WCN

IWMA INTERNATIONAL WIRE & MACHINERY ASSOCIATION

WIRE & CABLE NEWS Spring 2015 - issue No 52 www.iwma.org

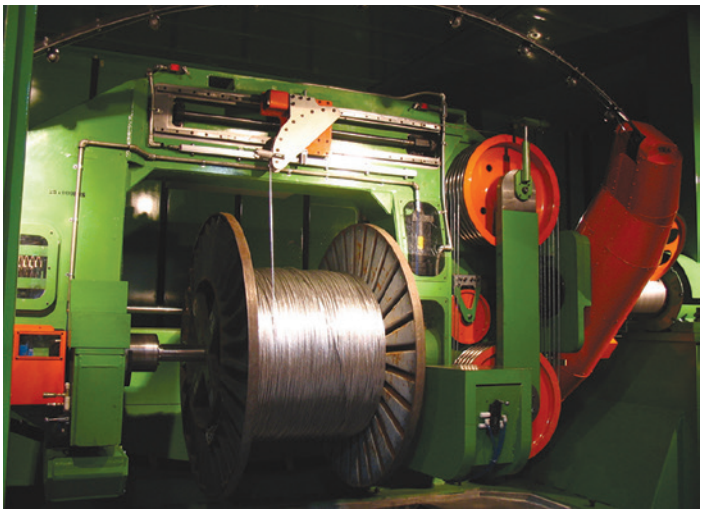
OFFICIAL NEWSLETTER OF THE INTERNATIONAL WIRE & MACHINERY ASSOCIATION

75th anniversary for Ceeco Bartell

This year gives good reason for Ceeco Bartell to be celebrating – its 75th anniversary!

The company, the Ceeco side of which gives a total history of more than 120 years, produces advanced fibre optic cable and LAN cable and high-speed manufacture of energy cables.

The Bartell range of Ceeco-Bartell branded wire and cable products have been at the forefront of technologies that cut costs, expand data signal rates and allow higher transmission frequencies to speed communications and power to all corners of the globe.



▲ *DoubleTwist 2 roll form stranding machine*

Advances in power cable manufacturing, via Ceeco-Bartell's roll form stranding machines, increase cable production rates up to five times over the traditional methods, while reducing costs in both drawing operations and insulating materials. The design expertise, in-depth process understanding and product development allow Bartell's customers to optimise their products, reduce manufacturing costs and improve competitiveness.

Ceeco-Bartell prides itself on setting new standards for quality, performance and value in every machine it builds and its drive for constant improvement has been rewarded with the distinction of being re-certified as a mature member of the ISO 9001:2008 quality community.

With generations of industry knowledge and engineering design experience, coupled with a sales and technical service network, Bartell's employees are dedicated to providing customers with technologies capable of meeting the most advanced production needs.

The company's wire and cable products are divided into three categories: fibre optic and data/telecom, electrical power and ferrous cables.

Ceeco Bartell – USA
Email: info@bartellmachinery.com
Website: www.bartellmachinery.com

The best 'green' business

Isleworth, UK-based Ormiston Wire has been awarded the Hounslow Business Award for Best Green Business.

The award recognises the company's ongoing commitment to environmental policy and sustainability procedures. The wire manufacturer has previously been commended with the Queen's Award for its achievements in sustainable development.

The company initially introduced cost-reducing energy efficiency measures at the beginning of the 1990s. Over two decades later, the wire manufacturer has developed its environmental sustainability measures still further, which includes the implementation of new energy saving technology and instilling an ethical ethos in the workforce. The measures it has introduced include installing light bulbs with motion sensors, recycling at every opportunity and utilising a high-efficiency condensing gas boiler. These changes have led to annual energy savings of tens of thousands of pounds.

▲ *Mark Ormiston receives the award*

"I'm delighted Ormiston Wire has won this award, which recognises our continuous commitment to environmental sustainability in the manufacturing process," said Mark Ormiston, managing director.

"Ormiston Wire regards excellent environmental sustainability alongside delivering outstanding customer service as a core business priority. We understand the benefits of adopting sustainable business practices and how it can positively affect both the planet and profits."

The annual Hounslow Business Awards are developed and organised by Hounslow Chamber of Commerce and celebrate the achievements of both small and large local businesses. The Best Green Business Award required nominees to best demonstrate how its green and sustainability ethos and practices positively contributed towards carbon reduction, recycling policy and the promotion and adoption of green innovation and technologies.

Ormiston Wire Ltd – UK
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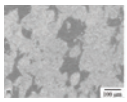
Website: www.ormiston-wire.co.uk

CONTENTS

Technical Article 24



Effects of niobium additions to a vanadium microalloyed high carbon wire steel
By Emmanuel De Moor and Stephanie L Miller, Advanced Steel Processing and Products Research Center, Colorado School of Mines, USA

Wire & Cable News

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Spring 2015
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WCN

New offices for IWMA

The International Wire & Machinery Association (IWMA) – the world's largest corporate trade association for the wire and cable industry – has moved into new offices.

The association has taken up residence at an office complex ideally situated near Birmingham International Airport, in the UK.

The move comes as part of the association's long-term expansion plans to develop its membership and grow internationally, and was passed at an executive board meeting in September 2014.

The IWMA was previously based in the same building as Intras Ltd, publishers of EuroWire, Wire & Cable ASIA and wiredInUSA, in Leamington Spa, Warwickshire, UK, and made the move on 1st December last year.

Steven Rika, outgoing chairman of the association, said: "This is both an exciting and challenging time for the IWMA, but one which we are very much looking forward to. It is an ideal opportunity for us to grow and we are relishing the challenge.

"I would like to take this opportunity of thanking Intras for the help and assistance we have had over four decades in building the IWMA into what it is today.

"We have, and continue to maintain, an excellent relationship with everyone at Intras and I expect to see us working closely together for the foreseeable future."

Caroline Sullens, managing director of Intras, added: "Over the last two years the IWMA has developed exponentially under the direction of the current executive committee and new management team.

"Following on from a corporate re-branding and new website in 2013 I am delighted to see the IWMA take up residence in its own premises which has come about at precisely the right time with the association in such good hands."

The new offices allow the IWMA to offer its member companies a meeting room should they need it, or even to book the room as a meeting point for members receiving guests. Additional administrative duties are also available.

Contact the IWMA on info@iwma.org or call +44 121 781 7367.

Amanda takes over the helm

Amanda Shehab has taken over as the new chairman of the IWMA, from retiring chairman Mr Steven Rika.

▲ *Amanda Shehab, new chairman of the IWMA*

Mrs Shehab, who started working life as an engineering apprentice in her father's electrical engineering company in Sheffield, UK, where she learned how to rewind motors and repair all kinds of industrial machinery.

Following her graduation from the University of Bradford in 1991 with an honours degree in electrical and electronic engineering, she undertook work placements with British Aerospace and Ford Motor Company.

She has accumulated more than 24 years' experience in the cable manufacturing industry, following her employment with BICC Cables as a manufacturing systems engineer, and later with General Cable and Pirelli.

Mrs Shehab has been a director of Cimteq Ltd since 2007. The Wrexham, Wales-based company provides software products and services to the cable manufacturing industry that increase manufacturing efficiency, improve quality, decrease lead times and reduce costs.

A tutor in software engineering for the Open University, she is also a chartered engineer (CEng) and a member of the IET.

New warehouse

A Karpat Ltd, a Canada-based importer and wholesaler of wire and wire products, has opened its fifth Canadian warehouse in Edmonton, Alberta.

The company is headquartered in Montreal, Quebec, and ships material from Montreal, Quebec; Lachine, Quebec; Halifax, Nova Scotia; Mississauga, Ontario; and now Edmonton, Alberta.

The company specialises in rebar tie wire, bulk nails, and engineered wire for various wire applications for industries such as fencing, mesh, forming, fasteners, etc.

A Karpat sells various wire materials such as galvanised and bright – low and high carbon including black annealed wire, epoxy coated, and stainless steel wire to users, consumers and fabricators throughout Canada and the USA through its network of warehouses, and on a direct ship basis. The company serves many industries including retail, manufacturing, construction and industrial. The company also sells merchant products such as T posts and other hardware items.

A Karpat has built an extensive network of sources, and procures material from Europe, Latin America, Mexico, Asia and North America.

The company is well recognised for providing its customers with quality products that meet and/or exceed various specifications, at competitive market pricing. All of the company's products are delivered according to the customer's required schedule.

A Karpat Ltd – Canada
Email: info@akarpat.com
Website: www.akarpat.com

LinkedIn to us!

Remember to follow the IWMA LinkedIn page to ensure you are kept up to date with all activities, whether it is announcements about exhibitions, conferences and events or the education trust, as well as members' news.

DIARY OF WORLD CLASS WIRE & CABLE EVENTS FOR BUSINESS, TECHNOLOGY, EDUCATION & NETWORKING

2015

APRIL			
28-30	**Interwire 2015** *Atlanta, Georgia, USA* Exhibition	→	**WAI** **Email:** info@wirenet.org **Website:** www.wirenet.org
MAY			
12-15	**wire Russia 2015** *Moscow, Russia* Exhibition	→	**Messe Düsseldorf GmbH** **Email:** ryfischd@messe-duesseldorf.de **Website:** www.wire-russia.com
JUNE			
3	**IWMA Golf Day** *Fairhaven Golf Club* *Lytham St Annes, UK* Event	→	**IWMA** **Email:** info@iwma.org **Website:** www.iwma.com
SEPTEMBER			
15-17	**wire Southeast Asia 2015** *Bangkok, Thailand* Exhibition	→	**Messe Düsseldorf GmbH** **Email:** beattrice@mda.com.sg **Website:** www.wire-southeastasia.com
OCTOBER			
6-8	**wire South America 2015** *São Paulo, Brazil* Exhibition	→	**Messe Düsseldorf GmbH** **Email:** niemannh@messe-duesseldorf.de **Website:** www.wire-south-america.com
NOVEMBER			
3	**CabWire 2015 World Conference** *Düsseldorf, Germany* Conference	→	**IWMA** **Tel:** +44 121 781 7367 **Email:** info@iwma.org **Website:** www.cabwire.com
20	**IWMA Dinner Dance** *Royal Garden Hotel,* *London, UK* Event	→	**IWMA** **Tel:** +44 121 781 7367 **Email:** info@iwma.org **Website:** www.cabwire.com

Customer service priority

It is not just the technology that is aimed at complete customer satisfaction for Zumbach's clients, but also its customer service.

In addition to classical service, Zumbach offers customer training, calibration and maintenance services if required. With its worldwide service support, customers can choose from a variety of possibilities – no matter in which part of the world the devices are operating.

For customers requiring monitoring of measurement equipment to ISO 9001 and other standards, Zumbach offers a calibration service. This allows the accuracy verification of the measuring device and provides its corresponding certification and documentation.

▶ *Diameter measuring head of the well known ODAC series during calibration*

Usually, the calibration of a device is required once per year. This can be realised by use of Zumbach's own supplied certified calibration standards, or if they do not wish to buy and maintain the calibration equipment themselves, it can offer an on-site or return-to-base service from any of the company's branches worldwide.

Zumbach Electronic AG – Switzerland
Email: info@zumbach.com
Website: www.zumbach.com

IWMA Chairman's Report 2014-15 by Steven Rika

▲ *Chairman, Steven Rika*

2014 has once again been a very eventful year for the IWMA.

The year began with our AGM in February which, as usual, preceded the 'Meet the Industry' luncheon held at The Mere Resort & Spa, Knutsford, UK.

From there we were straight into our flagship wire event in Düsseldorf, which again proved to be another very successful event.

Early June saw the annual golf day competition staged at our traditional venue, Fairhaven Golf Club in Lytham St Anne's, followed by an evening function at the nearby Glendower Hotel. This is a very enjoyable event for golfers of all abilities and we would like to encourage more members to take part. It is a great way to network with wire industry colleagues whilst enjoying a relaxed social atmosphere.

The executive board meeting in June proved to be a landmark meeting. It was decided that we now had a team of board members and staff with the appetite to drive the association forward. This decision resulted in a move from the Intras office in Leamington Spa, Warwickshire, which had been our home since the inception of the association in 1970.

I would like to take this opportunity of thanking Intras for the help and assistance we have had over four decades in building the IWMA into what it is today.

The new premises at Wellington House, Solihull, Birmingham, provides the required facilities and is ideally situated in the vicinity of Birmingham International Airport, has a rail link and is on the junction of the motorway networks.

A lot of hard work ensued culminating in a move date at the end of November 2014.

