



euro

July 2015 • US\$33*
www.read-eurowire.com

wire

The International Magazine for the Wire & Cable Industries

OIL RESISTANT,
FLAME RETARDANT,
LOW SMOKE EMISSIONS:

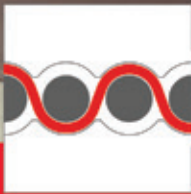
HFX 521

Fainplast is proud to present HFX 521, a new halogen free flame retardant crosslinkable compound (XLPO-HFFR) which can be used for the production of cables with high operating temperatures and excellent oil resistance.

 **Fainplast**
compounds
PASSION FOR PLASTICS

Ascoli Piceno - Italy
www.fainplast.com



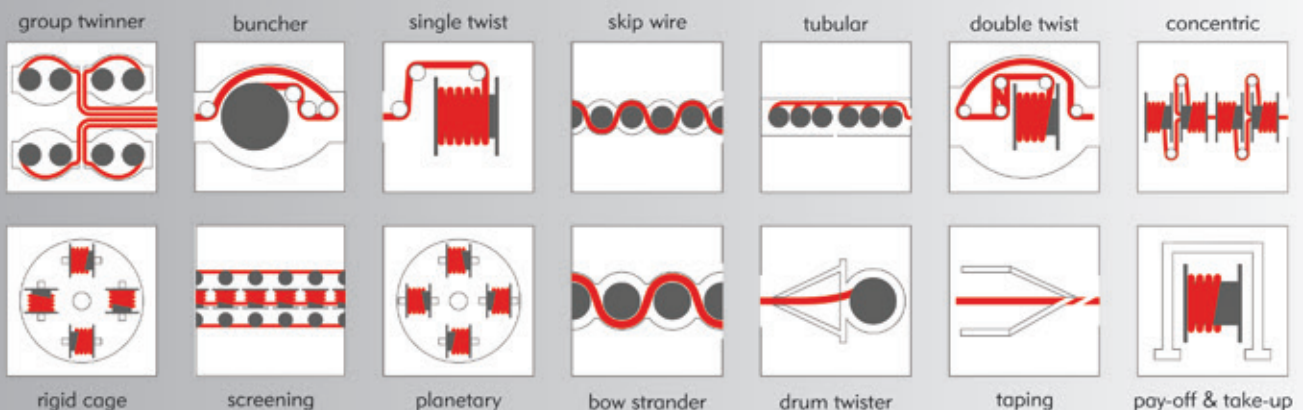


POURTIER Bow Cablers



Feel safe, go for Quality

All the machinery You need is here :



Visit us at :

www.pourtier-setic.com

Meet us at :

Bangkok
Sep. 16-18



São Paulo
Oct. 6-8



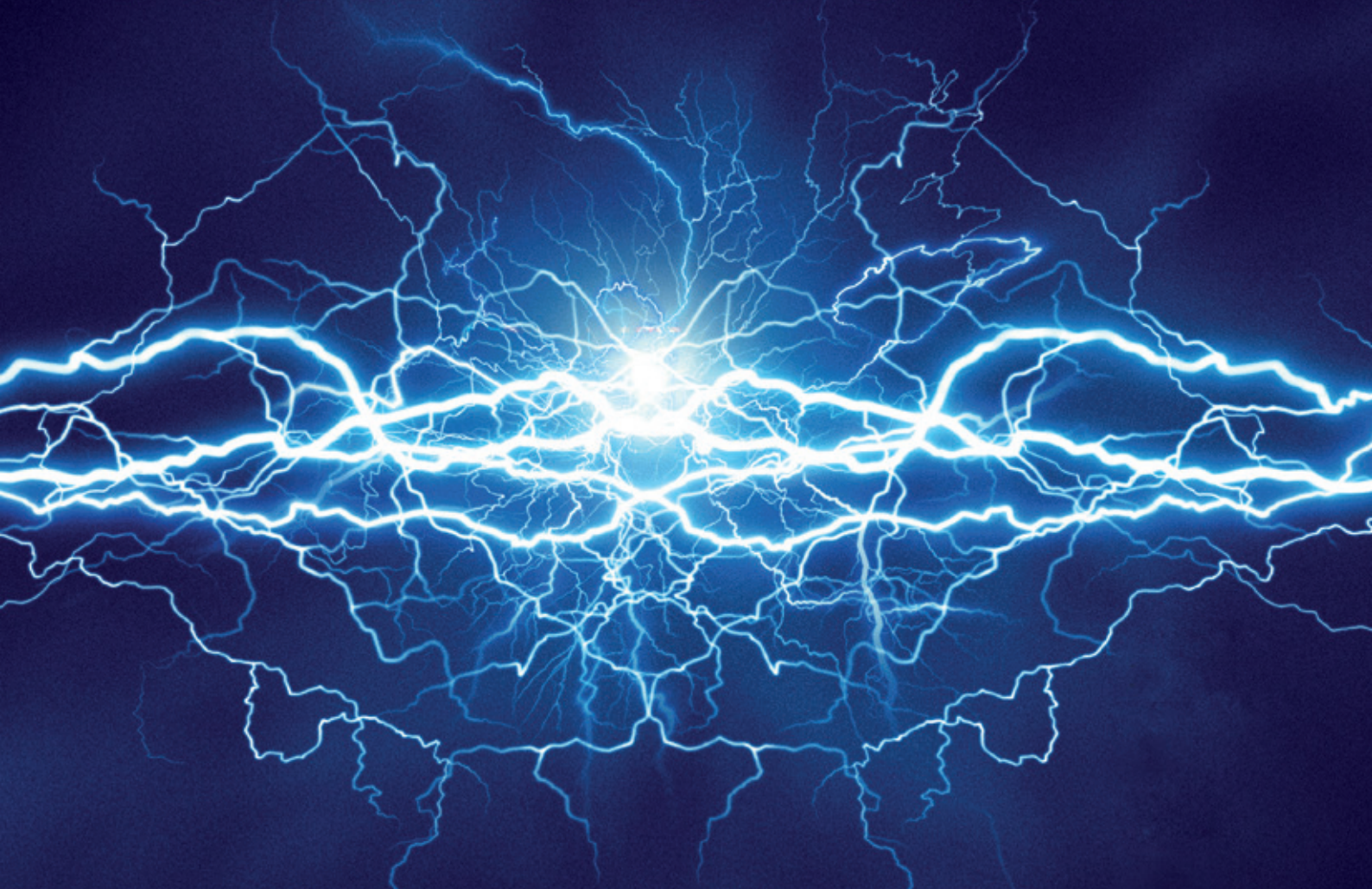
POURTIER France
Tel. : +33 1 64 21 84 00
pourtier@gaudergroup.com

SETIC France
Tel. : +33 4 77 23 25 55
setic@gaudergroup.com

POURTIER & SETIC of America
Tel. : +1 336 856 8176
pourtier.setic.america@gaudergroup.com

SPARK TESTER: ENSURE THE QUALITY OF CABLE JACKETS AND INSULATIONS

Powered To Perform



The new Spark Tester generation accurately maintains test voltage under any condition including highest capacitive loads.



- Shortest recovery time after disruptive breakdown
- Pin hole and bare patch detection
- Controlled, adjustable test voltage of up to 28kVDC / 15kVAC
- Complete range of electrodes
- Compliance with several standards including IEC 62230, UL 1581, UL 2556



Learn more about the
Spark Tester Family

Zumbach
SWISS PRIME MEASURING SINCE 1957

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

EQUIPMENT HIGHLIGHTS – SUMMER SPECIALS

- Eurodraw + Niehoff M85 Rod Breakdown Machines for Aluminum w/ Coilers and Dual Spoolers
- Ceeco + Caballe + Brondel 1.5m - 2.5m Drum Twisting Lines
- Davis-Standard + Nextrom + Rosendahl 45mm – 150mm Extruders (24 and 30 L/D)
- Nextrom + Maillefer EKP-50 (500mm), EKP-63 (630mm), and EKP-130 (1.25m) Dual Take-ups
- Skaltek 1.2m – 3.0m Portal Shaftless Payoffs and Take-ups
- Ceeco + Stolberger + Quiens + Northampton 400mm – 1.5m Planetary Stranders
- Northampton + Setic 1.0m, 1.25m and 1.8m Double Twist Bunchers



Eurodraw 14 Die,
2-Wire Rod Breakdown Line
WRD980



Niehoff
M85 11-Die Rod Machine
WRD971



Eurodraw
16-Wire Multi-wire Drawing Lines
WRD932



Ceeco
6-Wire 780mm Tubular Strander
CBR1157



Northampton
1.8m Double Twist Buncher
CBR1216



Ceeco
1.8m Drum Twister
CBR1202



Rosendahl
150mm 30:1 L/D Extruder
EXP1166



Niehoff + Maillefer
Tandem Line
EXPL362



Skaltek
3m Portal Take-up
TKU1284

We want to purchase your surplus equipment! We buy individual machines to complete plants for Cash.

FF**FORTUNA FEDERN****AUSTRIA**

The new generation of COM CNC spring coiling machines

**COM-16 CNC**

M smi metal
engineering expo

19-22 October 2015 booth # 601



More information:
www.fortunafedern.com/com

A-8544 Pöfing Brunn - Austria
T +43 (0) 3465 2949
F +43 (0) 3465 3704
M info@fortunafedern.com



*** US\$33 purchase only**
Front cover: Fainplast Srl
See page 76 for further details

EDITOR:David Bell
FEATURES EDITOR (USA):Dorothy Fabian
EDITORIAL ASSISTANT:Christian Bradley
DESIGN/PRODUCTION:Julie Tomlin
PRODUCTION:Lisa Wright
SALES & MARKETING:Jason Smith
(INTERNATIONAL)
UK & ROW sales
 Giuliana Benedetto
Italian speaking sales
 Hendrike Morriss
German speaking sales
 Linda Li
Chinese speaking sales

ADVERTISEMENT
COORDINATOR:Liz Hughes
ACCOUNTS MANAGER:Julie Case
SUBSCRIPTIONS:Julie Case
PUBLISHER:Caroline Sullens
FOUNDER:John C Hogg

INTRAS OFFICES

EUROPE: 46 Holly Walk, Leamington Spa
 Warwickshire CV32 4HY, UK
Tel: +44 1926 334137
Fax: +44 1926 314755
Email: eurowire@intras.co.uk
Website: www.intras.co.uk
Website: www.read-eurowire.com

USA: **ADVERTISING/MARKETING**
 Intras USA – Doug Zirkle
 Danbury Corporate Center,
 107 Mill Plain Road,
 Danbury, CT 06811, USA
Tel: +1 203 794 0444
Email: doug@intras.co.uk

US copies only:
 EUROWIRE (ISSN No: 1463-2483, USPS No: 022-738)
 is published bi-monthly
 by Intras Ltd and distributed in the USA by
 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
 Eurowire, 17B S Middlesex Ave, Monroe NJ 08831

www.read-eurowire.com

© 2015 Intras Ltd, UK
 ISSN 1463-2438



When you have finished with this magazine please recycle it recycle

Exhibitors lead the praise for Interwire

Interwire organiser Wire Association International has every right to be happy with the outcome from this year's exposition in Atlanta, USA.

A number of exhibitors were delighted with the response and quality of the leads they took home from the three-day show, and some of these can be found on pages 17 and 18 of this issue of *EuroWire*.

It is also time to look forward to another exhibition this year – wire Southeast Asia – which is being staged in Bangkok, Thailand, from 16th to 18th September. The latest details about the show can be found on page 14.

Also worthy of mention is the TKT Group's plans to celebrate its 70th anniversary – which includes expanding its production facilities with a new 25,000m² plant, due for completion by the end of 2015. Catch the story on page 22.

A new European cable manufacturer has also opened for business in Poland. MFK will be using some of Reelex Packaging Solution's most advanced lines in the production plant just outside of Krakow. See page 25 for details.

On the technology front, Germany's Hradil Spezialkabel has produced a 5,000V power supply cable for maritime applications as low as -200°C, that uses nickel rather than copper strands. The full story can be found on page 32.

UK manufacturer BWE has been making advances with its Conklad range. It has launched the Conklad 315 – the smallest in its range but which still includes many of the standard features of the larger machines. Turn to page 43.

NDC Technologies has launched the Beta LaserMike Laser Speed, which can help avoid products overages and shortages, as well as reducing scrap and rework. See page 45 for the full details.



David Bell
 Editor

Power up Your business



TBL - Skidless Wet Drawing Line



TBL increases significantly the productivity of drawing plants while reducing the operation costs. The exclusive design of the machine, guarantees higher drawing speeds (+ 50%), drawing die lifespan (+ 35%) and line efficiency (+ 30%), for an overall line productivity increase of 95%.

TBL can be easily connected to copper plating systems and is the ideal solution for welding wire production.

TBL eliminates wire slip during wet drawing, reducing wire mechanical stress. Moreover, each die and block is lubricated and cooled by dedicated high pressure water sprays. These exclusive features grant lower wire breakages, higher working speed and reduced die consumption.

Other advantages of *TECNOFIL TBL*:

- User friendly and highly accessible design
- Monolithic anti-vibration steel frame
- Wire drawing in one direction
- Heavy duty bearings with exclusive waterproof system
- AC independent motors electronically controlled and perfectly synchronized
- Switch board with touch screen
- Designed and successfully tested in intensive working conditions for almost 3 years

Tecnofil Machinery Division is specialized in the manufacture and supply of cutting edge machines for the production of steel wire and wirebands.

Tecnofil is the ideal partner thanks to its ability to create tailor-made solutions, its commitment to innovation and its overall control of production.



Tecnofil S.p.A. - via Brescia 49 - 25023 Gottolengo (BS) Italy
Tel. +39 030 9517655 / 57 - Fax +39 030 9517571
tecnofil.net - info@tecnofil.net

Contents

July 2015

Regulars

8 Diary of events

9 Corporate News

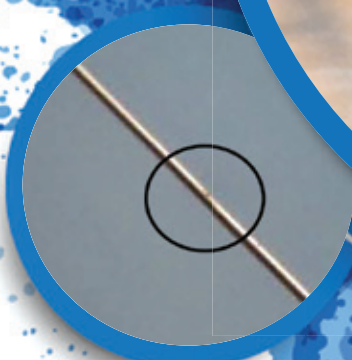
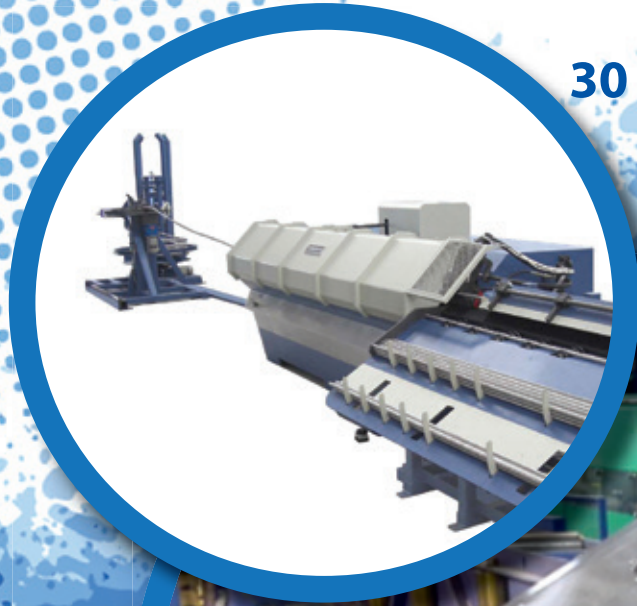
26 Transatlantic Cable

30 Technology News

76 Editorial Index

76 Advertisers' Index

30



48

10



Deutsch Inhalt

51 Neuigkeiten

76 Inserentenverzeichnis

Содержание на русском языке

56 Новости рынка

76 Перечень рекламодателей

Technical Articles

48 Ultra-fast, high resolution, surface quality measurement (SQM), for wires, optical fibres and cables

By Jean-François Fardeau, Gérald Novel and David Miara, Cersa-MCI, R&D division, Cabries, France

53 Extrem schnelle, hochauflösende Messung der Oberflächenqualität (SQM) für Draht, Lichtwellenleiter und Kabel

Von Jean-François Fardeau, Gérald Novel und David Miara, Cersa-MCI, F&E-Abteilung, Cabries, Frankreich

58 Сверхбыстрое измерение качества поверхности с высоким разрешением для проволоки, оптических волокон и кабелей

Жан Франсе Фарду, Джеральд Новел и Дэвид Миара, Cersa-MCI, научно-исследовательское подразделение, Кабре, Франция

63 Mesure de la qualité de la surface ultra-rapide, haute résolution pour fils, fibres optiques et câbles

Par Jean-François Fardeau, Gérald Novel et David Miara, Cersa-MCI, Division Recherche et Développement, Cabries, France

68 Misurazione della qualità della superficie ultra rapida, di alta risoluzione per fili, fibre ottiche e cavi

A cura di Jean-François Fardeau, Gérald Novel e David Miara, Cersa-MCI, Divisione Ricerca e Sviluppo, Cabries, Francia

73 Medición de calidad superficial ultra rápida, de alta resolución para alambres, fibras ópticas y cables

Por Jean-François Fardeau, Gérald Novel y David Miara, Cersa-MCI, Departamento I+D, Cabries, Francia

Next Issue

Getting Technical:
Standardisation of
PV wires and cables
2001-2014

Feature

wire South America
show issue

Subscribe Now!



Visit us online at:
www.read-eurowire.com



Sommaire Français

61 Nouvelles du Marché

76 Index des Annonceurs

Indice Italiano

66 Notizie del Mercato

76 Indice degli Inserzionisti

Indice Español

71 Noticias de Mercado

76 Índice de Anunciadores

dates for your diary ...

2015

October

5-10 October:

EMO – trade exhibition – Milan, Italy

Organisers:

EFIM-ENTE Fiere Italiane Macchine

Fax: +39 226 255 882

Email: info@emo-milano.com

Website: www.emo-milano.com

5-8 October:

IWCS Technical Symposium –

conference and exhibition –

Atlanta, Georgia, USA

Organisers: IWCS

Tel: +1 717 993 9500

Email: phudak@iwcs.org

Website: www.iwcs.org

6-8 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

November

3 November:

Cabwire Conference – conference –

Düsseldorf, Germany

Organisers:

IWMA, WAI, ACIMAF, CET IWCEA

Fax: +44 121 781 7404

Email: info@iwma.org

Website: www.cabwire.com

2016

April

4-8 April:

wire/Tube Düsseldorf – trade

exhibition – Düsseldorf, Germany

Organisers: Messe Düsseldorf GmbH

Fax: +49 211 45 60668

Email: wire@messe-duesseldorf.de

Website: www.wire.de

May

11-14 May:

Lamiera – trade exhibition –

Bologna, Italy

Organisers: Ucimu-Systems

Fax: +39 0226 255 894

Email: lamiera.esp@ucimu.it

Website: www.lamiera.net

June

8-9 June:

Wire Expo – trade exhibition –

Uncasville, Connecticut, USA

Organisers: Wire Association

International

Fax: +1 203 453 8384

Email: sales@wirenet.org

Website: www.wirenet.org

wire Southeast Asia

16-18 September – trade exhibition – Bangkok, Thailand

Organisers: Messe Düsseldorf Asia Pte Ltd

Fax: +65 6337 4633 • **Email:** wire@mda.com.sg

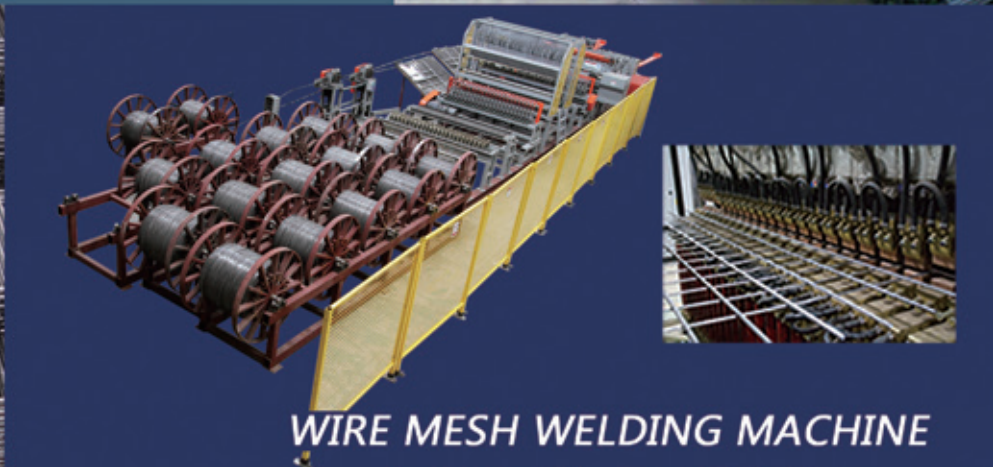
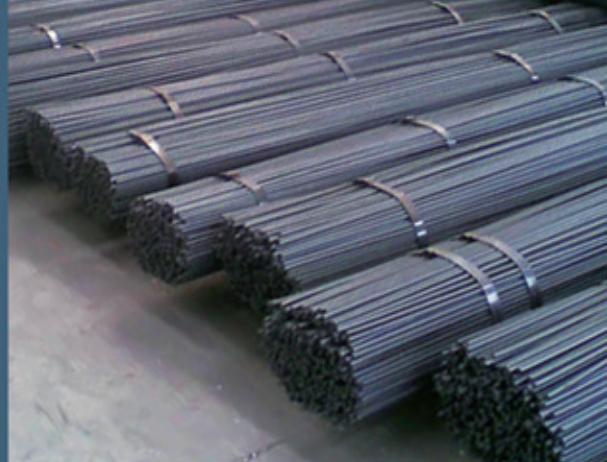
Website: www.wire-southeastasia.com



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.

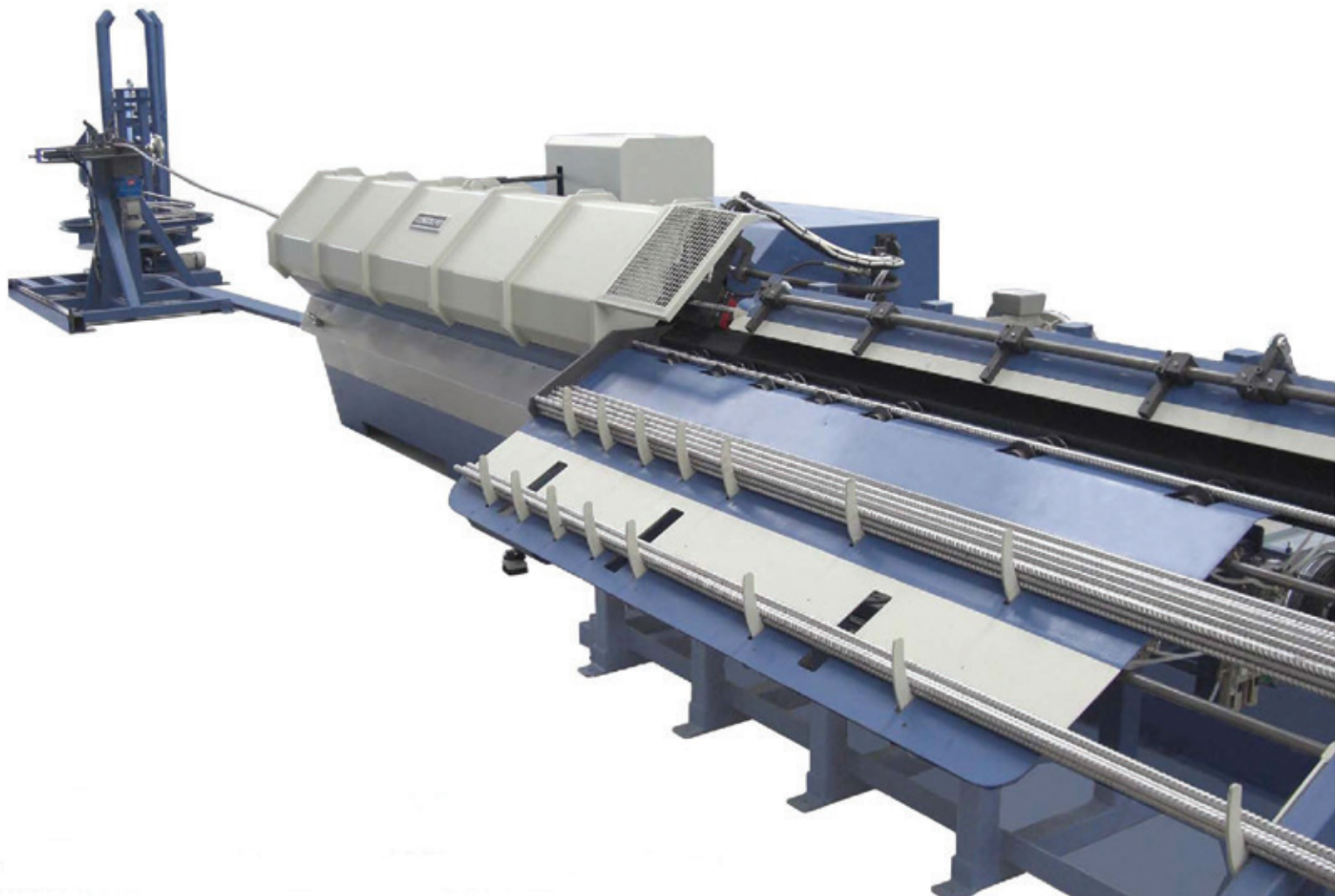
South Side of Huashi Rd., Beichen Dist.,
Tianjin, China, 300409

Tel: +86-22-26993766

Fax: +86-22-86996265

Website: www.tjkmachinery.com

E-mail: tjk@tjkmachinery.com



▲ The newest addition to the MELC straightening machines from Eurobend

Eurobend's new standards for wire straightening

EUROBEND GmbH operates through a new state-of-the-art production facility and headquarters, offices and service centres, which are located throughout the world in the USA, Germany, France, Dubai, Moscow, India and Brazil.

Its wire processing equipment lines include a complete range of high-output programmable wire straightening and cutting machines (type "MELC") based on the rotor straightening principle, a method that was invented and introduced by Eurobend engineers in the early 1980s, setting a new standard for the wire producing and processing industries.

The newest addition to the MELC straightening machines using the rotor

straightening method is the MELC 50 monoline, which can process wire up to 50mm (2").

Other machine versions are available (single line and multi line, with up to six independently operating lines), processing diameters from 2mm (0.0787") and above.

The Eurobend straightening method is based on its invented method – the rotor straightening system with hyperbolic rollers. These rollers execute the two fundamental operations of straightening and feeding, simultaneously. This is achieved by positioning the rollers at an angle to the wire axis and rotating around it, thereby at the same time feeding and straightening.

The placement of the rollers at an angle to the wire axis results in line contact with the wire surface and not in point contact as in conventional rotors with dies. When the rotor is spinning and the rollers are feeding the wire through, there is no sliding friction, but only rolling friction, not damaging the wire surface.

The Eurobend straightening method ensures:

- Optimal straightening quality and consistency
- No marking on the wire surface
- No continuous adjustments required
- Elimination of premature roller wear

Eurobend GmbH – Germany
Website: www.eurobend.com

Gauder second hand machines: Creating solutions together

GAUDER has earned a worldwide leadership position providing reliable and economical solutions ready to manufacture non-ferrous and ferrous products like rods, wires, conductors, cables and strands.

Stock and services with short delivery time are the cornerstones of the company, allowing customers to react quickly to their market request. Customers benefit from the company core business experience and worldwide availability thanks to the synergy between its wide network of cable and wire professionals and agents.

More than 1,000 second hand machines (drawing line, stranding line, extrusion line, etc) are immediately available for direct relocation and can be inspected at any time in Belgium.

The company is also specialised in equipment reconditioning, upgrading and new electrical control supply. In the modern workshop, a highly skilled team (programmers, engineers, electricians,



▲ Before and after reconditioning

and mechanics) can adapt immediately any second-hand machines from stock to match customer needs. European brands can easily be adapted to the US norms.

Gauder has upgraded and modernised a planetary line for fibre optic production. Designed to accommodate 12 bobbins of 630mm in 6+6, this backtwist planetary cage was integrated in a complete

production line, used to assemble fibre optic or small conductors.

Each reel was secured between pintles in a cast cradle and was driven by a brand new servo-motor. A photocell was installed to monitor the amount of conductor on each bobbin. Each cradle was equipped with a dancer to maintain an accurate tension in the conductor.

Tension on each dancer was controlled by a brand new servo-motor. A load cell, mounted on a return wheel of the dancer, monitored the tension value. Another photocell was installed to monitor the position of the dancer. The position of the dancer acted on the bobbin speed to maintain a constant tension.

Break detector and run out alarms were included. To minimise the effect of the centrifugal force on the cores, they were passed through aluminium tubes from the cradle to the lay plate.

Gauder sa – Belgium
Website: www.gauderonline.com



Guy Strand

According to ASTM A475, class A coating.
9/16" (14.29mm) 7x4.78mm (-0.05, +0.05mm)
Breaking load: ≥155.644kn (EHS grade)
Lay direction: left "S", lay length ≤16 times
Coil weight: 70m/coil (-0, +2%) Surface no greased
Zn coating: ≥305g/m²



ANBAO QINHUANGDAO INTERNATIONAL CORP.
Add: No.33 Qinhuangxi Street, Qinhuangdao, P.R.Chin, 066000
Tel: +86-335-3893600 Fax: +86-335-3870760
Email: anbao@anbao.net Website: www.anbao.net

In 1975, MAC led the way in flux leakage testing

Forty years ago, MAC engineers introduced Rotoflux[®], a new test system that could detect ID/OD defects in heavy-wall magnetic tubular products.

Today, MAC's high-speed flux leakage systems are the benchmarks for OCTG testing throughout the world.

Put Us To The Test



www.mac-ndt.com/intras

WE NEVER MISS A SHOW!

EuroWire exhibits at all the **major wire and cable trade fairs worldwide** giving you maximum global exposure for your advertising.



www.read-euowire.com



SEE US AT...



International sales team: Tel: +44 (0)1926 334137 - euowire@intras.co.uk

Innovative Prysmian recognised

PRYSMIAN Group has been recognised with the Frost & Sullivan 2015 European New Product Innovation Award for its BendBrightXS optical fibre, during a ceremony in London, UK.

Each year, Frost & Sullivan presents this award to a company that has developed an innovative product by leveraging leading-edge technologies. The award recognises the value-added features and benefits of the product and the increased ROI it offers to customers, which in turn enhances end-customer acquisition and overall market penetration potential.

BendBrightXS fibre, initially designed for FTTH deployment, has now opened an innovative stairway for many new cable solutions applicable to a variety of network configurations, combining an unprecedentedly low macro-bending sensitivity (G.657.A2 compliant) and industry reference micro-bending performance while still preserving all the features of regular single mode fibre (G.652.D compliant).

It enables the use of one single consistent fibre type throughout the network, from central office to customer outlets, and represents a significant innovation in single mode optical fibres, as it secures the full spectrum in a secured and durable way, allowing transmitting much larger amounts of data than competing technologies.

BendBrightXS has been the first-ever commercialised bend-immune single mode optical fibre, with a bend improvement of almost 100 times compared to standard technologies.

The advanced bending behaviour has been achieved while preserving the high transmission performance of legacy fibre yet securing all backwards compatibility, by adding macro- and micro-bending performances on top of all key traditional characteristics such as designs enabled to take standard optical fibre to the next performance level, securing transmission even in harsh environments, in every part of the network, triggering cable innovations that were not possible before.

BendBrightXS is maximising fibre's potential and fully secures the spectral abundance naturally offered by fibre, to accompany the current boom in bandwidth demand – and associated requirement for vast frequency spectrum. It is the industry-reference fibre, with its record-breaking performance heavily influencing next-generation networks.

This G.657.A2 fibre, thanks to immunity to macro and micro-bending, paved the way for smaller footprint solutions and lower operational costs due to the possibility of achieving unequalled fibre counts with increased density in cables; yet fully securing all transmission bands, including the most demanding L-band and U-band, securing network evolution paths.

"We are extremely proud of this award, which recognises our global leadership in the design and manufacturing of optical fibres and innovative solutions," said Philippe Vanhille, Prysmian Group executive vice president, telecom business.

Prysmian Group – Italy
Website: www.prysmian.com

Knowledge Base from the institute

The European Copper Institute has launched a new and unique app called the Copper Alloys Knowledge Base, which provides detailed and state-of-the-art knowledge on 27 copper-based conductivity materials.

For each of the materials, the app gives a detailed datasheet, references for known properties, and an advanced search function on properties.

The app also provides an extensive overview of copper, covering the atomic structure of copper; physical properties and thermodynamics of copper alloys; strengthening mechanisms of metallic materials; characteristics of copper alloy intended for electrical purposes; the impact of alloying additions on selected properties of copper alloys; and susceptibility to processing and processing capacity.

"We believe that the Copper Alloys Knowledge Base will be a significant resource to designers and students," said Hans De Keulenaer, European Copper Institute. "It's extremely comprehensive, constantly updated, based on extensive literature research, and easy to use."

It is accessible free-of-charge from the institute's website.

The European Copper Institute – Belgium
Website: www.conductivity-app.org



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 SIOPLAS (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



metalwire
FOR INDUSTRIES

We focus on two things.
The other one is you.

 **WE KNOW WIRE**

www.metalwire.com
Tel: +31 (0)77 398 5300

Heavy duty rope making machines

Queins/Stolberger, Germany, is a well-known supplier of heavy-duty machinery for the cable, rope and tube industry.

The production range covers skip/bow stranders, tubular stranders and planetary stranders as well as auxiliary equipment such as dual disc capstans up to 140t pull.

The production range also includes pay-off and take-up models such as an A-shape model for reel weights up to 600 tons, and reel flange diameters of 8,000mm.

This model is also of the PLC-controlled floor-traversing type and equipped with motorised telescopic tubes for adjustment of reel width.

It is mainly used for winding of big size steel wire ropes.

Queins Machines GmbH – Germany
Website: www.queins.com

Timely return to Bangkok

AMIDST a thriving manufacturing and industry background, the 11th edition of wire Southeast Asia and the 10th edition of Tube Southeast Asia make a timely return to the Bangkok Trade & Exhibition Centre (BITEC) in Thailand from 16th to 18th September 2015.

wire and Tube Southeast Asia are the region's most established trade fairs for the wire, cable, tube and pipe industries. Driven and supported by the wire and Tube Düsseldorf shows, the events present an ideal platform for companies to benefit from the growing market opportunities brought by robust industrial and manufacturing developments across the world.

Forecasted by Freedonia 2012/Market Research & Data Services 2012, global demand for plastic pipes, tubes and hoses is expected to reach €136.5 billion in 2016. Equally positive is the global demand for the insulated wire and cable market – projected by Global Industry Analysts, Inc/ Transparency Market Reports.

The industry sector will exceed €113.5 billion at the end of 2015. In Southeast Asia,



▲ Visitors in Thailand in 2013 at the last staging of wire Southeast Asia

wire and tube industries continue to grow and evolve.

