present news within the high-performance machinery sector for nail production. The company's nail manufacturing machinery offers nail producers advantages such as high capacity, low production costs, high uniform nail quality, easy maintenance,

high process stability, automated manufacturing, and clean and low-noise production, all ensuring a cost-effective production process and a competitive end result.

For some time, Enkotec has been working towards being able to offer complete in-line nail manufacturing systems, featuring real competitive advantages. Apart from its well-known rotary nail manufacturing machines, the company's product programme includes all kinds of accessory equipment, supplied as stand-alone units or integrated in in-line systems.

In recent years the company has developed an efficient thread rolling machine, which aroused big interest owing to its innovative features, such as a very accurate insertion principle. Furthermore, Enkotec established a strategic alliance with Bausmann, giving the company exclusive rights to sell and service the German manufacturer's wire coil collator and plastic strip collator worldwide.

Enkotec also supplies an in-house developed, high-capacity paper stick




**Daloo
Stand: E33**

Daloo is the logical extension of the Gauder Group's global offer for cable

Conform™ - Conklad™

Original Machines at Affordable Prices

Continuous Extrusion from **Copper** or **Aluminium** Rod

Applications Include:

- Copper Bus Bar, Rectangular (Magnet) Wire, Commutators & Other Shaped Conductors
- Solid Aluminium Conductor (SAC)
- Aluminium 'Seamless' Sheathing of OPGW, CATV and HV Cables and other cores
- Aluminium Round & Multivoid Tubes

Features:

- Low capital cost
- Low running costs
- Low energy requirement
- Low manpower
- Low maintenance
- High reliability

Visit BWE at wire Southeast Asia 2017 – Stand No. C25









SheathEx™

The Alternative Process for High Voltage Cable Sheathing

Main Features Include:

- Seamless aluminium sheath with no weld or bead
- Continuous extrusion (no stop marks) for very long cable lengths
- Standard CCR rod with no pre-heat requirement
- Suitable for Power Cables up to 170mm Ø
- In-line Corrugation





For more information visit: www.bwe.co.uk

Contact: :44 1233 627736 or kevinbennett@bwe.co.uk



○ High-performance machinery for nail production from Enkotec

collator, an innovative feeder bowl, a magnetic conveyor, packaging equipment and nail cleaning and washing systems. These strategic initiatives enable it to supply total in-line nail manufacturing systems from wire to finished nails in a box, giving the market the possibility of 'one-stop shopping' when it comes to nail manufacturing.

As the total supplier of its in-line manufacturing solutions, Enkotec guarantees the performance of the complete lines. By having only one supplier, Enkotec's customers benefit from its extensive worldwide after-sales programme featuring quick supplies of spare parts and technical service at all levels, including service agreements for continuous support, customised training programmes and consultancy assistance.

Enkotec A/S – Denmark
Website: www.enkotec.com



Eurobend
Stand: F03

The newest mesh welding line for the production of standard, customised, precast mesh and mesh with openings used in wall panels is equipped with Eurobend's patented wire feeding system, which ensures elimination of diameter change-over dead-times. Any type of mesh can be produced instantly without manual adjustments.

Different models are available for both the economic and high output production of precast mesh, offering maximum flexibility without changeover adjustments. Designed for the production of standard and non-standard mesh designs and sizes, these allow the welding of uneven line and cross wire lengths and different line and cross wire diameters within the same mesh, and mesh used in various precast wall panels with openings (for doors and windows).

Depending on the machine version, line and cross wires are fed fully automatically from two flexi-line rotor

straightening and cutting machines with automatic diameter changing system (patented) or from pre-cut wires/bars.

The lines are available with single or double Y-axis programmable, servomotor driven welding head configuration with four or eight welding points (PL X-Y series) or multi-head configuration with up to 81 fixed welding heads (PLC AMM series).

Cold or hot rolled wires up to 20mm from pre-cut bars or coils can be processed automatically by the machines. The productivity of the PL X-Y series ranges up to 2,200m² with single four-point moving welding head, or up to 3,800m² with double four-point moving welding head.



○ Producing mesh without manual adjustments, the Eurobend way

The PLC AMM series is equipped with fixed welding heads with either single or double cross wire feeding system. Available optional modules include:

- Mesh bending modules, which can be installed inline with the welding line for the automatic production of bent mesh used in various precast applications
- Robotic transportation systems to automatically move the produced meshes from the mesh collector to the precast moulds

Eurobend GmbH – Germany
Website: www.eurobend.com



Gauder
Stand: E33

Gauder, a Belgium-based supplier, is at the head of a large stock of second-hand machines for the wire and cable industry in Europe. The company is a partner to set up "ready to manufacture processes" for the production of wires, conductors, cables, ropes or steel products.

It has become a key player in reconditioning machines and gained – among other skills – specific know-how in lead extruder revamping. The company also markets new Mapré

extruders ranging from 38 to 150mm, available with accessories.

Gauder – Belgium
Website: www.gauderonline.com



Gauder Group
Stand: E33

Experts in rotating machines for the cable industry, Poutier and Setic, French members of the Gauder Group, offer a wide range of twisting/stranding solutions to cable makers, while Daloo, a Chinese member of the group, proposes medium-cost machinery based on the same quality standards. Services (C2S and Bow Technology) and used machines (Gauder) complete the group range.

Gauder Group – Belgium
Website: www.gaudergroup.com



Gotex
Stand: H42

In June 2016, Coats acquired Gotex, a Spain-based company which designs and manufactures high-tech industrial yarns and tapes used in the telecommunications, energy and oil and gas sectors. One year later, Gotex has gone from strength to strength and is performing ahead of management expectations.

The company has seen growth in two specific areas:

- Gotex's fibreglass products complement Coats' aramid, ripcord and binder product range. Together they have become a stronger combined player and increased market share in the fibre optics sector
- Gotex's tapes manufacturing capacity and aramid reinforcement innovation are natural synergies for composites. Combining Coats' carbon composites offering with Gotex's tape innovation provides customers with an optimal and advanced solution

Coats – UK
Website: www.coats.com

Gotex SA – Spain
Website: www.gotexweb.com



H Folke Sandelin
Stand: G33

H Folke Sandelin AB (HFSAB) from Motala, Sweden, will be a co-exhibitor with Maschinenfabrik Niehoff GmbH of

Germany. HFSAB has had a leading role worldwide for over 50 years, supplying continuous lead extrusion equipment and know-how for trouble-free lead sheathing of cables, providing a good moisture barrier. The latest design lead extruder from HFSAB is horizontal, floor standing, easy to install and maintain, fully automatic, and reliable, with its control system enabling continuous operation for weeks with little or no variation in temperature and wall thickness/concentricity.

The lead wall thickness can be kept to a minimum, with corresponding savings in lead. A range of die blocks are available to cover an extensive diameter range of 6mm-190mm (over lead), and a range of melting pots are available for 10, 18, 35 and 60 tonne capacities.

Additional equipment includes the cable repair and recovery system CRRS, which has the possibility of removing individual layers, such as the outer jacket, lead sheath or triple-layer XLPE insulation, without causing any damage to the subsequent layer below. This enables the outer jacket, lead sheath or triple-layer XLPE to be reapplied and the cable repaired.

Even if the cable is just going to be scrapped, the metal price differences for insulated or uninsulated cables are very large, and the equipment would have a short pay-back period if the metals are scrapped in their 'bright' form.

HFSAB is able to provide a full and extensive after-sales service, know-how, fully trained and experienced technician support and spare parts.

H Folke Sandelin AB – Sweden

Website: www.hfsab.com



iiM AG
Stand: F01

VisioCablePro® cable measurement, manufactured by iiM AG in Germany, presents its VCPX5 cable measuring device together with the sample preparation devices of the O-Ring Cutter family, which together allow shadow-free and reliable measurements with no user influence.

Samples of any common shape, size and amount of layers are possible with up to three camera sensors in one standard device (0-5.12" OD). Furthermore, the VCPX5-16 version, which has been in series production since the start of 2016, can now be supplied on request as an XL version with a measuring field of up to 200 x 200mm for very large cable samples.

Due to the thin, parallel and quick sample preparation with the ORCs as well as the bottom-up default set camera system of the VCPX5, measurements are always fully focussed without operator influence, and together with the database connection software VCPEasy, the offline measuring process is fully automated with an immediate pass/fail feedback, either with the homemade CAQ system ProCable or any other system, eg Advaris®.

Thus, a large time efficiency is gained compared to conventional methods, and due to the secure values, material usage during production can be minimised, which allows a quick return on investment.

Overconsumption calculations delivered by VisioCablePro® for many well-known international cable manufacturers show that a VCPX5 system along with a cutting device can reduce costs, so that the investment pays itself off below one year of usage. >>>

CONDAT



**TECHNOLOGY
THAT CARES**

CONDAT works on a daily basis to develop safer **LUBRICANTS** for both man and the environment.

**Higher
Safety**

- Low or zero Borax wire drawing soaps
- Minimum use of titanium dioxide
- Drawing oils with no short or medium chain length chlorinated paraffins



**Stand
E20**

CONDAT - 104 av. F. Mistral - 38 670 Chasse-sur-Rhône - FRANCE
Tel. +33 (0)4 78 07 38 38 - www.condat.fr - wire@condat.fr



○ *VisioCablePro from iiM*

iiM AG offers a complete range of sample preparation equipment and standard-conforming offline cable measurement devices for geometric measurements of cable cross-sections.

iiM AG – Germany

Website: www.cable-measurement.com



Medek & Schörner will be presenting the following equipment.

Cable marking machines:

- High quality gravure printers (LAN cables, control cables, etc) for speeds up to 1,200m/min
- Water misting unit for the application of fine water dust for pre-cooling of the hot wire immediately after the extruder
- Embossing metre markers/hot foil sequential metre markers for high accuracy of length measurement (power cables, telecommunication cables, optical fibre cables, etc)
- High performance ring markers for marking telephone wires, switchboard wires, automotive cables and LAN cables
- Video system for monitoring the print quality of fast-running cable printing machines, eg, allowing real-time inspection for bad quality and/or missing prints
- Laser marking system for cables

○ *High-performance cable marking machines from Medek & Schörner*



Optical fibre coating systems:

- Top speed optical fibre processing systems
- Optical fibre colour coding up to 3,000m/min
- Ring marking of optical fibres
- Tight buffering up to 1,300m/min
- Fibre ribbon production with excellent ribbon planarity, for speeds up to 1,000m/min
- Production of compact fibre units

Thanks to the modularity and flexibility of its systems, Medek & Schörner has been able to implement other applications, including some outside the field of optical fibres:

- Copper wire insulation with UV varnishes (enamelled wire)
- Manufacture of dimension-sensitive precision micro flexible flat cables (FFC) using UV resins

Medek & Schörner GmbH – Austria

Website: www.medek.at



In recent years, interest in power cables has increased in the Southeast Asia region, due to the tendency to switch from overhead cables to underground installations, following the process of modernisation that is occurring in most of the large metropolitan areas in the region.



○ *Productivity and consistency of production quality are high on the agenda for MFL Group*

Two main parameters become vital for the cable manufacturer: productivity and consistency of the production quality.

To achieve each of these manufacturing realities, the manufacturer needs to be able to react quickly to customer requests, which typically need to be delivered in short time. The fight to remain competitive will be increasingly focused on reaction time and flexibility in the manufacturing process.

For this reason, the answer to this market requirement can no longer be handled with conventional manufacturing methods, which use a traditional rigid

cage stranding line, well known to most cable manufacturers.

MFL Group, thanks to the 50 years' experience of OM Lesmo, can propose the best solution to meet this challenge: the large double twist model DTO lines, going from Ø1,600mm to 2,500mm. The perfectly balanced technology enables these machines to strand up to 500mm² copper conductors and up to 630mm² aluminium conductors.

The advantages related to this modern application are clear: +44 per cent of rotational speed (DTO2000 compared to a standard rigid cage line), and non-stop production with the use of coil pay-offs. The only time this stops is to change take-up reels.

As with all machines proposed by MFL Group, you will find all the latest technology for a modern production machine: AC motors electronically controlled with inverters, web connection to the control panel of the line, production recipes to be saved on the system, and all the features of an advanced MFL Group machine.

MFL Group – Italy

Website: www.mariofrigerio.com



High performance Micro-Weld butt welders offer efficient welding solutions for continuous processing of wire, rod and cable. The butt welders are built by Micro Products Company, a USA-based manufacturer of butt and flash welders since 1928.

Wire and cable companies in over 30 countries including India, China, Japan and South Korea now use Micro-Weld butt welding equipment. The welders are also used by manufacturers of fasteners,

○ *Efficient welding solutions from Micro-Weld*





automotive wire harnesses, automotive radials, and many other wire products. Micro-Weld has an international representative network, and offers sales, service and marketing support to reps and the markets they serve worldwide.

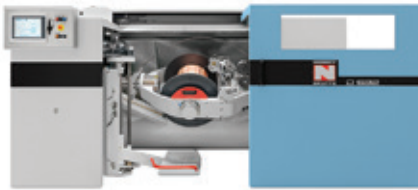
Micro Products Company – USA
Website: www.micro-weld.com



Maschinenfabrik Niehoff
Stand: G33

Maschinenfabrik Niehoff and its subsidiary Niehoff Singapore Pte Ltd will show a D 632 type double twist bunching machine built in left-to-right version. This machine is designed to produce strands with 0.09 to 6mm² cross section and a steplessly variable lay length of 6 to 100mm.

The maximum number of twists is 6,500 per minute, and the maximum speed is 300m/min. The machine is suited for the manufacture of strands of copper alloy wires (eg CuMg alloys) for automotive wires.



○ A D 632 type double twist bunching machine from Niehoff

The D 632 is equipped with an energy class IE3 energy-saving rotor drive and an adjustable fan drive in the soundproof cabin.

A further special feature is the patented opto-electronic NBAT system (Niehoff Bunching Automatic Traverse), which allows spools to be perfectly spooled. Spooled wire can then be paid off tangle-free at extremely high speeds with no damage.

Other features include the energy-saving single bow (Eco-Bow) design, the contactless transmission of machine data within the machine and the NMI (Niehoff Machine Interface) touchscreen display with colour user interface and simplified navigation structure.

Cold rolling mill manufacturer Bühler Redex and lead extruder and cable repair and recovery system manufacturer HFSAB will also be present on the stand.

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



Pourtier
Stand: E33

Pourtier, with its heavy-duty stranders, cablers and armouring lines for ferrous and non-ferrous cables, has made impressive achievement in the field of submarine and umbilical cables, offering a complete range of stranding/paper lapping/cabling and armouring machines.

Its high-efficiency multi-wire concentric stranding line is also used for low and medium power cable production. All the machines are made in Europe with high standards in design and manufacturing for the production of all types of high and extra-high voltage power cable from overhead cable (including ACCCTM, >>>

Precision Measurement & Control Solutions

The Beta LaserMike brand has been faithfully serving the wire and cable industry for over 50 years and we have thousands of satisfied customers that rely on our measurement systems every day to improve quality, increase productivity and deliver manufacturing savings. We are committed to your success.

In-Process Gauging • Off-Line Inspection • Quality Cable Testing

Get more from Beta LaserMike.

See us at Wire Southeast Asia, Booth H35

Over 50 Years Proven Performance

BETA LaserMike
An NDC Technologies Brand

www.betalasermike.com

Making Light Work



ACSS-TW and ACSR-TW) to insulated cable AC type (using high quality Milliken conductor) or DC type (using large, round, compacted conductor or trapezoidal wires).

Pourtier – France

Website: www.pourtier-setic.com



**Proton Products
Stand: D27**

Proton Products will debut its latest product innovations, which include:

- The IntelliSENS SL/SLR mini series speed and length sensors. These are small, fully featured, non-contact laser Doppler speed and length sensors with a footprint comparable to a smartphone. The IntelliSENS mini-series sensors are designed to replace inaccurate mechanical speed and length measurement devices with a sensor whose accuracy is better than $\pm 0.05\%$
- The IntelliSENS DG-k series diameter gauge is the smallest form-factor gauge in the DG-k series and is suitable for insulation and small jacketing processes. The DG-k gauge is an advanced, solid-state LED and CCD instrument with no moving parts and a measurement rate of 10,000 times per axis per second for high-speed applications
- The new IntelliTHERM HTG400 hand-held wire temperature gauge was recently introduced to the market in the USA. This instrument is suitable for use on all bare wire types and comprises a special bimetallic wheel construction with integrated electronics for precise, responsive measurement performance. It provides high-precision wire temperature measurement of better than $\pm 0.5^\circ\text{C}$ up to 400°C (752°F)

Other new enhanced Proton products currently available include the IntelliSENS ST-HF series spark tester for high-frequency testing. This spark tester permits increases in line speed and productivity with complete coverage detection of the wire surface.

All Proton Products instruments are supplied with intelligent, easy-to-integrate capabilities as standard that feature a broad range of embedded process interfaces. These include Ethernet, RS-232 and Wi-Fi communications with optional Profibus, Profinet, DeviceNet, and Industrial Protocol IP that can be substituted for the Ethernet communications interface.

Proton Products – USA

Website: www.protonproducts.com



**PWM
Stand: C22**

PWM will present its full range of British-made manual cold welding machines.

The range includes the heavy-duty M101 machine, the smaller BM30 and BM10 models and three hand-held machines, all precision engineered in PWM's own workshops to produce strong, consistent welds.

The best-selling M101 cold welder is designed for welding non-ferrous wire, strip and profile, and can also be used to weld strip for armouring lines. Robust, reliable and low-maintenance, the M101 can be used on a workbench or supplied with a trolley.



○ *The M101 from PWM*

The versatile machine will weld copper wire 1 to 3.6mm (0.04" to 0.141") and aluminium 1 to 5mm (0.04" to 0.197").

Also on show will be PWM's BM30 and BM10 bench/trolley-mounted cold welders and the M10, M25 and M30 machines for joining wire, strip and profile from 0.1 to 1.8mm (0.0039" to 0.071").

PWM's comprehensive range includes manual and powered cold pressure welding machines for wire 0.1 to 30mm (0.0039" to 1.181").

Video demonstrations of all PWM's cold welders can be seen at www.pwmltd.co.uk

PWM Ltd – UK

Website: www.pwmltd.co.uk



**Queins Machines
and Stolberger
KFM Maschinenfabrik
Stand: F20**

Queins and Stolberger, Germany-based companies, have been in operation for more than 40 years as manufacturers of high quality machinery. The companies will be displaying a number of large photographs of machines delivered to the rope and cable industry.



○ *Queins and Stolberger – in operation for more than 40 years*

Main products are all kinds of high-speed stranding machines, payoffs/take-ups, tapping heads, disc- and belt-type caterpillars, and extrusion/sheathing lines, as well as machines for manufacturing CTC strands (continuously transposed conductors), umbilicals and steel wire ropes.

The second-hand department offers a full choice of machines and equipment.

Queins Machines – Germany

Website: www.queins.com

Stolberger KFM Maschinenfabrik – Germany

Website: www.stolberger.com



**Roblon
Stand: G46**

Roblon will introduce its latest developments of both industrial fibres and machinery used for fibre optic cable production.

Roblon is a key supplier of high performance fibre solutions for optical

fibre cables (OFC) and at the same time a key manufacturer of cable machinery for OFC. Offering a wide range of E-glass, flexible strength members, binder yarn, ripcords and water-swellable yarns, Roblon can supply most of the products used in OFC designs. However, by using its special technologies and know-how, it is also able to supply materials for many different custom-made cable designs.

Roblon has introduced water-swellable yarns which are not only suitable as swell yarns, but will also excel as a binder yarn. Also, Roblon Binder Yarn ULS is made of high-grade polyester and is used for high-speed binding of SZ-stranded optical fibres and tapes, and is suitable for micro- and mini cables with weight-optimised wall thickness of tubes.

Roblon yarn servers and concentric binders are installed globally. Recently, it introduced a new low-tension concentric binder suitable for micro- and mini cables.

Roblon A/S – Denmark

Website: www.roblon.com



**RosendahlNextrom
Stand: E01**

RosendahlNextrom will boost ROI with efficient cable manufacturing solutions. Its goal is to maximise the productivity of the extrusion process by decreasing effort and expense at the same time.

The company will stage mini seminars and introduce its solutions for large cable jacketing and for high speed insulation for solar cables by co-extrusion technology. For fibre optic cable production, the high-performance SZ stranding line has been equipped with the new high-speed, low-tension binder ROBI.

This is the company's solution with active tension control for sensitive materials. From its optical fibre technology it also has new and efficient solutions for both telecom and speciality fibre preform and fibre production.

Over the past year it has also placed a particular focus on the manufacturing of silicone insulation. The rubber material properties have inspired its development teams to reach even more ambitious goals.