During this period of change, two further exhibitions took place, wire China in September and wire India in October, along with the annual dinner and dance in London.

We are now well settled in our new home enabling us to host the November board meeting in-house. These conference and meeting facilities are available for use by IWMA member companies. If this is of interest to you then please contact the IWMA office for further details.

As this is my final report as Chairman, I would like to thank all the board members, together with Andy Lewis and Debi Coleman in the office, for their support over the last three years.

I would also like to welcome our new Chairman, Amanda Shehab and wish her every success.

Autumn 2015 issue

Members: Please send us your editorials for free publication in the next WCN (or on the IWMA website at any time between editions of WCN).

One of the strictly members-only benefits of belonging to the IWMA is the facility to publish your company's editorials in WCN, both the hard copy and electronic versions, completely free of charge, and reach thousands of readers worldwide.

In addition to worldwide distribution WCN is freely distributed at all major industry trade fairs and IWMA technical events. The next important upcoming exhibitions are wire Southeast Asia in Bangkok, Thailand, and wire South America in São Paulo, Brazil.

Members should also bear in mind that the IWMA website can accept editorials at any time during the year.

Providing editorial for WCN and the website can help members in many ways:

- **Communicating important messages worldwide**
- **Attracting interest from the high number of national visitors to this year's exhibitions**
- **Creating a high profile at all events**
- **Advising customers of personnel changes**
- **Announcing major new developments**
- **Celebrating winning of new contracts/orders**
- **Staying one step ahead of the competition**

Please send us your editorials (not advertisements) with supporting photos to info@iwma.org for the Autumn 2015 edition. Photographs should be a minimum of 300 dpi and in .jpg format.

If marketing and public relations is not your area of responsibility please make sure that the relevant department/person is aware of this information.

Please submit editorials by 5th June 2015.

Light in weight, tough in working

▲ *The range of dies from Ajex and Turner*

Ajex & Turner has a revolutionary way of wire drawing/compacting, stranding copper, aluminium, aluminium alloy, high/low carbon-CO_2-stainless steel and brass, named vitrified nanocrystalline technology.

These VNT dies and extrusion tools are for multi-wire, bunching, compacting copper and aluminium, multi-wire strands for electric cables and high/low carbon and stainless steel wire for any size. The dies are made with multi-layer coatings of nanocrystalline diamond composites on PCD/hard metal. The VNT die can be used in compacting copper, aluminium, aluminium alloy, high/low carbon and stainless steel wire.

The VNT dies can give production of 20,000 to 30,000km of aluminium and copper. The thickness of the vitrified nanocrystalline diamond layer is remarkably thin at about 25 to 35 microns. Depending on the process and care of the dies, customers can save up to 2.4 per cent of the total aluminium required to manufacture fully compliant cables.

The structure of the vitrified nanocrystalline's diamond surface is unique, with individual diamond particles aligned unidirectionally.

The layer of diamond is 100 per cent diamond. Dies coated with VNT do not develop wear rings throughout their working life, hence cost-saving on re-polishing which means tolerance will remain same. The cost of VNT coating does not increase price but increases the life and quality of the wire. VNT dies can be re-cut like PCD dies from 1.15mm to 29mm in microns with special equipment. The company is in the process of re-cutting above 29mm.

Ajex & Turner Wire Dies Co – India
Email: sales@ajexturner.com
Website: www.ajexturner.com

Advanced AEI

AEI Machines manufactures various types of rotating cable machines for the stranding, screening, armouring and laying-up of power cables and overhead conductors.

The company offers suitable products ranging from the largest stranders in the world (128 bobbins rigid stranding machine for 500kV cables) to the highest productivity stranders (up to 46km of 600mm^2 conductor per day).

These machines are suitable for the production of up to 127 wires stranded conductor (70mm^2-2,000mm^2 in single pass and up to 3,000mm^2 in Milliken construction) for low, medium and extra high voltage (EHV) power cables.

The company's recent development is a new generation rigid strander ASRB/E designed for complete flexibility, which has the following features:

Strand tension is maintained constant from full to empty bobbin through diameter detection and break-force compensation of pneumatic bobbin braking mechanism; electronic wire break detection system (EWBDS) on each bobbin with broken wire display on operator touch panel; motorised opening/closing of pintles requiring minimal maintenance; fully automatic fast bobbin row loading system dedicated for each cage; independent drive to each machine element with electronic shaft synchronisation; speed of cages increase automatically to optimum level as the bobbins empty; intelligent control

▲ *One the of the rigid stranders from AEI Machines*

logic automatically optimises the line based on lay required to offer maximum speeds; recipe storage and configuration; production reports and data feed to client SCADA/MIS over Ethernet; and remote assist, a tele-service problem resolution over the Internet.

Associated Engineers and Industrials Ltd – India
Email: info@aeimachines.com
Website: www.aeimachines.com

CSM's range of products

Founded in 2002 in Istanbul, Turkey, CSM Metalurji Malat Sanayi Ve Muhendislik is an engineering and manufacturing company building complete wire galvanising plants, and offers consultancy services for process and operation of the plants.

The main products include:
Heat treatment equipment: Open fired furnaces, fluid bed furnaces, oil tempering lines, muffle tube furnaces, lead furnaces, batch process and dryer ovens.

Zinc and Zn-Al alloy coating furnaces: Steel kettle galvaniser, immersion

▲ *The CSM Metalurji plant in Istanbul, Turkey*

burner ceramic zinc furnaces, top heated zinc furnaces, flat wire galvanising processes, steel kettles, zinc pump, dross grab, ceramic sinker and mechanisms.

Take-ups and pay-offs: Zinc wiping systems, nitrogen wiping systems (automatic and manual control), and pad wiping.

Surface treatment systems: In-line phosphatisation, pickling lines, quench and waxing systems, fluxing systems, air knife wipes, acid and flux filtering systems, acid pumps, and phosphatisation lines.

CSM Metalurji Malat Sanayi Ve Muhendislik Ltd – Turkey
Email: info@csmmetal.com.tr
Website: www.csmmetal.com.tr

Technical Sub-Committee Chairman's Report 2014-15 by Peter Large

In 2014, we all attended the wire 2014 exhibition in Düsseldorf, Germany, and through the association's IWMA Educational Trust Fund, again awarded the 'John C Hogg Travel Award', this year to 15 individuals from as far afield as China and India, which enabled them to attend the exhibition.

This time, Geoff Church, a member of the Technical Sub-Committee, kindly arranged a tour of the show for the travel awardees in order to demonstrate the technologies involved in making a finished product from the feedstock. We would like to express our thanks to Mario Frigerio SpA, Maschinenfabrik Niehoff GmbH & Co KG, SAMP SpA, Tata UK, Condat, Queins Machines GmbH and QED Wire Lines Inc, who were all kind enough to spare their time at this busy show to explain their equipment and technology. I know that this was very well received and gave the awardees a real overview of the industry. We will try to repeat this at the next wire show in 2016.

This year the TSC is focused on the up-coming CabWire World Conference 2015, which will again be a joint venture between the IWMA, IWCEA, ACIMAF and the WAI – a major collaboration by these associations which represent the activities of the wire and cable industry worldwide.

▲ *Technical Sub-Committee chairman, Peter Large*

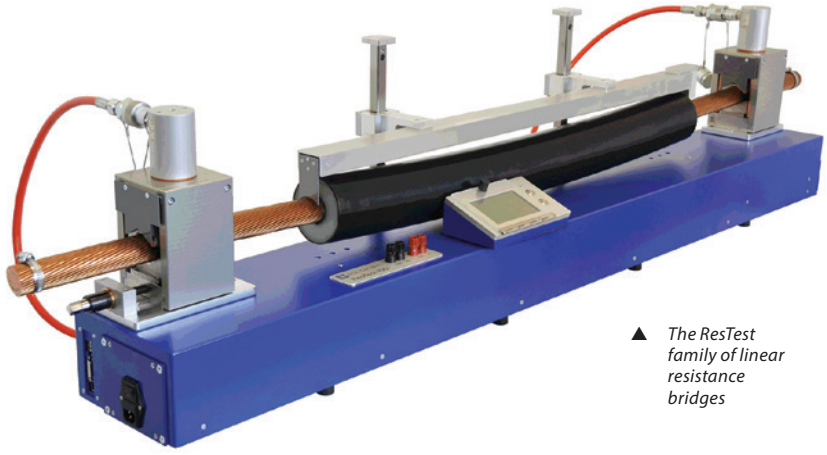
The conference returns to Düsseldorf and will be hosted at the Congress Centre which is an ideal venue for this type of event. The conference will be a one-day event with simultaneous sessions for ferrous and non-ferrous topics, and after the hard work is done we will meet in the Altstadt for a relaxed evening.

On the following day there are plant tours for those interested in both the ferrous and non-ferrous sides of our industry. In the meantime anyone interested in either attending the conference or presenting a paper should contact Andy Lewis at the IWMA office.

The TSC, together with the IWMA Educational Trust, are also exploring closer links with universities involved in our industry and we would welcome any input on this from our members.

I would like to personally thank Geoff Church and the rest of the TSC for their effort and continued commitment during the last 12 months. The TSC would also like to thank Andy Lewis, executive manager, and Debi Coleman, marketing and events co-ordinator, whose skills and hard work make these events possible.

Endless innovation at AESA



▲ *The ResTest family of linear resistance bridges*

Cobalt is AESA's high precision 'balunless' automatic test equipment for LAN cables. Its unique single-ended way of measuring makes the full dynamic range available and works over the full frequency range (>4 GHz), avoiding additional losses due to baluns.

This technology allows also measurement of shorter cables and reduces scrap. AESA has now added a recently developed adapter that allows use of the equipment to measure patchcords. It can be mounted or removed in few seconds from the Cobalt cable interface. Single-ended and mixed mode parameters are accessible.

The measurement can be done automatically from both sides according customer specification or standard values. Utilising de-embedding allows removal of the adapters mathematically and provides the opportunity to use other connectors if required.

Cable manufacturers produce not only wires, but also stranded, flexible, sector-shaped and insulated conductors, among others. Measuring them requires additional skills and constraints, otherwise results are not repetitive, or even incorrect. Using integrated equipment allows mastering the uncertainties related to the connecting device, and ensuring the overall measurement, on the line or in the laboratory. The ResTest family (linear resistance bridges) now consists of four integrated parts developed in this perspective.

AESA has reinforced its development team with the appointment of Peter Fischer. He brings significant experience as development and test engineer at Reichle & De-Massari, and a degree from Zurich's university. He is also a member of the standardisation committee, and works in innovation for high frequency measurements.

Take advantage of the spring events at wire Russia and Interwire in Atlanta, USA, to discover AESA's latest offerings.

AESA Cortaillod – Switzerland
Email: aesa@aesa-cortaillod.com
Website: www.aesa-cortaillod.com

Helping production go smoothly

▲ *The Southwire plant in Mineral Wells, Texas, USA, where the cable manufacturer is making a start on its project for more productivity throughout all its locations, based on Advaris Cable MES*

As a part of its cross-group switchover to SAP's ERP system, US cable manufacturer Southwire has decided to install Advaris Cable MES. In August the manufacturing execution system by Advaris Informationssysteme went live in the first Southwire cable factory in Mineral Wells, Texas, USA, where Southwire produces industrial cables for a wide range of applications.

Advaris MES is a core component of 'Advaris Cable', the integrated operations management system for length-based manufacturers. The installation of Advaris Cable MES is a pilot project for the subsequent installation in all the North American market leader's cable plants.

Installation was preceded by an exhaustive evaluation of relevant MES systems. Guy Brassard, company CIO in Carollton, Georgia, outlined the objectives of the system changeover: "We needed more transparency on production processes across all our sites, and we wanted to be able to trace back every product through the whole production process.

"Two other aspects that mattered a lot to us were keeping a close watch on the stocks in our factories, and possibilities for quality monitoring and control."

One decisive factor in favour of the system developer from Bruchsal, Germany, was its specific orientation to the cable and wire industry over more than 15 years. As a result, Southwire's IT specialists found that Advaris features a state-of-the-art, sector-specific MES solution for cable manufacturers – including the planning and control of complex multistage stranding operations, tracing of individual lengths and the management of manufacturing variants.

Speaking of the initial installation, Advaris managing director Dr Manfred Moser said: "We are proud that another enterprise in the world's 'top ten' cable manufacturers has decided in favour of our system. Southwire is getting a state-of-the-art MES which integrates seamlessly into the new SAP system."

