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January 2011  
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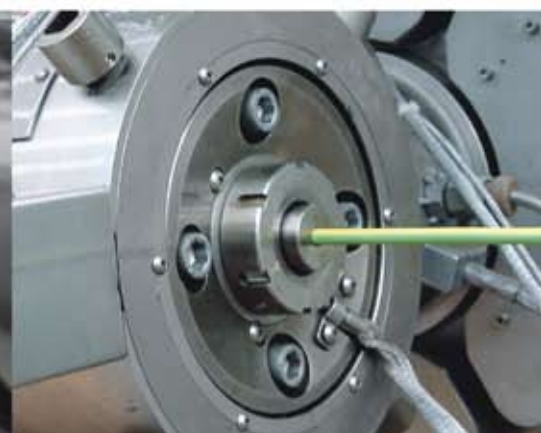
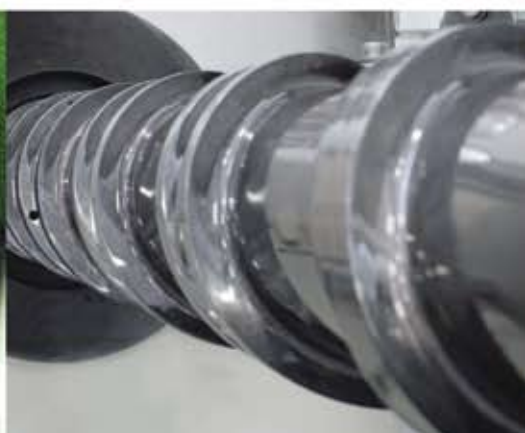
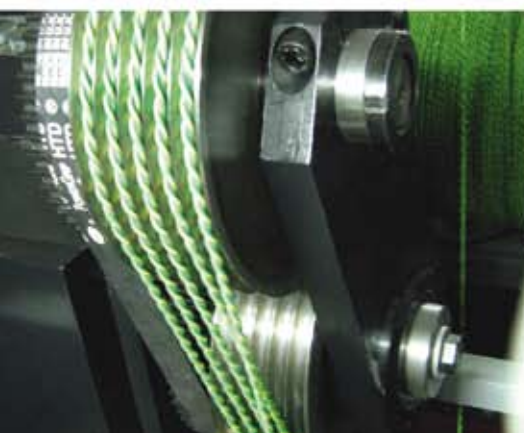
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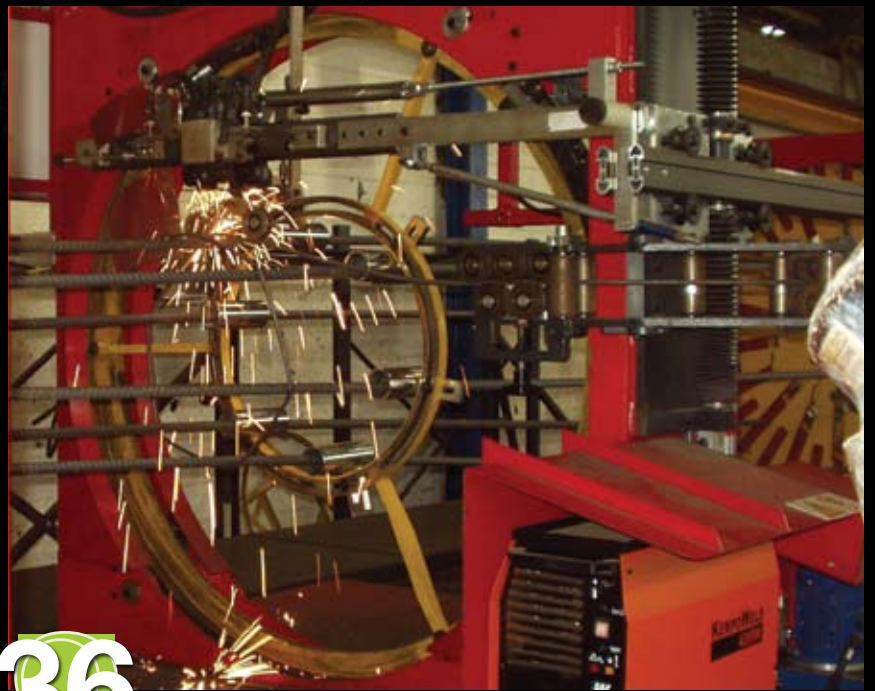
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'Atlanta, Georgia – State Capital Building At Night'  
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**May 2011**

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



'Detail of St Basil's, Red Square, Moscow'  
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**May 2011**

23–26: **wire Russia 2011** –  
 trade exhibition –  
 Moscow, Russia  
**Organisers:**  
 Messe Düsseldorf GmbH  
**Fax:** +49 211 4560 7740  
**Email:** info@wire-russia.com  
**Website:** www.wire-russia.com

**June 2011**

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

**September 2011**

13–15: **wire Southeast Asia** –  
 trade exhibition – BITEC,  
 Bangkok, Thailand  
**Organisers:** Messe Düsseldorf  
 Asia Pte Ltd  
**Email:** wire@mda.com.sg  
**Website:**  
 www.wire-southeastasia.com

**October 2011**

4–6: **WiCAB** – trade exhibition  
 – São Paulo, Brazil  
**Organisers:** Grupo CIPA Ltda  
**Website:** www.wicabfair.com.br

**March 2012**

26–30: **wire/Tube Düsseldorf** –  
 trade exhibition – Düsseldorf,  
 Germany  
**Organisers:** Messe Düsseldorf  
**Fax:** +49 211 45 60668  
**Email:**  
 wire@messe-duesseldorf.de  
**Website:** www.wire.de



'Shanghai Skyline at Sunrise'  
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 Photographer: 'Francesco Perre'

**September 2012**

25–28: **wire China 2012** –  
 trade exhibition – SNIEC  
 Shanghai, China  
**Organisers:**  
 Messe Düsseldorf China  
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8. 输送带钢丝绳	9. 工程轮胎钢帘线合绳	10. 电气控制无级调捻距	
11. 粗大直径多股绳内外层一次捻制合绳			







○ The opening ceremony of wire and Tube China 2010

## China's wire showcase voted a success

wire and Tube China 2010 was described as a resounding success, despite being held in a post-financial-crisis era.

Already the largest of the industry's Asia exhibitions, wire and Tube China managed to break its own records for trade visitors (26,035 over the four days) and exhibition space (74,500m<sup>2</sup>, 30% higher than the 2008 show).

The concurrent conferences and events, such as the China International Tube & Pipe Conference, China Wire & Cable Industry Conference, Wire & Cable Raw & Auxiliary Materials Technical Exchange Conference and the Wire & Cable Equipment Technology Seminar, also attracted attention from visitors.

wire China is jointly organised by Shanghai Electric Cable Research Institute (SECRI) and Messe Düsseldorf China Ltd. wire China 2012 will be held at Shanghai New International Expo Center from 25<sup>th</sup> to 28<sup>th</sup> September, providing an ideal platform to make contact with the developing Chinese and Asian markets.

**Messe Düsseldorf China Ltd – China**  
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Email: [press@mdc.com.cn](mailto:press@mdc.com.cn)  
Website: [www.wirechina.net](http://www.wirechina.net)

## Sumitomo to produce fibre optic cables in China

In September 2010, Japan's Sumitomo Electric Industries began fully integrated production of fibre optic cables in China to capitalise on the increasing demand in the country. Sumitomo Electric has established a new factory in Hangzhou, for mass production of the base materials, to be run by a joint venture with Futong Group, a major Chinese optical cable maker.

The Japanese business daily, *Nikkei*, suggests that major Japanese and US makers have been reluctant to produce glass base materials, a key fibre optic material, in China to prevent technology drain, but that the attitude appears to be changing. China accounts for approximately 50 per cent of global demand for fibre optic cables and the share is expected to expand.

In 2009, Sumitomo Electric controlled 14 per cent of the global market, the second-largest share. The planned production increase will bring its market share close to 20 per cent, *Nikkei* said.

The annual production of glass base materials will amount to six million kilometres when calculated in terms of fibre optics. Sumitomo Electric's fibre optic output is expected to increase 20 per cent to between 35 and 40 million kilometres.

Dutch firm Draka is presumed to be the only major maker currently producing base materials in China.

**Sumitomo Electric Industries – Japan**  
Website: <http://global-sei.com>



# Nexans to enter into discussions with Draka Holding NV

Nexans has obtained the commitment of Flint Beheer BV, subject to certain conditions, to tender its shares of Draka Holding NV if Nexans makes an offer to acquire Draka Holding NV.

Nexans has agreed to make a proposal to Draka Holding NV to negotiate an agreement for a recommended cash offer to purchase all of the outstanding ordinary shares of Draka Holding NV at a price of €15 per share, subject to certain conditions.

Frédéric Vincent, chief executive officer of Nexans, said: "The contemplated transaction would contribute to the consolidation of the cable sector, improve the competitiveness of Nexans' European asset base and reinforce its positions in specialty cables."

Nexans intends to begin negotiations with Draka Holding NV with a view to reaching an agreement as soon as possible.

However, asset manager Ed Manie at Keijser Capital says that Nexans' offer for Draka Holding NV could prove to be a hostile opening bid that could trigger a bidding war between Nexans and Italian rival Prysmian.

While Draka's big shareholder Flint Beheer, which owns 48.48% of the company's shares, has backed Nexans' offer, Manie believes that the remaining shareholders will await to see the further developments around the proposed acquisition.

Draka and Prysmian cancelled last year's merger talks as they could not agree on the major conditions of the deal.

**Nexans – France**  
**Fax:** +33 15669 8484  
**Email:** nexans.web@nexans.com  
**Website:** www.nexans.com

**Draka Holding NV – The Netherlands**  
**Website:** www.draka.com

## New plant to double production

Hu An Cable Holdings, wire and cable manufacturers in China, has started the construction of a new plant under a newly-incorporated subsidiary, Hu An (Wuxi) Cable Technology Co, to strengthen its cable production capabilities.

The plant occupies 80,000m<sup>2</sup> with 60,000m<sup>2</sup> floor space, and is located adjacent to the group's existing plant in Yixing city.

The group has already placed orders for two production lines for ultra-high voltage power cables from Finland and Germany.

Costing RMB338 million (\$67 million), the new plant will comprise three production lines for 110kV and above power cables, imported from Finland and Germany, and two domestic production lines for mid-voltage power cables.

The project will be financed using net proceeds from the company's initial public offering with the balance from internal funds and bank borrowings.

**Hu An Cable Holdings Ltd – China**  
**Website:** www.chinahuancable.com



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# Petar Erdeljan obituary

We are saddened to report that Petar Erdeljan, area sales manager of Roteq Machinery passed away on 21<sup>st</sup> September 2010 in his seventieth year, in Victoria Hospital in London, Ontario, Canada.

Petar was born in Kikinda, Yugoslavia and attained his higher education at Leicester School of Technology and Commerce in the United Kingdom, The Academy of Commerce in Belgrade Yugoslavia and the University of Subotica, Yugoslavia.

In 1968, on completion of his military duties in Yugoslavia, Petar started work with Wogau Engineering in London (UK) which was an agency that represented companies that sold equipment to the Soviet Union and Eastern Block companies.

His linguistic talents led him to represent and then be employed by General Engineering (Radcliffe) Co Lc. In 1989 he re-located to Canada and continued his wire and cable career in the position of area sales manager with Ceeco Machinery of Concord Ontario, a position he held until early 2010. In March of 2010 Petar joined Roteq Machinery of Concord Ontario as area sales manager.

Petar's wire and cable involvement totalled about 30 years, most of which most was conducting business in Eastern Europe and the Far East. Petar will be remembered as a highly respected professional with an easy charm that will be sadly missed by his many customers, colleagues and friends.

Petar is survived by his son Dr Petar Erdeljan, daughter-in-law Dr Meivys Erdeljan, and his brother Lazar. He was also a member of Wire Association International.



○ Mr Petar Erdeljan

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**Fax:** +86(755)-26420390  
**Email:** sales@adwantek.com  
**Web:** www.adwantek.com

## Continuous casting forum

The Wire Association International (WAI) has announced its first Global Continuous Casting Forum for copper practitioners, to take place at Interwire, Atlanta from 2<sup>nd</sup> to 5<sup>th</sup> May 2011.

33 industry experts will lead the forum, which will comprise technical and operational presentations, interactive workshops and panel discussions, and will serve as a user's group for all operations personnel involved with copper continuous casting.

Forum topics will include:

- Historical information on copper, continuous casting, wire drawing and the vertical shaft furnace
- Process overviews by Properzi, SCR, Contirod and Upcast OY
- New technologies: descaling; degassing; rod testing; scrap processing
- New refractory materials and installation practices
- Baghouses: design; fires investigation
- Filtration: molten metal; caster and process water
- Shaft furnace burner combustion ratios and dissolved oxygen
- Cathode impurities and rod quality
- Wire break analysis and copper fines generation
- Preventive maintenance: electronic drives; hardware and software solutions

Registration is \$395 for WAI members; \$495 for non-members. The fee includes access to Interwire 2011 exhibits, technical programme and the opening reception.

**Wire Association International Inc – USA**

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## General Cable acquires BICC Egypt

General Cable Corporation has acquired BICC Egypt. BICC Egypt manufactures a wide variety of wire and cable products for the electrical markets including low voltage insulated power and control cables, building wire, instrumentation cable, halogen free power and control cables, and overhead power cables. In the last twelve months, the business reported revenues of approximately \$30 million.

The acquisition of BICC Egypt furthers General Cable's geographic expansion by establishing a production and commercial base in the region. The company believes the demand for wire and cable products in Egypt will continue to grow faster than many other nations due to increasing investment in infrastructure and power generation projects. Egypt continues to invest heavily in large-scale transport, construction, power generation, and transmission and distribution infrastructure.

**General Cable Corporation – USA**  
**Email:** info@generalcable.com  
**Website:** www.generalcable.com

## Teknor Apex to distribute COIM compounds

The Italian chemical company COIM SpA has appointed Teknor Apex Company to be its exclusive distributor of Laripur™ thermoplastic polyurethane (TPU) elastomer compounds to wire and cable manufacturers in the USA, Canada and Mexico. Teknor Apex's Vinyl Division will supply the Laripur materials.

"We are very pleased to engage in a strategic co-operation with a high-value partner like Teknor Apex," said COIM's Antonio Piroddi, division manager for Laripur TPU. "Their technical and commercial capabilities combined with COIM's TPU expertise and broad product offering provides a valuable new resource for wire and cable customers in North America."

Teknor Apex vice president, Louis R Cappucci, noted: "TPUs are particularly valuable for withstanding rugged end-use conditions because of their resistance to abrasion, chemicals, microbial attack, and hydrolysis, as well as flexibility at low temperatures."

Laripur compounds are available in grades ranging in hardness from 60 Shore A to 75 Shore D. As elastomers they are inherently flexible and contain no plasticisers, except as required for certain specialised formulations. Typical applications include cables for automotive sensor and antilock brake systems and for mining, seismic monitoring and oil exploration.

**Teknor Apex Company – USA**  
**Email:** vinyl@teknorapex.com  
**Website:** www.teknorapex.com

**COIM SpA – Italy**  
**Website:** www.coimgroup.com

## Sharing expertise at international conference

AMEinfo.com reported that a delegation from Emirates Steel was among the participants sharing their expertise at a specialised iron and steel conference in Italy during October 2010. The conference, hosted by Danieli, focused on the latest achievements and developments in both long and flat products.



○ *Members of the Emirates Steel delegation with the conference organisers*

of projects, highlighted the various phases of Emirates Steel's development and explained that by the end of 2013, Emirates steel is anticipated to reach a capacity of 6 million MTPA, placing it amongst the largest producers of steel in the Middle East region.

Emirates Steel controls approximately 45% of the rebar and wire rod market in the UAE. Its main objective is to play a major role in advancing the industrial sector in the Emirate of Abu Dhabi whilst providing extensive work opportunities to UAE nationals.

**Emirates Steel Industries – United Arab Emirates**

**Website:** www.esi-steel.com

Highlighting the importance of the event, HE Hussain J Al Nowais, chairman of General Holding Company (GHC), Emirates Steel's parent company, said Emirates Steel has achieved its business goal to be an efficient and competitive producer of finished steel products. He added that "since the establishment of Emirates Steel four years ago, our goal has been to achieve a sustainable competitive advantage by delivering benefits that exceed those of competing products and creating superior value for our customers. By utilizing our resources and capabilities to the fullest, we have been able to create a series of competitive advantages in cost, production and environmental protection."

Mr Al Nowais, who headed the Emirates Steel delegation to the conference, pointed out that "the objective of our participation is to get acquainted with the latest technologies in the field in order for us to further improve our product quality and performance." Addressing the conference, Engineer Ahmed S Al Dhaheri, Emirates Steel's vice president



# 60 years of drawing dies

Foxton Dies Ltd celebrated its 60<sup>th</sup> anniversary during 2010. Established in 1950 by Frank Fox, the company has grown from a small, locally-based concern into a worldwide manufacturer of tungsten carbide wire drawing dies.

The company has flourished during a period which has seen general manufacturing ravaged in the UK. Frank Fox had worked during the 1940s in the die department at Charles Hurst & Son, a renowned wire drawing factory. He saw the opportunity of setting up a specialist die manufacturing business of his own and so started the company from a small wooden shed in Cleckheaton, Yorkshire just a few hundred metres away from the current premises.

Engineering excellence and customer service remain cornerstones of the company, but managing director Darrell Fox, son of the founder, takes a progressive approach to the future of the business.

“We are well known throughout the world for our quality and reliability, but we really want to strengthen our message even more. Our customers include manufacturers of wire, bar, cables, jewellery, reinforced concrete, tyres and many more, but new applications are being found all the time. Our experience in industry means that we can find solutions for all types of manufacturing challenges.”

Wire drawing dies are a speciality, both round and shaped, but other types of products are manufactured including extrusion, spinner and guide dies. A cleaning and repair service is also offered, along with various ancillary products. Dies can be supplied, often from stock, in any quantity and to any schedule to meet the customer's specific requirements.

Foxton Dies is always looking for talented and reliable agents to represent the company overseas, retaining their own territories but maintaining the same high level of customer service.

**Foxton Dies Ltd – UK** Fax: +44 1274 862 818 Email: [post@foxtondies.com](mailto:post@foxtondies.com) Website: [www.foxtondies.com](http://www.foxtondies.com)



○ Foxton Dies celebrated 60 years in business in 2010

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## New sales & marketing executive at *Wire & Cable ASIA*

International multi-media group INTRAS Ltd has appointed a new marketing executive for its two international wire & cable industry titles, *EuroWire* magazine and *Wire & Cable ASIA* magazine.

Jason Smith, whose sales & marketing career spans 15 years with major publishing houses and the Trinity Mirror newspaper group, takes over responsibility for international advertising sales of English speaking clients across Europe, the Middle East and parts of Asia.

"INTRAS provides its clients with unrivalled support in terms of corporate and promotional marketing, enhancing sales and promoting brand awareness through all the magazines – and at trade exhibitions across the world," he said. "A great advantage for our advertisers is the strong links we have – and the unique supporting role we play – with many international trade fair organisers and exhibition owners. Our 26 years' experience in developing and marketing niche wire & tube industry events, together with our leading industry trade publications, mean no other multi-media group is better positioned for this role."



○ Jason Smith of INTRAS Ltd

"I'm looking forward to meeting as many of our clients as I can, getting to know their business needs, what they want from the market and how we can help them develop their business and get them more sales," said Mr Smith, who was previously sales manager with another publishing company for eight years. "I will also be targeting new businesses which haven't previously advertised with us, and demonstrating why *EuroWire* and *Wire & Cable ASIA* magazines – which are available both in printed and digital e-zine versions – are essential trade magazines for their market."

INTRAS is a family-owned private limited company, whose CEO John C Hogg also co-founded the International Wire & Machinery Association (IWMA), the world's largest corporate membership association for the wire, cable and wire products industries – and the International Tube Association (ITA). Managing director Caroline Sullens added that the company maintains the finest database of wire and tube related industry contacts and company data, and offers marketing and support services to trade fair organisers wishing to develop or enhance sales of exhibition space or the promotion of visitor attendance at worldwide trade events.

Through its range of publications and industry services, INTRAS provides clients with excellent customer support in terms of corporate and promotional marketing, enhancing sales and promoting brand awareness throughout the magazines and at trade exhibitions across the world.

**INTRAS Ltd – UK**  
Email: [jason@intras.co.uk](mailto:jason@intras.co.uk)

**Fax: +44 1926 314755**  
**Website: [www.read-wca.com](http://www.read-wca.com)**

## Order revived as economy improves

German manufacturer SMS Group has announced that ArcelorMittal Hochfeld GmbH, a subsidiary of Luxembourg-based steelmaker ArcelorMittal, has placed an order with SMS Meer for the supply of a complete high-capacity wire rod mill for steel.

The order was originally requested two years ago, but later suspended in view of the economic situation at the time. According to the SMS statement, the wire rod blocks will also be equipped with a new individual drive technology (MEERdrive®) developed by SMS Meer.

The new wire rod mill has been designed to roll technically demanding grades, which are therefore of extremely high quality, to the closest of tolerances. The high-performance mill, designed for an annual capacity of 690,000mt, is expected to commence production in spring 2012.

SMS Meer's scope of supply comprises a walking-beam furnace, the mechanical and electrical equipment of the mill train, all the supply systems, the coil handling equipment, the entire rolling and cooling technology as well as the erection and installation.

**SMS Meer GmbH – Germany**

**Fax: +49 2161 350 1667**

**Email: [info@sms-meer.com](mailto:info@sms-meer.com)**

**Website: [www.sms-meer.com](http://www.sms-meer.com)**

## News and views

The most recent issue of *power & trends*, the customer newspaper of wire and cable machinery manufacturer Maschinenfabrik Niehoff, is now available, free of charge, from any Niehoff office, subsidiary or from the website.

*power & trends 2/2010* provides equipment and company news and is printed in English, Chinese and German with a Russian summary.