In line with these upward market trends, wire 2015 will feature a wide range of innovative machinery for wire manufacturing and finishing, fasteners and springs, pumps, valves, tube, bending and forming technologies. New processes in measuring, control and test engineering and specialist areas, as well as new and upgraded tools and auxiliary materials in process engineering and rod materials, will also be showcased at both trade fairs.

Messe Düsseldorf Asia – Singapore
Website: www.wire-southeastasia.com

PTFE Coaxial taping machine

RBJ-Z series driven taping machine (vertical, horizontal) 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-Z series heavy braider*
- WGSB series horizontal heavy braider*
- LRBJ series vertical taping machine*
- WRBJ series horizontal taping machine line*
- Extruding line*
- Pay-off and take-up*

 **上海南洋电器器材有限公司**
SHANGHAI NANYANG ELECTRICAL EQUIPMENT CO., LTD.

Address : No.110, Luda Road, Pudong New Area, Shanghai, China
Tel : 0086-21-33896307, 0086-21-33896308 Fax : 0086-21-33896305
E-mail : sales@shanghai-nanyang.com sales@shanghai-nanyang.sina.net
Contact person : Stephen Chen

Precision measurement specialist

LASERLINC specialises in laser and ultrasonic technology for precision measurement of diameter, ovality (sometimes called eccentricity or roundness), material thickness or wall thickness, concentricity, and inside diameter.

LaserLinc's measurement equipment and interface products reduce material usage, increase production efficiency, reduce scrap, facilitate process improvement, and improve and document product quality.

LaserLinc's scanning laser micrometers for diameter and ovality measurement measure diameters as small as 0.015mm (0.0006") and as large as 228mm (9"). With 16 models to choose from, solutions are available for virtually any requirement. For the best average diameter and ovality measurement, select a Triton™ three-axis micrometer.

LaserLinc's technology utilises all of the information available from its three-axis Triton micrometers to produce an accurate ovality measurement, regardless of product orientation. LaserLinc's models also offer one of the industry's fastest measurement rates of 4,000Hz per axis (12KHz aggregate for the three-axis Triton™-series).

High-speed models allow simultaneous diameter measurement and detection of lumps and neckdowns. Using one device for both saves money, simplifies installation and reduces maintenance.

LaserLinc's UltraGauge+™ product line measures wall thickness and eccentricity/concentricity using ultrasound. It accommodates a wide range of product diameters and material thicknesses. Many different styles and options are available encompassing fixed and adjustable transducer positioning, installation in vacuum or open tanks, product guiding, and up to eight transducers.

An UltraGauge+ system can measure thickness and concentricity on products with as many as four different layers. UltraGauge+ systems have been used to measure very thin wall as small as 25µm (0.001") and require no special options or settings to do so.

All UltraGauge+™ wall measurement systems feature Total Vu™ software, a PC-based human-machine interface (HMI) application. For systems with only scanning laser micrometers, the SmartLinc processor is also available.

The Total Vu HMI is a scalable platform

that provides tools and information needed for every stakeholder:

- Operators can access exactly what they need to operate the line efficiently
- Engineers get the monitoring, control and reporting they need to document quality and improve the process
- Managers get the reports they need and know that others have the tools they need to achieve objectives

gauge interface products are covered by a four-year warranty covering all parts and labour, and include "spare-in-the-air" loan of equipment in virtually all cases (not available in all countries). Ultrasonic transducers are covered by a one-year warranty. Technical support is free for as long as you own the product, including interactive Internet-based support.

LaserLinc – USA

Website: www.laserlinc.com

Scanning laser micrometers and



EUROBEND

Innovation & History

CORPORATE VIDEO

The MELC Series of Single Line & Multi Line Straightening and Cutting machines:

- Using our 4th generation Straightening Rotor with hyperbolic straightening rollers
- Rotation of the rotor results in spiral rotation of the rollers around the wire, thus achieving straightening and feeding simultaneously.
- Hyperbolic roller profile ensures full line and not point contact between roller and wire, minimizing wire marking and maximizing roller life.
- No frequent straightening adjustments required as in conventional straightening machines equipped with dies and regular rollers
- Flying shear cutter ensures uninterrupted operation
- Anti-twist twin-roller system (patented) guaranteeing the torsion-free production of wires during the straightening process
- Machines ranges: Up to 50mm (SINGLE LINE MACHINE VERSIONS)
Up to 12mm (MULTI LINE MACHINE VERSIONS)
- Constant straightening quality of 1/1000, regardless of material type (smooth, deformed, recessed, re-bar) and quality (high tensile, stainless steel, etc)
- Exceptional linear accuracies (±0.1mm)
- On multi line machines, each rotor operates independently from the others, processing the same or different wire diameter

EUROBEND GmbH
Allersberger Str. 185, Geb. G-3, D-90461, Nürnberg, Germany
Tel.: +49 911 9498980,
e-mail: sales@eurobend.com, www.eurobend.com

11TH INTERNATIONAL WIRE & CABLE TRADE
FAIR FOR SOUTHEAST ASIA

**16 – 18 SEPT
2015**

BITEC | BANGKOK

www.wire-southeastasia.com



**VISION
INNOVATION
TECHNOLOGY**



Industry Partners:



IWCEA - International Wire & Cable Exhibitors Association

- Austrian Wire and Cable Machinery Manufacturers Association (VÖÖKM-AWCMA)
- International Wire and Cable Exhibitors Association - France (IWCEA-France)
- German Wire and Cable Machinery Manufacturers Association (VDKM)

Officially Supported by:



Messe Düsseldorf / Organizer of:



Supporting Organisations:

- Design & Engineering Consulting Service Center (DECC)
- Thai Foundry Association
- Thai Stainless Steel Development Association (TSSDA)
- Materials Innovation Center - Kasetsart University
- Thailand Iron and Steel Industry Club
- Electrical and Electronic Products Testing Center (PTEC)
- Electrical and Electronics Institute (EEI)
- Thai Subcontracting Promotion Association (ThaiSubcon)
- Electrical Engineering Academic Association (Thailand)
- Electrical Electronics & Allied Industry Club
- Thai Electrical, Electronics and Telecommunication Industries Association
- Association of Thai Steel Industries

Messe Düsseldorf Asia Pte Ltd
3 HarbourFront Place
#09-02 HarbourFront Tower Two
Singapore 099254
Tel (65) 6332 9620 _ Fax (65) 6337 4633
wire@mda.com.sg



New role at the top

AMBRELL has appointed Anthony Mazzullo as president, chief executive officer and a director on the company's board, effective 26th May 2015.

Mr Mazzullo succeeds Tom Giglia who was interim CEO. Mr Giglia will assume a critical role focused on leading the aggressive expansion of Ambrell's global operations.



▲ Anthony Mazzullo

"I am extremely pleased to announce Tony Mazzullo's appointment as chief executive officer of Ambrell," said Richard Rosenbloom, founder and board director.

"Tony has a proven track record of leadership and profitably growing businesses. His background in engineering, finance, business development and M&A made him an obvious choice for the position. Simultaneously, we look to Tom to apply his many talents to continue building and expanding Ambrell's global capabilities."

Mr Mazzullo is the former president, CEO and chairman of Veramark Technologies Inc, a publicly traded company that provided software and outsource services for telecommunications and financial management. He led Veramark through dramatic growth in new markets culminating with a successful sale of the company to a private equity firm.

He remained with the company to help execute a multi-company merger. Mr Mazzullo holds a BS in Electrical Engineering from Cornell University and an MBA in Finance and Accounting from the University of Rochester.

Commenting on his appointment, Mr Mazzullo said: "I am honoured to have this opportunity to lead Ambrell during this time of investment and growth. I look forward to working with the world-class technologies and the incredible talent and passion of the Ambrell team."

Ambrell BV – The Netherlands

Website: www.ambrell.com

Exclusive contract

Mathiasen Machinery Inc has been awarded an exclusive contract to sell two complete continuous copper rod upcast systems.

COCESA, a power cable manufacture located in Chile, has appointed MMI as its exclusive sales agent for the two upcast systems. Both systems were purchased new in 2008. Each system has a monthly output of 770 tons of 12mm diameter oxygen-free copper rod.

Decommissioning took place in late 2014. The equipment is still installed. Complete specifications and photos are available by contacting Mike or Mark Mathiasen at +1 860 873 1423 or email mmi@mathiasen-machinery.com

Mathiasen Machinery Inc – USA

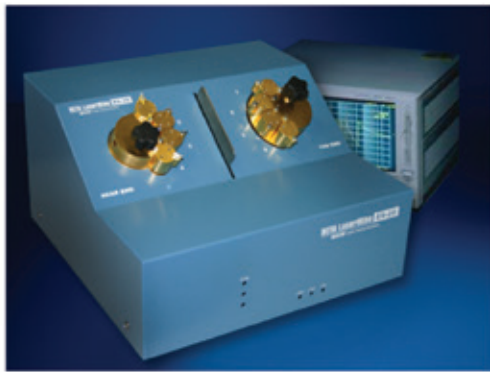
Website: www.mathiasen-machinery.com

Are You Spending Too Much Time Testing LAN/Data Cable?



If you are, there's a faster, simpler and more reliable way.

DCM automated testing systems can help you test more LAN cable in less time for higher quality results.



Test 4-Pair Cables up to 2.2 GHz DCM Model ES-2G

- ▶ Test Cat 7/7a ISTEP cables with option to test Unshielded Twisted Pair (UTP) Cat 5 and Cat 6/6a cables
- ▶ Automatic 4-pair switching system
- ▶ Suitable for testing upcoming 40 Gigabit Ethernet applications including Cat 8 cable
- ▶ Eliminates the effects of cable termination error
- ▶ Simple, easy-to-use software for automated testing



Test 4-Pair Cables up to 700 MHz DCM Model SCS-700

- ▶ Test Cat 5e/6/6a cables
- ▶ Automatic 4-pair switching system
- ▶ Simple, easy-to-use software for automated testing
- ▶ Time-saving, single-connection for HF and LF testing
- ▶ Automatic internal calibration routine completed in 30 seconds



Test 4-Pair to 28-Pair Cables up to 1 GHz DCM Model 3S-XLD

- ▶ Test Cat 5e/6/6a/7 cables
- ▶ Highly reliable, fast, accurate solid-state switching technology
- ▶ 28-pair platform tests Alien Crosstalk in minutes
- ▶ Test seven 4-pair cables in one operation
- ▶ Simple, easy-to-use software for automated testing
- ▶ Time-saving, single-connection for HF and LF testing
- ▶ Automatic internal calibration routine completed in 30 seconds

Contact us today to learn how NDC can automate and optimize your cable testing.

AMERICAS:
+1 937 233 9935

EUROPE:
+44 1621 852 244

GERMANY:
+49 231 758 930

CHINA:
+86 21 6113 3617



Measured by Commitment

BETA LaserMike

www.ndc.com/betalasermike

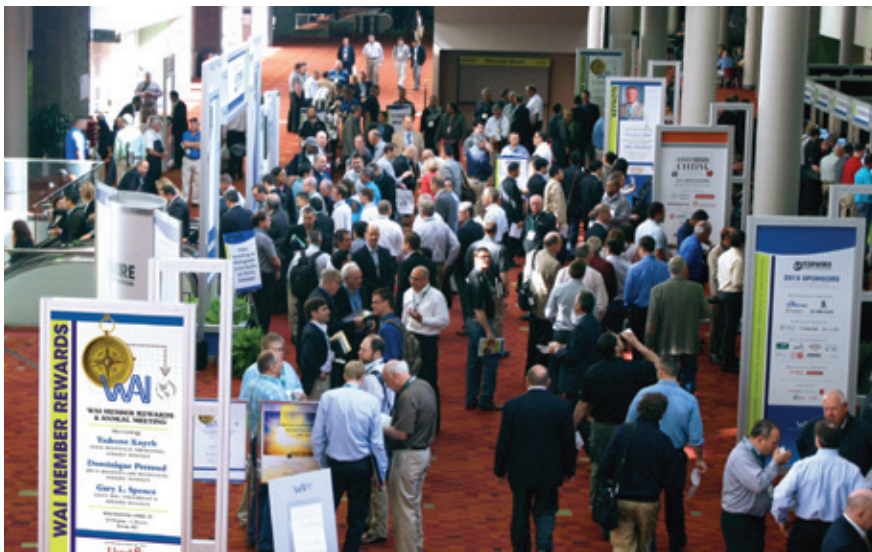
Surge of activity at successful Interwire

MORE than 4,080 wire and cable industry professionals from 53 countries were out in force at Interwire 2015 at the World Congress Center, Atlanta, Georgia, USA.

Organisers the Wire Association International (WAI) reported a successful result from its biennial Interwire trade show, its 85th Annual Convention, and the concurrent assembly of its 2nd Global Continuous Casting Forum (GCCF), at the end of April.

"Interwire is an excellent resource for North America, with strong value for many sectors of our industry. As a cable manufacturer, it is our best chance to spend time with our supplier partners and network with industry leaders," said WAI president William Reichert.

Mike Abrashoff, former Naval Commander of the USS *Benfold*, and author of the New York Times bestseller "It's Your Ship", shared lessons from "The Leadership Roadmap" in his



▲ And the doors are open... Interwire 2015 gets underway

keynote address describing how his system of management techniques helped him overcome the challenge of

low morale and high turnover. Many exhibitors were excited by the strong turnout of key decision makers in the sold-out exhibit hall, which featured operating machinery, supplies and ancillary equipment from more than 400 exhibiting companies, 54 of which were new to Interwire 2015.

Several new conference segments gave visitors the chance to learn innovative wire and cable manufacturing methods and investigate new technology. Applications, dust control, staffing, and capital expenditure topics were featured.

The Manufacturing Management workshop provided operations managers with practical leadership tools. Visitors chose from conference activities including 20 technical presentations, a Fundamentals of Wire Manufacturing workshop, three production solutions demonstrations, and a plant tour of the Southwire SCR mill.

The concurrent Global Continuous Casting Forum, organised by Gary Spence, of Encore Wire, and Richard Baker, of General Cable Co, drew 200 international casting practitioners from both the copper and aluminium segments of the industry. Separate and combined programme tracks were featured with time within the schedule for participants to see the Interwire exhibits.

Members of WAI's board of directors also welcomed the largest crowd in recent Interwire history to the popular opening reception, which was held at Atlanta's new College Football Hall of Fame.

Wire Association International – USA
Website: www.wirenet.org



▲ The SW6-14 on show at Interwire

Visitors from more than 40 countries

Windak, together with Axjo America, had a combined booth at Interwire, offering new packaging solutions and new modern spool designs.

The stand proved very popular during the show, with more than 100 visitors from 40 countries visiting.

Windak displayed SW6-14, a dual head spooler developed for fully automatic packaging of cable and wire products onto spools between 165mm (6.5") and 360mm (14") in overall diameter.

Spools are automatically loaded and unloaded into/from the spooling head.

Outer ends are secured with stretch wrap. All operational parameters and mechanical settings are controlled in order to reduce time between product and spool changeovers. The output of the new spooler is three spools per minute.

The company said that Interwire showed it that trade shows are very important for business development, industry knowledge and co-operation, and that it is expecting a lot of new orders related to the show.

Windak Group – Estonia
Website: www.windakgroup.com

Eight warehouses and 30,000 items in stock

WIRE & Plastic Machinery was founded in 1981 as a dealer of pre-owned wire and cable machinery, and has now grown to have eight warehouses in the USA with over 30,000 items in stock, and an additional two reconditioning centres with modern machine shops.

The range of services offered now include reconditioning of machinery including commissioning at the customer's site, equipment brokering, plant liquidations, worldwide sales and support.

Staffed with mechanical and electrical engineers with over 100 years of combined experience, the engineering team is able to offer reconditioned solutions from individual items to complete plants.

In-house capabilities include state-of-the-art machining centres and an electronics department well versed in the latest generation AC vector drives, PLC programming and HMI interfaces.



▲ A rebuilt Tensor SZ strander with state-of-the-art electronics

Rebuilt equipment is offered with a full warranty that is comparable to coverage offered by new equipment manufacturers. Its commissioning engineers travel the world for start-up, commissioning and trouble-shooting.

Recent rebuilding projects include:

- A complete optical fibre plant in Vietnam. All equipment was reconditioned and shipped to the customer's site. After installation an engineer was sent for commissioning and to train customer personnel in proper operation.
- A complete 150mm sheathing line for power cables, including 2.6m payoffs/take-ups, metering and pullout caterpillar capstans and ancillary equipment.
- Cu rod breakdown line with rod annealer featuring new electronics commissioned in South America.
- A Tensor SZ Strander with dual binder and new electrical package and HMI interface was shipped and commissioned in the UK.

There are several projects currently being worked upon in the Bristol, Connecticut, and Attleboro, Maryland, rebuilding centres.

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

Showcase success for PWM

Interwire 2015 provided good opportunities for British company PWM, which exhibited its range of cold pressure welders. The machines were presented by Joe Snee Associates, PWM's exclusive distributor for the USA and Canada.

"Although we felt visitor numbers were down compared with previous shows, the quality was excellent with plenty of decision-makers in evidence," said Joe Snee, president of Joe Snee Associates.

"PWM's powerful EP500 electro-pneumatic rod welder, in particular, attracted a lot of interest, with visitors keen to find out about the time and cost-saving benefits this machine offers when cold welding non-ferrous rod sections up to 15mm diameter.

"The smaller, manually operated M101 machine also proved popular with manufacturers looking for a fast, easy and reliable method of joining non-ferrous wire and strip 1mm to 5mm."



▲ The EP500 rod welder

PWM Ltd – UK

Website: www.pwmltd.co.uk



Inosym Reels



Inosym Limited
P +64 21 353 634
inosym@inosym.com
www.inosym.com

Tecnofil – the steel wire machine specialist

TECNOFIL specialises in the production of low and medium carbon steel wires and in the manufacture, supply and reconditioning of machines for the production of steel wire and wirebands.

Tecnofil offers not only equipment for high quality steel wires, but also top quality new and used machinery, thanks to its 20 years experience in the field.

The company retrofits, overhauls and repairs machines for wire and wire products.

It has a 3,000m² warehouse of second-hand machines where its qualified technicians verify mechanical, electrical and electronic parts, personalising, updating or replacing them, if necessary, in order to ensure the high productivity, precision, durability and reliability of the reconditioned line.

The engineering office tests and provides all conformity declarations (CE) required by current regulations.



▲ Top quality new and used machines

Tecnofil also gives the possibility to constantly monitor all the offers related to second-hand machines on the section of its website called 'USED'.

This added service provides clients with photos, detailed information (eg type of the machinery, year of construction and of recondition, number of pieces available) and technical features, in order to support them in the choice of the most suitable line.

Tecnofil SpA – Italy
Website: www.tecnofil.net

Three ways of buying machines

Flyro is a well-known Spanish used equipment dealer involved in all kind of machines for the wire and cable industry (made of copper, aluminium as well as steel).

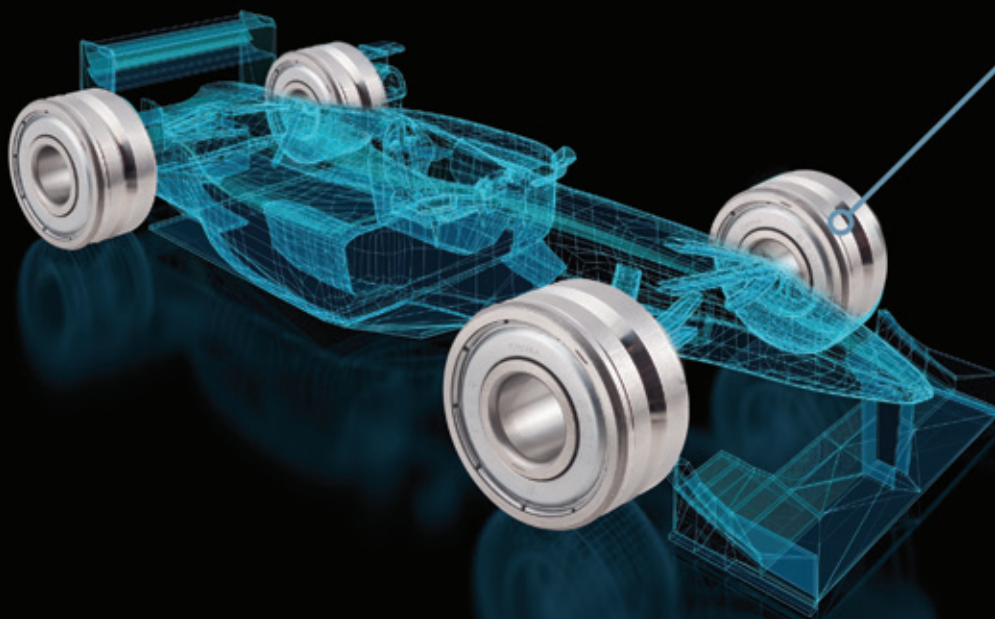
The company can sell the machines in three ways:

- In 'as is' condition (as they are during customer inspection)
- Verified, which means that a test is realised before dismantling and shipping to the customer
- Reconditioned/refurbished

Furthermore, when some items are missing, they can be supplied in order to complete the machine with new items. When selling a used machine to a customer, Flyro gives a complete and fully customised service.

Flyro – Spain
Website: www.flyro.es

Productivity wins



Cabopol solutions to extreme conditions

THE wire and cable industry market driver is sustained on high performance materials for extreme temperatures ranging from -60°C to +150°C, with mechanical and oil resistance.

Cabopol provides solutions such as:

- Lacovil PVC compounds for sheathing and insulation for power and telecom
- Sofiplus HZ compounds, halogen-free, for general application
- Sofiplus ONE compounds, halogen free, for specialities like marine, solar and railway

Being specialised with more than 15 years on automotive solutions and with operating temperatures of -40°C to +150°C, Cabopol's vision is providing smart solutions by a close collaboration, listening to and understanding customer requirements.

Cabopol provides automotive solutions including:



▲ The Cabopol site in Portugal

- PVC T2 -40 up to +105°C
- PVC T3 -40 up to +125°C
- Sofiplus AT T3 low halogen -40 up to +125°C
- Sofiplus AT T3 halogen free -40 up to +125°C
- Sofiplus AT T4 low halogen -40 up to +150°C
- Sofiplus AT T4 halogen free -40 up to +150°C

Cabopol Polymer Compounds SA – Portugal
Website: www.cabopol.com

Move complete

C&M Corporation, a vertically integrated manufacturer of bulk cable, coil cords, and cable assemblies, has completed its relocation from Wauregan, Connecticut, USA, to a new state-of-the-art manufacturing facility in nearby Dayville.

The new single floor 150,000ft² facility will create efficiencies and allow for the implementation of progressive manufacturing strategies not possible in the former Wauregan location. The Dayville facility will encompass all USA-based manufacturing.

CEO John Laskowsky said: "While the Wauregan facility was home to C&M for nearly 50 years, this move to a modern manufacturing facility will allow us to create the organisational effectiveness required in today's marketplace and allow us to continue to bring real value to our clients."

C&M Corporation – USA
Website: www.cmccorporation.com



Driving Improvements in wire straightening

This alignment marker — found exclusively on Sjogren rollers — helps optimize your straightening operation. And it's just one of many subtle-but-significant engineered enhancements that give our components and assemblies world-beating performance.

Replacement runs of any quantity, full custom engineering and fabrication, decades of specialized expertise, global distribution: **rely on Sjogren to push your productivity into high gear.**

SJOGREN.COM

Sjogren®

6 – 8 October 2015
Imigrantes Exhibition Centre
SÃO PAULO EXPO
EXHIBITION & CONVENTION CENTER

wire®

South America



wire & cable springmaking fastener

**International
Wire and Cable Fair**



www.wire-south-america.com

Held in conjunction with:



Supported by:



In co-operation with:



Messe Düsseldorf GmbH
P.O. Box 10 10 06 _ 40001 Düsseldorf _ Germany
Phone +49 (0) 2 11/45 60-77 68/-77 64 _ Fax +49 (0) 2 11/45 60-77 40
NiemannH@messe-duesseldorf.de _ HesseS@messe-duesseldorf.de
www.messe-duesseldorf.de



Marldon's North American link

Marldon has now brought together its offering under a single outlet in the USA and Canada with the appointment of Chris Semonelli of CTS as its North American representative.

Based in Rhode Island, USA, CTS travels widely and has connections throughout the territory.

The company would like to thank Clinton Instruments and Anthony Urbano who, together with Mr Semonelli, will be working on the transition.

Marldon Airwipes – UK

Website: www.marldon.com

Expansion plans to celebrate 70th anniversary



▲ *An artist's impression of the new plant*

As TKT Group celebrates seven decades of uninterrupted service to the steel wire industry, the company is launching several special initiatives in 2015 on wire drawing lubricants and dies.

The company is also pleased to announce a turning point in its long history, in that it is expanding its current production capacity by starting the building of Tecnovo's new lubricants plant, under construction in Cremona, Italy, by the side of Koner's dies factory.

The new plant, spread over 25,000m², is slated for completion by the end of 2015. Once completed, it will double Tecnovo's current capacity per annum.

Cremona's plant will be fully committed to innovative lubricants production, whereas in Novate Milanese factory both the current production lines and also the R&D department will continue in operation.

The new Cremona industrial hub will manufacture all the range of products for the steel wire industry (lubricants, dies and auxiliary products).

TKT Group – Italy

Website: www.tktgroup.it

Setic's high-precision slicing/ fending-off machine

THE Setic "MPE 120" high-precision slicing/fending-off machine for the preparation of smooth test pieces is specially designed to cut and shave off insulated and sheathed material, giving consistent and true mechanical properties (tensile strength test) on polyethylene, PVC, rubbers, halogen-free materials and synthetic elastomer.

The strip to be shaved is placed between two feeding rollers which accurately push the product against a blade.

The blade thickness is adjusted through a precision screw allowing a final strip from 0.6 to 2mm (24 to 80 mils) thickness with perfect parallel and mark-free faces. Precision is better than 0.05mm (2 mils).

This process enables cost-saving thanks to very accurate and repeatable measurement fully conformed to international standard IEC 811-1-1.

Compared to ground samples – involving micro irregularities – productivity is much higher as several preparation steps are followed, meaning cables are not rejected on the basis of insufficient tensile strength.

As a direct consequence, the characteristics of the material can be reduced, allowing the use of cheaper compounds.

Efficiency has been proven in laboratories of major cable manufacturers, with the tensile strength increasing up to 20 per cent for PVC and 40 per cent for halogen free.

Pourtier-Setic – France
Website: www.pourtier-setic.com

New role at Miltec

Randy Plunkett has joined Miltec Corporation as bulb division supervisor. He lives in Pasadena, Maryland, USA, with his wife and two children.

A graduate of the University of Spartanburg, South Carolina, where he received his Bachelor of Science degree in Business, Mr Plunkett worked for Bethlehem Steel in Sparrows Point, Maryland, for 11 years and most recently was a production supervisor for Crown Cork and Seal, where he directed a team of 20 employees responsible for production, quality and safety.

Bob Blandford, Miltec president, said: "Randy brings many years of cross functional manufacturing and leadership experience to Miltec.

"We look forward to utilising his skills in lean manufacturing, scrap reduction and other output improvements in our bulb division."

Miltec UV – USA
Website: www.miltec.com

The Wire Drawing Standard

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.



PARAMOUNT DIE
DRAWING SYSTEMS FOR THE WIRE INDUSTRY

paradie.com

IT'S TIME ...

...to book your advertising in our Düsseldorf show issues

These issues will be **FREELY** distributed from our stands



4 - 8 April 2016

Ad space
is filling up
fast!



Be seen at the show

in the leading magazines for the wire industries

www.read-eurowire.com / www.read-wca.com



Contact our international advertising office:

Tel: +44 (0)1926 334137 - Emails: eurowire@intras.co.uk / wca@intras.co.uk

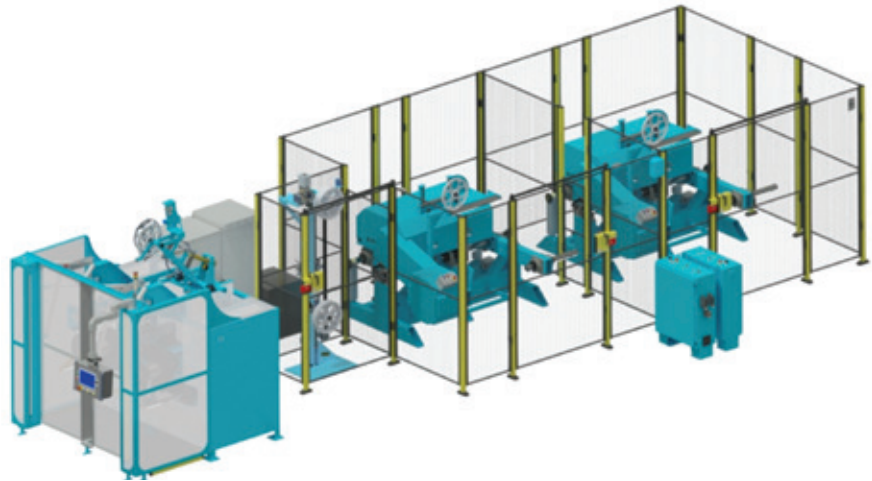
New Polish company MFK installs some of Reelex's most advanced lines

REELEX has successfully commissioned two G2 D-1500 packaging lines at one of Europe's newest cable manufacturers, Małopolska Fabryka Kabli Spółka zoo (MFK).

Located outside Krakow, Poland, and co-funded by the European Union through the European Regional Development Fund, MFK is a startup cable manufacturer utilising the latest technology to supply quality high-performance data cables.

Packaging those cables are two Reelex G2 D-1500 coiling lines equipped with the latest technology.

These lines are some of the most advanced Reelex lines installed, featuring unique characteristics such as two motorised payoffs per line (to minimise time between supply reels), digital tension control, EU safety guarding including new swinging door guarding,



▲ CAD model of one D-1500 coiling line with dual payoffs as installed at MFK

G2 controls with touch screen HMIs and more.

cables, and can be contacted at www.mfk.pl

Amongst other products, MFK will be producing Category 5e and Category 6

Reelex Packaging Solutions Inc – USA
Website: www.reelex.com

PBT & PBT Color Masterbatch

--- Professionally Producing Secondary Coating Materials for Optical Cable

RoHS / Reach / 2002/61/EC

SA 8000:2008

ISO9001 Quality Management

ISO14001 Environmental Management

OHSAS 18001 Occupation Health Safety Management System



The main customers



JINSEN®



Yangzhou Jinsen Optoelectronics Co.,Ltd

Add: NO.6, Jinsen Road, Shaobo Industry Cluster Zone, Jiangdu District, Yangzhou City, Jiangsu Province, China.

Tel: 86-0514-86583655

Website: www.yzjinsen.com

Fax: 86-0514-86974000

E-mail: yzjinsen@yzjinsen.cn



Transatlantic Cable

Transportation

▶ Yet again: A fatal train derailment, this time in Philadelphia, spotlights the continuing neglect of America's infrastructure

For the second time in two years in the USA, on 12th May a passenger train travelling well above its speed limit derailed – this time leaving eight people dead and over 200 injured. And, once more, it was reliably asserted that available technology that might have prevented the accident was missing.

Jad Mouawad reported in the *New York Times* that the publicly funded railroad service Amtrak has installed "positive train control" on parts of its rail network in the Northeast Corridor.

But the technology, designed to automatically slow or stop a train to prevent accidents, was not available on the critical stretch of track in Philadelphia where the train derailed. ("Technology That Could Have Prevented Amtrak Derailment Was Absent," 13th May)

As well as providing engineers and train dispatchers with real-time information about speed and location, positive train control programs the train to respond automatically to sensors along the tracks.

The train from Washington to New York was travelling at 106 miles per hour as it entered a curve limited to 50mph. Robert Sumwalt, a member of the National Transportation Safety Board, said at a news conference the following day, "We feel that, had such a system been installed in this section of track, this accident would not have occurred."

The safety board has repeatedly stressed the importance of positive train control, which it believes might have prevented the derailment of a Metro-North commuter train in the Bronx in December 2013 that killed four people and injured dozens. An investigation determined that the train was travelling at 82mph before it entered a curve certified for 30mph.

"Without [positive train control], everybody on a train is one human error away from an accident," according to the board.

▶ Partisan wrangling in Congress

The *Times* noted that, after a commuter train collided head-on with a freight train in Chatsworth, California, in September 2008, killing 25 people and injuring more than 100, Congress

mandated that positive train control be installed throughout the nation's railroad system by the end of 2015. But, he wrote, implementation has proved to be a challenge for regulators as well as for railroads, and Congress is considering extending the deadline to 2020 at the urging of the freight and passenger rail systems.

The Association of American Railroads has argued that meeting the 2015 deadline would be difficult for most of its members because of the high cost of the control system and the complexity involved in installing and testing it. But, also on 13th May, an increase in Amtrak funding to support the rail system was defeated by a 30-to-21 vote in the House of Representatives.

In a follow-up account of the train derailment in Philadelphia, Mr Mouawad and a colleague, Michael D Shear, wrote scathingly: "The bodies had not yet been fully recovered... before Capitol Hill erupted hours later into its usual partisan clash over how much money to spend on the long-struggling national rail service." ("One Day After Wreck, Increased Funding for Amtrak Fails in a House Panel")

Edward G Rendell, a former governor of Pennsylvania, also lashed out at lawmakers for refusing to increase Amtrak funding.

"It is absolutely stunning to me," Mr Rendell said of the vote. "It shows that ideology trumps reality, and that cowardice reigns in Washington. The callousness and disregard was shockingly contemporaneous."

▶ The derailment in Philadelphia moved several writers to consider the state of rail in America in light of some relevant statistics. *New Yorker* columnist John Cassidy recalled that a World Economic Forum survey from a few years back ranked the United States 25th globally in overall quality of infrastructure: behind, among others, Spain, Oman and South Korea.

He noted further that, according to the Congressional Budget Office, in the 1950s and 1960s the USA spent close to five per cent of gross domestic product (GDP) on new transport and water projects, and on maintaining existing systems.

European nations still spend about that much today, while China and other rapidly developing Asian countries spend close to twice as much.

In the US, wrote Mr Cassidy, "Spending on infrastructure is only about half of what it used to be, relative to GDP." ("After the Amtrak Crash, It's Time to Get Serious About Transportation Infrastructure," 13th May)

Transatlantic cable

- In "The Plot Against Trains" (15th May), another *New Yorker* staffer, Adam Gopnik, linked the derailment in May to a broader theme. He invoked the late British historian and New York University professor Tony Judt, who while dying of ALS wrote his last book on the subject of trains: trains as symbols of the public good.

"The railways were the necessary and natural accompaniment to the emergence of civil society," wrote Mr Judt. "They are a collective project for individual benefit . . . something that the market cannot accomplish, except by happy inadvertence. If we lose the railways we shall not just have lost a valuable practical asset. We shall have acknowledged that we have forgotten how to live collectively."

Seeking federal action, US airlines trade barbs with Persian Gulf carriers over subsidies and alleged poaching of passengers

Three USA airlines – American, United and Delta – are pushing for action from Washington on their charge that Persian Gulf carriers have expanded in the US by 25 per cent this year, enabled by unfair aid from their governments. The USA airlines claim that such help to the Gulf airlines is being used to increase US flights and offer discounted connections through Middle Eastern hubs to win international traffic.