The range of functions covered by Advaris Cable MES at Southwire includes detailed production scheduling, with the target criteria of meeting deadlines and minimising setup times. The production assignments to be carried out are displayed on the touch-screen terminals in production. Recorded production data includes barcode scanning of every individual drum with actual length, machine setup times and material consumption.

Process data such as production speeds, lengths produced and quality data measurements is directly recorded via interfaces from the PLC machine controls. If divergences from planning are recognised, such as delays in completing an order, machine stoppages, consumption of materials in excess of planning, occurrence of defective goods, etc, an alarm is automatically activated and immediately transmitted to the relevant group of employees by SMS, email or pop-up screen.

Guy Brassard praised the flexibility of the software specialists from Bruchsal, who have adapted their system optimally to the existing structures at Southwire.

Advaris Informationssysteme GmbH – Germany
Email: info@advaris.com
Website: www.advaris.de

Cable-wrapping tapes

▲ *A range of the tapes from Sneham*

Sneham International manufactures and exports cable-wrapping tapes, which focus on offering cost-effectiveness and quality.

It has expertise in manufacturing a complete range of water blocking tapes, and its comprehensive range of product portfolio includes tapes for optic fibre cables, power cables and submarine cables.

Sneham also manufactures electrical insulation tapes for B class, F class, H class and C class applications and masking tapes for the powder coating industry. With its own research and development team it is also able to deliver bespoke services.

Sneham International – India
Email: info@snehamtapes.com
Website: www.snehamtapes.com

IWMA at record-breaking wire China

More than 13,500 industry professionals flooded the exhibition halls on the first day alone at the New International Exhibition Center, Shanghai, for the 10th anniversary wire China in September.

▲ *The IWMA stand at wire China 2014*

The International Wire & Machinery Association played its part in being an industry partner at the show, which hit a new record on the first day with a 30 per cent increase in visitors from the 2012 edition.

The exhibition, which ran from 24th to 27th September 2014, featured 1,400 international exhibitors and various national pavilions including Austria, France, Germany, Italy, North America and South Korea.

Mr Steven Rika, IWMA chairman, said: "The International Wire Machinery Association was honoured to be an international supporter of the wire China 2014 exhibition.

"The event, enjoying its 10th anniversary, was again expertly organised by Messe Düsseldorf, Messe Düsseldorf China and local partners MC-CCPIT (Metallurgical Council of China Council for the Promotion of International Trade) and SECRI (Shanghai Electric Cable Research Institute).

▲ *The stand personnel on the IWMA stand at wire China 2014*

"The IWMA stand again proved to be a hit with both our existing members that were visiting the show, as well as those exhibiting and those interested in membership."

IWMA spices up Wire & Cable India 2014

▲ *The IWMA stand at Wire & Cable India 2014*

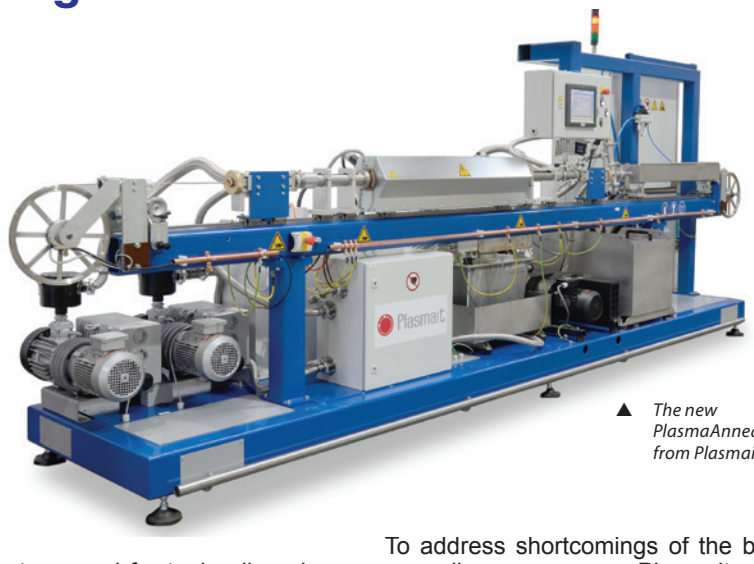
Over 380 exhibitors from 25 countries, including many members of the International Wire and Machinery Association, took part in Wire & Cable India and the concurrent fairs Tube India International and Metallurgy India in Mumbai at the end of October.

Industry partners IWMA, International Wire and Cable Exhibitors Association (IWCEA), Italian Wire Machinery Manufacturers Association (ACIMAF), Wire and Cable Industry Suppliers Association (WCISA), Steel Wire Manufacturers Association of India (SWMAI) and the ITA joined with representatives from organisers Messe Düsseldorf India and Messe Düsseldorf GmbH at the opening of the show.

Exhibitors took up 18,000m² of space during the three-day show.

▲ *Pictured at the opening are, from left, Dr Gerhard Bartz, VDKM; Dr Kurt Eder, VÖDKM/AWCMA; Peter Byroslawsky, ITA; Rahul Sachdev, WCISA; Erhard Wienkamp, Messe Düsseldorf; Steve Rika, chairman IWMA; Jörg Dübelt, Messe Düsseldorf; Krishnendu Sanyal, TATA Steel Ltd, wire division; Udo Schürtzmann, Messe Düsseldorf India; Prashant Ursekar, TATA Steel Ltd, wire division; Stephen Loynes, ITA; Sachin Warang, TATA Steel Ltd, wire division; Lunia SWMAI; and Tirthankar Banerjee, SWMAI.*

Plasma cleans and anneals conductors in-line with a taping machine



▲ *The new PlasmaAnnealer from Plasmait*

Conductors used for taping lines have traditionally been annealed in bell furnaces. Batch annealing can result in uneven recrystallisation and surface quality issues like sticking of flat products. Batch annealing is followed by wet and/or mechanical surface cleaning before the conductor is fed into the taping line.

To address shortcomings of the batch annealing process Plasmait has introduced a new PlasmaAnnealer that was designed to anneal and clean round or rectangular conductors in-line with a conventional taping line. So far three such annealers have been deployed in the USA. The new plasma annealing approach has been favoured in a taping line as it brings about improved accuracy of conductor mechanical properties and an above-all better surface finish, resulting in superior tape adhesion.

The new annealer comes in three alternative sizes depending on required output and can cover a wide cross-section range up to 0.18”2 (120mm²).

Rapid heating and reduced time of recrystallisation results in fine grain size and accurate yield strength values that can go all the way down to super-soft levels if necessary. The PlasmaAnnealer can cold start production in a few minutes and can be stopped immediately allowing for high utilisation of the taping line. The new annealer has been designed in a horizontal configuration, which allows easy handling. Vertically configured lines can also be offered to save space in production.

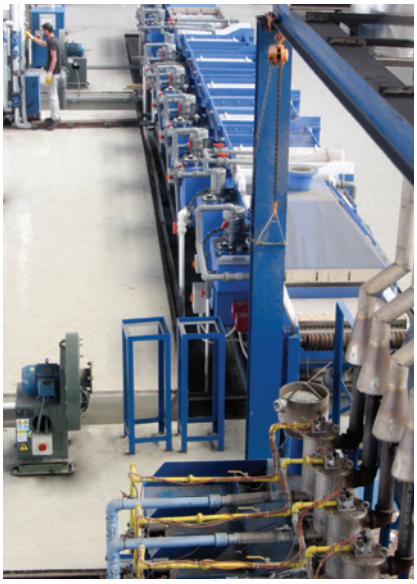
Plasmait GmbH – Austria
Email: info@plasmait.com
Website: www.plasmait.com

Innovation and design

QED specialises in equipment for heat-treating, cleaning and coating of steel wire. Custom designed and built, its high-speed lines are for galvanising, Galfan®, patenting, annealing, and oil tempering processes. Combining innovative design concepts with 30 years’ practical experience, QED has developed a range of products and equipment that is both technologically advanced and ruggedly dependable.

With a view to improved efficiency and to minimise environmental impact, QED developed the dual loop pressure control combustion system. This system maintains a steady output with precise air-gas ratio. This patented combustion control system is now used on all its multiple burner furnaces.

QED has recently upgraded its proven fluidbed technology with proportional, closed-loop feedback and mass flow controls. The Siemens PLC-based system provides much higher thermal efficiency and lower fuel costs than previous systems. Its fluidbeds operate from DV=120 to DV=240 and from 1.5t/h to 8t/h production with satisfied customers on six continents.



▲ *Mark 4 immersion burners on a high carbon line*

The latest development in galvanising furnaces is the advanced recuperative technology Mark 4 immersion burner. This burner offers dramatically higher combustion efficiency from a double pass pre-heat design with extended heat-transfer area. Constructed of stainless and high nickel alloy steels, the modularly constructed burner offers an extended operating lifespan and reduced maintenance.

In addition to the fuel savings, the new burner runs with a cooler skin temperature, providing a more pleasant working and maintenance environment.

The company also supplies the latest development in HighTurbulence® pickling and galvanising technology. The multiple stage cleaning systems have high turbulence acid that greatly accelerates the pickling process. Computer control, nitrogen wiping in galvanising and Galfan offer significant savings and accurate coating weights.

QED Wire Lines Inc – Canada
Email: sales@qedwire.com
Website: www.qedwire.com

wire Russia 2015

The Expocentre in Krasnaya Presnya, Moscow, Russia, will throw open its doors to wire Russia – the leading international wire and cable trade fair in the CIS region – from 12th to 15th May 2015

Organised by Messe Düsseldorf GmbH, OOO Messe Düsseldorf Moscow and Joint-Stock Company, VNIIKP, the trade fair proves an excellent opportunity for exhibitors to present their latest products to a broad Russian audience, to deepen customer relations and to develop new contacts and business.

The IWMA will again be supporting the fair and will be present with a stand offering support and services to its exhibiting and visiting members alike, as well as promoting the association to the wire and cable industry.

In 2013, some 250 exhibitors from 27 countries exhibited at the fair, attracting more than 10,800 visitors from Russia and other countries.

Companies interested in exhibiting can obtain full details from the Messe Düsseldorf web site at www.wire-russia.com.

Visitors can register and access the trade fair free of charge and ordering your ticket is easy and comfortable from the 'Online registration shop'.

Finely dosed powder coating

The Rolf Schlicht powder coating machine model RSC was designed to powder hoses, profiles, strips, bands and cables evenly, finely dosed and absolutely dust free with any powders for product diameters up to 200mm and bands up to 500mm width.

▲ *The powder coating machine RSC*

By electrostatic charging of the powder, a strong adhesive power and a very even layer on the surface are reached, and no powder falls from the product outside the dusting chamber. Machines can be delivered with or without electrostatic.

In the machine there is a fluidised powder hopper out of which the powder is sucked by pneumatic venturi pumps and blown through the guns or nozzles onto the product.

There is a fully automatic and maintenance-free filter system consisting of compact filter elements of large dimensions, which are cleaned by a special process. No blowing-in of compressed air is necessary. Thanks to this filter system, a strong and constant vacuum is generated in the machine, so that no powder escapes into the atmosphere.

If there is not enough space in the line to fit the machine, Schlicht can deliver a freestanding dusting chamber that is connected to the machine by hoses. For an extremely fine powdering of slowly running products it also offers a fine dosing device to make sure that only a breath of powder is adhering on the strand.

Accessories include an automatic 90l powder-refilling hopper, a powder flow indicator giving an alarm in case no powder flows through the guns, an automatic adjustment of the electrostatic and the pneumatic in compliance with the extrusion speed, and an interface to connect the machine to the line.

Rolf Schlicht GmbH – Germany
Email: info@schlicht-gmbh.de
Website: www.schlicht-gmbh.de

Simple and effective GER

▲ *Annealers are offered for a wide variety of wire diameter sizes*

GER SA, Belgium, has its own manufacturing programme of new continuous resistance annealers for inline use with copper wire drawing machines. The idea is to offer simple and effective machines to complete existing drawing machines at very attractive prices.

This manufacturing programme basically comprises three wire diameter ranges: Annealers are being offered for fine wire diameters ranging from 0.15 up to 0.5mm, for intermediate wire from 0.4 up to 1.2mm and for bigger wire diameters from 1 up to 3.6mm.

Machines for bespoke wire diameter ranges are also possible. All the annealers are offered as stand-alone models with own drive motor or without motor, driven by transmission belt from the wire drawing machine. All major parts (pulleys, steam generator, carbon brushes, transformer, etc) are of German origin.