**Maschinenfabrik Niehoff GmbH & Co KG – Germany**

**Fax: +49 9122 977 155**

**Email: [info@niehoff.de](mailto:info@niehoff.de)**

**Website: [www.niehoff.de](http://www.niehoff.de)**





○ 中国线缆管件展 2010开幕式

## 中国线缆展大获成功

wire and Tube China 2010举办得很成功，尽管处于金融危机后期。中国线缆管件会展已经是亚洲最大的工业会展，而且还打破了来访人数（4天26,035人）和会展面积（74,500m<sup>2</sup>，比2008会展大30%）纪录。

同时举办的大会和盛事还有中国国际管件研讨会、中国线缆工业研讨会、线缆材料和辅机技术交换研讨会和线缆设备技术讲座，都吸引了很多来访者。

中国线缆展由上海电缆研究所（SECRI）和杜塞道夫展览公司中国公司联合组织。中国线缆 2012 将于9月25日到28日在上海新国际展览中心举行，为发展中的中国市场和亚洲市场提供一个理想的连接平台。

**Messe Düsseldorf China Ltd - 中国**  
传真: +86 23 6232 8001  
电子邮件: [press@mdc.com.cn](mailto:press@mdc.com.cn)  
网址: [www.wirechina.net](http://www.wirechina.net)

### El Sewedy Cable增加对欧洲的出口

AMEinfo报告：埃及的El Sewedy Cables将由于欧洲、中东和非洲对其产品需求的增加而增加其2011年输出。公司计划在未来3年中获得2%-3%欧洲市场。

“欧洲是我们顶级出口市场，它通常是维护和更换用电缆最大的消费者之一，” El Sewedy投资者关系总监Ahmed Homossani告诉路透社新闻服务。

**El Sewedy Electric - 埃及**  
电子邮件: [info@elsewedy.com](mailto:info@elsewedy.com)

传真: +20 2291 7078  
网址: [www.elsewedyelectric.com](http://www.elsewedyelectric.com)

### General Cable兼并BICC Egypt

General Cable Corporation兼并BICC Egypt。BICC Egypt制造各种电气用线缆产品，包括低压绝缘电力和控制电缆、建筑线材、仪表电缆、无卤素电力和控制电缆和高架电力电缆。在以往12个月中，业务报告收入大约是3000万美元。

兼并 BICC Egypt 进一步扩展了General Cable的地域，将在该区域建立生产和商务基地。公司相信埃及的线缆产品需求将继续增长，埃及的增长速度因其不断增加的基础设施和发电项目投资而快于其它国家。埃及将继续大力投资大规模运输、建筑、发电、和输配电基础设施。

**General Cable Corporation - 美国**  
电子邮件: [info@generalcable.com](mailto:info@generalcable.com)  
网址: [www.generalcable.com](http://www.generalcable.com)





# NYDG

上海南洋电工器材有限公司主要从事于电线电缆机械的设计和制造，现主要产品为编织机，绕包机，印字机。其中，编织机按编织线径由小到大分为：轻型、标准型、重型。



GSB-1Q型

GSB-1Q型16锭高速编织机是目前我公司的最新产品.该机型适用于编织极细丝,应用行业包括微型电脑,移动通讯设施,航天航空及军事领域等.该机型的主要技术指标达到国内领先水平,接近国际先进水平,每分钟转速范围0~120米,无极调速;由交流伺服系统控制牵引.编织节距可在2~60mm范围内以精度0.1mm无级任意选择;可编织0.03~0.05mm的极细铜丝;恒张力收放线机构确保编织过程中的张力均衡;机器工作噪音 $\leq 75$ 分贝。



GSB-Z系列

重型机方面，GSB-Z系列高速编织机主要适用于大直径、大长度线缆及管材的钢丝编织。GSB-1Z, 2Z, WGSB-3, WGSB-3B型（16锭，24锭，32锭卧式，36锭卧式钢丝编织机）的最大编织丝直径可达0.4mm\*12股（钢丝）。最大编织芯线直径 $\phi$ 100mm。



绕包机系列

本系列产品可分单头，双头或三头绕包，绕包分为卧式或立式，是生产通讯电缆、控制电缆、防火电缆等专用设备。绕包盘最大转速可达1500r.p.m, 绕包节距0.5mm~30mm,绕包盘最大外径 $\phi$ 300mm。绕包带可分为片式和筒式两种。

## 上海南洋电工器材有限公司

地址: 上海南汇区鹿达路110号

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E-mail: sales@shanghai-nanyang.sina.net



## 在国际大会上分享专业知识

AMEinfo.com报告: Emirates Steel的一个代表团于2010年10月在意大利参加了一个钢铁专业会议,与其它参与者一起分享了他们的专业知识。会议由Danieli主持,主要介绍长型和扁平产品的最新成就和发展。

Emirates Steel 母公司General Holding Company (GHC)主席HE Hussain J Al Nowais概述了大会意义,并说Emirates Steel已达到其业务目标:成为高效的、具有竞争力的钢铁成品生产商。他补充道“自Emirates Steel成为4年来,我们的目标一直是要达到一个可持续的竞争优势,通过提供超越与我们竞争对手产品的效益,为我们的客户创造更高的价值。通过充分采用我们的资源和能力,我们一直能在成本、产量 and 环境保护方面创建一系列的竞争优势。”



○ Emirates Steel代表团成员与大会组织者

参加大会的Emirates Steel 代表团负责人Al Nowais先生指出“我们参加会议的目标是要了解领域的最新技术,以利于我们进一步改进我们的产品质量和性能”

Emirates Steel项目副总裁Ahmed S Al Dhaheri工程师概述了Emirates Steel发展的各个阶段,并解释说,到2013年末Emirates steel的产能将达到6百万吨/年,成为中东地区最大的钢铁生产商之一。

Emirates Steel控制着阿联酋大约45%的钢筋和线棒市场,其主要目标是在推进阿布扎比酋长国工业过程中起重要作用,并为阿联酋国家提供广泛的工作机会。

Emirates Steel Industries – 阿联酋

网址: [www.esi-steel.com](http://www.esi-steel.com)

## Alcan Cable获得ISO 9000

Rio Tinto的Alcan Cable在中国天津的工厂获得ISO 9000国际质量管理体系标准证书。ISO 9000质量管理体系系统强调预防、流程控制、质量活动过程管理实施。

“在日常生产和操作中,我们致力于流程管理,执行最严格的行业标准。中国新工厂获得ISO 9000证书这个成绩是对我们公司操作和管理模式的认可,” Alcan (Tianjin) Alloy Products Co Ltd.总经理Ivan Salamin说。

“天津工厂获得ISO 9000证书标志着重要的里程碑,巩固了我们在中国市场的地位,” Alcan Cable总裁Jack Miller说。

Alcan Cable – 美国  
网址: [www.cable.alcan.com](http://www.cable.alcan.com)

## Teknor Apex经销COIM化合物

意大利化学公司COIM SpA任命Teknor Apex Company为其Laripur™ 热塑聚氨酯(TPU)弹性体化合物供应给美国、加拿大和墨西哥线缆制造商的独家代理。“我们很高兴与Teknor Apex这样的高价值合作伙伴进行战略合作,” COIM 的Laripur TPU经理 Antonio Piroddi说。“他们的技术和商务能力、加上COIM的TPU专业知识、以及广泛的产品为北美的线材和电缆客户提供了一个有价值的新资源。”

Teknor Apex副总裁Louis R Cappucci说:“TPU对恶劣的最终使用环境尤有价值,因为它们具有极好的抵御能力,抗摩擦、化学和生物、水力、以及低温挠性。”

Laripur化合物有各种牌号,硬度从60 Shore A到75 Shore D。作为弹性体,他们本身具有挠性,不含塑料,除非采用某些专门配方。电缆的典型应用包括汽车传感器、防抱死刹车系统、矿产,地震监测和石油开采。

Teknor Apex Company – 美国  
电子邮件: [vinyl@teknorapex.com](mailto:vinyl@teknorapex.com)  
网址: [www.teknorapex.com](http://www.teknorapex.com)

COIM SpA – 意大利  
网址: [www.coimgroup.com](http://www.coimgroup.com)

## 新工厂使产量翻倍

Hu An Cable Holdings是在中国的线缆制造商,为了加强其电缆生产能力,动工建设一个新工厂。新工厂隶属其新成立的分公司 – Hu An (Wuxi) Cable Technology Co. 工程占地80,000m<sup>2</sup>, 厂房面积60,000m<sup>2</sup>, 位于宜兴市的集团现有工厂附近。集团已下订单,从芬兰和德国进口建造两条超高压电力电缆生产线。新工厂总投资达3.38亿人民币(约6700万美元),包括3条从芬兰和德国进口的110kV和以上电力电缆生产线,2条国产的中压电力电缆生产线。项目投资源于公司首发上市股净收入、内部融资和银行借贷。

Hu An Cable Holdings Ltd – 中国

网址: [www.chinahuanacable.com](http://www.chinahuanacable.com)

## 连续铸造论坛

国际线材协会(WAI)宣布将在2011年5月2日-5日的亚特兰大国际线缆会展期间举办第一届全球铜从业者连续铸造论坛。

33位工业专家将引领论坛,包括技术和操作介绍、互动研讨和专题讨论,他们将成为所有连续铸铜操作人员的一个用户组。

论坛话题包括:

- 历史信息: 关于铜、连续铸造、线材拉伸和立式燃烧炉
- 工艺概述,由Properzi、SCR、Contirod 和Upcast OY作介绍
- 新技术: 去锈、脱气、棒材测试、废料处理
- 新耐火材料和安装实践
- 囊式集尘室: 设计、火灾调查
- 过滤: 熔融金属、铸造设备和工艺水
- 立式燃烧炉燃烧比和溶解氧
- 阴极杂质和棒材质量
- 线材断裂分析和钢粉再生
- 预防性维护: 电子驱动、硬件和软件解决方案

WAI会员要支持登记费395美元;非WAI会员须支付登记费495美元。费用包括进入2011国际线缆会展展厅、技术活动和开幕式接待。

Wire Association International Inc – 美国  
网址: [www.wirenet.org](http://www.wirenet.org)

传真: +1 203 453 8384



## 经济复苏订单恢复

德国制造商SMS Group宣布：以卢森堡为基地的钢铁制造商ArcelorMittal的分公司ArcelorMittal Hochfeld GmbH给SMS Meer下达一份订单，要求供应一整套高速线材轧机。这份订单早在两年前提出，但当时因经济原因而搁置。

根据SMS声明，线材轧机还将配备SMS Meer新开发的单体驱动技术(MEERdrive®)。新的线材轧机设计轧制技术上要求很高的牌号，产品质量高，公差精。这套高性能线材轧机设计年产690000公吨。预计于2012年春季开始商业生产。

SMS Meer的供应范围包括一个步进式加热炉、冷轧机组机械和电气设备、所有供应系统、线圈搬运设备、整个冷轧和冷却技术以及安装。

**SMS Meer GmbH – 德国**  
 传真: +49 2161 350 1667  
 电子邮件: info@sms-meer.com  
 网址: www.sms-meer.com

## 新闻和观点

线材和电缆机械制造商Maschinenfabrik Niehoff的客户报纸Power & Trends发行最新版，你可以从Niehoff的任何办事处、子公司或从网站免费获得。Power & Trends 2/2010提供设备和公司新闻，印制成英语、中文和德语，包括俄语小结。

**Maschinenfabrik Niehoff GmbH & Co KG – 德国**  
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 电子邮件: info@niehoff.de  
 网址: www.niehoff.de

## Nexans与Draka Holding NV开始商谈

Nexans获得Flint Beheer BV的承诺：在一定条件下，对外招标它在Draka Holding NV的股份，如果Nexans提供兼并Draka Holding NV的报价。Nexans同意向Draka Holding NV提出一份报价，以便对提议的现金报价进行谈判，即在一定条件下，以15欧元/股的价格，购买Draka Holding NV所有的剩余普通股。

Nexans首席执行官Frédéric Vincent说：“当前交易将有助于电缆领域兼并，改进Nexans的欧洲资产基地的竞争力，加强其在特殊电缆领域的地位。”

Nexans抱着尽快达成协议的想法与Draka Holding NV开始谈判。但是，Keijser Capital的资产经理Ed Manie说：Nexans对Draka Holding NV的报价可能是一个有敌意的开叫，可能在Nexans和意大利对手Prysmian之间引发一场价格战。Draka的大股东Flint Beheer拥有公司48.48%的股票，它支持Nexans的报价，Manie相信其它股东正等着看提议兼并的进一步发展。Draka和Prysmian取消了去年的兼并会谈，因为他们无法在交易的主要条件上达成一致。

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## 60年拉伸模具经验

2010年，Foxton Dies Ltd庆祝其60华诞。Frank Fox于1950年创立了这家公司，以本地市场为基础，从小公司成长为全球碳化物线材拉伸模具制造商。

公司鼎盛一时，当时英国的一般制造业遭到损坏。1940年，Frank Fox在著名的线材拉伸工厂Charles Hurst & Son的模具部门工作。他看准机会，创立了自己的专业模具制造业务，从一个在约克郡Cleckheaton的小木棚发展成为一家公司，这个小木棚离现在的公司所在地仅一两百米。

工程优异和客户服务仍然是公司的基石，创始人之子公司总裁Darrell Fox对未来的业务积极进取。

“我们的质量和可靠性闻名全球，但我们还想进一步加强。我们的客户包括线材、棒材、电缆、钻石、钢筋混凝土、轮胎等制造商，但我们一直还在发现新的应用。我们在工业的经验意味着我们能发现所有类型的制造挑战的解决方案。”

线材拉伸模具（不管是圆形的还是成形的）是公司的特色产品，但公司还制造其它类型的产品，包括挤出、纺织、引导模具。公司还提供清洁和维修服务、以及各种辅助产品。公司经常能现货供应模具，在数量和进度上都能满足客户的具体要求。

Foxton Dies总是期望拥有优秀可靠的代理来代理公司的海外业务，维护其自己的业务领地，同时维护同样高水平的客户服务。

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○ Foxton Dies在2010年庆祝其60华诞

## 住友在中国生产光缆

2010年9月，日本Sumitomo Electric Industries开始整合在中国的光缆生产，向不断增长的需求投资。Sumitomo Electric在杭州与中国的一家主要光缆制造商Futong Group合资建设一个新工厂，大量生产基材。日本日经指数表明：日本和美国的主要制造商已不愿意在中国生产玻璃基材——一种关键的光纤材料，以防技术泄密，但看来态度在改变。中国对光缆的需求约占全球需求的50%，而且还会继续扩大。

2009年，Sumitomo Electric在全球市场占据14%份额，排行老二。日经指数说，计划产量增加后将使其市场份额接近20%。

若以光纤计算，玻璃基材的年产量将达到600万公里。Sumitomo Electric光纤输出预计增加20%，达到3500到4000万公里。德国Draka公司是目前中国唯一主要的基材制造商。

**Sumitomo Electric Industries – 日本**  
 网址: http://global-sei.com



## After a decade of growth driven by mobile technologies, the UN's telecoms agency takes stock of the connecting-up of the world

"Broadband is the next tipping point, the next truly transformational technology," asserts secretary-general Hamadoun Toure of the International Telecommunications Union. "It can generate jobs, drive growth and productivity, and underpin long-term economic competitiveness."

The report "The World in 2010: ICT Facts and Figures," published by the ITU in October, presents the Geneva-based UN agency's analysis of the current state of information and communication technologies around the globe. The opening section, "The Rise of 3G," provides these statistics:

- ① By the end of 2010, there will be an estimated 5.3 billion mobile cellular subscriptions worldwide, including 940 million subscriptions to third-generation (3G) services
- ① Access to mobile networks is now available to 90% of the world's population and to 80% of those living in rural areas
- ① People are moving rapidly from 2G to 3G platforms, in both developed and developing countries. In 2010, 143 countries were offering 3G services commercially, compared to 95 in 2007
- ① Regarding 4G, a number of countries have started to offer services at even higher broadband speeds, moving to next-generation wireless platforms. These include Sweden, Norway, Ukraine and the United States

"Towards The End Of Double-Digit Mobile Growth," the second section of the ITU report, supplies these statistics:

- ① Mobile cellular growth is slowing worldwide. In developed countries, the mobile market is reaching saturation levels with on average 116 subscriptions per 100 inhabitants at the end of 2010 and a marginal growth of 1.6% from 2009 to 2010
- ① At the same time, the developing world is increasing its share of mobile subscriptions from 53% of total mobile subscriptions at the end of 2005 to 73% at the end of 2010
- ① In the developing world, mobile cellular penetration rates will reach 68% at the end of 2010, mainly driven by the Asia-Pacific region. India and China alone are expected to add over 300 million mobile subscriptions in 2010
- ① In the African region, penetration rates will reach an estimated 41% at the end of 2010 (compared to 76% globally), leaving a significant potential for growth

The remaining sections of the report are: "SMS Triples in Three Years"; "Two Billion People on the Internet but Too Few in Africa"; "Connecting Homes"; "The Continuing Broadband Divide"; and "Broadband Speed and Affordability". The World in 2010: ICT Facts and Figures may be read in its entirety on the ITU website [www.itu.int](http://www.itu.int)

## Two cables under the Tasman Sea between New Zealand and Australia would be one too many

Each of two New Zealand companies – Kordia and Pacific Fibre – has plans for an undersea cable linking New Zealand with Australia. But, as reported on [telecomasia.net](http://telecomasia.net), both company chiefs acknowledge that only one such project would be viable. ("NZ Firms Square Off in Tasman Cable Race," 11<sup>th</sup> October). State-owned Kordia is the former

Television New Zealand transmission arm that now operates on both sides of the Tasman Sea. Pacific Fibre is a private company founded in 2010 by six New Zealanders.

Dylan Bushell-Embling of [telecomasia.net](http://telecomasia.net) noted the similarities and differences between the two projects. Kordia's \$100 million OptiKor cable would connect Auckland with Sydney and then link with the PPC-1 of PIPE Networks, running from Australia to Guam. The Pacific Fibre cable is slated to link Auckland with Sydney and then the United States. That project would cost an estimated \$400 million.

Kordia CEO Geoff Hunt told Dylan Bushell-Embling of [telecomasia.net](http://telecomasia.net) that his company's cable would take advantage of the absence of competition in New Zealand's international bandwidth market.

Southern Cross's SXC is currently the only cable with spare capacity linking Australia and New Zealand.

"There's a lack of diversity for the Auckland-to-Sydney route, [and] SXC is the only game in town," he said. "So competition was needed to bring bandwidth pricing out of New Zealand to realistic levels."

Mr Hunt commented that the mere threat of competition from the two projects had already brought capacity prices down significantly. Southern Cross was said to have slashed its fees by 75% since the OptiKor project was announced.

While OptiKor is in an "advanced stage of preparation," according to its CEO – with surveys completed and landing routes plotted – the project has not advanced to the construction phase.

Mr Hunt acknowledged, "We need foundation customers in place to underpin the financing of the project and we don't have them in place."

For its part, Pacific Fibre has a tentative rollout schedule that would see a vendor chosen early this year and the cable in service by 2013, CEO Mark Rushworth said. But his project, too, has met with obstacles: "typical" issues of technology, funding, and sales. As noted by [telecomasia.net](http://telecomasia.net), the two parties are looking into the possibility of a collaboration.

## Elsewhere in telecom . . .

- ① The *Nikkei Weekly*, Japan's English-language business newspaper, reported on 21<sup>st</sup> October that negotiations were believed to be under way for the imminent \$1.2 billion purchase of Keane Inc, a Boston-based IT services firm, by NTT Data Corp of Japan.

NTT Data is the network-services unit of the largest Japanese phone company, and the strengthening of its presence in the US would advance its stated aim to quadruple overseas sales in the three years to March 2013.



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The move would also be in line with the expansion by its parent Nippon Telegraph & Telephone Corp, which in July 2010 agreed to buy South Africa's Dimension Data Plc for \$3.3 billion. Keane is half-owned by a Citigroup Inc unit.

- ④ Next-generation broadband is among the comparatively few areas to be spared the cuts in public spending stipulated by British prime minister David Cameron. As announced in its spending review, released 20<sup>th</sup> October, his government will run a trial of super-fast broadband in rural areas of the Highlands, North Yorkshire, Cumbria and Herefordshire.

The BBC has agreed to contribute \$470 million towards the \$675 million cost of the project, which is expected to benefit some two million households, including those in remote locations currently restricted to dial-up Internet connectivity.

Speaking about the decision to test next-generation broadband in rural areas, chancellor George Osborne said: "It will help encourage the growth of our creative industries as a key part of the new economy we are seeking to build."

- ④ On the subject of broadband in Britain, research conducted by London-based YouGov discloses that more than two in five Britons (44%) "don't know" or "don't care" how fast their broadband connection is; while nearly a third (30%) say that inconsistent speeds account for most of the frustration they experience with their broadband connections.

As noted by Carrie-Ann Skinner in *PC Advisor* (15<sup>th</sup> October), the public-opinion sampling firm also discovered that nearly two in five (39%) of its British respondents consider value for money the most important factor in the selection of a Web connection; while 31% would like to have their broadband bundled with telephone and TV. It was found that nine in ten Britons access the Internet from home on a daily basis. On average, they spend two hours and 12 minutes online each day.

- ④ The latest Germany Telecommunications Report from Research and Markets (4<sup>th</sup> October) said that some mobile operators that acquired spectrum in the 800MHz band in the April 2010 auctions have begun activating their plans for long-term evolution networks in the country.

Vodafone was reported to have selected equipment manufacturers Huawei Technologies and Ericsson as technology partners for an LTE network mainly for underserved areas of Germany.

The British-based telecom planned to start the deployment at the end of September 2010, with around 1,500 base stations slated for LTE technology by the end of 2011.

In August 2010, Finnish-German telecom equipment vendor Nokia Siemens Networks (NSN) was selected to build a pilot LTE network in Halle, in southern Saxony.

According to Research and Markets, NSN is to roll out base stations and EPC (enhanced packet core) nodes to provide broadband capacity and coverage in both the city of Halle and suburban Teutschenthal.

The pilot network in Halle will operate in the 2.6GHz band; in Teutschenthal, in the 800MHz band. The project was scheduled to be in pre-commercial operation by the beginning of this year.

- ④ Communications equipment maker Alcatel-Lucent has introduced a new converged architecture for its next-generation communications platforms, bringing "SIP-to-the-core" to such applications as unified communications and collaboration.

The new Session Initiation Protocol-based communication platforms deliver multimedia conversations — including video, voice and SMS — to users across any device.

They can also be expected to reduce costs by consolidating all access points and devices across the enterprise.

As noted by John Kennedy of *siliconrepublic.com* (10<sup>th</sup> October),

Paris-based Alcatel-Lucent has a history of innovation in the technology, beginning with the introduction in 2000 of SIP trunking to its OmniPCX platform.

This was followed by the release of the Genesys SIP server and the addition of SIP device support to the OmniPCX.

- ④ In other news of Alcatel-Lucent, its chief executive Ben Verwaayen has said that he expects China and India to be "very attractive" markets for the company as the world's two most populous nations add more phone users and upgrade networks.

Mr Verwaayen is seeking to reverse a decline in Alcatel-Lucent's sales in China, the world's biggest phone market by users, which led the French company to a wider-than-expected loss in the third quarter of last year.

Speaking in a TV interview from Kuala Lumpur, Malaysia (5<sup>th</sup> October), he said, "Asia, for the telecom market, is to a large extent what happens in China and India."

- ④ As reported by Lucas Mearian of *Computerworld* (12<sup>th</sup> October), millions of small- and medium-sized businesses (SMBs) are vastly underserved by suppliers of data protection hardware and services, even though the organisations have many of the same needs as large enterprises.

He cited a report on the topic by research firm Storage Strategies NOW (Austin, Texas) to the effect that SMBs are now facing an explosion of data growth similar to what their bigger-business counterparts experienced some years back.

The study produced three key findings: a disconnect between the size of the business and the amount of data it needs to protect; a movement of SMBs to cloud-based technologies because of a lack of IT resources; and a shift by the great majority of SMBs away from tape to disk- or cloud-based backup as their primary mode of data protection.

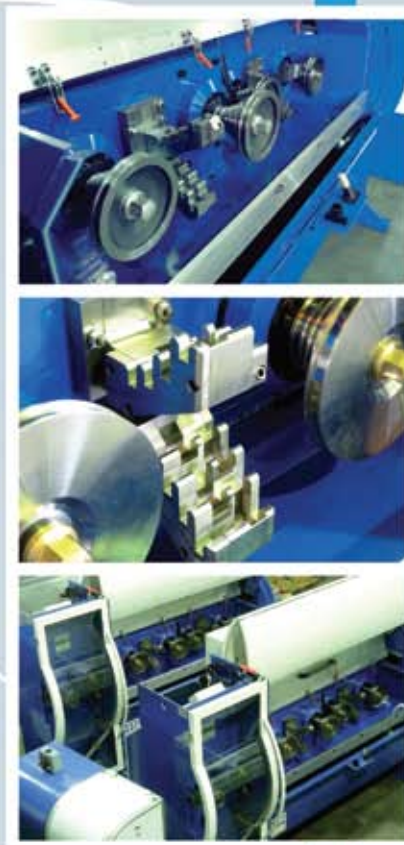


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## 移动技术驱动增长十年之际，国际电联盘点世界通信行业

国际电信联盟秘书长Hamadoun Toure确认说：“宽带是下一个增长点，是真正的革命性技术。它能带来就业，推动增长，提高生产率，巩固长期经济竞争力。”

国际电联10月份出版的题为《2010年的世界：信息通信技术动态与数字》的报告阐述了这家位于日内瓦的联合国机构的全球信息通信技术当前状况的分析。开篇章节“3G的兴起”，提供了如下统计数据：

- ① 到2010年底，全世界的移动电话用户估计有53亿，其中9.4亿是3G用户；
- ② 移动网络已经覆盖了世界人口的90%，以及农村人口的80%；
- ③ 人们正在迅速从2G平台转向3G平台，在发达国家和发展中国家均是如此。2010年提供3G商业服务的国家已有143个，2007年为95个；
- ④ 对于4G，一些国家已经开始以更高的宽带速度提供业务，转移到新一代无线平台上。这些国家有瑞典、挪威、乌克兰和美国。

国际电联报告的第二章题为“移动业务两位数增长时代走向终结”，提供了如下统计数据：

- ① 移动电话的增长在全球逐步放缓。在发展中国家，到2010年底，移动市场正在接近每100个居民116个用户的饱和水平，2009年到2010年的增长率仅为1.6%；
- ② 同时，发展中国家移动用户的份额从2005年底的53%已经增长到2010年底的73%；
- ③ 在发展中国家中，移动渗透率到2010年底已经达到68%，主要是受亚太地区的推动。中国和印度移动用户数在2010年将新增3亿；
- ④ 在非洲地区，渗透率到2010年底预计将达到41%（全球76%），具有显著的增长潜力。

国际电联下几个章节的标题是“SMS三年内翻三番”、“二十亿人上网，但非洲很少”、“连接到户”、“持续中的宽带分野”和“宽带速度和资费承受力”。《2010年的世界：信息通信技术动态与数字》可以到国际电联网站：[www.itu.int](http://www.itu.int)上阅读。

## 塔斯曼海新建两条海底光缆将带来过剩

两家新西兰公司Kordia和Pacific Fibre都计划兴建一条连接新西兰和澳大利亚的海底光缆。不过据telecomasia.net的报道，两家公司的首脑承认，只有一个这样项目是可行的。（10月11日《新西兰公司塔斯曼海底光缆争夺战开打》）

国有的Kordia的前身是新西兰电视台的传输部门，现在在塔斯曼海两岸都有业务。Pacific Fibre是2010年由六名新西兰人创建的私营公司。

telecomasia.net 的记者 Dylan Bushell-Embling 指出了这两个项目的异同。Kordia投资1亿美元的OptiKor光缆将把奥克兰与悉尼连接起来，然后连接到PIPE网络的PPC-1，从澳大利亚一直延伸到关岛。Pacific Fibre cable则首先把奥克兰和悉尼连接在一起，然后连接到美国。该项目计划投资4亿美元。

Kordia的首席执行官 Geoff Hunt在接受telecomasia.net记者Dylan Bushell-Embling采访时表示，该公司的光缆可以利用新西兰国际带宽市场缺乏竞争的空档。Southern Cross的SXC是连接澳大利亚和新西兰唯一有空闲容量的光缆。

Hunt表示：“奥克兰到悉尼的线路比较单一，SXC是唯一的选择。因此需要引入竞争，让新西兰的带宽价格降低到合理的水平。”