On top of that is it working intensively on solutions for Industry 4.0. It will show its innovations on the line control system RIO, and illustrate which options this can give for predictive maintenance and smart factory production.

The company will exhibit an RX110 crosshead designed for jacketing power cables with a diameter up to 110mm. It stands out with high centricity and perfect material flow.

RosendahlNextrom – Austria

Website: www.rosendahlnextrom.com



**Setic
Stand: E33**

Setic provides high-speed double twist bunchers/stranders for the automotive industry as well as complete solutions to produce high quality LAN, special and control cables with enhanced performance (in one or two steps, according to product mix). >>>



QUEINS Machines
Stolberger

STOLBERGER & QUEINS – Your specialists for:

Cable & Rope making machines newly manufactured or pre-owned & reconditioned.

Generations of experience in manufacturing machines for

- > power cables
- > communication cables
- > continuously transposed conductors (CTC)
- > umbilicals
- > special cables
- > steel ropes

pre-owned & reconditioned

Please take a look at our currently available used equipment at www.queins.com



Planetary cabler for 50-tons pay-off reels



QUEINS Machines GmbH
Monschau · Germany
+49 2472 8080
info@queins.com · www.queins.com



STOLBERGER KMB-Maschinenfabrik GmbH
Monschau · Germany
+49 2472 80816
info@stolberger.com · www.stolberger.com



○ High-speed double twist bunchers and stranders from Setic

The company is continuously developing new lines and new concepts for non-ferrous cables in order to meet customers' needs, such as tandem "mica taping/bunching", special high-speed lines for battery cable, and new high-speed lines for special and instrumentation cables.

All these machines are made in France with high standards in design and manufacturing.

Setic – France

Website: www.pourtier-setic.com



**Sikora
Stand: F13**

Sikora is presenting a full programme of non-contact measuring, control, inspection, analysis and sorting devices for quality assurance and cost reduction in the wire, cable, optical fibre and plastic industries.

○ The X-Ray 6000 measures the diameter, wall thickness and eccentricity of cables



The product range includes laser and X-ray devices for the measurement of diameter, eccentricity, ovality and wall thickness. In addition, lump detectors for the detection of non-conformities on the product surface as well as high-voltage spark-testers, which detect faults within the insulation, will be shown.

The company will showcase the Preheater 6000 TC, a temperature-controlled conductor preheating device that assures an optimum adhesion of the insulation material on the conductor.

In this context the Wire-Temp 6000 will be introduced: a non-contact conductor temperature measurement system that is also available for diameters up to 50mm and thus suitable for installation in CV lines.

With the Purity Scanner, Sikora offers a system for on-line inspection and sorting of plastic pellets that are used for the insulation material of cables.

The system contributes to process optimisation, quality assurance and cost savings during plastic processing as well as cable manufacturing.

For off-line inspection and analysis of plastic pellets, flakes and tapes, the Purity Concept systems are available.

Sikora AG – Germany

Website: www.sikora.net

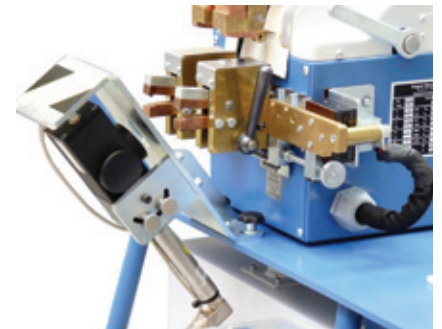


**August Strecker
Stand: H27**

August Strecker is acknowledged worldwide when it comes to manufacturing butt welding machines for the varied needs of the wire and cable industry. The company was founded more than 80 years ago and has a reputation for its machinery and service, given by more than 65 skilled employees working on company-owned premises in the city of Limburg, about 70km from Frankfurt/Main, Germany.

Strecker welders are well represented in many renowned national and international wire and cable factories. The majority of the company's production is exported to more than 110 countries all over the world.

There are more than 45 representative offices globally assisting customers from the very first contact, eg to choose the right product and adapt it to individual needs, until final delivery, sometimes including commissioning of these special machines.



○ Welding technology from Strecker

Participating in European as well as overseas exhibitions also helps to further promote the trademark of Strecker butt welders.

The range includes:

- Butt welding machines for all kinds of wires, starting at 0.04mm diameter up to about 60mm diameter for solid steel and about 56mm diameter for solid non-ferrous wires, including welders with automatic deburring cycle
- For steel there are various annealing devices available, suiting the needs of the most varied steel grades
- Butt welders for stranded conductors starting at 0.08mm² up to about 2,500mm². Welding by means of tubes or without any tubes (with automatic deburring)
- Cold pressure butt welders with automatic deburring cycle

Wide specialised range for the most varied applications, for example:

- * Butt welding machines for steel cord
- * Battery-operated parting guns for steel cord or steel strands
- * Electric wire butt welding guns
- * High-output butt welding machines for production of wire-made mass articles
- * Special-purpose welding machines, tailored to individual customer needs

August Strecker GmbH & Co KG – Germany

Website: www.strecker-limburg.de



**Traxit International
Stand: G25**

Traxit International is known worldwide as a manufacturer of dry lubricants, coating agents and emulsions for the wire drawing industry.

The company offers customised product solutions with over 135 years of experience. It has two new additions to the emulsion range: EHD 550 and EHD 8000.



When talking about welding wire, a clean and flawless wire surface is required. The new emulsion EHD 550 has been developed especially for the wet drawing of welding wire, to obtain the clean and flawless wire surface needed.

EHD 550 is suitable for multi-pass and skin pass drawing as well. Natural modified ingredients are the basis of EHD 550 to ensure a stable lubrication film under high pressure at lower concentrations.

Advantages of EHD 550 are the high acid stability and anti-separation of the emulsion due to resistance against any drag-in from the pre-drawing. EHD 550 can be applied to single machines or to several machines from a central tank. A working temperature up to 60°C is possible.

EHD 8000 is an all-rounder in the world of emulsions and suitable for the wet multi-pass drawing of galvanised and phosphated wire. Drawing low to high carbon content is possible.

The specific relation of saponified ingredients to emulsified vegetable oils is the key to creating this next-generation emulsion, which offers high lubrication and high cleaning effect.

Another advantage is the micro stability, which results in a long lifetime with constant drawing performance.

EHD 8000 can be applied to single machines or to several machines from a central tank. A working temperature up to 60°C is possible.

All Traxit International emulsions are free of halogens and silicones.

Traxit International GmbH – Germany
Website: www.traxit.com



Troester is a worldwide supplier of machines and complete lines for the cable manufacturing and rubber processing industry, comprising CV lines for XLPE and rubber cables, silane lines, and sheathing and insulation lines.

On display will be solutions for:

- High voltage CCV and VCV line concepts for XLPE power cables up to 500kV
- Medium voltage CCV lines (35kV)
- Sheathing lines for medium- and high-voltage cables



○ Troester – a worldwide supplier of machines and complete lines

X-Compound, the new company of the Troester Group, will join the stand and present its kneader technology for the continuous compounding of HFFR, PVC, XLPE, semiconductive materials and EPR/EPDM.

Troester GmbH & Co KG – Germany
Website: www.troester.de



Woywod Kunststoffmaschinen's Plasticolor range of products includes dosing units, colour change systems, volumetric and gravimetric mixing stations, gravimetric throughput measurement systems and hopper loaders for the materials, as well as drying equipment.



○ Plasticolor dosing units and mixing stations from Woywod

A sales engineer from the company's head office will be available throughout the exhibition.

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

- Electrolytic plating
- Candojet hot water cleaning
- Electrolytic & Ultrasonic degreasing
- Welding wire cleaning and copper coating
- Pickling & phosphating



Wire plating plant



Hot water cleaning

CANDOR Sweden AB
Tel: +46 11 21 75 00 Fax: +46 11 12 63 12
Email: info@candorsweden.com

Manufacturers of both
'HUSH' & 'LOCK ON'
PULLING IN DOGS

T: +44 (0)1527 570977 F: 882423
E: sales@locton.co.uk
www.locton.co.uk

Live 5G demo

Huawei, with Japan's NTT Docomo, have carried out a live 5G demo using 39GHz mmWave technology based on 3GPP standard 5G New Radio (NR) current agreements.

During the trial, which took place at the 3rd Global 5G Tokyo Bay summit, the companies reported that the cell coverage reached up to 2km with Gbps peak throughput for a single user in the mmWave, demonstrating a real-time three-way 4K video conference.

Takehiro Nakamura, general manager of Docomo's 5G Laboratory, said: "The successful field tests and showcase of the real-time three-way 4K video conference conducted at 39GHz high frequency band technology is an important achievement of the 5G joint innovation and field trial between the pair, and this breakthrough will have a significant impact moving 5G a step closer to commercialisation."

The test system used a base station working in the 39GHz band with 1.4GHz bandwidth, and two UEs (user equipment) and achieved 1.3Gbps (MAC layer) peak throughput for a single user in the high band at a distance of 1.5km.

The test employed key 5G technologies, such as the MMFA (meta-material focal array) and polar code.

Nokia expanding in China

Nokia plans to establish a dedicated unit to help major Chinese Internet companies expand overseas.

The new unit will focus on data centres, cloud computing, IP routing, transport and services, as well as emerging technologies such as AI, machine learning and edge cloud.

Nokia's move is among efforts to expand the business beyond its core telecoms operator market, and to increase its Chinese presence following the launch of the Nokia Shanghai Bell joint venture in China (formerly Alcatel-Lucent Shanghai Bell).

In the meantime, Nokia has completed its acquisition of the telecoms software company Comptel, first announced in February, at a cost of around \$396.8 million.

Filipino fibre rollout

Globe Telecom of the Philippines has struck a deal with the city governments of Cebu and Mandaue to deploy fibre facilities in the two cities. Work is already underway in Mandaue, with plans to eventually roll out 18 'Globe-at-Home' fibre sites in Cebu.

Earlier this year, the telco unveiled its plans to commission around 400,000 broadband lines, countrywide, by the end of 2017 while it continues to strengthen its mobile network in the province.

In the meantime, Globe's competition in the Philippines, PLDT Inc (formerly Philippine Long Distance Telephone Company), has extended the reach of its FTTH network to parts of east Metro Manila, deploying more than 70,000 new lines in Antipolo, Caloocan, Cainta, Marikina, Pasig, Pateros, Taguig and Taytay. The provider's 'Home Fibr' services in east Metro Manila will include access to TV and film streaming platform Roku.

In June *TeleGeography* revealed that PLDT had extended its FTTH footprint in southern Metro Manila, enabling homes and the area's commercial district to access super-high speed Internet access. PLDT's fibre optic rollout programme aims to pass a total of 4.4 million homes by the end of 2017, up from three million homes passed at the end of March.

2G comes to an end

Following a previously announced timetable, Taiwan's mobile operators will no longer offer 2G services.

The *China Post* reported that all GSM-based cellular services have been discontinued, affecting around 60,000 subscribers belonging to Chunghwa Telecom, 20,000 with Taiwan Mobile, and around 8,000 contracted to FarEasTone.

After the 2G network shutdowns, subscribers are left unable to send or receive text messages, use any data service, or to make any outbound calls other than to emergency numbers. Customers have until the end of December to purchase 4G- or 5G-capable handsets and retain their existing number, as all remaining 2G numbers will be deleted after the end of the year.

China could be world's largest 5G market by 2025

GSMA Intelligence and the China Academy of Information and Communications Technology (CAICT) have issued a joint report on the prospective 5G market.

The report reveals that Chinese operators expect to launch commercial 5G networks by 2020, after a phased testing period between 2017 and 2019. Following commercial deployment China is likely to be the world's largest 5G market, with connections expected to reach 428 million by 2025. Global connections are expected to reach 1.1 billion at that point, with China accounting for 39 per cent of all connections.

Chinese operators are expected to deploy standalone 5G networks, requiring the construction of new base stations, backhaul links, and a core network, while other Asian markets are considering non-stand alone 5G that will run mainly on the existing infrastructure. In these regions, 4G and 5G services will run in parallel.

The report also shows that 4G penetration in China has increased fivefold to 61 per cent over the two-year period to March 2017, with still significant headroom for 4G growth. As a result, 4G and 5G networks are expected to co-exist in China for a considerable period of time. Despite the "largest market" forecast, the rate of 5G network rollout and adoption in China is expected to be slower than it was for 4G, which Chinese operators were

able to deploy rapidly within a mature 4G ecosystem. 5G investment is likely to follow a more gradual path, over a longer timeframe, with capital expenditure not expected to account for more than 25 per cent of operator revenue prior to commercial launch.

In the early phase, 5G networks will concentrate on boosting the capacity of 4G networks to support increasing cellular data traffic demands. 5G will also enable enhanced mobile broadband (eMBB) services such as 4K/8K Ultra-HD video, augmented reality and virtual reality applications.

Although some services will require devices with new form factors, the smartphone is expected to remain the principal 5G interface at launch. The first 5G smartphones are likely to be priced at a premium to 4G models, as they will require an enhanced chipset and RF module supporting multiple sub-6GHz, and possibly extremely high frequency bands (mmWave), as well as, potentially, a 4K or 8K screen.

Operators are collaborating with the broader mobile ecosystem and vertical industry players to develop new services and business models that fully exploit 5G networks. 5G will support applications that require massive scale, or that are mission-critical and demand low latency. Key vertical markets for 5G applications are expected to include energy and utilities monitoring, security, transport, finance, healthcare and industry.

Pre-paid segment faces disruption

India's mobile providers are facing a potential loss of revenue following disruption surrounding the implementation of a new Goods and Services tax system. The *Economic Times* reported that many distributors and retailers were unable to register under the new scheme by 1st July, preventing the outlets from selling top-ups. Pre-paid customers make up around 90 per cent of India's wireless subscribers and provide over 80 per cent of the industry's revenue.

A large number of pre-paid customers recharge their accounts with small sums on a daily basis and the disruption could potentially leave many without service.

The *Economic Times* added that even where distributors were able to complete registration, customers faced additional uncertainty over tariffs while retailers awaited updated information from cellcos detailing how much credit customers would receive for their top-ups.

Commenting on the disruption, Rajan Matthews, director general of the industry group Cellular Operators Association of India (COAI), said: "All policy changes of this size are bound to face teething problems. As long as the government and industry work together for the greater good, we are certain that all issues will get resolved."

In a related development, India has added ten per cent basic customs duty (BCD) on mobile phone imports to maintain support for the domestic manufacturing industry. Under the previous tax structure imported smartphones cost an additional 11.5 per cent over Indian-made handsets, but the new tax system eliminated any difference between locally made and imported devices. The new BCD ensures the continuation of the incentive for domestic manufacturers.

Subscriber slowdown as excitement fades

Light Reading reports that Reliance Jio, launched last September, has witnessed a sharp fall in subscriber additions and a drop in the number of active subscribers to its service.

Controlled by Indian billionaire Mukesh Ambani, RJio attracted 100 million customers within five months of entering the market, chiefly by offering Indian consumers free voice services for life and free data services for three months. Subscriber numbers dropped to 72 million, however, when charging was introduced.

Subscriber growth has fallen for several consecutive months, but more worrying than the decline is the drop in active subscribers. According to a recent report from Goldman Sachs and ICICI Securities, RJio added just 400,000 active subscribers in April, compared to gains of 16 million in September and October 2016.

A key reason for the drop is that many bought RJio SIM cards purely to

take advantage of the free offers and stopped using the service when they had to pay for the privilege. Although tariffs continue to be minimal, RJio's initial allure appears to be diminishing.

Market researcher Velocity MR believes that only 18 per cent of RJio's subscribers use their connections as a standalone SIM, as evidenced by mobile number portability (MNP) data released by Telecom Regulatory Authority of India.

The number of subscribers asking to port their phone numbers remained stable after Jio's launch: nearly six million subscribers submitted MNP requests in March 2017 and 4.96 million in April 2017, compared with 4.91 million MNP requests in July 2016 and 5.1 million in August.

RJio continues to attract more customers than any of its rivals, but the steady fall in numbers must offer encouragement to longer-established providers such as Bharti Airtel Ltd and Vodafone India.

Chip production begins in Seoul

Samsung Electronics has begun production and shipping at its new semiconductor fabrication facility in Pyeongtaek, south of Seoul, South Korea, said to house the largest single fabrication line in the industry. Production focus will be on the company's latest three-dimensional V-NAND flash chips, and will help to meet semiconductor demand in the fields of Internet of Things, artificial intelligence, big data and automotive technologies.

By 2021 the company plans to have invested 30 trillion Korean won in the Pyeongtaek facility with a view to further expanding the semiconductor fabrication capacity. Samsung is also committing six trillion Korean won to its Hwaseong plant to install new infrastructure, including extreme ultra violet (EUV) equipment, and is reviewing plans to establish a new OLED (organic light-emitting diode) manufacturing site in Asan, South Korea, by 2018, with a second semiconductor fabrication line in Xi'an, China.

Gill Watson
Features Editor

现场5G演示

华为携手日本NTT Docomo公司，运用基于3GPP标准5G新无线(NR)当前协议的39GHz毫米波技术进行了现场5G演示。

在第三届东京湾全球5G峰会演示期间，两家公司报告信号覆盖率高达两公里，并且单一用户毫米波达到Gbps峰值吞吐量，展示了三方实时4K视频会议。

Docomo 5G推进室室长中村武宏表示：“本次基于39GHz高频技术的三方实时4K高清视频会议现场测试和展示的成功，是华为与Docomo在5G联合创新与现场测试上的重要成就，并且这一突破将对5G的商业化起到重要的推进作用。”

测试环境由一个工作在毫米波段39GHz、带宽1.4GHz的基站，以及两台UE(用户设备)共同组成，实测单一用户在1.5公里处的高波段峰值吞吐量达到1.3Gbps(媒介存取控制层)。

测试采用了MMFA(超材料聚焦阵列架构)和极化码等关键5G技术。

诺基亚扩张中国业务

诺基亚计划成立一个专门的机构，帮助中国的大型互联网公司拓展海外业务。

这个新机构的重点是数据中心、云计算、IP路由、传输和服务，以及AI、机器学习 and 边缘云等新兴技术。

诺基亚此举是踏出核心电信运营市场的措施之一，接续诺基亚上海贝尔合资公司(原上海贝尔)落户中国，旨在继续提高其在中国的影响力。

与此同时，诺基亚还完成了对电信软件公司Comptel的收购。该消息于二月首次公布，耗资达3.968亿美元。

菲律宾光纤铺设

菲律宾Globe Telecom已与宿务及曼达韦市政府达成协议，将在这两个城市部署光纤设施。工程已在曼达韦起步，最终计划将在宿务市建立18个“Globe-at-Home”光线站点。今年早些时候，Globe Telecom推出其计划，即到2017年底，在全国铺设约400,000条宽带线路，同时继续加强省内移动网络的建设。

与此同时，Globe Telecom在菲律宾的竞争对手PLDT公司(原菲律宾长途电话公司)已将其FTTH网络扩展至东马尼拉部分地区，并在安蒂波洛、卡洛坎、卡因塔、马里基纳、帕西格、帕特罗斯、达义和泰泰等地部署超过70,000条新线路。这家电信公司在东马尼拉提供的“Home Fibre”服务将能够接入其新的电视和电影流媒体平台“Roku”。

今年六月，TeleGeography透露PLDT已将其FTTH网络扩展至南马尼拉，使住宅区和商业区都能够接入超高速互联网。PLDT的光纤部署计划目标是到

2017年底，将3月底经过300万家的铺设量增加到440万家。

2G即将终结

按照此前公布的时间表，台湾的移动运营商将不再提供2G服务。据《中国邮报》报道，所有基于GSM的蜂窝网络服务均已终止，影响约60,000名中华电信、20,000名台湾移动以及大约8,000名台湾远传的签约用户。

2G网络关闭之后，用户将无法发送或接收短信、使用任何数据服务，或拨出紧急号码以外的任何电话。用户必须在十二月底之前购买4G或5G功能手机，才能保留其现有号码，因为所有剩余的2G号码都将在年底后被删除。

中国可能在2025年成为全球最大的5G市场

GSMA Intelligence和中国信息通信研究院(CAICT)发布了一份针对未来5G市场的联合报道。

报告显示，中国运营商预计将在2017年至2019年期间进行分阶段测试，然后在2020年之前推出商用5G网络。按照商业部署，中国到2025年可能成为全球最大的5G市场，用户预计将达到4.28亿。届时的全球用户总数预计将达到11亿，中国占据其中的39%。

中国运营商预计将部署独立的5G网络，需要建设新的基站、回程链路和核心网络，而其他亚洲市场则倾向于非独立的5G，主要在现有基础设施上运行。在这些地区，4G和5G服务将同时运行。

报告还显示，截至2017年3月，中国4G的普及率已在两年时间内增加了五倍，达到61%，同时仍有大幅增长的空间。

因此，4G和5G网络预计将在中国共存相当长的一段时间。尽管获得“最大市场”的预测，但中国5G网络的部署和采用速度预计将慢于4G网络，中国运营商无法像后者一样在成熟的4G生态系统中进行快速部署。5G投资可能会在一段较长的时间内逐步增长，在商业铺开之前，资本支出预计不会占到运营商收入的25%以上。

5G网络的早期阶段将侧重于提高4G网络的容量，以支持日益增长的蜂窝数据需求。5G还将加强移动宽带(eMBB)服务，例如4K/8K超高清视频、增强现实以及虚拟现实技术的应用。虽然一些服务将需要新规格的设备，但智能手机有望继续成为新网络启动时的主要5G接口。第一批5G手机的售价可能高于4G机型，因为其需要更高级的芯片和射频模块来支持多个sub-6GHz、可能非常高的频段(毫米波)，以及可能出现的4K或8K屏幕。

运营商正在与更广泛的移动生态系统和垂直行业参与者合作，开发可以充分利用5G网络的新服务和业务模式。5G将支持需要大规模、或任务关键型以及低延迟需求的应用。5G应用的主要垂直市场预计将包括能源和公用事业监测、保安、运输、金融、医疗和工业。

预付费模式面临混乱

随着新商品服务税制度的实施，印度的移动供应商正面临着潜在的收入损失。据《经济时报》报道，许多分销商和零售商无法在7月1日前依据新法进行注册，因此无法销售充值商品。预付费客户占印度无线用户的90%左右，提供该行业80%以上的收入。大量预付费客户都采取每日小额充值账户的模式，因此这次混乱可能会导致许多人无法使用服务。

《经济时报》补充道，即使经销商能够完成注册，依然需要等待通信运营商下达详细的新通知，说明客户在充值之后可以获得多少积分，因此客户仍将面临费用上的不确定性。谈及这次混乱，印度移动运营商协会(COAI)总干事Rajan Matthews表示：“这种规模的政策变化势必会面临困难。只要政府和业界为全社会共同努力，我们就肯定能够解决所有问题。”

作为相关措施，印度对手机进口增加了10%的基本关税(BCD)，以继续支持国内制造业。依据以前的税收结构，进口智能手机的成本比印度制造的手机高出11.5%，但新的税收制度消除了国产设备和进口设备之间的差异。新的基本关税确保国内制造商能够获得持续的激励措施。

Gill Watson
专栏编辑

SEE US AT...