GER SA – Belgium
Email: ger@ger.be
Website: www.ger.be

Powered and manual cold welders at Interwire

British company PWM will present its best-selling EP500 rod welder, plus a range of powerful portable cold welders and manual machines at Interwire 2015 in Atlanta, USA. The products will be featured on booth 1355 by Joe Snee Associates, exclusive distributor of PWM cold welding equipment, spares and dies in the USA and Canada.

PWM's electro/pneumatic EP500 cold welder provides a cost-effective method of welding large non-ferrous rod sections. The machine is designed for wire sizes 5mm to 12.5mm (0.197" to 0.492") copper and 5mm to 15mm (0.590") aluminium, and is quiet, clean and energy efficient to operate.

The smaller air/hydraulic HP100 cold welder, for welding wire and strip 1mm

▲ *The EP500 rod welder that will be on display at Interwire*

to 5mm (0.039" to 0.197") is mounted on a trolley, so it can be wheeled quickly to the work area.

Manual cold welders on show include the manually operated M101 cold welder, for copper wire and strip 1mm to 3.6mm (.040" to 0.141") and aluminium 1mm to 5mm (0.197"). The M101 can be used on a workbench or supplied with a trolley.

Ideal for joining fine wire in confined spaces, PWM's M10, M25 and M30 hand-held machines are suitable for wire and strip 0.1mm to 1.8mm (0.0039" to 0.071"). The BM10 and BM30 models, for similar wire sizes, can be used on a workbench or trolley.

PWM machines and dies, standard or custom made to suit round or profile wire and rod, are designed and made in the company's own UK workshops.

Video demonstrations of PWM's cold welding machines can be viewed at the company's website.

Pressure Welding Machines Ltd – UK
Email: pwm@btinternet.com
Website: www.pwmltd.co.uk

The easy option for your trade show stand

According to an industry survey, 86 per cent of business directors agree that exhibitions are the second most effective means of generating sales leads after a company's own website (Association of Event Organisers). That is why exhibitions play a key role in the marketing strategies of so many successful companies.

International Trade Shows Link has been transforming marketing strategy into action for commercial companies and trade organisations of all sizes and in all industry sectors for more than 25 years.

The '360° service' offered by ITSL puts the exhibitor at the centre of operations from before the decision to exhibit is taken right through to the conclusion of the event – and beyond, taking in floorspace allocation, stand design, construction, graphics creation and production, stand services specification, project management and handover to the company stand staff. The attention continues during and after the event to ensure the customer has the best opportunity to achieve their objectives.

wire & Tube – the world's most influential trade shows for the wire, cable, tube and pipes sectors – staged by Messe Düsseldorf every two years, has over 80 UK exhibitors, of which many have, over the years, used the skills and experience of the ITSL team to organise their presence at the show. The next wire & Tube will be 4th to 8th April 2016 and exhibitors will start booking space in January 2015.

For the upcoming GIFA, METEC, Thermprocess and Newcast exhibitions (16th to 20th June 2015) catering to the precision castings, foundry and metalworking sectors, ITSL will be supporting and advising more than 60 UK companies on their stand space and construction.

Any company wishing to exhibit at the next wire & Tube, GIFA, METEC, Thermprocess and Newcast or Valve World Expo (December 2016) should contact Brigitte Shepherd on brigitte@itsluk.com for information and advice.

ITSL – UK
Email: www.info@itsluk.com
Website: www.itsluk.com

Two new appointments at Gauder Group

▲ *Igor Barinov (left) and Massimo Gori (right)*

Gauder Group has appointed Igor Barinov as its new Russian representative.

Mr Barinov is the exclusive representative for Pourtier, Setic and Daloo rotating machines, as well as C2S services and Bow Technology spare parts, in Russia and CIS countries.

Pourtier and Setic have also appointed Massimo Gori as area sales manager in cooperation with Roger L Brown, sales manager of Pourtier and Setic of America.

He is charged with focusing on business development in Italy.

Gauder Group – France
Email: info@gaudergroup.com
Website: www.gaudergroup.com

Pourtier and Setic of America – USA
Email: pourtier.setic.america@gaudergroup.com
Website: www.gaudergroup.com

Tee up time

Budding Ian Poulters can test their golfing skills at the IWMA's annual golf day at Fairhaven Golf Club, Lytham St Annes, Lancashire, UK, on Wednesday, 3rd June, 2015.

The annual golf day, open to members and guests, will see around 50 players take to the Fairhaven course, followed by an evening dinner and overnight stay in the nearby Glendower Hotel.

Further details are available at info@iwma.org

Heading Stateside

Member companies will be able to benefit from the IWMA's help and assistance if they are attending Interwire this year in Atlantia, Georgia, USA.

The association will be offering its regular services for all member companies when it takes up residence on booth 602 at the Georgia World Congress Center from 27th to 30th April.

Any company needing assistance before heading to the exposition should contact info@iwma.org

Thin the way forward for Wolco

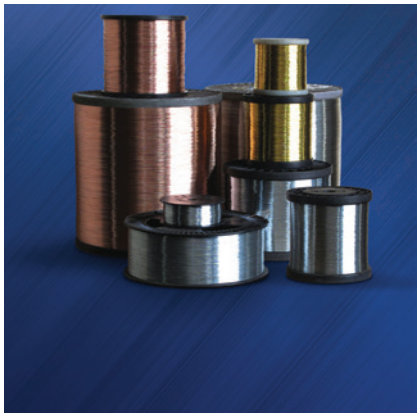
Wolco Sp is a Polish producer of thin wires made of steel, as well as copper and copper alloys within the range of 0.1 to 1mm diameter.

In order to ensure the highest quality of its products and services, Wolco is the holder of ISO 9001 and ISO 14001 quality assurance certificates.

According to the needs of customers, wires are electroplated or chemically coated with other metals: nickel, copper, tin, zinc or silver.

Products include:

- Low-carbon steel wires (annealed), copper plated in diameters below 0.8mm, intended mainly for combining nails into tapes (collated nails)
- Low-carbon steel wires, diameter 0.45 to 0.8mm, annealed, nickel plated with a layer of different thickness within 2 to 5 µm, mainly for the lighting industry
- Bare steel wires or plated with nickel, copper, tin, zinc, diameter 0.15 to 0.7mm, mainly for staples, meshes, brushes or bookbinding
- Brass wires for metal electrical discharge machining (EDM) with the trade name Wolcut 460, 500, 900, diameter 0.15 to 0.3mm, standard or coated with zinc



▲ *Examples of wire available from Wolco*

- Copper and brass wires, diameter 0.15 to 1mm (intended for, eg pins, plaited meshes, brushes)
- Zinc coated low carbon steel wire diameter 0.3 to 0.8mm used to produce wicker or reed mats

The company also offers services connected with straightening steel, copper and brass wires, and connected with galvanic or chemical covering.

Wolco Sp zoo – Poland
Email: info@wolco.pl
Website: www.wolco.pl

Niehoff's D 1251 double twist buncher works at 1200 tpm

▲ *Close cooperation between Niehoff and renowned cable manufacturers*

In a permanent and close cooperation with renowned cable manufacturers, Maschinenfabrik Niehoff has been designing and building bunching machines and stranders since 1966. The result of this development was the D series of double twist bunching machines whose biggest model, the D 1251 type version, works with a pulling force of 12,000 N.

Its production speed is also impressive: In one industrial application, for instance, when used for the manufacture of conductors with a 7 x 3.05mm design and a compaction of 10 per cent, the machine works at a speed of 1,200 twists/min (tpm). This is approximately three times as fast as the industry standard production speed.

The D 1251 is foreseen for the manufacture of copper wire strands with a cross-section of up to 95mm² and aluminium wire strands with a cross-section of up to 120mm² with a steplessly variable lay length of 40 to 500mm.

The strands can be compressed or formed into sector-shaped conductors. The D 1251 is designed for spools with a flange diameter of 1,250mm and a maximum weight of four tons. Another advantage of the machine is that no special foundation is required for its installation.

Like all machines of the D series, the D 1251 features a single-bow design and contactless machine data transmission. The result: Lower energy consumption, lower noise emissions, lower maintenance costs than with double-bow machines.

All the new D type machines are operated using a network-compatible human machine interface (HMI) colour touchscreen monitor called NMI (Niehoff machine interface) which clearly displays any information, instructions and system status messages in the language of the operator.

The winding tension is infinitely adjustable and is precisely regulated by an integrated load cell throughout the entire winding operation. The result: Compliance with closest production tolerances and reduction of material use.

Maschinenfabrik Niehoff GmbH – Germany
Email: info@niehoff.de
Website: www.niehoff-gmbh.info

Wire's sleeve protection

◀ *Protecting the wire while in the furnace*

To produce high quality wire, you need to prevent fouling or damaging of the wire during the annealing process. This is a problem for annealing companies today. The solution is to avoid metal-to-metal contact.

A new way of thinking is all you need to produce the quality needed in today's demanding world. ALF sleeve is the solution.

When ALF sleeve is installed in the pipe through which the metal wire runs, it will prevent the wire touching the metal of the pipe and becoming distorted.

One important aspect when using ALF is the straight alignment of the pipes running through the furnace. This can be obtained by using, for instance, counterweights attached to the end of the pipes.

The weights will capture the expansion of the pipe during the annealing process in the furnace.

Hiltex Technische Weefsels BV – Netherlands
Email: sales@hiltex.com
Website: www.hiltex.com

Expansion on the horizon

Doubling turnover in the last five years has led to significant job creation at Wintwire's Sheffield, UK, manufacturing site. The company has developed a three-year plan that will see turnover grow by a further 30 per cent. This will be supported by a production system, which has been co-developed by the company to ensure operating efficiencies are maximised.

This, along with the addition of a purpose-built power rolling line incorporating a brand new Fenn turks head, will allow Wintwire to produce a greater range of profiles to closer tolerances.

These and many other positive developments have led to the company assessing its branding with a fresh new look that will complement the on-going expansions.

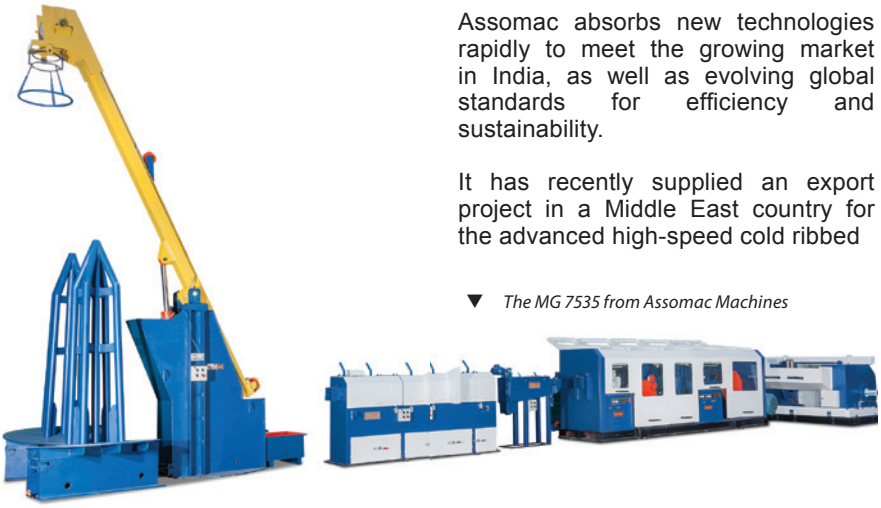
Wintwire is a manufacturer and supplier of round, profile, free-machining wire and more, made to the customer's expectations.

It combines both traditional and modern technology to provide high quality products. And its worldwide network of agents continues to grow with exports to more than 50 countries.

Wintwire specialises in round wires from 0.25 to 12mm in diameter – available in most malleable metals including brass, copper, phosphor bronze, nickel alloys, titanium, stainless steels and carbon steels.

Wintwire Ltd – UK
Email: sales@wintwire.co.uk
Website: www.wintwire.co.uk

Catering for the industry



▼ *The MG 7535 from Assomac Machines*

India-based Assomac Machines manufactures plants and machines for making wire, cables and other related machinery. It develops and manufactures machines according to the customer's requirement, and successfully caters to the needs of the small, medium and large-scale sectors of the industry worldwide.

Assomac absorbs new technologies rapidly to meet the growing market in India, as well as evolving global standards for efficiency and sustainability.

It has recently supplied an export project in a Middle East country for the advanced high-speed cold ribbed bar line for manufacturing 4-14mm finish range with a speed up to 12m/sec which can produce 4,000 to 5,000mt/month of finished ribbed wire in different diameters.