Hunt表示，仅这两个项目之间的竞争就已经能够把容量价格大幅度下拉。Southern Cross据称在OptiKor项目宣布之后，已经把资费下调了75%。据OptiKor的首席执行官称，虽然OptiKor已经进入“高级筹备阶段”，调研已经结束，登陆线路已经规划完毕，但项目还没有推进到建设阶段。Hunt承认：“我们需要基础性的客户群来保证项目的资金，但我们现在还没有。”

Pacific Fibre的首席执行官Mark Rushworth表示，Pacific Fibre也准备了自己的临时性推出日程，在今年初选定厂商，在2013年投入使用。但他的项目也遇到了阻力：“典型”如技术、资金和销售。据telecomasia.net报道，双方正考虑进行合作。

## 其他电信新闻...

- ① 据日本英文经济报刊《日经新闻周刊》(Nikkei Weekly)10月21日报道，日本NTT Data Corp据信正在进行磋商，准备出资120亿美元，买下

波士顿的IT服务公司Keane Inc。NTT Data是日本最大电话公司的网络服务部门，通过增强在美国的地位，可以帮助实现其到2013年3月海外销售增长翻三倍的目标。该行动也与其母公司Nippon Telegraph & Telephone Corp同步。NTT在2010年7月同意出资33亿美元买下南非的Dimension Data Plc。Keane的一半股份为花旗持有。

- ② 新一代宽带是英国首相卡梅伦公共开支缩减中为数不多的几个被豁免的领域。英国政府在10月20日公布的开支评审报告中称将在高地郡、北约克郡、坎布利亚郡和赫里福德郡的乡村地区进行超高速宽带的试点。BBC已经同意承担项目总投资6.75亿美元中的4.7亿美元。该项目预计将惠及大约200万户家庭，包括目前只能通过拨号上网的偏僻地区的居民。对于在乡村地区测试新一代宽带，英国通信部大臣George Osborne表示：“这将有助于我们创新产业的增长，推动我们新经济的发展。”

- ③ 就英国建设宽带一事，伦敦的YouGov进行了相关调研，发现在每五个英国人中，超过2人（44%）“不知道”或者“不在乎”他们的宽带连接速度如何。而有大约三分之一（30%）的人速度不能保持一致是他们使用宽带连接时遇到的最大问题。据PC Advisor（10月15日）记者Carrie-Ann Skinner的报道，这个公众观点调研机构还发现每五个英国受访者中，有两个（39%）认为经济原因是选择网络连接的主要因素，而且有31%的受访者希望把宽带与电视和电话绑定在一起。调研还发现，10个英国人中有9个每天都从家里上网。平均来说，他们每天花的时间是两小时12分钟。

- ④ 来自Research and Markets的德国电信报告（10月4日）称部分在2010年4月购入800MHz频段的移动运营商已经开始启动它们在德国的长期演进网络计划。据报道，沃达丰已经选中电信设备制造商华为技术和爱立信作为在德国尚未建设3G地区建设LTE网络的技术合作伙伴。这家英国电信公司计划在2010年9月底启动部署，到2011年底完成1,500个基站的建设。

2010年8月，芬兰—德国电信设备厂家诺基亚西门子网络（NSN）被选中在萨克森南部的Halle建设一个LTE网络实验局。根据Research and Markets提供的消息，诺西准备建设基站和EPC（增强型包核心）节点，为Halle市和Teutschenthal郊区提供宽带容量和覆盖。Halle的实验局网络将工作在2.6GHz频段上，Teutschenthal的工作在800MHz频段上。该项目预计将在今年初投入商用。



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## Telecom

### The science of fibre optics takes up the challenge of satisfying an insatiable appetite for the Internet

Internet traffic, which doubles every two years, may soon fill its transmission systems to capacity. And the laws of nature do not permit any acceleration in the speed of light, not even in a fibre optic network. Stojan Radic, a professor of electrical engineering at the University of California, San Diego, warned the *New York Times*, "We are looking at a point soon where we cannot satisfy demand. And if we don't, it will be like going over a cliff."

This does not overstate the case. The everyday marvels of Internet communication that we take for granted must share the central networks with ever-proliferating mobile devices and ceaselessly expanding information databases: now they must also accommodate the demands of cloud computing. Only a very remarkable imagination is able to comprehend the amount of traffic that, every second, will have to be carried around the world along optical fibres no thicker than human hairs.

The good news, reports the *Times*'s Anne Eisenberg, is that scientists are finding ingenious ways to satisfy our bandwidth hunger. Constrained by the speed of light, they "can tap other characteristics of light to pack layers of information into each optical fiber in the network, so that far more data can flow simultaneously down those glass backbones." ("Wider Streets for Internet Traffic," 9<sup>th</sup> October)

Light is an electromagnetic wave, with an electrical field. A fibre can carry many wavelengths of laser light, with each wavelength adding to the bits transmitted per second. It is this that the scientists who spoke with Ms Eisenberg are exploiting to add to the information on each wavelength. The bit rates now attainable are in the billions (gigabits) per second or even trillions (terabits) per second.

Paris-based Alcatel-Lucent recently announced a system for telecom service providers that takes advantage of both the polarisation and phases of light to encode data. James Watt, head of the company's optics division, told the *Times* that the system can more than double the capacity of a single fibre – thus enabling the transmission of more than twice the number of high-definition TV channels than can now be streamed concurrently.

❖ Other companies active in developing the next-generation systems that will be needed include Ciena (Linthicum, Maryland) and Infinera (Sunnyvale, California). As to cost considerations, a spokesman for Alcatel-Lucent said that the company expects its equipment to reduce the cost per transmitted bit of information. Its systems are based in part on the work of the researcher Gabriel Charlet, a scientist at an Alcatel-Lucent Bell research facility in France, who in 2009 sent data at a rate of 7.2 terabits a second over a single fibre more than 7,000 kilometres long.

Andrew Chraplyvy, a scientist and executive at the Bell Labs of Alcatel-Lucent in Crawford Hill, New Jersey, where

fibre optic research originated in the 1960s, pointed out that scientists have long known how to use polarisation and phases of light to encode information. Dr Chraplyvy, a winner of the prestigious Marconi Prize for his work in communications and information technology, told Ms Eisenberg, "Although we could do it, we never needed to before, because the capacities we had were enough."

❖ Now, that capacity is being drawn down; demand for core network improvement grows as we read this; and the scientists must pedal furiously to stay ahead of the impending Internet traffic jam. Keren Bergman is a professor of electrical engineering at Columbia University, in New York, and heads the Lightwave Research Laboratory there. She told the *Times* that the new equipment is part of a continued research drive to increase the capacity of each strand of optical fibre.

"We are," Dr Bergman said, "stuffing more information into the same space."

### Older is better, to judge from the accident reports on Apple's latest-version iPhone

Apple's iPhone 4 smartphones are 67% more likely to be accidentally damaged than their iPhone 3GS predecessors, according to warranty provider SquareTrade. As reported by Danny King of *DailyFinance* (12<sup>th</sup> October), an analysis was made of 20,000 accident claims from registered iPhone 4 customers. The vast majority of the accidents involved broken screens, with iPhone 4 owners being 82% more likely to report damaged screens than their 3GS counterparts.

Some 15.5% of owners of the fourth-generation phone will have an accident within a year of purchase, SquareTrade predicted. "The iPhone 4 appears to be significantly more likely to break than previous versions, as we speculated back in our June iPhone report," the company said. "Not only has the scratchable surface area doubled – the new aluminosilicate Gorilla glass used in the iPhone 4 doesn't seem any less likely to break than previous models."

Mr King noted that Apple, which introduced its first iPhone in 2007 and unveiled its fourth-generation iPhone in June of last year, continues to see growth in profits from the popular phone. In July 2010 the company posted a third-quarter profit that surged 78% from the year-before quarter on a record \$15.7 billion in revenue, partly on the sale of 61% more iPhones. Fourth-quarter results were expected to be gratifying, as well.

## Latin America

### Seabed cables are seen as key to a market whose IP traffic will grow faster than that of any other region through 2014

"Poised for huge leaps in data consumption and subscriber growth, Latin America could be telecom's golden goose if carriers can overcome infrastructure challenges, including the lack of undersea cable systems."



Writing in *SearchTelecom.com*, Jessica Scarpati went on to consider the prospects for telecom operators interested in Latin America's potential. Having only so many new revenue opportunities in mature markets like North America, these operators, she said, are trying "desperately" to drum up new services to compensate for a saturated market weighed down by sluggish growth in average revenue per user (ARPU). ("Latin America Poised for Growth, Challenged by Lack of Undersea Cable," 5<sup>th</sup> October)

Latin America is clearly a land of opportunity for operators in that situation. According to the latest Visual Networking Index released by Cisco Systems, consumer and business Internet protocol (IP) traffic there is expected to show a 51% compound annual growth rate (CAGR) in the period 2009-2014, faster than in any other region.

This puts Latin America ahead of the Middle East and Africa, each with a 45% CAGR over the five years. Mobile data will likely be the fastest-growing category of IP traffic almost everywhere, with Latin America expected to achieve a 111% CAGR through 2014.

The outlook for Latin America is too good to have escaped notice. But, vis-à-vis North America, Asia and Europe, the region is woefully underserved by undersea cable. "There are not that many systems that go down there," said Michael Wheeler, vice president of the global IP network

business unit at NTT America Inc (New York). "And a lot of them [run only up and down] the Atlantic seaboard."

Ms Scarpati confirmed that – compared with the large amount of undersea cable between California and Japan, say, or New York and Britain – the submarine cable system landing in South America appears paltry, particularly below the Equator.

She wrote, "Central America and the Caribbean fare better, benefiting from their proximity to North America and the ample number of landing points on the various islands."

❖ While an ocean-floor cable network is not a project to be undertaken lightly, to those operators seriously interested in tapping the potential of Latin America it may present the least challenging approach. New Jersey-based telecom consultant Tom Nolle told *SearchTelecom* that, throughout many parts of the region, fixed-line isn't always financially or logistically feasible, and wireless is constrained by line-of-sight. Accordingly, he said, undersea cable is the best option to connect countries within Central and South America and to the rest of the world.

"If you're going through the jungles of Panama or northern Colombia, I wouldn't want to try to install cables through that mess," Mr Nolle said. "At that point, it would be cheaper to start at a place like Bogotá and [trench] undersea cable."

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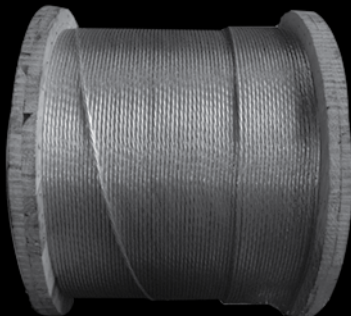
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## Automotive

### The most environmentally responsible auto maker in the US is Honda, with Toyota and Hyundai the runner-ups

According to a study released on 6<sup>th</sup> October by the Union of Concerned Scientists, Honda Motor Co, of Japan, produces the greenest vehicles in the United States. Toyota Motor Corp and Hyundai Motor Co – Japanese and South Korean, respectively – are tied for second place. The study considered eight auto makers that together sold 92% of the vehicles on offer to Americans during the 2008 model year. This was the most recent year for which the non-profit advocacy group was able to gather comprehensive information from the Transportation Department and the Environmental Protection Agency.

The results were derived from the predicted impact of auto makers' fleets on global warming (based largely on miles-per-gallon of fuel) and the smog-forming emissions of the engines. The scores were calculated by giving the global warming and smog-forming emissions data equal weight.

As explained by Christopher Jensen of the *International Herald Tribune* (7<sup>th</sup> October), a score of 100 represents the average of the eight companies examined. Scores with lower numbers indicate better, greener performance. A score of 80 means that the auto maker beat the industry average by 20 per cent.

Honda, which has taken the top spot every time over the five-year course of the study, received 86 points; Toyota and Hyundai, 87 points each; Volkswagen, 90; Nissan, 93; Ford, 108; General Motors, 109; and Chrysler, in last place, 113 points.

Mr Jensen, who writes the "Wheels" blog in the *Tribune*, noted that, while all auto makers must meet certain minimum emissions standards, some manufacturers produce more sophisticated and cleaner engines. Jim Kliesch, the author of the study and a senior engineer in the group's Clean Vehicles Program, acknowledged that selling a great many small, fuel-efficient vehicles could help an auto maker in the rankings. But, he pointed out in an interview with "Wheels", to excel a producer must do well – on fuel economy as well as on emissions – with vehicles of all sizes.

## Steel

### Northeast Florida, on the Atlantic coast, gains in importance as a scrap steel exporter

As reported by staff writer Mark Szakonyi of the *Jacksonville Business Journal*, the growing demand from developing countries for steel scrap is a boon for northeast Florida, benefiting ports, transportation companies, and – increasingly – junk car exporters. Exports of scrap metal from the US, mainly from junked cars, totalled \$21.4 billion in 2009.



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Alberto Cabrera, the director of cargo sales and marketing for the Jacksonville Port Authority, offered two reasons for the burgeoning demand for steel scrap from the United States: infrastructure investment by South American countries, and China's shutdown of many steel mills that did not meet carbon-dioxide emission standards.

According to the Institute of Scrap Recycling Industries Inc, a Washington-based trade association, China accounted for about a third of American steel scrap exports, with Canada, South Korea and Turkey the other major takers. The \$54 billion domestic recycling industry employed about 105,000 people

in 2009, according to the institute. As noted by Mr Szakonyi of the *Journal*, the "anecdotal evidence" of a developing hub in northeast Florida includes a dozen known recyclers and a new marine terminal in Talleyrand to handle steel scrap. ("Jacksonville Scrap Steel Creates Export Opportunity," 8<sup>th</sup> October)

#### Elsewhere in steel . . .

❖ Craig Bouchard, who gained a reputation for acumen by getting out of the steel business just before the global recession sapped demand, is getting back in. Mr Bouchard, with his brother James, sold the steel assets of their company Esmark Inc (Chicago) to Russia's OAO Severstal for \$775 million in August 2008.

Now, perceiving that weak steel demand and restricted access to credit represent an opportunity, he is founding a company to acquire steel producers and distributors. "The steel market has no legs right now. Customer demand is not there," Craig Bouchard told *Bloomberg News* (1<sup>st</sup> October). "It creates incredible valuation opportunities if you believe the world is going to start recovering next year [2011]. And I believe the world is going to start recovering next year. Therefore I'm a buyer."

Shale-Inland LLC will seek acquisitions in \$20 million to \$100 million range, said Mr Bouchard, who will serve the Chicago-based start-up as chief executive officer.

#### Trade

#### In a green-tinged issue with China, the United Steelworkers union finds a receptive ear close to the President

US Trade Representative Ron Kirk said (15<sup>th</sup> October) that he would investigate claims by the United Steelworkers (USW) union that China is violating trade laws through massive subsidies of its clean energy industry.

He holds a Cabinet-level position and serves as President Barack Obama's principal trade advisor, negotiator and spokesperson on trade issues.

Mr Kirk announced his decision a month after the 850,000-member union asked Washington to pursue a trade case based on what USW officials called "protectionist and predatory practices" by which China threatens US jobs and manufacturing.

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“Green technology will be an engine for the jobs of the future, and this administration is committed to ensuring a level playing field for American workers, businesses and green technology entrepreneurs,” Mr Kirk said.

The USW charges China of breaching trade rules on five counts, notably by requiring Chinese manufacturers to use a high percentage of Chinese-made goods in their clean-energy products. The trade case decision was also welcomed by the Alliance for American Manufacturing.

Another 15<sup>th</sup> October development on the China front held less cheer for the union. The USW and American steel producers allege that by keeping the value of the yuan artificially low – thereby providing a subsidy of up to 40% for Chinese exports – China has cost millions of US workers their jobs.

But US Treasury Secretary Tim Geithner announced that that he would put off issuing a statement on China’s conduct of its currency policy until the G-20 summit meeting of finance ministers and central bank governors in Seoul, South Korea, in November.

For another view of the postponement by Mr Geithner, Scott Lincicome, an international trade lawyer with the New York law firm White & Case, saw it as a good thing.

Mr Lincicome told Len Boselovic, of the *Pittsburgh Post-Gazette* (16<sup>th</sup> October), “A bunch of name-calling right before you get together for an adult conversation is not the best strategy to use when conducting international negotiations that could affect hundreds of billions of dollars in global trade.”

## ‘A trust gap’

### Encountering sceptics in the halls of Congress, China’s Huawei sets itself to exhibit greater transparency in the US

“Huawei’s experience illuminates the hole at the center of the United States’ relations with China: the absence of strategic trust.”

The reporter is John Pomfret of the *Washington Post*, who cites an episode from late 2009 as a sign that – despite President Obama’s claim that the United States welcomes China’s rise – “significant parts” of the US government view China as a security threat.

The Chinese telecom equipment maker Huawei was eliminated from consideration by AT&T (Dallas, Texas) as a supplier for a next-generation phone system, reportedly at the strong recommendation of the US National Security Agency (NSA).

While Huawei, AT&T, and the NSA all declined to discuss the instance with the *Post*, several people with knowledge of the agency’s call to the telecom confirmed its substance: if AT&T wished to continue doing lucrative business with the US government, prudence urged the selection of a supplier other than Huawei.

In February of last year, AT&T announced that it would buy the equipment it needed from Swedish-owned Ericsson and Paris-based Alcatel-Lucent. (“History of Telecom Company Illustrates Lack of Strategic Trust Between US, China,” 7<sup>th</sup> October)

The *Post*’s sources said that the NSA call to AT&T was prompted by fears that China’s intelligence agencies could insert digital trapdoors into Huawei’s technology that would serve as secret listening posts in the US communications network. While the aborted AT&T deal was a setback for Huawei, it hardly was a decisive blow. Huawei sells equipment, software and services to 35 of the world’s 40 biggest telecom companies.

It supplies one-third of the telecommunications equipment used in China. It is the leading vendor of such equipment in the developing world and number two (behind Ericsson) in Europe.

As noted by the *Post*, “The sun never sets on Huawei’s empire, which stretches from South Africa to Sweden, Bangalore to Brisbane, Vancouver to Vanuatu.” Even so, Mr Pomfret observed, “The trust gap is a major obstacle for China and its companies as they seek to enter more sensitive parts of the global economy.”

The next challenge is already forming in the US Congress, where – in advance of the 4<sup>th</sup> November midterm elections – eight senators lobbied against another potential big transaction: the purchase by Sprint Nextel (Overland Park, Kansas) of Huawei equipment for the backbone of its next-generation mobile and wireless technology.

❖ To counter this mind-set in Washington, Huawei has hired lobbyists, consultants, and a public relations firm. Its executives have announced a programme under which independent companies will check Huawei’s software and equipment for potential national security problems.

“In the past, one of our shortcomings was that we weren’t transparent enough,” Guo Ping, the company’s chief of strategy, acknowledged in an interview with the *Post* at the company’s headquarters in Shenzhen. “We understand that in America we need to increase our transparency, to show people who is Huawei, what is Huawei.”

Meantime, the Chinese company is not without friends in the US Congress. Mr Pomfret observed that Huawei’s backers on Capitol Hill have charged that its critics are animated by protectionism. He wrote, “Most telecommunications equipment, they say, is manufactured in China. So why pick on Huawei?”

Dorothy Fabian – Features Editor

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## 电信新闻

### 光纤技术肩负起满足互联网饕餮需求的重任

互联网流量每两年翻一番，会很快让传输系统不堪重负。由于自然规律，没有物质的运动速度能够超过光速，在光纤网络中也不例外。

加州大学圣迭戈分校的电气工程教授Stojan Radic在接受《纽约时报》采访时告诫说：“我们很快就会到达一个我们无法满足需求的点。如果我们不能满足需求，就有如从悬崖上纵身一跃。”

这不是夸大其辞。我们每天视理所当然的互联网奇迹必须将中央网络与不断扩展的移动设备和永无止境扩展的信息数据库进行共享：现在它们还必须容纳云计算的需求。只需要稍加想象就能理解在比头发丝还细的光纤上世界各地每秒流动的信息量。

据《时报》记者Anne Eisenberg报道，科学家们已经找到巧妙的方法来满足我们对带宽的渴求。虽然受限于光速，他们“可以利用光的其他特性来将多层次的信息封装到网络中的每条光纤中，这样就可以大幅度增加这些光纤骨干上同时流动的数据量。”（10月9日《拓宽互联网流量的带宽》）

光是一种带电场的电磁波。一根光纤可以通过许多波长的激光，每种波长都可以携带需要传输的数据。这就是科学家在接受Eisenberg采访的时候所说的正在从事的让每个波长携带信息的技术。现在能够实现的比特率可以达到数十亿（千兆）每秒乃至上万亿（千千兆）每秒。

位于巴黎的阿尔卡特朗讯近期为电信运营商推出了一款新系统，可以同时利用光的极化和相位特性来进行数据编码。公司光网络部的总监James Watt告知《时报》，该系统可以让单根光纤的容量翻番，可以传输比目前多两倍多的高清电视频道。

❖ 其他活跃在开发新一代系统的领域的企业还包括Ciena（马里兰州Linthicum）和Infinera（加州Sunnyvale）。在成本方面，阿尔卡特朗讯的发言人表示该公司预计这种设备可以降低传输每比特信息的成本。为设在法国的阿尔卡特朗讯贝尔实验室工作的科学家Gabriel Charlet为该系统做出了相当大的贡献。2009年，他取得了以7.2千千兆的速率在单根光纤内将数据发送7000多公里远的成就。

Andrew Chraplyvy是为阿尔卡特朗讯设在新泽西州Crawford Hill的贝尔实验室工作的科学家和高管。这个实验室从60年代起就开始光纤研究。他指出，科学家很早就发现可以利用光的极化和相位特性进行信息编码。Chraplyvy博士曾因在通信和信息技术领域的工作获得知名的马可尼奖。他告知Eisenberg：“虽然我们可以实现，但过去我们不需要这样做，因为我们已有的容量已经足够了。”

❖ 在，现有的容量正被消耗殆尽，对核心网改造的需求正在我们阅读本文的时候稳步上升，科学家们必须加快脚步，抢在即将到来的互联网流量拥塞之前。她告知《时报》，新设备是一项持续研究工作的组成部分，旨在增加每条光纤的容量。

Bergma博士表示：“我们正向相同的空间里塞入更多的信息。”

### 越老越好，阅读苹果最新版iPhone故障报告的心得

根据质保商SquareTrade提供的消息，苹果的iPhone4智能手机的意外损坏率比它们的iPhone3GS前辈高67%。据

DailyFinance（10月12日）记者Danny King报道，这是对已经注册的iPhone4用户提出的2万起故障索赔的研究结果。在这些意外故障中，大部分涉及屏幕损坏。iPhone4的用户报告屏幕损坏的比之前的3GS高82%。

SquareTrade预计，大约有15.5%的第四代手机用户会在购买后一年内遇到意外损坏问题。该公司表示：“正如我们在6月份的iPhone报告中预计的，与以前的版本相比，iPhone4要容易损坏得多。不仅是易磨损表面的损坏率翻番，iPhone4使用的铝硅酸盐强化玻璃也不比之前的型号好。”

King报道称，苹果自2007年推出首款iPhone，到去年6月推出iPhone第四版，一直从这款畅销手机上收获不断增长的利润。2010年7月，据该公司公布的三季度利润报表，该公司三季度利润飙升78%，收入达到创纪录的157亿美元，其中61%以上是iPhone的功劳。四季度的业绩预计也将令人满意。

## 拉美

### 海底线缆是应对南美IP流量猛增的关键性解决方案

“拉美已经准备好迎接数据消费和用户增长的飞跃，如果运营商能够克服基础设施领域的挑战，包括海底线缆系统的缺乏，拉美将成为电信行业下金蛋的母鸡。”

Jessica Scarpati在SearchTelecom.com发表的这篇报道为看中拉美潜力的电信运营商揭示了拉美市场的前景。她在报道中称，在诸如北美这样的成熟市场有如此多的新收入机遇的情况下，这些运营商还是在不断余力地推出新业务，以弥补成熟市场用户人均收入（ARPU）增长停滞带来的损失。（见10月5日《拉美已经为增长做好准备，但遇到海底电缆不足的问题》）

对于处于那种情况中的运营商来说，拉美无疑是一块充满机遇的土地。据思科公司提供的最新的视觉网络指数，拉美的消费者和商业互联网（IP）流量预计在2009年到2014年间的年均复合增长率将达51%，高于其他任何地区。

这使得拉美超越了过去五年年均复合增长率45%的中东和非洲。在世界各地，移动数据都将成为IP流量增长最为迅速的门类，预计拉美到2014年这块的年均复合增长率将达111%。

拉美未来的展望非常美好，不容忽视。但是，与北美、亚洲和欧洲相比，该地区的海底线缆严重不足。NTT America Inc（纽约）的全球IP网络业务副总裁Michael Wheeler表示：“拉美的海底线缆系统不足，而且许多只在大西洋一侧。”

Scarpati确认，与加州和日本间大量的海底线缆，或者与纽约与英国之间大量的海底线缆相比，在南美登岸的海底线路寥寥可数，特别是赤道以南地区。她在报道中指出：“中美洲和加勒比地区情况要好得多，因为接近北美而且这些加勒比岛国上有很多登录点。”