IWCS



**THE
International
Cable • Connectivity
Symposium**

**Orlando, Florida, USA
8th - 11th October 2017**

www.iwcs.org

**...AND PICK UP
YOUR FREE
MAGAZINES
AND CDS**



**euro
wire**
The International Magazine for the Wire & Cable Industries

July 2017 • US\$33*
www.read-eurowire.com

SIKORA
Technology to Perfection

**Quality in its
sparkling
form.**

With passion, we develop ultra-oriented
stranding and control devices for quality
cables and wires, such as the SIKORA
A high-frequency, high-voltage spark
DC and AC voltage that is typically
after the coating section or in reweaving.
An essential component to reliably
holes and bars patches in the insulation
ing that only flawless cables are delivered.

- Processor controlled temperature
precision
- Integrated 3-step self-act and control
system with interchangeable modules
- Fulfills all important tool and safety

Visit us at WireChina, Shanghai
Aug 30 - Sept 1, 2017

Wires • Cables • Fibre Optics • Springs • Fasteners • Precision Parts

Wire & Cable
ASIA 线缆

July 2017
US\$33*
www.read-wca.com

WireShow 2017
Date: 08.30-09.01
Booth: WSD03

Tube & Wire Southeast Asia 2017
Date: 09.19-09.21
Booth: B02

High speed building wire extrusion line

DJ-630-2500 II type single twister

SI-12500 type-I double twist bunching machine

**WSTZ-330 vertical double layer
taping machine**

EXT High efficiency extrusion line

HANDING
CABLE MACHINERY

Jiangsu Handing Machinery Co., Ltd.
E-mail: export@hdxljx.com www.hdxljx.com
Mobile: +86 13815079818



LEADING MAGAZINES

for the wire and
cable industries



www.read-eurowire.com



www.read-wca.com

Automotive

Automotive electrics, in all its forms, can't stay out of the news

Globetouch Inc has acquired the IoT solutions provider Teramatrix Technologies Ltd. The aim is to integrate the Teramatrix xFusion platform to create high value IoT applications that support connected cars, autonomous driving, predictive maintenance and edge intelligence.

Teramatrix's xFusion is a software platform that enables cross-industry enterprise applications to enhance operational intelligence. The system collects, aggregates and analyses contextual data from devices, sensors, enterprise apps, workforce and customers.

"The addition of Teramatrix significantly improves our IoT and connected car strategies," said Riccardo Di Blasio, CEO of Globetouch. "We will be using our Cloud SIM and xFusion IoT technologies to enable the future of autonomous cars."

End in sight for the internal combustion engine?

The Chinese owners of Sweden-based Volvo have announced that all new Volvo models launched after 2019 will be either electric or hybrids. The move sets Zhejiang Geely Holding Group apart as the first traditional motor manufacturer to confirm a date for phasing out vehicles powered solely by an internal combustion engine. While electric and hybrid vehicles are still only a small fraction of new cars sales, they are gaining ground at the premium end of the market where Volvo operates. As technology improves and prices fall, many in the automotive industry expect mass-market adoption to follow. "This announcement marks the end of the solely combustion engine-powered car," predicted Volvo Cars CEO Hakan Samuelsson.

Volvo has invested heavily in new models and plants since being bought by Geely in 2010, establishing a niche in a premium auto market dominated by larger rivals such as Daimler's Mercedes-Benz and BMW. Part of Geely's strategy has been to embrace emerging technologies that allow higher performance electric vehicles as well as, eventually, self-driving cars.

And the self-driving car may soon be coming to a highway near you. The *Tech Blog* reports that General Motors is rolling out cars to test on the roads in San Francisco, Arizona and Detroit, looking to debut "in the near future" what could be the first self-driving car to come to market. Impressive that such a first could be coming from a traditional auto manufacturer, rather than a new, dedicated high-tech developer. GM has a fleet of around 180 Bolt EVs, using software from San Francisco's Cruise Automation to keep its self-driving technology on track.

VentureBeat observed: "The car has multiple cameras, and 40 sensors are installed across the vehicle. A radar

system detects oncoming traffic. LIDAR (light detection and ranging) sensors on top of the car use lasers to make a three-dimensional map of the area when driving.

"With the 10.2-inch screen, you have the ability to watch your car drive from a bird's eye view – seeing your car plus the area behind and around you – but only if you're travelling at low speeds."

All that technology has to go somewhere. *Reuters* recently reported the findings of USA auto supplier Visteon Corp, when they looked behind the sleek instrument panels on new cars. As automotive cockpits become crammed with ever more digital features such as navigation and entertainment systems, the electronics holding it all together have become, quote: "A rat's nest of components made by different parts makers."

Visteon is among a number of suppliers aiming to make dashboard wiring simpler, cheaper and lighter as the industry moves towards the all-digital dashboard of self-driving cars. Among Visteon's solutions is its SmartCore computer module, a cockpit domain controller that operates a vehicle's instrument cluster, infotainment system and other features, all on the same tiny piece of silicon. Research firm IHS Markit estimates that the \$37 billion cockpit electronics market could nearly double to \$62 billion by 2022, while accounting firm PwC estimates that electronics could account for up to 20 per cent of a car's value in the next two years (compared to 13 per cent in 2015).

Meanwhile, the number of suppliers for those components is likely to dwindle as automakers look to work with fewer companies capable of doing more, according to Mark Boyadjis, principal automotive analyst at IHS Markit. "The complexity of engineering ten different systems from ten different suppliers is no longer something an automaker wants to do," Mr Boyadjis said. He estimates manufacturers eventually will work with two to three cockpit suppliers for each model, down from the six to ten suppliers typically employed at present.

"You have to be changing and adapting fast. If not, you're not going to keep up in this market," said Tim Yerdon, Visteon's head of global marketing. "It's about reinventing yourself to stay ahead. Five years ago, the dashboard was a plastic moulded cockpit that we stuffed electronics into," he continued. "Now it's more about an electronic architecture that's experience-driven, and we mould plastic around it."

Internet of Things

Security

IT security firm Trend Micro has launched a corporate venture fund with initial investments of \$100 million on offer to technology startups, especially those involved with the Internet of Things (IoT). Trend Micro seeks to ensure safe digital exchange of information, and with an estimated 26 billion devices connected to the Internet by 2020,

the company understands that the ecosystem is yet to evolve to ensure safe transactions. Eva Chen, founder and CEO, Trend Micro, said: “We have a 29-year history of successfully anticipating technology trends to secure all types of environments. The first mega wave we caught was the growth of the PC marketplace; we committed early on to endpoint protection. The second mega wave was all about the Cloud; we made a bet early on to securing the Cloud and so far we have secured over two billion workload hours on Amazon Web Services (AWS) alone.

“Now we believe the next wave has arrived with IoT; our fund will help us harness this opportunity.”

Who starts with what?

Countries are currently agonising over which IoT technology should be utilised first: CAT-M1 offers a quicker time-to-market, but CAT-NB1 is said to be simpler, and more cost efficient. *IoT Tech News* reviewed the decisions so far. Within the US, Verizon and AT&T are offering services on their individual CAT-M1 networks, the logic being that M1 can be implemented through a relatively straightforward software update to the existing radio infrastructure, while NB1 will require new hardware. With existing CAT-1 base stations upgraded to support M1, providers can now offer more competitive solutions in terms of service cost, compared to the previous M2M technologies. Given that M1 networks are already in operation, network providers and device manufacturers can refit base stations for an eventual NB1 rollout almost at their leisure.

In Europe, having initially indicated they would begin with the simpler and, eventually, lower-cost NB1 networks, they are now opting for the lower initial investment required for an upgrade to M1. This is due to the availability of an M1 eco-system driven by the initial USA deployment. With the initial USA deployment in place, an M1 ecosystem has been created that can be easily applied to Europe, with devices, chipsets and certification processes already available. In February 2017, Orange Europe announced pilot schemes and deployment of M1, with NB1 to be added at some point in the future.

Asia continues to be divided over the M1/NB1 issue. Much like their European counterparts, Japanese operators have opted to start with M1, motivated by the existence of an M1 ecosystem. China, on the other hand, has chosen NB1, driven predominantly by Huawei as the only current vendor with a commercial narrowband offering. In South Korea this division is even more evident, with at least one carrier ready to roll out M1 offerings this year, but with others waiting for NB1. Some countries will have M1 coverage, some will have NB1 coverage, and some will have both, leaving industry with a situation where devices that target global applications, such as pallet tracking and cold chain management, will need dual-mode operation as a key requirement.

Elsewhere in USA industry

Communities get smart: US Ignite has announced the latest cities to join the Smart Gigabit Communities (SGC) programme. Washington DC, Phoenix, San Diego, Albuquerque and Jackson (Tennessee) have all made a

commitment towards the adoption of next generation smart city technologies. The SGC programme brings together municipalities, network carriers, corporate partners, non-profit organisations and university research communities, to develop smart gigabit applications that address local community needs, be they in education, workforce development, public safety, community health, smart energy or transportation. The announcement focused on various initiatives taking place in the cities. Current smart city projects in Washington DC include smart waste management, movement analytics and water quality sensing, while Jackson has partnered with Jackson Energy Authority to align the city's gigabit infrastructure as a tool, test bed and accelerator for economic, educational and community benefit.

In Albuquerque, the initial phase of a project to install LED lighting around the city includes plans for sensors and cameras in key places for monitoring and data collection, while Phoenix is able to provide the best tools to the area's entrepreneurs to help them build their companies and create real solutions for residents and businesses. San Diego, the newest participant in the programme, will advance innovation, technology and entrepreneurship in the city and promote further collaboration among local government, community leaders and corporate partners. Every year, the newly announced SGC communities will develop two gigabit applications or gigabit services to provide advanced technology solutions to issues faced by that community, as well as sharing those applications with other SGCs. US Ignite is a non-profit organisation, helping to accelerate new wired and wireless networking advances from research to prototype, through to full-scale smart community and interconnected national deployments.

Factory activity near three-year high

Despite construction spending remaining steady, USA factory activity rose sharply in June to its highest level in almost three years, raising hopes of economic growth in the second quarter. The Institute for Supply Management (ISM) said its index of national factory activity rose to a reading of 57.8 in June, its best performance since August 2014, from 54.9 in May. A reading above 50 in the ISM index indicates an expansion in manufacturing, which accounts for roughly 12 per cent of the overall USA economy.

“The ISM index provides further evidence that the prospects for the manufacturing sector remain bright,” said Andrew Hunter, an economist at *Capital Economics*.

The index reading is another encouraging sign that the USA economy rebounded strongly in the April-June quarter. Following the data, the Atlanta Federal Reserve raised its forecast for second-quarter GDP to a three per cent annualised rate from its previous forecast of 2.7 per cent. The Commerce Department reports that the US economy grew at a 1.4 per cent annual rate in the first quarter, better than had been previously estimated. The ISM survey's new orders sub-index rose to 63.5 in June from 59.5 in May, while a measure of factory employment increased to a reading of 57.2 from 53.5.

According to ISM, comments from those surveyed generally reflected expanding conditions, “with new orders, production, employment, backlog and exports all growing

From the Americas

in June, compared to May, and with supplier deliveries and inventories struggling to keep up with the production pace.” Fifteen of the 18 manufacturing industries reported growth in June.

Meanwhile, although federal government outlays on construction projects were the highest in over four years, USA construction spending remained flat in May.

Cloud focus

USA regional fixed operator Consolidated Communications has closed its acquisition of FairPoint, in an all stock transaction valued at \$1.3 billion, including debt and based on present equity value. Consolidated said the deal takes its fibre route miles to 36,000 across a 24-state service area, making it the ninth largest fibre provider in the USA.

The company added that the merger will create significant operational and financial scale while maintaining strong capital investment strategy.

The company now plans to expand its Cloud services product suite to FairPoint markets, and bring about other broadband enhancements.

Who needs regulation?

Following the recent introduction of ‘roam like at home’ (RLAH) in the EU, a number of consumer groups and politicians are calling for the similar regulation of international call prices. The theory is, if we pay the same to call home from, say, Spain as we would pay at home, then why not pay the same to call Spain from home? It’s a seductive argument.

However, *Telecompaper* is suggesting that the continued perceived discrepancy in charges fulfils a useful purpose. A high rate for a little-used service isolates high costs in a single, clear place (calling abroad). This is a profit generator for operators and helps ensure they don’t raise prices elsewhere. If international prices are regulated, after termination rates and roaming, then other prices – used by many more people – will start to rise. Operators need to maintain their margins.

The European Commission speaks against regulating international calls, noting that there are sufficient alternatives, such as Skype, for end-users. In short, concludes *Telecompaper*, this is an issue better left to the market.

Cybersecurity

One area where the USA can learn from Singapore

With almost daily revelations of security breaches, whether current or retrospective, data security continues to be a major concern, and a financial drain, on business and government worldwide.

A recent survey of data from the 193 member states of the United Nations’ International Telecommunications Union (ITU), revealed by *Telco Transformation*, makes interesting reading.

As a centre for finance and technology, Singapore’s economy and Smart Nation programme rely on secure systems, so it’s no surprise that Singapore came out top. Equally unsurprising then, that the USA came second. But the rest of the top ten included some small and developing countries: Malaysia, Oman, Estonia, Mauritius, Australia, a tie for eighth place between Georgia and France, with Canada in tenth. Russia was 11th with China in 34th.

The survey results were largely based on the ‘five pillars’ of the ITU Global Cybersecurity Agenda: legal, technical, organisational, capacity building and international cooperation.

While cybersecurity is key to any country’s digital transformations, the survey found an “evident gap between countries in terms of awareness, understanding, knowledge and, finally, capacity to deploy the proper strategies, capabilities and programmes.”

In order to be more effective, countries need to create a cybersecurity ecosystem comprising laws, organisations, skills, cooperation and technical implementation.

ITU said the first crucial step was countries adopting a national security strategy, adding: “More cooperation should be initiated between developed and developing countries to assist them in cybersecurity development.”

The ITU survey can only give a snapshot of cybersecurity today. It cited recent ransomware attacks as a primary driver for better worldwide cooperation, and that, of course, is the big issue. Hackers and malevolent developers are honing their skills all the time: the risk is constantly evolving, and defence against it needs worldwide cooperation.

So come on Singapore (and the USA, Malaysia, Oman, Estonia, Mauritius, Australia, Georgia, France and Canada) – share nicely.

Speaking of Singapore

Local broadband operator MyRepublic has announced plans to launch mobile services in Singapore as early as October, having received its MVNO licence in June. The *Straits Times* reports that, rather than build its own physical network, MyRepublic will buy airtime in bulk from an existing dominant telecommunications company such as Singtel, StarHub or M1.

Last year, MyRepublic missed out on the fourth MVNO licence in Singapore, which was given to Australia-based TPG Telecom. MyRepublic said it received calls from two telcos shortly after TPG won the fourth licence, and that the objective is: “To make it as difficult as possible for TPG to be successful.”

MyRepublic’s chief executive officer, Malcolm Rodrigues, said the company will offer “generous mobile data” in Singapore, adding: “We are committed to being disruptive.”

MyRepublic, which started fund raising in May, hopes to raise \$100 million to realise its telecommunications aspirations in Singapore and three other markets. Mobile service launches are planned for 2018 in Australia, New Zealand and Indonesia. The cash will also be used to install optical fibre infrastructure in Indonesia to grow its fibre broadband customer base.

In Singapore, MyRepublic has 70,000 fibre broadband subscribers. The company aims to have a five per cent mobile market share within five years, and to be profitable by mid-2018.

More MVNO news

Mexico has a new mobile virtual network operator (MVNO). Oui Movil, a unit of domestic retail group Elektra, will offer both 3G and 4G connectivity from day one.

TeleGeography revealed in March 2015 that Grupo Elektra was to lease capacity on Telcel's network. Elektra, which sells electronic goods and household appliances, and also runs Banco Azteca through its financial division, is owned by Ricardo Salinas Pliego, who exited the Mexican wireless sector in 2015 when he sold his interest in Iusacell to AT&T Inc.

Elsewhere, Snail Mobile, China's largest MVNO has revealed that its subscriber base has reached ten million. The unit, which is a division of the Suzhou Snail Digital Technology Company, commonly known as Snail Games, describes itself as the industry's premier 'gaming MNVO' and offers monthly gaming privileges to subscribers.

China's second largest MVNO, YuanTel, has confirmed that it now has eight million active users. Clarifying its Internet of Things (IoT) ambitions at Mobile World Congress Shanghai in June, the virtual operator noted that its "installed capacity of front-end in-vehicle infotainment (IVI) exceeded 300,000 units, and the subscription base for its IoT accounts is now more than 100,000."

Fallout from Paris pact falling out

President Donald Trump's recent decision to withdraw the USA from the 2015 global agreement to fight climate change provoked anger from world leaders, environment groups and heads of industry alike.

"The regrettable announcement by the USA makes it inevitable that Europe must facilitate a cost efficient and economically feasible climate policy to remain internationally competitive," said Matthias Wissmann, president of the German auto industry lobby group VDA, in a statement. (The VDA represents carmakers including BMW, Volkswagen and the Mercedes-Benz parent Daimler.)

"The preservation of our competitive position is the precondition for successful climate protection. This correlation is often underestimated," Mr Wissmann added.

The VDA said electricity and energy prices are already higher in Germany than in the USA, putting Germany at a disadvantage.

The VDA's warning comes as German chancellor Angela Merkel, a strong advocate of the global pact to curb the emission of climate change gases, said there was no turning back from the 2015 Paris climate agreement.

On the other hand...

After 2016, a record year for USA solar installations, the first quarter of 2017 saw the installation of over 2GW of new solar capacity, a quarter of it on individual rooftops, according to data released by the Solar Energy Industries Association (SEIA) and GTM Research.

It puts solar second to natural gas overall for new US electricity installations in the quarter, with only a two per cent year-on-year decline.

This is happening under President Trump, who has proposed to cut solar energy research funding, rescind the Clean Power Plan, and bring the USA from the Paris climate agreement, and whose Energy Department is undertaking a study of the USA grid that critics claim is aimed at undermining energy sources such as wind and solar.