The company has also won a large export order for a turnkey project for wire drawing and galvanising plant. For the first time, Assomac will supply a high-speed galvanising line with a combination of nitrogen and pad wiping to facilitate both heavy and medium commercial wires with complete wire drawing set up.

Assomac group is engaged in the design and development of economical and highly efficient machinery to the wire industry.

With a history of providing many stainless steel wire plants and MIG wire plants in the past, the company has been helped to make further inroads into the industry with the trend changing toward investing in new and more modern technology.

The company can also be found exhibiting at the forthcoming Interwire exhibition in Atlanta, USA, from 28th to 30th April.

Assomac Machines Ltd – India
Email: info@assomacmachines.com
Website: www.assomacmachines.com

CabWire 2015 world technical conference – a date for your diary!

The IWMA is delighted to announce that the 7th biennial CabWire world cable and wire technical conference will take place on Tuesday, 3rd November 2015 in Düsseldorf, Germany, home of the wire industry.

The conference will be held at the Congress Center, and is already attracting interest following the successful CabWire conference which was held at the Palazzo Turati, Milan, in November last year, and attracted 200 wire and cable professionals from all over the world.

Preparations are well under way with Dr Probst, retiring CEO of Leoni AG, committed as a keynote speaker, and Arcelor/Mittal preparing to host a visit for delegates to its rod mill in Duisburg on Wednesday, 4th November.

There will also be an event at a downtown Düsseldorf location on the Tuesday evening where delegates will get the chance to network and socialise.

If you would like to be involved by presenting a paper at this exciting event, then please forward by email a short abstract of no more than 75 words to the IWMA office at **info@iwma.org** as a matter of urgency.

There are also a variety of promotional opportunities available, such as sponsorship and table top displays. Similarly, if you are interested in attending as a delegate and would like to be kept up to date with conference developments then please get in touch.

www.cabwire.com

IWMA INTERNATIONAL WIRE & MACHINERY ASSOCIATION C.E.T ACIMAF IWCEA

WCN

ABSTRACT SUBMISSION & PAPERS
In order for the conference organisers to assess the scope and content of a proposed technical article please submit a 75-word abstract.

Accepted speakers will receive an Author's Guide with details about manuscript and presentation preparation. Only original papers not previously published will be eligible for paper awards presented by the IWMA or possible publication in the association's newsletters and magazines.

Accepted authors receive:
• Complimentary meeting registration
• A copy of the conference proceedings materials
• Access to the conference sessions, table top exhibits and reception

Check your category:

☐ Ferrous ☐ Non-ferrous ☐ Electrical ☐ Fibre Optic ☐ General

Author(s) _____

Title of paper _____

Company _____

Address _____

Tel _____ Email _____ Web _____

Abstract (75 word maximum)

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Please send me further information when available on:

☐ Attending the conference as a delegate

☐ Booking a table top exhibit

☐ Conference sponsorship

Please forward your submission to info@iwma.org

IWMA new members

Lamifil nv, Belgium

Lamifil nv, Belgium, develops, casts and manufactures aluminium, aluminium alloy, copper and copper alloy wires and conductors. Lamifil was one of the first in Europe to produce GAP conductors and developed AAAC UHC conductors providing superior conductivity. Other productions are catenary wires for railway and semi finished wires in aluminium alloys and copper alloys.

Fenn LLC, USA

Fenn has been providing high quality metal forming machinery to its global clientele for over a century. Its mission is to form a partnership with its customers, allowing it to provide years of technical process and engineering experience, helping to transform production goals into a profitable reality. Its number one goal is for its customers' success.

Trafco Srl, Italy

Trafco is located in the industrial area of Rivara Canavese, a few kilometres from Torino and close to Torino's Caselle airport. With more than 40 years in the field of copper and aluminium rolling mill processes, in non-ferrous materials drawing as well as in all cables manufacturing procedures, allows it to be technologically advanced in the repair, refurbishment and modernisation of all kind of machinery and plants for producing all type of wire and cables.

ITSL, UK

International Trade Shows Link Ltd (itsl) is the UK representative of Messe Düsseldorf, Germany, and IFEMA, Spain, organisers of many of the market-leading events for the machinery, medical, fashion and leisure industries.

itsl provides routes to market in Germany, central and eastern Europe, Spain, South East Asia, the Middle East, India, China and South America.

itsl provides an all-inclusive service package for international organisers, exhibitors, visitors and trade media from market research, to show promotion, sales and marketing, exhibitor and visitor recruitment and project management. Together with a small number of carefully selected and accredited specialist partners it provides a one-stop service offer from exhibitor training, stand design and construction, stand catering and personnel, seminar, conferences and event venues, logistics to hotel accommodation.

COMPANY	COUNTRY	WEBSITE
Fenn LLC	USA	www.fenn-torin.com
Wolco Sp zoo	Poland	www.wolco.pl
CSM Metalurji Imalat Sanayi ve Muhendislik	Turkey	www.csmmetal.com.tr
Trafco Srl	Italy	www.trafcomachinery.com
Cortinovis Sictra	Italy	www.cortinovismachinery.com
Sictra Cortinovis	Italy	www.sictra.it
ITSL Ltd	UK	www.itsluk.com
LCP TPOE	Russia	www.bakerhughes.com
Lamifil n.v.	Belgium	www.lamifil.be
Acuity Products Ltd	UK	www.acuityproducts.co.uk

Radio-based wire control systems

▲ *A range of systems from FMS*

Producers in the highly competitive cable market will realise significant increases in quality and throughput with the use of radio-based wire control systems. For these reasons the RTM solutions from Force Measuring Systems (FMS) are becoming increasingly popular.

The RTM product family has evolved from a pure tension monitoring device to a multi-purpose control and analysis system. The RTM X2.MP system has now been expanded to enable the processing of encoder signal, eg for closed loop control of drives and the control of the traverse guide in individual bobbins.

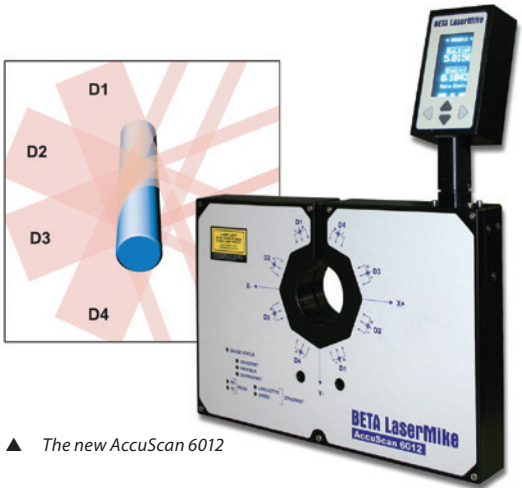
It provides for control of spindle locks and proximity switches on traverses, and obtains wire tension data (as obtained through the use of FMS force measuring rollers).

All of this relevant control data is securely transmitted from the rotating to the static portion of the machine via a radio link, without the use of troublesome and expensive slip rings. The RTM components can quickly be integrated into the control infrastructure of existing machines.

Force Measuring Systems AG – Switzerland
Email: info@fms-technology.com
Website: www.fms-technology.com

New launch from NDC Technologies

NDC Technologies has launched the highly anticipated Beta LaserMike AccuScan 6012 four-axis diameter and ovality gauge. Built on the proven and widely deployed AccuScan series platform, the new AccuScan 6012 is claimed to be the industry's first four-axis gauge for measuring products up to 12mm.



▲ *The new AccuScan 6012*

Over the years, manufacturers of high-performance communication cables have relied on two and three-axis diameter and ovality gauges for their on-line and off-line measurement applications. But increasing production line speeds and uncontrollable rotation and vibration of products still pose measurement challenges.

This advancement enables communication cable manufacturers to measure product diameter and ovality with higher accuracy than two and three axis gauges for added quality assurance and bottom-line savings.

The need to precisely measure the diameter and ovality of cylindrical round products to ensure they meet tight design and quality specifications is of paramount importance to cable manufacturers. Any error in the diameter or roundness of the conductor or insulation in coaxial and twisted-pair LAN products directly impacts the cable's performance characteristics – rendering it useless for the designed application. This unusable product winds up being scrapped, increasing manufacturing costs.

The new Beta LaserMike AccuScan 6012 four-axis gauge solves this problem by providing a more comprehensive measurement coverage than two and three-axis gauges and an ultra-fast scan rate. This combination of advantages now makes it possible to achieve a more accurate average outer diameter and ovality measurement at higher line speeds and for off-line applications.

Highlights include:

• More accurate average diameter – the AccuScan 6012 performs ultra-fast measurements at 2,400 scans per second per axis (totalling 9,600 measurements per second) and has single-scan repeatability to one micron. This means with each and every scan you get a true and more accurate average diameter measurement.

• Significant improvement in ovality accuracy – the AccuScan 6012 offers a 42 per cent improvement in detecting true ovality over three-axis gauges and delivers 100 per cent ovality accuracy when the product is aligned with the measurement axes.

• Highest flaw detection accuracy – the AccuScan 6012 provides the highest flaw detection accuracy with 25 per cent improvement over three-axis gauges. The ultra-fast scan rate and higher accuracy coupled with the high-speed tolerance checking option permits the early, accurate and dependable detection of product flaws such as lumps and neckdowns. This enables manufacturers to better control product quality, reduce scrap, and realise manufacturing savings.

• High-accuracy off-line part/sample inspection – using the Beta LaserMike PC-based AccuNet display system, the AccuScan 6012 can be easily and quickly set up as an off-line part measurement system to check samples, and track, manage and analyse critical product data. This eliminates the need to set up two dual-axis gauges to perform four-axis measurements.

• The AccuScan 6012 gauge offers flexible communications capabilities, allowing for easy connection to PCs, PLCs, or processes with leading protocols. This gauge can also be equipped with an optional ultra-bright display and human interface to easily configure and view measurement data. The AccuScan 6012 allows for top or side mounting of the display.

NDC Technologies – USA
Email: sales@betalasermike.com
Website: www.ndc.com

Backing up at Vinston

Vinston US Corp has been busy on the software and hardware fronts. Along with regular maintenance and improvements in its current software and hardware infrastructure, it has made progress on backup features and hybrid models.

Two new features on current software models address issues with power fluctuations and backup systems. The software system designates automatic saves to the current program in increments of one minute, up to one hour.

This feature is crucial during the design phase should any power issues cause outages. Also, before each manual save of a program, the system makes a backup of the current design prior to saving the changes. This feature provides the ability to revert back to the original program should unforeseen circumstances result in the current program not saving properly.

The company has two new hybrid benders scheduled for rollout this summer that will incorporate the best features of a CNC former and CNC bender. The sliding arms of a former will allow this hybrid bender to open up vast possibilities on parts that would require secondary operations on a traditional bender.

Vinston US Corp – USA
Email: info@vinstonus.com
Website: www.vinstonus.com

Membership benefits review

As a not-for-profit association, the IWMA considers its primary function is to promote new technology, education and growth within the wire and cable industry.

It also realises the importance of not resting on its laurels and keeping one eye very firmly on the future.

With this in mind, an "IWMA Membership Benefits Sub-Group" has been established comprising a number of key members of the executive board with a task of assessing the current level of membership and exploring ideas for improvements.

The Educational Trust Fund will also be included in this project.

If you have any comments regarding your membership, the IWMA would love to hear from you. Please forward any comments or suggestions to info@iwma.org

The group will report its finding in the next quarter.

Increased membership coverage

The association is delighted to announce that up to a maximum of ten subsidiaries of an IWMA member company can also now enjoy the benefits of membership.

This is a great way of extending the promotion of the various brands within your company structure, as each will be included on the IWMA website and publicised on the IWMA stand at the leading wire and cable trade fairs.

The association will also include editorials for these additional subsidiaries in newsletters.

The IWMA office will shortly be contacting all member companies asking for the details of any such companies, but in the meantime if you wish to contact the office the email address is info@iwma.org

Linear dives – a different approach

The rolling ring drive has been around for decades. It is an efficient mechanism which imparts linear motion to a carrier from a plain rotating shaft. The beauty of the system lies in the ability to vary pitch with ease and for it to synchronise with line speed when winding cable onto reels.

Originally designed in Germany, there are now countless versions of the mechanism produced around the world. Each version has simply adopted the same basic structure as the original invention to apply the spring pressure and to support the unit on the shaft. Marldon took a look at this mechanism to see if it could be improved to design out two side effects of the mechanism.

The unit clamps around the shaft using springs positioned between the carriage body and the shaft along which it is travelling. The carriage, therefore, effectively floats along the shaft on these springs giving rise to unwanted movement varying with the load applied. Some manufacturers have overcome this by adding an extra internal bearing, with the added cost implications. The system must also be entirely dismantled to effect repairs and replacements as the body and internal components operate as a mutually dependent set.