❖ 虽然海底线缆网络不是一个轻松的项目，对那些真正想开发拉美市场潜力的运营商来说，这可能是难度最小的方法。新泽西的电信咨询师Tom Nolle告知SearchTelecom，在这个地区的许多地方，固网无论是从成本上还是从逻辑上都不适用，而无线网的覆盖严重不足。由此，他表示，海底线缆是把中美洲和南美洲的国家连接到世界其他地方的最佳选择。

Nolle表示：“如果你在穿越巴拿马或者哥伦比亚北部的丛林，你不会想在这里安装线缆。这样还不如从波哥大开始铺设海底电缆，应该还要便宜一些。”



## 汽车行业

## 本田、丰田和现代囊括美国最环保车商前三强

据忧思科学家联盟(Union of Concerned Scientists) 10月6日公布的一项研究,日本本田汽车在美国生产的汽车最环保。丰田和现代——日本和韩国并列第二名。该研究考察了8家汽车厂商,其生产的汽车占2008车型年度美国消费的汽车总量的92%。这是该非盈利性倡导组织能够从交通部和环境保护署收集到全面信息的最近一年。

研究结果依据的是汽车厂商的产品对全球变暖的预计影响(主要根据英里油耗)和引擎排放的导致烟雾形成的尾气量。计分的时候给全球变暖数据和导致烟雾形成的尾气量数据同等权重。据《国际先驱论坛报》专栏记者Christopher Jensen 10月7日报道,100分为这八家公司的平均得分。分值越低越好,越环保。80分意味着该车商优于行业平均20%。在过去五年中在研究中一直得分名列前茅的本田这次得分为86分,丰田和现代各得分87分,大众90分,尼桑93分,福特108分,通用109分,克莱斯勒113分。

Jensen一直在为《论坛报》的“车轮”专栏提供报道。他指出,虽然所有的车商必须满足某些最低的排放标准,一些车商的发动机更为先进、也更为清洁。负责该研究报告的Jim Kliesch和该组织的“清洁车辆计划”的一名高级工程师指出,尽量多销售小型燃油经济型轿车有助于车商提升名次。但他又同时指出,要获得优胜,生产商必须在燃油经济性和排放两方面同时发力,不论车辆大小。

❖ Kliesch提到,丰田有丰富的产品类别,包括卡车和高性能车辆。它与第一名得主本田的差距只有1分。

他在接受Jensen采访时表示:“丰田能够获得优异名次的原因之一是它大批量生产高能效的混合动力车辆。如果不考虑Prius,丰田的名次将在第四位。从很多方面来说,丰田的环保光环是Prius赋予的。”

## 能源

## 快速连线的谷歌曲线保障电力供应: 用电力传输骨干为离岸风电场供电

谷歌想要索引世界上所有的在线数据的勃勃雄心大大增加了它对电力的需求。谷歌和其他公司合作,共同投资建设一个350英里长的海底输电网络,将建立准备建设的离岸风电场发出的电力输送给美国大西洋沿岸的客户。

建成之后,该大西洋风电网(AWC)骨干将连接到6千兆瓦的离岸风电场。据谷歌的绿色业务营运总监Rick Needham表示:“这相对于2009年全国风电总装机容量容量的60%,足以为190万户家庭供电。”

据《波士顿环球报》亚太能源专栏记者Chris Kahn 10月12日报道,AWC将在新泽西到弗吉尼亚的外海铺设20英里长的线缆。这个投资50亿美元的网络将连接到PJM Interconnection,一个为大西洋中部州和华盛顿特区供电的电网。初期建设的150英里将从2013年开始,到2016年截止,可以输送2千万兆瓦的风电,足以为大约50万户家庭供电。

从美国内政部长Ken Salazar在美国风电协会(AWEA)的年会上的发言来看,这个项目得到了华盛顿的支持。在他10月6日做的基调讲话中,他激情澎湃地表示:“欢迎来到美国新能源战线上一个关键性的篇章,我们正准备建设美国历史上第一个离岸风电项目。”

据《环球报》报道,风电并不是AWC项目的组成部分。实际上参与者希望这样可以节省在海底到处铺设电缆、将风电场发出的电力送上岸的成本,他们可以沿海岸快速启动离岸风电场的建设。谷歌环保营运官Rick Needham告知Kahn:“这样可以避免零零散散的连接,为风电场提供一条高速公路。”

谷歌(加州Mountain View)表示希望引入其他合作伙伴参加AWC项目。目前谷歌和投资公司Good Energies(纽约)在这个项目上的投资各占37.5%。日本工业集团丸红投资了15%,另一个位于马里兰州的输电公司Trans-Elect投资了剩余的10%。

❖ 不过正如Kahn的报道,风电行业里不是每个人都对谷歌为保证电力供应而采取的行动欢欣鼓舞——因为它付出了比常规电力高几倍的成本。在新泽西外海修建风电设施的PSEG Global质问说该地区是否需要这样大的输电网络。

PSEG的Scott Jennings在发言中表示:“最好还是把资源集中在实际建造风机和发出可再生的风电上。”

## 钢铁

## 大西洋沿岸的东北佛罗里达废旧钢铁出口业日渐兴旺

据《杰克森维尔商业期刊》特约记者Mark Szakonyi报道,来自发展中国家对废旧钢铁的不断增长的需求成为东北佛罗里达的经济助推剂,为港口、运输公司和不断增多的废旧汽车出口商带来了福音。美国废旧汽车为主的废旧金属出口业2009年的产值达214亿美元。

杰克森维尔港务局的货物销售和市场营销总监Alberto Cabrera认为对美国废旧钢铁需求的增长来自两个方面:南美国家的基础设施投资;中国关闭了许多不符合二氧化碳排放标准的钢铁厂。

据位于华盛顿的贸易组织——废旧回收行业研究所提供的信息,中国消费了美国废旧钢铁出口的三分之一,接下来是加拿大、韩国和土耳其。

据该研究所提供的信息,总产值540亿美元的废旧回收行业2009年的雇员有大约10.5万人。据《期刊》的Szakonyi报道,北卡罗莱纳东北的该行业蓬勃发展的证据包括十余家知名回收公司和在Talleyrand新建的一个处理废旧钢铁的海运港。(10月8日《杰克森维尔废旧钢铁创造出口机遇》)

## 其他钢铁新闻...

❖ 曾因明智地在全球衰退抑制需求之前退出钢铁行业而名声大噪的Craig Bouchard又回来了。在2008年8月,Bouchard和他的兄弟James以7.75亿美元将他们公司Esmark Inc(芝加哥)持有的钢铁资产转让给了俄罗斯的OAO Severstal。现在,考虑到萎靡的钢铁需求和有限的信贷资源带来的机遇,他正在成立一家公司来购入钢铁生产商和分销商。

Craig Bouchard在接受彭博新闻采访(10月1日)的时候表示:“钢铁市场现在比较疲软,客户需求不足。如果你相信世界经济将从明年(2011年)开始复苏,就会带来可观的估值机会。我相信世界经济将从明年复苏。因此我是买家。”

Bouchard表示,Shale-Inland LLC将寻求金额在2千万美元到1亿美元的并购。Bouchard将担任这家芝加哥创始企业的首席执行官。

专栏编辑: Dorothy Fabian



○ Welding with the new GAM

## Enhancing pile cage production

Colin Prior of Lemon Groundwork Supplies has specified the latest automatic pile cage machine from Italian manufacturer, MEP to enhance the company's existing pile cage operations. The GAM was supplied through MEP's UK agents Whitelegg Machines.

Lemon Groundwork Supplies is both a supply and supply and fix company for cut and bent steel reinforcement bars, mesh and clay heave products, along with a full range of associated accessories and services.

Before the arrival of the new GAM, pile cages were produced by hand; these ranged in size from 100mm (outside diameter) to 2,100mm and were either wire tacked or hand welded.

The full GAM range is said to offer fast, accurate pile cage assembly with the capability to produce automatically welded cages from 150mm (outside diameter) up to 2,000mm and up to 21m long.

**Whitelegg Machines Ltd – UK**  
**Fax:** +44 1306 711865  
**Email:** sales@whitelegg.com  
**Website:** www.whitelegg.com

## Green alternative for cable packaging

A new environmentally-friendly RF60 paper fibre tube is now available from Reelex. This new payout tube allows all cabling packages using Reelex coiling technology to be 100% recyclable, 100% compostable, and be manufactured entirely from post-consumer recycled materials. End users can discard both box and tube into the corrugated recycling stream – eliminating plastic waste from the cabling package, and greatly simplifying disposal.



○ RF60 paper fibre tube from Reelex

The RF60 tube is said to offer improved payout performance and increased flexibility without an increase in pricing. The RF60 is offered at the same price as existing MP60-TWR plastic tubes and is shipped 5,000 per pallet.

**Reelex Packaging Solutions Inc – USA**  
**Email:** sales@reelex.com  
**Website:** www.reelex.com



## Huge wire order from Korea

American Superconductor Corporation has received what is expected to be the world's largest order for high temperature superconductor (HTS) wire.

LS Cable Ltd, a client of long standing with AMSC, has placed an order for 3,000,000m (nearly 10 million feet) of Amperium wire, AMSC's proprietary second generation (2G) HTS wire.

LS Cable intends to utilise the wire to complete alternating current (AC) and direct current (DC) superconductor cable projects globally. Under the terms of the contract, AMSC is to begin shipping Amperium wire to LS Cable in 2012.

"Our objective is to be the leading provider of superconductor power cables for electric utilities worldwide," said LS Cable president, Jong-ho Son.

He added, "This Amperium wire contract helps ensure we will have the wire we need to complete the superconductor cable projects we have underway with KEPCO in Korea and also take on commercial project opportunities globally such as Tres Amigas in the US."

**American Superconductor Corporation – USA**  
Website: [www.amsc.com](http://www.amsc.com)

## World's first PVC/halogen-free solution?

Electronics OEMs looking for PVC alternatives to make flexible cords safer and more environmentally sustainable now have halogen-free options from The Dow Chemical Company.

Dow Sustain™ is said to offer the first PVC and halogen-free compounds to meet key global industry standards for continuous operating temperature, low smoke and heat deformation. Four different product grades for jacketing and insulation are available in sample quantities for producers of wires, cables and cords for electrical and electronics applications.

"With the demand for PVC alternatives in an electronics market growing fast, Dow has made a significant investment over the last three years in perfecting halogen-free compounds," says Simon Leung, platform leader for personal electronics at Dow Wire & Cable. "Dow Sustain is the first halogen-free offering qualified to meet UL 62, JCS4509 and HD21.14 requirements on a commercial scale while delivering excellent look and feel as well as enhanced product and extrusion performance."

In addition, Dow Sustain exhibits good chemical resistivity, low corrosive off-gassing in the event of a fire, and flexibility for ease of handling during manufacturing of the end product.

Dow Wire & Cable worked with Shenzhen BaoHing Electric Wire & Cable Manufacture Co Ltd and Volex to trial Dow Sustain under manufacturing conditions. The companies were able to meet key global standards using the new Dow Wire & Cable compounds.

**Dow Wire & Cable – USA**  
Website: [www.dowwireandcable.com](http://www.dowwireandcable.com)

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# Compounds for severe conditions

A new material blend from S&E Specialty Polymers, featuring extreme toughness and resistance to severe environmental conditions, is being used by a leading custom cable manufacturer in the USA for wire jacketing for wind turbine applications around the world.

The blend, designated Tufflex 2200 series, is a chlorinated thermoplastic elastomer (TPE) compound that is flame retardant, UV resistant, oil resistant and extremely temperature resistant.



○ The nacelle at the top of the wind turbine tower

Tufflex 2200 series meets the requirements for (UL) type WTTC and CSA type CIC cable products and is suitable for installation in the tower and nacelle of wind turbines, where it is exposed to extreme conditions that include cold, heat and vibration. The finished electrical cables are used for control and service power for the wind turbines. They are critical components for the operation and maintenance of the tower and nacelle.

S&E first developed compounds for wind turbine producers in 2005. Iliia Charlat, S&E's vice-president of engineering, commented: "The specifications have evolved and become much more stringent since then as the use of wind turbines has expanded significantly around the world."

**S&E Specialty Polymers LLC – USA**  
Email: [info@sespoly.com](mailto:info@sespoly.com)

**Fax: +1 978 537 5310**  
**Website: [www.sespoly.com](http://www.sespoly.com)**

## True sequential footage gives precision

Cerro Wire LLC, a manufacturer of copper electrical building wire and cable, has introduced True Sequential Footage™, a sequentially printed cable reel that provides accurate wire length with each cut. True Sequential Footage prevents the need to carry excess cable inventory, providing precision length, accurate footage, and cost control.

True Sequential Footage uses a footage mark to document remaining wire, beginning with zero at the bottom of the reel and ending with the finished length at the top. The accurate footage mark allows for quick identification of the re-order point, guaranteeing the full purchased wire length and reducing random lengths. This better controls end-of-reel scrap. The need to carry excess inventory is reduced with the precision cutting allowed by True Sequential Footage. Wire normally lost on each cut made with less accurate cutting systems (3 to 8%) is said to be saved when True Sequential Footage's precision footage marking system is used.

**Cerro Wire LLC – USA**

**Website: [www.cerrowire.com](http://www.cerrowire.com)**

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Email: [zlf@changan.net](mailto:zlf@changan.net)



## Laser micrometer

LaserLinc has released a new laser scan micrometer, the Triton331™. Like the Triton330, the Triton331 has a 30mm measurement window but is said to be much faster at up to 12,000 measurements per second (4,000 per axis).

The higher scan rate enables detection of shorter-length flaws and accurate measurement of hexagonal or other product shapes that incur oscillation, and measurement of non-constant diameter products, such as corrugated tubing.

The standard measurement rate is 4,800 per second, with 12,000 as an option.

The gauge is also suitable for use with LaserLinc's new Lobex™ system for in-process lobing measurement on centreless ground products, including centreless ground wire.

Like all LaserLinc scanners, the Triton331 links, via the TLaser400™ micrometer interface card, to a PC running Total Vu™ software.

Total Vu software is LaserLinc's measurement/data processing package, which runs on any Windows-based PC to provide in-process tolerance checking, trending, SPC, feedback control, data logging, recipes and other features.



○ Triton331 high-speed, three-axis laser micrometer

LaserLinc Inc – USA

Fax: +1 937 318 2445

Email: info@laserlinc.com

Website: www.laserlinc.com



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Los Angeles, California, United States of America

## Contracts with North Sea wind farms

ABB is reporting orders worth over \$50 million from the German transmission system operator, TenneT TSO (formerly transpower), to provide maintenance services for the grid connections of offshore wind farms located in the North Sea off the coast of Germany.

"Offshore wind power is becoming a key source of large-scale renewable energy, and makes a significant contribution to reducing emissions and lowering environmental impact," said Peter Leupp, head of ABB's Power Systems division. "Growth of our service business is a key focus area for ABB, and we are in a good position to support TenneT in maintaining the efficiency and reliability of these transmission links."

ABB will be responsible for maintaining the HVDC Light (high-voltage direct current) connections of TenneT's BorWin1 and DolWin1 wind projects to the German grid on the mainland.

ABB will maintain the land- and sea-based HVDC converter stations connecting the wind farms as well as the offshore platforms.



○ Cable loaded onto a turntable, onboard a cable-laying vessel

BorWin1 connects the world's most remote offshore wind farm to the German grid over a 200km long underwater and underground cable route. DolWin1 will connect the 400MW Borkum West II wind farm and other wind farms to be built near to the German grid. The 800MW ABB-built link will include onshore and offshore HVDC converter stations and 165km of underwater and underground DC cables with a rated voltage of 320kV, believed to be the highest voltage level of extruded cable ever used for HVDC transmission.

**ABB – Switzerland**  
Website: [www.abb.com](http://www.abb.com)

## High density coiling

The new Live Bloc Coiler from Lämneå Bruk is designed for coiling large size flux-core welding and hard surfacing wire into drums, but can also be used for other types of wires. The machine can act as a take-up directly after the production line or as part of a rewinding operation.



○ Lämneå Bruk's Live Bloc Coiler

The machine has advanced features including cast adjustment during coiling, fully controlled by the machine's PLC, to produce a coil with an extremely high density. The machine is said to solve the problem of filling drums with the required weight while maintaining a safe operation, fully enclosed and with electrically interlocked guards. The high quality coiling allows increased drum weights, giving longer runs and saving transport and packaging costs.

**Lämneå Bruk AB – Sweden**  
Email: [info@lamnea.se](mailto:info@lamnea.se)

**Fax:** +46 122 232 99  
**Website:** [www.lamnea.se](http://www.lamnea.se)

## Highest level of length measurement

The new length measuring device Length 6000 is a high performer in extrusion lines. The system, which is based on an optical measuring principle, offers a non-contact online length measurement of cables. Length measuring devices are used in order to ensure that the required product length is produced, as short- or over-lengths inevitably lead to a loss in profit.

Mechanical systems provide limited precision, due to the slip on the product surface. The technology of the Length 6000, which defines the length through comparison of image patterns, is reliable for round products and for products with reflective surfaces.

The Length 6000 precisely calculates the length at high line speeds, independent of whether the product is moving forwards or backwards. Moreover, the measurements start from zero line speed. All these features make the Length 6000 a suitable measuring system for extrusion lines. Product diameters from 0.5mm up to 180mm can be measured.

**Sikora AG – Germany**  
Email: [sales@sikora.net](mailto:sales@sikora.net)

**Fax:** +49 421 48900 90  
**Website:** [www.sikora.net](http://www.sikora.net)



## Payoffs and take-ups

Fine International offers a wide range of payoffs and take-ups. Three basic versions are available for handling medium to large size reels: cantilevered, floor traversing and portal.

Cantilevered versions utilise a rigid frame design and allow for picking up reels direct from the floor. The cantilevered design usually restricts weight capacity. The telescoping frame design collapses the end of the machine into the reel and utilises an electric lift system.

Standard portal units utilise a rigid frame and bring the hanging pintle arms together. The reel limitation of the telescoping and portal version is typically one half of the maximum size. The telescoping and portal version are most commonly used for traversing reel style, where the reel itself is traversed to provide optimum winding and unwinding with minimal cable stress. All units are available in sizes ranging from 1,250–3,200mm (50" to 126").

Smaller reel sizes can be handled with overhung shaft style, cantilevered or fixed pintle designs. Overhung shaft style machines can be used for reel sizes up to 800mm but A-frame units with dual-side supported shafts can be utilised for much larger reel sizes. Fixed pintle designs can handle typical line speeds up to 2,000fpm (600mpm) and utilise lift platforms to get the reel into place. These machines typically have limited reel width range. The cantilevered versions are the best for medium to large sized reels and can cover a wide range of operating line speeds.

Fine also offers a wide range of multiple reel systems for cablers or bunchers. Dual reel take-up systems are available in manual, semi-automatic or fully automatic and horizontal semi-automatic coiling machines are also available.

**Fine International Corporation – USA**  
**Email:** finesales@gmail.com

**Fax:** +1 732 933 4005  
**Website:** www.fineinternational.com

## New single fibre assemblies

To allow the use of fibre optics in potentially damaging environments, Fiberguide Industries has introduced a new standard line of single fibre assemblies.

Fiberguide's assemblies have proved effective in a number of scientific and industrial applications ranging from light measurement, process monitoring and control, to UV-VIS spectroscopy, chromatography and fluorescence.



○ *Fiberguide's single fibre assemblies*

monocoil sheathing. The monocoil is vacuum compatible and resistant to tight bending, crushing, cutting, kinking and high temperatures.

Both standard cable designs are rated for use at ambient temperatures. Single fibre assemblies are available with core sizes ranging from 50µ to 1000µ and wavelengths from deep UV (DUV) to UV-VIS and VIS-IR. Assemblies are also available upon request with ST and FC connectors and in continuous lengths up to 50m.

**Fiberguide Industries Inc – USA**  
**Email:** info@fiberguide.com

**Website:** www.fiberguide.com

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ADAX, spol. s r.o. was founded in 1991 and specializes in providing solutions in the following Strategic Business Units (SBU): Industrial Automation, Automotive, Biotechnology, in the **Cable Industry**, Chemical Industry, Construction, Energy, Engineering, Food & Beverages, IT & ICT, Manipulation and Handling, Metallurgy, Packaging Industry, Plastic, Printing Industry, Technology and Transportation industries.

ADAX manufactures and supplies automatic single purpose machines. ADAX reconstructs old machines and assembles the complete manufacturing lines. ADAX is certified ISO 9001:2008 and is fully capable to implement any project in the area of control systems and industrial automation.

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## Welding ribbed concrete reinforcement steel

August Strecker's programme of machinery includes butt welding machines with a vertical welding axis. The material to be welded is usually hot-rolled ribbed concrete reinforcement steel, but other material qualities, including high-carbon and alloyed steels, can be connected in this method which was developed for process optimisation and to relieve operator labour. Especially with the dimensions of hot-rolled ribbed concrete reinforcement steel most commonly used (WR18mm, WR16mm, WR14mm and WR12mm) it is difficult to pull the wire ends to be connected far enough out of the line to be positioned horizontally for joining in a conventional welding machine. In addition, the large wire loop resulting from welding must then be forcibly pushed back into the line, which often presents problems, such as loop jams, and an interruption to continuous operation.

Strecker's vertically configured machines allow the welding head to be positioned very close to the wire ends. The machine is designed so that the wire ends do not need to be straightened for welding, but instead the wires can be hydraulically clamped into the clamping device in the radius of the coil.

Various configurations and options are available to suit individual conditions, such as swivelling machines (suspended on a pillar) or welding machines with flanged wheels that roll on rails.

Or, if welding takes place at various points along the horizontal sequence, a machine configuration is useful that allows motor-driven movement on a platform along the line. At the same time, the welding machine itself is also moveable on the platform, toward the coil ends to be connected.



○ The SS80 vertical butt welder from August Strecker

After welding the motion is reversed, away from the line. Depending on the requirements of the steel quality, various annealing options are possible, including programmable microprocessor control of the welding and annealing processes, or, of course, adjustable infrared pyrometers. Strecker also offers the SS series dual upset butt welding machines with automatic flash removal, configured vertically.

The vertical SS welding machine is said to offer the following advantages:

- High welding quality through the dual upset process, nearly all the heated and therefore molten material is pressed out of the joint so a weld with extremely high tensile strength is created
- Automatic flash removal integrated into the process provides welded joints with exactly the same diameter as the original material. Reworking through manual flash removal is unnecessary, saving time, and in addition there is no risk of wire breaks due to excessive deburring, ie reduction of the cross section at the welded joint
- Reproducible, same-diameter welded joints even with difficult materials
- The machine offers simple, user-friendly operation even for personnel without special qualifications

Machines from the SS series for vertical welding are also available in various configurations. Whether swivel-mounted on an additional pillar at the horizontal payoff, or motor-driven on flanged wheels, every option is available to ideally fit the welding machine to the on-site requirements of the end customer.

**August Strecker GmbH & Co KG – Germany**  
Email: [sales@strecker-limburg.de](mailto:sales@strecker-limburg.de)  
Website: [www.strecker-limburg.de](http://www.strecker-limburg.de)



# Solutions for fibre optics

At wire China 2010, PolyOne focussed on its portfolio of solutions for optical fibres. The product family includes several grades of ECCOH™ and ECCOH™ PF low smoke and fume, zero-halogen (LSFOH) compounds, as well as OnColor™ and OnCap™ colourant and additive solutions. PolyOne Corp sees rising global demand for optical fibre is being led by China, Japan and Korea. In China, government stimulus funds promoting rural infrastructure and major construction programmes have significantly expanded the optical fibre market.

In the past, optical fibre cables were mainly for outdoor use and, as such, did not require flame retardant sheathing materials. Increasingly, however, bandwidth providers are bringing fibre optics into buildings. These cables must not only be flame retardant, but must also contain materials that are low-smoke, low-fume, and non-halogenated (also called LSFOH, for Low Smoke and Fume, Zero Halogen).

Responding to this trend, PolyOne developed a range of solutions for the FTTB and FTTH markets, called ECCOH™ and ECCOH™ PF compounds. Both product families are said to meet the requirements for LSFOH material use inside buildings, and are classified as a PolyOne Sustainable Solution.

In addition to excellent flame retardance, these solutions offer low smoke and low toxicity benefits, and include the following features:

- ECCOH™ compounds meet tight buffering and sheathing requirements, offer low corrosion, very low shrinkage (less than 1%), good mechanical strength to prevent fibre breakage, and low memory retention to ensure good attenuation properties
- ECCOH™ PF grades are recommended for mini-ducts through which fibre is routed. These compounds offer good flame retardance, while an inherent stiffness allows easy installation and provides bend radius control
- OnCap™ anti-static compound enables optical fibres to be blown further. This compound can be coextruded as an internal layer 0.5mm thick. A patent is pending on the application using LSFOH as an outer layer and antistatic slip compound as the internal layer
- Each ECCOH™ compound can also be provided with suitable OnColor™ colour concentrates to match specific requirements, with masterbatches available for other materials such as HDPE, PBT and TPU. PolyOne also offers OnCap™ UV additive and slip additive masterbatches suitable for FTTx applications

**PolyOne Corp – USA** Fax: +1 440 930 3064 Website: [www.polyone.com](http://www.polyone.com)

## 344 superconductor has a new name

American Superconductor Corporation (AMSC) has introduced Amperium wire, the new brand name for the company's proprietary second generation (2G) high temperature superconductor (HTS) wire.