Abigail Ross Hopper, president and chief executive of the solar association, explained the apparent anomaly:

- 🌐 There are state-level incentives to add renewables to the grid
- 🌐 The majority of the projects that came online in 2017 were procured under the Obama administration in 2016
- 🌐 Solar power keeps getting cheaper
- 🌐 The 30 per cent solar investment tax credit has been extended through to 2021

"The majority of projects are economic, not policy-driven, at this point, so as the prices have gone down, installations have gone up," said Ms Hopper. But installations aren't expected to slow down. The industry projects there will be a total of 12.6GW of solar installed in 2017, which falls a little short of 2016's record but is still a very impressive figure.

Could Trump's decision to withdraw the USA from the Paris climate agreement have unexpected and surprising consequences?

Tom Werner, chief executive of US solar company SunPower, told the *Washington Post* that Trump's withdrawal from the Paris climate agreement just poses "one more challenge" for the industry, adding: "It's likely that the industry will sort that economic challenge out.

"I think the broader picture is still quite positive for solar, I just think there's a little bit of friction by not supporting the Paris accord ... and the general demeanour of the administration."

Werner noted concerns within the industry regarding a loss of support from the Energy Department for renewables or solar projects, but he argued that homeowners could react to Trump's Paris move with defiance. He believes they may reason: "I'm not in agreement with what Trump's doing with the Paris accord, so I'm going to put a solar system on my house." Only time will tell.

Gill Watson – Features Editor

汽车

各种各样的电动汽车都不会远离新闻

Globetouch公司已收购物联网解决方案提供商Teramatrix技术有限公司。其目的是集成Teramatrix的xFusion平台，从而打造高价值的物联网应用，以支持联网汽车、自动驾驶、预测性维护和边缘智能。

Teramatrix的xFusion是一个软件平台，可以实现跨行业企业应用，以加强运营智能。该系统收集、汇总和分析来自设备、传感器、企业应用、员工和客户的上下文数据。

Globetouch首席执行官Riccardo Di Blasio表示：“Teramatrix的加入大幅加强了我们的物联网和联网汽车策略。我们将运用我们的云SIM和xFusion物联网技术，使自动驾驶在未来成为可能。”

内燃机末日已至？

瑞典沃尔沃公司的中国老板宣布，2019年以后推出的所有沃尔沃车型都将采用电动或混合动力。此举标志着浙江吉利控股集团成为首家确定日期，取消纯内燃机动力车辆的传统汽车制造商。

虽然电动汽车和混合动力汽车仍然只占新车销售的一小部分，但在沃尔沃所运营的高端市场中，其份额正在日渐提高。随着技术的进步和价格的下降，许多汽车业内人士都期望出现大规模的市场采纳。

沃尔沃汽车首席执行官Hakan Samuelsson表示：“这项公告标志着纯内燃机动力汽车的彻底终结。”

自从2010年被吉利收购之后，沃尔沃已向新车款和工厂投入巨资，在被戴姆勒的奔驰和宝马等大型竞争对手所主宰的高档汽车市场中建立起一个细分。

吉利战略的一部分就在于接纳新兴技术，打造更高性能的电动汽车，以及最终的自动驾驶汽车。

自动驾驶汽车可能很快就会开上高速公路，出现在你的身边。据《科技博客》报道，通用汽车公司正在旧金山、亚利桑那州和底特律开展汽车上路实测，意图在“不久的将来”推出首款上市的自动驾驶汽车。令人惊讶的是，这种创新首款可能来自一家传统的汽车制造商，而不是新兴的专业高科技开发商。

通用汽车拥有大约180辆Bolt EV，使用来自旧金山Cruise Automation公司的软件，保证其自动驾驶技术的正常运行。

据《VentureBeat》观察：“该汽车设有多个摄像头，并在车上安装了40个传感器。通过一个雷达系统探测迎面而来的车辆。汽车顶部的激光雷达LIDAR（光探测和测距）传感器利用激光，在驾驶时绘制附近区域的三维地图。

“通过10.2寸的屏幕，你可以鸟瞰汽车的驾驶，不但能看到你的汽车，还有前方和后方的区域，但仅限于低速驾驶的时候。”

所有这些技术都必须得到容身之所。《路透社》最近报道了美国汽车供应商伟世通公司在研究新车流线型仪表盘时发现的成果。

随着汽车驾驶舱中挤入越来越多的数字功能，例如导航和娱乐系统等等，引用报道的话来说，控制这一切的电子设备成为了：“由不同零部件制造商生产的零件所组成的老鼠窝。”

在行业向自动驾驶汽车数字仪表盘迈进的过程中，伟世通是众多旨在简化、廉价化和轻量化仪表盘接线的供应商之一。SmartCore计算模块是伟世通各种解决方案的核心。这是一种驾驶舱域控制器，在一小块硅制品上运行车辆的各种仪表、信息娱乐系统及其他功能。

研究公司IHS Markit估计，到2022年，价值370亿美元的驾驶舱电子设备市场将达到620亿美元，接近翻倍，而会计师事务所普华永道则估计，未来两年内，电子设备最高将占据汽车价值的20%（相较于2015年的13%）。

与此同时，据IHS Markit的首席汽车分析师Mark Boyadjis称，这些零部件供应商的数量可能会有所减少，因为汽车制造商期望与多才多艺的公司合作，以减少合作对象的数量。

Boyadjis先生表示：“管理来自十个不同供应商的十个不同系统，汽车制造商们不再想要承担这样的复杂工作。”据他估计，制造商最终将在每款车型上与两到三个驾驶舱供应商合作，少于目前常见的六到十个供应商。

“你必须迅速改变和适应。否则就无法跟上市场的步伐。”伟世通全球营销主管Tim Yerdon说道，“这就叫做重塑自身以保持领先。五年前，仪表盘只是一个用来塞入电子设备的塑料成型驾驶舱。”他继续说道，“而现在，它更倾向于一个体验为主的电子设备架构，我们只是在它四周围上塑料。”

物联网

安全

IT安全公司趋势科技推出了一个面向科技初创公司的企业风险基金，特别是那些参与物联网（IoT）发展的公司，初始投资1亿美元。

趋势科技致力于确保安全的数字信息交换。据估计到2020年底，将有260亿台设备连接到互联网，而公司知道，目前的生态系统仍需进一步发展，才能确保交易的安全。

趋势科技的创始人兼首席执行官Eva Chen表示：“过去29年来，我们总是能在各种不同时空背景之下准确预测科技的发展趋势。过去我们所搭上的第一波巨大浪潮就是PC市场的崛起，我们很早就专注于端点防护。第二波巨大浪潮是云端；同样的，我们很早就投入云端防护的研发，至今，趋势科技在Amazon Web Services(AWS)平台上所保护的工作负载时间就高达20亿小时。

“如今，我们相信IoT将是下一波浪潮，而这笔基金将协助我们掌握这个机会。”

由谁从何处开始？

各国目前都在对首先使用哪一种物联网技术感到苦恼：CAT-M1的上市时间更快，但CAT-NB1据说更简单、更高效。《物联网科技新闻》对目前为止的决策进行了汇总。

在美国，Verizon和AT&T在他们的个体CAT-M1网络上提供服务，原因是M1可以通过对现有无线基础设施进行相对直接的软件更新来实现，而NB1则需要新的硬件。

随着现有CAT-1基站升级至支持M1，与此前的M2M技术相比，供应商现在可以提供服务成本方面更具优势的解决方案。鉴于M1网络已经在运行中，网络提供商和设备制造商几乎随手就可以为最终的NB1铺开进行基站改装。

欧洲最初表示，他们将从简单且最终成本较低的NB1网络起步，但他们现在选择了初始投资要求较低的M1升级。这是出于美国初始部署所推动的M1生态系统的可用性。

随着美国初始部署的到位，欧洲可以轻松地使用已创建完成的M1生态系统，包括设备、芯片组和认证过程均直接可用。2017年2月，Orange Europe宣布了M1的试点计划和部署，而NB1则会在未来的某个时候加入。

亚洲在M1/NB1问题上持续分歧。鉴于现有的M1生态系统，日本运营商与他们的欧洲同行一样，选择从M1起步。另一方面，中国则选择了NB1，主要由华为担当目前唯一具备商业窄带产品的供应商进行推动。在韩国，这种分歧更为明显，今年至少已有一家运营商准备推出M1产品，而其他则继续等待NB1。

有些国家将覆盖M1，有些则将覆盖NB1，还有些会两者兼具，这导致业内出现一种情况，即对于瞄准全球应用市场的设备，例如货盘追踪和冷链管理等来说，双模操作将成为一项关键要求。

美国其他行业

社区变得更聪明

US Ignite公布了加入智能千兆社区(SGC)的最新城市名单。华盛顿特区、菲尼克斯、圣地亚哥、阿尔伯克基和杰克逊(田纳西州)都承诺采纳下一代智能城市技术。

SGC计划让城市、网络运营商、企业合作伙伴、非营利组织和大学研究团体汇聚一堂，开发智能千兆应用，解决当地社区的需求，无论涉及教育、劳动力发展、公共安全、社区卫生、智能能源还是交通运输领域。

此次公告的重点在于各个城市的各项举措。华盛顿目前的智能城市项目包括智能废物管理、活动分析和水质检测，而杰克逊市则与杰克逊能源局合作，将城市的千兆基础设施作为工具和试验台，以及经济、教育和社会效益工的加速器。

阿尔伯克基有一个在市内安装LED照明的项目，其初始阶段包括在重要地区安装传感器和摄像机的计划，用来监测和收集数据；而菲尼克斯则能为该地区的企业家提供最优质的工具，帮助他们建立自己的公司，并为居民和企业创造切实的解决方案。该项目的最新参与者圣地亚哥将推动该市的创新、技术和创业精神，并进一步促进地方政府、社区领袖和企业伙伴之间的合作。

每年，新公布的SGC社区都将开发两个千兆应用或千兆服务，提供先进的技术解决方案以解决该社区所面临的问题，并与其他SGC共享这些应用。US Ignite是一个非盈利组织，帮助加速新有线和无线网络从研究到原型，再到全面的智能社区和互联的国家部署之间的进展。

工厂活动接近3年创高

尽管建筑支出保持稳定，但美国的工厂活动在6月出现大幅上升，达到近三年来的最高水平，为第二季度的经济增长带来了希望。美国供应管理协会(ISM)表示，6月的全国工厂活动指数升至57.8，达到2014年8月以来的最佳水平，而5月份则为54.9。ISM指数高于50代表制造业正在扩张，而制造业占据美国整体经济的12%左右。资本经济公司的经济学家Andrew Hunter表示：“ISM指数进一步表明制造业的前景依然光明。”

该指数是美国经济在四月至六月期间强劲反弹的又一个积极例证。根据数据，亚特兰大联邦储备委员会将其第二季度国内生产总值的预测从原先的2.7%提高到3%。

据商务部报告，美国经济第一季度的年增长率为1.4%，比此前估计的要好。

ISM调查的新订单分项指数从5月份的59.5上升到6月的63.5，而工厂就业率的指数则从53.5提高到57.2。

据ISM称，受调查者的评论总体反映出扩张的情况。“与5月份相比，6月的新订单、生产、就业、积压和出口都有所增长，而供应商的交货和库存则难以跟上生产速度。”18个制造业中有15个在6月出现增长。

与此同时，尽管联邦政府在建筑项目上的支出为四年最高，但美国在5月份的建筑支出仍然持平。

云聚焦

美国区域固定运营商Consolidated Communication已结束其对FairPoint的收购，这场全股份交易的价值为13亿美元(包括债务)，并且以目前的股权价值为依据。Consolidated表示，这项交易使其光纤线路里程达到36,000英里，服务区域跨越24个州，成为美国第九大光纤供应商。公司补充道，这次并购不但会创造可观的业务和财务规模，还将继续保持强劲的资本投资策略。

公司现在正计划将其云服务产品套件扩展至FairPoint的市场，并带来其他的宽带增强。

谁需要调整?

随着欧盟近期推出“像本地一样的漫游”(RLAH)，一些消费者团体和政治家呼吁国际电话价格实施类似的调整。他们的理论是，如果我们从西班牙打电话回家所需支付的费用，和我们在家中所需支付的相同，那我们何不支付同样的费用，从家中打往西班牙呢？这是一个非常有趣的论点。

然而，Telecompaper表示一直以来的收费差异自有其目的。低使用率服务的高昂价格能够将高成本隔绝在一个明确的范围内(拨打国外电话)。这是运营商的利润点，有助于确保他们不会在其他地方提高价格。如果国际电话价格终端费用和漫游费用进行调整，那么很多人所使用的其他服务的价格就将开始上升。运营商需要维持他们的利润。

欧盟委员会不支持对国际电话费进行调整，并指出最终用户拥有充足的替代品，例如Skype。简而言之，根据Telecompaper的结论，这个问题最好留给市场去解决。

网络安全

美国可以在这方面向新加坡学习

无论现在还是以前，几乎每天都有安全漏洞被揭发，因此数据安全仍然是全球企业和政府的主要关切点和资金消耗点。最近一项由Telco Transformation出具，关于联合国国际电信联盟(ITU)193个成员国的数据调查透露出了有趣的信息。

作为一个金融和技术中心，新加坡的经济和智慧国家计划均依赖于安全的系统，所以新加坡脱颖而出并不足为奇。然后同样不出意外的，美国名列第二。但其余前十名中包括了不少小型的发展中国家：马来西亚、阿曼、爱沙尼亚、毛里求斯、澳大利亚，以及格鲁吉亚和法国并列第八，加拿大位列第十。俄罗斯为第11名，而中国则是第34名。这项调查的结果主要以国际电联全球网络安全议程的“五大支柱”：法律、技术、组织性、能力建设和国际合作为依据。

尽管网络安全是任何国家数字转型的关键，但调查发现，“各国在意识、理解、知识，以及适当的战略、能力及方案的最终部署能力方面存在明显的差距。”为了提高效率，各国必须建立起一个网络安全的生态系统，包含法律、组织、技能、合作和技术实现。

国际电联表示，第一个关键步骤就是实行全国性的安全战略，并且：“发达国家和发展中国家之间应当开展更多合作，协助他们发展网络安全。”

国际电联的调查只是当今网络安全现状的惊鸿一瞥。它将最近的勒索攻击视为推动全球加强协作的主要驱动因素，而这当然是个严重的问题。黑客和恶意程序开发者一直在磨练他们的技能：风险不断提升，而防御则需要全球合作。

所以新加坡（还有美国、马来西亚、阿曼、爱沙尼亚、毛里求斯、澳大利亚、格鲁吉亚、法国和加拿大），请和大家好好分享。

说到新加坡

当地宽带运营商MyRepublic宣布最早10月份在新加坡推出移动服务的计划，并在6月获得了虚拟运营商执照。据《海峡时报》报导，MyRepublic将从现有的主要电信公司，例如新加坡电信、星和以及M1等处大批量购买通话时间，而非建立自己的物理网络。

去年，MyRepublic错过了新加坡的第四张虚拟运营商执照，致其落入澳大利亚公司TPG电信手中。MyRepublic表示在TPG获得第四张执照后不久，他们便收到了来自两家电信公司的电话，其目的是：“尽可能阻止TPG的成功。”

MyRepublic的首席执行官Malcolm Rodrigues表示，公司将在新加坡提供“优厚的移动数据”，并补充道：“我们致力于颠覆市场。”

MyRepublic在5月份开始集资，希望能够筹集1亿美元，实现其在新加坡和另外三个市场中的电信野心。公司计划于2018年在澳大利亚、新西兰和印度尼西亚推出移动服务。这笔资金还将用于在印度尼西亚安装光纤基础设施，扩大其光纤宽带用户群。

在新加坡，MyRepublic拥有70,000光纤宽带用户。公司的目标是在五年内获得百分之五的移动市场份额，并在2018年中实现盈利。

更多移动虚拟网络运营商新闻

墨西哥出现一家新的移动虚拟网络运营商（MVNO）。Oui Movil是该国零售集团Elektra的一个部门，现将开始提供3G和4G连接。

据《TeleGeography》于2015年3月透露，Elektra集团将租借Telcel的网络能力。Elektra集团销售电子产品和家用电器，并且通过财务部门经营阿兹台克银行，其所有者为Ricardo Salinas Pliego。他在2015年将Iusacell的股份出售给AT&T公司，并由此离开墨西哥无线行业。

在世界的另一个角落，据中国最大的虚拟运营商蜗牛移动称，其用户规模已达到一千万。该单位属于苏州蜗牛数字科技公司，俗称蜗牛游戏旗下的一个部门。他们形容自己为业内首屈一指的“游戏虚拟运营商”，并每月为用户提供游戏特权。

中国第二大虚拟运营商远特通信已确认其现有八百万的活跃用户。这家虚拟运营商在6月的上海移动通信大会上公开了他们的物联网（IOT）雄心，并表示他们的“车载信息娱乐系统（IVI）前端装机容量突破30万台，其物联网账户的用户规模已超过10万。”

退出巴黎公约之争

唐纳德·特朗普总统最近让美国退出2015年全球气候变化协议的决定引起了世界各国领导人、环境组织和业界人士的愤怒。

“美国令人遗憾的宣告致使欧洲必须促成一项具有成本效益，并且经济上可行的气候政策，以保持国际竞争力。”德国汽车行业游说组织VDA主席Matthias Wissmann在一份声明中表示。（VDA代表的汽车制造商包括宝马、大众和梅赛德斯奔驰的母公司戴姆勒）

“维持我们的竞争地位是成功保护气候的先决条件，而这种关联性却经常被低估。”Wissmann补充道。

VDA表示，德国的电力和能源价格已经高于美国，这令德国处于劣势。VDA的警告获得了德国总理默克尔的支持，作为遏制气候变化气体排放的全球协议的大力倡导者，她表示2015年的巴黎气候协议不容退步。

而另一方面……

根据太阳能行业协会（SEIA）和GTM研究公布的数据，美国太阳能安装经历了创纪录的2016年之后，在2017年第一季度期间新增超过2GW，其中四分之一安装在个人屋顶上。

这使太阳能成为本季度仅次于天然气的美国新电力设施安装，同比仅下降百分之二。

这一现象发生在特朗普总统的领导下，也正是他提出了削减太阳能研究经费、取消清洁能源计划、要求美国退出巴黎气候协议，并且其能源部门对美国电网的研究被批评者视为旨在破坏太阳能和风能等能量来源。

太阳能协会主席兼首席执行官Abigail Ross Hopper对这种明显的反常作出如下解释：

- 国家有政策鼓励电网增加可再生能源
- 2017年上线的大部分项目都是奥巴马政府在2016年促成的
- 太阳能越来越便宜
- 30%的太阳能投资税收抵免已延长至2021年

Hopper女士表示：“大多数项目都是经济型的，而非由政策驱动，因此随着价格的下降，安装数量也在上升。”但设备增速预计不会放缓。行业预计2017年的太阳能安装总量将达到12.6GW，相比2016年的纪录稍有不足，但仍然是一个非常可观的数字。

特朗普让美国退出巴黎气候协议的决定是否会造成意料之外的惊喜结果？

美国太阳能公司SunPower的首席执行官Tom Werner告诉《华盛顿邮报》，特朗普退出巴黎气候协议只是对行业“构成了另一个挑战”，并补充道：“业内很可能会将这个经济挑战解决掉。”

“我认为太阳能从大局来看仍然前景光明，我觉得不支持巴黎协议……以及政府的总体态度只会造成一点小摩擦。”

Werner指出了业内人士对可再生能源或太阳能项目失去能源部门支持的忧虑，但他辩称，广大屋主可能会对特朗普退出巴黎协议的举动持蔑视态度。他认为他们的想法可能是：“我并不不同意特朗普对待巴黎协议的态度，所以我打算在我的房子上安装太阳能系统。”一切都需要留待时间去证明。

Gill Watson
专栏编辑

TPV-Based Insulation for Medium Voltage Applications

By Andrea Galanti, Stefano Dossi and Andrea Magri of Mixer SpA, Ravenna, Italy, and Camillo Cardelli, iPool Srl, Pistoia, Italy

Abstract

The development of three fully thermoplastic lead-free medium-voltage (MV) insulation compounds based on the thermoplastic vulcanisate (TPV) technology is presented in this paper. The TPV MV insulation compounds were prepared starting from a peroxide curable lead-free MV insulation, which is the actual market benchmark. For this reason, they were extensively investigated in comparison to the standard lead-free MV insulation. To evaluate the results of the dynamic vulcanisation process, the compounds were studied by means of differential scanning calorimetry (DSC). To simulate the extrusion behaviour, their rheology was investigated. Mechanical properties were measured before and after ageing at 135°C and 150°C up to 21 days. Finally, a comprehensive study on their electrical features, in dry conditions (from 25°C to 90°C) and wet (up to 28 days at 90°C in water), is presented.