The solution came in the form of the Marldon RT range of traversing units, which separate the functions of carrying the carriage on the shaft (the box body) and the function of applying pressure to the shaft (the spring loading). In this system the carriage is supported on bushes making it completely stable, and the spring pressure is applied using a separate spring loaded clamping plate.

The connection between the two components allows for some float in the non-critical vertical plane, but not in the critical horizontal plane, maintaining positioning accuracy along the shaft. This unique and simple design offers not only functional advantages, but also permits easy maintenance as it can be disassembled into its two major sections, facilitating easy parts replacement.

Marldon Ltd – UK
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More than half a century of experience

Serving industry for more than 55 years, UK-based Braude is primarily a process heating specialist manufacturer of non-corrodible heating and cooling equipment for the highly corrosive liquids found typically in pickling and similar processes in the wire and metal-based industries.

"We are focused on the liquids and conditions other suppliers would avoid; our expertise is in aggressive and corrosive solutions that conventional equipment cannot withstand," said David Snoxhill, managing director.

Braude has been exporting for many years and over the last few years has increased its efforts to the Asian markets. It was recently approached by a stainless steel mill manufacturer in India who required high output 400,000 kcal/hr heaters for the offline pickling tanks used in its plant design.

Braude designed and built steam heat exchangers specifically to suit the tanks whilst meeting the challenges of the cost profile.

The company also undertook another contract in Asia to supply heat exchangers for the pre-treatment line for one of the largest galvanising plants in the world. All its products are manufactured from high integrity chemically inert fluoropolymers (eg Teflon™) and have been designed to ensure long life in aggressive solutions.

The product range includes:
Tank and vessel heaters/coolers for use with steam, hot water or thermal fluids; chemical service pumps; electric heaters and controllers; and external heating systems which are mounted outside the process tank to avoid clutter and to prevent damage by heavy workloads.

Braude is an ISO 9001 registered company.

Braude Ltd – UK
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Meeting demands

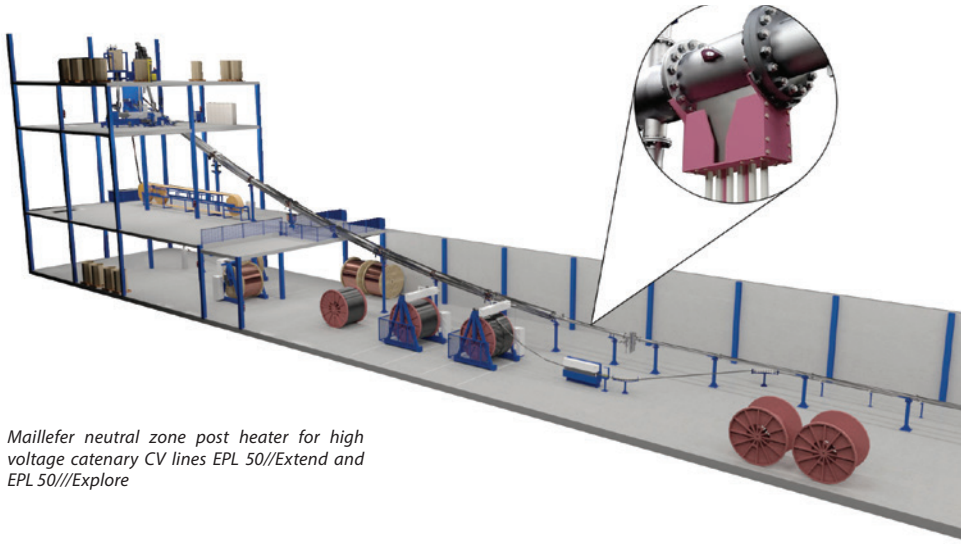
With Maillefer, you do not need to be fixed within the limits of your current business, whether considering different product types, production capacities, or application areas. Instead, you can stay ahead of competition and meet new demands of your market.

As an industry innovator, Maiffefer constantly seeks new ways to improve existing practices. The company is not satisfied with status quo and we strive to question today's habits in order to discover the hidden potential of modern manufacturing.

New in cable production solutions is the neutral zone post heater, a method to increase the line speed in medium, high and extra high voltage cable production, part of EPL 50// Extend and EPL 50///Explore.

More than 25 per cent higher line speeds have been achieved in customer pilot cases with excellent MV, HV and EHV cable quality and higher crosslinking capacity in catenary CV lines, and post-heating in the neutral zone minimising the insulation drooping risk.

Perfect roundness value package: Are reliable and easily made joints and terminations combined with lower material costs relevant to you?



▲ *Maillefer neutral zone post heater for high voltage catenary CV lines EPL 50//Extend and EPL 50///Explore*

If so, one solution is the perfect roundness concept. Not only does it improve high and extra high voltage cable roundness but it also brings remarkable savings in insulation material.

Production of 500kV cables using the perfect roundness concept resulted in Dmin/Dmax values ≥0.998. These extraordinary results are achievable with the value package for high voltage vertical CV line EPL 51///Explore. This line is also equipped with the NCC, Maillefer's curing calculation and simulation program.

New in low voltage cable solutions is the low output screw. This is an easy option to increase the flexibility of production for smaller wire and cable sizes without compromising cable quality, and is part of MXC extruder technology.

This provides better production optimisation at low outputs, enhanced surface in XLPE insulated wires and PVC sheathed cables, and improved extrusion process control preserving full capacity in all product types.

Maillefer will be exhibiting at both Interwire, Atlanta, (Booth 932) and wire Russia (Booth FOB31) in Moscow.

Maillefer SA – Switzerland
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New sales manager

▲ *New sales manager Richard Fichtner*

GEO-Reinigungstechnik, Germany, has appointed Richard Fichtner as sales manager and project development engineer.

Mr Fichtner has more than 20 years of sales and account management experience in surface treatment and welding wire material technology, most recently working as technical sales representative for an internationally active company with emphasis on the production of wire surface treatment systems, in whose development and marketing he played a key role.

He brings a wealth of knowledge and experience to GEO, and will focus on the development of new systems, cultivating existing customer relations and to convince new customers of GEO's ability to perform with multiple solutions in the field of wire cleaning.

Almost all of today's demands on cleaning processes can be realised with proven GEO components, such as high performance ultrasonic tube reactors and high pressure or steam jets. Its in-line cleaning systems can be complemented by systems for continuous bath monitoring and much more according to individual requirements. For less demanding cleaning tasks, mechanical methods are suitable.

Mr Fichtner will join the GEO team in the German pavilion at wire Russia 2015, and looks forward to meeting many business partners on this occasion.

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Scaling new heights

▲ *Sket's tandem cage type stranding machine was delivered to a Scandinavian company*

Sket Verseilmaschinenbau has recently scaled new heights related to the output of the company and the size of the machines it has designed and delivered.

The company has supplied the largest tandem cage type stranding machine in the world to a Scandinavian cable producer for the armouring of offshore power cable, having a diameter of up to 350mm. The machine, a type MKVD 96x800+112x800, is 150m long, not including the turntables at the input and the take-up ends.

It consists in the main of two stranding cages arranged to accommodate 96 and 112 bobbins, respectively. The bobbins have a flange diameter of 800mm and are suitable for up to 7mm diameter steel wire. The stranding cages can be operated either with 100 per cent or with zero per cent back twist in single or in tandem mode.

The machine is suitable for the stranding of galvanised or plastic insulated round or flat steel wire and copper and aluminium alloy wire. A particular technical feature of the machine is that each of the cages is fitted with a single cradle, which can accommodate bobbins having a flange diameter of 1,000mm suitable for fibre optic conductors. These bobbins are arranged to operate with a single reverse twist.

The stranding system is completed by tape wrapping heads suitable for the application of four tapes, jute applicators for up to 72 copses, special die boxes and pre-form heads and a number of band haul-offs. Semi-automatic portal cranes are provided for the loading and unloading of the machine bobbins.

With the fulfilment of major contracts for leading wire rope and cable producers worldwide, including among others General Cable, NKT, Bridon, Kiswire and Brunton Shaw, Sket has demonstrated its ability and its reliability as a supplier time and time again.

Sket Verseilmaschinenbau GmbH – Germany
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Smallest version of automatic double take up

▲ *The new automatic double take up from PS Costruzioni*

PS Costruzioni has recently designed, manufactured and sold the new automatic double take up, model PS 630 DS with motorised shaft and scrapping device.

This new machine is the smallest version of other two already designed automatic double take ups – the PS 1250 DS and PS 800 DS.

It is suitable for reels with a diameter from 400 to 630mm and has been designed to run in tandem with left/right extrusion lines.

Maximum cable diameter is 4mm, and cable size range is 26 AWG (0.15mm^2) to 10 AWG (3.3mm^2).
The production speed can vary according to the extruder speed and it depends also on the reels dimensions and max weight.

This machine consists of:
• Two doors, controlled by electrical locks
• Reels rotation: by means of a motorised (AC motor) shaft or pintles, according to the customer's requirements
• Reels loading/unloading by means of a steel plate (motorised platform)
• One wire guide motorised with a brushless servo motor, in digital electrical axis with the spooling head
• One scrapping device: This divides, automatically, the initial scrap cable, produced as the extruder starts working and before starting the winding up process onto reels. The operator can check the initial scrap cable coming from the extruder at pre-set speed, before starting the winding onto reels. The 'good' cable is then automatically hooked to the reels.

Reels dimensions: Flange diameter 400 to 630mm, barrel diameter 200 to 315mm, flange outer width 210 to 470mm, maximum reel weight 300kg.

PS Costruzioni Meccaniche Srl – Italy
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Website: www.pscostruzioni.com

Material world for SHWX

▲ *The company's workshop in Shanghai*

Shanghai Wangxun New Material Co Ltd (SHWX) supplies material for fibre optic and power cables.

Its products include copolymer coated AL tape, copolymer coated steel tape, AL PET Mylar tape, copper PET Mylar tape, copper tape and PET tape etc, which are widely applied in various kinds of cables such as fibre optic cable, telecommunication cable, power cable, submarine cable, OPGW, control cable, signal cable and track cable, etc. Its products are also used for magnetic apparatus, cold/hot water pipe and flexible packing.

With extensive research and development, the company owns the intellectual property rights outright, and has obtained six invention patents. Additionally, the company was involved in the stipulation of China's new telecommunication industry standards, YD/T723-2007 laminated metal plastic strip for telecommunication cable and fibre optic cable.

SHWX has a significant market share in China, with many orders from telecom operators specifying that SHWX's products be used. These include China Mobile, China Telecom, China Netcom, China Unicom and China Tietong.

The company also has extensive customers from 30 countries from across the USA, Europe and Asia.

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Driving efficiency, minimising waste

The latest product offering from Cimteq, a producer of cable manufacturing software, has taken the industry by storm. Since its launch last year CableMES has changed the landscape of the arena in which its early adopters operate.

Whilst the concept of a manufacturing execution system is nothing new in the world of production, research showed that within the cable manufacturing industry it is a mechanism that, until now, has been severely under-utilised.

Ali Shehab, CEO of Cimteq, identified the potential such a system, tailored specifically to the manufacturing of cables, would bring to the industry. Dedicated to enabling manufacturers to achieve higher yields at lower costs, more efficiently in terms of both time and material waste, CableMES has the ability to truly transform production. Based on one of the leading MES platforms from Wonderware, CableMES controls the process of cable production by electronically relaying manufacturing instructions to the operators on the shop floor and collecting order progress, as well as process information from machine sensors, process controllers and manual operator input. It also collects quality data from test equipment and ensures traceability of materials used in every batch.

CableMES can be fully integrated to run simultaneously with Cimteq's cable design software CableBuilder, as well as numerous ERP systems, ensuring optimal streamlining for the business. To put the impact of the system in context, if a cable manufacturing company spending $50m per annum on materials were to reduce the amount of scrap, give-away and over-length they produce by only 0.5 per cent as a result of utilising CableMES they could produce a saving in one year of $250,000.

CableMES has an innovative pricing structure with the cost of implementing the system paid for by the savings generated in only the first few months.

The company has also expanded its global presence and provided its CableBuilder program to Greek company Hellenic Cables SA. The company, renowned for specialising in submarine cables, holds a 45 per cent of its home market.

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Quality counts

▲ *The measuring and control units from Conoptica*

Nota Precision Engineering has taken a decisive step in improving the quality of its products and services.