Previously called "344 superconductors," the new name reflects the product's ability to conduct more than 100 times the electrical current (amperage) of copper wire of the same dimensions. In high-voltage power transmission systems just one of these ultra-thin wires is believed to be capable of carrying enough power to serve the needs of approximately 10,000 homes.

The high power density of Amperium wire dramatically reduces the footprint and cost of large-scale electrical equipment, such as power cables and wind generators.

In the USA, Amperium wire is utilised by Nexans to produce an extension of the superconductor power transmission cable system that has been running in Long Island Power Authority's (LIPA) primary power corridor since April 2008.

Additional cable projects that are expected to utilise Amperium wire include the Tres Amigas™ SuperStation, which aims to connect America's three power grids for to unlock the country's renewable energy resources.

**American Superconductor Corporation – USA**  
Website: [www.amsc.com](http://www.amsc.com)

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## Diameter measurement with high single value precision

Sikora presents the new Laser Series 6000 for online diameter measurement during wire and cable production.

With a measuring rate of 2,500 measurements per second, all measurements show an extremely high single value precision. Precise single values are decisive in order to define the fluctuation range of diameter values of a product. Only an instrument with a significantly lower fluctuation range than the product to be



○ The new diameter gauge head Laser 6040 XY with measuring value display

measured is capable of providing a representative value. The Laser Series 6000 is able to take single measurements of the diameter with high precision and low fluctuation, and therefore ensures an optimum line control and provides reliable statistical data.

The opening of the gauge heads is directed to the bottom and is twice as wide as the measuring range, which allows for an easy product feed through. Directly integrated in the gauge head is a pluggable universal interface module for all connections. In this position it is optimally protected against water, dirt or mechanical influences during the production. There are no external plugs.

As there are no moving parts in the Laser Series 6000, the gauge heads maintain their accuracy during the entire operation time. Calibration procedures or maintenance are not necessary.

The product range of Sikora's laser devices includes dual- and triple-axis gauge heads and covers diameter ranges from 0.05mm to 500mm.

**Sikora AG – Germany**  
Email: sales@sikora.net

Fax: +49 421 48900 90  
Website: www.sikora.net

## South Africa to Brazil – submarine cable

Submarine cable infrastructure company Alcatel-Lucent says it has been selected by eFive Telecoms, a South African telecommunications company, to build a new submarine cable network linking the west coast of Africa to South America. The system will comprise two trunks, the first one connecting South Africa to Angola and Nigeria, and the second trunk linking Angola to Brazil.

This is a significant development for South African telecoms, which is already benefiting from additional international bandwidth capacity which was introduced to the country via the SEACOM and Eassy submarine cable systems in the last year. "We believe that high-growth areas such as the African continent require the development of new projects," said Lawrence Mulaudzi, managing director of eFive Telecoms. "The planned submarine network will also provide cable route diversity to South America, making the most economical and operational sense in the current landscape."

Alcatel-Lucent will be in charge of the project end-to-end, including the system design, manufacturing, installation and commissioning. The system will also be maintained by Alcatel-Lucent through its Atlantic Private Maintenance Agreement (APMA), which currently covers over 100,000km of submarine cable infrastructure from the west coast of Africa to the Caribbean and as far north as Greenland.

"Growth in African Internet and mobile telephony is driving service providers' demand for more connectivity options to ensure higher reliability, as well as increased widespread access to bandwidth. This project will further position Africa as a major hub for broadband connectivity," said Philippe Dumont, head of Alcatel-Lucent's submarine network activity.

**Alcatel-Lucent – France**

Website: www.alcatel-lucent.com

## Automatic heating mat production

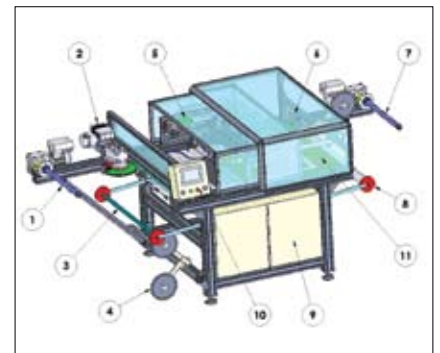
ADAX spol sro is a Czech company, founded in 1991 and currently specialising in the development of new methods and technologies for various industrial sectors, including industrial automation, and the cable and chemical industries.

A recent success is the development of a fully automatic machine for the production of electric heating mats. The mats have a variety of uses including room heating and to protect outside facades from freezing.

The basis of the heating mats is loops of wire or cable fixed in various widths and spans. Loops of heating cable are fixed to the carrier fabric.

The machine illustrated unwinds the heating cable and woof from the reel – creating loops of the required width and spacing – fixes the heating loop and generates an output coil.

Away from the machine the matting roll is divided into the desired length and outlets are fitted for the connection of electricity.



○ Automatic machine for the production of heating mats

1. Woof decoiler
2. Auxiliary towing pulley of the heating cable
3. Decoiler woof compensator
4. Adhesive tapes decoiler
5. Mechanism to set up the heating cable
6. Marking the end of the preset length
7. Heating mat retractor
8. Heating mat compensator
9. Control system
10. Control panel
11. Safety guard

**ADAX spol sro – Czech Republic**  
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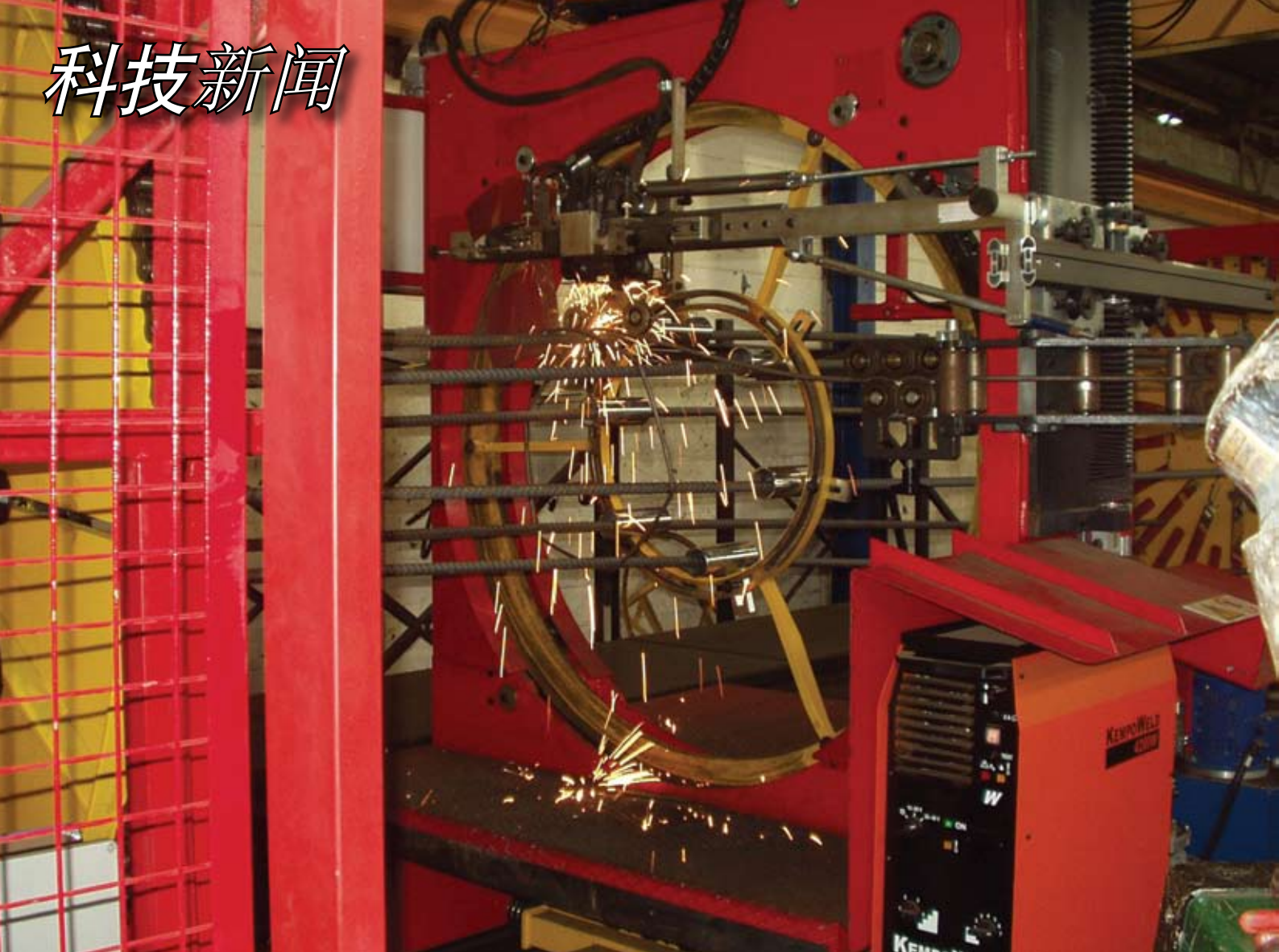
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○ 用新型GAM进行焊接

## 改进桩笼生产

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Lemon Groundwork Supplies是切割和弯曲钢筋、丝网和粘土制品供应商和制作商，并提供各种相关的辅助件和服务。

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传真: +44 1306 711865  
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### 从南非到巴西的海底电缆

海底电缆基础设施公司Alcatel-Lucent说，南非的一家电信公司eFive Telecoms选中Alcatel-Lucent来新建一个海底电缆网，以连接非洲西海岸和南美洲。这个系统包括两根主电缆，第一根将连接南非和安哥拉以及尼日利亚，第二根将连接安哥拉和巴西。这是南非电信事业的一次大发展。去年，通过SEACOM和Eassy海底电缆系统，这个国家的国际宽带能力得到扩展，电信事业受益。“我们相信像非洲大陆这样高速发展的区域需要开发新的项目，”eFive Telecoms总裁Lawrence Mulaudzi说。“计划的海底网络还为南非提供电缆路径多样性，使其最经济、最易于操作。”

Alcatel-Lucent将从头至尾负责这个项目，包括系统设计、制造、安装和开车。Alcatel-Lucent还通过大西洋私人维护协议（APMA）来维护这个系统，目前包括从非洲西海岸到加勒比海和格林兰北部的10万公里的海底电缆基础设施。“非洲互联网和移动通信发展推动服务提供商需求，形成更多的连接方案来保证更高的可靠性、更多更广的宽带接入。这个项目将更使非洲成为宽带连接的一个主要枢纽，”Alcatel Lucent海底网络业务负责人Philippe Dumont说。

**Alcatel-Lucent – 法国**

网址: [www.alcatel-lucent.com](http://www.alcatel-lucent.com)



## 适用于严酷环境的化合物

S&E Specialty Polymers推出一种新型材料，能抵御严酷的环境条件，美国的一家领军型定制电缆制造商用这种材料制造线材护套，用于世界各地的风力透平。这种材料被命名为Tufflex 2200系列，是一种氯化热塑性弹性体（TPE）化合物，能阻燃、抗紫外线、抗油和抗极端温度。



○ 风力透平塔顶机舱

Tufflex 2200系列满足对（UL）型WTTC和CSA型CIC电缆产品的要求，适用于风力透平塔和机舱，暴露于极端条件，包括冷、热和振动。最终电气电缆用于风力透平的控制和服务电源。它们是风力塔和机舱操作和维护的关键元件。

S&E 于2005年首次为风力透平生产商开发化合物。S&E工程副总裁Illa Charlat评论道：“自从风力透平在世界上应用大大扩展后，规格在演变，变得更严格。”

**S&E Specialty Polymers LLC – 美国**  
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## True sequential footage精密定尺

Cerro Wire LLC生产建筑电气铜线铜缆，推出True Sequential Footage?：一种按序打印的线缆卷轴，为每次线缆切割提供精密的线缆长度。True Sequential Footage防止卷轴承载过量线缆，提供精密的长度，准确的尺数和成本控制。True Sequential Footage采用尺数标记来记录剩余线材，它从卷轴底部的零长度开始，到顶部的最终长度结束。准确的尺数标记可以快速识别再次订购点，保证采购的线材总长，减少随意确定的长度。这更好地控制了线缆卷轴末端损耗。True Sequential Footage的精密切割避免卷轴过度承载。不够准确的切割系统的每次切割通常会造成线缆损耗（3到8%），采用True Sequential Footage的精密尺数标记系统后，免除了这种损耗。

**Cerro Wire LLC – 美国**  
 网址: www.cerrowire.com

## 放线和收线

Fine International提供各种放线和收线设备，能提供三种基本型设备来适用中等和大型卷轴：悬臂式、地面横动式和门台式。悬臂式采用刚性框架设计，可以直接从地面提起卷轴。悬臂式通常对重量有限制。伸缩式框架设计使设备末端凹入卷轴，并采用一个电动起重系统。标准对门台式采用刚性框架，将悬挂枢轴连在一起。伸缩式和门台式对卷轴限制通常是最大尺寸的一半。伸缩式和门台式通常用于横动式卷轴，卷轴本身横洞，提供最好的卷绕和解卷，对电缆造成的应力最小。所有设备尺寸齐全，从1250到3200毫米（50”到126”）。

尺寸较小的卷轴可以采用外挂轴式、悬臂式或固定枢轴式设计。外挂轴式设计最大可用于800毫米的卷轴，对尺寸更大的卷轴，可使用带有双侧支撑轴的A-型框架式。固定枢轴式设计通常的处理速度可达到2000fpm（600mpm），并用起重平台使卷轴到位。这些设备通常对卷轴宽度有限制。对于中等到大型卷轴，最好使用悬臂式设计，它适用于各种生产线操作速度。

Fine还提供用于成缆机或聚束器的各种多卷轴系统。提供的双卷轴缠绕系统可以是手动的、半自动的或全自动的，还提供卧式半自动成卷机。

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 网址: www.fineinternational.com

## 焊接混凝土钢筋

August Strecker的机械设备包括立式焊轴对焊机，通常用来焊接热轧带筋混凝土加强筋，也能焊接其它材质（包括高碳钢和合金钢），它能优化工艺，解放劳动力。尤其是对热轧钢筋混凝土加强筋最常用尺寸（WR18mm、WR16mm、WR14mm 和 WR12mm），人们难以从生产线拉出足够长的待连接线头，以便水平定位，与传统的焊接即连接。另外，必须将焊接后的大回路线材送回生产线，这常常会造成问题，例如火炉堵塞，造成连续操作中。Strecker的立式组态焊接机可以让焊接头的定位非常接近线头。焊接机能直接进行焊接，不必拉直线头，而且，能液压夹持线材，使线材在回路半径内进入夹持装置。

公司能提供各种组态和方案来适合具体的条件，例如旋转焊接机（悬在立柱上）、或者法兰连接滚轮沿导轨滚动的焊接机、或者如果焊接沿着水平顺序发生在各种点上，可以采用一种很有用的焊接机组态，用马达驱动，沿着生产线在平台上移动，同时，焊接机本身也在平台上移动到需要连接的线头。焊接完成后，反向运动，离开生产线。根据对钢材质量的要求，可以提供各种退火方案，包括可编程微处理机控制焊接和退火工艺，或者，当然还有可调节式红外线高温计。Strecker还提供SS系列双翻转对焊机，能自动除渣，垂直组态。

立式SS焊机具有以下优点：

采用双翻转工艺，接近全加热，焊接质量高，所以，将熔融材料压出接头，焊接形成的抗张强度极高。

○ August Strecker的SS80立式对接焊接机



自动除渣与工艺融为一体，焊接接头直径与原材料直径完全相同。不必重新手工除渣，节约时间，也没有因为过度去刺（即减小横截面）而造成线材焊接点断裂的风险。

即使对难度高的材料，焊接也是可重复的，而且产生相同的焊接点直径。

焊接机提供简单友好操作界面，即使没有特别资格的人员也能操作。

还能为SS系列的立式焊接机提供各种组态。可以安装旋转功能 - 装在水平送卷的立柱上，也可以采用马达驱动法兰连接滚轮，每一种方案都有，能理想地使焊接机适合最终用户的现场要求。

**August Strecker GmbH & Co KG – 德国**  
 电子邮件: sales@strecker-limburg.de  
 网址: www.strecker-limburg.de

## 高密度成卷

Lämneå Bruk推出新型在线成卷机，可以卷绕大尺寸包芯焊条焊接丝和表面淬火丝，也可用于其它类型的线材。这种成卷机位于生产线下游或作为再卷绕操作的一部分直接进行卷绕。这种成卷机具有先进的性能，包括卷绕期间的铸造调整，由设备的PLC进行全程控制，形成的线卷带有极高的密度。这种设备解决了用砗码填充卷轴的问题，同时保持安全操作，完全封闭，具有电气连锁保护。高质量的成卷允许增加卷轴重量，允许更长的运行周期，并节约运输和包装成本。

### ○ Lämneå Bruk的在线成卷机



**Lämneå Bruk AB – 瑞典**  
 传真: +46 122 232 99  
 电子邮件: info@lamnea.se  
 网址: www.lamnea.se

## 电缆包装环保替代品

Reelex推出一种新款环保型RF60纸质缆管。采用这种新式缆管后，所有采用Reelex成卷技术的电缆包装可以100%再生、100%堆肥、完全采用消费后的再生材料进行再制造。最终用户可以丢弃所有的箱子和管子，丢入波纹式再生物料中 - 电缆包装不再使用塑料材料，从而大大简化了最后处置。

RF60缆管改进了送缆性能，提高了挠性，但不增加价格。RF60的价格与现行MP60-TWR塑料缆管价格相同，发运时5000个/码垛。

**Reelex Packaging Solutions Inc – 美国**  
 电子邮件: sales@reelex.com  
 网址: www.reelex.com

## 光纤解决方案

在中国2010线材会中，PolyOne致力于光纤解决方案，产品系列包括若干牌号的ECCOH™ 和ECCOH™ PF低发烟和零卤素(LSFOH) 化合物、以及OnColor™ 和OnCap™ 着色剂和添加剂溶液。

PolyOne Corp预见到由中国、日本和韩国引领的全球对光纤的需求。在中国，政府提供刺激性贷款，促进农村基础设施和重大项目发展，大大扩张了光纤市场。在过去，光缆主要用于室外，并不要求阻燃护套材料。然而现在，宽带提供高越来越多地将光纤引入建筑物。这些光缆不仅要阻燃，而且要含有低发烟、低烟雾、无卤素材料(也称作LSFOH，用于低发烟、零卤素)。为了响应这个趋势，PolyOne为FTTB和

FTTH市场开发了各种解决方案，称为ECCOH™和ECCOH™ PF化合物。

两种产品系列能满足LSFOH室内材料要求，被列为PolyOne的可持续解决方案。除了优秀的阻燃性能外，这些解决方案还提供低发烟和低毒性，并包括以下性能：

ECCOH™化合物满足严格的缓冲和护套要求，提供低腐蚀、低收缩(小于1%)，高机械强度，防止光纤断裂和低记忆保留，以保证好的衰减性能。

建议把ECCOH™ PF牌号用于小型光纤通道。这些化合物提供很好的阻燃性能，本质又具有刚性，以便于安装和提供弯曲半径控制。

OnCap™抗静电化合物有利于进一步吹制光纤。这种化合物作为一种0.5毫米厚的内层，能同轴挤出。

公司正在申请一种应用专利，将LSFOH用为一种外层，并用作内层，作为一种抗静电打滑化合物。

每种ECCOH™化合物还能配备合适的OnColor™色浓度，达到具体的要求，能为HDPE、PBT和TPU等其它材料配备色母料。PolyOne还提供适合于FTTx应用的OnCap™ UV添加剂和抗打滑添加剂色母料。

**PolyOne Corp – 美国**  
 传真: +1 440 930 3064  
 网址: www.polyone.com

## 新型单纤组件

为了能在可能具有破坏性的环境中使用光纤，Fiberguide Industries推出一种新的标准化生产线，以生产单股光纤组件。许多科学和工业应用(从光线测量、工艺监测和控制、到UV-VIS光谱学、色谱学和荧光学)证实：Fiberguide的组件是有效的。

单股光纤组件有两种选择：抗化学性、非磁性覆层。对于一般应用，Fiberguide的光纤分歧管包含一层凯夫拉芳纶加强的PVC护套，包裹在聚乙烯管上。光纤分歧管是非传导的，为纤维提供液封保护。

对于特别应用，Fiberguide提供不锈钢单线覆层。单线是真空兼容的，能抵御紧弯曲、压碎、切割、扭结和高温。

能在环境温度下使用这两种标准的电缆设计。单股光纤组件的内芯尺寸从50u到1000u，波长从深紫外(DUV)到紫外/可见光(UV-VIS)和可见红外(VIS-IR)。按照客户要求，组件还可提供系统测试(ST)和光纤(FC)连接头，连续长度可达50米。

**Fiberguide Industries Inc – 美国**  
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○ Fiberguide的单股光纤组件

## 来自韩国的超大订单

American Superconductor Corporation (AMSC) 获得被认为是世界上最大的高温超导体(HTS)线材订单。LS Cable Ltd是AMSC的常期客户，已下达一份300万米(将近1000万英尺)Amperium线材(AMSC专有第二代(2G)HTS线材)订单。

LS Cable要用这些线材来完成全球的交流 and 直流超导体电缆项目。根据合同条款，AMSC将于2012年开始发运Amperium线材给LS Cable。

“我们的目标是全球电力公用工程的超导体电力电缆领军型提供商，”LS Cable总裁Jong-ho Son说。“这份Amperium 线材合同使我们拥有我们完成超导体电缆项目所需的线材，我们在韩国为KEPCO公司执行超导体电缆项目，我们还在全球获得商业化项目的机会，例如美国的Tres Amigas。”

**American Superconductor Corporation – 美国**  
 网址: www.amsc.com



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原文 - Jeremy R Austin, Herbert S.-I Chao, Sartomer Company

Wire & Cable Asia - November/December 2010

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## Interactivity

Watch Video Clips and see Video Links



## Social Networking

WCA builds communication via Facebook, twitter and its RSS feeds.

www.read-wca.com







# *Wire drawing* machinery

Can anything useful be said in the Third Millennium about a manufacturing method that anticipated the Industrial Revolution by some 400 years — and has since been brought to a pitch of near-perfection? The makers of an Internet video on wire drawing didn't try. To soft-jazz accompaniment, they simply tracked the progress of a round piece of metal as it moves through a series of dies that reduce its diameter while concentrating its volume.

The suppliers reviewed in this section are likewise inclined to let the machinery of wire drawing speak for itself. Their experience informs the details of a state-of-the-art drawing line, ensuring the accuracy, speed, and certifiability that are standard operating procedure in this process at the heart of the wire making enterprise.



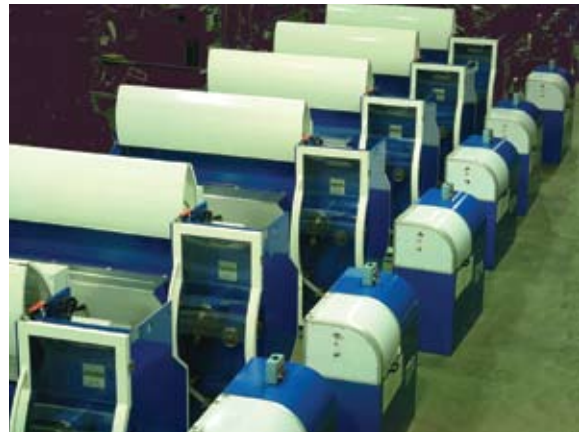
# Wet drawing for saw wire

GCR Eurodraw SpA supplies the tyre cord industry with specialised dry drawing equipment, brass-plating lines and wet drawing machines. In recent years a new product, based on a technology similar to tyre cord, has been developed – saw wire, used for slicing silicon wafers for the photovoltaic industry.

For this particular application GCR Eurodraw has designed a specific saw wire wet drawing machine that fulfils the specific requirements of this demanding product.

The machine is a 7-shaft, horizontal-type cone machine with 25 to 28 drafts and includes the following features:

- Extra sturdy, monolithic die-holders reduce vibration on the wire
- 6-cone CERS design with external finishing capstan
- Specific cone design allows reduced slip and perfect alignment of the wire into the following die
- Accurate wet wire drawing lubricant temperature and circulation control to maximise the lubrication effect in the dies and to reduce die wear
- Ergonomic and compact design allows immediate access to all machine components for easy threading and operation with virtually zero maintenance
- Specific spooler, with patented wire traversing system, for accurate winding without any operator adjustment
- Integrated electrical cabinet for fast installation



○ Saw wire wet drawing machines from GCR Eurodraw

GCR Eurodraw designs and builds other wet wire drawing machines for other applications, including stainless steel, galvanised staple wire and high-carbon spring wire. The company also has a complete range of wet drawing machines for the welding wire industry, marketed through its welding wire machinery division Comapac Wire Machinery Srl.