1 Introduction

Twenty years ago, both XLPE and EPDM-based insulation systems were used in many parts of the world for MV cable applications. North America remains a very active market for EPDM-based MV insulations, while in other parts of the world XLPE is preferred. Recently, we are seeing a renewed interest in EPDM-based MV insulations in the global market due to the unmatched performance in cable lifetime for long-term applications (>20 years).

Since 1996, Mixer SpA has produced MV insulation compounds based on EPDM and EPDM/LDPE blends: its strategy is to offer innovative and competitive materials to the cable market, believing that the continuous improvement of materials will give a new life to rubber cables for special applications.

The first step of this approach was the development of lead-free EPDM solutions, which were presented in 2012 and are now commercially available (see *Figure 1*)^[1]. Due to the fact that lead salts are insoluble in water and therefore do not contribute to any leakage current through the insulation layer, lead oxide is one of the most effective additives in MV insulation compounds. However, lead oxide is listed in Reach SVHC (Substances of Very High Concern) for its well-known bioaccumulation risk and long lasting effects, leading to severe damage to the environment and life^[2].



○ **Figure 1:** MV insulation containing lead (orange) and lead-free (white), from pellets to cables

Mixer has successfully replaced lead oxide with an inorganic ion scavenger system capable of immobilising ions, succeeding in the production of EPDM-based lead-free MV insulation compounds with superior thermal and electrical stability.

From this starting point, it has developed a new fully thermoplastic TPV for MV insulation dynamically cross-linking the lead-free MV insulation compound in a PP matrix.

Mixer presents three upgrades of MV TPV compounds towards a material able to pass thermomechanical testing for 90°C and 105°C continuous operation temperature and 250°C short circuit emergency, according to the Italian standard CEI 20-86, which is, so far, the only standard on thermoplastic compounds for MV insulation.

Firstly, the preparation and the macroscopic properties of the novel MV TPV compounds is discussed. The company then investigated the novel MV TPV compounds by means of DSC to study the dynamic vulcanisation process. In the third part, the rheology of the MV TPV was analysed at low shear to simulate their extrusion behaviour.

Subsequently, the MV TPV compounds were tested for mechanical properties before and after heat ageing up to 150°C and 21 days. Electrical properties of the compounds were studied at Imerys Laboratories, Par, UK. In detail, loss factor ($\tan\delta$), dielectric constant (ϵ_r) and volume resistivity were measured up to 90°C in dry conditions.

Additionally, $Tan\delta$ and ϵ_r were investigated after immersing the compounds in water at 90°C up to 28 days. Test results were compared to the standard lead-free MV IS79 demonstrating that an innovative, highly electrically insulating compound that simultaneously combines the properties of lead-free XL-EPDM compound with the possibility to process it as a thermoplastic material, can be offered.

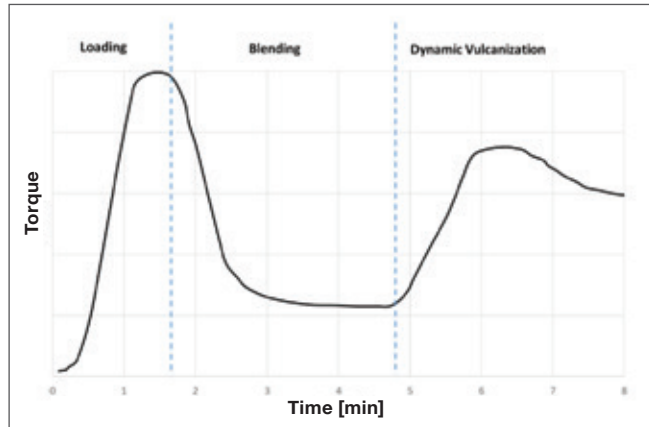
2 Lead-free MV TPV compounds

2.1 Preparation of the MV TPV compounds

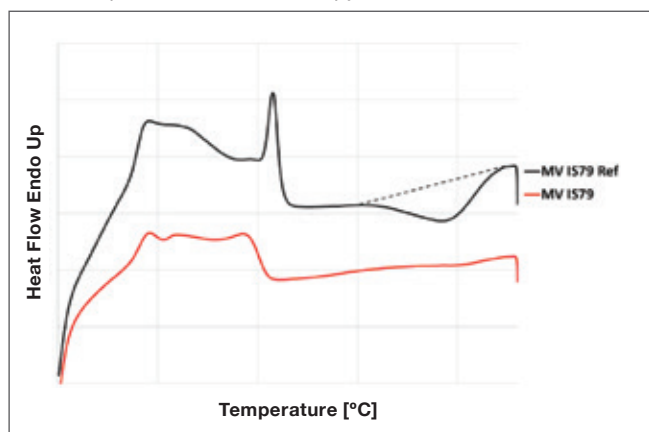
Lead-free MV insulation compound, MV IS79, and MV thermoplastic vulcanisate compounds, MV TPVs, were prepared in an internal mixer equipped with two counter-rotating rotors and a chamber with 8cm³ volume. The composition of the MV TPV compounds is summarised in Table 1. Obviously, MV TPV79 A and B have the same ratio between elastomeric and thermoplastic phase; nonetheless, different co-agents were utilised in their formulation. This was done following the studies on co-agents influencing the properties of TPVs compounds by preventing the decomposition of PP via β -scission caused by free radicals^[3].

MV IS79 was prepared by mixing all the components in the internal mixer leading to a complete blending of the ingredients. After unloading, peroxide was added at low temperature in a two-roll mill.

- **Figure 2:** Representation of the torque pattern in function of time during the production of the MV TPV compounds. The three main steps of the process are indicated



- **Figure 3:** DSC analysis of uncured (top) and cured (bottom) MV IS79. Dotted line: graphical representation of the baseline used to compute the reaction enthalpy



TPV Composition	MV TP79 A	MV TP79 B	MV TP79 C
MV IS79	75%	75%	70%
PP-1 ¹	25%	25%	20%
PP-2 ²	-	-	10%

¹d = 0.891 gr/cm³, MFI (230°C; 2.16kg) = 8.0 gr/10min; ²d = 0.900 gr/cm³, MFI (230°C; 2.16kg) = 10.0 gr/10 min

- **Table 1:** Formulation of the MV TPVs

	MV IS79	MV TP79 A	MV TP79 B	MV TP79 C
TS ¹ [N/mm ²]	16.61	17.31	17.19	15.73
EB ¹ [%]	321	360	310	341
TS @ 200% [N/mm ²]	14.23	13.57	14.48	13.62
HS ² [Shore A-D]	80-/-	96-45	95-46	96-48
MFI ³ [gr/10min]	27.6 ⁴	4.4	4.2	21.3

¹ASTM D412; ²ASTM D2240; ³ASTM D1238 (190°C, 21.6kg),

⁴Measured on the compound without peroxide

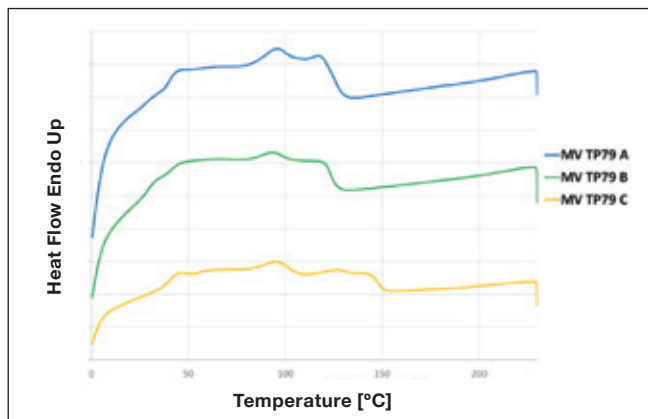
- **Table 2:** Typical physical properties of the MV insulation compounds

Samples for testing were obtained by pressing the milled sheets in a compression moulding machine at 180°C for ten minutes. Specimens for mechanical properties were die cut in the milling direction.

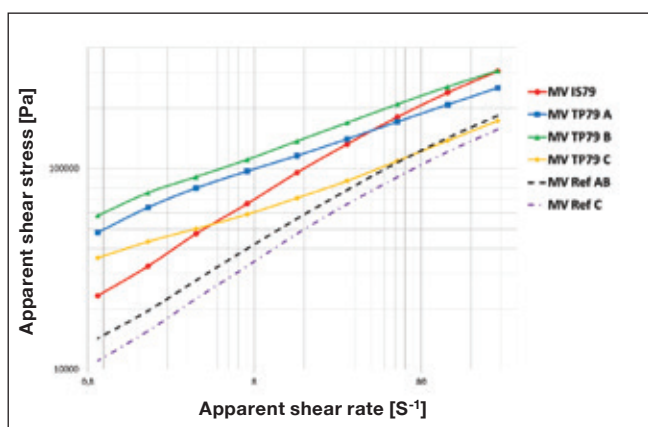
MV TP79 compounds were prepared by mixing the lead-free compound (MV IS79) with thermoplastic polypropylene (PP) according to the ratio shown in Table 1. During the mixing process, as the radical reaction takes place, while the temperature rises continuously, the torque follows a characteristic pattern, which is graphically represented in Figure 2^[4,5]. After loading the ingredients, the torque grows due to the high viscosity of the components at low temperature. Increasing the temperature, the materials start to soften and the torque drops while the blending takes place. As the radical reaction begins, the simultaneous crosslinking of rubber phase and β -scission of PP phase occurs, with consequent phase inversion leading to the torque rapidly increasing. The final temperature, at which the TPVs were unloaded after about eight minutes of processing, was between 200°C and 220°C. The still hot compounds were calendered in a two-roll mill in sheet shape; plaques were obtained by pressing the sheets in a compression moulding machine at 180°C for one minute. Specimens for mechanical properties were die cut in the milling direction.

As shown in Table 2, all the compounds show comparable mechanical properties, namely tensile strength (TS), elongation at break (EB) and TS at 200 per cent elongation. The choice of PP and its ratio seem not to influence greatly the mechanical properties, which are close to the standard MV IS79. On the contrary, the crystallinity of PP leads to a conspicuous increment of hardness (HS), which is 48 Shore D for MV TP79 C, ie the compound with the highest content of PP. Due to the high viscosity of MV TP79 A and B, the melt flow index (MFI) was measured at 190°C with 21.6kg weight.

Their low flow rate can be ascribed principally to two main factors: the ratio between thermoplastic and elastomeric



○ **Figure 4:** DSC analysis of MV TP79 A (top), MV TP 79 B (middle) and MV TP79 C (bottom)



○ **Figure 5:** Apparent shear stress in function of apparent shear rate measure at 180°C of the MV insulation compounds. Dotted lines: reference compounds

phases and the choice of a PP with low MFI at the test temperature. However, it can be noted that, by a careful balancing of the ratio between the two phases and an accurate choice of PP, it was able to obtain an MFI for MV TP79 C comparable to the standard MV IS79. Those results are confirmed by the rheological studies presented in section 2.3.

For the sake of comparison and to highlight the successful achievement of the MV TPV compounds, reference materials without peroxide were produced. Thereby, in those compounds, the dynamic vulcanisation could not take place after the blending of the components. The reference compound MV Ref AB has the same composition of MV TP79 A and B (without peroxide and co-agents); the reference compound MV Ref C was formulated as MV TP79 C (without peroxide). Rheology and mechanical properties of both the reference compounds were analysed in comparison to the MV TPV compounds presented in this paper to demonstrate the capability to obtain TPV compounds in a reproducible and controlled fashion.

2.2 DSC analysis

In order to determine the unreacted peroxide remaining in the compounds after the curing process, DSC was implemented. The spectra were measured in a Perkin-Elmer DSC 6000 in inert nitrogen atmosphere from 0°C to 230°C with a heating rate of 20°C/min; after heating, the samples were cooled down to 0°C with 10°C/min rate. This cycle was repeated three times. However, as the aim of this study was to quantify the ratio between initial and

residual (after curing or dynamic vulcanisation) peroxide, only the first heating cycle is presented and discussed in the following.

Firstly, the uncured MV IS79 containing 100 per cent of unreacted peroxide was analysed and used as reference. From the DSC shown in Figure 3, the calculated enthalpy of reaction (ΔH) given by the peroxide decomposition was -8.97 J/g. In the same figure is represented the DSC plot of the cured MV IS79 (ten minutes at 180°C). A ΔH of -1.16 J/g was detected, corresponding to a residue of about 13 per cent of unreacted peroxide. This indicates that MV IS79 was almost completely vulcanised. In the same way, the amount of unreacted peroxide of the MV TPV compounds was computed, considering that MV TP79 A, B and MV TP79 C were formulated with 75 per cent and 70 per cent of uncured MV IS79, respectively.

From the data collected and shown in Figure 4, the residual peroxide detected in MV TP79 A was about 4 per cent ($\Delta H = -0.27$ J/g) and in MV TP79 B was about 5 per cent ($\Delta H = -0.33$ J/g). For MV TP79 C the computed residual peroxide was around 11 per cent ($\Delta H = -0.68$ J/g). Those results confirm beyond any doubt the almost complete decomposition of the initial peroxide during the dynamic vulcanisation.

2.3 Rheology

Rheological studies are fundamental to predict the extrusion behaviour of compounds. As such, we have investigated the rheology at apparent shear rates from 200 s⁻¹ to 1 s⁻¹ in a Göttfert Rheograph 2002 capillary rheometer. The L/D of the capillary was 30 and measurements were carried out at 180°C. The temperature was chosen to allow the complete fusion of the PP. Normally, standard compounds as MV IS79 are characterised at 125°C before the curing step, however, at this temperature the PP is not molten resulting in misleading results. Due to the high test temperature, to prevent the decomposition of the peroxide during the analysis, MV IS79 was investigated without peroxide. As previously mentioned, the reference compounds MV Ref AB and C, were included in this study to underline the change of rheological behaviour as a consequence of the dynamic vulcanisation. The plots of the apparent shear stress in function of the apparent shear rate are shown in Figure 5.

The response of MV IS79 is typical of EPDM/PE-based compounds: the shear stress diminishes rapidly in an almost linear fashion decreasing the shear rate. Small deviations from a perfect linearity can be noted and are usually ascribed to EPDM rubbers. MV Ref AB and C exhibit the same pattern with the shear stress translated toward lower values. This effect is caused by the thermoplastic phase, which shows lower viscosity at this temperature.

Accordingly, by increasing the content of PP the shear stress decreases. Owing to the different nature of the MV TPV compounds, their rheological behaviour is rather different^[6,7]. Essentially, such a dissimilar character stems from the elastic response of the elastomeric crosslinked particles, which is dominant at low shear stresses. On the contrary, at high shear stresses, the behaviour of the TPV compounds is governed by the thermoplastic phase. As a result, the three MV TPV compounds have a similar behaviour to the reference compounds at high shear rates. Diversely, at low shear rates, the curves are clearly divergent.

Focusing only on the MV TPV compounds, as noted previously for the MFI in section 2.1, by careful balancing of the components and a correct choice of PP, it is possible to “tune” the rheological behaviour of the TPV MV compounds, keeping or even improving the thermomechanical properties. In this regard, MV TP79 C exhibits lower stresses, ie viscosity, until very low shear rates together with the best thermomechanical properties among the studied TPV MV compounds.

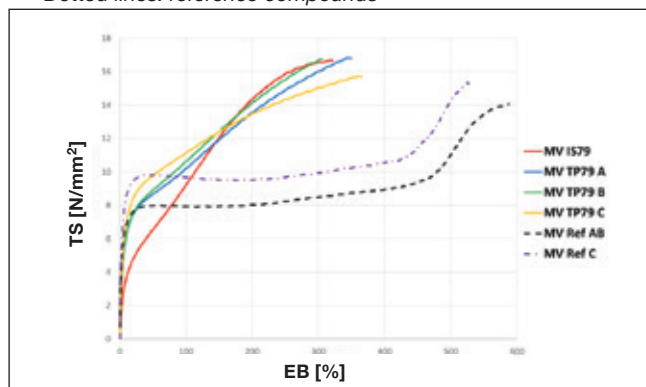
2.4 Mechanical testing

The stress strain properties of the MV insulation compounds were measured according to the method ASTM D412, averaging the results of five dumb-bell test specimens obtained in a Gibitre Tensor Check Profile. The specimens were die cut along the milling direction from plaques obtained in a compression moulding machine at 180°C. MV IS79 was pressed ten minutes to complete the curing process. MV TP79 A, B and C were pressed for one minute and cooled down under pressure. MV Ref AB and C were treated identically to the MV TPV compounds to obtain the test specimens. Figure 6 illustrates one example of the stress strain curve for each compound.

At first sight, the analysis of the stress strain curves of the materials reveals that the MV TPV compounds have similar performance to the benchmark MV IS79 in terms of TS and EB, as already pointed out in section 2.1. Besides the absolute values, the outlined curves follow a similar pattern with a strong elastic response to the stress applied.

The main difference which can be observed is the higher Young’s modulus of the MV TPV compounds. This is caused by the crystallinity of the thermoplastic phase and is therefore larger for MV TP79 C. The same behaviour is recognisable in the reference compound MV Ref AB, which has a Young’s modulus virtually identical to MV TP79 A and B. Likewise, MV Ref C has a similar Young’s modulus to MV TP79 C.

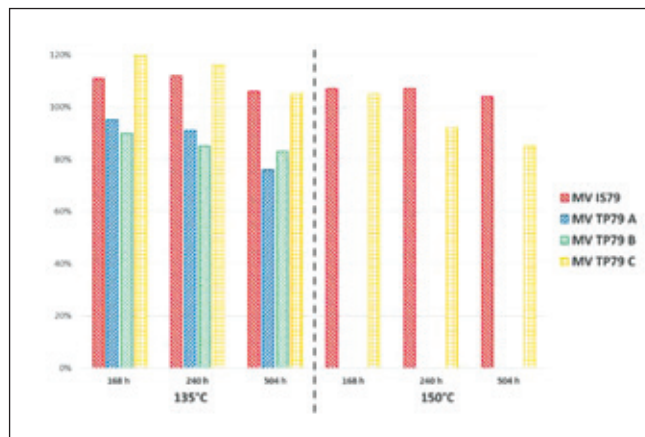
○ **Figure 6:** Stress strain plots of the MV insulation compounds. Dotted lines: reference compounds



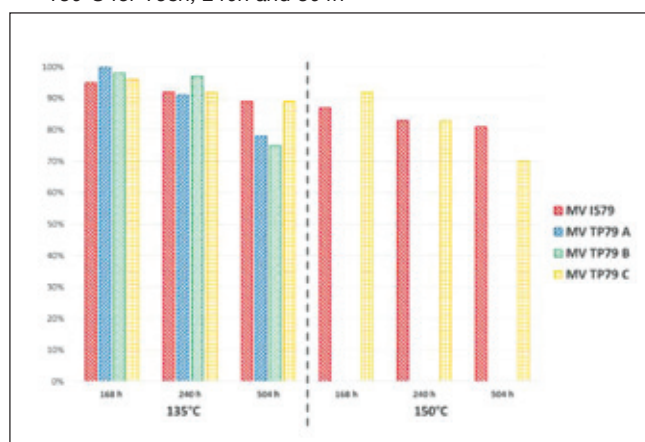
○ **Table 3:** Hot pressure test and longitudinal shrinkage at 130°C of the MV TPV compounds

	MV TP79 A	MV TP79 B	MV TP79 C
Hot Pressure Test ¹ [%]	n.a. ²	27	3
Longitudinal Shrinkage ¹ [%]	14	11	2

¹CEI 20-86; ²Not applicable



○ **Figure 7:** Tensile strength retained after air ageing at 135°C and 150°C for 168h, 240h and 504h



○ **Figure 8:** Elongation at break retained after air ageing at 135°C and 150°C for 168h, 240h and 504h

However, those reference compounds, not being vulcanised and lacking the elastic character, yield until the final rupture. In contrast, the MV TPV compounds behave as crosslinked materials with high elongation^[8-10]. These results are in agreement with the rheological studies, confirming the successful achievement of thermoplastic vulcanisate compounds. According to CEI 20-86, to evaluate the performance of the MV TPV compounds at high temperature, a hot pressure test was carried out and the longitudinal shrinkage at 130°C summarised in Table 3, which is mandatory for thermoplastic insulating materials rated for 90°C and 105°C. The results show an improvement of the results going from MV TP79 A to MV TP79 C. However, this is not a consequence of the ratio between thermoplastic and elastomeric phase, but results from the addition of a PP (see Table 1), which can withstand such high temperatures.

2.4.1 Heat ageing resistance

MV insulation compounds were tested at 135°C and 150°C for 168, 240 and 504h, to assess their resistance to accelerated ageing. Retained TS and EB are graphically shown in Figure 7 and Figure 8. MV TP79 A and B could not be tested at 150°C, as the thermoplastic phase completely melts at this temperature. In this regard, MV TP79 C, which contains PP with higher melting temperature, represents the only alternative to MV IS79 at the test temperature of 150°C.