The Polish company has purchased measuring and control units from Conoptica, and has implemented the quality management system ISO 9001:2008.

The Lublin-based company provides tools of super hard materials, such as diamond dies (production and regeneration), diamond and CBN grinding wheels, diamond pastes and powders, diamond and CBN plates, and diamond dressers.

Nota Precision Engineering Company – Poland
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WCN

Going strong after 70 years

Since its beginnings in 1945, Techna has been involved with wire, cable and electrical products. Over those years, wire and cable manufacturers and end users have been talking to Techna and the company, representing several of the world's leading wire and cable equipment manufacturers, has become a major supplier to the industry.

Relationships, some going back over more than 40 years, provide the market with an unrivalled combination of product ranges, high quality engineering, continuous research and development, comprehensive spares and servicing, extensive sales support and a wealth of applications knowledge and 'know-how'.

All of this is reflected in Techna's new machinery catalogue packed full of in-depth technical information, drawings, applications and ordering information and, for the first time, bringing together the product ranges of some of the world's manufacturers in a single reference catalogue.

These include: Joachim Uhing KG GmbH (since 1974): The inventor of rolling ring linear drives, and supplier of rolling ring and timing belt linear drive systems, drive nuts, non-contact flange detection winding, automatic winding width control, and wireless transmission for double-twist bunchers, shaft/spool clamping systems and retaining collars.

Witels Albert GmbH (since 1976): Wire and cable straightening and guiding with manual, semi and fully automated wire and strip straighteners, roller guides, straightening and guide rolls, cable stripping and length measurement, transportation/drive rolls and pre-form heads.

Mobac GmbH (since 2004): Providing flyers for bobbin holes and frames, flyers with tension control, single and multiple flyer payoff frames, high-speed payoffs, payoff baskets, tangential payoffs, spoolers and winders, wind-around hysteresis brakes and dancer accumulators.

Naber & Wissmann GmbH (since 1996): Manufacturer of wire drawing components, capstans, rings and cones for most drawing machines, in ceramic (zirconium oxide/aluminium oxide), various thermally coated vacuum alloyed materials, oxide ceramic coated for fine wire machines, high alloyed hardened special steels, pulleys, sheaves, ceramic eyelet guides and spool caps.

G H Sachsenroeder GmbH (since 2004); Rimtec Corporation (since 2004); Magnetic Technologies Ltd (since 2004); and Meccanica Nicoletti Srl (since 2009).

▲ *Techna's Watford, UK, distribution centre*

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New company in the group

Inductotherm Group has opened a new group company in Turin, Italy – Inductotherm Group Italy Srl.

Italian customers will benefit from timely and direct access to Inductotherm Group product brands, covering the many active market segments in Italy. "Inductotherm Group Italy Srl will further fulfil the Inductotherm Group strategy of being a truly global yet local company," said Gary Doyon, chief executive of Inductotherm Group. Inductotherm Group Italy Srl sales manager Vincenzo Tosetto brings over 25 years of induction heating experience to the local team. He is responsible for delivering to Italian customers the latest technologies the group offers, including Inductoheat Europe's induction heating process technology and pace-setting new equipment such as Inductoheat's latest line of crankshaft hardening machines.

Inductotherm Group – USA
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Continuous improvement

InnoVites continuously improves its CableERP software to add value for its customers in the wire and cable industry. The company finds inspiration in discussions with customers and builds solutions for their business problems every day, based on the foundation of the powerful and popular Microsoft Dynamics AX software.

InnoVites CableERP allows customers to easily search for available cable designs and capture customer requirements completely. The customers-required length breakdown with tolerances can be specified, including the drum requirements and the copper or aluminium pricing conditions (and other precious materials). It helps customers to improve customer satisfaction by meeting cable requirements better and faster.

▲ *Constant improvements to software*

Companies in the wire and cable industry use expensive conducting raw materials in their production processes. It is very important to ensure that these materials are converted into finished cables in the shortest possible time and with the least possible material losses.

The planning and scheduling module in CableERP allows customers to reduce working capital and material losses by optimising for length in logistics and production.

The costs of the conducting materials, such as copper and aluminium, often represent over 80 per cent of the value of a finished cable. The prices of these non-ferrous metals are highly volatile.

The precious materials module in InnoVites for Cable helps cable manufacturers to protect themselves against risks of these raw material price changes and reducing the risk of price volatility.

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Second Queen's award

▲ *Managing director Robert Brown receives the Queen's Award from Mrs Edith Conn, Her Majesty's Vice Lord-Lieutenant of Greater Manchester*

Christmas came early for wire lubricating specialist firm Metalube Ltd.

The company, with offices in China, India and Brazil, received its second Queen's Award for Enterprise in December at its Manchester, UK, headquarters from Mrs Edith Conn, Her Majesty's Vice Lord-Lieutenant of Greater Manchester.

The innovation award was made to Metalube for inventing OCG 6000, a synthetic grease that protects over-head line electrical conductors. The corrosion-preventing grease can operate at over 200°C with an operational life exceeding 20 years.

OCG 6000 extends the lives of conductors and, ultimately, saves capital investments by delaying future renewal of pylon infrastructure.

This was the second successive year that the company had been bestowed a Queen's Award for Enterprise. Exporting to over 86 countries worldwide, the company won in the International Trade category in 2013.

Robert Brown, managing director, said: "It is a tremendously proud day for Metalube and I am particularly delighted for the company's many innovators, who work in our laboratory. It is their skills that set us apart, and for one of our ground-breaking products to be publicly recognised is a great compliment."

The company manufactures a range of non-ferrous drawing oils and maintenance lubricants as well as a variety of corrosion protection and forming oils. The experienced exporter employs 34 people.

Metalube Ltd – UK
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WCN

Effects of niobium additions to a vanadium microalloyed high carbon wire steel

By Emmanuel De Moor and Stephanie L Miller, Advanced Steel Processing and Products Research Center, Colorado School of Mines, USA

Abstract

The need for weight reduction in a number of wire applications is stimulating the development of alloys with increased strength. Vanadium alloying is successfully used to increase strength levels of pearlitic high carbon wire steels predominantly through precipitation strengthening.

The current paper investigates additions of niobium to a vanadium microalloyed 0.80 wt pct carbon steel. Obtained strength increases are believed to predominantly relate to interlamellar pearlite spacing refinement.

Introduction

An increased demand for higher strength wire steels exists in a number of applications, driving further alloy development. Hypereutectoid carbon levels for increased strength are used in combination with silicon additions to prevent grain boundary proeuteuctoid cementite formation which can detrimentally affect drawability[1,2]. Chromium additions are used to alter pearlite reaction kinetics, yielding optimised microstructures for strength through interlamellar spacing (ILS) refinement[3]. ILS refinement can be a major strength contributor according to:

$$\sigma_{ys} = \sigma_{ss} + 460L^{-½} + 145(\sqrt{2}\lambda)^{-½} \quad (1)$$

with σ_{ys} the yield strength in MPa, σ_{ss} a term representing the combination of solid solution and cementite volume strengthening, L colony size in µm, and λ the ILS in µm[4,5]. Experimental data for carbon contents ranging from 0.75-1.8 wt pct have shown good correlations with this equation[5]. Yield strength follows a Hall-Petch type relationship with colony size and ILS and since ILS is generally several orders of magnitude less than colony size, it is the dominant strength contributor. Alloying and processing strategies for increased strength are hence effective when ILS refinement is obtained.

In addition to microstructural refinement, precipitation strengthening can also be employed to improve strength. For instance, the addition of vanadium to a eutectoid steel is reported to result in 9.6-11.0 MPa strengthening per 0.01 wt pct vanadium in the presence of nitrogen through vanadium carbonitride precipitation strengthening without drawability impairment [6].

Niobium microalloying is frequently used in low carbon steels where significant strengthening is obtained through grain size refinement when thermomechanical processing is conducted. Effects of niobium additions to eutectoid alloys have received only limited attention [7].

Experimental Procedure

Laboratory materials were prepared using a vacuum induction furnace, and chemical compositions of the studied materials are shown in Table 1. A vanadium and chromium alloyed 0.80 wt pct carbon steel was used as a reference material. Niobium alloying levels of 100 ppm were used in the second alloy. The steels are identified as 1080V and 1080V+Nb in the present paper. Nitrogen levels of approximately 60 ppm were employed to mimic nitrogen levels of industrial as-cast electric arc furnace material.

The castings were sectioned and hot rolled. Reheating was conducted using a reheating ramp to 1,200°C over approximately two hours and a 20-minute soak. A six-pass deformation schedule was employed with an approximate 20 pct reduction per pass resulting in an overall reduction ratio of 3 to 1. A 15-minute reheating was performed following the third reduction pass.

Samples were machined from the hot rolled plates with a cylindrical geometry of 5.5mm in diameter and 72mm in length. Continuous cooling experiments were conducted using a Gleeble® 3500 thermomechanical simulator in high vacuum conditions (< 10-3 torr). The thermal profile for continuous cooling experiments consisted of heating at 20°C/s to 1,093°C, holding for five minutes, and controlled cooling to room temperature at constant rates of 2.5, 5, 7.5, 10 and 12.5, 50°C/s.

Microstructural analysis was performed on all samples and Vickers hardness testing was conducted according to ASTM E-92 using a grid of nine measurements per sample centred along a bisecting line at one quarter of the sample diameter [8]. Following hardness testing, a 6 sec etch of 4 pct Picral was

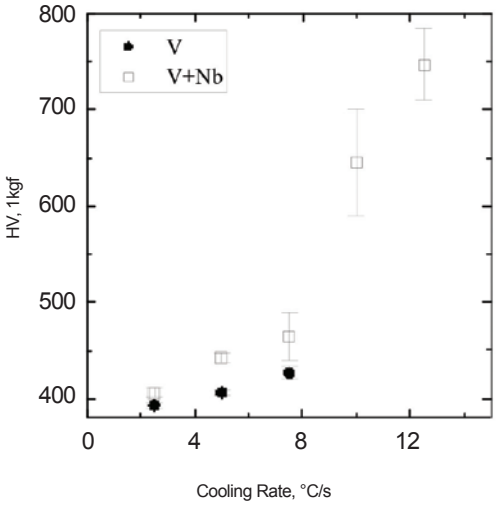
▼ *Table 1 – Compositions of experimental test alloys in wt pct*

	C	Mn	Si	Cr	Nb	V	A1	N	S	P
1080V	0.8	0.5	0.2	0.2	-	0.079	0.005	0.006	0.004	0.004
1080V + Nb	0.8	0.4	0.2	0.2	0.010	0.079	0.004	0.006	0.004	0.004

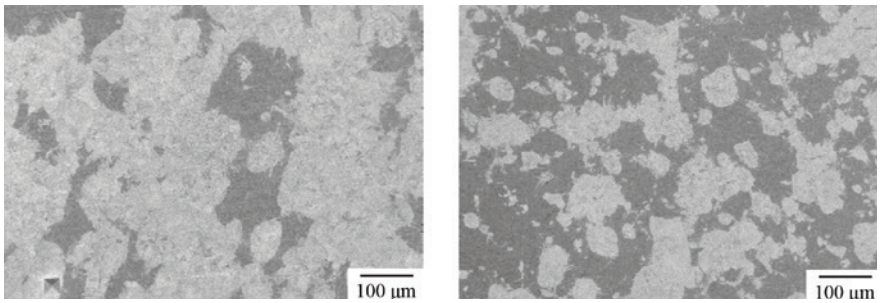
applied to the polished surfaces and optical metallography was conducted. Pearlite interlamellar spacing was measured using Field Emission Scanning Electron Microscopy (FESEM) images taken at a magnification of 10,000x, employing a circular intercept method according to ASTM E-112[9]. Error bars reported for all plots represent the standard error of the data sets.

Results and Discussion

Hardness values are shown in Figure 1 as a function of cooling rate for both alloys. It is apparent that the 1080V+Nb alloy exhibits greater hardness values than the 1080V alloy. Hardness data is only shown for cooling rates of 2.5 and 5°C/s for the 1080V+Nb steel since non-pearlitic microstructural constituents including martensite and occasionally bainite were observed via FESEM at higher cooling rates in the Nb containing alloy. In addition, more martensitic/bainitic constituents were observed at these cooling rates in the Nb alloyed steel versus the 1080V steel as qualitatively shown in Figure 2 for a cooling rate of 12.5°C/s. Both samples were etched using a 4 pct Picral etchant and the regions that appear light correspond to pearlite whereas the darker regions not attacked by the etchant correspond to martensitic regions. Although no quantitative analysis was conducted, it is apparent that more martensite formed in the 1080V+Nb alloy, which suggests increased hardenability or slower pearlite transformation kinetics.