In mid-May, federal regulators had not yet responded to an April request from the US carriers to block Emirates Airline; Etihad Airways, also of the United Arab Emirates; and Qatar Airways from adding more USA flights until the issue is resolved.

Mary Schlangenstein and Alan Levin reported in *Bloomberg News* that the chief executive officers of the three US carriers said they expected the US to open talks with Qatar and the United Arab Emirates over the alleged subsidies, which would violate existing Open Skies agreements.

"I'm highly confident they'll take action because the evidence is so compelling and it cannot be ignored," American's CEO Doug Parker said on 15th May at a National Press Club forum held in Washington. "We are concerned there isn't enough urgency in the process."

According to Delta CEO Richard Anderson, the three airlines will take their cause to Congress if the Obama administration does not limit growth by the Gulf carriers. He said at the forum: "We've been at it over two years and we're not going to stop." ("US Airlines Press Regulators to Act as Gulf Carriers Expand," 16th May).

For their part, the three Gulf carriers have repeatedly denied that they were sustained by \$42 billion in government subsidies. They also dispute the results of a study released by the US airlines asserting that the Gulf carriers are diverting passengers from the domestic lines instead of attracting new ones.

"[The US carriers] are being forced to compete," Etihad general counsel James Callaghan said in a *Bloomberg News* interview. "When you compete, your prices go down and, therefore, you attract more passengers."

- In a counterclaim about outside support, Etihad charged that the USA carriers received some \$64.9 billion in bankruptcy and pension-related aid from the USA government, benefits which generally are available only to domestic carriers and which helped to create a "highly distorted market."

- United CEO Jeff Smisek called the suggestion that bankruptcy involves government aid "patently absurd." As reported by *Bloomberg*, he said: "The people who paid [in the United Airlines bankruptcy period 2002-2006] were our fine employees, our creditors, and our shareholders."

Telecom

In a first for the USA, Los Angeles stipulates that new cellphone towers be built to earthquake-resistant standards

"The proposal passed by the City Council on an 11-0 vote on 8th May takes aim at one of the great unknowns in earthquake country: How will cellular and mobile technology fare?"

The question, posed by the *Los Angeles Times*, is an important one for California residents. Even though the state has not experienced a major quake for some time, when the destructive 6.7 Northridge quake hit, in 1994, the Internet was not yet central to daily life. Landlines still ruled.

Two decades on, cellphones, smartphones and WiFi have become commonplace. And Los Angeles recognises the necessity of preserving its telecom services in the event of another big temblor.

As noted by the *Times*, the city has taken example of the 7.9 earthquake which in 2008 left a path of destruction in the Chinese province of Sichuan, levelling whole communities and leaving as many as 88,000 dead. The chaos and confusion was made worse by the disabling of more than 2,000 cellphone towers, leaving huge communication gaps that lasted weeks.

"The failure of so many cellphone towers in China has given American experts cause for concern because they were built to a standard similar to the one used in the United States," wrote the *Times* reporters Rosanna Xia and Rong-Gong Lin II.

Accordingly, the Los Angeles plan requires new freestanding cellphone towers to be built to the same seismic standards as public safety facilities. Currently, cellphone towers must be built only sturdily enough to resist collapse during a major earthquake. They are not required to be able to continue functioning. ("LA Becomes First US City to Enact Quake Safety Standards for New Cellphone Towers," 8th May)

Ms Xia and Mr Lin reported that the new law will not require the retrofitting of cellphone towers in current use, estimated to be no less expensive than building new ones. A report from Los Angeles Mayor Eric Garcetti, released in December, recommended that the focus be on new, stronger towers, which would increase construction costs by only 10 to 20 per cent. "We're not trying to solve all the problems," said Lucy Jones, a US Geological Survey seismologist who served as Mr Garcetti's earthquake science advisor last year. "This is about earthquake functionality. It's about getting us back on our feet."

- A limitation of the new law noted by the *Los Angeles Times* is that it covers only freestanding cellphone towers, and will not apply to new towers attached to buildings. Currently, about 60 per cent of cellphone towers in Los Angeles are attached to buildings – many of these ageing structures that could themselves be at risk of collapse in an earthquake.
- Further, Ms Xia and Mr Lin observed, making cellphone towers more secure will not help with another likely

Transatlantic cable

by-product of a big quake: widespread power failures. Many cellphone towers have a battery supply that may last as little as four hours. A US Geological Survey report warned that power could be cut off for weeks should a magnitude 7.8 earthquake strike the San Andreas fault, which lies about 35 miles from Los Angeles. This could render swaths of the cellphone network useless.

Energy

Growing global demand for air conditioning will require extensive investment in electricity grids

"In the United States, which uses more air conditioning than the rest of the world combined, most of the grid is sized to meet the few days a year when coolers are cranking at full blast under sweltering temperatures."

In *IEEE Spectrum*, published by the Institute of Electrical and Electronics Engineers, science writer Katherine Tweed went on to note that this has meant a grid that runs inefficiently most of the year. To help remedy this, some technologies for regulating demand – eg remote control of air conditioner compressors – have come into use in recent years.

Such expedients must become standard procedure as air conditioning is more widely adopted around the globe. In China, sales of air conditioning units have nearly doubled in over the past five years, with more than 60 million units sold in 2013 alone.

According to new research from the University of California at Berkeley, reviewed by Ms Tweed, that trend will contribute heavily to greatly increased energy use in developing and middle-income countries even as it flattens somewhat in the US and Europe. ("Electricity Use Could Soar as Global Middle Class Embraces Air Conditioning," 4th May)

Using data from Mexico, researchers at UC Berkeley's Haas School of Business studied air conditioning in relation to climate and income.

Taking into account the likely rise in both household incomes and air temperatures, they project that air-conditioned interiors worldwide will rise from 13 per cent of residences today to more than 70 per cent by the end of the century.

This is "mostly good news," said Professor Lucas Davis, lead author of the Haas School report: "Air conditioning will bring relief to the more than three billion people who live in the tropics and subtropics."

But the growing prevalence of air conditioning will require intensive investment in electricity generation in places such as India and southeast Asia, where even meeting today's needs is a strain.

India's demand for cooling is 12 times what it is in the USA, according to the Berkeley team; and Indonesia, Thailand and the Philippines experience more "cooling degree days" than India. Within just a few decades, the Haas School model shows "near universal saturation" in air conditioning use.

➤ Powering all those air conditioners will call for grids capable of generating adequate electricity. The UC Berkeley research strongly suggests that the time has come for

decision-making about energy costs and technologies. Dr Davis advocates an 'all-hands-on-deck' approach that includes aggressive funding for innovation, efficient pricing of energy, and evidence-based environmental policies.

He said: "We need efficient markets if we are going to stay cool without heating up the planet."

That is the challenge for a warming world.

Slow to kindle to offshore windmills, Americans seem willing at last to put some 'steel on the water'

More than 2,300 wind turbines twirl off the coasts of 11 European countries today, and the United Kingdom has just awarded approval for the world's largest offshore wind farm.

When completed, the Dogger Bank Creyke Beck project off the coast of Yorkshire will have installed 400 turbines across 430 square miles and be more than double the size of the current biggest offshore windfarm in the UK.

Bobby Magill, a senior science writer at *Climate Central* (Princeton, New Jersey), invoked the embrace of wind energy in Europe to point up the contrast with the US attitude toward this source of renewable energy.

While Americans debate the viability of wind farms off their coasts, Europeans have been in the offshore wind development business for decades.

Climate Central is an independent organisation of scientists and journalists researching and reporting on climate change and its impact on the American public.

Drawing on its work, Mr Magill believes that Americans may now be ready to shake off their tentativeness and follow the European lead on offshore wind energy.

In *Climate Central's* journal of the same name, he reviewed a wind farm set to "break ground" in July off the coast of Rhode Island. With it, he said, offshore wind energy seems suddenly to have a future in America. ("Steel on the Water' Critical for Offshore Wind in US," 11th May)

Mr Magill wrote: "If completed, the Block Island Wind Farm will be the first offshore wind farm in the USA. If it is successful, it could prove that wind power generated by turbines off the coast is a viable enterprise similar to onshore wind farms, which generate about four per cent of America's electricity."

That could, he said, set the stage for other offshore wind projects all along the East Coast as Washington opens up more waters to wind farm development.

President Barack Obama's Climate Action Plan includes offshore wind in the administration's push to generate 20,000 megawatts (MW) of renewable power on federally controlled public lands and waters by 2020.

This makes wind a major element in Mr Obama's declared intention to counter climate change with low-carbon energy.

➤ The 30MW, five-turbine Block Island Wind Farm, which will sell its electricity to the utility National Grid, will be significant for the USA out of proportion to its size. "I think the Block Island project is a significant milestone for offshore

Transatlantic cable

wind because seeing is believing," Bill White, senior director for offshore wind at the Massachusetts Clean Energy Center, told *Climate Central*.

"It's going to be a big deal because people can touch it and feel it and see it and understand it. Until that moment, it's not real."

A similar view was expressed by Jeffrey Grybowski, CEO of Deepwater Wind (Providence, Rhode Island), the developer of the Block Island Wind Farm. Getting policymakers, regulators and utility executives to take a good look at offshore wind will, he said, require "standing up" a project so as to bring offshore wind from theory to reality.

"It's important for the industry to have a success," said Mr Grybowski. "It's important to have steel on the water."

- According to the US Department of Energy the offshore wind power potential in the US is huge – totalling more than 4,000 gigawatts (GW) at full development.

That is about four times the electric power-generating capacity in the USA today and enough electricity to power some 800 million homes.

Automotive

▶ With 34 million airbags ordered replaced in a US recall, Canadian drivers are waiting their turn

"As automakers scramble to replace Takata airbags in 34 million recalled vehicles, there is less urgency in Canada. That's because it's cold up there."

The reference, by Alisa Priddle of the *Detroit Free Press*, is to the investigation by Washington into exploding automotive airbags that have been linked to six deaths and more than 100 injuries.

It was confirmed on 19th May that Takata, of Japan, is under criminal investigation related to the airbag issue and the company's response to the USA inquiry.

While teams of engineers have not yet assigned a definitive cause to the explosions, they are considering heat and humidity as factors.

The hypothesis is that these may degrade the propellant and cause bags to rupture with enough force to blow apart their canisters and shoot metal shards.

Cooler Canadian climes presumably exert a beneficial retardant effect. Because Takata had produced only about 3.8 million replacement kits to date – "not nearly enough," observed Ms Priddle – automakers are prioritising repairs within the United States. ("Canada Protected In Takata Airbag Recall?", 20th May) The recall covers vehicles from 11 automakers and multiple brands. Most of the vehicles are from the 2002 to 2008 model years.

Regulations require timely notice to car owners of a recall when there is a safety issue; but the reality is that it could take years to accomplish all the Takata fixes, Mark Rosekind, the new, proactive head of the National Highway Traffic Safety Administration, told the *Free Press*.

- Some discouraging data from Autotrader, supplied by Ms Priddle, indicate that the delay may not be noticed – still less resented.

The online auto site says that only 61 per cent of drivers say they try to stay informed about recalls; 56 per cent of those who are aware of a recall take the vehicle in for the free repair; and 35 per cent of prospective buyers enquire into recalls when shopping for a car.

Technology

▶ A new metal matrix composite combines lightweight with heat resistance, promising improved automotive fuel economy

While syntactic foams have been around for some time, the first-time achievement of a lightweight metal matrix syntactic foam has been announced.

The work of a team of researchers from Deep Springs Technology (DST) and the Polytechnic School of Engineering of New York University (NYU), in collaboration with the US Army Research Laboratory, the composite is light enough to float and resistant to heat – which would commend it to automakers seeking to shave weight for better fuel economy.

As reported in *R&D Magazine* (Rockaway, New Jersey), in recent years efforts to replace heavier metal-based components in automobiles and marine vessels have focused on lightweight polymer matrix composites.

The new magnesium alloy matrix composite, which is reinforced with silicon carbide hollow particles, has a density lower than that of water (0.92g/cc compared to 1.0g/cc). It thus offers both substantial strength and the lightness of foams. ("A Metal Composite That Will Float Your Boat," 13th May)

"This development of very light metal matrix composites can swing the pendulum back in favour of metallic materials," suggested Nikhil Gupta, an NYU School of Engineering professor and the study's co-author.

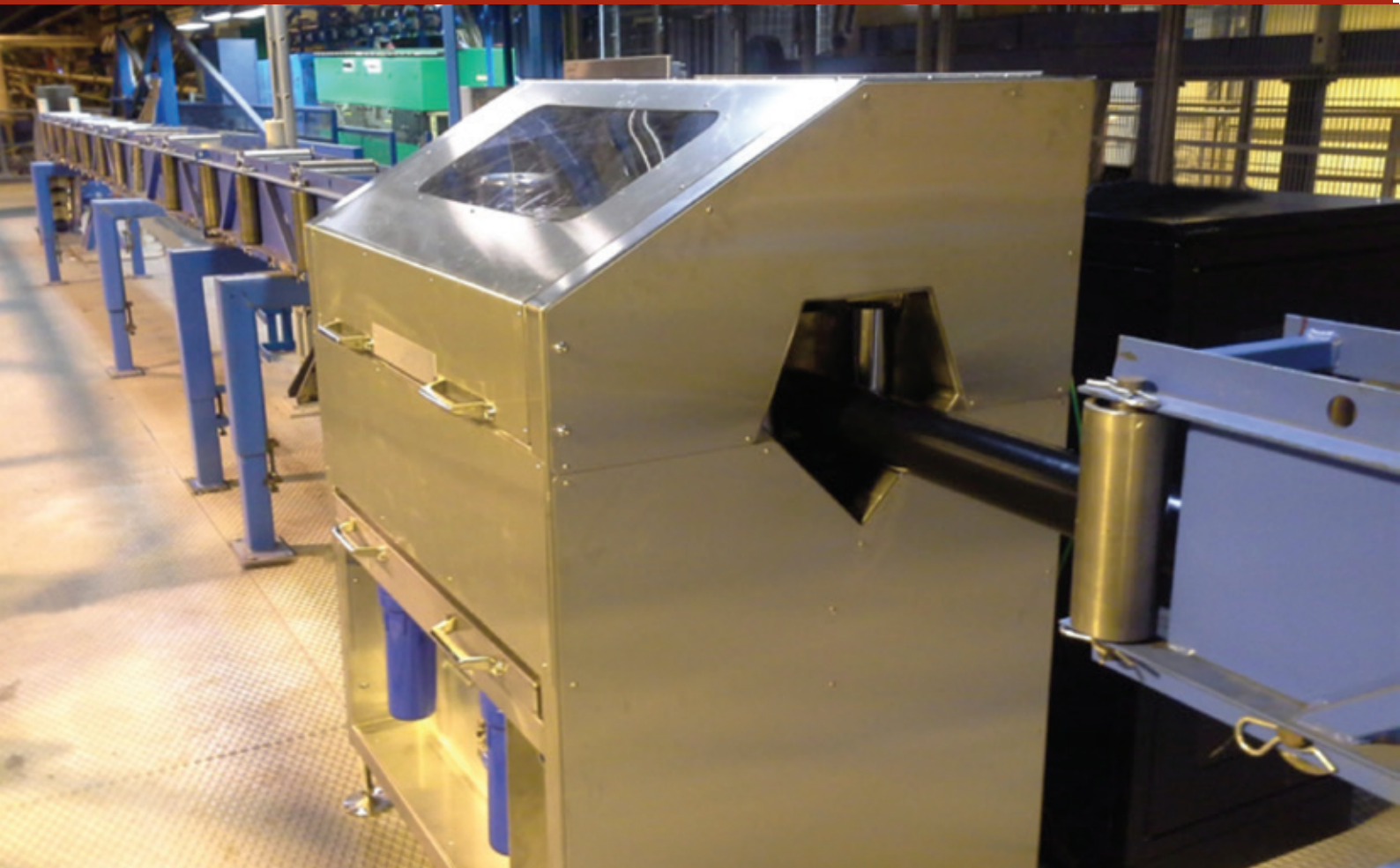
Mr Gupta noted that the ability of metals to withstand higher temperatures can be a huge advantage for these composites in engine and exhaust components, quite apart from structural parts.

The syntactic foam from DST (Toledo, Ohio) and NYU starts with a matrix made of a magnesium alloy, which is then turned into foam by the addition of strong, lightweight hollow spheres of silicon carbide manufactured by DST. A single sphere's shell can reportedly withstand pressure of over 25,000 pounds per square inch (PSI) before it ruptures – 100 times the maximum pressure in a fire hose.

The hollow particles are also said to impart impact protection to the syntactic foam, with each shell acting like an energy absorber during fracture. Adjusting the proportion of shells in the metal matrix can customise the composite for density and other properties.

Again according to the developers, who expect to present prototypes for testing within three years, the concept is also adaptable to other non-flammable magnesium alloys.

Dorothy Fabian – USA Editor



▲ The UltraScreen system from Acuity Products

Flaw density in check

WHEN extruding highly expensive submarine length (XLPE) MV/HV power cables, it is important for good run economics to continuously be aware of the status of extrusion quality monitoring (EQM) systems, including the level of contaminants, protrusions and voids (CPV) which affect post-production electrical stress testing.

A lot of work has already been undertaken into keeping process cleanliness factors high in an attempt to ensure that no contaminants find their way into the cable, or are formed during the molten process.

This helps to keep the process running continuously for as long as possible without stopping to clean down and eliminate any build-up of excess product. But how do they know when to finally stop the extrusion before problems build up?

At present, experiential factors are used as there are very few on-line methods to ensure the internal quality of the cable

over its entire length of production, since it is, of course, designed to be a continuous process lasting several days or weeks – you simply cannot cut into the cable to find out how good it is currently!

So a non-contact 'scanning' method of monitoring the cable as it is being produced is required, and rapidly scanning ultrasonics is the only solution, according to Acuity Products.

The UltraScreen system has feature detectors that automatically look for geometric anomalies at the inner and outer semicon interfaces with the insulation layer (typically linked to features like protrusions and fall-ins) and for the presence of unexpected artefacts within the insulation layer (typically linked to features like contaminants and voids).

These features are automatically detected when their level of geometry anomaly and/or presence within the insulation layer exceeds certain predefined threshold values. But in looking for positive indication of a stopping point,

the cable maker does not need to know where each of the defects lie, just to know if their density has increased. Acuity Products has included flaw density measures in the UltraScreen system with an associated alarm threshold.

From recent assessment of several long production runs in which the UltraScreen system has been employed, Acuity has established that there are small changes in the layers of the extrusion and their form which give rise to new indicators about the current effectiveness of production.

Using a combination of time and frequency domain analysis, the data sets analysed support a proposition that the quality of the extrusion of the inner screen changes over the length of the run.

These gradual changes can be considered as degradation as they increase the measured variability.

Acuity Products – UK
Website: www.acuityproducts.co.uk

83,000 operating hours and now as good as new

FOR Maschinenfabrik Niehoff, top quality, durability and value retention have always been the priorities when it designs and produces its machines and lines. Niehoff machinery which has been in operation for decades is worth reconditioning and being brought up to the latest technical standards.

With special measures, Niehoff upgrading specialists are even able to increase the machines' original level of productivity.

In this way, Niehoff Original+ After Sales has been optimising machines and lines for decades. One example is the full reconditioning of a multiwire drawing line which was supplied by Niehoff in 1996.

The line, an MMH 101 multiwire drawing machine with integrated RM 140 continuous annealer and an S 631 spooler designed for the simultaneous drawing of 24 copper wires, already has 83,000 hours of operation behind it and is used after reconditioning in one of the user's non-European plants.

The first measure taken before every machine is reconditioned is an inspection of the line by a Niehoff engineer on-site. After this the Niehoff specialists discuss with the user all the reconditioning work which is necessary, and draw up a quotation for the work.

In the present case, the drawing line was transported to Niehoff's headquarters in Schwabach, Germany, completely dismantled, cleaned and stripped of its paint. After each of the assemblies had been checked, the machines were repainted. The bearings and sealing flanges were completely replaced.

In addition, the annealer was completely refurbished and the line's electrical



▲ The newly reconditioned MMH 101

components were adapted to the power network of the country in which it is to be used in future.

Given the hot climate where the line is to be used, an additional cooling system was installed in the control cabinet.

Following assembly, a test run and a pre-shipment inspection by the user, the line was delivered to its new point of use in North America, installed and put into operation by Niehoff engineers.

Niehoff specialists are best qualified to recondition the machines and lines manufactured at Niehoff with maximum expertise and put them back into tip-top condition.

The Niehoff specialists who are involved in a reconditioning project are fully familiar with all aspects of the underlying machine technology.

Moreover, they have access to well-maintained documentation and machine data. Most of the spare parts required for each reconditioning job are produced in-house on cutting-edge machining centres to OEM quality.

Where third-party components are brought in, Niehoff makes sure that they all meet the high Niehoff quality standards.

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



Inosym Reels



Inosym Limited
P +64 21 353 634
inosym@inosym.com
www.inosym.com

Beating temperatures as low as -200°C

HRADIL Spezialkabel, based in Bietigheim, Germany, presents a flexible 5,000V power supply cable for maritime applications at temperatures as low as -200°C. The cable is typically used on LNG carriers. What makes this cable so special is that, instead of copper strands, it contains strands made from pure nickel.

Thanks to this new low-temperature cable, disruptions to operations caused by frequent cable malfunctions are reduced to a minimum. The cable is available in diameters from 6mm² to 185mm² and, on request, can be delivered with UL/CSA certification. For some time, attention has been turning to alternative, previously uneconomical, transportation options in response to the growing demand for natural gas and high gas prices. One such option is transporting liquefied natural gas by carrier.

Here, natural gas is cooled down to its boiling point at -161.5°C. At this temperature – and at a normal ambient pressure – natural gas changes to its liquid state, reducing its volume by a factor of 600. This would allow one cubic metre of natural gas to be transported in a piece of hand luggage, eg in a 1.5 litre thermos bottle.



▲ Hradil power supply cable for maritime applications at temperatures as low as -200°C

Liquefied natural gas is a non-toxic, limpid and odourless fluid. After being temporarily stored in cold boxes at the port of destination, eg Rotterdam, it is returned to a gaseous state by increasing its temperature as and when required – allowing it to be transported by pipeline again.

A pump and power supply cable must be lowered into the icy storage tanks before liquefied natural gas can be pumped in or out. The cable in particular has often been identified as a weak point in this process. Cable malfunctions have been a regular occurrence – not only because cables have to be able to withstand bitterly cold temperatures as low as -200°C, but also because mechanical

loads are significant, as the cable and the pump need to be lowered more than 40 metres below the surface into gas storage tanks. The harsh environmental conditions of the open sea, with permanent UV radiation and saline humidity, place an additional burden on the cable. To overcome these challenges, Hradil engineers have developed a special cable with steel armouring for this type of maritime application. Hradil's low-temperature cable is available in diameters from 6mm² to 185mm². The steel armouring offers vital protection against high mechanical loads, but means that the cable can no longer be manufactured in a conventional cable extrusion process.

This is why Hradil Spezialkabel has developed a special manufacturing process that creates multi-layered PTFE (polytetrafluoroethylene) film. PTFE is also known under its trade name Teflon® produced by DuPont®. The new low-temperature cable is available in different lengths depending on customer requirements, completely preassembled, and is delivered with certified connectors.

Hradil Spezialkabel – Germany
Website: www.hradil.de

www.cablecompoundfinder.com





The Cable Compound Finder App.

The quick and easy way to help you find the perfect compound for your cable construction.

▪ Insulation ▪ Sheathing ▪ Bedding



Google play



App Store



PC



Compounds for the cable world



Specialty compounds for wire and cable

The RN-Z silicone extrusion line is the newcomer

ROSENDAHL is constantly investing in its cable manufacture technology. Its decision to deal with liquid-cooled extruders and silicone was therefore rather inherent. With this new manufacturing solution, the company is ringing in a new round in its product development.

The properties you have to consider when dealing with silicone as a material are quite different from those of polymers. A perfect crosslinking process is the be-all and end-all in order to keep the material stable and process it into a cable with the requisite mechanical properties. In so doing, the extruded cable is treated at temperatures from 600°C to 800°C.

The RN-Z silicone extrusion line has been extensively tested at Rosendahl's new technology centre. The process was analysed and mathematically tracked, evaluated, and the figures compared. The results were very positive with a perfect crosslinking, high product quality, high centricity and high throughput.

Rosendahl – Austria

Website: www.rosendahlaustria.com



▲ The new RN-Z silicone extrusion line from Rosendahl

OCG™ – extending the life of your overhead line conductors



OCG™ is a world-beating range of cold-applied greases for the protection of overhead line conductors. Fully compliant with all international specifications, the range delivers unrivalled protection against fretting, multi-metal corrosion and high temperature oxidation.

OCG™ greases deliver significant cost savings, extending conductor life and delaying the need for the costly renewal of infrastructure.

Global specialists in high-performance lubricants



METALUBE®

Metalube Brazil
Tel: + 55 11 6188-7088
vendas@metalube.com.br

Metalube China
Tel: + 86-(0)21-5489 2146
sales@metalube.cn

Metalube India
Tel: +91 22 2545 9338
sales@metalube.in

Metalube UK
Tel: +44 (0)161 775 7771
post@metalube.co.uk



Offices in Manchester, Mumbai, São Paulo and Shanghai

www.metalube.co.uk

Enhanced flame retardance and low-shrinking grades

NEW additions to a low-cost series of Halguard® halogen-free flame retardant (HFFR) compounds for general-purpose jacketing applications include two compounds from Teknor Apex with enhanced flame retardance and one that exhibits lower post-extrusion shrinkage.

The new compounds cost less than premium compounds while entailing little compromise in performance properties. Teknor Apex recommends them for cable used in subway, mass transit, cell tower, data centre and infrastructure applications, as well as internal wiring in electrical and electronic equipment. The grades include:

- Halguard 58610 and 58615. These 53 Shore D compounds have UL-94 vertical burn ratings of V-0 for 1/16" (1.59mm) thick specimens, and oxygen indices of 52 and 45 per cent, respectively. Both enable passing the UL-1685 FT-4 and UL-1666 riser flame tests for more complex cable constructions
- Halguard 58620. This 54 Shore D compound provides the low level of post-extrusion shrinkage that is important for fibre optic cable applications, and enables passing the UL-1685 flame test

Teknor Apex – USA
Website: www.teknorapex.com

Properties of 3 Halogen-Free Flame Retardant (HFFR) Compounds

Properties	General-Purpose HFFR Compounds		
	Halguard® 58600	Halguard® 58610	Halguard® 58620
Hardness, Shore D	47	53	54
Specific gravity	1.56	1.65	1.56
Tensile strength, MPa	12.1	12.8	14.9
Elongation, %	212	178	156
Flexural modulus, MPa	103	144	156
Brittle point, °C	-38	-36	-29
Oxygen index, %O ₂	40.0	52.0	40.5
UL-94 vertical burn rating (1/16" specimen)	V-0	V-0	V-1
Post-Extrusion Linear Shrinkage, %	12.0	--	3.6

Source: Teknor Apex Company

▲ New additions to the Halguard range

DISCOVER THE POWER OF STEAM



CLEANING AND DRYING
LOW RUNNING COSTS
IN-LINE PROCESS
SPACE-SAVING
NO SOLVENTS
VERSATILITY



WEBSITE:
WWW.REASRL.EU

EMAIL:
INFO@REASRL.EU

TEL:
+39 011 6804250

Quality assurance for production of optical fibres

THE production of optical fibres is a single process that some manufacturers have specialised in.

After the drawn fibre has been proof-tested and wound onto reels, the fibre is coloured in a separate step and subsequently processed to an optical cable in a loose tubing or tight buffering line. During the production of optical fibre cables, one important aspect is the protection of the fibre inside the cable.

Typically, optical fibre cables receive an outer insulation layer made from PE as an outer protective coating. For this cable type, the measurement of the wall thickness of the outer insulation layer is usually necessary, especially with regards to the eccentricity of the insulation layer. The measurement of the diameter is naturally also of importance. However, a diameter measurement alone is generally not sufficient.

The applied measuring technique for the measuring of the diameter, wall thickness and eccentricity of optical fibre cables also has to be applicable for 'loose tube', 'fibre ribbon', 'loosely bundled' and 'tight buffered' cables. Furthermore, the measuring technique should be independent of the shielding material under the outer coating.

Inductive and optical measuring principles, as applied by the Centerview 8010 and 8025, have proven their effectiveness for the measuring of the eccentricity of cables with an electrical conductor made from copper or aluminium. For larger dimensions, measuring by means of X-ray is a process offering

continuous quality control during production. The applied X-ray technology is convincing as no calibration is required for different insulation materials or ambient conditions.

The devices of the X-Ray 6000 series are suited to the measurement of optical fibre cables. The diameter, minimum wall thickness, eccentricity and ovality are directly defined from the X-ray image. The recording of the measuring values is carried out by an X-ray sensitive image sensor within fractions of a second.

When the eccentricity of the wall thickness of the insulation layer is non-critical and the focus lies on the compliance with the specified average wall thickness, the diameter of the optical fibre cables is measured online before and after the extruder crosshead, and the average wall thickness is defined by the difference of the measured values.

Generally the line speed is controlled for a singular insulation layer and the extruder rpm for multi-layer extrusion. For an optimum use of resources, an automatic allowance of material shrinkage, resulting from the cooling of the insulation layer, is recommended.

The applied measuring and control technology can only be successful when it receives a high acceptance of the operator. This implies that the workload of the operator is lightened and that he can concentrate on other tasks.

Sikora AG – Germany

Website: www.sikora.net



- > Flat and Profile
- > Precision strip
- > Hi-carbon steel
- > Stainless steel
- > Flat copper conductors
- > Wire reduction
- > Aluminium
- > Copper alloys
- > Lithium, Beryllium
- > Precious metals

BÜHLER REDEX

info@redex-group.com
Hanaeur Str. 1-5
75181 Pforzeim - Germany
T. +49 7231 7755-0

www.wire-rolling-mills.com

MultiStrip 9480 – versatile cut and strip platform

SCHLEUNIGER has debuted the new MultiStrip 9480, the company's latest innovation in its cut and strip product family.

"Thanks to innovative technical solutions, the MultiStrip 9480 simplifies and extends the spectrum of possible applications once again," said Schleuniger product manager Rajeevan Kumaran. "There is no machine that allows a wider variety of cables to be processed than the MultiStrip 9480."

A range of technical characteristics form the foundation for this versatility.

First, Schleuniger's unique indexing cutter head allows a wide variety of blade and tool sets to be mounted. Next, the freely programmable rotary incision capability enables high-precision and fast processing of coaxial and micro-coaxial cables, as well as the handling of other multi-layer applications.

In addition, an optional universally deployable slitting unit that attaches

directly to the SmartBlade blade cartridge is available and considerably increases accuracy during the slitting process.

The MultiStrip 9480 can be set up quickly and easily and features short retooling times. Mr Kumaran explains: "With this machine, changeover times are minimised in order to maximise productivity."

Mr Kumaran's statement is supported by the machine's SmartBlade system, which enables complete blade sets to be exchanged in a matter of seconds, and the magnetic guide tubes, which can also be exchanged in seconds without the use of tools. The machine's high degree of productivity is also based on its fast transport speeds, the parallel and simultaneously running axes, as well as the extremely fast cutter head. Finally, Schleuniger's reliable technology almost completely eliminates downtime due to technical breakdowns.

The MultiStrip 9480 features intuitive programming via high-definition colour

touchscreen. With its user-friendly navigation, both experienced users as well as the occasional machine operator can learn to program the machine with ease.

The time required for programming is reduced even further by predefined standard parameters for common cable types and freely programmable material and processing libraries.

The MultiStrip 9480 is available in six machine versions to meet individual production needs and budgets, allowing customers to invest in a customised solution.

A wide range of options and accessories increase the machine's versatility and provides users with a virtually unlimited range of application possibilities. For example, users can choose between roller drives and belt drives as well as a large selection of blades, combing and slitting units.

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

High Precision Specialized Manufacturer of a Variety of Shaped Metal Wire & Bars for Special Requirement



TAIWAN LINKIGI METAL CO., LTD.

was established in October 1981. We are a professional manufacturer of various high precision cold-rolled and cold-drawn special shaped and profile wire, rods and bars which can be widely applied to many different industries.

We are known for high quality, reasonable price and prompt delivery.

Add: No. 117, Long Hsiao Street, Kweishan Hsiang, Taoyuan Hsien, Taiwan

Tel: +886-3-350-2577 Fax: +886-3-350-2626 Email: trade@tmetal.com.tw www.tmetal.com.tw

Frigecco to the automotive rescue

THERE are many factors that have contributed to manufacturers moving from copper to toward aluminium for many automotive applications. Today aluminium is used in primary cable and power/battery cables for passenger and commercial vehicles.

The justification for going to aluminium is reduced weight, which provides up to a 47 per cent mass reduction compared to copper. This can result in improved fuel economy, easier assembly and cabling that is easier to handle.

In addition, copper prices are much more volatile. Aluminium is abundant and copper is getting more difficult to find. This, coupled with the pressure being placed on copper demand from other industries, gives the manufacturer a much more stable supply chain and cost source.

However, there are other factors to consider when using aluminium. For example, the conductivity of aluminium is approximately 60 per cent of copper. Therefore the conductor cross section

has to be increased for the same current capacity. There are also other factors such as tensile strength, thermal expansion and thicker oxide layers. Regardless, the future of automotive cables is moving in this direction.

The finished conductor sizes are typically 0.75 to 2.5mm² for primary cable and 3 to 160mm² for intermediate power/battery cables. To produce these conductors there are several steps in manufacturing. Firstly, the small wires need to be produced. Typically these are made on a Frigecco multi-wire line, a single row of 16 wires with 100mm capstans. Once the wires come off the multi-wire machine and onto reels they need to be twisted into small bunches or sub units. The preferred method of production of the small sub units is to pay them off into a double twist buncher (typically 630mm or an 800mm).

Depending on the number of wires required in the sub unit and the number of wires that can be processed on the multi-wire, the number of payoffs required needs to be determined. Once the sub units are assembled, the reel holding the sub unit is either sent to insulating, if the desired cross section has been reached, or multiple reels coming from the bunchers are placed into driven, dancer controlled payoffs and assembled into a larger cross section using a larger single twist cabler. There are many constructions that

can be used. The following are some of these conceptual constructions and are not intended to reflect preferred constructions. The final construction is determined to meet a specific requirement as determined by the supplier and the final customer.

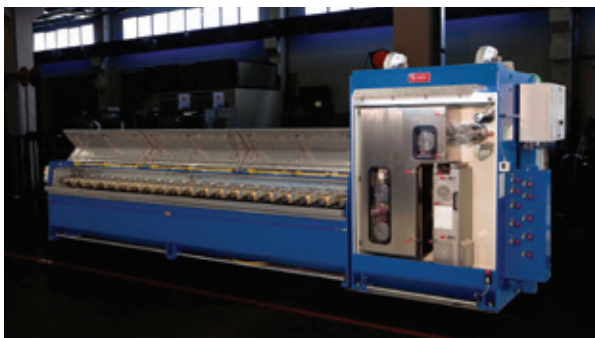
A typical construction on the Frigecco machines for 160mm² would be – 798 wires of x 0.51mm – 17.9mm Cond OD. This is made of 19 sub units of 42 wires of 0.51mm diameter and assembled into a 1+6+12 to produce the final conductor. First the 0.51mm wires are made on the multi-wire as above. These sub units of 42 wires are assembled on a Frigecco double twist buncher.