First, it must be pointed out that all the compounds have good to excellent resistance at 135°C in terms of retained TS and EB, which are higher than 70 per cent after 504h.

Both MV IS79 and MV TP79 C excellently withstand the heat ageing at 135°C, achieving retained TS and EB > 90 per cent. Although the heat resistance performance slightly decays in comparison to MV IS79, MV TP79 C exhibits a TS retained > 80 per cent and a EB retained ca 70 per cent after 504h at 150°C.

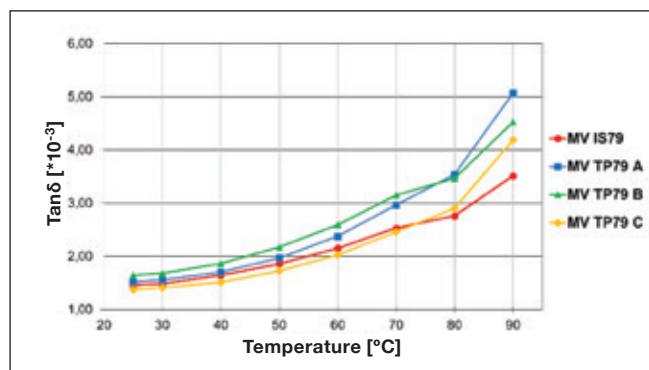
The tests indicate that MV TP79 C can withstand the same ageing conditions as MV IS79. It has to be considered that MV IS79 is rated for a service temperature of 105°C and therefore routinely tested for 508h at 150°C with typical values of TS and EB retained of 95 per cent and 75 per cent. According to CEI 20-86, MV insulation compounds must withstand ageing for 240h at 135°C and 150°C for service temperature rating of 90°C and of 105°C, respectively. Thus, MV TP79 C represents a valid thermoplastic alternative to standard lead-free elastomeric MV insulation compounds.

2.5 Electrical performance

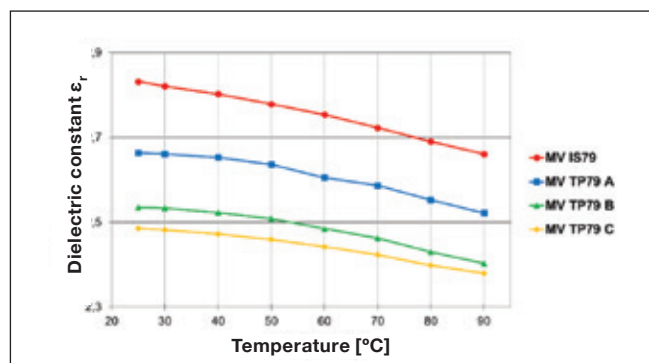
Insulating properties of the compounds were estimated by measuring loss factor (Tanδ), dielectric constant (εr) and volume resistivity in function of temperature from 25°C to 90°C in dry conditions. In addition, loss factor and dielectric constant were measured after immersing the compounds in water at 90°C for up to 28 days. The electrical properties were measured on 2mm thick press moulded samples. An Omicron MI600 system was utilised to evaluate Tanδ and εr; a QuadTech model 1868A was implemented in investigating volume resistivity. All the electrical properties of the compounds were studied at the Imerys laboratories.

Figure 9 shows the plot of Tanδ from 25°C to 90°C in dry conditions. The four compounds are characterised by small variations of the loss factor, which remains in the same order of magnitude (10⁻³) up to 90°C.

○ **Figure 9:** Loss factor (Tanδ) in function of temperature at 500V and 50Hz



○ **Figure 10:** Dielectric constant (εr) in function of temperature at 500V and 50Hz



Volume Resistivity [*10 ¹⁴]	MV IS79	MV TP79 A	MV TP79 B	MV TP79 C
At 25°C [Ω-cm]	47.0	41.6	41.3	50.3
At 90°C [Ω-cm]	2.54	0.378	0.284	0.321

○ **Table 4:** Volume resistivity measured at 25°C and 90°C with 500V potential

	MV IS79	MV TP79 A	MV TP79 B	MV TP79 C
Water absorption ¹ [mgr/cm ²]	0.34	0.32	0.35	0.34

¹Gravimetric method, CEI EN 60811-402

○ **Table 5:** Water absorption according to CEI 20-86

Furthermore, all the compounds present a similar trend of Tanδ increasing the temperature. In more detail, the loss factor of the four compounds is virtually identical at room temperature, about 1.5·10⁻³, and grows steadily with the temperature to values between 3.5·10⁻³ and 5.0·10⁻³ at 90°C for MV IS79 and MV TP79 A, respectively. As described for Tanδ, εr varies in a narrow range for all the compounds raising the temperature.

In Figure 10, only a small lowering of the dielectric constant is observed increasing the temperature. As εr is calculated through the following formula:

$$\epsilon_r = \left(\frac{C}{\epsilon_0}\right) \left(\frac{t}{A}\right)$$

in which C is the capacitance measured by the instrument and ε₀ is the permittivity of vacuum, while t and A are geometrical factors indicating the separation between the plates (electrodes) and their area, respectively. The lower dielectric constant of the MV TPV compounds in comparison to MV IS79 is given by their content of PP, which increases the insulation performance of the overall compound. As a consequence, MV IS79 is characterised by the larger dielectric constant, in contrast to MV TP79 C characterised by the lower.

However, it has to be pointed out that the difference between the compounds is rather limited at either low or high temperature. Lastly, the volume resistivity was measured at 25°C and 90°C applying a potential of 500V (see Table 4). At 25°C, all the compounds have a volume resistivity in the order of magnitude of 10¹⁵ Ω-cm, which is standard value for MV insulants. At 90°C the volume resistivity of the MV TPV compounds is about one order of magnitude lower than that of MV IS79.

Most probably, this difference results from a partial melting of the thermoplastic phase of the TPV compounds, which leads to a higher mobility of the charge carriers in the material. However, besides this, the volume resistivity of the four MV TPV compounds is above 10¹³ Ω-cm.

2.5.1 Electrical performance in water

Electrical properties were also tested upon immersion in water at 90°C up to 28 days. At first, the absorption of water of the MV TPV compounds was estimated in comparison to MV IS79, according to the Italian standard CEI 20-86. The results summarised in Table 5 indicate that the compounds have virtually identical water absorption after 14 days in water at 85°C, well below the upper limit (5mgr/cm²).

The low water absorption reflects on the variation of $\text{Tan}\delta$ after immersing the samples in water at 90°C (see *Figure 11*).

The compounds have a good retention of the loss factor, which is, after 28 days in water, in the worst case about 0.035 and in the best 0.017. Again, MV TP79 C, thanks to its superior stability, has the best performance, close to the benchmark performance of MV IS79.

Having low water absorption, ϵ_r remains almost unvaried after immersion in water at 90°C. As illustrated in *Figure 12*, the increasing of the dielectric constant is rather small after immersion in water.

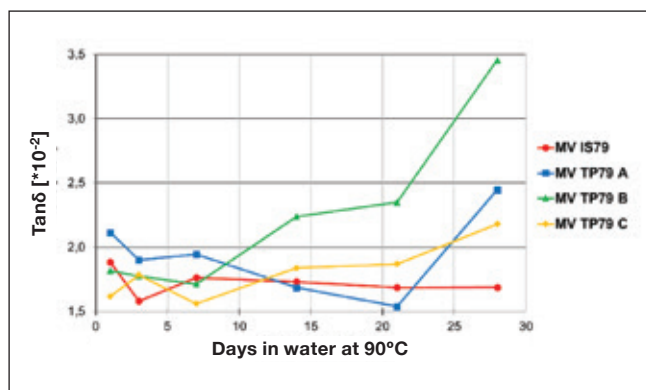
Among the MV TPV compounds, MV TP79 C displays the best stability over time, having a lower ϵ_r compared to the benchmark MV IS79 even after 28 days in water.

Conclusions

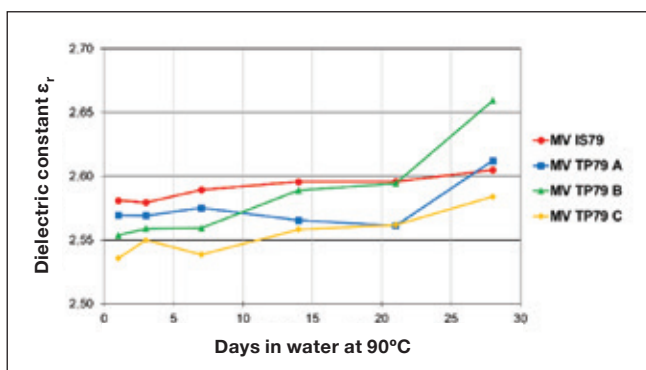
Newly developed MV TPV compounds have been presented in this paper. The promise is to produce MV insulation compounds with properties equal to the actual lead-free MV insulation market standard and the easy processing of thermoplastics.

The preparation of such compounds was described along with their full characterisation in comparison to the standard lead-free MV insulant. By means of DSC the dynamic vulcanisation process was investigated. Indeed, the capability to produce in an industrial pilot plant TPV compounds for application as MV insulation was investigated.

○ **Figure 11:** Loss factor ($\text{Tan}\delta$) in function of days immersed in water at 90°C measured at 500V and 50Hz



○ **Figure 12:** Dielectric constant (ϵ_r) in function of days immersed in water at 90°C measured at 500V and 50Hz



Despite the complex formulation containing polymers, fillers, co-agents and antioxidants, the MV TPV were obtained in a fully reproducible and reliable process. The results of the technology are the overall properties of the MV TPV compounds, which resemble the performance of the standard lead-free MV IS79.

Rheological studies, besides confirming the TPV nature of the compounds, simulate their extrusion behaviour, demonstrating that, thanks to an accurate choice of the thermoplastic PP, it is possible to lower the shear stress maintaining unaltered the typical elastic response of TPV compounds.

A detailed analysis of the stress-strain plots of the MV TPV compounds confirms their elastic behaviour is affected only partially by the crystallinity of the thermoplastic phase, resulting in mechanical properties similar to the benchmark MV IS79.

Upon ageing at 135°C, MV TPV compounds proved their resistance up to 504h with TS and EB retained > 70 per cent. After ageing for 504h at 150°C, MV TP79 C preserved 80 per cent of its TS and 70 per cent of its EB, almost matching the reference MV IS79.

Lastly, dry and wet electrical properties were measured for all the compounds at 500V and 50Hz. Dry $\text{Tan}\delta$ raises with the temperature until an upper limit of about $5 \cdot 10^{-3}$ at 90°C for MV TP79 A, which is still comparable to $\text{Tan}\delta$ of MV IS79 at the same temperature, $3.5 \cdot 10^{-3}$.

Similarly, ϵ_r varies in a very narrow range (between 2.8 and 2.4) at 25°C and up to 90°C for all the compounds. Volume resistivity measurements confirm excellent insulating properties at 25°C ($10^{15} \Omega\text{-cm}$), slightly decreasing at 90°C ($10^{13} \Omega\text{-cm}$).

Wet electrical properties were measured immersing the samples in water at 90°C up to 28 days. Wet $\text{Tan}\delta$ increases to a maximum of $3.5 \cdot 10^{-2}$ for MV TP79 B.

MV TP79A and C exhibited better resistance to water; the latter close to the performance of MV IS79 after 28 days in water at 90°C, $2.2 \cdot 10^{-2}$ and $1.3 \cdot 10^{-2}$, respectively. The same trend was observed for ϵ_r , which slowly increases after immersing the samples in water. However, the fluctuations are virtually irrelevant, being between 2.53 and 2.66 and considering the error associated to the measure.

In conclusion, a full study on TPV compounds as insulation materials for MV applications was presented.

The step-by-step approach showed how it could incrementally improve the properties of the compounds, obtaining a fully thermoplastic lead-free material, namely MV TP79 C, with mechanical, rheological and electrical performance comparable to those of the lead-free market standard MV IS79.

According to the standard CEI 20-86, MV TP79 C has the potential to be implemented as MV insulation with 105°C rating for continuous operating temperature and emergency shortcut of 250°C.

Pushing forward the strategy, Mixer expects to develop MV TPV compounds with higher resistance and better electrical properties at high temperature and in water in the near future.

Acknowledgements

The authors wish to thank Imerys as supplier of the raw materials used in this study. Furthermore, the authors wish to thank Imerys Laboratories in Par, UK, for the electrical measurements carried out on its compounds.

References

- [1] <https://www.scribd.com/doc/317018709/Mixer-SpA-Lead-Free-EP-DM-Compounds-for-MV-Cables>
- [2] <http://echa.europa.eu/substance-information/-/substanceinfo/100.013.880>
- [3] F R De Risi and J W M Noordermeer, "Effect of Methacrylate Co-agents on Peroxide Cured PP/EPDM Thermoplastic Vulcanizate," *Rubber Chem. Technol.*, 80(1), 83-99, (2007).
- [4] R Rajesh Babu, N K Singha and K Naskar, "Influence of 1,2-Polybutadiene as Coagent in Peroxide Cured Polypropylene/Ethylene Octene Copolymer Thermoplastic Vulcanizates," *Mater Design*, 31, 3374-3382, (2010).
- [5] Y Chen, C Xu, X Liang and L Cao, "In Situ Reactive Compatibilization of Polypropylene/Ethylene-Propylene-Diene Monomer Thermoplastic Vulcanizate by Zinc Dimethacrylate via Peroxide-Induced Dynamic Vulcanization," *J Phys. Chem B*, 117, 10619-10628, (2013).
- [6] L A Goettler, J R Richwine and F J Wille, "The Rheology and Processing of Olefin-based Thermoplastic Vulcanizates," *Rubber Chem. Technol.*, 55(5), 1448-1463, (1982).
- [7] A A Katbab, H Nazockdast and S Bazgir, "Carbon Black-reinforced Dynamically Cured EPDM/PP Thermoplastic Elastomers. I Morphology, Rheology, and Dynamic Mechanical Properties," *J Appl Polym Sci.*, 75(9), 1127-1137, (2000).
- [8] S Abdou-Sabet, R C Puydak and C P Rader, "Dynamically Vulcanized Thermoplastic Elastomers," *Rubber Chem Technol.*, 69(3), 476-494, (1996).
- [9] M Boyce, K Kear, S Socrate and K Shaw, "Deformation of Thermoplastic Vulcanizates," *J Mech Phys Sol.*, 49(5), 1073-1098, (2001).
- [10] Y Yang, T Chiba, H Saito, and T Inoue, "Physical Characterization of a Polyolefinic Thermoplastic Elastomer," *Polymer*, 39(15), 3365-3372, (1998).

Mixer SpA

Villa Prati di Bagnacavallo,
Ravenna,
Italy

Tel: +39 0545 47125

Email: info@mixercompounds.com

iPool Srl

Ripa Castel Traetti,
Pistoia,
Italy

Email: info@i-pool.it

中压应用的TPV绝缘

著：Andrea Galanti、Stefano Dossi和Andrea Magri(意大利拉文纳，Mixer SpA)，以及Camillo Cardelli(意大利皮斯托亚，iPool Srl)

摘要

本文记述基于热塑性硫化橡胶 (TPV) 技术的三种全热塑性无铅中压 (MV) 绝缘化合物的开发。TPV中压绝缘化合物由一种过氧化处理的可固化无铅中压绝缘物开始制备，后者是实际的市场标准。因此，我们对比标准无铅中压绝缘体，对它们进行了广泛的研究。为评估动态硫化过程的结果，我们通过差示扫描量热法 (DSC) 对复合物进行研究。为模拟挤出行为，我们对其流变性进行了研究。在135°C和150°C下老化21天前分别对其力学性能进行了测量。最后，针对其在干燥 (25°C到90°C) 和湿润 (在90°C水中浸泡最多28天) 条件下的性能出具一份全面的研究报告。

1 前言

二十年前，世界上许多地方都在中压电缆应用中使用XLPE和EPDM绝缘系统。北美的EPDM中压绝缘市场依然活跃，而世界其他地方则更青睐于XLPE。最近，我们发现全球市场对EPDM中压绝缘表现出了新的兴趣，这是因为其在长期应用 (>20年) 电缆寿命中无与伦比的性能。自1996年开始，Mixer SpA公司便生产基于EPDM和EPDM/LDPE共混物的中压绝缘材料：其战略是为电缆市场提供创新且具有竞争力的材料，相信材料的不断改进将为特殊用途橡胶电缆带来新的生命。

该战略的第一步就是无铅EPDM解决方案的开发，该方案于2012年推出，并且现已在市销售(见图1)^[1]。由于铅盐不溶于水，因此不会使绝缘层产生任何漏电流，所以氧化铅是中压绝缘材料中最有效的添加剂之一。然而，氧化铅被列入Reach SVHC (高度关注物质) 清单上，这是因为其众所周知的累积风险和长期持久的影响力，会对环境和生命导致严重的破坏^[2]。

Mixer已经成功地用一种能够固定离子的无机离子清除系统取代氧化铅，成功生产基于EPDM的无铅中压绝缘化合物，并具有优异的热稳定性和电稳定性。以这一点为基础，公司开发了全热塑性TPV的中压绝缘材料，可以动态交联PP基体中的无铅中压绝缘复合物。Mixer推出了三种级别的中压TPV化合物，依据意大利规范CEI 20-86 (目前为止唯一的中压绝缘热塑性化合物标准)，这种材料可以通过90°C和105°C的连续运行温度，以及250°C短路突发情况的热力测试。

首先，我们讨论了新中压TPV化合物的制备和宏观性质。然后，公司通过DSC对新中压TPV化合物进行探索，以研究动态硫化工艺。第三步，公司分析了中压TPV在低剪切条件下的流变性，以模拟其挤出行为。随后，中压TPV化合物在热老化到150°C，持续21天前接受了力学属性的测试。复合物的电气性能研究在英国Par的Imerys Laboratories中进行。详细来说，我们在最高90°C的干燥条件下测量了损耗系数 (Tanδ)、介电常数 (ε) 和体积电阻率。此外，还将化合物在90°C的水中浸泡最多28天后，对Tanδ和ε进行了研究。我们将测试结果与标准无铅MV IS79对比，证明可以实现一种创新的高电绝缘性复合物，同时结合无铅XL-EPDM复合物的性能，以及将其作为热塑性材料进行加工的可能性。



○ 图1: 含铅 (橙色) 和无铅 (白色) 的中压绝缘，从粒料到电缆

2 无铅中压TPV化合物

2.1 中压TPV化合物的制备

我们在配备了两个反向旋转转子，以及8cm³容室的内部混合器中制备无铅中压绝缘化合物MV IS79，以及中压热塑性硫化橡胶化合物中压TPV。中压TPV化合物的构成摘要请见表1。显然，中压TPV79 A和B的弹性和热塑性相比比例相同，但配方中使用了不同的助剂。我们首先通过防止PP由自由基^[3]引发β裂变造成分解来研究助剂对TPV复合物的影响，然后才完成上述操作。

MV IS79通过在内部混合器里混合所有成分进行制备，从而实现成分的完整混合。取下后在二辊磨中加入过氧化物。在180°C的条件下用压缩成型机压缩轧制板10分钟后获得测试样本。力学性能测试用的样本以铣削方向切割。

通过混合无铅复合物 (MV IS79) 与热塑性塑料聚丙烯 (PP) 制备MV TP79化合物，比例如表1。混合过程中，由于发生自由基反应，在温度不断上升的时候，扭矩展现出一种特征模式，如图2^[4,5]图形所示。加入配料后，由于成分在低温下的高粘度，扭矩随之增大。提高温度，材料开始软化，扭矩在混合时下降。随着自由基反应开始，橡胶相和PP相的β断裂发生同时交联反应，产生相反转，使扭矩迅速增大。大约经过8分钟的处理后，TPV被取下，此时的最终温度为200°C到220°C。将依旧高热的化合物在二辊轧机内压延为板状；在压缩成型机中以180°C压制板材1分钟，得到片材。力学性能测试用的样本以铣削方向切割。

如表2所示，所有化合物都表现出相似的力学性能，即拉伸强度 (TS)、断裂伸长率 (EB) 和200%伸长率的TS。

PP及其比例的选择似乎不会对力学性能产生显著的影响，与标准MV IS79相近。与此相反，PP的结晶度导致硬度 (HS)