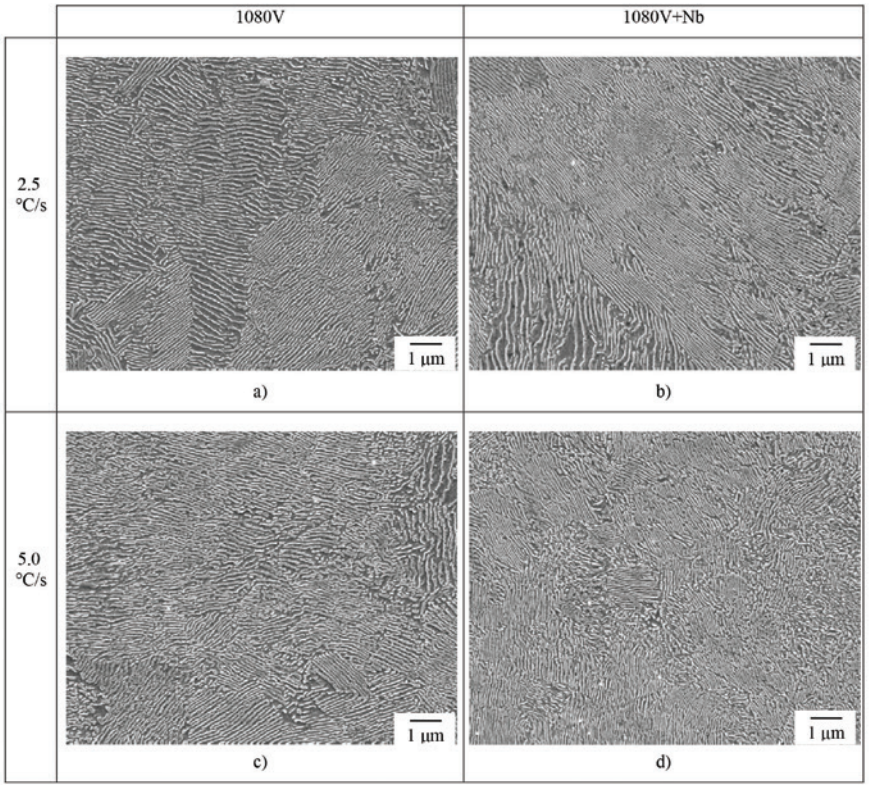
▲ *Figure 1 – Vickers hardness as a function of cooling rate*



▲ *Figure 2 – Low magnification FESEM taken from samples continuously cooled from 1,093°C at 12.5°C/s for a) 1080V and b) 1080V+Nb steels. Samples etched with 4 pct Picral*

The obtained hardness values corresponding to fully pearlitic microstructures are also presented in Table 2 and greater hardness values are obtained in the Nb alloyed steel. The hardness values are also observed to increase with cooling rate for both alloys.

construction steels [7]. FESEM micrographs are shown in Figure 3 for the alloys investigated in the present study for constant cooling rates of 2.5 and 5°C/s. A refinement of ILS and pearlite colony size for the 5°C/s cooling rate is qualitatively observed for the 1080V+Nb alloy. Results from ILS



▲ *Figure 3 – FESEM micrographs of 1080V (a and c) and 1080V+Nb (b and d) alloys cooled from 1,093°C at constant cooling rates of 2.5°C/s (a and b) and 5°C/s (c and d)*

As evident from Equation (1), pearlite colony size and ILS contribute to strengthening in pearlitic steels. In addition, microalloying may contribute to increased strength through precipitation strengthening. Effects of niobium additions to eutectoid alloys have received only limited attention; Jansto reports ILS refinement through niobium additions in high carbon

and pearlite colony size measurements are presented in Table 2 and plotted in Figure 4 as a function of cooling rate. Increased ILS refinement is observed with cooling rate whereas pearlite colony size seems less dependent on cooling rate for the 1080V steel. ILS refinement is observed for both cooling rates in the niobium alloyed steel. A different trend with cooling

rate is observed for pearlite colony size namely, similar colony sizes are obtained for a cooling rate of 5°C/s and greater pearlite colonies were observed in the 1080V+Nb steel at 2.5°C/s. The dependence of colony size on cooling rate is also different for both alloys. The 1080V exhibits no measureable dependence, whereas a refinement was observed with increasing cooling rate in the 1080V+Nb steel for the two cooling rates investigated here.

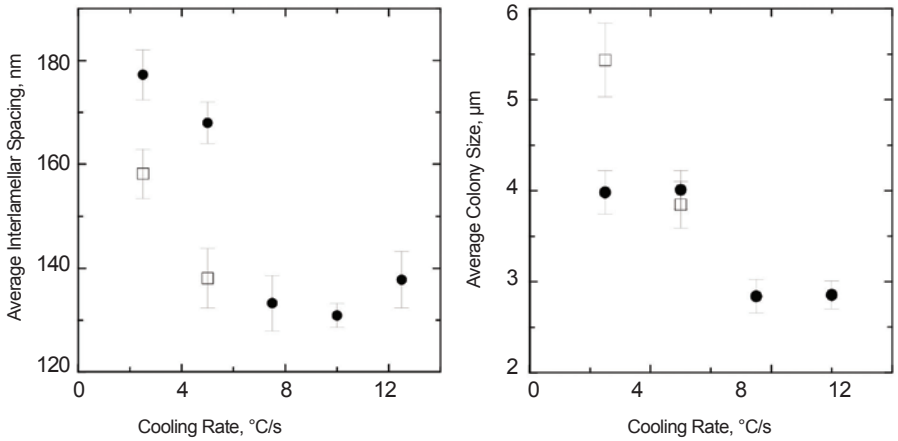
Using Equation (1), strengthening contributions from the quantified microstructural differences were calculated and results are shown in Table 3 along with the measured hardness difference between the two alloys. Yield strength, σys in MPa, was correlated to Vickers hardness, HV at 1kgf, according to:

$$\sigma_{ys} = -90.7 + 2.876\,(HV) \quad (2)$$

The expression given in Equation (2) is the result of a regression analysis conducted by Pavlina for over 150 hypoeutectoid steels ranging from yield strengths of 300-1,700 MPa [10]. The reported differences in Table 3 are the data obtained for the 1080V subtracted by the 1080V+Nb data. It should be noted that precipitation strengthening is not taken into account here. Perspectives on precipitation strengthening have been discussed in [11]. From Table 3 it is apparent that for the 5°C/s condition the strength difference seems to correlate with ILS refinement and a reasonable agreement between observed hardness difference and calculated difference is obtained. The calculated strengthening for the 2.5°C/s cooling rate does not correlate with the measured hardness difference. The increased pearlite colony size with niobium alloying was not expected and further work is required to confirm this observation, in particular of Stelmor® deck cooling profiles. It is reasonable to expect that niobium would refine austenitic grain size, in particular when thermomechanical processing is employed, which would also result in reduced pearlite colony size [12].

▼ *Table 2 – Vickers hardness, ILS, and pearlite colony size measurements obtained in both alloys for cooling rates 2.5 and 5°C/s*

	1080V			1080V+ Nb		
Cooling rate, °C/s	Vickers Hardness (HV, 1kg)	ILS (nm)	Pearlite Colony Size (µm)	Vickers Hardness (HV, 1kg)	ILS (nm)	Pearlite Colony Size (µm)
2.5	348±6	177.3±4.8	4.0±0.2	393±2	158.2±4.7	5.4±0.4
5.0	377±10	168.0±4.0	4.0±0.2	406±3	138.1±5.7	3.8±0.3



▲ *Figure 4 – a) Average ILS and b) average pearlite colony size for the 1080V (filled circles) and 1080V+Nb steel (open squares)*

Pearlite ILS refinement was obtained for both cooling rates with niobium alloying and is calculated to result in a 17-31 HV increase in hardness, or a 89-49 MPa increase in yield strength according to Equation (2). More research is needed to elucidate the mechanism by which Nb affects the pearlite transformation and ILS. Precipitation reactions and solute drag may influence pearlitic boundary movement and these mechanisms are likely dependent on transformation temperature and alloying levels. In addition, solute partitioning through (in)solubility in cementite may affect pearlite growth and ILS. For instance, vanadium has been reported to enrich in cementite [13].

▼ *Table 3 – Calculated strengthening contributions from the ILS and pearlite colony size differences (data for 1080V+Nb subtracted by 1080V data) between the 1080V and 1080V+Nb alloys*

Cooling rate, °C/s	Measured Vickers Hardness, difference (HV, 1kg)	ILS Difference (nm)	Pearlite Colony Size difference (µm)	Measured Vickers Hardness, difference (HV, 1kg)	ILS Difference (nm)	Pearlite Colony Size difference (µm)
2.5	348±6	177.3±4.8	4.0±0.2	393±2	158.2±4.7	5.4±0.4
5.0	377±10	168.0±4.0	4.0±0.2	406±3	138.1±5.7	3.8±0.3

Conclusions

The effects of an addition of 0.01 wt pct niobium to a vanadium alloyed, 0.80 wt pct C steel were investigated. Hardness increases were observed likely predominantly resulting from pearlite interlamellar spacing refinement. Non-pearlitic microstructural features including martensite were more prevalent in the Nb modified alloy which may result from improved hardenability or reduced pearlite transformation kinetics.

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References

1. K Han, G D W Smith, and D V Edmonds, "Pearlite Phase Transformation in Si and V steels," Metall and Mater Trans A, 26 (1995) pp. 1617-1631.

2. K Han, T D Mottishaw, G D W Smith, D V Edmonds, and A G Stacey, "Effects of Vanadium Additions on Microstructure and Hardness of Hypereutectoid Pearlitic Steels," Mat Sci and Eng A, 190 (1995) pp. 207-214.

3. T Tauri, J Takahashi, H Tashiro, N Maruyama, S Nishida, "Microstructure Control and Strengthening of High-carbon Steel Wires," Nippon Steel Technical Report No 91, (2005) pp.56-61.

4. E Taleff, C Syn, D Lesuer, and O Sherby, "Pearlite in ultrahigh carbon steels: Heat treatments and mechanical properties," Metall and Mater Trans A, vol 27A, pp. 111–118, 1996.

5. E M Taleff, J J Lewandowski, and B Pourladian, "Microstructure-property relationships in pearlitic eutectoid and hypereutectoid carbon steels," JOM, vol 54, no 7, pp. 25–30, Jul 2002.

6. M Korchynsky, "Microalloyed High-Carbon Rod," Wire Journal Intl (1988) pp. 129-136.

7. S Jansto, "Niobium-Bearing Construction Steels and Global Applications Trends", Proc of Value-Added Niobium Microalloyed Value-Added Construction Steels Symposium, Singapore, Nov 5-7, 2012.

8. ASTM Standard E92, Standard Test Method for Vickers Hardness of Metallic Materials, 2nd ed, ASTM International, West Conshohocken, PA, 2003.

9. ASTM E112, Standard Test Methods for Determining Average Grain Size, ASTM International, West Conshohocken, PA, 2010.

10. E Pavlina and C J Van Tyne, "Correlation of Yield Strength and Tensile Strength with Hardness for Steels," Journal of Materials Engineering and Performance, vol 17, no 6 (2008), pp. 888-893.

11. S L Miller and E De Moor, "Vanadium and Niobium Microalloying to Increase Strength of High-Carbon Wire Steels", Interwire, Proc. of the 83rd Annual Convention of the Wire Association International, pp. 1-13.

12. A J DeArdo, H Mingjian, and C Garcia, "Basic Metallurgy of Modern Niobium Steels," International Symposium on Nb Microalloyed Sheet Steel for Automotive Application, TMS (2006) pp. 499-549.

13. T D Mottishaw and G D W Smith, "Microalloyed Pearlitic Steels for the Wire Industry – Mechanisms of Alloy Element Redistribution and Strengthening Processes in Cr-V Eutectoid Steels," HSLA Steels, Technology and Applications; Philadelphia, Pa, USA, 3-6 Oct 1983, pp.163-175.

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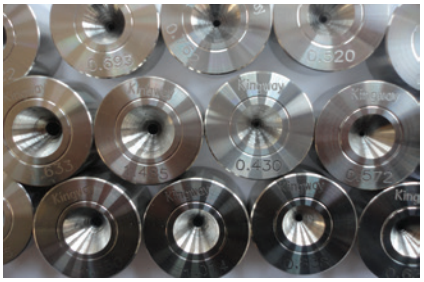

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