Once the sub units are assembled, the bobbins are placed into 19 driven dancer controlled payoffs to produce the larger conductors. Each of the payoffs has a motor and the speed of the bobbin is controlled with the pneumatic dancer. These individual units are assembled using a lay plate where the sub units are arranged in a 1+6+12 symmetrical orientation and placed into the 1,600mm single twist cabler to produce a very high quality unilay construction.

Once the primary or battery cable conductor is produced, it must be insulated. These insulated conductors need to meet the hostile and demanding requirements of the engine compartment where the temperature can range from -40 to +180°C.

Mario Frigerio SpA – Italy
Website: www.mariofrigerio.com

▼ A Frigecco multi-wire line



looking for:

- efficiency?
- reliability?
- customer service?

the answer at:
www.uhing.com

...made by

Joachim Uhing GmbH & Co. KG · Tel.: +49 (0) 4347 906-0

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

PLASTIC SPOOLS



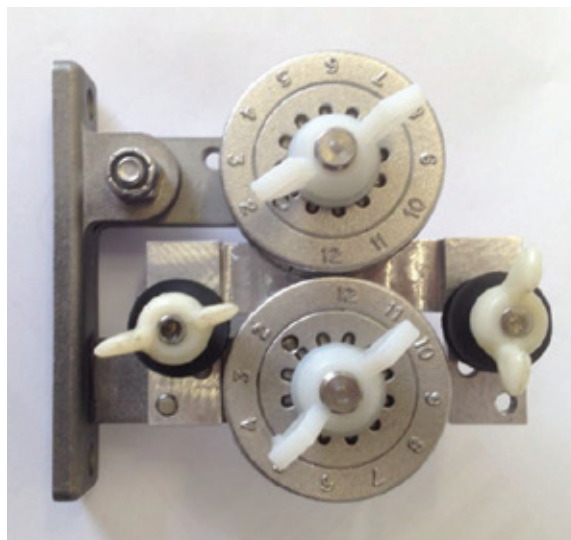
STEEL REELS

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

New feature added to Marldon airwipes

THE Marldon "variable orifice" airwipe design has always offered users the economy of a single unit to process a range of cable (or tube) diameters effectively, but the guidance of cable into the unit has been the responsibility of the customer.

Correct alignment of cable through the unit is essential to good drying and also to avoid the cable coming into contact with the airwipe, which may damage the cable and, over time, the airwipe.



▲ Airwipe design with rollers

Marldon now offers an attachment which holds roller guides on the input and output side of the unit. The attachment is compact and sits neatly within the airwipe assembly. Each roller is independently adjustable for height to accommodate the specific diameter of cable (or tube) being processed (as the centreline must remain constant across all cable diameters).

Marldon Group Ltd – UK Website: www.marldon.com

INTRODUCING
VITRIFIED NANOCRYSTALLINE TECHNOLOGY
DIES & TOOLS



(From Smallest to Biggest Size)
PCD / ND / Carbide - Stranding & Multiwire Drawing Dies
Shape Dies (PCD & Carbide)
Carbide Pressure Dies
Carbide Split & Enamelling Dies
Ceramic Tools / Pulleys
Diamond Angular Pins & Files
Boron Carbide Powder & Paste
Diamond Lapping Compound / Powder
Die Polishing Machine for PCD, ND & Carbide Dies
Extrusion Tools (PCD & Carbide)
Measuring Pins & Steel Pins
Lubricants for Copper / Aluminium / CO2

In-House PCD/ND Die Polishing Machine
In-House Pneumatic Carbide Die Polishing Machine

AJEX & TURNER
A-53, G.T. Karnal Road, Azadpur, Delhi-110033 (India)
Mobi.: 0091-9871890709 / 9810111137
Email: sales@ajexturner.com, info@ajexturner.com
Website: www.ajexturner.com

Truly steam-cleaned!

REA Steam Cleaning has introduced the inline cleaning of wires using saturated steam, giving the following advantages:

- higher degreasing levels
- wire is absolutely dry after cleaning
- directly cleaning in line at any speed
- different diameters and shapes without changing the equipment
- low water consumption (in most cases < 50 litre/hour)
- very little waste water produced (in most cases < 10 litre/hour)
- greater reduction in encumbrances on the production line (in most cases < 2 metres)
- an environmentally friendly alternative to solvents

Higher degreasing levels are an intrinsic feature of steam cleaning due to the high temperature of the steam which hits the wire at temperatures of over 140°C. When the wire is heated by steam it stays perfectly dry and avoids the need for the drying phases which are essential in other cleaning systems.

The line speed allows for a passage speed of up to 60m/minute and the amount of water is always contained, especially in cases where the section is very small, such as in wire, and gives water consumption figures of between 15 and 100 litres per hour.

One of the features that makes steam cleaning systems distinctive is the low amount of waste water produced, which consists mainly of the dirt removed and the water from the condensed steam.

All cleaning systems on the production line stand out for their much lower level of encumbrances, and all the other support units are placed outside the line.

The steam cleaning systems have always been a truly environmentally friendly alternative to the use of solvents. Should it be necessary to use detergents, these are continuously recycled so consumption is very low, generally less than one litre per day.

REA Steam Cleaning Srl – Italy

Website: www.reasrl.eu

Efficient, versatile and future-pointing BMV braiding concept

AS cable products have to meet continuously increasing demands, wire and cable manufacturers need machinery which enables an energy-, raw materials- and cost-effective manufacturing process. Furthermore, the machines must be flexibly adaptable to new production requirements. The machinery developed and built by Maschinenfabrik Niehoff meets all these requirements. One example is the lever arm rotary braiding machines of the BMV series, designed for 12, 16 or 24 spools in vertical operation.

The BMV machines feature an infinitely variable electronic control of braiding speed and pitch as well as an automatic central lubrication system. All process steps – from the pay-off of the cable to be braided to the individual wires and bundles of wires and the final take-up of the braided cable – are monitored by a quality control system. As an option, an empty bobbin detection system can be installed which ensures that a BMV machine is stopped automatically before a braiding bobbin is completely empty. This system minimises waste and the amount of residual wire left on the bobbin.

For greater operational safety and reliability, the temperature of slideways is monitored by a monitoring system. The operator can use this system for adjusting the lubrication frequency and amount of lubricant to optimise lubricant consumption. As a result of all these measures, BMV braiders can be operated for a long time unattended and without an operator. The most recent innovation in the field of the BMV braiders is the 24-carrier lever

arm rotary braiding machine BMI 124. A striking feature of the 24-spool machine is its inclined braiding rotor. The inclination means a cable deflection of just 45° (instead of 90°) on each deflection pulley – resulting in reduced cable deformation and improved braiding quality. If combined with a caterpiller haul-off, the machine can be used to manufacture cables with diameters up to 40mm. The BMI 124 enables bundles of braiding wire to be produced with maximum bundle cross-sections of 24 x 1.5mm².

The BMV machines can be combined with different types of taping systems so that braiding and taping can be performed in a single operation. This simplifies the manufacturing process, reduces the amount of space required and increases the product quality compared with when individual process steps are used. The experience of many cable manufacturers has shown that one BMV braider can be used to replace two to three older types of braiding machine. Niehoff's BMV braiding machines are designed for the processing of bare or coated round and flat wire made of copper, aluminium and stainless steel, with single-wire diameters of 0.05 to 0.3mm, as well as yarns and fibres made of plastic. The machines can be used for the production of data cables, control cables and coaxial cables, braiding for battery cables, strand braids and for mechanical reinforcement for pressure hoses.

Maschinenfabrik Niehoff GmbH & Co KG – Germany
Website: www.niehoff-gmbh.info

Improve dosing with the Miniblend V

The volumetric Miniblend V dosing and mixing unit offers excellent mixing quality and consistently accurate dosing. Mounted between the machine hopper and the feed throat of the plastics processing machine, the unit requires very little space.

Disc dosing with the Miniblend V gives real volume dosing which guarantees a very high dosing accuracy – even for very small dosing quantities.

Three different disc sizes as well as dosing modules made of materials such as stainless steel or glass, and special wear-resistant discs for hard and abrasive materials are available. Module exchange is quick and easy and thus allows fast colour changes.

The Miniblend V is designed to dose free and normal-flowing materials and micro-batches.

The unit can be operated by motan's volumetric controls VOLU MC or VOLUnet MC, which is equipped with an Ethernet interface.

motan colotronic GmbH – Germany
Website:
www.motan-colotronic.com



▲ *Miniblend V volumetric dosing and mixing unit*

**AK EXPORT
IMPORT**



We care about your business, because we care about ours.



We offer the best quality product at the right prices, worry-free returns and exchanges, no minimum quantity to order and great credit. You are assured of the highest product quality.

www.akexport.com.tr

Tel: +90.216.339.2403
Fax: +90.216.339.2961

Tel: +90.216.339.6624
Email: info@akexport.com.tr

Acıbadem - Zerrin sok. Akman Apt. No:11/A 34660 Üsküdar, Istanbul, Turkey

Join the best: worldwide

WIRE & CABLE
INDIA
Mumbai

wire
Moscow

wire
Southeast
ASIA
Bangkok

wire
South America
São Paulo

wire
CHINA
Shanghai

wire Düsseldorf: Innovations go global. Take advantage of the highest calibre expertise of the No. 1 international fair as the show goes global. Draw on international synergies from these leading trade fairs. A cycle of regional events, staged in succession around the globe, responding to local market and customer needs. Detailed information on the full programme can be found at: www.wire.de

wire®



Messe Düsseldorf GmbH
P.O. Box 10 10 06
40001 Düsseldorf, Germany
Tel. +49 (0) 2 11 45 60-01
Fax +49 (0) 2 11 45 60-5 88

www.messe-duesseldorf.de



Videojet's answer to ultra-small printing

MANUFACTURERS in the electronics, components and cable sectors, as well as other industries requiring ultra-small printing capabilities, can now benefit from high quality micro printing with advanced uptime thanks to the new 1650 High Resolution (HR) and 1620 HR Continuous Inkjet (CIJ) printers from Videojet Technologies. Enhanced micro printing capabilities of the new printers achieve high-resolution, quality printing of characters as small as 0.6mm in height, and speeds of up to 348 metres per minute. The 40 micron nozzle enables the 1650 HR and 1620 HR systems to print 2D bar codes and highly legible alphanumeric multiline codes at high speeds on integrated circuits, small-diameter cables, and other products with limited printing space, optimising traceability for manufacturers without compromising line productivity.

The new HR micro printers build off the successful Videojet 1000 Line platform and the application-tested 'Ultra-High-Speed' nozzle innovations that Videojet released in 2013. With tens of thousands of successful installations, the 1000 Line platform continues to be the standard for CIJ uptime performance. The new HR printer nozzle leverages the proprietary Precision Ink Drop™ technology which allows the nozzle to operate at over 100,000 drops per second via the advanced high frequency printhead design, which together with sophisticated software algorithms modifies the flight path of individual ink drops for optimal code quality. Anthony Blencowe, business unit director for CIJ at Videojet Technologies, said: "Manufacturers using micro print place a premium on print quality. The 1650 HR and 1620 HR incorporate these enhancements plus specialised rasters to overcome the print quality challenges inherent in shortened character heights and fast line speeds. Manufacturers can now print more data with better legibility, at faster line speeds, often in the same, limited print area."

The new HR printers feature Videojet patented CleanFlow™ technology, which reduces ink build-up on nozzle ends, enabling the printers to run longer than traditional micro printing systems between nozzle cleaning intervals, significantly cutting maintenance requirements. The printhead offers automated cleaning, supporting faster system start-ups even after extended line shut downs, increasing production uptime. An internal pump eliminates the need for external air, lowering the risk of contaminants in the ink stream, further boosting print consistency. Complementing the advanced nozzle technology, the HR printers use a range of specialised halogen-free inks, which offer abrasion, temperature and chemical resistance. All inks can be used on RoHS-compliant products (EC 2011/65/EU Annex II) to meet the specific needs of the electronics industry.

In common with the other 1000 Line Videojet CIJ printers, the 1650 HR and 1620 HR solutions feature the Smart Cartridge™ fluid system that helps to ensure that only the correct ink is selected for each product, supporting electronics and wire and cabling manufacturers who may be using multiple ink types. The printers use a needle and septum to draw ink from each cartridge, eliminating the risk of spillages and reducing waste. To meet manufacturers' specific operational needs, both HR systems offer unique features to aid functionality for line personnel. The 1650 HR features the Videojet exclusive CLARITY™ touchscreen, which offers built-in productivity tools to help boost OEE and enhance line efficiency. The 1620 HR comes with a keypad interface that is robust and easy to use with minimal training, facilitating simple and speedy product changeovers.

Videojet Technologies – UK

Website: www.videojet.co.uk

Smooth surface and low friction

AFTER studying for years how to make cost effective dies, Ajex & Turner has developed diamond coated dies, which are replacing PCD with more wear resistance, an extremely smooth surface with immensely low friction.

The dies are suitable for:

- Drawing stainless steel wire or carbon steel wire up to 0.6%C
- Drawing aluminium or Al alloy wire
- Drawing nickel silver wire
- Drawing copper/brass tubes
- Drawing wire and compacting/stranding copper and aluminium

Aluminium RBD processes make stronger and better wire using low friction diamond coated dies.

There is much better performance than TC or PCD dies, made possible by improved diamond die technology.

The die also gives a surface finish hold +0 tolerance for up to 500 tones (stainless steel and carbon steel wire up to 0.6%C). The price is two to ten times lower than PCD dies (depending on the bore diameter).

These diamond coated dies can be used for wire drawing and compacting copper/aluminium/aluminium alloy/nickel/stainless steel, copper and brass tube and it can be made from 3mm to 72mm.

For high and low carbon, Ajex & Turner has developed pressure dies for a long life. These dies are used for dry and wet drawing, respectively.

With its revolutionary concept of disassembling die, it improves lubrication, gives 30 per cent more nib or pallet life and produces higher quality wire.

The pressure dies contribute significantly to an increase in drawing speeds and improve productivity to the wire plant.

By using the pressure die, the re-cutting or refurbishment is very much eliminated and the wire drawing speed also increases up to 50m per second.

The company claims that this performance can only be achieved with Ajex pressure dies and their drawing inserts.

The company also provides three-day workshops to engineers and operators to learn step-by-step maintenance of the die for maximum utilisation and longer life.

The cost of the die plays an important role, and Ajex & Turner has developed many machines for die polishing and

re-cutting for carbide and polycrystalline. Dies which are running one to three shifts need periodic cleaning for smooth performance and a long life.

For the same purpose the company has developed a die cleaning solution with an ultrasonic machine which is developed in two parts for longer life.

Ajex & Turner – India
Website: www.ajexturner.com



▲ Carbide pressure die



is now



Kkalpana Industries (India) Limited

A leading polymer compound manufacturer in India with a global focus, providing solutions to all your needs.

PRODUCT RANGE FOR CABLES

- PVC Compounds
- HFFR Compounds
- Sioplas Compounds (36 KV)
- XLPE Compounds (36 KV)
- Semi Conducting Compounds (36 KV)
- PE Insulation & Jacketing Compounds

Kkalpana Products are RoHS & Reach Compliant



Manufacturing
India: Daman, Kolkata, Silvassa



Warehouse
Istanbul & Sao Paulo



Kkalpana Industries (India) Limited www.kkalpanagroup.com

Head Office:
2B, Pretoria Street, Kolkata - 700 071
Tel: +91-33-22823744 / 45 / 8818, Fax: +91-33-22823739, Email: kolkata@kkalpana.co.in

Sales & Marketing Office:
106, Laxmi Plaza, Laxmi Industrial Estate, New Link Road, Andheri (W), Mumbai - 400 053
Tel: +91-22-67021470 / 71 / 72, Fax: +91-22-67021473, E-Mail: mumbai@kkalpana.co.in

Energising Lives Through Speciality Compounds

Get your company noticed!

by advertising in the
March 2016 show issue



4-8 April 2016



The March 2016 issue will be freely distributed from our stand in the main North Entrance hall and in Hall 4 stand 11D28

Advertising deadline:

MARCH 2016

SHOW ISSUE

11 January 2016

Contact: +44 1926 334137

Email: wca@intras.co.uk

www.read.wca.com



▲ The Conklad 315 from BWE

Smallest in the range

BWE's Conklad 315 machine is based on the highly successful and well-proven Conform 315 model. The Conklad 315 is the smallest machine in the BWE Conklad range but incorporates many of the standard design features found on the larger machines, such as hydraulic shoe opening, feedstock shear, epicyclic gearbox and torque tube.

The Conklad 315 operates in tangential mode, using a single infeed rod, for cladding and sheathing operations. The machine has been optimised for high efficiency production of:

- Aluminium clad steel wire (AS Wire)
- OPGW and CATV cables
- Sheathed composite cores
- Reinforced aluminium wire
- Solid aluminium conductor (SAC)

The basic machine construction is based on the proven BWE design, which has a record of reliable operation over many years of service. Extreme rigidity, the ability to operate at high extrusion pressures and separately controlled wheel and die temperature ensures that tooling clearances remain optimal throughout long periods of continuous operation.

Automatic die heating and wheel cooling systems ensure rapid pre-heat to the correct starting temperature and maintain optimum extrusion conditions during production without operator intervention.

Overall economics are further improved by insert tooling that allows the wearing surface of the main tooling component, the die chamber, to be replaced at minimal cost.

BWE offers a wide range of services tailored to customers' needs, ranging from machine-only supply with customers providing their own ancillaries to full turn-key systems including plant engineering, training, installation and commissioning.

BWE Ltd – UK

Website: www.bwe.co.uk

WIRE, BAR AND TUBE DRAWING DIES

Celebrating 65 years

'Committed to quality and service since 1950'



Pressure Die System Now Available!

FOXTON

+44 1274 874422

+44 1274 862818

post@foxtondies.com

www.foxtondies.com

Paragon Works
Westgate
Cleckheaton
West Yorkshire
BD19 5HT



www.candorsweden.com

- Electrolytic plating
- Candojet hot water cleaning
- Electrolytic & Ultrasonic degreasing
- Welding wire cleaning and copper coating
- Pickling & phosphating

Multi wire cleaning plant



**Ultrasonic
& Electrolytic**

Single wire plating plant



CANDOR Sweden AB

Tel: +46 11 21 75 00 Fax: +46 11 12 63 12

Email: info@candorsweden.com

Ultrasonic welding the favoured method of assembly

WITH manufacturers using wire harnesses in increasingly challenging functional and environmental conditions, ultrasonic welding is becoming the favoured method of assembly, since it produces welds with high conductivity and tensile strength. In fact, it is estimated that at least two-thirds of the cabling used in today's cars is ultrasonically welded.

"Wire harnesses are like the central nervous systems for equipment in a wide variety of industries, including consumer electronics and appliances, data and

telecommunications, lighting, medical, automobile, marine and aerospace," said Melissa Alleman, Sonobond Ultrasonics' vice president.

Ultrasonic welding has become a popular alternative to other methods of welding because it uses vibrational energy to disperse surface oxides and create galling on wire strands. This forms a solid-state metallurgical bond with high conductivity, producing the lowest resistance weld available.

"Unlike resistance welding that generates high heat, in ultrasonic welding the metals do not melt, so there are no significant changes in the material properties, and the lower heat means no external water cooling is needed," added Ms Alleman. Also, unlike soldering – which cannot be used if the temperature at the weld during use approaches the melting point of the solder – ultrasonic welding requires no flux or filler materials. Plus, ultrasonic welding uses much less time and energy than its alternatives.

The ultrasonic welding process begins with a power supply that converts input line power into high frequency electrical power and transmits that energy to a transducer.

The transducer transforms the electrical energy into vibratory energy, which is delivered to the welding area as sound waves, or ultrasonics. When the vibrating, shear forces of the ultrasonic waves are directed by the welding tip to the interface between two metals, which are held together under clamping force, internal stresses cause deformation where the materials are in contact.

A localised increase in temperature and interfacial slip breaks up oxides and surface films, permitting metal-to-metal contact at many points. Continued vibration causes further deformation of the points, increasing the contact area and essentially creating a weld without melting, and producing a metallurgical bond with high conductivity and tensile strength.

The Wedge-Reed system uses a vertical vibrating reed, driven by a wedge-shaped coupler and transducer assembly perpendicular to the reed, allowing high clamp force without bending stress or stalling.

Sonobond's Dual Head SpliceRite™ features welding heads on both sides of the weld area, enabling it to provide one-pulse wire splicing of up to 100mm² in stranded bare copper wire and tinned wire to about 60mm². Also available are a Dual Head Spot Welder, as well as Sonobond's SonoWeld® units, which can be custom-tooled to weld tinned wire to bare or coated terminals. Every Sonobond welder is equipped with a microprocessor controller that can program welds by height, energy or time, and store and recall up to 250 jobs.

Additionally, all units have heat-treated, taper-lock tips that are capable of achieving up to 100,000 welds and that are easily replaceable without requiring machine readjustment or calibration. Sonobond's equipment also offers automatic frequency control and overload protection, and can detect and prevent wrong-part or no-part activation.

Sonobond Ultrasonics – UK

Website:

www.sonobondultrasonics.com

New powerful cable feeding systems

Schleuniger has introduced the new PreFeeder 3300 and PreFeeder 4300 cable feeding systems. The systems distinguish themselves through simple design and ease of use. For easy reel handling and fast changeovers, all axes are electrically driven. Both the PreFeeder 3300 and PreFeeder 4300 use a shaftless design for easy loading and unloading of reels.

The PreFeeder 3300 is suitable for reels weighing up to 150kg (330lb) with a maximum diameter of 600mm (24") while the PreFeeder 4300 can handle reels weighing up to 400kg (880lb) with a maximum diameter of 900mm (36"). These powerful machines can increase production rates and economic efficiency.



▲ The new PreFeeder 4300 cable feeding systems

Schleuniger North America Inc – USA

Website: www.schleuniger-na.com

bongard
machines trading

More than 1.200 second-hand
machines in stock



Reconditioned straight line
drawing machine

bongard
machines engineering

New machines designed
for your production



New Bongard drawing line
for trolley wire

Bongard Group

58730 Fröndenberg/Germany

Tel. +49 2378 915-5

Fax +49 2378 915-300

info@bongard.de · www.bongard.de

High accuracy helps reduce manufacturing costs

NDC Technologies reports that its innovative Beta LaserMike LaserSpeed® non-contact laser gauge enables wire and cable manufacturers to accurately measure the length and speed of products during production to avoid costly product overages and shortages, as well as reduce product scrap and rework.

Manufacturers of wire and cable have applications where they need to tightly control the length and speed of product during production.

Applications include continuous length measurement, differential speed control, cut-to-length control, product positioning, printing/marking control, and other demands. Most manufacturers depend on the accuracy of their drive speeds or mechanical contact encoders.

However, mechanical encoders can lose contact on various product surfaces due to slippage or vibration, and require frequent calibration because of mechanical wear and tear. A contact encoder with inaccuracies as much as two per cent can cost a manufacturer a significant amount of money due to product give-away, waste, maintenance, and system downtime.

To solve this problem, manufacturers have installed the LaserSpeed non-contact gauge on their production line to directly measure the length and speed of product.



▲ Measuring the length and speed of products during production to avoid costly product overages and shortages

The LaserSpeed gauge uses advanced laser-based technology to precisely measure the length and speed of wire and cable during production without making contact with the product. This high-performance gauge projects a unique pattern on the surface of the product.

As the product moves, light is scattered back to the LaserSpeed unit. This information is translated into product speed, and pulses are produced to determine the product length. Length and speed measurements are captured with $\pm 0.05\%$ accuracy and $\pm 0.02\%$ repeatability.

NDC offers a complete line of LaserSpeed systems with measurement speeds up to 12,000m/min (39,400ft/min) and down to the true zero speed, standoff distances up to 1,000mm (39.4"), and measurement depth of field up to 100mm (3"). NDC also offers a European certified length measurement system that meets MID (Measuring Instruments Directive) 2004/22/EG requirements.

NDC Technologies – USA

Website: www.ndc.com



**SEZ-6-302
Double-Head Belt Grinding
Machine (Sander)**

Wire diameter 5.5 - 20 mm.

Control: Automatic mode with
Drawing Machine.

Wire inlet speed up to 3.5 m/s.

Adjustable sand belt speed.

www.witech.de



QUNYE ELECTRICAL CO.,LTD.

**Qunye Spool Expert
Comparable Trustable**

ISO9001:2008

Jiangsu Qunye Electrical co., Ltd. is specialized spools manufacturer. We have high standard workshops and office, first class equipment line and complete inspect facilities, advanced management and quality control to fulfill all customers' requirements. We could make spools according to standards or according to customers' specifications. We make all kinds of steel and plastic spools and sell spools well in domestic and overseas market. We have a good team, rigorous management and quality control. QUNYE spools, comparable, trustable.



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

Advertorial on behalf of Decalub

Wire cleaning: From drawn dull to wire clean glossy plating finish

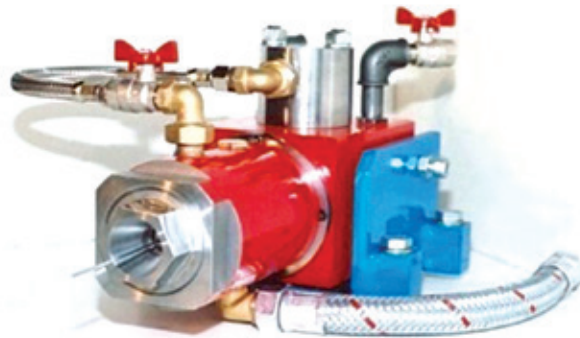
THE PWC system simultaneously performs drawn wire cleaning and polishing, in-line with wire drawing machine at up to 12m/s (2,400ft/min), in a totally green application.

Exceptional cleanliness obtained in glossy finish and plating quality permits wire direct brass coating, copper coating, galvanising, plating, Al and Cu cladding and wire cleaning prior to heat treatment and coating applications including patenting, annealing, painting, plastic coating, etc.

For a clean mirror reflective wire finish, for decorative applications, the system can be used with a conventional emulsion diluted at 3-5 per cent concentration.

The PWC incorporates new technology that enables normal plant cold water to be converted into a unique cleaning medium generating pressure wetting/contaminants extreme pressure extrusion/hydrodynamic cavitations displace/and contaminants flush out, used to clean drawn wire at high-speed in a completely green application.

The PWC system effectively loosens and removes lubricant residue from base material and is particularly recommended for cleaning applications with wires drawn upon severe conditions resulting in increased heat and burned lubricant tightly bound to the wire surface and embedded in micro-cavities which are



▲ Wire cleaning by PWC system in dual core configuration

further smoothly polished under high pressure, generated by the unit, effectively separating lubricant residue from base material, washing away dispersed contaminants, enabling wire exiting the unit very clean of white-metal appearance with reflective finish and totally dry.

The PWC system provides the ultimate combination of simplicity and effectiveness: acid-free, caustic-free, without ultrasonic, without chemicals, hermetically sealed zero-emission system, no fume, no foam. Economical and environmentally friendly, the system provides significant process savings in production of clean wire. The PWC unit is compact and can be easily installed on the finishing/last block of a wire dry drawing machine.

Decalub – France

Email: info@decalub.com

Website: www.decalub.com

Ethernet cable standards

Energy chain and continuous flex cable expert igus® now offers a full range of Ethernet chainflex® cables, qualified for CAT 5, 6, 6A and 7 standards.

Each cable type has been rigorously tested for more than 40 million strokes at the igus test facility in Cologne, ensuring secure data transmission even under the highest mechanical demands.

The special construction of the chainflex CAT 7 cable guarantees reliability and integrity in continuous flex applications. The braiding has been increased substantially and overall shielding has 90 per cent optical cover, which ensures high-level functionality, even after millions of bending cycles.

The CAT 7 cable is flame retardant, as are all cables with the abrasion-resistant TPE outer jacket. In addition, the cable is UL / CSA, EAC and CTP certified and DESINA compliant. The CAT 7 range is also suitable for use in clean room environments and has DNV GL approval for energy chain applications in offshore environments.

igus – UK

Website: www.igus.co.uk

**GEEIGNET
UM ALLE METALLDRÄHTE**
Wir verstehen alle Ihre Bedürfnisse
Wir erfüllen alle Ihre Anforderungen

**T I E N C H E N D I A M O N D
I N D U S T R Y C O . , L T D .**

Website: www.tienchen.com.tw
E-mail: diamonddie@tienchen.com.tw (English)
tcdiamonddie@tienchen.com.tw (Deutsch)
Tel: +886 3 4853838 Fax: +886 3 4785333

Online diameter control during wire and cable production

ONLINE measuring devices with controlling functions have become a standard in extrusion lines.

For the measurement of a product diameter there are two established techniques. The first method was invented 40 years ago and is commonly known as the 'scanning system'.

The technology that was presented 20 year later uses a laser beam, which is directed onto a high resolution CCD line sensor, with no rotating mirror and lenses in between. The product causes a shadow on the CCD line sensor. In this case the number of dark pixels on the line sensor is equivalent to the diameter.

The main differences between the two techniques are that the second technology is completely digital, and requires no moving components and no lenses. As a consequence, accuracy, repeatability and measuring rate are higher, and calibration is not necessary.

The technological base of Sikora diameter gauges described in the following is the second principle, using CCD-line sensor technology combined with laser diodes as light sources and powerful analysis software. There are two types of measuring heads available that meet classic respectively high-end requirements demanded for quality control on cable production lines.

There are diameter gauges with classic functions available such as the gauge heads of the Laser Series 2000 that meet the standard requirements which are imposed on a diameter measuring system. The gauges measure the diameter in two or three planes with a measuring rate of 500 measurements per second. Interesting is the three-axis gauge head

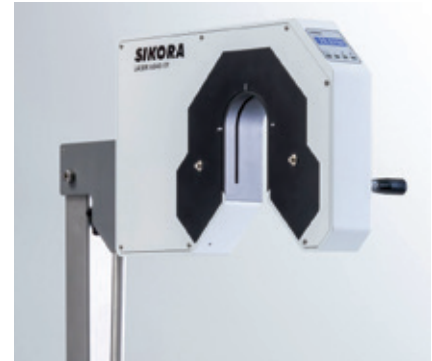
for defining the ovality of a product. It is known that an oval is defined by five tangents.

Accordingly, by using three measuring axes (six tangents on the oval) not only the min/max value of the oval, but also the orientation of the oval can be defined. All devices are equipped with standard interfaces such as RS 485, optional Profibus-DP and other industrial field buses for data transfer to a line PC or a display and control device.

With an additional control module, which is integrated into Sikora's display and control devices, the diameter is continuously controlled to the nominal value. Customers can select from 18 types of devices covering a diameter range from 0.05mm to 500mm. These devices are standard in extrusion lines.

Today, users are aiming for a permanent quality control of their production as well as maximum productivity and cost reduction, for instance, by using advanced innovative measuring devices. Due to this demand, Sikora has developed three diameter gauge head models of the Laser Series 6000, which meet the current high-end requirements in the wire and cable sector. The gauge heads of the Series 6000 combine a variety of technological innovations to improve the productivity of extrusion lines sustainably.

Up to 5,000 measurements per second, each of them with highest single value precision, allow for an optimum line control and provide reliable statistical data. The high measuring rate also allows the detection of lumps and neckdowns. Therefore, the user receives a two-in-one system with which investment costs are reduced and more space is achieved in the line, as the installation of only one



▲ No rotating mirror and lenses in between gauge head is required. Transparent and coloured products can also be measured with the Laser Series 6000.

For applications where statistical data will be processed and stored and/or where reports will be printed, external processing systems of the EcoControl Series are available. Directly integrated in the gauge heads is a universal interface module for all connections such as RS 485, RS 232, Profibus-DP, Profinet or alternative industrial field buses.

Additionally, the Laser Series 6000 has an optional Wi-Fi interface, which allows for a direct connection to a smartphone or laptop.

An important feature for integration in the production line is the swivelling gauge head design. The gauge heads can easily be moved up and out of the extrusion line. The feeding of the cable connection to the interface module is also safely protected in the gauge head stand. Sikora offers the three diameter measuring devices for a product diameter from 0.2 up to 78mm.

Sikora AG – Germany
Website: www.sikora.net



BURSERYDS BRUK

4-side galvanized steel strip,
produced with extremely narrow
tolerances, tailored to meet our
customers special requirements

www.burserydsbruk.se
+46 371 375 00

SIGNODE INDUSTRIAL GROUP



Ultra-fast, high resolution, surface quality measurement (SQM), for wires, optical fibres and cables

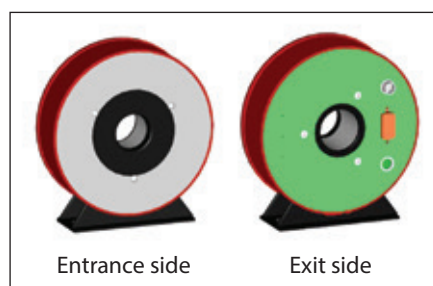
By Jean-François Fardeau, Gérald Novel and David Miara, Cersa-MCI, R&D division, Cabries, France

Abstract

This project meets a long-time wire, cable and fibre industry requirement for efficient in-line surface quality measurement and defect detection. It was recently allowed by the very latest technology progresses in optoelectronics.

The system works like a ring linear camera around the wires. The fine wire version works from 10 μ m (0.4 mils) to 2mm (80mils) in two models, fine and ultra-fine. With 64 dots per circumference, about 300,000 circumferences per second (c/s), and a dot size proportional to the wire diameter, it brings surface detection performance far above all present existing technologies at a competitive cost.

It includes all necessary real-time electronic computing: defect characterisation and selection, and alarms. It connects to external computers for data logging, parameter setting, and image display of the surface on PC screen, statistic computing, production quality reports and maintenance. (International patent July 2004). Other models, for larger diameters and higher resolutions but lower speed will follow by next year.



Introduction

In applications where surface quality (roughness, flaw, lump, neck) is critical, like special fine stainless steel wires, gold wires and wire plating, coatings or colourings of optical fibres, enamelling of copper wires, broadband cables, there was no instrument for high resolution and high-speed whole-surface analysis.

The existing surface quality instruments are based on standard camera image analysis. The limits for fine wire are the resolution on the wire, the image frequency, and the lighting system for surface analysis.

With the non-contact full circumference imaging, this covers all the surface of the wire at high resolution and high speed. It becomes possible to evaluate the surface and shape of the defect. At 300,000 circumferences per second and 64 dots per circumference, at line speed of 30m/s (1,800m/min) the axial resolution (pitch) would be 0.1mm (4 mils).

Including the wire feed pulses for wire length and speed measuring, the two dimensions are known: length and circumference.