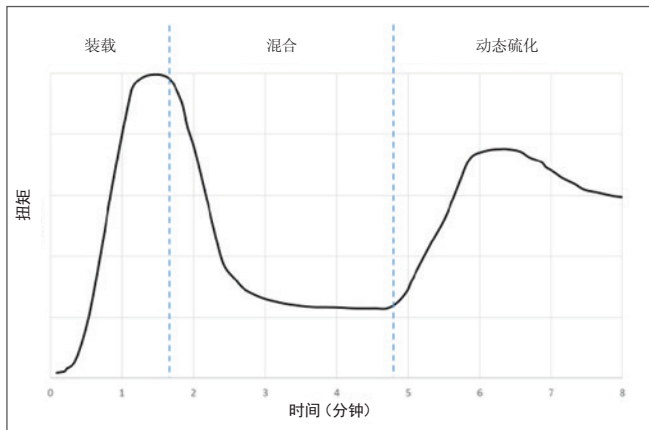


图2: 中压TPV化合物生产过程中扭矩模式与时间函数示意。该过程的三个主要步骤示意

明显增加, MV TP79 C达到48邵氏D, 即PP含量最高的化合物。由于MV TP79 A和B的高粘度, 在190°C的温度及21.6kg的重量下对熔体流动指数 (MFI) 进行了测量。

它们的低流速归因于两个主要因素: 热塑性和弹性相的比率, 以及测试温度下的低MFI PP选择。但可以注意到的是, 通过仔细平衡两相之间的比率, 以及准确的PP选择, 能够使MV TP79 C获得相当于标准MV IS79的MFI。这些结果均由2.3节中的流变学研究证实。

为便于比较和突出中压TPV化合物的成功, 我们制作了不含过氧化物的参考材料。因此, 在这些化合物中, 动态硫化不可能在成分混合后发生。参考化合物MV Ref AB的成分和MV TP79 A、B相同 (不含过氧化物和助剂), 参考化合物MV Ref C的配方同MV TP79 C (无过氧化物)。两个参考化合物的流变性和力学性能均对本文中的MV TPV化合物进行分析, 从而证明我们通过可重复且受控的方式获得TPV化合物的能力。

2.2 差示扫描量热分析

为测定固化过程后化合物中残留的未反应过氧化物, 我们采用了DSC。使用Perkin-Elmer DSC 6000测量光谱, 惰性氮气为0°C到230°C, 加热速率为20°C/分钟, 加热结束后以10°C/分钟的速度将样本冷却至0°C。该循环重复三次。但由于这项研究的目的是量化初始和剩余 (固化或动态硫化后) 过氧化物的比值, 所以下文只讨论第一个加热循环。

首先分析包含100%未反应过氧化物的未固化MV IS79, 并用作参考。从图3的DSC可以看到, 过氧化物分解产生的反应焓 (ΔH) 为-8.97焦/克。已固化MV IS79 (180°C下10分钟) 的DSC图也具备同样的数据。检测到-1.16焦/克的 ΔH , 对应约13%左右的未反应过氧化物残留。这表明MV IS79几乎完全硫化。同样对MV TPV化合物的未反应过氧化物量进行计算, 考虑到MV TP79 A、B和MV TP79 C分别含有75%和70%的未固化MV IS79。

从收集到的数据和图4可以看出, MV TP79 A中检测到的过氧化物残留约为4% ($\Delta H=-0.27$ 焦/克), MV TP79 B中约为5% ($\Delta H=-0.33$ 焦/克)。MV TP79 C的残余过氧化物为11%左右 ($\Delta H=-0.68$ 焦/克)。这些结果无疑证明初始过氧化物在动态硫化过程中几乎完全分解。

2.3 流变性

流变性研究是预测化合物挤压行为的基础。因此, 我们研究使用Göttfert Rheograph 2002毛细管流变仪在表观剪切率200 s⁻¹到1 s⁻¹的范围内对流变性进行了研究。毛细管的L/D为30, 在180°C下进行。选择这一温度是为了让PP完全融合。通常来说, MV IS79这样的标准化合物在固化步骤前的特性为125°C, 但这个温度并不能熔化PP, 从而产生误导性的结

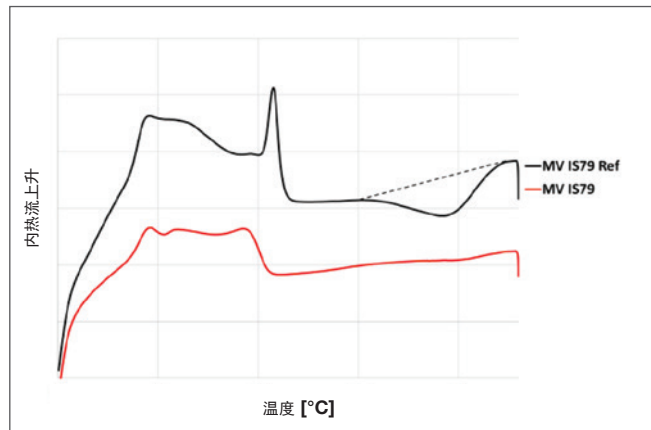


图3: 未固化 (上) 和已固化 (下) MV IS79的DSC分析。虚线: 用于计算反应焓的基线的图形示意

果。高测试温度可以防止过氧化物在分析过程中分解, 因此可以在无过氧化物的情况下研究MV IS79。如前所述, 参考化合物MV Ref AB和C都包括在这项研究中, 以强调动态硫化造成的流变行为变化。表观抗剪强度与表观剪切速率的函数如图5所示。

MV IS79的反应是EPDM/PE混合物的典型反应: 剪切应力在基本呈线性降低的剪切速率中迅速下降。可以注意到完美线性中的小偏差, 这通常归因于EPDM橡胶。MV Ref AB和C表现出剪切应力向较低值转化的相同模式。这种效应由热塑性相造成, 表明此温度下的低粘度。

相应地, 增加PP含量使剪切应力降低。由于MV TPV化合物的性质不同, 其流变行为也截然不同^[6,7]。本质上, 这种性质上的不同来源于弹性交联粒子的弹性反应, 而这种弹性粒子在低剪切应力下占主导地位。相反, 在高剪切应力的条件下, TPV化合物的行为由热塑性相控制。因此, 三种MV TPV

TPV 构成	MV TP79 A	MV TP79 B	MV TP79 C
MV IS79	75%	75%	70%
PP-1 ¹	25%	25%	20%
PP-2 ²	-	-	10%

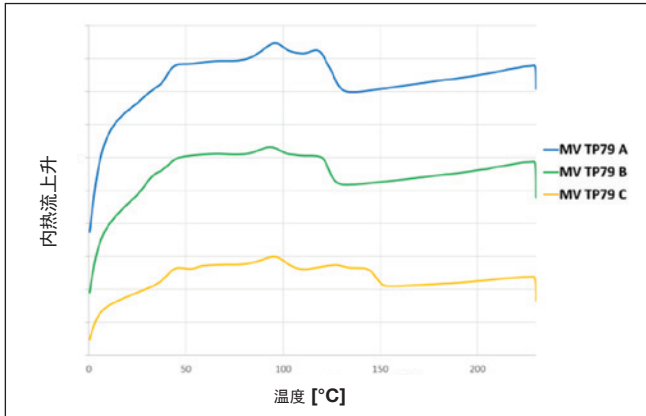
¹d = 0.891 gr/cm³, MFI (230°C; 2.16kg) = 8.0 gr/10min;
²d = 0.900 gr/cm³, MFI (230°C; 2.16kg) = 10.0 gr/10min

表1: 中压TPV的配方

	MV IS79	MV TP79 A	MV TP79 B	MV TP79 C
TS ¹ [N/mm ²]	16.61	17.31	17.19	15.73
EB ¹ [%]	321	360	310	341
TS @ 200% [N/mm ²]	14.23	13.57	14.48	13.62
HS ² [邵氏A-D]	80-/	96-45	95-46	96-48
MFI ³ [gr/10min]	27.6 ⁴	4.4	4.2	21.3

¹ASTM D412; ²ASTM D2240; ³ASTM D1238 (190°C, 21.6kg),
⁴无过氧化物复合物的测量数据

表2: 中压绝缘化合物的典型物理性能



○ 图4: MV TP79 A (上)、MV TP 79 B (中) 和MV TP79 C (下) 的DSC分析

化合物在高剪切速率的行为与参考化合物相似。而在低剪切速率下的曲线则明显不同。

只关注MV TPV化合物的话，如前2.1节针对MFI所述，通过仔细平衡两相之间的比率，以及准确的PP选择，能够“调节”为TPV MV化合物的流变行为，保持甚至加强形变热属性。在这方面，MV TP79 C显示出较低的应力，即粘度，直到极低的剪切速率，并且在参与研究的TPV MV化合物中具有最佳的形变热属性。

2.4 力学测试

根据ASTM D412法测量中压绝缘混合物的应力应变特性，均衡Gibitre拉力试验机得出的五个哑铃试验片的结果。试验片切沿加工方向切割，来自180°C下压缩成型机压制的板材。将MV IS79压缩10分钟，以完成固化。MV TP79 A、B和C压缩1分钟，并在压力下冷却。MV Ref AB和C经过与MV TPV化合物一样的处理，以获得试样。图6为各个化合物应力应变曲线的例子。

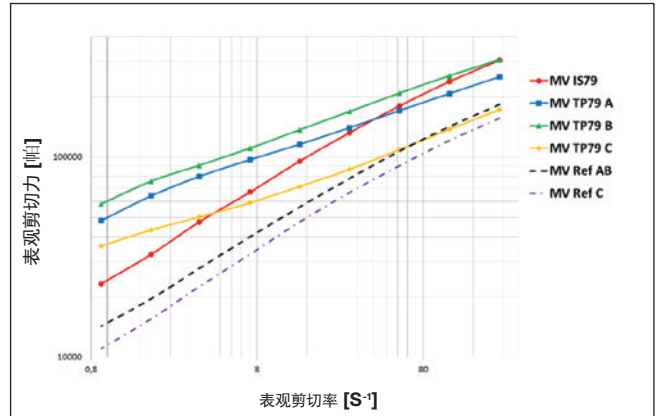
乍看之下，材料的应力应变曲线分析表明MV TPV化合物在TS和EB方面与标准MV IS79的性能相似，如2.1节中所述。除了绝对值以外，轮廓曲线遵循类似的模式，对所施加的应力具有很强的弹性反应。可以观察到，其中的主要区别是MV TPV化合物的杨氏模量更高。这是由热塑性相的结晶引起的，因此MV TP79 C的更大。参考化合物MV Ref AB也可观察到相似的行为，其杨氏模量几乎与MV TP79 A和B相同。同样，MV Ref C的杨氏模量与TP79 C相似。但这些未硫化且缺乏弹性的参考化合物会一直弯曲直到断裂。与此相反，MV TPV化合物表现出高伸长率^[9-10]交联材料的行为。这些结果与流变学研究一致，证明了热塑性硫化橡胶化合物的成功。

根据CEI 20-86，为了评估MV TPV化合物的高温性能，我们进行了热压力测试。130°C下的纵向收缩如表3总结，这是额定90°C和105°C的热塑性绝缘材料的强制要求。结果表明，从MV TP79 A到MV TP79 C呈现改进趋势。但这并不是热塑性塑料相和弹性相之比导致的结果，而是来自可以经受如此高温的PP(见表1)的加入。

2.4.1 热老化抗性

中压绝缘化合物在135°C及150°C下测试168小时、240小时及504小时，以评估其加速老化抗性。保留的TS和EB如图7和图8所示。MV TP79 A和B不能150°C下进行测试，因为热塑性相在此温度下会完全融化。在这方面，MV TP79 C包含熔点温度更高的PP，是MV IS79在150°C下的唯一替代。

首先，必须指出的是，所有化合物的保留TS和EB在135°C下均表现出优良的抗性，在504小时后高于70%。MV IS79和MV TP79 C在135°C下的热老化抗性都非常出色，保留TS和EB达到90%以上。虽然与MV IS79相比耐热性能略有下降，但MV TP79 C在150°C下504小时后依然保留80%以上的TS和



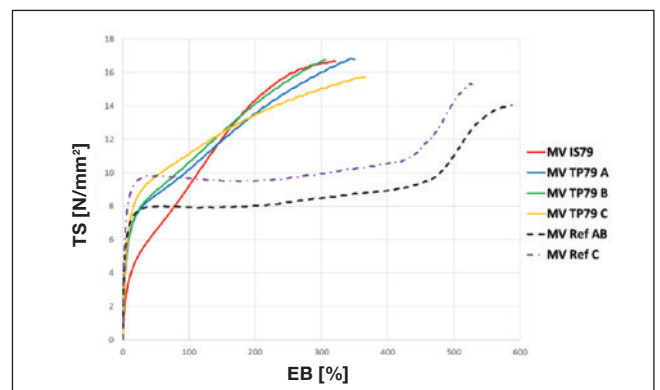
○ 图5: 中压绝缘化合物在180°C下的表观抗剪强度与表观剪切速率测量函数。虚线: 参考化合物

70%以上的EB。试验表明，MV TP79 C可以承受与MV IS79相同的老化条件。需要考虑到的是，MV IS79的额定使用温度是105°C，因此通常在150°C下测试508小时，TS和EB的典型保留值为95%和75%。根据CEI 20-86，额定使用温度90°C和105°C的中压绝缘化合物分别必须在135°C和150°C下承受240小时的老化。因此，MV TP79 C是标准无铅中压绝缘化合物的有效热塑性替代品。

2.5 电气性能

化合物的绝缘性能通过在干燥条件下测量损耗系数(Tanδ)、介电常数(ε)和体积电阻率与25°C到90°C的温度函数进行评估。此外，还将化合物在90°C的水中浸泡最多28天后测量其损耗系数和介电常数。电气性能使用2mm厚的压制成型样品进行测量。使用Omicron MI600系统评估Tanδ和ε; 使用QuadTech 1868A模型研究体积电阻率。化合物的所有电气性能研究均在Imerys laboratories进行。

图9为干燥条件下25°C到90°C之间的Tanδ示意图。四种化合物的区别在于少量损耗系数变化，并且在最高90°C下保持同一量级(10⁻³)。此外，所有化合物都表现出Tanδ随温度增加的相似趋势。更详细来看，这四种化合物的损耗系数在室温下



○ 图6: 中压绝缘材料的应力应变图。虚线: 参考化合物

	MV TP79 A	MV TP79 B	MV TP79 C
热压测试 ¹ [%]	n.a. ²	27	3
纵向收缩 ¹ [%]	14	11	2

¹CEI 20-86; ²不适用

○ 表3: 130°C下中压TPV化合物的热压试验和纵向收缩

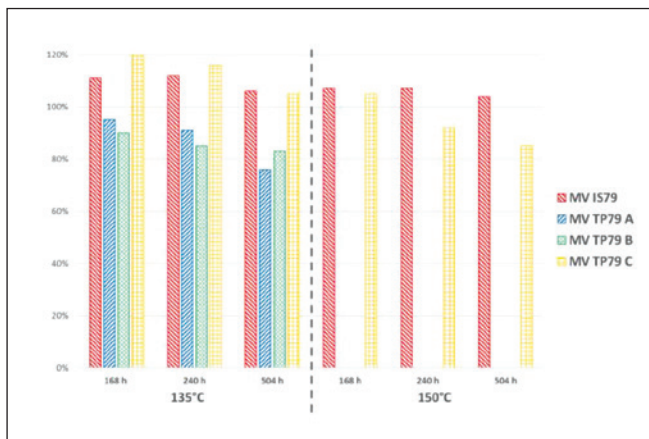


图7: 135°C及150°C下空气老化168小时、240小时及504小时后保留的拉伸强度

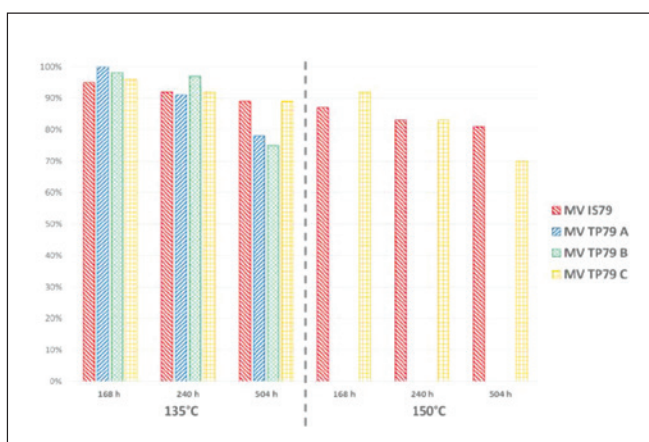


图8: 135°C及150°C下空气老化168小时、240小时及504小时后保留的断裂伸长率

几乎相同, 约为 $1.5 \cdot 10^{-3}$, 并随着温度稳步增长, MV IS79和MV TP79 A分别在90°C下达到 $3.5 \cdot 10^{-3}$ 与 $5.0 \cdot 10^{-3}$ 之间。

与Tanδ的情况一样, 所有复合物的ε_r随着温度提高出现小范围的变化。在图10中, 随着温度的提高只观察到小幅度的介电常数降低。ε_r通过以下公式计算:

$$\epsilon_r = \left(\frac{C}{\epsilon_0}\right) \left(\frac{t}{A}\right)$$

其中C是仪器测量的电容, ε₀是真空介电常数, 而t和A是几何系数, 代表板材(电极)及其各自区域之间的分离度。MV TPV化合物与MV IS79相比介电常数较低, 这是由于其内含的PP提高了化合物整体的绝缘性能。因此, MV IS79与MV TP79 C相比拥有更高的介电常数。但必须指出的是, 在低温或高温条件下, 这些化合物之间的差异相当有限。

最后, 我们测量了25°C和90°C下500V电位的体积电阻(见表4)。在25°C条件下, 所有化合物均具备 10^{15} Ω厘米量级的体积电阻率, 是中压绝缘材料标准值。在90°C条件下, MV TPV化合物的体积电阻率比MV IS79低大约1个量级。这种结果上的差异最有可能来自TPV化合物热塑性相的部分融解, 导致材料里的电荷载体子表现出更高的迁移性。但除此之外, 四种MV TPV化合物的体积电阻率均大于 10^{13} Ω厘米。

2.5.1 水中的电气性能

我们还将化合物在90°C的水中浸泡最多28天后, 对其电学属性进行了研究。首先, 根据意大利CEI 20-86规范对比MV

体积电阻率 [$\cdot 10^{14}$]	MV IS79	MV TP79 A	MV TP79 B	MV TP79 C
25°C [Ω-cm]	47.0	41.6	41.3	50.3
90°C [Ω-cm]	2.54	0.378	0.284	0.321

表4: 25°C和90°C下500V电位的体积电阻

	MV IS79	MV TP79 A	MV TP79 B	MV TP79 C
吸水性 ¹ [mgr/cm ²]	0.34	0.32	0.35	0.34

称重法, CEI EN 60811-402

表5: 依据CEI 20-86标准的吸水性

IS79评估了MV TPV化合物的吸水性。结果如表5总结, 表明化合物在85°C水中浸泡14天后的吸水性几乎相同, 大幅低于上限(5mgr/cm²)。

在90°C水中浸泡样本后, 低吸水性反映在了Tanδ的变化上(见图11)。这些化合物具有良好的损耗系数保留能力, 即浸泡水中28天后, 最坏的情况约为0.035, 最好为0.017。