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**Website:** [www.gcrgroup.com](http://www.gcrgroup.com)



## CABLE TECH MACHINES

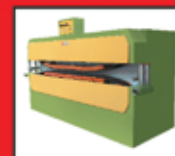
(An ISO 9001 : 2008 Company)

India's leading Wire & Cable Machinery Manufacturer

Skype ID : cable.tech1

### OUR PRODUCTS & SERVICES

<b>Conductor Machinery</b>	Rod Break Down Machine, Tubular/Skip Strander, Rigid/Planetary Stranding Machines
<b>Power Cable (ABC/LT/HT) Machinery</b>	Rod Break Down Machine, Tubular/Skip Strander, Rigid/Planetary Stranding Machines, Wire/Strip Armoring Machines - Rigid/Planetary Type (Single/Multiple Carriage)
<b>Control &amp; Communication Cable Machinery</b>	S-Z Stranding Lines, Drum Twisters, Steel Tape Armoring Machines, High Speed Automatic Core Re-winding Lines, Multi Core Cable Laying Up Machines
<b>Rope Making Machinery</b>	Planetary Strander, Tubular Strander
<b>Take-up &amp; Pay-off</b>	Portal Self Traversing Type, Bridge Type, Column Type, Cantilever Type up to 5000 mm
<b>Caterpillar/Capstan</b>	Pneumatic Actuated Fix/Rotating Caterpillar & Capstan



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# Components for most wire drawing machines

As UK representative, Techna provides the entire range of wire drawing components from Naber & Wissmann GmbH. Capstans, cones and drawing rings for almost any wire drawing machine, including those of Niehoff, Henrich, Herborn, Samp and Syncro, are available to manufacturers' specifications, in a wide range of materials.

**Materials include:**

NWZ-A ceramic (zirconium oxide/aluminium oxide) or ceramic-steel compound, said to have been tested under the most difficult drawing conditions, and shown to provide optimum wear resistance and operational efficiency, in sizes up to 500mm diameter.

NWM-74 for drawing of non-ferrous metals, especially copper and its alloys. This is thermally coated and alloyed to the basic material to provide a fine spread of hard materials such as carbides, borides and silicides for an extremely wear-resistant working surface.

NWM-81/83 is built-up in a thermal coating process but with a higher proportion of tungsten carbide, making it suitable for drawing steel cord wires. With a thickness of around 0.8mm and a hardness of HV=2,900 to 4,600kp/mm, it may be repeatedly re-ground and is resistant to shock, breakage and thermal shock.

NWK-78 material provides an oxide-ceramic coated surface for components with high surface quality, believed ideal for drawing copper and plated-copper wires. Worn draw-steps can be re-coated and returned to their rated diameters.

NWS-12 is a high-alloyed special steel, hardened to 65 Hfc, with high stability and excellent surface finish for good drawing performance for steel, iron and steel-cord. For greater draw speeds, NWS-90 is recommended.

○ A selection of wire drawing components from Naber & Wissmann GmbH



## bongard machines trading

More than 1.200 second-hand machines in stock



Reconditioned straight line drawing machine

## bongard machines engineering

New machines designed for your production



New Bongard drawing line for trolley wire

**Bongard Group**  
58730 Fröndenberg/Germany  
Tel. +49 2378 915-5  
Fax +49 2378 915-300  
info@bongard.de · www.bongard.de

**Techna International Ltd – UK**  
Email: sales@techna.co.uk

Fax: +44 1923 219700  
Website: www.techna.eu

## Pulling-in dogs for easier drawing

Tecnosider has designed a new series of pulling-in dogs, the TEK series, for easier and improved wire drawing. As with existing Tecnosider pulling-in dogs, the aim was to produce an extremely tough instrument, suited to the heavy duty working conditions under which they are used.

Features of the new model include:

- Versatility and ease of use – designed for working on either the left or right-hand side
- Pincers open simultaneously and easily when the lever is operated. The clamps are both fitted with special guides
- Rapid and easy replacement of clamps
- Wire inserted in the clamps runs inside the pincer and, when necessary, can come out of the rear of the pincer through a specially drilled guide. This makes it possible to insert a long enough length of wire into the pincer to tighten the clamps on an intact area of the wire, and so avoid working on the part which the sharpener has worked on. This part is fragile, and a breakage will necessitate the operation to be repeated and valuable production time lost.



○ Pulling-in dogs from Tecnosider

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## Rod breakdown lines for aluminium profile wire

In numerous countries around the globe increasing energy demands make overhead transmission lines reach the limit of their transmission capacity. Reconductering the transmission lines with High Temperature Low Sag (HTLS) conductors can solve the growing structure and capacity problems of electricity networks. Niehoff now provides conductor manufacturers with rod breakdown machines designed for the production of Aluminium Conductor Steel Supported/Trapezoidal Wire (ACSS/TW) conductors. ACSS/TW conductors (manufactured on Niehoff MSM 85 rod breakdown machines) combine the concept of annealed aluminium wires in a trapezoidal shape stranded around a steel core.



○ Niehoff MSM 85 rod breakdown machine with integrated RA 501 continuous annealer

The finished profile can be drawn out of a round inlet material with profile dies (as shown in the diagram). As an example, inlet material aluminium 1350 (Al 99.5) wire with a diameter of 9.52mm to a finished profile of 13.431mm<sup>2</sup>. To reach a conductivity of 61.8% IACS (International Annealed Copper Standard) an annealing process is implemented. The electronically controlled Niehoff MSM 85 with individually driven capstans and the integrated RA 501 continuous annealer can be used for this application, or existing Niehoff rod breakdown machines can be upgraded.

DIE SEQUENCES	
	Ø 9.52 mm
	Ø 9.52 mm
	Ø 9.52 mm
	Ø 9.52 mm
	Ø 9.52 mm
	Ø 9.52 mm
	Ø 9.52 mm
	Ø 9.52 mm
	Ø 9.52 mm
	Ø 9.52 mm
	Ø 9.52 mm

Conductor Type	
HTLS	High Temperature Low Sag
ACSR conductor	Aluminum Conductor Steel Reinforced
ACSS conductor	Aluminum Conductor Steel Supported
ACSS/TW conductor	ACSS conductor with trapezoidal wires
ACCC conductor	Aluminum Conductor with Carbon Fibre Composite Core
ACCC/TW	ACCC conductor with trapezoidal wires
IACS	International Annealed Copper Standard

○ Drawing shaped aluminium on an MSM 85/RA 501 drawing line (die sequences)

The MSM machine enables the manufacturer to draw round and trapezoidal wires of aluminium and aluminium alloys on the same line. The RA 501 annealer is specially designed for the in-line annealing of aluminium and aluminium alloy wires. Instead of an expensive batch type annealer Niehoff offers an in-line annealing process.

In the MSM 85 machine each drawing capstan is individually driven by its own AC motor, which allows a minimised slip operation. As a result working with different wire elongations for each draft – according to the material properties and shapes of the wires – is possible. The MSM line is equipped with energy-saving AC motors and energy-optimised components.

**Maschinenfabrik Niehoff GmbH & Co KG – Germany**  
**Email:** info@niehoff.de

**Fax:** +49 9122 977 155  
**Website:** www.niehoff.de

## New combined drawing machine from SAS

SAS manufactures combined lines and pulling benches to draw bars and tubes (coil to bar as well as bar to bar) for ferrous and non-ferrous products. SAS also produces shears, peeling, chamfering and straightening machines, shot blasting, eddy current lines and entry/exit line service. Care of the product is taken in every phase: from projecting to construction and assembling, up to load testing. The lines are equipped with twin cams, hydraulic carriages and hydraulic flying shears, which make the lines able to work at a very high speed while maximum accuracy is guaranteed, in a working range from Ø 2mm to 54mm.

The SAS combined drawing machine can be supplied completed with the most advanced accessories in order to obtain a totally automated line; these accessories include: pay-off group, pre-straightening device, draw bench, chamfering machine, bundle strapping and weighing and handling. Everything is managed automatically. Reacting to the increased demand for faster drawing lines, SAS has designed and produced hydraulic flying shears cutting “bushing-to-bushing”.

This kind of cut decreases the specific pressure generated by cutting stress on the material. A better quality of the point is obtained (nail effect) and the cut is perfectly orthogonal in respect of bar axis. The shearing tool is assembled on a carriage sliding along on ball guides and powered by a brushless electric motor. An electronic encoder, controlled by the central drive, powers the motor until the carriage reaches the same speed as the bar; the bar is cut only when the difference between the two speeds is zero and therefore the differences in lengths are dramatically reduced.

**SAS Engineering and Planning Srl – Italy**  
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**Website:** www.sas.it

## In-line drawing solutions

Rockford Manufacturing Group (RMG) is a supplier of in-line wire drawing equipment, and has recently introduced the model 1922 drawer for 35mm diameter material.



○ RMG's 1922 wire drawer

This machine utilises a solid D2 tool steel 1,525mm capstan with an integrated hoist to assist in guiding the material into the power-driven retractable feed head. This development is said to simplify feeding and straightening the wire during set-up. In addition it has RMG's new digital diagnostic/fault display and an electronic "end of coil" detector that is standard equipment on the model 1011 (17.5mm) and larger wire drawers.

RMG offers solutions for all in-line wire processing needs, from 2.5mm to 35mm for wire drawers and up to 45mm with power driven uncoilers. In-line wire drawing is key to lean manufacturing, said to offer reduced inventory, reduced downtime, improved tool life, increased productivity, minimised material handling and improved product finish. A fully utilised wire drawing line with descaler and Z-flipper can provide continuous production.

RMG's in-line wire processing equipment is in use for many manufacturing processes including fastener production, nail making, wire bending and wire straightening and cutting.

**Rockford Manufacturing Group – USA**  
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Website: www.rmgfelm.com

## Reels for drawing

GMP Slovakia's range of products includes reels for drawing, the most suitable being the HD-heavy duty reel.

The HD reel has a very heavy structure, with reinforced double flanges and barrel to support high wire tension. The barrel and top of the flanges are machined.

Options are available, such as a wire accumulator for continuous process, and hardened changeable bushings, dynamically balanced for high speed.

GMP Slovakia also offers a wide range of equipment for the handling of reels and coils, for example the RA-Reel Autolift, which allows the operator to lift the reel vertically from the central hole, and the TU-Tilting unit, which turns reels or coils 90° to bring them to the vertical to horizontal position, or vice versa.

For drawing the take-apart reels are also suggested: TA/SCS-Take Apart Single Central Screw and EK-Easycoil, a patented reel that releases the coils automatically.

For this reel the Plus version is also available, a take apart reel which also works as a coil lifter. Both take apart reels are fully machined on the parts in contact with the wire, have slots for metal strap insertion and can be supplied with circular slots in the flanges to fit the cardboard barrel.

To prevent wear problems, due to the high rotation speed, hardened changeable bushings are recommended.

GMP Slovakia can also supply changeable flanges to make coils with different widths.

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## New and used equipment

GER SA specialises in the sale of new and second-hand wire machinery for the ferrous and non-ferrous industry. The company sells single machines and complete plants for most products including steel rod and wire, non-ferrous wire and steel ropes.

A wide range is available from stock, or GER will source equipment as required including wire drawing machines from rod to fine wire, stranders and bunchers of different sizes and models from established manufacturers. Machinery can be reconditioned and modernised on request. GER also offers new electrical control systems, using state-of-the-art drives and components.

Machines are test run before shipment, or can be installed and commissioned at the customer's plant where full training for the operators completes the service for the customer.

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# 拉丝设备

在第三个千禧年有什么有用的东西可以被认为是一个期待400多年以来的工业革命的制造方法——而且自此已达到接近完美的程度？一个拉丝网络视频制作者并没有尝试。用轻柔爵士伴奏，他们只是简单地跟踪一个圆形金属通过一系列模具的过程，能减少直径同时浓缩容量。

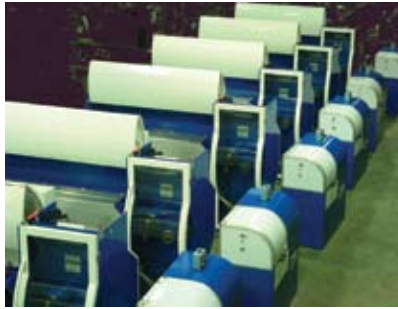
供应商看到这一段时同样倾向于让拉丝机自己来说话。他们的经验讲述了一条一流的拉丝生产线的细节，确保精度、速度和可保证性，它们是线材生产企业核心过程的标准操作程序。

## 切割钢线湿式拉拔

GCR Eurodraw SpA向钢帘线行业提供专业干式拉丝机，镀铜生产线和湿式拉丝机。近年来，开发了一种以类似帘线技术为基础的产品——切割钢线，用于光伏产业硅片切割。对于这一特定应用，GCR Eurodraw 设计了一个专门的切割钢线湿式拉丝机，满足这一高要求产品的特殊要求。

该机器为7轴，25到28个道，卧式锥形机，该机器具有以下特点：

- 超坚固整体模具夹持器减少线材振动；
- 6芯CERS设计，带外部加工绞盘；
- 特殊的锥形设计能减少滑动以及精确将线材在接下来的模具中对准；
- 准确的湿拉丝润滑温度和循环控制使模具里的润滑效果最佳，减少了模具磨损；
- 人机工程学紧凑设计允许直接进入所有机器部件，易于穿线和操作，而且几乎是零维护；
- 特殊的绕线机，带专利的排线系统，可以精确卷绕，无需操作者调整；
- 一体化电气盘柜，便于快速安装。



○ 来自GCR Eurodraw的切割钢线湿式拉丝机

GCR Eurodraw设计和制造其它湿式拉丝机用于其它应用，包括不锈钢，镀锌装订线材和高碳弹簧丝。公司还有一整套用于焊丝工业的湿式拉丝机，该机器由焊丝机器分部Comapac Wire Machinery Srl销售。

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## 用于大多数拉丝机的零部件

作为英国代理，Techna提供全套来自Naber & Wissmann GmbH的拉丝零部件。绞盘、锥体、拉拔圈，几乎能用于所有拉丝机，包括Niehoff、Henrich、Herborn、Samp和Syncro，对制造商任何规格的各种材料都适用。材料包括：

NWZ-A陶瓷或陶瓷钢化合物据说是在最具挑战性的拉拔条件下进行测试的，并且显示出最优的耐磨性和运行效率，直径在500毫米内。

NWM-74用于拉拔有色金属，尤其是铜和铜合金。对母材是热涂层和合金，这对硬质材料能提供一个良好的延展性，如碳化物、硼化物和硅化物，形成超耐磨的工作表面。

NWM-81/83在热涂层过程中被组合，但硬质合金占了很高的比例，使其适合控制钢丝帘线。厚度为0.8毫米左右，硬度为HV=2,900 to 4,600kp/mm，它可以被反复打磨，能抗震动，破损和热冲击。



○ 来自Naber & Wissmann GmbH的拉拔零部件

NWK-78材料为零部件提供了一个氧化陶瓷涂层表面，具有高度表面质量，被认为对拉拔铜和镀铜线材是最理想的材料。磨损的拉拔部分可以重新涂层和恢复到额定直径。

NWS-12是一种高合金特种钢，淬火到65 Hfc，具有高稳定性和良好的表面质量，对钢、铁和钢丝帘线的拉拔具有很好的拉拔性能。如果追求更高的拉拔速度，推荐使用NWS-90。

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## 来自SAS的全新组合拉丝机

SAS Engineering and Planning是一家实力雄厚的意大利公司，生产组合生产线和拉床，为黑色和有色金属产品拉拔棒材和管材(线卷到棒材以及棒材到棒材)，生产的其他设备包括剪切机、去皮机、倒角和矫直机、抛丸、涡流生产线和出/入线服务。

SAS因生产效率高以及高认证质量使其成为全球领先者。公司还拥有不同的专利，已发现其应用被世界市场所接收。SAS关注到从计划到施工到装配以及负荷试验各个阶段的产品。该生产线配有双凸轮轴，液压机架和液压飞剪，使该生产线能够以较高的速度工作，同时能确保最好的精度，工作范围 Ø 2毫米到54毫米。为了获得一个全自动化生产线，SAS组合拉丝机可以提供一整套最先进的附件，这些附件包括：放线组、预矫直设备、拉床、倒角机、困扎、称重和搬运设备等。一切都是自动化管理。

SAS对要求更快的拉拔生产线以及切割质量和精确度不断增长的需求做出了反应。公司设计和生产了液压飞剪切割“轴衬到轴衬”。这种切割减少了在材料上由切削应力产生的比压。更高质量已得到(钉子效应)以及关于棒材轴的切割是完美的正交。剪切工具组装在一个机架上沿滚珠号筒滑动，并由一个无刷电机去驱动。一个电子编码器，由中央驱动控制，驱动电机直到机架达到与板材相同的速度，该棒材只能在两个速度差为零时被切割，因此长度差大大降低。

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## 全新和二手设备

GER SA 专为黑色金属和有色行业销售新的和二手的线材机械。公司销售单个机器和整套设备，用于大多数产品生产，包括钢制棒材和线材，有色金属丝以及钢丝绳。有很多存货可供，或GER将按要求寻找设备，包括从已建制造厂寻找各种大小和型号的从棒材到精细线材的拉丝机，捻股机和成束机。

机器可以按要求重新检修和现代化。GER还提供新的机器控制系统，使用一流的驱动装置和零部件。机器在装运前试运行，也可以在客户工厂里安装和调试，培训操作者，为客户提供整套的服务。

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## 在线拉丝解决方案 铝成型线材粗拉线

Rockford Manufacturing Group (RMG) 是一家在线拉丝设备供应商，最近推出了1922型拉拔机，用于直径35毫米的材料。该机器利用实体D2工具钢1,525毫米线盘以及一个一体化起重机协助引导机器进入的电动可伸缩进料头。该发展据说可以在设置期间简化进料和矫直线材。此外，它有RMG的新型数字诊断/故障显示以及一个电子“线卷尾部”检测器，这是1011 (17.5mm) 型上的标准设备以及更大的拉丝机。

RMG 提供所有在线线材处理所需的解决方案，从2.5毫米到35毫米的拉丝机以及45毫米内的电动开卷机。在线拉丝是精实生产的关键，据说可以减少存货、减少停机时间，提高工具寿命，增加生产率和最小化材料运输和提供产品精度。一个充分利用的拉丝生产线带除磷机和Z-flipper，能够提供连续生产。RMG的在线电线加工设备在很多制造流程中使用，包括紧固件生产、制钉、电线弯曲和线材矫直以及切割。

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## 拉丝用卷轴

GMP Slovakia的产品系列包括用于拉丝的卷轴，最适合的是HD——重型卷轴。HD卷轴有一个非常重型的结构，用双法兰和卷筒加固来支撑高的线材张力。卷筒和法兰顶部是机械加工的。可供选择的有，比如用于连续加工的储线装置以及硬化的可变轴衬，用于高速动态平衡。

GMP Slovakia还提供一系列广泛的设备，用于卷轴和线盘处理，比如RA-Reel Autolift，它允许操作者从中心孔垂直吊起卷轴，还有TU-Tilting 装置，可以90°旋转卷轴或线盘，将它们带到垂直和水平位置，反之亦然。

用于拉丝，建议可拆装的卷轴：TA/SCS-Take Apart Single Central Screw 和EK-Easycoil，专利的线轴可以自动释放线盘。对于这种卷轴，也有Plus版可提供，这是一个可拆装卷轴，也可用作线盘升降机。这两种可拆装卷轴与线材接触部件全是机械加工的，有金属带插槽，还可提供法兰内的圆槽，适合硬纸板卷筒。为防止因高转速产生的磨损，推荐使用硬化的可变轴衬。

GMP Slovakia 还可以提供可变量法兰变化使线盘可以成不同的宽度。

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在全世界许多国家对能源需求的不断增加使得架空输电线路达到了输电能力极限。重新导通通电线路，用高温低弧垂导体可以解决日益增长的电网结构和容量问题。Niehoff现在向导体制造厂提供生产钢芯软铝绞线/梯形钢丝导体的粗拉机。

ACSS/TW导体（在Niehoff MSM 85粗拉机上制造的）在一个绕钢芯成梯形捻股里融入了软铝线理念。

成品型材可以用型材模具由圆形入口材料拉制出（如图所示）。比如，直径为9.52mm 的入口材料Aluminium 1350 (Al 99.5)线材到13.431mm<sup>2</sup>的成品型材。为了达到61.8 %IACS（国际软铜标准）导电性，一个退火程序被执行。



○ Niehoff MSM 85粗拉机以及一体化RA 501连续退火装置

电子控制的Niehoff MSM 85带单独驱动的绞盘和一体化RA 501连续退火装置可用于这些应用，或现有的Niehoff粗拉机可以升级。

MSM机器使制造商能够在一条生产线上拉拔圆形和梯形铝和铝合金线材。RA 501退火炉专门设计用于铝和铝合金线材在线退火。不是昂贵的分批式退火炉，Niehoff提供的是在线退火工艺。

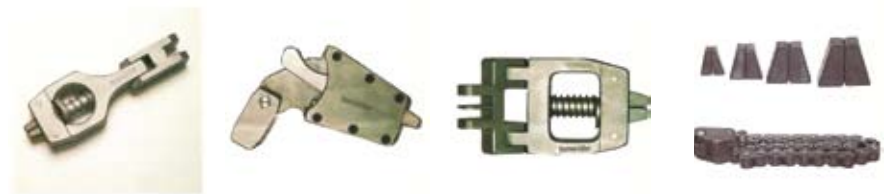
在MSM 85 机器里，每个拉拔绞盘由其自己的交流电机单独驱动，这样可以使滑动操作最小化。这样每个道与不同的线材拉伸工作——根据材料性能和线材型号——是可能的。

该MSM生产线配有节能交流电机和能量优化零部件。

**Maschinenfabrik Niehoff GmbH & Co KG – 德国**      传真: +49 9122 977 155  
 电子邮件: info@niehoff.de      网址: www.niehoff.de

## 使拉拔更容易的牵引钳

Tecnosider设计了一系列新的牵引钳，TEK系列，使拉丝更容易并且得到了改进。与现有的Tecnosider 牵引钳一样，目的是产生一个更好的器具，适合在重型工作条件下的使用。



○ 来自Tecnosider的牵引钳（选择一种或几种）

新型号的特点包括：

- 用途广泛，易于使用——既可以在左边也可以在右边工作；
- 当用手柄操作时，钳子可以很方便的同时打开。夹具还可以用于特殊的导架。
- 可以快速、方便的更换夹具。
- 线材插入牵引钳的夹具里，必要时，可以通过一个特殊的钻孔导架从钳子的后面出来。这使得足够长的线材可以插入钳子里，用来固定线材接触面上的夹具，因此可以避免在研磨器作业的部件上作业。这一部分是脆弱的，一旦断裂需要重复操作，损失宝贵生产时间。

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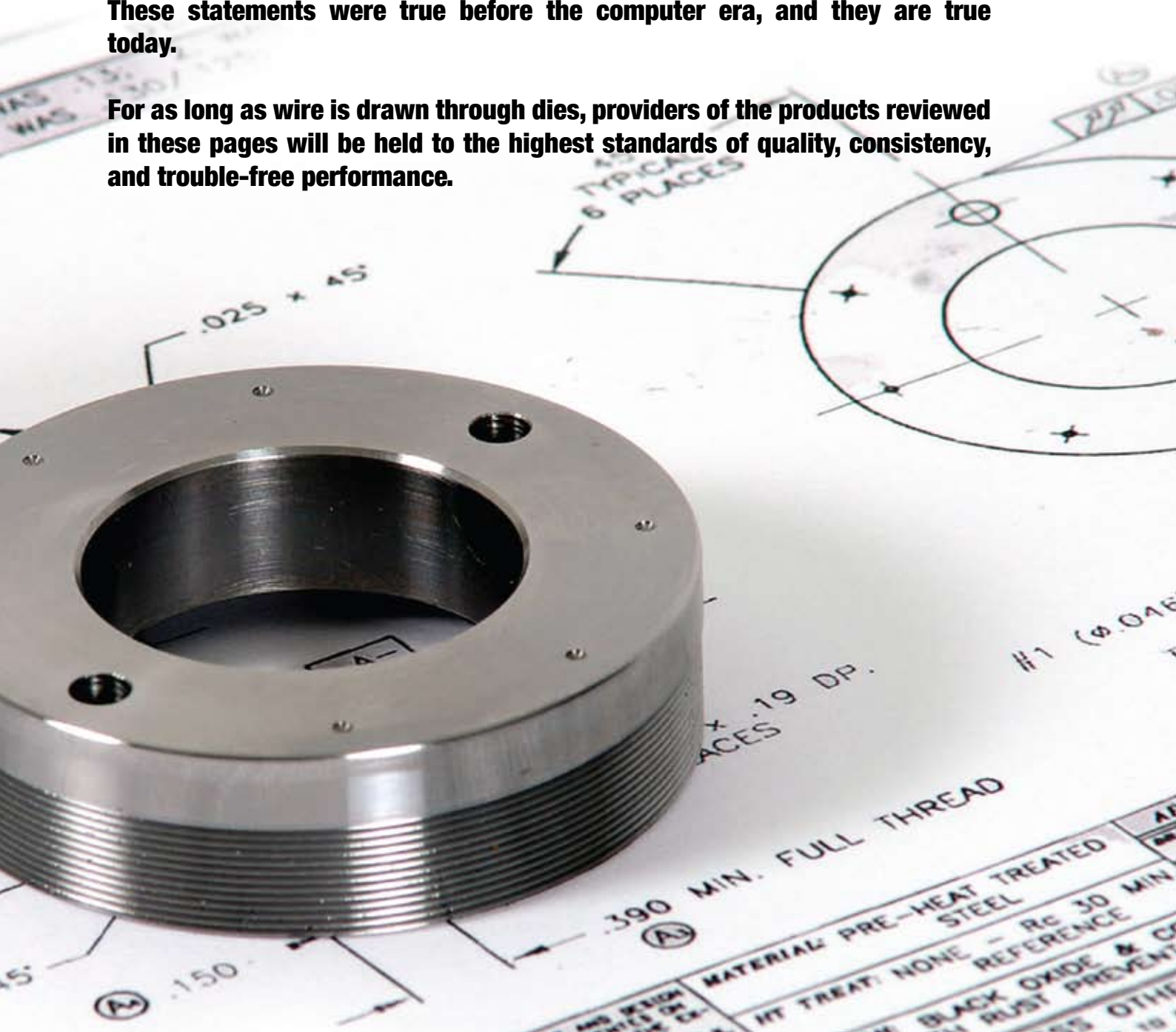
# Dies

**In the drawing process, the pressure between the wire and the die may rise to 450kg/mm<sup>2</sup>, and temperatures to 400°C are not extraordinary.**

**In these conditions the selection, mounting and orientation of the die are critical to achieving the precise profiling, accurate hole-sizing and wearability essential to a flawless production run of wire.**

**These statements were true before the computer era, and they are true today.**

**For as long as wire is drawn through dies, providers of the products reviewed in these pages will be held to the highest standards of quality, consistency, and trouble-free performance.**





# New drawing die

Lubrication is a crucial factor for the quality of the drawn wire. An interrupted lubrication in the steel wire drawing process causes an increase of surface tension in the wire, strong pressures inside the die, rapid die wear, breakage of the drawing nib and consequent non-programmed interruptions in the wire drawing process.