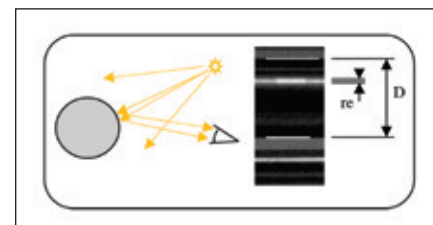
That gives a two-axis image of the wire for defect characterisation. Connected to a PC, this can display local images of the wire surface, especially when there is a defect, for analysis and knowledge.

Using only static components, lifetime is not a problem. Maintenance of optical systems in harsh environments requires specific care.

For low maintenance action, it uses clean air pressure to avoid dust, vapour or particles deposition on the inner glass tube interface.

Principle

The idea came from the gleam of a spotlight on a cylinder.

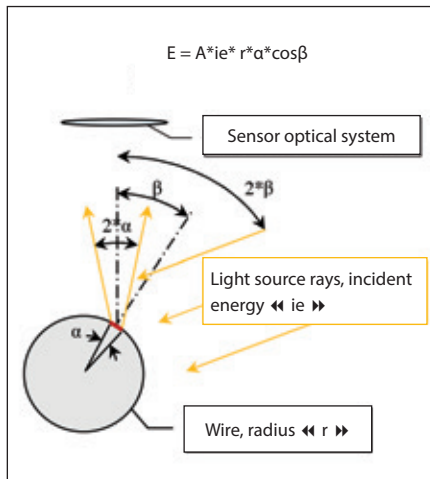


▲ Figure 1

In this image, re/D is about two per cent. Then $re/\pi \cdot D < 1\%$ of the circumference. The size of the gleam depends on the size of the spot source and on the angular aperture of the observer (optic of the sensor).

The energy gleamed to the observer (sensor) is strongly modulated by the surface quality; roughness, colour (absorption) and flaw, but also the local shape of the cylinder. Then, rotating the light around the wire axis will also rotate the gleam on the surface referring to a fixed observer.

This generates a circumference image. When the wire moves, it develops a complete surface image of the wire. If the design is well made, any small surface defect, colour or shape change will produce locally a significant reduction of the gleamed energy to the sensor.



▲ **Figure 2:** Lighting

Figure 2 shows the key parameters of the principle:

On the section plan of the wire, the incident light rays are almost parallels. Perpendicularly to the wire axis, each source beam is focused in a narrow line.

$2*\alpha$, comes from the angular aperture of the optical system. It determines the spot size on the circumference of the wire: $r*\alpha$.

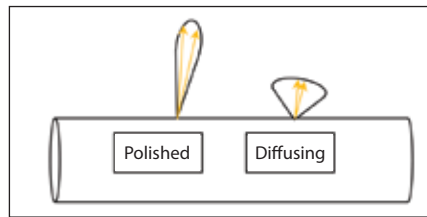
$2*\beta$, comes from the angular incidence of the light source.

If "A" is the surface absorption/diffusion factor of the wire, the light energy "E" received by the sensor is:

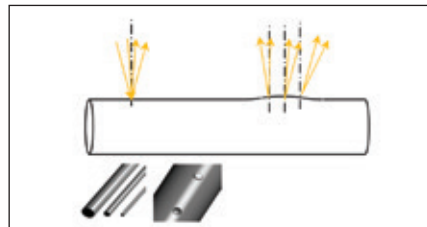
$$E = A*ie*r*\alpha*cos\beta$$

The consequences of these relations are:

- Spot size ($r*\alpha$) proportional to the wire diameter, which is quite satisfactory, and of the angular aperture of the optical system
- The energy received by the sensor fluctuates with the angular incidence of the light source by $cos\beta$. Using three sensors, " β " fluctuates within $\pm 60^\circ$ per sensor, generating a signal amplitude modulation by 50 per cent. This is compensated by a correction factor in order to display a flat response. With five sensors, the direct fluctuation falls to 20 per cent
- The energy received by the sensor is also directly proportional to the wire diameter. This means that the incident light source energy "ei" must be adapted accordingly, but also the sensor technology depending of the range of diameters to check. The smallest diameter able to have been checked properly was from a tungsten wire (black colour) of $10\mu m$
- The A factor has a significant impact either by diffusing the energy (roughness) or absorbing the light ray at 850nm



▲ **Figure 3:** Roughness effect

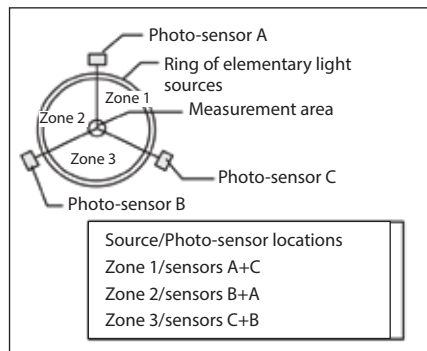


▲ **Figure 4:** Shape changing effect. Modelling image

Another important effect is the shape change along the wire axis (lump, neck, flaw) that deflects the reflected rays out of the angular aperture of the sensor

Design

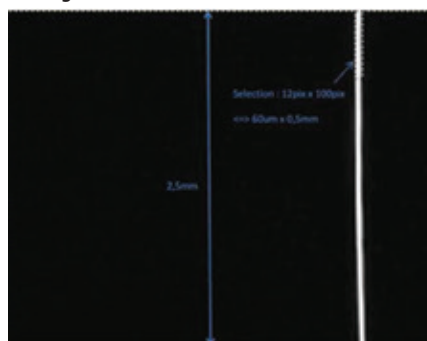
To rotate the lighting point source a ring of light sources was made around the wire axis, with only one source light on at once. Switching the lighting from source to source generates a rotating light point around the wire. Three sensors at 120° simultaneously check the gleamed energy on the surface of the wire.



▲ **Figure 5:** Front view of the system

The light source system concentrates on each source beam in a narrow line perpendicular to the wire axis. The beam is about parallel to the other plan.

▼ **Figure 6**



The thickness of the line determines the resolution on the wire axis. Then the sizes of the sources must be small and the optical system good enough for the application.

Figure 6, caught by a CCD matrix at the place of the wire, shows the size of the (white) light line perpendicular to the wire axis. The Gaussian shape of the energy density in the light line makes the efficient width at about $20\mu m$.

Then the spot size along the wire axis (Line Resolution: LR) is about constant, but on the circumference (Circumference Resolution: CR), it fluctuates proportionally to the wire diameter ($r*\alpha$).

The line resolution on the wire depends only on the light source system, not on the sensor.

To succeed in this development, one key point was the light sources. They must be small and fast, but generate very homogeneous light beams with uniform characteristics. They have been specially developed for this application.

Another key point was the sensor technologies. For the smallest range, it was necessary to use a highly sensitive sensor but one that was also very fast.

The movement of the wire with the rotation of the light source generates an elliptic scan of the surface and a continuous image on the sensor.

Image computing

The sensor must be able to characterise the size and the shape of the defect according to the requirements of the user.

The SQM computes in real time the perimeter (P) and the surface (S) of the defect. The ratio $R = k*S/P^2$ gives information on the shape of the defect. $k = 4\pi$.

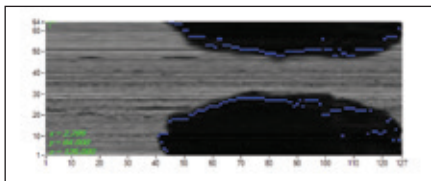
In this case, $R = 1$ for a circular defect. It tends toward zero when the defect elongates. Then R and S are two key detection parameters.

In order to have homogeneous resolution, the line speed is measured by the SQM (pulse counting) and the diameter is a user parameter. Then the scanning frequency is adjusted automatically.

Test results

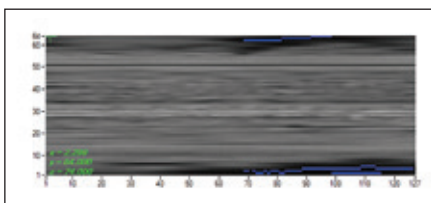
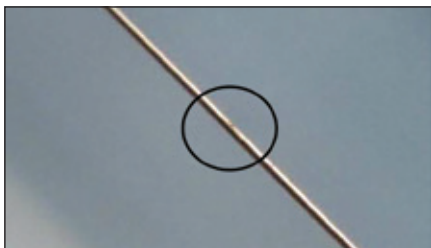
At the time of writing, the authors were just at the start of application and conducting industrial tests.

Still in laboratory conditions, a stainless steel wire 0.38mm in diameter (15mils) was moved and this generated marks or scratches.



▲ **Figure 7:** First case, one side inked mark. Reading at 25kHz

In both cases the blue line determines the periphery of the defect. Unfortunately the display is cut right on the top of the wire where the marks are.



▲ **Figure 8:** Second case, one scratch on the surface. Reading at 140kHz

Nevertheless, it shows the computing analysis that works all around the wire. The surface quality of the wire can also be seen. Image calibration must be made on a smooth surface of the wires.

This is also a process to develop to be able to deliver the reference wires.

The measurements are not sensitive to the vibration of the wire. Nevertheless, the independency has to be optimised to the position of the wire.

Conclusions

This unique instrument is in its last optimisation phase. All technological issues are solved efficiently.

The expectation once tests are complete is to undertake marketing throughout this year (2015). ■

Paper courtesy of the 63rd International Wire and Cable Symposium, Providence, Rhode Island, USA, 10th to 12th November 2014.

Cersa-MCI,
13480 Cabries,
France
Tel: +33 442 020 044
Fax: +33 442 027 979
Email: sales@cersa-mci.com
Website: www.cersa-mci.com

Großartiger Erfolg der Interwire

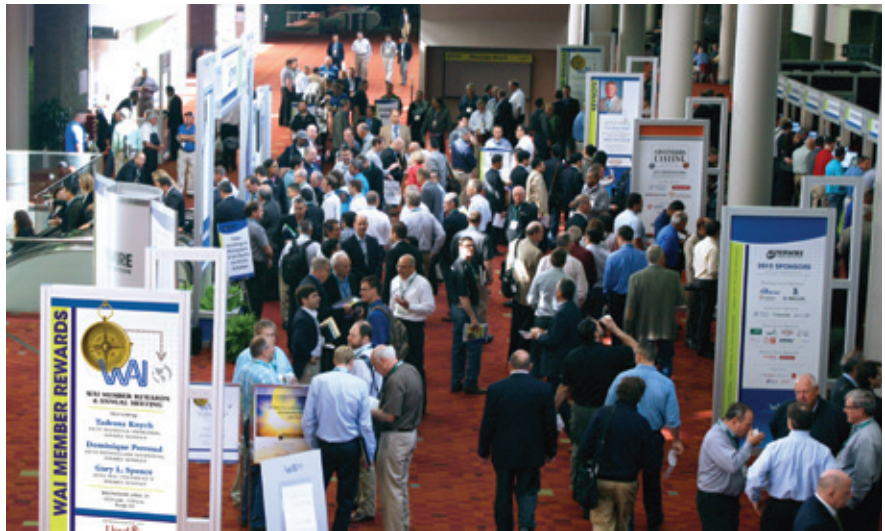
ÜBER 4.080 Fachleute aus 53 Ländern aus der Branche der Draht- und Kabelindustrie waren stark bei der Interwire 2015 im World Congress Center, Atlanta, Georgia, USA, vertreten.

Die Veranstalter der Wire Association International (WAI) berichteten von einem erfolgreichen Ergebnis der zweijährlichen Fachmesse Interwire - deren 85. Jahrestagung - sowie der Versammlung des 2. Global Continuous Casting Forum (GCCF), die zeitgleich Ende April stattfanden.

„Interwire ist eine ausgezeichnete Ressource für Nordamerika, mit einer sehr großen Bedeutung für zahlreiche Sektoren unserer Industrie. Als Kabelhersteller ist es die beste Möglichkeit, Zeit mit unseren Lieferantenpartnern zu verbringen und sich mit Branchenführern zu vernetzen,“ so William Reichert, Präsident von WAI.

Mike Abrashoff, ehemaliger Kommandant der US-Navy der USS Benfold, und Autor des New York Times Bestseller „It’s Your Ship“ präsentierte Erkenntnisse aus „The Leadership Roadmap“ in seiner Grundsatzrede, indem er beschrieb wie sein System der Führungstechnik ihn dabei unterstützte, die Herausforderung einer schlechten Moral und hohen Personalfuktuation zu überwinden.

Viele Aussteller waren begeistert über die starke Beteiligung von Entscheidungsträgern in der ausverkauften Messehalle, die Betriebsmaschinen, Betriebsmittel und Nebeneinrichtungen von über 400 Ausstellern vorstellten, von denen 54 zum ersten Mal auf der Interwire 2015 waren.



▲ Und die Tore sind offen ... Interwire 2015 wird in die Wege geleitet

Verschiedene neue Konferenzsegmente boten den Besuchern die Möglichkeit, mehr über innovative Draht- und Kabel-Herstellungsmethoden zu erfahren und neue Technologien zu erfahren. Themen zu Anwendung, Entstaubung, Personal und Kapitalaufwand wurden angesprochen.

Betriebsleitern wurde ein Workshop zum Produktionsmanagement mit praktischen Führungstools geboten. Die Besucher konnten aus verschiedenen Konferenzangeboten auswählen, einschließlich 20 technischen Präsentationen, einem Workshop zu den Grundsätzen der Drahtherstellung, drei Vorführungen über Produktionslösungen und einer Besichtigung zum Southwire-Walzwerk des Typs SCR.

Das gleichzeitig stattgefunden Global

Continuous Casting Forum, das Gary Spence/Encore Wire, und Richard Baker/General Cable Co organisierten, begeisterte 200 internationale Fachleute aus dem Bereich Gießen aus den Kupfer- sowie aus den Aluminiumsegmenten der Industrie. Getrennte und kombinierte Programmpunkte wurden zeitgerecht angeboten, damit die Teilnehmer auch die Interwire-Ausstellungen besuchen konnten.

Die Mitglieder des Verwaltungsrats von WAI begrüßten zudem die größte Publikumsansammlung in der neuesten Geschichte der Interwire bei der populären Eröffnungszeremonie, die in der neuen College Football Hall of Fame in Atlanta stattfand.

Wire Association International – USA
Website: www.wirenet.org

Besucher aus über 40 Ländern

Windak hatte einen gemeinsamen Messestand mit Axjo America bei der Interwire, auf dem neue Verpackungslösungen und neue moderne Aufbauten für Spulen vorgestellt wurden.

Windak präsentierte SW6-14, ein Doppelkopfaufwickler, der für eine vollautomatische Verpackung von Kabel- und Drahtprodukten auf Spulen mit einem Gesamtdurchmesser zwischen 165mm (6,5 Zoll) und 360mm (14 Zoll) entwickelt wurde. Die Spulen werden automatisch in/aus dem Spulkopf be- und entladen.

Die äußeren Enden werden mit Dehnfolie gesichert. Alle Betriebsparameter und mechanische Einstellungen werden geprüft um die Umrüstzeiten zwischen Produkt und Spule zu reduzieren. Die Leistung des neuen Aufwicklers entspricht drei Spulen je Minute.

Windak Group – Estland
Website: www.windakgroup.com

Präsentation in den USA für PWM

Interwire 2015 war eine ideale Plattform für das britische Unternehmen PWM, um sein Sortiment an Kaltschweißern vorzustellen. Die Maschinen wurde durch Joe Snee Associates präsentiert, PWMs Exklusiv-Vertriebspartner für USA und Kanada.

„Der leistungsstarke, elektronische-pneumatische EP500 Stabschweißer von PWM weckte da Interesse von besonders vielen Besuchern, die sehr gespannt waren mehr über die zeit- und kostensparenden Vorteile zu erfahren, die diese Maschine beim Kaltschweißen von Stäben aus NE-Materialien mit einem Durchmesser bis zu 15mm bietet.“

„Die kleinere manuell betriebene Maschine M101 fand auch großen Anklang bei den Herstellern, die eine schnelle, benutzerfreundliche und zuverlässige Methode zum Fügen von NE-Draht und NE-Band von 1 bis 5mm suchten.“

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

Die kleinste in der Baureihe

DIE Conklad 315-Maschine von BWE basiert auf dem sehr erfolgreichen und bewährten Modell Conform 315. Conklad 315 ist zwar die kleinste Maschine der Baureihe Conklad von BWE, umfasst jedoch viele der Standard-Konstruktionsmerkmale, die bei den größeren Maschinen zu finden sind, wie z. B. die Öffnung der hydraulischen Backe, Rohstoffschere, epizyklisches Getriebe und Torsionsrohr, usw.

Conklad 315 wird im Tangentialmodus betrieben, mit Einsatz eines einzelnen Einlaufstabs für Plattierungs- und Ummantelungsverfahren. Die Maschine wurde optimiert für eine hohe Produktionseffizienz von:

- Stalumdrahte (AS Wire)
- Erdungsseile (OPGW) und CATV-Kabel
- Ummantelte Verbundmaterial-Kerne
- Verstärkter Aluminiumdraht
- Aluminium-Festleiter (SAC)

Die Grundkonstruktion der Maschine basiert auf dem bewährten BWE-Entwurf, der sich durch höchste Zuverlässigkeit beim Betrieb über viele Einsatzjahre hinweg auszeichnet. Extreme Steifigkeit, die Fähigkeit bei hohen Extrusionsdrücken und separat steuerbarer Temperatur des Rads und des Ziehsteins zu betreiben, sichert dass das Werkzeugspiel über längere Zeit Dauerbetrieb optimal bleibt.

Die automatische Heizung des Ziehsteins und die Kühlsysteme des Rads sichern eine schnelle Vorwärmung auf die richtige Ausgangstemperatur und behalten



▲ Die Conklad 315 von BWE

optimale Extrusionsbedingungen während der Produktion ohne Bedienungseingriff. Die Gesamtrentabilität wird weiter verbessert durch den Einsatz von Werkzeugen, durch die die Verschleißschicht der wichtigsten

Werkzeugkomponente - die Ziehsteinkammer - mit geringstem Aufwand ersetzt werden kann.

BWE Ltd – UK
Website: www.bwe.co.uk

Effizient, vielseitig und zukunftsweis BMV

Da Kabelprodukte ständig steigenden Anforderungen nachkommen müssen, benötigen Draht- und Kabelhersteller Maschinen, die ein Energie-, Rohstoff- und kostengünstiges Herstellungsverfahren ermöglichen. Die von der Maschinenfabrik Niehoff entwickelten und hergestellten Maschinen erfüllen all diese Anforderungen. Ein Beispiel dazu sind die Rotations-Flechtmaschinen mit Hebelarm der Baureihe BMV, die für 12, 16 oder 24 Spulen im Vertikalbetrieb entwickelt wurden.

Die BMV-Maschinen haben eine stufenlose elektronische Regelung von Flechtgeschwindigkeit und Flechtsteigung und ein automatisches Zentralschmiersystem. Ein Qualitätssicherungssystem kontrolliert alle Arbeitsschritte vom Ablauf des zu umflechtenden Kabels über die Einzel- und Bündeldrahte bis zum endgültigen Aufspulen des umflochtenen Kabels.

Auf Kundenwunsch kann ein Leerspulen-Erkennungssystem eingebaut werden, durch das gesichert wird, dass die BMV-Maschine stoppt, bevor eine Flechtspule völlig entleert ist.

Für eine höhere Betriebssicherheit und -zuverlässigkeit wird durch ein Kontrollsystem die Temperatur der Gleitbahnen überwacht. Mit Hilfe dieses Systems kann der Bediener die Schmierfrequenz und Schmierstoffmenge regeln, um den Schmierstoffverbrauch zu optimieren.

Die aktuellste Innovation im Bereich der BMV-Flechtmaschinen ist die Rotations-Flechtmaschine mit Hebelarm mit 24 Spulen - die BMI 124. Das beeindruckende Merkmal der Maschine mit 24-Spulen liegt in dem geeigneten Flechtrotor. Die Neigung bedeutet eine Kabelbiegung von nur 45° (statt 90°) je Umlenkrolle - das wirkt sich auf eine reduzierte Kabelverformung und erhöhte Flechtqualität aus.

Durch die BMI 124 können Bündel aus Litzendraht mit Bündelquerschnitten von höchstens 24 x 1.5mm² hergestellt werden.

Maschinenfabrik Niehoff GmbH & Co KG – Deutschland
Website: www.niehoff-gmbh.info

Extrem schnelle, hochauflösende Messung der Oberflächenqualität (SQM) für Draht, Lichtwellenleiter und Kabel

Von Jean-François Fardeau, Gérald Novel und David Miara, Cersa-MCI, F&E-Abteilung, Cabries, Frankreich

Übersicht

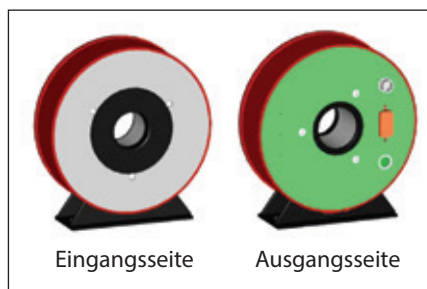
Dieses Projekt kommt einer langjährigen Forderung der Draht-, Kabel- und Lichtwellenleiterindustrie für eine effiziente Inline-Messung der Oberflächenqualität und Erkennung von Defekten nach. Ermöglicht wurde dies dank der neusten technischen Fortschritte in der Optoelektronik.

Das System arbeitet wie eine kreisförmige Linearkamera rund um die Drähte. Die Version für Feindraht läuft von 10µm (0,4mils) bis 2mm (80mils) in zwei Modellen bzw. fein und ultrafein.

Mit 64 Punkten je Umfang, zirka 300.000 Umfänge pro Sekunde (circumferences per second, c/s) und eine Punktgröße im gleichen Verhältnis zum Drahtdurchmesser, erhöht das System die Leistung der Oberflächenerkennung weit über alle derzeit bestehenden Technologien zu konkurrenzfähigen Kosten.

Eingeschlossen werden dabei alle erforderlichen Funktionen für die elektronische Berechnung in Echtzeit: Bezeichnung und Auswahl der Mängel, und Alarme. Somit erfolgt der Anschluss zu externen Rechnern für die Datenprotokollierung, Parametereinstellung und Bildanzeige der Oberfläche auf dem PC-Bildschirm, statistische Berechnungen, Produktionsqualitätsbericht und Wartung. (Internationales Patent Juli 2004).

Weitere Modelle, für größere Durchmesser, höhere Auflösungen aber geringerer Geschwindigkeit, werden nächstes Jahr folgen.



Einleitung

Bei Anwendungen mit kritischer Oberflächenqualität (Rauheit, Mangel, Knoten, Dellen), wie z. B. spezielle feine Edelstahldrähte, Golddraht, Drahtplattierung, Beschichtungen oder Einfärbungen der Lichtwellenleiter, Emaillieren von Kupferdrähten und Breitbandkabel, stand bislang kein Instrument für die gesamte Oberflächenanalyse mit hoher Auflösung und hoher Geschwindigkeit zur Verfügung.

Die derzeit bestehenden Instrumente für die Erfassung der Oberflächenqualität basieren auf einer Standardkamera-Bildanalyse. Die Beschränkungen im Falle von Feindraht sind die Drahtauflösung, die Bildfrequenz und das Beleuchtungssystem für die Oberflächenanalyse.

Mit der berührungslosen Bildverarbeitung des vollen Umfangs, wird die ganze Oberfläche des Drahts mit hoher Auflösung und hoher Geschwindigkeit gedeckt.

Dadurch wird es möglich, die Oberfläche und die Form des Defekts zu bewerten. Bei 300.000 Umfängen pro Sekunde und 64 Punkten je Umfang und bei

einer Liniengeschwindigkeit von 30m/s (1.800m/min) würde die axiale Auflösung (Raster) 0,1mm (4mils) entsprechen.

Einschließlich der Drahtvorschub-Impulse für die Abmessung der Drahtlänge und -geschwindigkeit, sind zwei Abmessungen bekannt: Länge und Umfang. Daraus folgt ein zweiachsiges Bild des Drahts für die Bezeichnung des Defekts. Über einen Rechner angeschlossen, kann das System lokale Bilder der Drahtoberfläche - insbesondere wenn ein Defekt besteht - für die Analyse und Studie anzeigen.

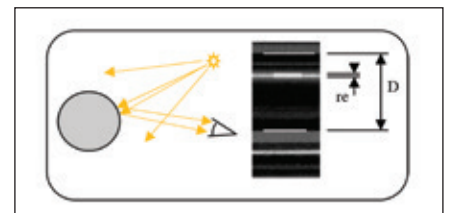
Beim Gebrauch von nur statischen Komponenten, ist die Lebensdauer der Vorrichtung kein Problem. Die Wartung der optischen Systeme in rauen Umgebungen bedarf einer besonderen Pflege.

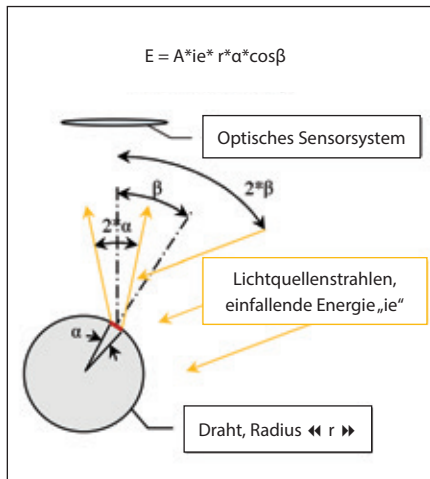
Zur Reduzierung der Wartung wird dabei unter Druck stehende reine Luft eingesetzt, um Staub, Dampf oder die Abscheidung von Teilchen am Zwischenstück des inneren Glasrohrs zu vermeiden.

Grundsatz

Die Idee entstand aus dem Schimmer eines Punktstrahlers auf einem Zylinder.

▼ Abb. 1





▲ Abb. 2: Beleuchtung

In dieser Abbildung entspricht r/D zirka zwei Prozent. Daher ist $r/\pi * D < 1\%$ des Umfangs. Die Größe des Schimmers hängt von der Größe der Leuchtpunktquelle ab sowie von der Winkelöffnung des Beobachters (Optik des Sensors).

Die zum Beobachter (Sensor) schimmernde Energie ist durch die Oberflächenqualität stark moduliert; Rauheit, Farbe (Absorption), Fehler, aber auch durch die lokale Form des Zylinders.

Das Drehen des Lichts um die Drahtachse wird dann auch den Schimmer auf die Oberfläche drehen, bezogen auf einen fixen Beobachter. Daraus ergibt sich ein Bild des Umfangs. Wenn der Draht sich bewegt, entwickelt er ein Bild der gesamten Oberfläche des Drahts. Wenn der Entwurf gut verarbeitet ist, wird jeder kleiner Oberflächenmangel, Farbe- oder Formänderung örtlich eine wesentliche Reduzierung der schimmernden Energie gegenüber dem Sensor hervorrufen.

Abbildung 2 zeigt die Schlüsselparameter des Grundsatzes.

Auf der Schnittansicht des Drahts sind die einfallenden Lichtstrahlen fast Parallel. Senkrecht zur Drahtachse ist jeder Strahl der Quelle in eine schmale Linie fokussiert.

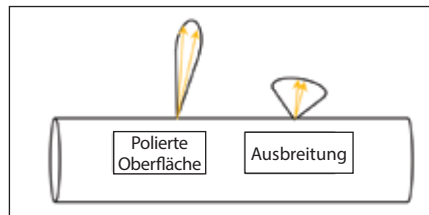
$2 * \alpha$, hängt von der Winkelöffnung des optischen Systems ab und bestimmt die Leuchtpunktgröße auf dem Umfang des Drahts: $r * \alpha$.

$2 * \beta$, hängt vom schrägen Einfall der Lichtquelle ab.

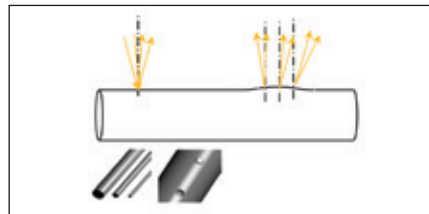
Wenn „A“ der Faktor der Oberflächenabsorption/-diffusion des Drahts ist, ist die vom Sensor empfangene Lichtenergie „E“:

$$E = A * i_e * r * \alpha * \cos \beta$$

Die Folgen dieser Relationen sind:



▲ Abb. 3: Rauheitswirkung



▲ Abb. 4: Wirkung der Formveränderung Modellierungsbild

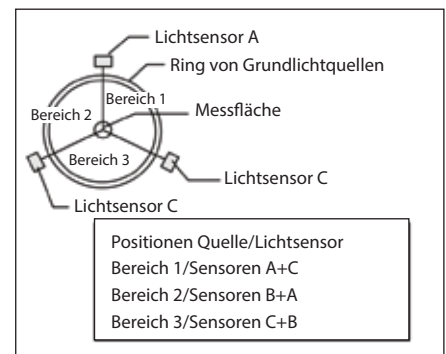
- Die Leuchtpunktgröße ($r * \alpha$) liegt im gleichen Verhältnis zum Drahtdurchmesser - was durchaus zufriedenstellend ist - und zur Winkelöffnung des optischen Systems.
- Die vom Sensor empfangene Energie schwankt mit dem schrägen Einfall der Lichtquelle entsprechend $\cos \beta$. Mit dem Einsatz von drei Sensoren, schwankt „ β “ innerhalb $\pm 60^\circ$ je Sensor, und erzeugt somit eine Amplitudenmodulation des Signals von 50 Prozent. Ausgeglichen wird dies durch ein Korrektionsfaktor, um eine flachen Verlauf anzuzeigen. Mit fünf Sensoren, fällt die direkte Schwankung auf 20 Prozent.
- Die vom Sensor empfangene Energie steht auch in unmittelbarem Verhältnis zum Drahtdurchmesser. Das bedeutet, dass die einfallende Lichtquellenenergie „ e_i “ entsprechend angepasst werden muss, aber auch die Sensorik, abhängig von dem zu prüfenden Durchmesserbereich. Der kleinste Durchmesser, der sachgemäß geprüft werden konnte, war ein $10 \mu\text{m}$ (schwarzer) Wolframdraht.
- Der A-Faktor hat einen wesentlichen Einfluss sowohl während der Ausbreitung von Energie (Rauheit) wie bei der Absorption von Lichtstrahlen bei 850nm .

Eine weitere wichtige Auswirkung liegt in der Formänderung entlang der Drahtachse (Knoten, Dellen, Mangel), die die reflektierten Strahlen aus der Winkelöffnung des Sensors ablenkt.

Design

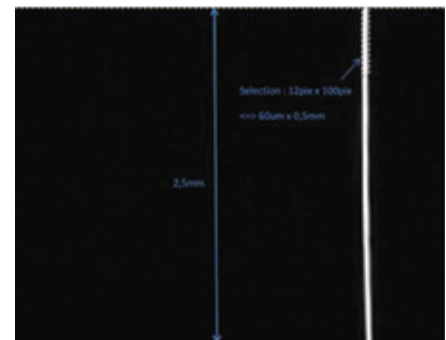
Zur Drehung der Lichtpunktquelle wurde ein Lichtquellenring um die Drahtachse angebracht, mit lediglich einer jeweils eingeschalteten Lichtquelle. Das Einschalten der Lichtquelle von Quelle zu Quelle erzeugt einen drehenden

Lichtpunkt um den Draht. Drei Sensoren bei 120° prüfen gleichzeitig die schimmernde Energie auf der Oberfläche des Drahts.



▲ Abb. 5: Vorderansicht des Systems

Das Lichtquellen-system konzentriert sich auf jeden Strahl der Quelle in eine schmale Linie senkrecht verlaufend zur Drahtachse. Der Strahl ist beinahe parallel zur anderen Ebene. Die Dicke der Linie bestimmt die Auflösung an der Drahtachse. Darüber hinaus sollen die Quellengrößen gering sein und die Optik ausreichend gut für die Anwendung.



▲ Abb. 6

Die Abbildung 6, die aus der Position des Drahts durch eine CCD-Matrix aufgenommen wurde, zeigt die Größe der (weißen) Lichtlinie senkrecht verlaufend zur Drahtachse.

Die Gauss-Form der Energiedichte in der Lichtlinie bestimmt die effiziente Breite bei zirka $20 \mu\text{m}$. Danach ist die Leuchtpunktgröße entlang der Drahtachse (Line Resolution: LR - Auflösung der Linie) fast konstant, aber am Umfang (Circumference Resolution: CR - Auflösung des Umfangs) schwankt sie im Verhältnis zum Drahtdurchmesser ($r * \alpha$). Die Linienauflösung am Draht hängt nur vom Lichtquellen-system ab und nicht vom Sensor.

Für eine erfolgreiche Entwicklung waren die Lichtquellen ein wichtiger Gesichtspunkt: schmal und schnell, jedoch sehr gleichmäßige Lichtstrahlen mit einheitlichen Eigenschaften erzeugend.

Entwickelt wurden sie speziell und erfolgreich für diese Anwendung. Ein weiterer Schwerpunkt war die Sensorik.

Für die kleinste Auswahl war der Einsatz eines höchst sensiblen Sensors erforderlich, der aber auch sehr schnell sein sollte.

Die Bewegung des Drahts mit der Drehung der Lichtquelle erzeugt eine elliptische Abtastung der Oberfläche und ein kontinuierliches Bild im Sensor.

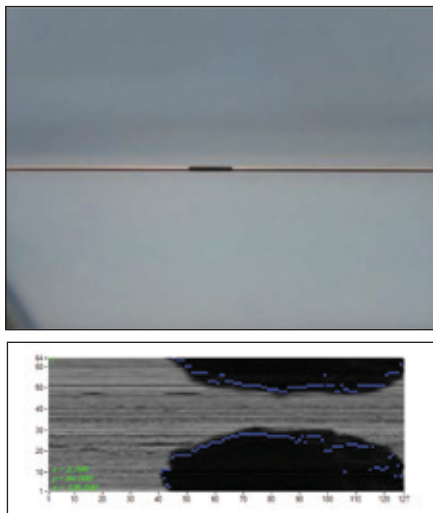
Bildberechnung

Der Sensor soll die Größe und die Form des Mangels charakterisieren, entsprechend den Anforderungen des Benutzers. Die SQM berechnet in Echtzeit den Umfang (P) und die Oberfläche (S) des Defekts. Das Verhältnis $R = k \cdot S / P^2$ vermittelt eine Information über die Art des Defekts. $k = 4\pi$. In diesem Fall, $R = 1$ für einen kreisförmigen Defekt. Es tendiert gegen Null wenn sich der Defekt in die Länge zieht. Demzufolge sind R und S zwei wesentliche Erfassungsparameter.

Um eine einheitliche Auflösung zu erzielen, wird die Liniengeschwindigkeit durch die SQM (Impulszählung) gemessen und der Durchmesser ist ein Benutzerparameter. Daher wird die Abtastfrequenz automatisch geregelt.