归功于优越的稳定性, MV TP79 C再次表现最佳性能, 接近MV IS79的标准性能。

吸水率低, 并且ε_r在90°C水浸泡后基本保持不变。如图13所示, 水中浸泡后介电常数的增加量相当小。

MV TPV化合物中, MV TP79 C表现出最佳的时间稳定性, 即使在水中浸泡28天之后, 其ε_r也比标准MV IS79更低。

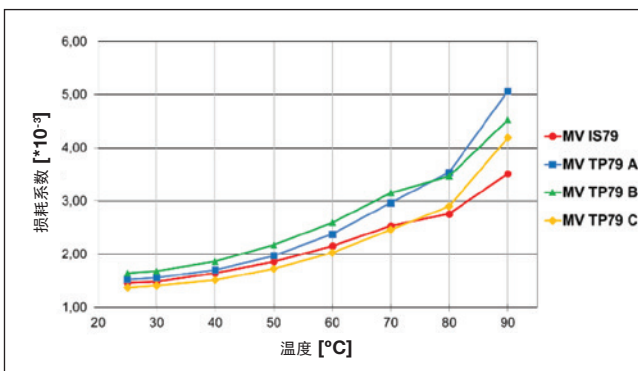


图9: 500V和50Hz下损耗系数(Tanδ)与温度的函数

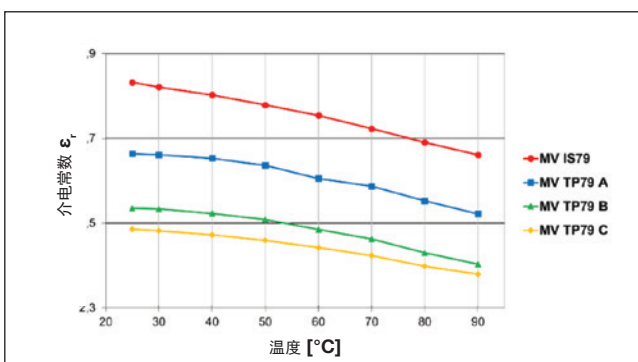


图10: 500V和50Hz下介电常数(ε_r)与温度的函数

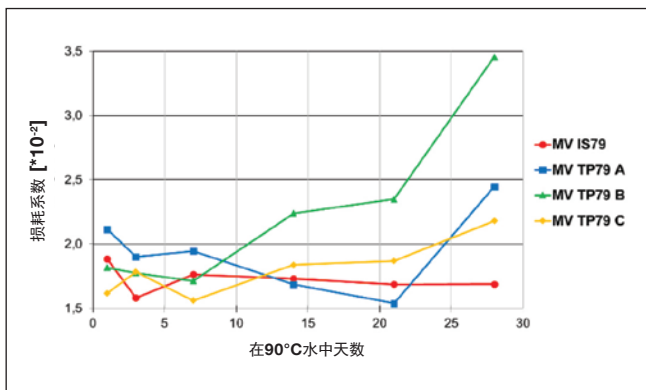


图11: 500V和50Hz下损耗系数 ($Tan\delta$) 与在90°C水中浸泡天数的函数

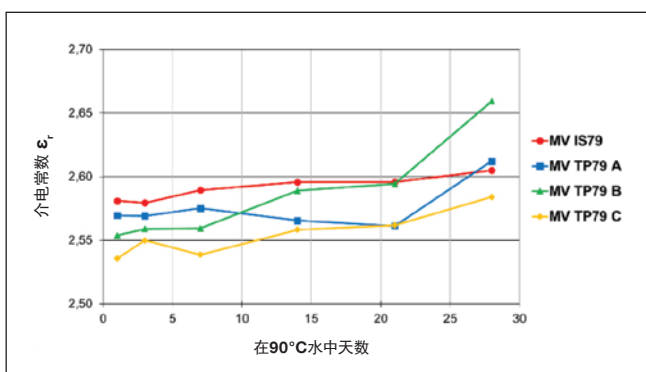


图12: 500V和50Hz下介电常数 (ϵ_r) 与在90°C水中浸泡天数的函数

结论

新开发的MV TPV化合物如本文所述。我们的目标是生产性能与实际无铅绝缘市场标准相当的中压绝缘化合物，并具备热塑性材料的易加工性。这些化合物的制备及其对比标准无铅中压绝缘材料的完整特性如本文所述。动态硫化过程通过DSC进行评估。事实上，我们还对在工业试验厂中生产TPV化合物以用作中压绝缘材料的能力进行了研究。尽管复杂的配方内包含聚合物、填料、助剂和抗氧化剂，但中压TPV可以通过一套完全可重复的可靠流程获得。这项技术的成果是中压TPV化合物的整体属性，与标准无铅MV IS79的性能相似。流变性研究除了证实化合物的TPV性质以外，还模拟了它们的挤压行为，证明合适的热塑性PP选择可以降低剪切应力，保持TPV化合物的典型弹性反应不变。

对中压TPV化合物的应力应变曲线的详细分析，印证了其弹性行为只会部分受到热塑性相结晶度的影响，导致其力学性能与标准MV IS79相似。在135°C条件下老化时，中压TPV化合物的抗性经证明可在504小时后保留70%以上的TS和EB。在150°C下老化504小时后，MV TP79 C保留80%的TS和70%的EB，几乎与参考MV IS79相同。最后，所有化合物都在500V及50Hz条件下接受了干湿电性能测试。MV TP79 A在90°C干燥条件下的 $Tan\delta$ 随温度提升至上限约 $5 \cdot 10^{-3}$ ，依然与同温度下MV IS79的 $Tan\delta$ ($3.5 \cdot 10^{-3}$)相当。

同样，所有化合物在25°C到最高90°C的条件下， ϵ_r 的变化幅度均很小(2.8到2.4之间)。体积电阻率的测量证实了25°C ($10^{15}\Omega$ 厘米)下的优异绝缘性能，在90°C下略有下降($10^{13}\Omega$ 厘米)。我们还将样本在90°C的水中浸泡最多28天后，对其湿电属性进行了研究。MV TP79 B的 $Tan\delta$ 在湿润条件下最高升至 $3.5 \cdot 10^{-2}$ 。MV TP79A和C具有较好的耐水性，后者在90°C水中浸泡28天后的性能与MV IS79相近，分别为 $2.2 \cdot 10^{-2}$ 和

$1.3 \cdot 10^{-2}$ 。 ϵ_r 也表现出同样的趋势，将样本浸泡水中后呈现缓慢的增长。但2.53到2.66之间的这种波动实际上是无紧要的，因为存在度量相关的误差。

总结来说，本文记述了将TPV化合物作为中压应用绝缘材料的综合性研究。分步做法表明如何逐步提高化合物的性能，从而获得全热塑性的无铅材料，即MV TP79 C，具备可媲美无铅市场标准MV IS79的力学性能、流变性能和电气性能。根据规范CEI 20-86，MV TP79 C可以用作中压绝缘材料，其额定连续运行温度为105°C，并可承受250°C的紧急短路温度。Mixer将继续推进这一策略，希望不久后能够开发出在高温下及水中具有高抗性和更好电气性能的中压TPV化合物。

鸣谢

作者感谢Imerys作为本研究中所用原材料的供应商。此外，作者还感谢英国Par的Imerys实验室对其化合物进行的电气测量。

参考文献

- <https://www.scribd.com/doc/317018709/Mixer-SpA-Lead-Free-EPDM-Compounds-for-MV-Cables>
- <http://echa.europa.eu/substance-information/-/substanceinfo/100.013.880>
- F R De Risi and J W M Noordermeer, "Effect of Methacrylate Co-agents on Peroxide Cured PP/EPDM Thermoplastic Vulcanizate," Rubber Chem. Technol, 80(1), 83-99, (2007).
- R Rajesh Babu, N K Singha and K Naskar, "Influence of 1,2-Polybutadiene as Coagent in Peroxide Cured Polypropylene/Ethylene Octene Copolymer Thermoplastic Vulcanizates," Mater Design, 31, 3374-3382, (2010).
- Y Chen, C Xu, X Liang and L Cao, "In Situ Reactive Compatibilization of Polypropylene/Ethylene-Propylene-Diene Monomer Thermoplastic Vulcanizate by Zinc Dimethacrylate via Peroxide-Induced Dynamic Vulcanization," J Phys. Chem B, 117, 10619-10628, (2013).
- L A Goettler, J R Richwine and F J Wille, "The Rheology and Processing of Olefin-based Thermoplastic Vulcanizates," Rubber Chem. Technol, 55(5), 1448-1463, (1982).
- A A Katbab, H Nazockdast and S Bazgir, "Carbon Black-reinforced Dynamically Cured EPDM/PP Thermoplastic Elastomers. I Morphology, Rheology, and Dynamic Mechanical Properties," J Appl Polym Sci., 75(9), 1127-1137, (2000).
- S Abdou-Sabet, R C Puydak and C P Rader, "Dynamically Vulcanized Thermoplastic Elastomers," Rubber Chem Technol, 69(3), 476-494, (1996).
- M Boyce, K Kear, S Socrate and K Shaw, "Deformation of Thermoplastic Vulcanizates," J Mech Phys Sol, 49(5), 1073-1098, (2001).
- Y Yang, T Chiba, H Saito, and T Inoue, "Physical Characterization of a Polyolefinic Thermoplastic Elastomer," Polymer, 39(15), 3365-3372, (1998).

Mixer SpA
Villa Prati di Bagnacavallo,
Ravenna,
意大利
电话: +39 0545 47125
电子邮件: info@mixercompounds.com

iPool Srl
Ripa Castel Traetti,
Pistoia,
意大利
电子邮件: info@i-pool.it

Agir Technologies 41, 57	Huber+Suhner 18, 52	Sikora AG 43, 54
AIM Inc 68	Ideal Networks 16, 51	Southwire Company LLC 45, 54
Ajex and Turner Wire Dies 79	IISCO Steel Plant 79	Staku Anlagenbau GmbH 50, 71
Alloy Wire International 37, 54	Leoni AG 26, 53	Sterlite Technologies 78
AndinaFairs SAS 34	Friedrich Kocks & Co GmbH... 24, 51	SunWyre Inc 65, 77
Azure Power 79	Messe Düsseldorf 12, 32, 52, 53	Tenova 22
Bharat Broadband Network Ltd 79	Messe Düsseldorf Shanghai 8, 48	Troester GmbH & Co KG... 38, 39, 56
Cimteq Ltd 45, 54	Plasmait GmbH 66, 75	Tsubaki
Contrôle Mesure Systèmes 68, 77	Proton Products 60, 77	Kabelschlepp GmbH 60, 75
Davis-Standard LLC 41, 51	Prysmian Group 14, 34, 50, 57	Ugitech SA 28, 55
Decalub 66, 76	Reiku GmbH	Weber & Scher Mfg Co Inc 20, 53
Gebr Kufferath AG 30, 50	Kabelschutzsysteme 58, 74	Wire & Cable Guangzhou 34, 57
Gimax Srl 73	RosendahlNextrom 62, 76	Wire & Plastic Machinery Corp 30
Guill Tool & Engineering 59, 76	Schlatter Industries AG 62	wire 2018 47, 55

Front cover courtesy of Mexichem Specialty Compounds, showing their tailored plastic compound solutions.
For more details please call +44 1664 882462 (UK) or +1 888 540 9074 (USA), Website: www.mexichemspecialtycompounds.com

Advertisers Index

Adwantek Technologies Co Ltd 30	Messe Düsseldorf GmbH – IRAN WIRE 2017 22
Agir Technologies 21	Mexichem Specialty Compounds Front cover
AIM Inc 2	MFL Group 40
Anbao Qinhuangdao International Corp 28	Maschinenfabrik Niehoff GmbH & Co KG 17
ATE Applicazioni Termo Elettroniche Srl 44	Paramount Die Co 69
Beta LaserMike	Pressure Welding Machines Ltd 65
(An NDC Technologies Brand) 91	PS Costruzioni Meccaniche Srl 18
Blachford Corporation Inside front cover	Queins Machines GmbH 93
Borouge Pte Ltd 13	Reelex Packaging Solutions Inc 25
BWE Ltd 87	Rosendahl Nextrom GmbH 9
Candor Sweden AB 95	Shanghai Hosn Machinery
CERSA-MCI 41	Technology Co Ltd Inside back cover
Comsac Technology Development Co Ltd 47	Shanghai Nanyang Equipment Co Ltd 49
Condat SA 89	Shantou Senyang Wire & Cable Material Co Ltd 120
Continuus-Properti SpA 46	Shaoxing Kaicheng Mica Material Co Ltd 15
CRU's World Optical Fibre & Cable 2017 72	Sheng Chye Enterprise Co Ltd Back cover
DeWal Industries 37	Sjogren Industries Inc 43
Dongguan Nanyue Mold Die Casting Co Ltd 12	Sket Verseilmaschinenbau GmbH 33
Enkotec A/S 29	SMS Group GmbH 61
Eurolls SpA 63	Spirka Schnellflechter GmbH 35
Fort Wayne Wire Die Inc 85	Stolberger KMB GmbH 93
FUHR GmbH & Co KG 24	August Strecker GmbH & Co KG 84
Gimax Group Srl 42	Supremac Industries India Ltd 47
GMP Slovakia sro 16	THELEICO Schleiftechnik GmbH & Co KG 71
Guanbiao Electrical Machinery Co Ltd 20	TJK Machinery (Tianjin) Co Ltd 36
Hefei Smarter Technology Co Ltd 14	Troester GmbH & Co KG 45
Henrich Maschinenfabrik GmbH 67	Ultimate Automation Ltd 73
Jia Jiun Steel Co Ltd 26	Upcast Oy 19
Jiangsu Handing Machinery Co Ltd 1	Wardwell Braiding Co 35
Jiangsu Qunye Electrical Co Ltd 59	Weilly Diamond Industrial Co Ltd 26
Ernst Koch GmbH 31	Wire & Plastic Machinery Corp 10-11
Lämneå Bruk AB 27	Yangzhou Havet Machinery Co Ltd 30
Locton Ltd 95	Zumbach Electronic AG 3



46 Holly Walk • Leamington Spa • Warwickshire CV32 4HY • UK
Tel: +44 1926 334137 • Fax: +44 1926 314755 • Email: wca@intras.co.uk • Website: www.read-wca.com

US copies only: Wire & Cable ASIA (ISSN No: 0218-3277, USPS No: 022-979) is published bi-monthly by Intras Ltd and distributed in the USA by Asendia USA, 17B S Middlesex Ave, Monroe NJ 08831. Periodicals postage paid at New Brunswick, NJ and additional mailing offices.
Postmaster: send address changes to Wire & Cable ASIA, 17B S Middlesex Ave, Monroe NJ 08831.



PVC WRAP FILM

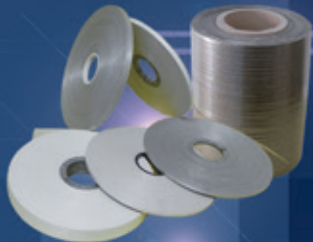
SENYANG

WIRE&CABLE MATERIALS

Guangdong Senyang Wire&Cable Materials Technology Co., Ltd is a leading, large-scale enterprise with more than ten years experience, specialising in the development, manufacture, marketing and servicing of wire and cable materials.



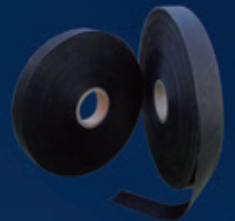
PP FILLER YARN



MICA TAPE

PRODUCTS:

- ◆ Semi-conductive series (Semi-conductive water blocking tape, Semi-conductive Nylon tape, etc)
- ◆ Flame retardant series (fire-resistant Mica tape, etc)
- ◆ Insulation shielding series(Polyester tape, Non-conductive water blocking tape, Nonwoven tape, etc)
- ◆ Filler products(PP filler yarn, etc)
- ◆ Packing products(Packing film, etc)
- ◆ Marking products(Cable color distinguishing ribbons, etc)
- ◆ Galvanized Steel tape for cable armoring



SEMI-CONDUCTIVE TAPE



GALVANIZED STEEL TAPE



NON-WOVEN TAPE



SENYANG ALONG WITH HIGH QUALITY CABLE. SENYANG MATERIALS MADE CHINESE STANDARD CABLE



Address: Shantou, Guangdong, China
Tel: +86-754-88388392/93/94/95/96/97/98
E-mail: senyang@stsenyang.com

Fax: +86-754-88341878
Website: www.stsenyang.com

SINCE 1984

HOSN

SHANGHAI HOSN
MACHINERY TECHNOLOGY CO.,LTD.



www.wireshow.com
A Grand Wire & Cable Event

China International Wire & Cable Industry Exhibition

Shanghai New International Expo Center(SNIEC)

30th Aug -- 1st Sep 2017

Booth No.

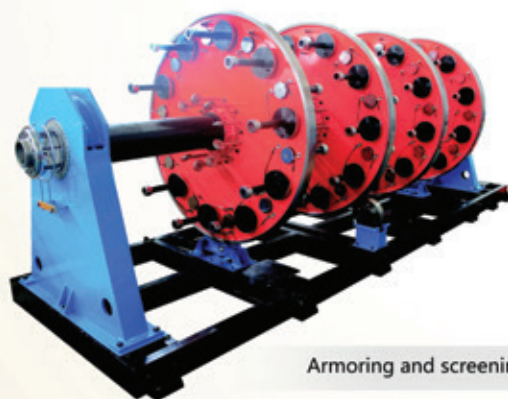
W5E41



Rigid Frame Stranding Machine --- By Reducer



Rigid Frame Stranding Machine --- By Belt



Armoring and screening Machine



Tubular Strander



Aluminum Alloy / Copper Rod Breakdown Machine Separate Motor



Drawing machine series



Copper Rod Breakdown Machine with Continuous Annealer



Dram Twister

Tel : 021-58588333 Fax : 021-58961185 E-mail : hosn@hosnglobe.com <http://www.hosnglobe.com>

Add: Suite 909C, Building1, Jidiangang, Zhangjiang High-tech Park, No.3000, Longdong Avenue, Shanghai



SHENG CHYEAN
SHENG CHYEAN ENTERPRISE CO., LTD.

COLD DRAW BAR MACHINERY

冷拉金屬棒材設備

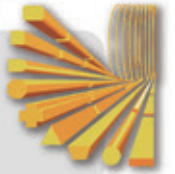


伸棒機



video

**COIL TO BAR COMBINED
DRAWING MACHINE**



兩輓矯直機

**2 ROLLER
STRAIGHTENING
MACHINE**



video

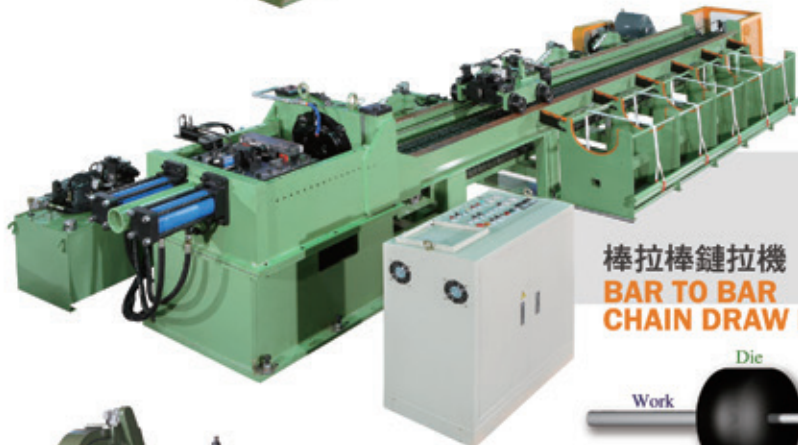
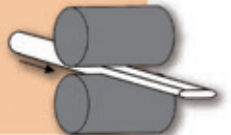


壓延機



video

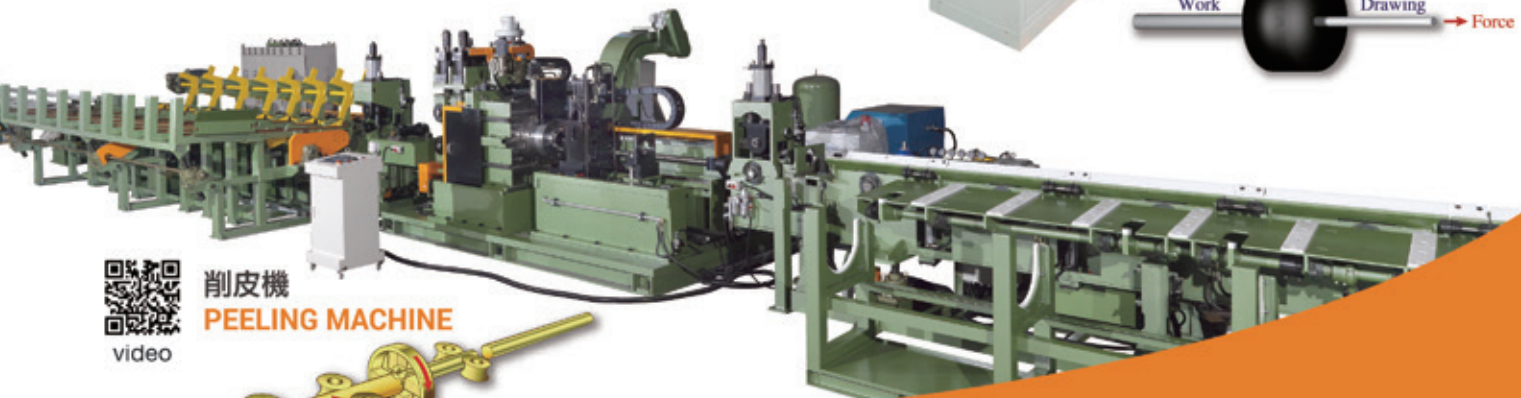
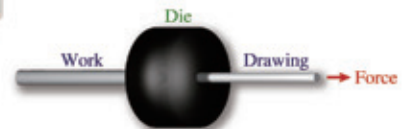
FLAT ROLLING MILL MACHINE



棒拉棒鏈拉機
**BAR TO BAR
CHAIN DRAW BENCH**



video



削皮機

PEELING MACHINE

video



省權實業股份有限公司 SHENG CHYEAN ENTERPRISE CO., LTD.

台灣彰化縣線西鄉中華路 283 巷臨 99 號

No. 99, Ln. 283, Zhonghua Rd., Xianxi Township, Changhua County, Taiwan

+ 886 4 758 8533 + 886 4 758 8500

sales@tw-sc.com www.tw-sc.com