In order to avoid these problems, Koner has developed a new line of drawing dies – K.340 and K.370 pressure drawing die (patented worldwide), specially constructed and designed to greatly improve lubrication in dry drawing of steel wire.

For wet drawing the K.320 die has been created; its inside geometry allows optimum wet drawing process characteristics and offers economic savings.

The K.340, K.370 and K.320 methods are said to provide considerable operating advantages:

- Production at maximum drawing speeds
- Less machine downtime for die replacement
- Better and more homogeneous wire quality
- Wire drawing under optimum quality control
- Nib life increased by 30% compared to traditional dies
- Overall costs reduced by around 40% (only change the nib, not the entire die)
- Application of the required quantity of lubricant coating to the wire
- Better wet or dry redrawing operations
- Overall dimensions are the same as for traditional dies
- Savings on transport – even large quantities of nibs can be delivered rapidly in small packages directly to customers in any part of the world
- Elimination of die rejects and the accumulation of unusable drawing dies. Return can be gained from the sale of worn tungsten carbide parts



○ K.340, a new line of dies from Koner

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**Website:** www.tktgroup.it

# Re-grinding in-house

Ajex & Turner has manufactured a wide range of wire drawing dies, tools and machinery since 1962, dedicated to improving the equipment and technology with a policy of ongoing development.

New die polishing machines are now available. For PCD and ND wire and stranding dies up to 20mm, the model SAU 450 can re-grind and polish dies from 0.5mm. An in-built grinder automatically grinds the needles in any degree. In one working shift, up to 20 large dies can be re-ground and polished, depending on the PCD blank size.

Also available is the UPM-515 with swinging head. This machine, believed unique to Ajex & Turner, has been developed for polishing and re-cutting diamond and PCD dies up to 3mm. It has a built-in generator, to save space, and is easy to operate. The ultrasonic frequencies of this machine are said to be very stable, while the oscillating head removes sharp edges and produces well blended angles. For 3mm, it takes 20-40 minutes in shaping, depending on the PCD nib size.

For in-house grinding of carbide dies the company offers model TCD-11, suitable for grinding and polishing carbide dies of 1mm to 50mm. It can also hold a casing size of up to 100mm. Depending on nib size, up to 50 dies can be ground and polished in one working shift.

Ajex & Turner can also supply accessories such as diamond powder, pastes and steel and diamond needles.

**Ajex & Turner Wire Die Co – India**  
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QUALITY-INNOVATION & EUROPEAN KNOWHOW  
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- DIE REPAIRING CONSUMABLES**
- Diamond Paste-Powder - Suspension
- Diamond Hand Files, Angular Pins, Checking Pins - Steel Pins
- Boron Carbide Powder & Paste
- Ceramic Parts, Bush & Pulley
- IN HOUSE DIE POLISHING MACHINES**  
**FOR PCD - ND - CARBIDE DIES**



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## Die Saver finisher

Die Quip has released the Die Saver line of die finishing machines for tungsten carbide wire drawing dies. The line comprises three models, said to be capable of grinding or polishing dies in either manual or automatic cycles to meet the requirements of any die shop. All models are of a heavy-duty construction, with simple controls and Die Quip's sine bar angle setting for accurate angles and faster polishing times.

The HDF-100 is the starting machine, designed mainly for high speed polishing but capable of grinding small numbers of dies per day with its 9,000rpm spindle. The MGF-200 is a semi-automatic machine with a high-speed spindle to meet the needs of most wire mills, and the SGF-300 (with the largest die holding capacity of 100mm) has the most powerful grinding spindle and automatic cycle.

For large production of dies the MGF or SGF machines can be combined with Die Quip's Die Flex line of calibrating and polishing machines.

Die Quip's machines are designed to produce tooling in-house to improve material delivery times, reduce tooling costs and provide productivity improvements by increasing die life through better design, but the company also offers extensive training programmes, with on-site training, detailed manuals and the exclusive Die Making handbook.

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○ Die grinding machine from Die Quip

## Cable compacting and stranding dies

Sanxin Nano dies, for compacting and stranding operations, are manufactured from a tungsten carbide die, to which a very thin layer of nanocrystalline diamond particles is applied to the working surface of the nib.

The particles are in the nanometre size range and all the particles are the same size, locked together in a pattern to produce exceptional hardness and strength.

Tungsten carbide and PCD dies continue to wear until they go out of tolerance; Nano dies hold +0 tolerance for their entire working life. When a Nano die finally fails it is due to the collapse of the diamond surface, caused by metal fatigue in the tungsten carbide foundation material.

In compacting and stranding applications, the +0 working life of a Nano die might be as high as 1,000km, but typical die life is in the range 500-800km.

The Nano die +0 tolerance offers savings in raw material. For example, if compacting a 240mm copper cable at 18.4mm diameter, a comparison may be made between a tungsten carbide die which opens out by 0.1mm in 100km of cable compacted, and a Nano die which holds +0 tolerance.

The Nano die is said to have the potential to pay for itself in the first few kilometres, and to continue to save raw material costs over 600 or 700km.

Nano dies are thought to impart a better surface finish on the cable than TC dies. Furthermore, less energy is required to run compacting and stranding machinery when using Nano dies, due to the extremely smooth working surface.

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**FOXTON DIES**

**THANK YOU TO ALL OUR VALUED CUSTOMERS FOR 60 YEARS SUPPORT**

Tungsten Carbide Round Wire Drawing Dies  
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 Quality Engineering Solutions for Manufacturers Worldwide

**ESTABLISHED 1950**

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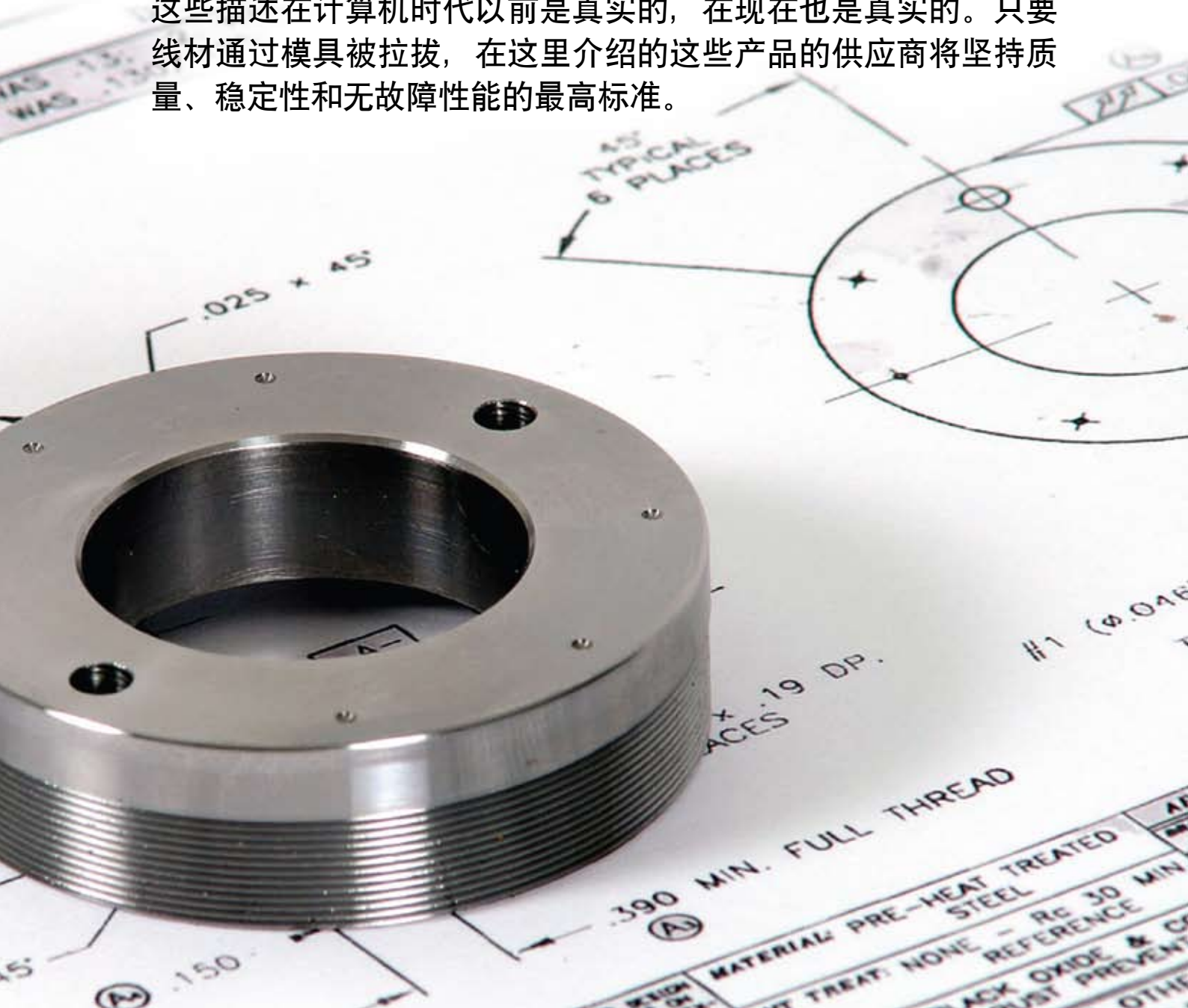
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# 模具

在拉丝过程中，线材和模具之间的压力可能上升到 $450\text{kg}/\text{mm}^2$ ，温度达到 $400^\circ\text{C}$ 是不奇怪的。在这些条件下，模具的选型、安装和方位对实现完美线材生产运行必不可少的精确成型、精确钻孔和耐磨性这些要素来说是至关重要的。

这些描述在计算机时代以前是真实的，在现在也是真实的。只要线材通过模具被拉拔，在这里介绍的这些产品的供应商将坚持质量、稳定性和无故障性能的最高标准。



## 新型拉丝模

润滑是影响拉丝质量的一个非常重要的因素。

在拉丝过程中，一个中断的润滑将使得线材的表面张力增加，模具内部压力增强，模具磨损加快，拉拔尖断裂以及随后造成拉丝过程中非程序化中断。

为了避免这些问题，Koner开发了新的拉丝模具系列——K.340和K.370压力拉拔模（世界专利），专门制造和设计用来大大提高钢丝干式拉拔的润滑功能。

对于湿式拉拔，K.320模具已诞生，其内部轮廓可以优化湿式拉拔工艺特点并可节约成本。

K.340、K.370和K.320方法据说能提供巨大的操作优势：

- 以最大的拉拔速度进行生产
- 减少模具更换机器停机时间
- 线材质量更好、更均匀
- 在最佳质量控制下进行拉丝
- 与传统模具相比，模嘴寿命增加了30%
- 总体成本降低40%左右(只有改变模嘴，而不是整个模具)
- 线材润滑涂层达到要求的质量
- 更好的干式或湿式拉丝操作
- 与传统模具外形尺寸相同
- 节约运输，甚至大量的模嘴可用小包装直接快速发送到在世界上任何地方的客户。
- 消除了模具废料以及无法使用的拉拔模具积累。可以通过销售破旧的硬质合金部件得到回报。



○ K.340. Koner的新的模具系列

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 电子邮件: tkt@tktgroup.it  
 网址: www.tktgroup.it

## Die Saver 精加工机

Die Quip 已经推出了硬质合金拉丝模具精加工设备Die Saver系列。该系列有三种型号组成，据说能够手动或自动循环打磨或抛光模



○ 来自Die Quip的模具研磨机

具，可以满足任何模具加工的要求。所有型号都是重型构造，具有简单的控制以及Die Quip的正弦规角度设计可以实现精确的角度和更快的抛光次。

HDF-100是起步机器，主要用于高速抛光，但凭借其转速为9,000rpm的主轴每天也能够打磨小数量的模具。

MGF-200 是一台半自动机器，带有高转速的主轴，能满足大多数线材加工工厂的需要，以及SGF-300机器（最大模具尺寸为100毫米），拥有最强大的磨轮主轴和自动循环。对于模具的大量

生产，MGF或SGF机器可以集成到Die Quip的Die Flex测量和抛光机生产线。

Die Quip的机器设计用来生产内置工具来改进材料交货期，减少工具成本并通过更好的设计延长模具寿命来提高生产率，公司还提供详尽的训练课程，提供现场培训，详细的说明书和专门的模具制造手册。

**Die Quip Corporation – 美国**  
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 网址: www.diequip.com

## 电缆紧压和绞缆模

用于紧压和绞缆生产的Sanxin Nano模由一个硬质合金模具制造而成，一个非常薄的纳米晶体金刚石粒子用于磨嘴的工作表面。该粒子在纳米大小范围内，所有粒子尺寸一样，一起锁在一个模式里来形成特殊的硬度和强度。

硬质合金和金刚石模具继续磨损直到他们超出公差；Nano模具在整个使用寿命内保持+0的公差。

当一个Nano模具最终失效时是因为硬质合金基础材料中的金属疲劳引起的金刚石表面磨损而造成的。在紧压和绞缆应用中，一个Nano模具的+0使用寿命可能高达1,000km，但传统的模具寿命在500-800km范围内。

Nano 模具 +0的公差可以节约原材料。比如，如果以18.4毫米的直径紧压一段240毫米的铜缆，可以比较在一个100km紧压电缆长度内，硬质合金模具有0.1毫米超差和一个只有+0公差的Nano模具。据说该Nano模具可以在最初的几公里支付其本身的费用，并且继续在600 或700km节约原材料成本。

与TC模具相比，Nano模具被认为可以为电缆提供一个更好的表面加工质量。此外，当使用Nano模具时，因为超光滑的加工表面，只需要很少的能量来运行紧压和绞缆机。

**Sanxin Wire Die Inc – 美国**  
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 网址: www.sanxinamerica.com

## 内置研磨

自1962年以来，Ajex & Turner已制造了一系列线材拉丝模具、工具和机械，在持续发展政策下致力于提高设备和技术。先在可提供新的模具抛光机。对于20毫米内的PCD和ND线材和合股模具，SAU 450型机器可以再磨和抛光0.5毫米以上的模具。一个内置磨机口可以自动将针头打磨到任何程度。在一个轮班里，可以修磨和抛光20个大模具，具体根据PCD坯料尺寸。

带旋转头的UPM-515也可提供。Ajex & Turner相信该机器是独一无二的，开发用来抛光和再切割3毫米以内的钻石和金刚石模具。它有一个内置的发电机，可节省空间而且易于操作。该机器的超声频率据说非常稳定，同时旋转头可以去除掉锐边并产生完美角度。对于3毫米的模具，在20-40分钟内能成型，这取决于PCD尖部尺寸。

对于硬质合金模具内部打磨，公司提供TCD-11型机器，适合打磨和抛光1毫米到50毫米内的硬质合金模具。它还可以夹住100毫米内的套管。根据尖部大小而定，可以在一个轮班里打磨和抛光50个模具。

Ajex & Turner 还可以提供配件，如金刚石粉、膏、钢和钻石针头。

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# Reducing cost in manufacturing compact conductors using roll form stranding

By Sean Harrington, sales and marketing manager for Ceeco Bartell Products

## Abstract

The roll form stranding process combines the advantages of two highly productive processes, namely roll forming and double-twist stranding.

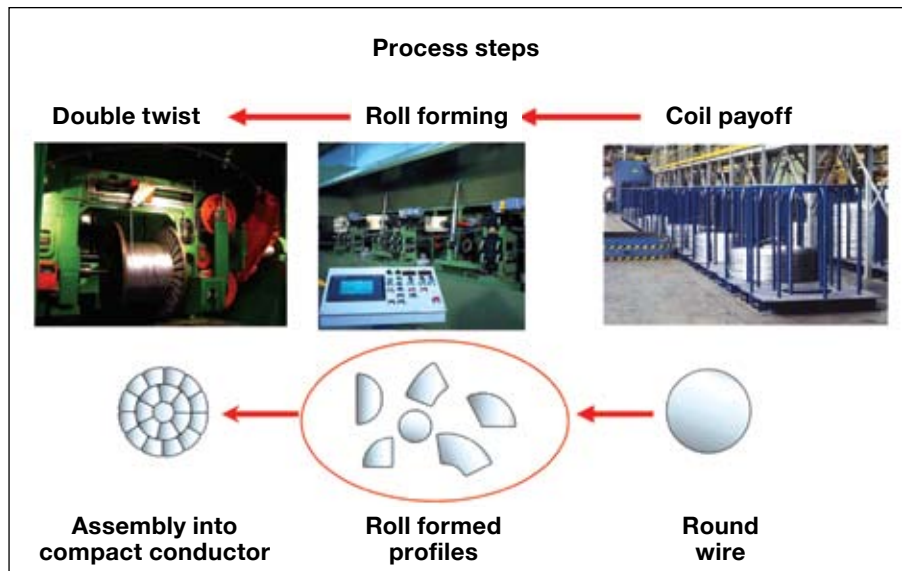
These two systems are forged together to create one high-speed continuous manufacturing cell. This system not only produces compact strand at high speeds, but also allows significant savings to be made throughout the stranding process, from wire drawing all the way through to the extrusion process.

## Introduction

Recent years have presented a great challenge to the cable industry, especially through the current world recession when demand for cable has reduced, in some cases, by 50 per cent. At the same time raw material prices and energy costs have continued to rise. This has made the competition between manufacturers increasingly aggressive in terms of product range, product quality and costs.

The aim of this paper is to present a cost saving technological solution for the wire drawing process. This is the use of the roll form strander, which allows the use of a single input diameter wire to be utilised throughout the stranding process giving significant process savings and advantages, including:

- I. Higher stranding productivity (typically 40 tonne/day compact Al)
- II. Higher productivity in wire drawing
- III. Lower drawn wire scrap
- IV. Lower insulating costs
- V. Lower capital investment
- VI. Improved return on investment
- VII. Quicker set-up
- VIII. Reduced work in process
- IX. Shorter cycle times



- X. Smaller input wire storage area
- XI. 75% more energy efficient than a typical rigid strander

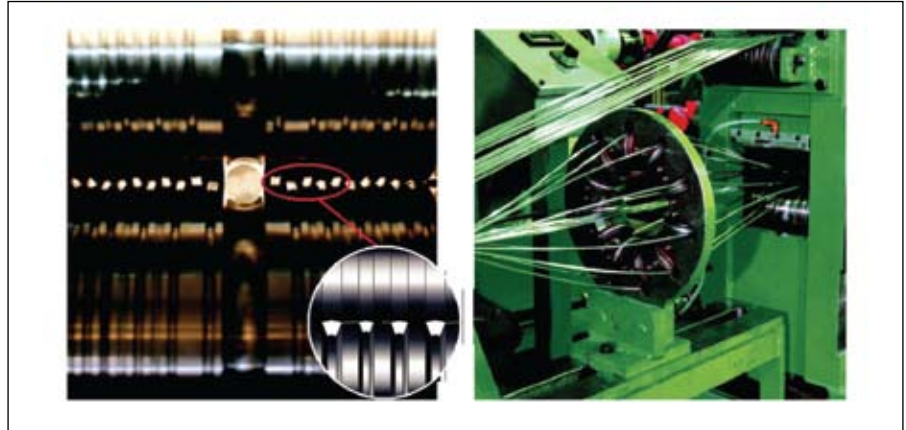
The roll form stranding process combines the advantages of two highly productive processes: roll forming of shaped wire and double twist stranding of conductors. These two systems are forged together to create one high-speed continuous manufacturing cell.

This system not only produces compact strand at high speeds, but also allows significant savings to be made throughout the stranding process, from wire drawing through to the extrusion process. Round wire is paid off from stem-type payoff packages allowing up to 1,000kg (2,000lb) of aluminium or 3,000kg (6,000lb) of copper conductor material to be staged behind the roll form strander. The stem package allows continuous operation and is the preferred solution for this process, maximising productivity when the single input wire method is an integral part of the manufacturing process. The round wire passes into the external roll forming section, an integral part of the roll form strander.

The object is to present profiled material to the strander. The round wire is re-shaped into the optimum format for the desired strand construction and finished cable size.

This roll form system can be as simple as a two-layer (1+6) construction or as intricate as a five-layer (1+6+12+18+24) construction.

The scope of the strand design determines the application configuration; there are many different designs available for each layer.



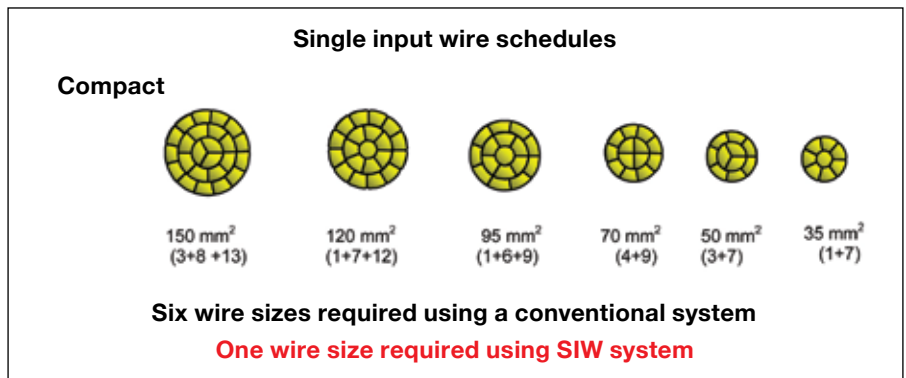
- (a) Roll forming of the input wires. This is achieved with a driven roll stand shaping each wire in a layer to a precisely designed shape.
- (b) Round wire layers where a number of round wires are closed without any change in section.

○ Figure 1: Close up of roll formers

○ Figure 2: Roll form unit and closing point

Depending on the strand design, up to four layers of roll forming strand may be produced.

Each roll strand is driven individually, allowing slight changes in speed to be made at each position to compensate for the variances in the spiral length.



○ Figure 3

It further allows more precise distribution of wire tension in each layer, optimising the straightness of the resulting conductor.

The shaped conductors are formed into a compact unilay strand using a high-speed double twist strander.

The machine is a side-loading unit equipped with a standard floor loader, designed to load and unload the take-up reel with minimum operator effort.