Prüfergebnisse

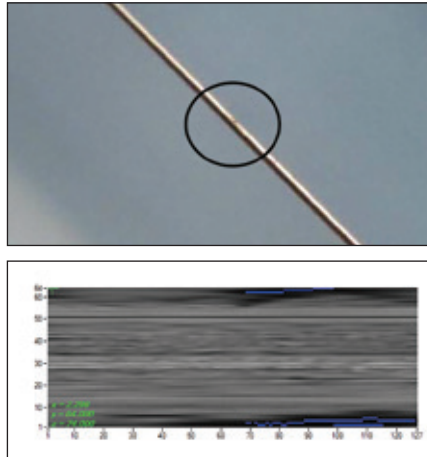
Zum Redaktionsschluss standen die Autoren nur am Anfang der Anwendung und führten industrielle Prüfungen durch. Dennoch wurde unter Laborbedingungen ein Edeldraht mit einem Durchmesser von 0,38mm (15mils) versetzt und das erzeugte Markierungen bzw. Kratzer.



▲ **Abb. 7:** Erster Fall, eine eingefärbte, große, seitlich angeordnete Markierung. Ablesung bei 25kHz

In beiden Fällen bestimmt die blaue Linie den Umfang des Defekts. Leider ist die Anzeige am obersten rechten

Teil des Drahts geschnitten, wo sich die Markierungen befinden. Dennoch wird somit die Datenverarbeitungsanalyse gezeigt, die ringsum den Draht verläuft. Außerdem ist auch die Oberflächenqualität des Drahts sichtbar. Die Bildkalibrierung soll auf einer glatten Oberfläche der Drähte durchgeführt werden.



▲ **Abb. 8:** Zweiter Fall, ein Kratzer auf der Oberfläche. Ablesung bei 140kHz

Dies ist auch ein Entwicklungsprozess, um Referenzen für Drähte bestimmen zu können.

Die Abmessungen sind unempfindlich gegenüber der Vibration des Drahts. Dennoch ist diese Unabhängigkeit bezogen auf die Position des Drahts zu optimieren.

Schlussfolgerungen

Dieses einzigartige Instrument ist in seiner letzten Optimierungsphase. Alle technologische Probleme wurden effizient gelöst. Es wird erwartet, dass nachdem die Tests abgeschlossen werden, die Vertriebsaktivitäten über das ganze Jahr (2015) erfolgen werden. ■

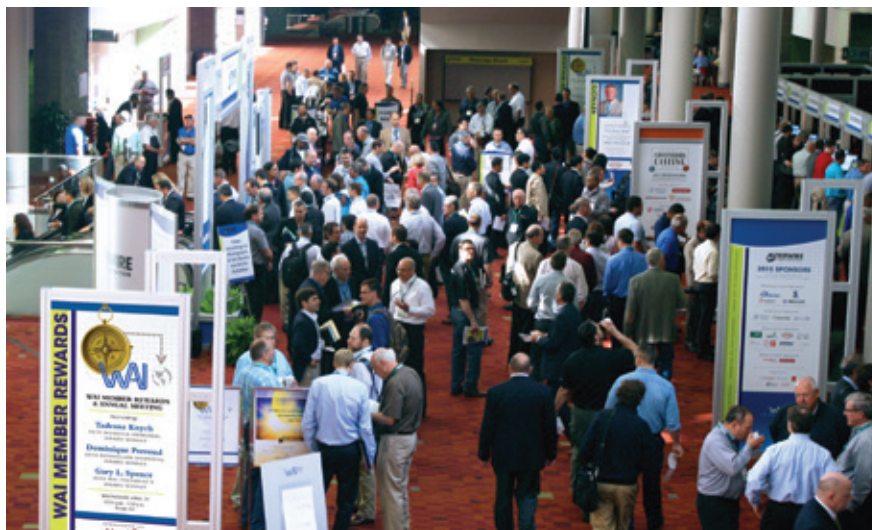
Dieser Artikel wurde freundlicherweise während des 63. International Wire and Cable Symposium, Rhode Island, USA, vom 10. bis 12. November 2014 zur Verfügung gestellt.

Высокая активность на успешной выставке Interwire

Выставка Interwire 2015 в World Congress Center в США, штате Джорджия, городе Атланта собрала более 4080 профессионалов в кабельной и проволочной промышленности из более 53 стран. Организаторы Wire Association International (WAI) доложили об успешном результате с отраслевой выставки Interwire, проходящей раз в два года на 85 ежегодном съезде и проходящем одновременно 2-ом глобальном форуме по непрерывному литью Global Continuous Casting Forum (GCCF) в конце апреля.

“Interwire – это отличный ресурс для Северной Америки с ее высокими показателями во многих секторах нашей промышленности. Для производителей кабеля это лучший шанс провести время с нашими партнерами по поставкам и с сообществом лидеров промышленности”, – сказал президент WAI Уильям Райхерт.

Майк Абрашофф, бывший капитан ВМФ подводной лодки Benfold и автор бестселлера *New York Times* “It’s Your Ship” рассказал об уроках из “The Leadership Roadmap” в своем основном докладе, описав, как его система методов управления помогла ему преодолеть трудности низкого боевого духа и текучки кадров. Многие участники выставки были рады появлению большого количества ведущих лиц в многолюдном выставочном помещении, где помимо прочего можно было увидеть работающую технику, оборудование для поставки и комплектующие более 400 компаний-участников, 54 из которых стали новичками на Interwire 2015.



▲ И двери открылись...Interwire 2015 началась

Несколько новых сегментов конференции дали шанс посетителям узнать об инновационных методах производства проволоки и кабеля и изучить новые технологии. Среди представленных тем были приборы, контроль запыленности, персонал и капитальные расходы. Руководители производства познакомились с практическими инструментами руководства на семинарах по управлению производством. Посетители могли выбрать программу из мероприятий конференций, включая 20 технических презентаций, семинара по основам производства проволоки, три демонстрации производственных решений и экскурсии по заводу медной катанки Southwire SCR. Проходящий одновременно форум по непрерывному литью Global Continuous

Casting Forum, организованный Гари Спенсом из Encore Wire и Ричардом Бейкером из General Cable Co собрал 200 международных специалистов по литью медного и алюминиевого секторов промышленности. Отдельные и совмещенные программы были организованы по расписанию для предоставления возможности посетителям увидеть экспонаты Interwire.

Кроме того, совет директоров WAI принял самое большое количество посетителей за последнюю историю приемов, посвященных открытию, который прошел в новом футбольном зале славы колледжа Атланты.

Wire Association International – США
Вебсайт: www.wirenet.org

Посетители из более 40 стран

Windak вместе с Axjo America выставались на одном совмещенном стенде на Interwire, предлагая новые решения для упаковки и новые современные профили катушек.

Компания Windak продемонстрировала катушку SW6-14 с двойной головкой, разработанную для полностью автоматической упаковки кабельной и проволочной продукции в катушки с общим диаметром между 165 мм (6.5”) и 360 мм. Внешние концы надежно закрепляются натяжной обмоткой. Все рабочие параметры и механические настройки контролируются для сокращения времени от продукции до смены катушек. Производительность нового устройства намотки – три катушки в минуту.

Windak Group – Эстония
Вебсайт: www.windakgroup.com

Презентация PWM в США

Interwire 2015 предоставила хорошие возможности британской компании PWM. Устройства были представлены Joe Snee Associates, эксклюзивным дистрибьютором PWM в США и Канаде. “Несмотря на меньшее количество посетителей по сравнению с предыдущими выставками качество было великолепным благодаря присутствию лидирующих компаний. Мощная электро-пневматическая установка для сварки стержневым электродом EP500 от PWM привлекла интерес многих; посетители стремились узнать о временных и ценовых преимуществах, которые предлагает данное устройство при холодной сварке секций электродом из цветных металлов до 15 мм в диаметре”, – сказал Джо Сней, президент Joe Snee Associates.

PWM Ltd – Великобритания
Вебсайт: www.pwmltd.co.uk

Самая маленькая в линейке

Установка Conklad 315 BWE основана на высокоэффективной и надежной модели Conform 315. Conklad 315 – это самая маленькая установка в линейке BWE Conklad, но она сочетает много стандартных характеристик больших установок таких, как открытие гидравлического башмака, обрезание сырья, планетарная система шестерен и трубчатый вал, и т.д.

Conklad 315 работает в тангенциальном режиме при использовании одного валика подачи для нанесения покрытия и резки. Устройство может быть оптимизировано для высокой производительности:

- Стальной проволоки с алюминиевым покрытием
- Оптико-волоконных и телевизионных кабелей
- Экранированных кабелей из композиционного материала
- Проволоки с алюминиевым покрытием
- Твердых алюминиевых проводников

Конструкция устройства основана на проверенном дизайне BWE с превосходными характеристиками надежной эксплуатации за долгие годы работы. Повышенная прочность, способность работать при высоком экструзионном давлении и по отдельности контролируемая температура станка и головки обеспечивают оптимальное функционирование приборов долгое время при непрерывной работе.

Автоматические системы подогрева головки и охлаждения станка



▲ Conklad 315 от BWE

обеспечивают быстрый подогрев до надлежащей стартовой температуры и сохранение экструзионных условий во время производства без вмешательства оператора. Общие технико-экономические показатели улучшены вставными инструментами,

которые позволяют заменять изнашиваемую поверхность основных компонентов приборов, камеру головки с минимальными расходами.

BWE Ltd – Великобритания
Вебсайт: www.bwe.co.uk

Эффективная, гибкая и перспективная концепция обмотки от BMV

Так как кабельная продукция должна отвечать постоянно растущим требованиям, производителям кабеля и проволоки необходимо оборудование, которое предусматривает выгодные с точки зрения энергии, сырья и стоимости производственные процессы. Одним из примеров является рычажные вращающиеся оплеточные установки серии BMV, разработанные для 12, 16 или 24 катушек в вертикальном положении.

Установки BMV предусматривают плавно регулируемый электронный контроль скорости обмотки и шага, а также автоматическую систему центральной смазки. В качестве альтернативы может быть установлена система обнаружения порожних шпуль, которая предусматривает автоматический останов устройства BMV до того, как обмоточная катушка будет полностью пустая. Данная система минимизирует отходы и количество остатков проволоки на катушке.

Для большей эксплуатационной надежности и безопасности температура направляющих управляется системой контроля. Оператор может использовать данную систему для настройки частоты смазки и количества смазки с целью оптимизации потребления смазки.

Самой последней инновацией в отрасли установок для обмотки BMV является 24-катушечная рычажная вращающаяся оплеточная установка BM1 124. Действительно удивительной характеристикой 24-катушечной установки является наклоненный ротор обмотки. Уклон означает отклонение кабеля всего на 45° (вместо 90°) на каждом натяжном барабане, что сокращает деформацию кабеля и улучшает качество обмотки.

Maschinenfabrik Niehoff GmbH & Co KG – Германия
Вебсайт: www.niehoff-gmbh.info

Сверхбыстрое измерение качества поверхности с высоким разрешением для проволоки, оптических волокон и кабелей

Жан Франсе Фарду, Джеральд Новел и Дэвид Миара, Cersa-MCI, научно-исследовательское подразделение, Кабре, Франция

Аннотация

Данный проект отвечает давно существующему в кабельной и волоконной промышленности требованию эффективного встроенного устройства для изменения качества поверхности и обнаружения дефектов. Это стало возможным недавно благодаря последним технологическим достижениям в оптоэлектронике.

Система работает как кольцевая линейная камера вокруг кабелей. Конструкция для тонкого кабеля работает от 10 мкм (0,4 мил) до 2 мм (80 мил) в двух моделях: тонкая и ультра-тонкая. С 64 точками по окружности и около 300 000 окружностей в секунду, и размером точек, пропорциональному диаметру кабеля, установка выводит обнаружение дефектов на уровень выше всех существующих технологий по конкурентоспособным ценам.

Она включает все необходимые электронно-компьютерные приспособления, функционирующие в режиме реального времени, отбор и характеристику дефектов, а также сигнализацию. Установка связана с



внешними компьютерами для ввода данных, установки параметров и вывода изображения поверхности на экран компьютера, статистических вычислений, отчета о качестве продукции и техобслуживании. (Международный патент июль 2014). Другие модели для больших диаметров, более высокого разрешения, но с более низкой скоростью будут доступны к следующему году.

Введение

В областях применения, где качество поверхности (шероховатость, дефекты, вздутия, сужение) является критически важным, например, особые тонкие провода из нержавеющей стали, золотые провода, обшивка проводов, покрытия или окраска оптических волокон, покрытие эмалью медной проволоки, широкополосные кабели, не существовало прибора для высокого разрешения и высокоскоростного анализа всей поверхности.

Существующие в настоящее время приборы по оценке качества поверхности основаны на стандартном анализе снимков камеры. Пределами для тонких проводов является разрешение на проводе, видеочастота и система освещения для анализа поверхности.

С бесконтактным полным изображением по окружности устройство охватывает всю поверхность провода при высоком разрешении и с высокой скоростью. Оценка поверхности и формы дефектов становятся возможными. При 300 000

окружностях в секунду и 64 точках по окружности, при линейной скорости 30 м/с (1 800 м/мин) осевое разрешение (шаг) будет 0,1 мм (4 мил).

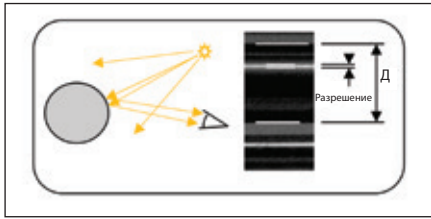
Включая импульсы при подаче провода для измерения длины провода и скорости, две величины известны: длина и окружность. Это предоставляет двухосевое изображение провода для характеристики дефектов. Устройство, связанное с персональным компьютером, может выводить на экран местные снимки поверхности провода, особенно при наличии дефекта для анализа и информации.

Благодаря использованию только статических компонентов срок службы не имеет ограничений. Техобслуживание оптических систем в жестких условиях эксплуатации требует особого внимания. Для отсутствия необходимости частого техобслуживания и ремонта в системе используется давление чистого воздуха для уменьшения накопления пыли, пара или частиц на внутреннем стеклянном интерфейсе.

Принцип действия

Идея появилась от отсвечивания прожектора на цилиндре.

На данном изображении разрешение около двух процентов. Тогда разрешение/ $\pi \cdot D < 1\%$ окружности. Размер отсвечивания зависит от размера источника отпечатка и от угла раскрытия контрольного устройства (оптика сенсора).



▲ Рисунок 1

Энергия, засвечивающаяся на контрольном устройстве (сенсор) сильно регулируется качеством поверхности, шероховатостью, цветом (поглощением), дефектом, а также местной формой цилиндра. Затем вращение света вокруг оси провода приведет к вращению отсвечивания на поверхности, принадлежащей закрепленному устройству контроля.

Так получается изображение окружности. При вращении провода возникает полное изображение поверхности провода. Если конструкция спроектирована хорошо, любой небольшой дефект поверхности будет вызывать местное значительное уменьшение энергии, отсвечивающей на сенсор.

На Рис. 1 показаны основные параметры принципа:

На профиле сечения провода лучи падающего света почти параллельны. Перпендикулярно к оси провода каждый источник луча сфокусирован на узкой линии.

$2*\alpha$, выходит из угла раскрытия оптической системы. Это определяет размер отпечатка на окружности провода: $r*\alpha$.

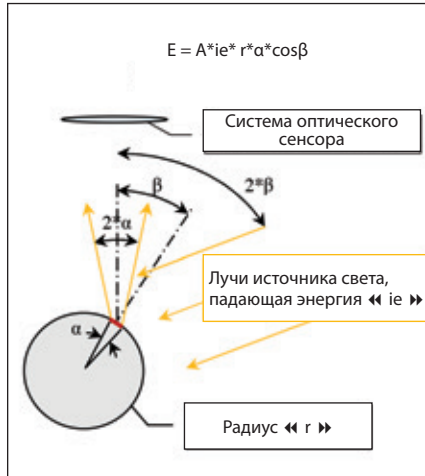
$2*\beta$, выходит из наклонного падения источника света.

Если "А" является фактором поверхностного поглощения/рассеивания провода, световая энергия "Е", полученная сенсором, равна:

$$E = A * i_e * r * \alpha * \cos \beta$$

Следствия данных соотношений следующие:

- Размер пятен ($r*\alpha$) пропорционален диаметру провода, что является вполне достаточным, и углу раскрытия оптической системы.
- Энергия, полученная сенсором, колеблется с наклонным падением источника света на $\cos \beta$. При использовании трех сенсоров " β " колеблется между $\pm 60^\circ$ по каждому сенсору, изменение амплитуды угла на 50 процентов. Это компенсируется фактором коррекции для



▲ Рисунок 2: Освещение

отображения плоской амплитудно-частотной характеристики. С пятью сенсорами прямое колебание снижается до 20 процентов.

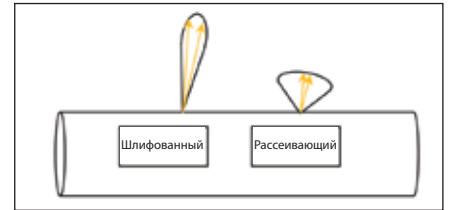
- Энергия, полученная сенсором, также прямо пропорциональна диаметру провода. Это означает, что не только источник энергии падающего света "ei" должен быть изменен соответствующим образом, но также должна быть проверена технология сенсора в зависимости от диапазона. Самый маленький диаметр, который можно было проверить, был диаметр вольфрамовой проволоки (черного цвета) 10 мкм.
- Фактор А имеет значительное влияние либо рассеивая энергию (шероховатость), либо поглощая солнечные лучи при 850 нм.

Еще одно важное влияние – это изменение формы вдоль оси провода (вздутие, сужение, дефекты), которое преломляет отраженные лучи от угла раскрытия сенсора.

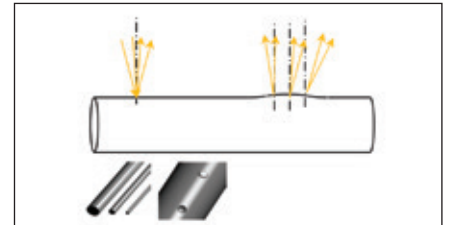
Устройство

Для вращения источника световой точки кольцо световых источников было предусмотрено вокруг оси провода при только одном непосредственно включенном источнике света. Перемещение освещения с одного источника на другой источник производит вращение световой точки вокруг провода. Три сенсора одновременно проверяют отраженную на поверхности провода энергию при 120° .

Система источника света концентрируется на каждом луче источника в виде узкой линии, перпендикулярной оси проволоки. Луч почти параллелен другой проекции.



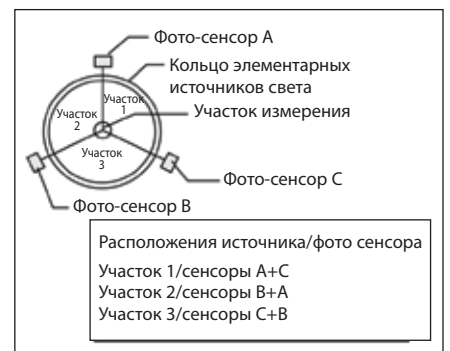
▲ Рисунок 3: Эффект шероховатости



▲ Рисунок 4: Эффект изменения формы. Моделирующий снимок

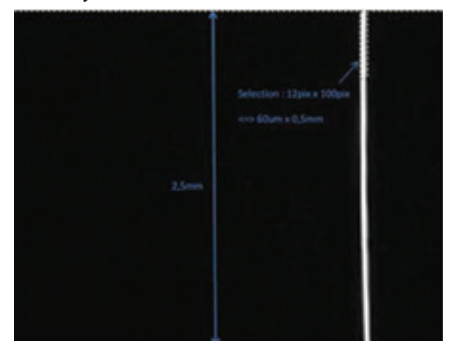
Толщина линии определяет разрешение на оси проволоки. Тогда размеры источников могут быть небольшими, а оптическая система довольно хорошей для применения.

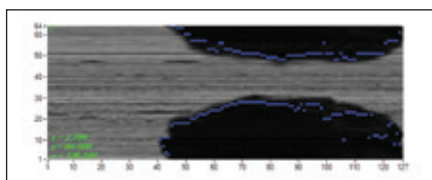
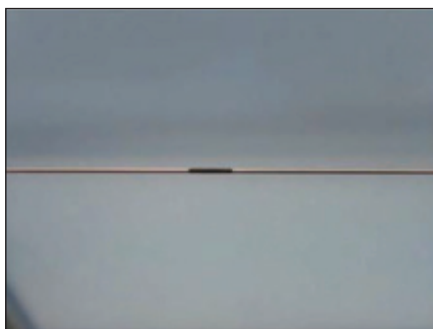
На Рисунке 6 изображен размер (белой) световой линии, перпендикулярной оси проволоки на снимке, сделанном ПЗС-матрицей в месте проволоки. Гауссова форма спектральной линии плотности энергии на линии света делает эффективной толщину при приблизительно 20 мкм. Тогда размер отпечатка вдоль оси проволоки (Разрешение линии: РЛ) почти постоянен, но на окружности (Разрешение окружности: РО), он колеблется



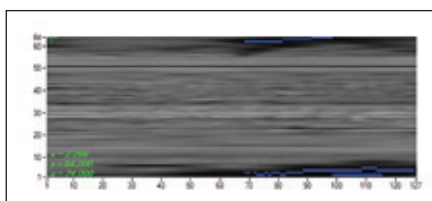
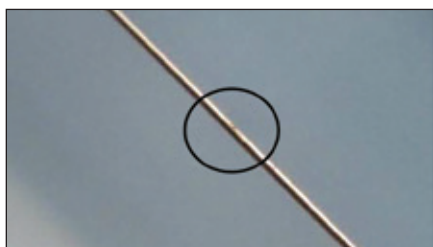
▲ Рисунок 5: Вид спереди на систему

▼ Рисунок 6





▲ **Рисунок 7:** Первый случай, одна большая маркированная отметина сбоку. Показатель при 25 кГц



▲ **Рисунок 8:** Второй случай, одна царапина на поверхности. Показатель при 140 кГц

пропорционально диаметру проволоки ($r^* \alpha$). Разрешение линии на проволоке зависит только от системы источника света, не от сенсора.

Для получения результата в данной разработке источники света были приняты в качестве одного ключевого фактора. Они должны быть небольшими и быстрыми, но должны производить однородные лучи света с единообразными характеристиками. Это было специально и успешно разработано для данного применения. Другим ключевым пунктом были технологии сенсора. Для самого маленького диапазона необходимо было использовать высокоинтенсивный сенсор, который кроме того функционирует очень быстро.

Вращение проволоки с вращением светового источника образуют эллиптическое изображение поверхности и непрерывное изображение на сенсоре.

Вычисление изображения

Сенсор должен быть предусмотрен для характеристики размера и формы дефекта в соответствии с требованиями пользователя. Система измерения качества обработки поверхности в режиме реального времени рассчитывает периметр (P) и поверхность (S) дефекта. Пропорция $R = k \cdot S / P^2$ дает информацию о форме дефекта. $k = 4\pi$. В данном случае, $R = 1$ для кругообразного дефекта. Радиус стремится к нулю, когда дефект удлиняется. Тогда R и S являются двумя ключевыми параметрами определения.

Для получения однородного разрешения скорость линии измеряется системой измерения качества обработки поверхности (подсчет пульса), а диаметр является параметром пользователя. Тогда частота сканирования устанавливается автоматически.

Результаты испытаний

При написании работы авторы только начали испытывать применение и проводить промышленные испытания. Еще в лабораторных условиях проволока из нержавеющей стали 0,38 мм в диаметре (15 мил) была сдвинута, что стало причиной отметин и царапин.

В обоих случаях голубая линия определяет контур дефекта. К сожалению, дисплей обрезан прямо сверху проволоки, где находятся дефекты.

Тем не менее, показан компьютерный анализ, который работает вокруг всей проволоки. Качество поверхности проволоки также видно. Калибровка изображения должна быть сделана на гладкой поверхности проволок.

Это также является технологией для получения образцовых проволок.

Измерения не чувствительны к вибрации проволоки. Однако, независимость должна быть настроена с учетом позиции проволоки.

Заключения

Уникальный прибор находится в последней стадии оптимизации. Все технологические проблемы успешно решены.

Ожидается, что сразу после завершения испытаний в этом году начнется маркетинговая кампания. ■

Работа опубликована с разрешения 63-его Технического симпозиума IWCS, проходившего с 10 по 12 ноября 2014 в городе Провиденс штате Род Айленд, США.

Cersa-MCI, 13480 Cabries, Франция
Тел: +33 442 020 044
Факс: +33 442 027 979
Email: sales@cersa-mci.com
Вебсайт: www.cersa-mci.com

Accélération de l'activité à l'exposition Interwire qui a été une véritable réussite

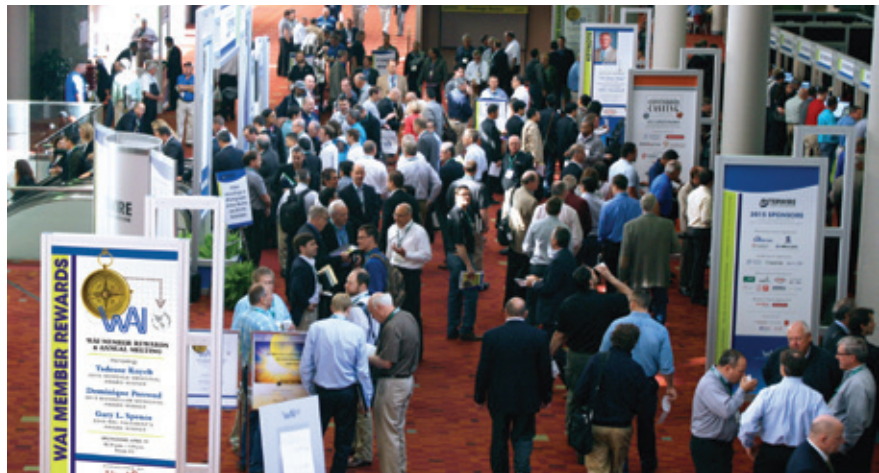
PLUS de 4 080 spécialistes de l'industrie du fil et du câble provenant de 53 pays étaient présents en masse à Interwire 2015 au World Congress Center d'Atlanta en Géorgie (États-Unis).

Les organisateurs de Wire Association International (WAI) ont obtenu un résultat positif de la foire bisannuelle Interwire, du 85ème congrès annuel et de l'assemblée concomitante du 2ème Global Continuous Casting Forum (GCCF) à la fin d'avril.

"Interwire représente une excellente ressource pour l'Amérique du Nord, à forte valeur pour de nombreux secteurs de notre industrie. En tant que producteur de câbles, j'estime que cet événement représente notre meilleure occasion pour passer du temps avec nos partenaires fournisseurs et pour créer des réseaux d'échange avec les leaders industriels" a déclaré William Reichert président de WAI.

Mike Abrashoff, ancien commandant naval de l'USS Benfold, et auteur du New York Times bestseller "It's Your Ship" a fait profiter de ses connaissances tirées de "The Leadership Roadmap" dans son discours d'ouverture en illustrant comment son système de techniques de gestion l'a aidé à surmonter le défi représenté par la démotivation et par la rotation fréquente du personnel.

De nombreux exposants ont fait part de leur enthousiasme quant à la forte participation de décideurs économiques présents au salon, qui a affiché complet, et dans le cadre duquel plus de 400



▲ Les portes s'ouvrent... Interwire 2015 va débiter

entreprises, dont 54 étaient à Interwire pour la première fois, ont exposé des machines, des moyens de production et des équipements auxiliaires.

Plusieurs nouvelles sections de la conférence ont offert aux visiteurs l'opportunité d'apprendre des méthodes de fabrication du fil et du câble innovantes et d'examiner de nouvelles technologies. Les sujets traités ont été les applications, l'abattage des poussières, le personnel et les dépenses en capital.

L'atelier sur la gestion de la production a offert aux directeurs opérationnels des instruments de gestion pratiques. Les visiteurs ont pu choisir parmi des activités de conférence qui comprenaient 20 présentations techniques, un atelier sur les

principes fondamentaux de la fabrication du fil, trois démonstrations de solutions de production et une visite au laminoir de Southwire du type SCR.

Le Global Continuous Casting Forum, organisé parallèlement par Gary Spence de Encore Wire et Richard Baker de General Cable Co, a attiré 200 opérateurs internationaux du secteur de la coulée continue des deux segments de l'industrie du cuivre et de l'aluminium. L'exposition a également présenté des programmes individuels et mixtes permettant aux visiteurs de participer aux expositions d'Interwire dans le cadre du programme.

Wire Association International – États-Unis
Website: www.wirenet.org

Présentation de PWM aux États-Unis

Interwire 2015 a offert de bonnes opportunités à la société britannique PWM, qui a exposé sa gamme de soudeuses à froid.

Les machines ont été présentées par Joe Snee Associates, concessionnaire exclusif de PWM pour les États-Unis et le Canada.

"En particulier, la puissante soudeuse électropneumatique pour barres EP500, a suscité un vif intérêt auprès des visiteurs qui se sont démontrés enthousiastes de connaître les avantages en termes d'économie de temps et de coûts offerts par cet équipement dans le cas de soudage à froid de sections de barres non ferreuses jusqu'à 15mm de diamètre."

PWM Ltd – Royaume-Uni
Website: www.pwmltd.co.uk

Visiteurs provenant de plus de 40 pays

Windak et Axjo America ont partagé un stand à Interwire dans lequel les deux sociétés ont exposé les nouvelles solutions d'emballage et les dernières conceptions modernes de bobines. Le stand a suscité un vif intérêt durant l'exposition avec plus de 100 visiteurs provenant de plus de 40 pays différents.

Windak a exposé le SW6-14, un enrouleur à double tête conçu pour l'emballage entièrement automatique de câbles et fils sur bobines de 165mm (6,5") à 360mm (14") de diamètre total. Les bobines sont chargées sur la tête d'enroulement et en sont déchargées automatiquement.

Windak Group – Estonie
Website: www.windakgroup.com

La machine la plus petite de la gamme

LA machine Conklad 315 de BWE est basée sur le projet de Conform 315, un modèle qui a été couronné de succès.

La Conklad 315 est la machine la plus petite de la série Conklad de BWE, mais elle regroupe de nombreuses caractéristiques quant à la conception standard de machines de dimensions supérieures, telles que l'ouverture de la mâchoire hydraulique, la cisaille de coupe pour le matériau, le réducteur épicycloïdal et le tube de torsion, etc.

La Conklad 315 fonctionne en mode tangentiel, en utilisant un seul fil d'alimentation pour les opérations de placage et revêtement. La machine a été optimisée pour la production à haut rendement de:

- Fil d'acier plaqué d'aluminium (AS Wire)
- Câbles OPGW et CATV
- Noyaux composites avec revêtement
- Fil d'aluminium renforcé
- Conducteurs d'aluminium solide (SAC)

La construction essentielle de la machine est basée sur le projet testé BWE, qui a d'excellents antécédents en matière de fonctionnement pendant de nombreuses années de service.

L'extrême rigidité, la capacité de fonctionner à des pressions d'extrusion élevées et à une température de la roue et de la filière contrôlée séparément, garantissent le maintien des jeux des équipements optimaux pour des périodes de fonctionnement prolongées.

Les systèmes automatiques de réchauffage de la filière et de refroidissement de la roue, assurent



▲ Conklad 315 de BWE

un préchauffage rapide à la correcte température initiale et le maintien des conditions idéales durant le cycle de production sans exiger aucune intervention de l'opérateur.

Les caractéristiques économiques d'ensemble sont davantage améliorées

grâce à l'incorporation d'équipements permettant de remplacer la surface d'usure du composant principal de l'équipement et la chambre de la filière à un coût minimal.

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

Conception de tressage BMW efficace, souple et projeté vers le futur

Les produits de câbles devant constamment satisfaire une demande croissante, les fabricants de câbles et de fils ont donc besoin d'équipements répondant à des critères spécifiques en matière d'énergie, de matières premières et de processus de fabrication avantageux. Les machines développées et fabriquées par Maschinenfabrik Niehoff répondent à la totalité de ces exigences. Un exemple est représenté par les tresseuses rotatives équipées de bras de levier de la série BMV, conçues pour 12, 16 ou 24 bobines fonctionnant dans le sens vertical.

Les machines BMV sont équipées d'un système de réglage électronique de la vitesse et du pas de tressage ainsi que d'un système de lubrification automatique centralisé. Les phases du processus, de l'enroulement des câbles à tresser aux fils

individuels, aux faisceaux de fils et à l'enroulement final du câble tressé, sont surveillées par un système de contrôle de la qualité.

En option, il est possible d'installer un système de détection des bobines vides garantissant l'arrêt automatique de la machine BMV avant que la bobine de tressage ne soit complètement vide. Ce système réduit au maximum le rebut et la quantité de fil résiduel laissé sur la bobine. Pour plus de sécurité et de fiabilité, la température des glissières est contrôlée par un système de surveillance. L'opérateur peut utiliser ce système pour régler la fréquence de lubrification et la quantité de lubrifiant afin d'optimiser la consommation du fluide.

Maschinenfabrik Niehoff GmbH & Co KG – Allemagne
Website: www.niehoff-gmbh.info

Mesure de la qualité de la surface ultra-rapide, haute résolution pour fils, fibres optiques et câbles

Par Jean-François Fardeau, Gérald Novel et David Miara, Cersa-MCI, Division Recherche et Développement, Cabries, France

Résumé

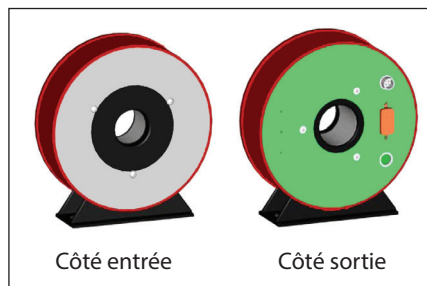
Ce projet répond à l'exigence perçue depuis longtemps par le secteur du fil, du câble et de la fibre optique, d'effectuer de façon efficace la mesure de la qualité de la surface et la détection des défauts en ligne. Cela a été possible grâce aux plus récents progrès technologiques dans le secteur de l'optoélectronique.

Le système fonctionne comme une caméra en anneau autour des fils. La version pour fil mince fonctionne de $10\mu\text{m}$ (0,4 mils) à 2mm (80mils) et elle est fournie en deux modèles, pour fil mince et ultra mince.

Avec 64 points par circonférence, environ 300 000 circonférences par seconde (c/s), et une dimension du point proportionnel au diamètre du fil, le système augmente les performances de détection de la surface bien au-delà du niveau de la totalité des technologies existant déjà à un coût compétitif.

Le système comprend toute les fonctions de calcul électronique requis en temps réel: caractérisation et sélection des défauts, et alarmes. Il se connecte à des ordinateurs extérieurs pour l'enregistrement des données, la configuration des paramètres et pour l'affichage des images de la surface sur l'écran de l'ordinateur, des calculs statistiques, des rapports sur la quantité de la production et de l'entretien (Brevet International juillet 2004).

D'autres modèles, conçus pour des diamètres supérieurs, de résolutions plus hautes mais ayant une vitesse inférieure seront disponibles au cours de l'année prochaine.



Introduction

Dans les applications où la qualité de la surface (rugosité, défauts, nœuds, étranglements) est critique, comme dans le cas de fils d'acier inoxydables minces spécifiques, de fils d'or, du plaquage de fils, de revêtements ou de colorations de fibres optiques et de l'émaillage de fils de cuivre à bande large, il n'existait aucun instrument pour l'analyse superficielle complète à haute résolution et haute vitesse.

Les instruments de détection existant actuellement sont basés sur l'analyse de l'image avec caméra standard. Dans le cas du fil mince, les limites sont représentées par la résolution sur le fil, par la fréquence de l'image et par le système d'éclairage pour l'analyse de la surface.

Avec l'élaboration des images dans la circonférence complète sans contact, l'on couvre la totalité de la surface du fil à haute résolution et haute vitesse, et l'on peut évaluer la surface et la forme du défaut.

À 300 000 circonférences par seconde et 64 points de circonférence, à une vitesse de ligne de 30m/s (1 800m/mn), la résolution axiale (pas) serait de 0,1mm (4 mils).

En considérant les impulsions d'alimentation du fil pour la mesure de la longueur et de la vitesse, deux dimensions sont déterminées : longueur et circonférence. On obtient ainsi une image du fil à deux axes pour la caractérisation du défaut. En connectant le système à un ordinateur, l'on peut afficher des images locales de la surface du fil, spécialement dans le cas d'un défaut du fil, pour l'analyser et l'étudier.

En utilisant exclusivement des composants statiques, la durée du dispositif ne pose aucun problème. L'entretien des systèmes optiques dans des environnements difficiles exige une attention particulière.

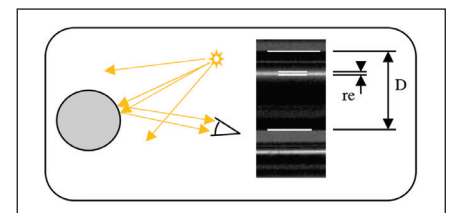
Pour réduire l'entretien, l'on utilise de l'air propre comprimé pour éviter la déposition de poudre, de vapeur ou la précipitation de particules dans l'interface du tube de verre intérieur.

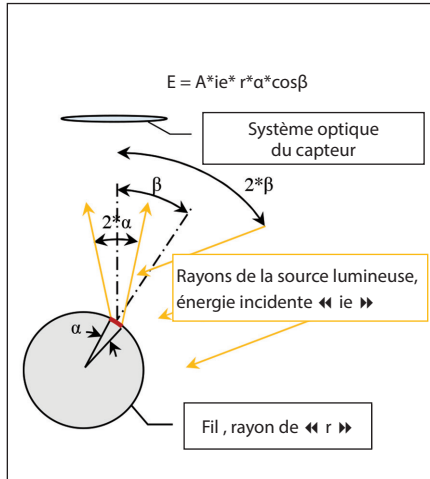
Principe

L'idée est née de la lueur d'un projecteur sur un cylindre.

Dans cette image, re/D est environ égal à deux pour cent. Il s'ensuit que $re/\pi \cdot D < 1\%$ de la circonférence.

▼ Figure 1





▲ Figure 2: Éclairage

Les dimensions de la lueur dépendent des dimensions de la source lumineuse ponctuelle et de l'ouverture angulaire de l'observateur (optique du capteur).

L'énergie émise par une lueur vers l'observateur (capteur) est fortement modulée par la qualité de la surface, par la rugosité, par la couleur (absorption), par les défauts, mais également par la forme locale du cylindre.

Par conséquent, en faisant tourner la lumière autour de l'axe du fil, la lueur tournera, elle aussi, sur la surface en faisant référence à un observateur fixe. Cela génère une image de la circonférence. Durant son mouvement, le fil développe une image complète de la surface.

Si le projet est réalisé correctement, tout petit défaut de surface, toute modification de couleur ou de forme, produira localement une réduction considérable de l'énergie émise par la lueur vers le capteur.

La Figure 2 montre les paramètres clé du principe:

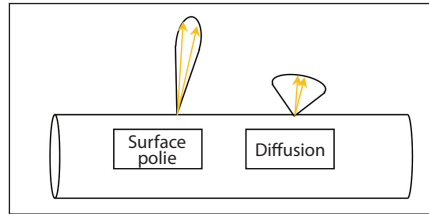
Dans la vue en section du fil, les rayons de lumière incidente sont quasiment des lignes parallèles. Perpendiculairement à l'axe du fil, chaque rayon de la source converge sur une ligne étroite.

La valeur $2*\alpha$, dépend de l'ouverture angulaire du système optique et détermine le diamètre du spot sur la circonférence du fil: $r*\alpha$.

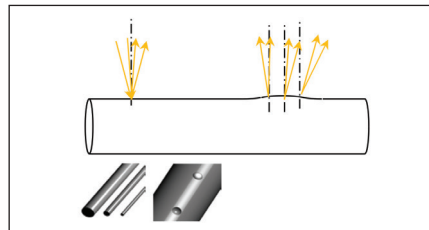
La valeur $2*\beta$, dépend de l'incidence angulaire de la source lumineuse.

En supposant que "A" soit le facteur d'absorption/diffusion de la surface du fil, l'énergie lumineuse "E" reçue par le capteur est la suivante :

$$E = A*ie*r*\alpha*cos\beta$$



▲ Figure 3: Effet de la rugosité



▲ Figure 4: Effet du changement de forme. Image de la modélisation

Les conséquences de ces réactions sont les suivantes:

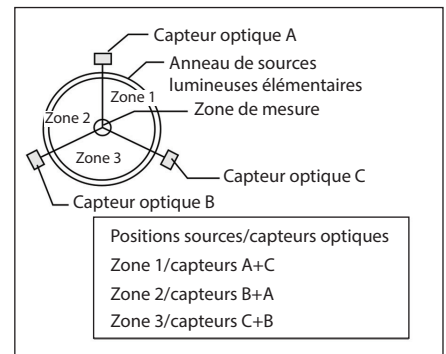
- Le diamètre du spot ($r*\alpha$) est proportionnel au diamètre du fil (donnée plutôt satisfaisante) et à l'ouverture angulaire du système optique.
- L'énergie reçue par le capteur varie en fonction de l'incidence angulaire de la source lumineuse en fonction de $\cos\beta$. En utilisant trois capteurs, " β " varie de $\pm 60^\circ$ par capteur, en générant une modulation d'amplitude du signal de 50 pour cent. Cela est compensé par un facteur de correction afin d'afficher une réponse uniforme. Avec cinq capteurs, la variation directe se réduit à: 20 pour cent.
- En outre, l'énergie reçue par le capteur est directement proportionnelle au diamètre du fil. Il s'ensuit qu'il est nécessaire d'adapter en conséquence l'énergie de la source lumineuse incidente "ei", ainsi que la technologie des capteurs en fonction de la gamme des diamètres à contrôler. Le diamètre le plus petit ayant pu être contrôlé était celui d'un fil de tungstène (couleur noire) de $10\mu\text{m}$.
- Le facteur A a un impact significatif à la fois durant la diffusion de l'énergie (rugosité) et durant l'absorption du rayon de lumière à 850nm .

Un autre effet important est représenté par le changement de forme le long de l'axe du fil (nœuds, étranglements, défauts) qui dévie les rayons réfléchis hors de l'ouverture angulaire du capteur.

Conception

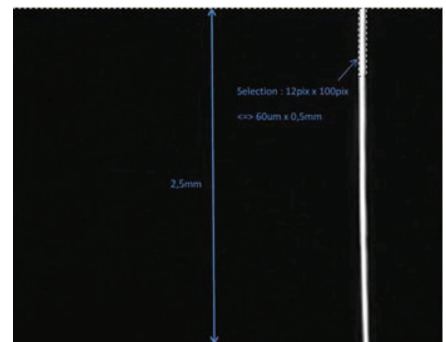
Pour obtenir la rotation de la source du point lumineux, un anneau de sources lumineuses a été réalisé autour de l'axe du fil, avec une seule source lumineuse allumée à la fois. L'allumage en séquence de chaque source lumineuse génère

un point lumineux tournant autour du fil. Trois capteurs à 120° contrôlent simultanément l'énergie qui émet une lueur sur la surface du fil.



▲ Figure 5: Vue frontale du système

Le système de sources lumineuses se concentre sur chaque rayon de la source dans une ligne étroite perpendiculaire à l'axe du fil. Le rayon est approximativement parallèle à l'autre plan. L'épaisseur de la ligne détermine la résolution sur l'axe du fil. Par conséquent, les dimensions des sources doivent être réduites et le système optique indiqué pour l'application.



▲ Figure 6

La Figure 6 ci-dessus, prise d'une matrice CCD là où est positionné le fil, montre les dimensions de la ligne de la lumière (blanche) perpendiculaire à l'axe du fil.

Avec la forme Gaussienne de la densité de l'énergie dans la ligne lumineuse, l'ampleur efficace se situe à environ $20\mu\text{m}$.

Il s'ensuit que le diamètre du point lumineux le long de l'axe du fil (Résolution Ligne: LR) est presque constant, mais sur la circonférence (Résolution Circonférence: CR), varie proportionnellement au diamètre du fil ($r*\alpha$).

La résolution de la ligne sur le fil dépend exclusivement du système de source lumineuse, et non du capteur.

Un point clé pour réussir dans ce développement était représenté par les sources lumineuses. Ces sources doivent être petites et rapides, mais elles doivent générer des rayons lumineux très homogènes avec des caractéristiques uniformes.

Ces caractéristiques ont été tout spécialement développées, et ce avec succès pour cette application. Un autre point clé était représenté par les technologies des capteurs.

Pour la plus petite gamme, il était nécessaire d'utiliser un capteur hautement sensible, mais également très rapide.

Le mouvement du fil avec la rotation de la source lumineuse génère un balayage elliptique de la surface et une image continue sur le capteur.

Élaboration de l'image

Le capteur doit être en mesure de caractériser les dimensions et la forme du défaut selon les spécifications de l'utilisateur. Le système de mesure de la qualité de la surface (SQM) calcule en temps réel le périmètre (P) et la surface (S) du défaut.

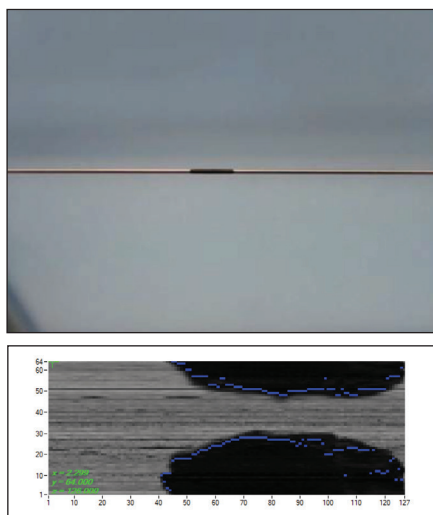
Le rapport $R = k \cdot S / P^2$ fournit une information sur la forme du défaut. $k = 4\pi$. Dans ce cas, $R = 1$ pour un défaut circulaire. Il tend vers zéro lorsque le défaut se développe en longueur.

Par conséquent, R et S sont deux paramètres de détection clé. Pour obtenir une relation homogène, la vitesse de la ligne est mesurée au moyen du système SQM (comptage d'impulsions) et le diamètre est un paramètre utilisateur. Ensuite, la fréquence de balayage est réglée de façon automatique.

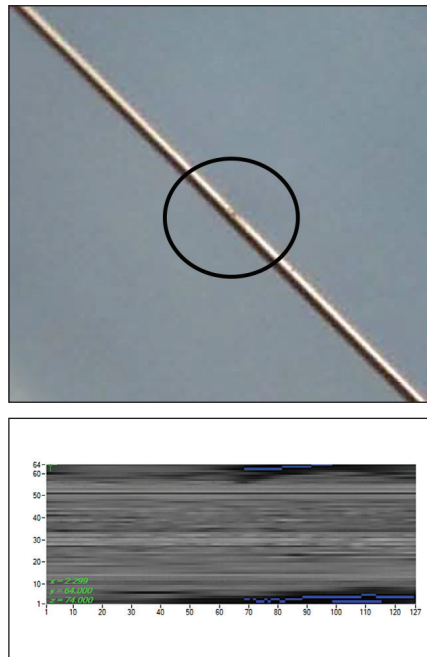
Résultats des essais

Au moment de la rédaction de cet article, les auteurs n'étaient qu'au début de l'application et ils effectuaient des essais industriels.

▼ **Figure 7:** Premier cas, une trace encrée de grandes dimensions. Lecture à 25kHz



Toutefois, dans des conditions de laboratoire, un fil d'acier inoxydable de 0,38mm de diamètre (15mils) a été déplacé et cela a généré des marques ou des éraflures.



▲ **Figure 8:** Deuxième cas, une éraflure sur la surface. Lecture à 140kHz

Dans les deux cas, la ligne bleue indique les marges du défaut. Malheureusement, l'affichage paraît coupé à droite dans la partie supérieure du fil où on trouve les marques.

Cependant, il montre l'analyse de mesure valable qui a lieu autour du fil. Il est également possible de voir la qualité de la surface du fil. Le calibrage de l'image doit être réalisé sur une surface lisse des fils.

Il s'agit également d'un processus qui doit être développé pour déterminer les fils de référence.

Les mesures ne sont pas sensibles à la vibration du fil. Toutefois, cette indépendance doit être optimisée par rapport à la position du fil.

Conclusions

Cet instrument unique en son genre est dans sa dernière phase d'optimisation. Tous les problèmes technologiques ont été résolus efficacement.

Une fois les essais complétés, on prévoit d'entreprendre la commercialisation cette année (2015). ■

Cet article a été présenté au 63ème Symposium Technique IWCS qui s'est tenu à Providence, Rhode Island, États-Unis, du 10 au 12 novembre 2014.

Cersa-MCI,
13480 Cabries,
France
Tel: +33 442 020 044
Fax: +33 442 027 979
Email: sales@cersa-mci.com
Website: www.cersa-mci.com

Grande aumento delle attività alla riuscita esposizione di Interwire

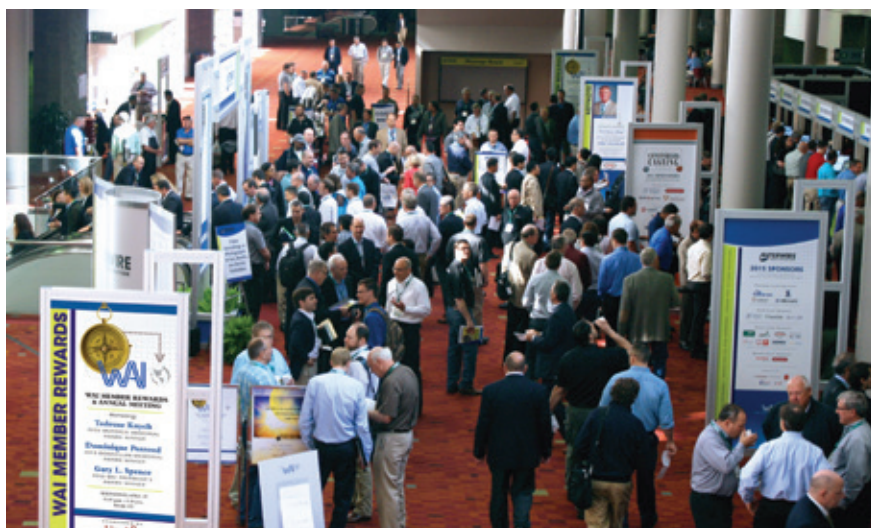
OLTRE 4,080 professionisti dell'industria del filo e del cavo provenienti da 53 paesi erano presenti in massa a Interwire 2015 presso il World Congress Center di Atlanta in Georgia (Stati Uniti).

Gli organizzatori di Wire Association International (WAI) hanno ottenuto un risultato positivo dalla fiera biennale Interwire, dall'85° congresso annuale e dalla concomitante assemblea del 2° Global Continuous Casting Forum (GCCF) alla fine di aprile.

"Interwire costituisce un'eccellente risorsa per il Nord America, di notevole valore per numerosi settori della nostra industria. Come produttore di cavi, ritengo che questa sia la nostra migliore occasione per trascorrere del tempo con i nostri soci fornitori e creare reti di scambio con i leader industriali" ha dichiarato William Reichert presidente di WAI.

Mike Abrashoff, ex comandante di marina del USS Benfold, e autore del libro "It's Your Ship" classificato come bestseller dal New York Times, ha condiviso delle conoscenze tratte da "The Leadership Roadmap" nel suo discorso d'apertura descrivendo come il suo sistema di tecniche di gestione lo abbiano aiutato a superare la sfida della demoralizzazione e della rotazione frequente del personale.

Numerosi espositori sono rimasti entusiasti per la nutrita partecipazione di responsabili aziendali presenti nello spazio fieristico che ha registrato il tutto esaurito, dove sono state esposte macchine operative, mezzi di produzione ed equipaggiamenti ausiliari di oltre 400



▲ Si aprono le porte.... Interwire 2015 prende il via

aziende espositrici, 54 delle quali erano nuove a Interwire 2015. Diverse nuove sezioni della conferenza hanno offerto ai visitatori l'opportunità di apprendere metodi di fabbricazione del filo e del cavo innovativi e di esaminare nuove tecnologie. Sono stati trattati argomenti quali le applicazioni, l'abbattimento delle polveri, il personale e i costi di capitale.

Il workshop sulla gestione della produzione ha offerto ai direttori operativi pratici strumenti di gestione. I visitatori hanno potuto scegliere fra attività congressuali che comprendevano 20 presentazioni tecniche, un workshop sui principi base della fabbricazione del filo, tre dimostrazioni di soluzioni di produzione e una visita al laminatoio di Southwire del tipo SCR.

Il concomitante Global Continuous Casting

Forum, organizzato da Gary Spence di Encore Wire e Richard Baker di General Cable Co, ha attirato 200 operatori internazionali del settore della colata da entrambi i segmenti dell'industria del rame e dell'alluminio. Sono stati presentati programmi separati e combinati che consentivano ai partecipanti di assistere alle esposizioni di Interwire nell'ambito del programma.

I membri del consiglio di amministrazione di WAI hanno inoltre ospitato la folla più numerosa della recente storia di Interwire al popolare ricevimento d'apertura tenutosi presso il nuovo College Football Hall of Fame di Atlanta.

Wire Association International – Stati Uniti
Website: www.wirenet.org

Presentazione di PWM negli Stati Uniti

Interwire 2015 ha offerto delle buone opportunità alla società britannica PWM, che ha esposto la propria gamma di saldatrici a freddo. Le macchine sono state presentate da Joe Snee Associates, distributore esclusivo di PWM per gli Stati Uniti e il Canada.

"In particolare, la potente saldatrice per barre elettro-pneumatica EP500, ha suscitato un gran interesse presso i visitatori che si sono dimostrati desiderosi di conoscere i vantaggi in termini di risparmio di tempi e costi offerti da questa macchina per la saldatura a freddo di sezioni di barre non ferrose fino a 15mm di diametro."

PWM Ltd – Regno Unito **Website:** www.pwmltd.co.uk

Visitatori da oltre 40 paesi

Windak, assieme ad Axjo America, ha condiviso uno stand a Interwire nel quale le due aziende hanno esposto le nuove soluzioni d'imballaggio e i nuovi e moderni progetti di bobine.

Windak ha esposto il SW6-14, un avvolgitore a doppia testa sviluppato per l'imballaggio completamente automatico di cavi e fili in bobine da 165mm (6,5") a 360mm (14") di diametro complessivo. Le bobine vengono caricate sulla testa di avvolgimento e scaricate da essa automaticamente. Le estremità esterne del materiale vengono fissate mediante una pellicola in plastica.

Windak Group – Estonia **Website:** www.windakgroup.com

La più piccola macchina della gamma

La macchina Conklad 315 di BWE si basa sul progetto della Conform 315, un modello che ha riscosso un grandissimo successo.

La Conklad 315 è la macchina più piccola della serie Conklad di BWE, ma include molte caratteristiche progettuali standard di macchine di dimensioni maggiori, come l'apertura della ganascia idraulica, la cesoia di taglio per il materiale, il riduttore epicicloidale e il tubo di torsione, ecc.

La Conklad 315 funziona in modalità tangenziale, utilizzando una sola barra di alimentazione per le operazioni di placcatura e rivestimento. La macchina è stata ottimizzata per la produzione ad alto rendimento di:

- Filo d'acciaio placcato e rivestito (AS Wire)
- Cavi OPGW e CATV
- Nuclei compositi con rivestimento
- Filo di alluminio rinforzato
- Conduttori di alluminio solido (SAC)

La costruzione della macchina si basa sul progetto collaudato BWE, che vanta eccellenti risultati da un punto di vista del funzionamento in anni e anni di servizio.

L'estrema rigidità, la capacità di funzionare a pressioni di estrusione elevate e ad una temperatura della ruota e della filiera controllate separatamente, garantiscono il mantenimento di giochi delle attrezzature ottimali per periodi di funzionamento prolungati.



▲ Conklad 315 di BWE

La filiera e di raffreddamento della ruota assicurano un rapido preriscaldamento alla corretta temperatura iniziale e il mantenimento delle condizioni di estrusione ideali durante il ciclo produttivo senza l'intervento dell'operatore.

ulteriormente migliorato grazie all'inserimento di attrezzature che consentono di sostituire la superficie di usura del componente principale dell'equipaggiamento, la camera della filiera, ad un costo minimo.

I sistemi automatici di riscaldamento della

L'aspetto economico generale è

BWE Ltd – Regno Unito
Website: www.bwe.co.uk

Concetto di trecciatura BMW efficiente, versatile e proiettato verso il futuro

Dato che i prodotti di cavi devono costantemente soddisfare requisiti crescenti, i fabbricanti di cavo e filo necessitano di macchinari che rispondano a criteri specifici in materia di energia, materie prime e processo di fabbricazione economico. Inoltre, le macchine devono essere flessibili per potersi adattare alle nuove esigenze produttive. Le macchine sviluppate e fabbricate da Maschinenfabrik Niehoff soddisfano tutti questi requisiti.

Un esempio è costituito dalle trecciatrici rotanti con bracci di leva della serie BMW, progettati per 12, 16 o 24 bobine che operano in verticale. Come opzione, è possibile installare un sistema di rilevamento delle bobine vuote che garantisce l'arresto automatico della macchina BMW prima che la bobina di trecciatura sia completamente vuota.

Questo sistema riduce al minimo lo scarto e la quantità di filo residuo lasciato sulla bobina. Per maggiore sicurezza e affidabilità operativa, la temperatura delle guide di scorrimento è controllata da un sistema di monitoraggio. L'operatore può utilizzare questo sistema per regolare la

frequenza di lubrificazione e la quantità di lubrificante al fine di ottimizzare il consumo del fluido.

Grazie a tutte queste misure, le trecciatrici BMW possono essere utilizzate per tempi prolungati, incustodite e senza la presenza di un operatore. L'ultima novità nel settore delle trecciatrici BMW è costituita dalla trecciatrice BMI 124, una macchina di trecciatura rotante con braccio di leva a 24 bobine.

La caratteristica più saliente della macchina a 24 bobine è rappresentata dal rotore di trecciatura inclinato. L'inclinazione comporta una deflessione del cavo di appena 45° (anziché 90°) su ciascuna puleggia di deflessione con conseguente riduzione della deformazione del cavo e miglioramento della qualità di trecciatura. Se associata ad un traino a cingoli, la macchina può essere utilizzata per fabbricare cavi fino a 40mm di diametro. La BMI 124 consente di produrre fasci di filo per trecciatura con fasci fino ad una sezione massima di 24 x 1,5mm².

Maschinenfabrik Niehoff GmbH & Co KG – Germania
Website: www.niehoff-gmbh.info

Misurazione della qualità della superficie ultra rapida, di alta risoluzione per fili, fibre ottiche e cavi

A cura di Jean-François Fardeau, Gérald Novel e David Miara, Cersa-MCI, Divisione Ricerca e Sviluppo, Cabries, Francia

Riassunto

Questo progetto soddisfa l'esigenza sentita da lungo tempo dal settore del filo, del cavo e della fibra ottica, di effettuare in modo efficace la misurazione della qualità della superficie e la rilevazione di difetti in linea.

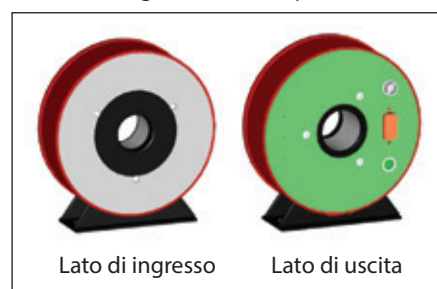
Ciò è stato reso possibile grazie ai più recenti progressi tecnologici nel settore dell'optoelettronica.

Il sistema funziona come una telecamera lineare ad anello attorno ai fili. La versione per filo sottile funziona da 10µm (0,4 mils) a 2mm (80mils) ed è fornita in due modelli, per filo sottile e ultra sottile.

Con 64 punti per circonferenza, circa 300.000 circonferenze per secondo (c/s), e una dimensione del punto proporzionale al diametro del filo, il sistema aumenta le prestazioni di rilevamento della superficie ben oltre il livello di tutte le tecnologie esistenti ad un costo competitivo.

Il sistema comprende tutte le funzioni di calcolo elettronico richiesto in tempo reale: caratterizzazione e selezione dei difetti, e allarmi.

Si collega a computer esterni per la registrazione dei dati, la configurazione dei parametri e la visualizzazione delle immagini della superficie sullo



schermo del computer, calcoli statistici, rapporti sulla qualità della produzione e manutenzione (Brevetto Internazionale luglio 2004). Altri modelli, per diametri maggiori, risoluzioni più alte ma con una velocità inferiore, saranno disponibili entro l'anno prossimo.

Introduzione

In applicazioni in cui la qualità della superficie (rugosità, difetti, nodi, strozzature) è critica, come nel caso di fili di acciaio inossidabile sottili speciali, fili di oro, placcatura di filo, rivestimenti o colorazioni di fibre ottiche, smaltature di fili di rame e cavi a banda larga, non era disponibile alcuno strumento per l'analisi superficiale completa ad alta risoluzione e alta velocità.

Gli strumenti di rilevamento della qualità della superficie attualmente esistenti si basano sull'analisi dell'immagine con telecamera standard. Nel caso del filo sottile, i limiti sono costituiti dalla risoluzione sul filo, dalla frequenza dell'immagine e dal sistema di illuminazione per l'analisi della superficie.

Con l'elaborazione delle immagini della circonferenza completa senza contatto, si copre l'intera superficie del filo ad alta risoluzione e alta velocità, e si può valutare la superficie e la forma del difetto. A 300.000 circonferenze per secondo e 64 punti per circonferenza, ad una velocità di linea pari a 30m/s (1.800m/min), la risoluzione assiale (passo) sarebbe di 0,1mm (4 mils).

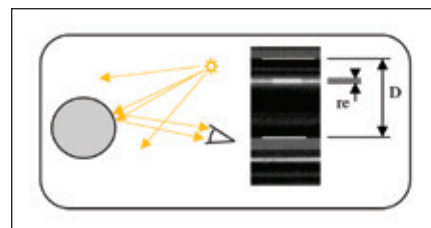
Considerando gli impulsi di alimentazione del filo per la misurazione della lunghezza e della velocità del filo, vengono determinate due dimensioni: lunghezza e circonferenza. Si ottiene così un'immagine

del filo a due assi per la caratterizzazione del difetto. Collegando il sistema ad un PC si possono visualizzare immagini locali della superficie del filo, specialmente nel caso di un difetto, per analizzarlo e studiarlo.

Utilizzando esclusivamente componenti statici, la durata del dispositivo non costituisce un problema. La manutenzione dei sistemi ottici in ambienti difficili richiede un'attenzione particolare. Per ridurre la manutenzione si utilizza dell'aria pulita compressa per evitare la deposizione di polvere, vapore o della precipitazione di particelle nell'interfaccia del tubo di vetro interno.

Principio

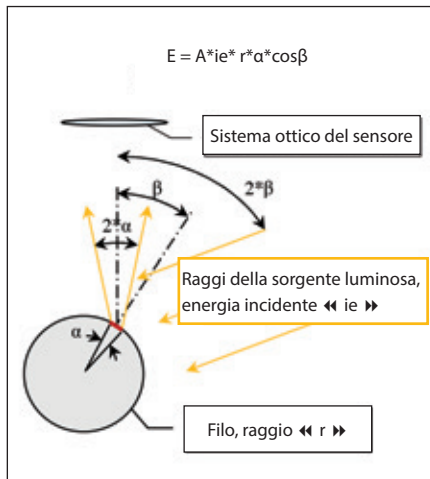
L'idea è nata dal bagliore di un proiettore a fascio stretto su un cilindro.



▲ Figura 1

In questa immagine, re/D è approssimativamente pari a due per cento. Pertanto, $re/\pi \cdot D < 1\%$ della circonferenza. Le dimensioni del bagliore dipendono dalle dimensioni della sorgente luminosa puntiforme e dall'apertura angolare dell'osservatore (ottica del sensore).

L'energia emessa da un bagliore verso l'osservatore (sensore) è fortemente modulata dalla qualità della superficie, dalla rugosità, dal colore (assorbimento), dai difetti, ma anche la forma locale del cilindro.



▲ **Figura 2:** Illuminazione

Pertanto, facendo ruotare la luce attorno all'asse del filo, ruoterà anche il bagliore sulla superficie facendo riferimento a un osservatore fisso. Ciò genera un'immagine della circonferenza.

Durante il suo movimento, il filo sviluppa un'immagine completa della superficie. Se il progetto viene realizzato correttamente, qualunque piccolo difetto superficiale, cambio di colore o di forma, produrrà localmente una notevole riduzione dell'energia emessa dal bagliore verso il sensore.

La **Figura 2** mostra i parametri chiave del principio:

Nella vista in sezione del filo, i raggi di luce incidente sono quasi delle linee parallele. Perpendicolarmente all'asse del filo, ciascun raggio della sorgente converge su una linea stretta.

Il valore 2α , dipende dall'apertura angolare del sistema ottico e determina il diametro del punto luminoso sulla circonferenza del filo: $r\alpha$.

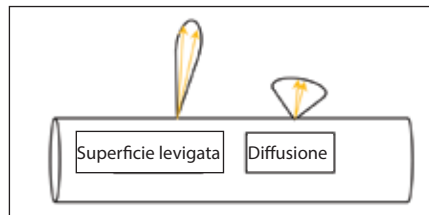
Il valore 2β , dipende dall'incidenza angolare della sorgente luminosa.

Supponendo che "A" sia il fattore di assorbimento/diffusione della superficie del filo, l'energia luminosa "E" ricevuta dal sensore è:

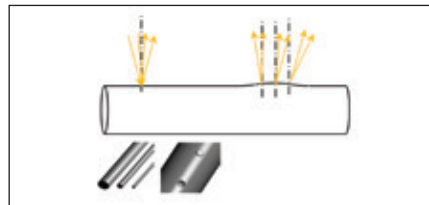
$$E = A \cdot i_e \cdot r \cdot \alpha \cdot \cos \beta$$

Le conseguenze di tali relazioni sono le seguenti:

- Il diametro del punto luminoso ($r\alpha$) è proporzionale al diametro del filo (dato piuttosto soddisfacente), e all'apertura angolare del sistema ottico.
- L'energia ricevuta dal sensore varia in funzione dell'incidenza angolare della sorgente luminosa secondo $\cos\beta$. Utilizzando tre sensori, " β " varia



▲ **Figura 3:** Effetto della rugosità



▲ **Figura 4:** Effetto del cambio di forma. Immagine della modellizzazione

di $\pm 60^\circ$ per sensore, generando una modulazione d'ampiezza del segnale del 50 per cento. Ciò è compensato da un fattore di correzione al fine di visualizzare una risposta uniforme. Con cinque sensori, la variazione diretta si riduce al: 20 per cento.

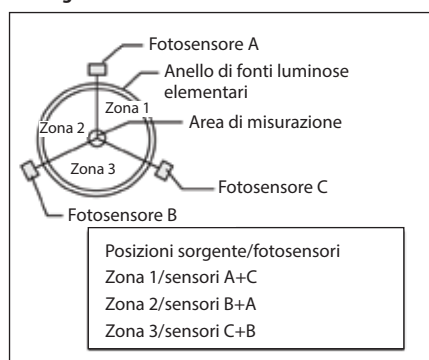
- L'energia ricevuta dal sensore è inoltre direttamente proporzionale al diametro del filo. Ciò significa che è necessario adattare conseguentemente l'energia della sorgente luminosa incidente "ei", come pure la tecnologia dei sensori in funzione della gamma di diametri da controllare. Il diametro più piccolo che è stato possibile controllare era quello di un filo di tungsteno (colore nero) di $10\mu\text{m}$.
- Il fattore A ha un impatto significativo sia durante la diffusione dell'energia (rugosità), sia durante l'assorbimento del raggio di luce a 850nm .

Un altro effetto importante è rappresentato dal cambio di forma lungo l'asse del filo (nodi, strozzature, difetti) che devia i raggi riflessi fuori dall'apertura angolare del sensore.

Progettazione

Per ottenere la rotazione della sorgente del punto luminoso, è stato realizzato

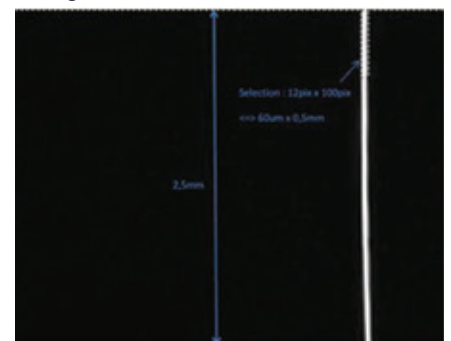
▼ **Figura 5:** Vista frontale del sistema



un anello di sorgenti luminose attorno all'asse del filo, con una sola sorgente luminosa accesa alla volta. L'accensione in sequenza di ciascuna sorgente luminosa genera un punto luminoso rotante attorno al filo. Tre sensori a 120° controllano simultaneamente l'energia che emette un bagliore sulla superficie del filo.

Il sistema di sorgenti luminose si concentra su ciascun raggio della sorgente in una linea stretta perpendicolare all'asse del filo. Il raggio è approssimativamente parallelo all'altro piano. Lo spessore della linea determina la risoluzione sull'asse del filo. Pertanto, le dimensioni delle sorgenti devono essere ridotte e il sistema ottico sufficientemente buono per l'applicazione.

▼ **Figura 6**



La **Figura 6**, presa da una matrice CCD nella posizione del filo, mostra le dimensioni della linea della luce (bianca) perpendicolare all'asse del filo.

La forma Gaussiana della densità dell'energia della linea della luce determina la larghezza efficace a circa $20\mu\text{m}$.

Ne consegue che il diametro del punto luminoso lungo l'asse del filo (Risoluzione Linea: LR) è quasi costante, ma sulla circonferenza (Risoluzione Circonferenza: CR), varia proporzionalmente al diametro del filo ($r\alpha$). La risoluzione della linea sul filo dipende esclusivamente dal sistema di sorgenti luminose, e non dal sensore.

Un punto chiave per avere successo in questo sviluppo era rappresentato dalle sorgenti luminose. Esse devono essere piccole e rapide, ma devono generare raggi luminosi molto omogenei con caratteristiche uniformi.

Queste caratteristiche sono state sviluppate specificamente e con successo per questa applicazione.

Un altro punto chiave era rappresentato dalle tecnologie dei sensori. Per la gamma più piccola, era necessario utilizzare un sensore altamente sensibile, ma allo stesso tempo molto rapido. Il movimento del filo con la rotazione della sorgente luminosa genera una scansione ellittica della superficie e un'immagine continua sul sensore.

Elaborazione dell'immagine

Il sensore deve essere in grado di caratterizzare le dimensioni e la forma del difetto secondo i requisiti dell'utente.

Il sistema di misurazione della qualità della superficie (SQM) calcola in tempo reale il perimetro (P) e la superficie (S) del difetto. Il rapporto $R = k \cdot S / P^2$ fornisce un'informazione sulla forma del difetto. $k = 4\pi$. In questo caso, $R = 1$ per un difetto circolare. Tende verso zero quando il difetto si sviluppa in lunghezza. Pertanto, R e S sono due parametri di rilevamento chiave.

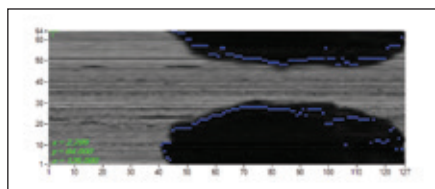
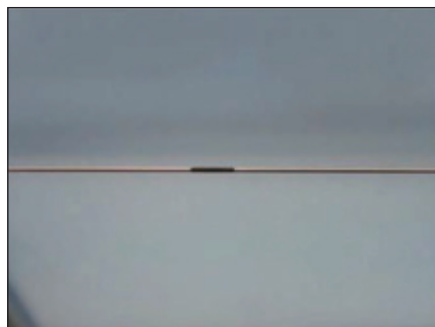
Per ottenere una relazione omogenea, la velocità della linea viene misurata mediante il sistema SQM (conteggio di impulsi) e il diametro è un parametro utente.

Quindi la frequenza di scansionamento viene regolata automaticamente.

Risultati delle prove

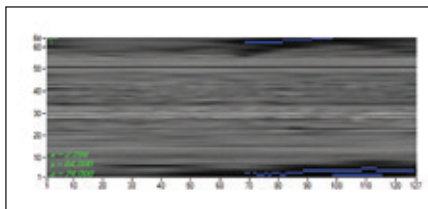
Nel momento in cui è stato scritto il presente articolo, gli autori erano solo all'inizio dell'applicazione ed effettuavano prove industriali.

Tuttavia, in condizioni di laboratorio, un filo di acciaio inossidabile di 0,38mm di diametro (15mils) è stato spostato e ciò ha provocato segni o graffi.



▲ **Figura 7:** Primo caso, segno colorato di grandi dimensioni. Lettura a 25kHz

In entrambi i casi, la linea blu indica i margini del difetto. Purtroppo, la visualizzazione appare tagliata a destra nella parte superiore del filo dove si incontrano i segni. Ciò nonostante, viene evidenziata l'analisi di misurazione valida che avviene tutto intorno al filo.



▲ **Figura 8:** Secondo caso, graffio sulla superficie. Lettura a 140kHz

E' inoltre possibile vedere la qualità superficiale del filo. La calibrazione dell'immagine si deve realizzare su una superficie liscia dei fili.

Si tratta anche di un processo che deve essere sviluppato per determinare i fili di riferimento.

Le misure non sono sensibili alla vibrazione del filo. Tuttavia, questa indipendenza deve essere ottimizzata rispetto alla posizione del filo.

Conclusioni

Questo strumento unico nel suo genere è nell'ultima fase di ottimizzazione. Tutti i problemi tecnologici sono stati risolti efficacemente.

Una volta completate le prove, si prevede di intraprendere la commercializzazione quest'anno (2015). ■

Documento presentato per il 63° Simposio IWCS, Providence, Rhode Island, USA, dal 10 al 12th novembre 2014.

Cersa-MCI,
13480 Cabries,
Francia
Tel: +33 442 020 044
Fax: +33 442 027 979
Email: sales@cersa-mci.com
Website: www.cersa-mci.com

Actividad intensa en la exitosa edición de Interwire

EN la edición Interwire 2015, celebrada en el Centro Mundial de Congresos de Atlanta (Georgia, EE.UU.), hubo un despliegue de más de 4.080 profesionales del sector del cable y alambre procedentes de 53 países distintos.

Los organizadores de la Wire Association International (WAI) registraron un gran éxito en su feria bienal Interwire, en su 85º Congreso Anual y en la celebración paralela de su 2º Foro Global sobre Colada Continua, organizados a finales de abril.

"Interwire es un excelente recurso para Norteamérica, de gran valor para numerosos sectores de nuestra industria. Como productor de cable, es la mejor ocasión que tenemos para pasar un rato con nuestros socios proveedores y relacionarnos con figuras importantes del sector", declaró William Reicher, presidente de la WAI.

Mike Abrashoff, ex Comandante del buque USS Benfold y autor del libro "It's Your Ship", clasificado de bestseller por el New York Times, expuso algunos de los conceptos de "The Leadership Roadmap" en su discurso de apertura sobre cómo le ayudaron sus técnicas directivas a afrontar el desafiante clima de baja moral y el problema de la elevada rotación de personal.

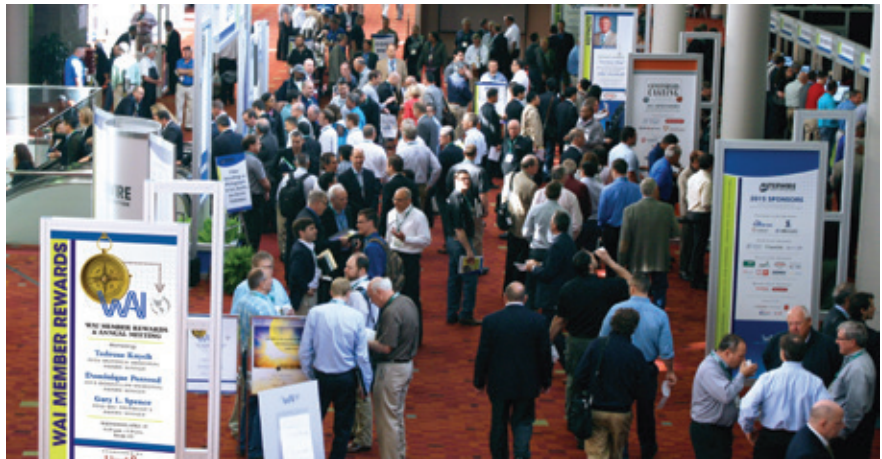
Muchos expositores quedaron entusiasmados con la alta concurrencia de gerentes clave en el pabellón de la feria al completo, donde se exponían maquinaria operativa, suministros y equipos auxiliares de más de 400 empresas expositoras, entre las que se contaban 54 nuevas presencias en Interwire 2015.

Presentación de PWM en Estados Unidos

Interwire 2015 ofreció el marco comercial ideal a la empresa británica PWM, la cual expuso su gama de soldadoras a presión en frío. Las máquinas fueron presentadas por Joe Snee Associates, distribuidor exclusivo de PWM para Estados Unidos y Canadá.

"En concreto, la potente soldadora de alambres electro-neumática EP500 de PWM despertó gran interés entre los visitantes, quienes se interesaron por saber más sobre los beneficios en términos de tiempo y rentabilidad de la máquina a la hora de soldar en frío secciones de alambres no ferrosos de hasta 15mm de diámetro. La soldadora manual M101, más pequeña, también recibió gran aceptación entre los fabricantes que buscaban un método rápido, fácil y fiable de unir alambre no ferroso con fleje de 1 a 5mm," comentó Joe Snee, presidente de Joe Snee Associates.

PWM Ltd – Reino Unido Website: www.pwmltd.co.uk



▲ Las puertas quedan abiertas... da inicio Interwire 2015

Varios sectores de la conferencia, nuevos este año, brindaron a los visitantes la oportunidad de aprender técnicas de fabricación de cable y alambre innovadoras e investigar sobre tecnología nueva. Entre los temas tratados cabe citar las aplicaciones, control de polvos, contratación de personal e inversión de capital.

El seminario sobre Gestión de la Producción ofreció a los gerentes de operaciones valiosas herramientas prácticas. Durante las jornadas de conferencia los visitantes pudieron elegir entre 20 presentaciones técnicas, un seminario sobre Fundamentos de Fabricación de Alambre, tres demostraciones de soluciones para la producción y una visita a la planta de laminación SCR de Southwire.

El Foro Global sobre Colada Continua,

celebrado en paralelo y organizado por Gary Spence, de Encore Wire, y Richard Baker, de General Cable Co, contó con la presencia de 200 profesionales internacionales del mundo de la colada, tanto del sector del cobre como del aluminio.

Para que los participantes pudieran asistir a las ferias de Interwire los organizadores prepararon programas separados y combinados encajados a la perfección.

Los miembros del consejo directivo de la WAI también dieron la bienvenida al público más numeroso de la breve historia de Interwire a la famosa ceremonia de apertura, celebrada en el nuevo Salón de la Fama del Fútbol Americano Universitario de Atlanta.

Wire Association International - EE.UU.
Website: www.wirenet.org

Afluencia de visitantes de más de 40 países

Windak, junto con Axjo America, compartieron puesto en Interwire, donde expusieron las nuevas soluciones de embalaje y los nuevos y modernos diseños de bobinas. El stand registró un gran número de visitas durante la feria, con más de 100 visitantes procedentes de 40 países distintos.

Windak expuso su SW6-14, una bobinadora de doble cabezal desarrollada para embalar cable y alambre de modo totalmente automático en bobinas de 165mm (6,5") a 360mm (14") de diámetro total.

Las bobinas son cargadas y descargadas automáticamente desde el cabezal de bobinado.

Windak Group – Estonia
Website: www.windakgroup.com

La más pequeña de su clase

LA máquina Conklad 315 de BWE se basa en el diseño de la Conform 315, un modelo más que probado y que ha cosechado gran éxito.

La Conklad 315 es la máquina más pequeña de la serie Conklad de BWE, pero incluye muchas características de diseño estándares de las máquinas grandes, como la apertura hidráulica de la zapata, la cizalla para cortar el material, la caja reductora planetaria, el tubo de cola, etc.

La Conklad 315 funciona en modo tangencial, usando un solo alambroón de alimentación, para las operaciones de chapado y revestimiento. La máquina ha sido optimizada para la producción eficiente de:

- Alambre de acero chapado en aluminio
- Cables OPGW y CATV
- Núcleos compuestos con cubierta
- Alambre de aluminio reforzado
- Conductor de aluminio sólido

La construcción básica de la máquina se basa en el probado diseño BWE, que ostenta un magnífico récord de funcionamiento fiable durante años y años de servicio. Rigidez extrema, capacidad para funcionar a presiones de extrusión elevadas y temperatura de la rueda y de la hilera controladas separadamente garantizan la holgura perfecta de las herramientas durante tiempos de funcionamiento continuo prolongados.

Los sistemas automáticos de



▲ La Conklad 315 de la casa BWE

calentamiento de la hilera y de enfriamiento de la rueda garantizan un rápido precalentamiento a la temperatura inicial correcta y mantienen las condiciones de extrusión ideales durante el ciclo productivo sin intervención del operador. El aspecto económico general también ha sido optimizado

incorporando herramientas que permiten sustituir la superficie de desgaste del componente principal de la herramienta, la cámara de la hilera, con un gasto mínimo.

BWE Ltd – Reino Unido
Website: www.bwe.co.uk

Concepto de trenzado BMW eficiente, versátil y orientado al futuro

Como los productos de cable deben responder a la continua y creciente demanda, los fabricantes de cable y alambre necesitan maquinaria con determinados requisitos de energía, materias primas y procesamiento productivo. Un ejemplo son las trenzadoras giratorias de brazo de palanca de la serie BMV, diseñadas para procesar 12, 16 ó 24 bobinas con sentido de trabajo en vertical.

Las máquinas BMV disponen de un sistema electrónico de control de la velocidad de trenzado y del paso infinitamente variable, además de un sistema de lubricación central automático. Todos los pasos del proceso, desde el desenrollado del cable a trenzar hasta los distintos alambres y manojos de alambres y la recogida final del cable trenzado, son monitorizados por un sistema de control de calidad. Como opción, se puede instalar un sistema de detección de bobinas vacías que para la máquina BMV automáticamente antes de que la bobina de trenzado se quede totalmente vacía. El sistema minimiza el derroche y los recortes de alambre que quedan en la bobina.

Para mayor seguridad y fiabilidad operativa, la temperatura de los carriles de guía es vigilada por un sistema de monitorización. El operador puede utilizar este sistema para regular la frecuencia de lubricación y la cantidad de lubricante a fin de optimizar el consumo de lubricante.

La última novedad en el campo de las trenzadoras BMV es la trenzadora BMI 124, una trenzadora giratoria de brazo de palanca de 24 husos. La inclinación se traduce en una deflexión del cable de 45° (en lugar de 90°) en cada polea deflectora, que produce una ligera deformación en el cable y mejora la calidad del trenzado.

Combinada con un desenrollador de arrastre, la máquina puede ser usada para fabricar cables de hasta 40mm de diámetro. La BMI 124 permite producir fajos de alambre para trenzado con fajos de 24x1,5mm² de sección máxima.

Maschinenfabrik Niehoff GmbH & Co KG – Alemania
Website: www.niehoff-gmbh.info

Medición de calidad superficial ultra rápida, de alta resolución para alambres, fibras ópticas y cables

Por Jean-François Fardeau, Gérald Novel y David Miara, Cersa-MCI, Departamento I+D, Cabries, Francia

Resumen

Este proyecto responde a la necesidad desde hace tiempo de medir la calidad superficial y detectar defectos en línea del alambre, del cable y de la fibra óptica de manera eficiente. Esto ha sido posible hace poco gracias a los últimos adelantos en optoelectrónica.

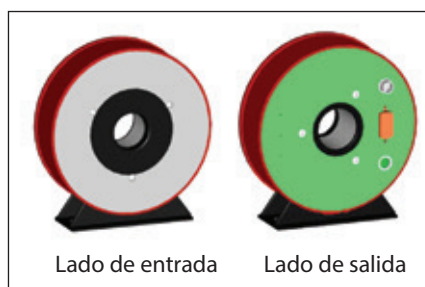
El sistema trabaja como una cámara lineal en forma de anillo dispuesta alrededor de los alambres. La versión para alambre fino trabaja de $10\mu\text{m}$ (0,4 mils) a 2mm (80mils) y está disponible en dos modelos, para alambre fino y ultra fino.

Con 64 puntos por circunferencia, unas 300.000 circunferencias por segundo (c/s) y un tamaño del punto proporcional al diámetro del alambre, lleva la detección superficial a un nivel muy por encima de todas las tecnologías existentes a un coste competitivo.

El sistema comprende todas las funciones de cálculo electrónico en tiempo real necesarias: caracterización y selección de defectos, y alarmas.

Se conecta a ordenadores externos para el registro de datos, configuración de parámetros y visualización de imágenes de la superficie en la pantalla del PC, cálculos estadísticos, generación de informes sobre la calidad de producción y para el mantenimiento. (Patente internacional de julio de 2004).

Otros modelos, para diámetros mayores, resoluciones más altas pero con una velocidad inferior, estarán disponibles el año próximo.



Introducción

En aplicaciones donde la calidad superficial (rugosidad, defectos, abultamientos, estrechamientos) es de suma importancia, como en el caso de alambres de acero inoxidable finos especiales, alambres de oro, chapado de alambre, revestimientos o coloraciones de fibras ópticas, esmaltado de alambres de cobre y cables de banda ancha, no se disponía de ningún instrumento para el análisis superficial completo de alta resolución a alta velocidad.

Los instrumentos actualmente existentes para medir la calidad superficial se basan en el análisis de la imagen con cámaras estándares. Los factores limitantes, en el caso de alambre fino, son la resolución sobre el alambre, la frecuencia de la imagen y el sistema de iluminación para el análisis de la superficie.

Con el procesado de imágenes de la circunferencia entera sin contacto, se cubre toda la superficie del alambre a alta resolución y alta velocidad y se puede evaluar la superficie y la forma del defecto.

A 300.000 circunferencias por segundo y 64 puntos por circunferencia, a una

velocidad de línea de 30m/s (1.800m/mn), la resolución axial (paso) sería 0,1mm (4 mils).

Incluyendo los impulsos de alimentación del alambre para la medición de longitud y velocidad, se determinan las dos dimensiones: longitud y circunferencia. Esto proporciona una imagen en dos ejes del alambre para la caracterización de los defectos.

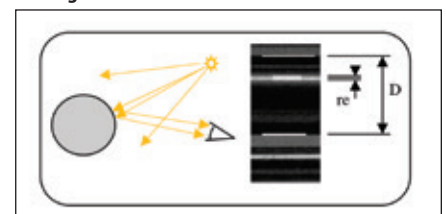
Conectando el sistema a un ordenador, es posible presentar las imágenes locales de la superficie del alambre, especialmente cuando hay un defecto, para analizarlo y estudiarlo.

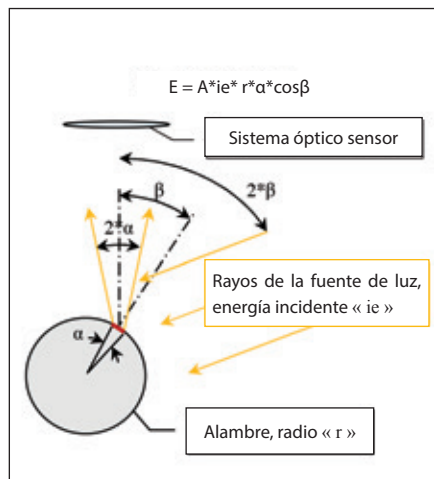
Usando sólo componentes estáticos, la duración del dispositivo no es un problema. El mantenimiento de los sistemas ópticos en entornos hostiles requiere una especial atención. Para reducir el mantenimiento, se usa aire limpio presurizado para evitar la deposición de polvo, vapor o partículas en la interfaz del tubo de vidrio interno.

Principio

La idea fue desarrollada a partir del destello de un proyector de haz sobre un cilindro.

▼ Figura 1





▲ **Figura 2:** Iluminación

En esta imagen, re/D es aproximadamente un dos por ciento. Por lo tanto, $re/\pi \cdot D < 1\%$ de la circunferencia. Las dimensiones del destello dependen de las dimensiones de la fuente de luz puntual y de la apertura angular del observador (óptica del sensor).

La energía destellada al observador (sensor) es modulada fuertemente por la calidad de la superficie, la rugosidad, el color (absorción), los defectos, pero también por la forma local del cilindro. Por lo tanto, haciendo girar la luz alrededor del eje del alambre, girará también el destello sobre la superficie con relación a un observador fijo.

Esto genera una imagen de la circunferencia. Durante su movimiento, el alambre desarrolla una imagen completa de la superficie.

Si el diseño está realizado bien, cualquier pequeño defecto superficial, cambio de color o forma producirá localmente una reducción significativa de la energía destellada hacia el sensor.

La **Figura 2** muestra los parámetros clave del principio:

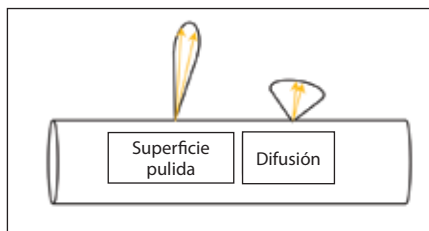
En el plano de corte del alambre, los rayos de luz incidentes son casi líneas paralelas. Perpendicularmente al eje del alambre, cada rayo de la fuente de luz es enfocado en una línea estrecha.

$2 \cdot \alpha$, depende de la apertura angular del sistema óptico y determina el tamaño del punto luminoso sobre la circunferencia del alambre: $r \cdot \alpha$.

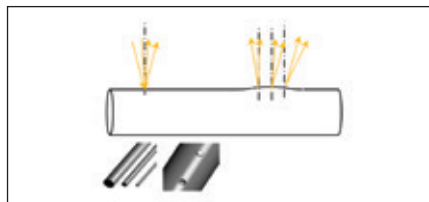
$2 \cdot \beta$, depende de la incidencia angular de la fuente de luz.

Si « A » es el factor de absorción/difusión superficial del alambre, la energía luminosa « E » recibida por el sensor es:

$$E = A \cdot i_e \cdot r \cdot \alpha \cdot \cos \beta$$



▲ **Figura 3:** Efecto de la rugosidad



▲ **Figura 4:** Efecto del cambio de forma. Imagen de modelación

Las consecuencias de estas relaciones son:

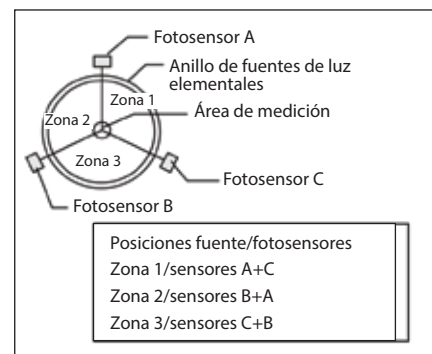
- El tamaño del punto luminoso ($r \cdot \alpha$) es proporcional al diámetro del alambre, que es bastante aceptable, y a la apertura angular del sistema óptico.
- La energía recibida por el sensor varía según la incidencia angular de la fuente de luz en función del $\cos \beta$. Usando tres sensores, « β » varía de $\pm 60^\circ$ por sensor, generando una modulación de amplitud de la señal de un 50 por ciento. Esto es compensado por un factor de corrección para visualizar una respuesta plana. Con cinco sensores, la variación directa se reduce a un 20 por ciento.
- La energía recibida por el sensor también es directamente proporcional al diámetro del alambre. Esto significa que es necesario adaptar la energía de la fuente de luz incidente « i_e », como también la tecnología de los sensores, según la gama de diámetros a controlar. El diámetro más pequeño que se pudo controlar fue el de un alambre de tungsteno (color negro) de $10 \mu\text{m}$.
- El factor A tiene un impacto significativo tanto durante la difusión de la energía (rugosidad), como durante la absorción del rayo de luz a 850nm .

Otro efecto importante es el cambio de forma a lo largo del eje del alambre (abultamientos, estrechamientos, defectos) que desvía los rayos reflejados fuera de la apertura angular del sensor.

Diseño

Para hacer girar la fuente del punto luminoso, se realizó un anillo con varias fuentes de luz alrededor del eje del alambre, con una sola fuente de luz en función a la vez. Encendiendo las fuentes de luz una a una se genera un

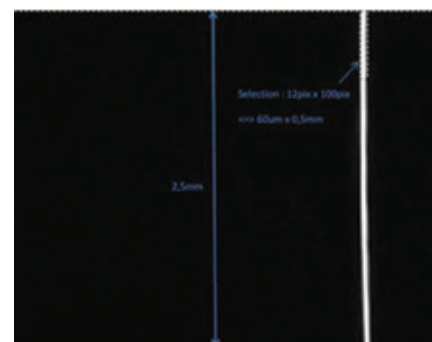
punto luminoso que gira alrededor del alambre. Tres sensores a 120° controlan simultáneamente la energía destellada sobre la superficie del alambre.



▲ **Figura 5:** Vista frontal del sistema

El sistema de la fuente de luz concentra cada rayo emitido en una línea estrecha perpendicular al eje del alambre. El rayo es casi paralelo al otro plano.

El espesor de la línea determina la resolución sobre el eje del alambre. Por lo tanto, las dimensiones de las fuentes deben ser pequeñas y el sistema óptico suficientemente bueno para la aplicación.



▲ **Figura 6**

La **Figura 6**, tomada con una matriz CCD en la posición del alambre, muestra el tamaño de la línea de luz (blanca) perpendicular al eje del alambre. La forma Gaussiana de la densidad de energía de la línea de luz determina la anchura eficaz a aproximadamente $20 \mu\text{m}$.

Entonces, el tamaño del punto luminoso a lo largo del eje del alambre (Resolución Línea: LR) es casi constante, pero en la circunferencia (Resolución Circunferencia: CR), varía proporcionalmente al diámetro del alambre ($r \cdot \alpha$).

La resolución de la línea sobre el alambre depende sólo del sistema de fuentes de luz y no del sensor.

Para tener éxito con este desarrollo, las fuentes de luz eran el punto clave. Deben ser pequeñas y rápidas, pero deben generar rayos de luz muy homogéneos con características uniformes. Estas características fueron desarrolladas específicamente y con éxito para esta aplicación.

Las tecnologías de los sensores eran otro punto clave. Para la gama más pequeña, era necesario usar un sensor muy sensible, pero al mismo tiempo muy rápido.

El movimiento del alambre con la rotación de la fuente de luz genera un barrido elíptico de la superficie y una imagen continua en el sensor.

Procesado de imágenes

El sensor debe ser capaz de caracterizar las dimensiones y la forma del defecto según los requisitos del usuario.

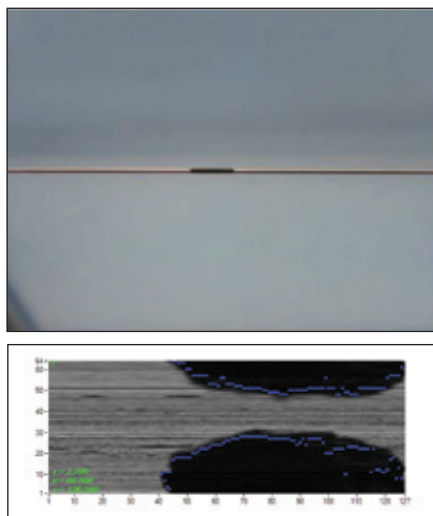
El SQM calcula en tiempo real el perímetro (P) y la superficie (S) del defecto. La relación $R = k \cdot S / P^2$ da indicaciones sobre la forma del defecto. $k = 4\pi$.

En este caso, $R = 1$ para un defecto circular. Tiende a cero cuando el defecto se alarga. Por lo tanto, R y S son dos parámetros de detección clave.

Para tener una resolución homogénea, la velocidad de línea se mide mediante SQM (recuento de impulsos) y el diámetro es un parámetro del usuario. Por lo tanto, la frecuencia de barrido se ajusta automáticamente.

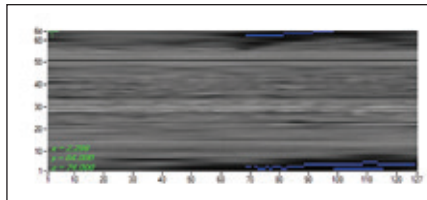
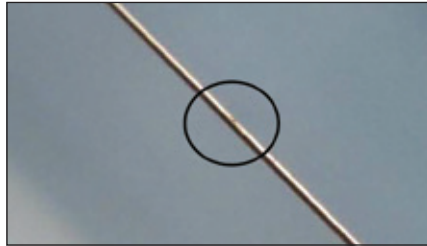
Resultados de las pruebas

Cuando se redactaba este artículo, los autores estaban justo al inicio de la aplicación y estaban realizando pruebas industriales.



▲ **Figura 7:** Primer caso, una marca de lado amplio indicada con tinta. Lectura a 25kHz

Luego, en condiciones de laboratorio, un alambre de acero inoxidable de 0,38mm de diámetro (15mils) fue movido y se produjeron marcas o arañazos.



▲ **Figura 8:** Segundo caso, un arañazo en la superficie. Lectura a 140kHz

En ambos casos la línea azul determina los márgenes del defecto. Desafortunadamente la imagen aparece cortada arriba a la derecha del alambre, que es donde se encuentran las marcas.

De todos modos, muestra el análisis de medición válido en toda la circunferencia del alambre. Se puede ver también la calidad superficial del alambre.

La calibración de la imagen se debe realizar en una superficie lisa de los alambres.

También es un proceso que debe ser desarrollado para determinar los alambres de referencia.

Las medidas no son sensibles a la vibración del alambre. Sin embargo, esta independencia debe ser optimizada por lo que se refiere a la posición del alambre.

Conclusiones

Este excepcional instrumento está en su fase de optimización final.

Se han resuelto eficazmente todos los problemas tecnológicos. Después de completar las pruebas, se espera iniciar su comercialización en este año (2015). ■

Documento presentado por cortesía del 63º Simposio IWCS, Providence, Rhode Island, EE.UU., del 10 al 12 de noviembre de 2014.

Cersa-MCI,
13480 Cabries,
Francia
Tel: +33 442 020 044
Fax: +33 442 027 979
Email: sales@cersa-mci.com
Website: www.cersa-mci.com

editorial index

Acuity Products.....	30	NDC Technologies.....	45
Ajex & Turner.....	41	Maschinenfabrik Niehoff GmbH.....	31, 39, 52, 57, 62, 67, 72
Ambrell BV.....	16	Pourtier Setic.....	23
BWE Ltd.....	43, 52, 57, 62, 67, 72	Prysmian Group.....	13
C&M Corporation.....	21	PWM Ltd.....	19, 51, 56, 61, 66, 71
Cabopol Polymer Compounds SA.....	21	Queins Machines GmbH.....	14
Decalub.....	46	REA Steam Cleaning.....	38
Eurobend.....	10	Reelex Packaging Solutions Inc.....	25
European Copper Institute.....	13	Rosendahl.....	33
Flyro.....	20	Schleuniger.....	36
Gauder sa.....	11	Schleuniger North America Inc.....	44
Hradil Spezialkabel.....	32	Sikora AG.....	35, 47
igus.....	46	Sonobond Ultrasonics.....	44
LaserLinc.....	15	Tecnofil SpA.....	20
Mario Frigerio SpA.....	37	Teknor Apex.....	34
Marldon Airwipes.....	22, 38	TKT Group.....	22
Mathiasen Machinery Inc.....	16	Videojet Technologies.....	40
Messe Düsseldorf Asia.....	14	Windak Group.....	18, 51, 56, 61, 66, 71
Miltec UV.....	23	Wire & Plastic Machinery.....	19
motan-colortronic GmbH.....	39	Wire Association International.....	18, 51, 56, 61, 66, 71

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. EUROWIRE RESERVES THE RIGHT TO EDIT, REWORD AND SUBEDIT ALL EDITORIAL SUBMISSIONS IN ACCORDANCE WITH EDITORIAL POLICY. EUROWIRE 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.

EUROWIRE IS PUBLISHED SIX TIMES PER YEAR AND INCORPORATES THE TITLE AND PUBLISHING RIGHTS ONLY OF THE FORMER SERIES OF PUBLICATIONS KNOWN AS 'TRANSFIL EUROPE'. EUROWIRE IS CIRCULATED TO ENGINEERS, MANAGERS AND PERSONNEL IN THE WIRE, CABLE, FIBRE OPTIC AND WIRE PRODUCT INDUSTRIES UPON RECEIPT OF A COMPLETED SUBSCRIPTION FORM. AN ANNUAL SUBSCRIPTION IS AVAILABLE FROM INTRAS LTD, UK, AT EUROS 140.00, £120.00, US\$195.00.

advertisers index

Ajex & Turner Wire Dies Co.....	38	Messe Düsseldorf GmbH – wire South America 2015.....	22
AK Export Import.....	39	Messe Düsseldorf GmbH – wire Southeast Asia 2015.....	16
Anbao (Qinghuangdao) Wire & Mesh Co Ltd.....	11	Metalube Ltd.....	33
Beta LaserMike (NDC Technologies).....	17	Metalwire BV.....	13
Bongard Trading GmbH & Co KG.....	44	Paramount Die Co.....	23
Bühler Redex.....	35	Pourtier, a member of the Gauder Group.....	Inside front cover
Burseryds Bruk AB.....	47	Rea Steam Cleaning Srl.....	34
Candor Sweden AB.....	43	Setic, a member of the Gauder Group.....	Inside front cover
Comsuc Technology Development Ltd.....	38	Shanghai Nanyang Electrical Equipment Co Ltd.....	14
Decalub.....	46	Sheng Chyeen Enterprise Co Ltd.....	Back cover
Eurobend.....	15	Sjogren Industries Inc.....	20-21
FA.IN.PLAST Srl.....	Front cover	Supermac Industries India Ltd.....	13
Fortuna Federn GmbH.....	3	Taiwan Linkigi Metal Co Ltd.....	36
Foxtan Dies Ltd.....	43	Tecnofil SpA.....	5
Gauder, a member of the Gauder Group.....	Inside front cover	Tien Chen Diamond Industry Co Ltd.....	46
Inosym Ltd.....	19, 31	TJK Machinery (Tianjin) Co Ltd.....	9
IWCS.....	Inside back cover	Joachim Uhing GmbH & Co KG.....	37
Jiangsu Qunye Electrical Co Ltd.....	45	Wire & Plastic Machinery Corp.....	2
Kkalpana Industries (India) Ltd.....	41	WITechs GmbH.....	45
Magnetic Analysis Corporation.....	11	Yangzhou Jinsen Optoelectronics Co Ltd.....	25
Melos GmbH.....	32	Zumbach Electronic AG.....	1
Messe Düsseldorf GmbH.....	40		

* Front cover courtesy of Fainplast Srl, showing their HFX 521 halogen free, flame retardant crosslinkable compound. For more details please call +39 (0)736 403605, or fax +39 (0)736 403807 Website: www.fainplast.com

EuroWire is published 6 times per year and is distributed to persons in the wire, cable, fibre optic and wire product manufacturing and supply industries, as well as manufacturers and suppliers of machinery, equipment and services. Registered readers in Europe, NAFTA, Latin America, Africa and certain Middle East countries will receive all editions via surface or air-assisted mail services as requested from the publishers. Additional information on air mail services and subscriptions can be obtained from the publisher, Intras Ltd, UK.

JOIN the INDUSTRY LEADERS
OCTOBER 5 – 8, 2015
Hyatt Regency Hotel • Atlanta, GA, USA

**World's leading conference
for peer reviewed
technical papers and presentations
on technologies and trends
in wire, cable, connectivity and assemblies**

IWCS



**THE
International
Cable • Connectivity
Symposium**

**for the communications, data,
electronics, power, industrial,
automotive and
aerospace industries**

One month earlier than usual.

Phone: (+1) 717.993.9500

Visit: www.iwcs.org

Questions: phudak@iwcs.org

 **SHENG CHYEAN**
省權實業股份有限公司

Cold Draw Bar Equipment
(Ferrous and Non Ferrous)



Chain Draw bench



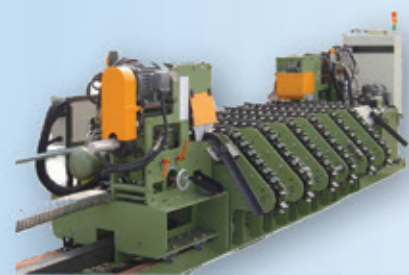
Combined Drawing Machine



Rk Two Roller Straightening Machine



Peeling Machine



Chamfering Machine



Website: www.tw-sc.com.tw Youtube: <http://goo.gl/mucgy9>

Email: tw.sc@msa.hinet.net

Tel:+886-4-7588533 Fax:+886-4-7588500

Address: No.217-1, Yu-Pu RD., Yu-Pu Village, Hsienhsi, Changhua, Taiwan