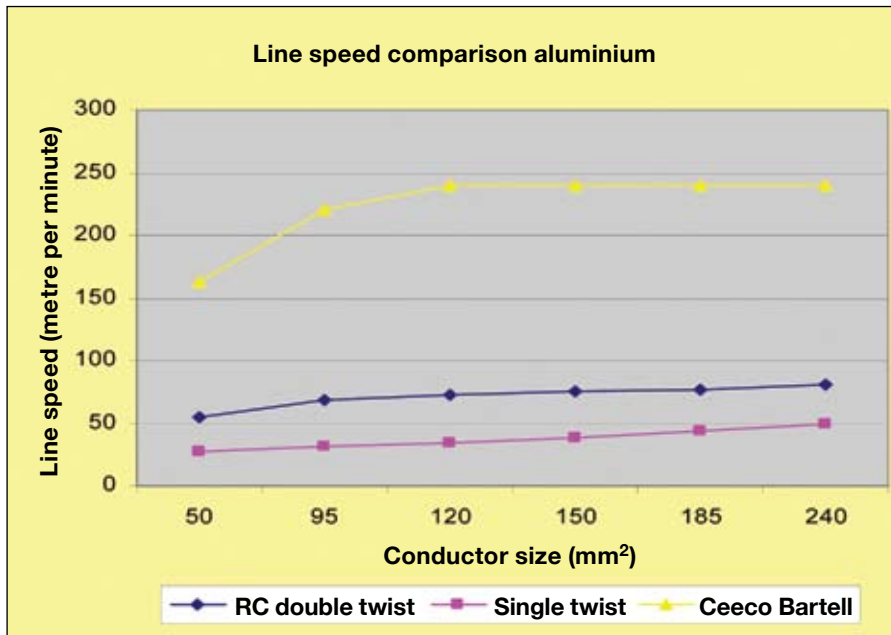
The scope of products that can be manufactured includes:

- Copper and aluminium stranded conductors between 8AWG and 600kcmil or 10mm<sup>2</sup> and 300mm<sup>2</sup>
- Bunched conductors to compact strand with fill factors between 76% and 97%
- Aluminium conductors steel reinforced (ACSR) using a single steel wire core
- All aluminium and aluminium alloy conductors (AAC & AAAC)
- Cabling of insulated conductors

○ Figure 4: Process cost/twist comparison

Capital cost/ Twist	\$	\$	\$	\$	\$
	Double twist Strander	Tubular Strander	Drum Twister	Rigid Strander	Planetary Strander
Factors	Double Twist Strander	Tubular Strander	Drum Twister	Rigid Strander	Planetary Strander
Capital cost/twist	1	3-5	7-16	9-12	16-24
"Working factor"	Significant (rigid)	Almost none (planetary)	Significant (rigid)	Significant (rigid)	Almost none (planetary)
Lay limitations	Unilay only	Not applicable	None	None	None
Layer limitations	Up to 4 layers	2 layers	None	None	None
Typical payoff package	Stem	Bobbin	Stem	Bobbin	Bobbin
Payoff mode	Continuous	Required loading cycle	Continuous	Required loading cycle	Required loading cycle





○ Figure 5: Line speed comparisons

Ceeco Bartell believes its roll form strander is the only process to fully utilise the advantages of single input wire (SIW) diameter. SIW represents a strand and design mentality, with a manufacturing methodology that effectively reduces the conversion cost from rod to strand without compromising conductor performance.

This concept replaces the traditional stranding of wires using different wire diameters with the stranding of wires using the same wire diameter for a wide range of cross sections. SIW diameter meets major conductor standards such as IEC 60228, HD 383 and the ASTM standards. By incorporating a single input wire diameter program into the strand design, significant savings can be achieved in wire drawing, stranding and the insulation processes.

Traditionally a finished stranded conductor requires its own drawn wire diameter. Each wire diameter typically requires a new string-up in the wire drawing machine. Some conductor designs require more than one drawn wire size. The set up time taken on the drawing, combined with inventory levels that are necessary to manage the number of wire diameters, represent unnecessary activities that add to the cost of conversion from rod to strand.

The SIW approach, using the same input wire diameter to finish a range of stranded conductors, eliminates much of the unnecessary activity associated with the traditional set up.

This leads to increased efficiency in the wire drawing process. Instead of having to produce a large number of different wire sizes only one or two are required using the SIW system.

The improvements can be seen in the following areas:

- Higher productivity in wire drawing
- Lower drawn wire scrap
- Quicker set-up
- Reduced work in process
- Shorter cycle times
- Smaller input wire storage area
- Reduced drawing die inventories

The single input wire method can save between 15% and 20% on wire drawing costs, including the elimination of re-strings for size changes, lower die inventory and reduced in-process wire.

Double twist stranding has always been among the most productive methods of producing strand. Its incorporation into the roll form strander, with the application of the individual shaping of the wire, has further extended its performance range.

In Figure 4 its performance can clearly be seen. Each machine type works the wire differently, and this impacts on the strand design that can be used for that process.

Figure 4 highlights some of the advantages and disadvantages of each machine type as they relate to product capability and relative

cost. It is important to recognise that if the roll formed or die shaped wire is used in the strand construction a 'rigid' machine, or a machine that puts a twist in the wire for each lay length, is a prerequisite for manufacture.

#### Capital cost per twist

Determining the range of equipment to cover the strand designs is an important consideration in achieving the lowest conversion cost.

For example, the double twist machine offers the lowest cost per twist but is the most limiting in terms of the construction possibilities. By its incorporation into the roll form strander this range of construction possibilities has been greatly expanded. The planetary machine, at the other end of the spectrum, has the highest cost per twist but the greatest construction possibilities, which is why it is used for special purpose products.

#### Material limitations

Each machine type works the wire differently. For this reason alone it is necessary to identify the differences to be able to use the same drawn wire size for the multitude of stranding possibilities.

This applies not only to the principle of the machine but also to the area reduction that can be expected from different machine types. Keep in mind that in most cases the area reduction through the machine varies at different speeds and, to some extent, all machines used to manufacture strand require that the stress in the wire during the stranding point exceed the yield point of that material.

For example, the double twist, single twist and rigid strander put a twist into each input wire along the axis of the wire for each lay length; the tubular and planetary machines are more forgiving and put almost no twist into each wire, which is important when stranding steel wire.

#### Lay and layer limitations

Both the double twist and single twist machines currently can manufacture up to four layers (typically a 37-wire

construction) in one pass. The lay length and the lay direction are identical, which is a limitation for some specifications. The tubular strander is typically a one-layer machine manufacturing a reverse concentric strand.

Rigid and planetary machines, in the correct configuration, effectively have no limitations for the majority of conductor materials. With the roll form strander it is possible to use this as a highly productive feeder into the rigid strander for larger products, while still optimising the SIW concept.

The optimum mix of machines in a manufacturing plant will not be discussed at length in this paper. Suffice it to say that this analysis represents perhaps the most significant economic risk in the installation of any stranding capacity.

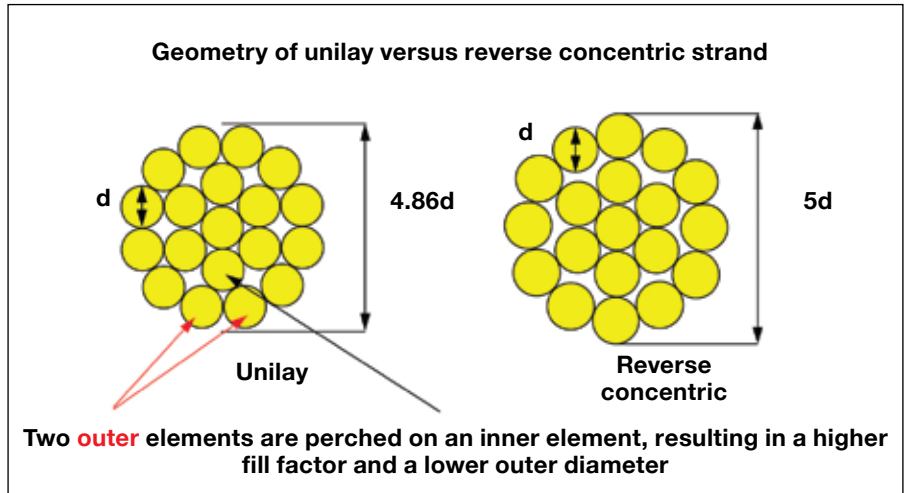
The process of defining the scope of what constructions need to be made, both present and future, is an important prerequisite to determine the optimum manufacturing cell for conductor strand. Using the roll form strander not only to produce finished compact conductor, but as a feeder into a rigid strander for larger products such as 400mm<sup>2</sup> and 500mm<sup>2</sup>, allows for a flexible stranding manufacturing cell.

When a comparison in line speed is made between compact conductor production and other high speed stranding processes, the impact on performance using the roll form strander and the SIW process is dramatic, with the roll form strander achieving double the productivity.

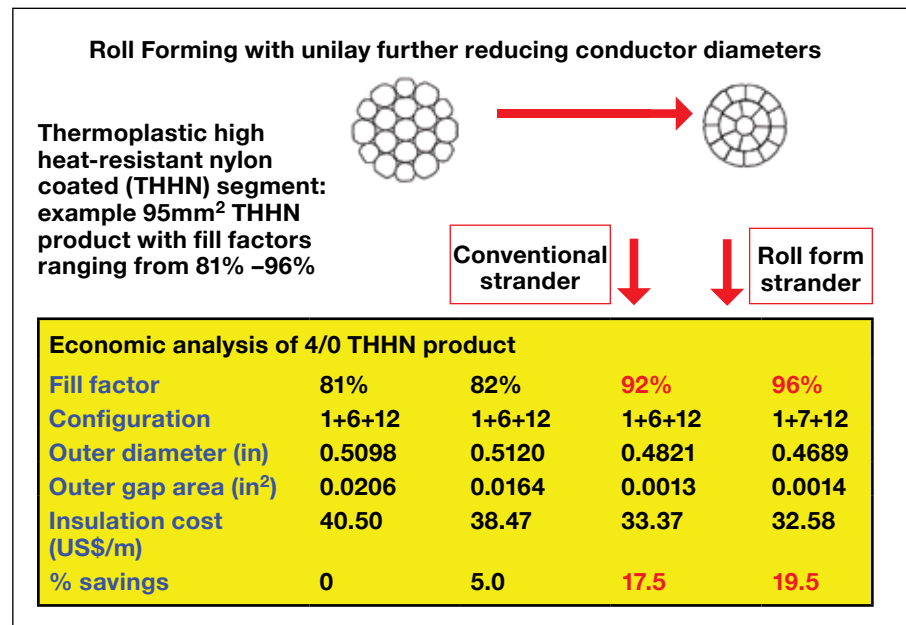
The benefits of the roll form strander are more apparent when compared to conventional stranding processes, such as rigid stranding.

**Important points to remember:**

- I. The speed of the roll form strander is 1,200tpm, product dependent. In comparison the rigid strander will operate at 300tpm maximum
- II. While the loading time of 19 DIN 630 reels can be minimised, the rigid strander must still be stopped in order to replenish the reels and allow welding of the wires. Even with modern automatic loading, it is estimated that two operators will take 45 minutes to complete a loading sequence. In comparison with the use of the automatic changeover facility at the payoff system, the operator is able to change the 19 coils of wire and weld them together while the roll form strander is running. Therefore the only time the machine stops is to change the take-up drum, which should not take longer than 10 minutes
- III. The whole roll form stranding process requires only one operator



○ Figure 6



○ Figure 7

After the strand has been formed it is often insulated; the ease and cost of this process are greatly dependent on the stability, tightness and surface of the strand. If the geometry of the strand is unstable, the strand elements will shift and, ultimately, birdcaging will result.

This not only makes the process much more difficult, but the incurred losses due to scrap and down time can be significant. A tightly wound conductor is less likely to be subject to birdcaging; again, the tightness of the strand is greatly dependent on the geometry of the elements.

Figure 6 shows two strand designs. Both designs consist of the same number of wires, of identical input diameter, and both have the same cross sectional area.

The difference is that the construction on the left is unilay or unidirectional lay, while the construction on the right is of a reverse concentric lay design. The elements of the unilay/unidirectional strand are nested; all of the elements touch and each element of a layer rests on an element of the layer below. The result is a more stable and a more compact geometry.



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Comparing unilay and reverse concentric strands of the same round element input diameter, the unilay strand will inherently have a smaller conductor diameter (4.86d versus 5d) and thus a higher fill factor (80.3% versus 76%).

Note: the fill factor represents the ratio of conductor area to the total circular area enclosing the elements.

The amount of extrusion material necessary is defined by the strand design; the smaller the outer diameter of the bare conductor, the less extrusion material is necessary.

Figure 6 shows how a unilay/unidirectional lay conductor is inherently smaller in diameter than a reverse concentric lay conductor. The more compact the conductor, the smaller the outer diameter.

The surface of the outer diameter is critical. A smooth outer layer, such as one found on a solid conductor or a roll formed layer, has fewer interstices and, therefore, fewer gaps that need to be filled with insulation. This can be clearly seen when comparing a compressed conductor with a compacted conductor, as seen in Figure 7.

As the conductor is compacted the diameter of the conductor and the interstices are reduced in size, leading to a reduction of used extrusion material. The extrusion process is most economical and productive when using a stable, tight conductor with the minimum outer diameter and smoothest possible surface.

Conventional stranders can only achieve a maximum fill factor of 92%, whereas the roll form strander can achieve fill factors of 96% and above. The effective saving in insulation costs between the two processes is around 2%.

Case studies have been carried out from wire drawing to final insulation of the conductor, taking all downtime parameters into consideration. The comparison was between a conventional 19-wire rigid strander and a roll form strander, each producing 3,000km of 150mm<sup>2</sup> compact aluminium per year. The predicted annual savings were demonstrated to be in the region of €430,000.

It should be remembered that savings in production costs depend on many factors such as existing manufacturing facilities, whether the strand is currently manufactured in-house or purchased, the care and control exercised over input copper and aluminium wire, general housekeeping and the control of high-speed roll form stranding machines. Under the most advantageous conditions savings can provide extremely short payback periods, but should of course be calculated for each individual application.

The high performance of roll form stranders coupled with the Ceeco Bartell patented roll forming process will allow the cable manufacturer to reduce costs without compromising finished conductor performance.

An awareness of this and other new technologies, combined with enlightened specifications, will further enhance the development of strand design and the potential to optimise further the manufacture of stranded conductors.

*Sean Harrington was awarded the HW Bennett Non-Ferrous Trophy 2010 for this paper, which was presented at Istanbul Cable & Wire '09. It is reproduced here by kind permission of the conference organiser the IWMA.*

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# 用轧辊成型绞线机生产紧压绞线，降低成本

作者：Sean Harrington, Ceeco Bartell Products销售和经理

## 摘要

轧辊成型绞线工艺汇集两种高生产力工艺之优点，即轧辊成型和双节距绞合。将这两个系统融合之后，创建一个高速连续生产系统。这个系统不仅能高速生产紧压绞线，还能使整个绞合工艺从拉丝一直到挤出工艺大大节约成本。

## 前言

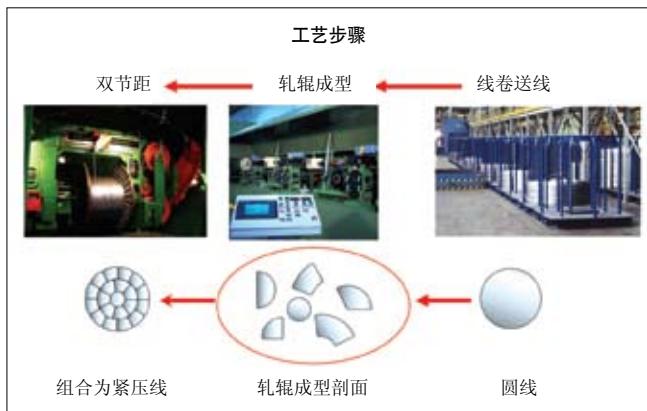
在电缆需求下降、有些地方下降50%的情境下，电缆工业近年来面临着巨大的挑战，尤其是经历了当前世界经济衰退的时节，与此同时，原材料价格和能源成本持续上涨，导致制造商之间在产品范围、产品质量和成本方面的竞争日益激烈。

本文旨在为线材拉伸工艺介绍一种节约成本的技术解决方案：使用轧辊成型绞合机，整个绞合工艺只用单根输入直径线，给出很大的工艺节约和优点，包括：

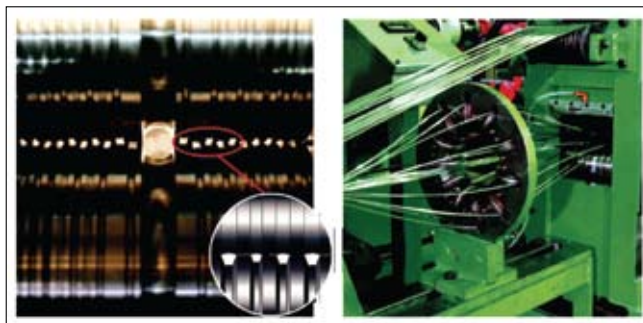
- I. 绞线机具有更高的生产率（通常40吨紧压Al线/天）
- II. 更高的线材拉伸生产率
- III. 更低的拉伸线材废品率
- IV. 更低的绝缘成本
- V. 更低的资本投资
- VI. 更高的投资回报
- VII. 更快的设定
- VIII. 降低了工作量
- IX. 更短的循环时间
- X. 更小的输入线材储存区域
- XI. 比典型刚性绞线机提高能源效率75%

轧辊成型绞合工艺集两种高生产率工艺之优点：线材轧辊成型和双节距绞合。融合这两种系统后，创建出一种高速连续生产单元。这个系统不仅高速生产紧压绞线，还使整个绞合工艺从拉伸一直到挤出工艺大为节省。

圆线从杆式放线装置送出，从轧辊成型机后送入，放出铝线时可达1000kg (2000lb)，放出铜线时可达3000kg (6000lb)。杆式放线装置可连续操作，是这个工艺的首选解决方案，它使生产率最大化，而单输入线法是生产工艺不可分割的一部分。



○ 工艺步骤



○ 图1: 轧辊成型机近视图

○ 图2: 轧辊成型机和绞合点

圆线进入外轧辊成型段，这是轧辊成型绞合机不可分割的一部分，旨在向绞合机提供已成型的材料。

这种轧辊成型系统可以是简单的两层(1+6)构造，也可以是复杂的五层(1+6+12+18+24)构造。绞合机设计范围决定了应用组态；每层还有许多不同设计。

- (a) 输入线轧辊成型：由被动轧辊绞合而完，每根线在一层面上成型，达到精确的设计形状。
- (b) 圆线绞合成层：许多圆线绞合，没有截面变化。

取决于绞合设计，最多可生产四层轧辊成型绞合线。每根轧辊独立驱动，允许每个位置速度略有变化，以补偿螺旋长度差。它还允许每层更精密的线张力分布，优化导线直度。

用高速双节距绞合机将成型导线制成一根紧压的同节距绞线。设备从侧面进料，配备标准的落地进料机，便于装卸卷绕轴。

可生产的产品范围包括：

- 介于8AWG和600kcmil或10mm<sup>2</sup>和300mm<sup>2</sup>的铜和铝绞线
- 紧压绞合的束线，装填因素介于76%和97%
- 采用单钢丝芯的钢补强铝线(ACSR)
- 所有铝和铝合金线(AAC & AAAC)
- 绝缘线成缆

Ceeco Bartell相信其轧辊成型机是唯一的能完全利用单输入线(SIW)直径优点的工艺。SIW展示了一种绞合机和设计理念，这是一种既不影响性能又能有效降低棒材到绞线成本的生产方法。这种概念用相同直径的绞线代替传统的不同直径绞线，生产出各种截面形状。

SIW直径满足主要导线标准，例如IEC 60228、HD 383和ASTM标准。在绞合机设计采纳单输入线直径后，使线材拉伸、绞合和绝缘工艺达成重大的节约。

在传统工艺中，绞线产品对拉伸线直径有其自己的要求。每个线直径通常都需要在线拉伸机重新串线。有些线设计要求的拉伸线尺寸不止一个。在拉伸设定上所花的时间、对许多不同直径线的库存量管理所化的时间，这些都是不必要的工作，增加了从棒到绞线的成本。

SIW法采用相同的输入线直径，却产出各种绞线，消除许多不必要、与传统设置相关的工作。



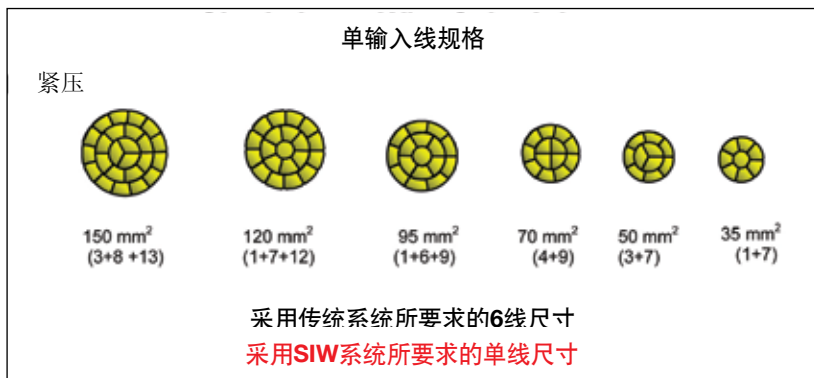


图3

这增加了线材拉伸工艺效率，不必生产许多不同尺寸的线材，只要SIW系统所需的一种或两种尺寸。我们可以从以下方面看到改进：

- 更高的线材拉伸生产率
- 更低的拉伸线材废品率
- 更快的设置
- 降低了工作量
- 更短循环时间
- 更小的输入线材储存区域
- 降低拉伸模具库存

单输入线法能节约15%到20%的线材拉伸成本，包括不必因为尺寸改变而再串线、更低的模具库存、更低的在线处理线材量。双节距绞合一直是具有最高生产力的绞线生产方法。它包括轧辊成型绞合机，采用独自成型的线材，进一步扩展了性能范围。我们可以清楚地从下表看到它的性能。

每种设备类型生产线材时是不同的，这对能用于这种工艺的绞合设计有影响。图4表示每种设备类型的一些优缺点，因为它们与产能和相关成本相关。要认识到：如果在绞合构造中使用轧辊成型线或模具成型线，那么能为线材的每个节距长度绞合一次的“刚性”设备或设备是生产的先决条件。

#### 单位节距投资成本

确定囊括各种绞合设计的设备范围是达到最低转化成本的一个重要考虑。例如，双节距设备提供最低的单位节距成本，但在构造可能性方面却是最大的限制。将其纳入轧辊成型绞合机后，就大大扩展了这个构造可能性的范围。另一方面，行星设备具有最高的单位节距成本，这就是为什么它只用于生产特殊产品。

图4: 工艺成本/节距比较

投资成本/节距	\$	\$	\$	\$	\$
	双节距绞合机	管绞机	绞盘式绞合机	刚性绞合机	行星绞合机
因素	双节距绞合机	管绞机	绞盘式绞合机	刚性绞合机	行星绞合机
投资成本/节距	1	3-5	7-16	9-12	16-24
工作因素	重大的（刚性）	几乎没有（行星）	重大的（刚性）	重大的（刚性）	几乎没有（行星）
层限制	仅同节距	不适用	无	无	无
层限制	最多达4层	2层	无	无	无
典型放线装置	杆	盘	杆	盘	盘
放线模式	连续	要求的进料周期	连续	要求的进料周期	要求的进料周期

#### 材料限制

每种设备类型在生产线材时是不同的。因此，必须识别不同之处，以便能把相同的拉伸线材尺寸用于许多种绞合可能性。这不仅适用于设备的原理，也适用于从各种设备希望得到的面积降低。

请记住：在多数情况下，通过设备在不同速度下发生变化所造成的面积降低，以及在一定程度上，生产绞线的所有设备都要求绞合点期间的线材应力超过该材料的屈服点。例如，双节距、单节距和刚性绞合机沿着线轴在每个节距长度上绞合每根输入线一次。管绞机和行星绞合机更加宽容，几乎不在每根线上绞合，这在绞合钢丝时很重要。

#### 节距和层限制

目前，双节距和单节距设备每孔型最多生产4层（通常是37层构造）。节距长度和节距方向相同，这对有些应用来说是一种限制。管绞机通常是单层机，生产反向同心绞线。组态正确的刚性和行星绞合机对大多数线材没有限制。采用轧辊成型绞合机后，有可能将其用作高产喂料机，把材料喂入刚性绞合机，生产更大产品，但仍然优化了SIW概念。

本文不详细讨论生产装置设备优化组合，但只说一句，这种分析也许说明了绞线生产装置最大的经济风险。在现在和将来，确定采用什么构造范围的过程都是确定最优的绞线生产装置的一个重要的先决条件。我们不仅用轧辊绞合机生产紧压线产品，还能将其用作刚性绞合机的喂入机，以生产更大产品，例如400mm<sup>2</sup>和500mm<sup>2</sup>，给出灵活的绞线生产装置。

在比较紧压线生产和其它高速绞线工艺的生产速度时，采用轧辊绞合机和SIW工艺后对性能的影响是巨大的，采用轧辊绞合机后，生产率翻倍。

与诸如刚性绞线之类的传统绞线机工艺比较，轧辊成型绞合机的效益更加明显。

#### 请记住要点:

- I. 轧辊成型绞合机的速度是1200tpm，取决于产品。相比之下，刚性绞合机的最大速度是300tpm。
- II. 当可以尽量缩短装载19DIN 630线卷的时间，而刚性绞合机仍然必须停车，补充线卷和焊接线材。即使采用现代化的自动装载，估计两个操作工要花45分钟才能完成一个装载过程。若比较使用送线系统的自动切换设施，那么操作工能切换19卷线并将它们焊在一起，而轧辊成型绞合机保持运行。所以，设备唯一需要停车的是在切换卷绕鼓的时候，但这不会超过10分钟。
- III. 整个轧辊成型绞合机工艺只需一名操作工。

在绞线成型后，通常要被绝缘；其难易性和成本与稳定性、紧密度和绞线表面有关。如果绞线几何形状不稳定，那么绞线内芯会漂移，最终形成鸟笼状。这不仅增加了工艺难度，还因为大量废品和停工而增加了损失。紧密卷绕线不太可能形成鸟笼，而且，绞线紧密度在很大程度上取决于内芯几何形状。

图6显示两种绞线设计。两种设计都采用相同的线材数量、输入直径、横截面积，不同之处在于左侧构造是单节距或单向节距，而右侧构造是反向同心节距。

单节距/单向绞线被包络起来，所有内芯都紧贴，一层的每根内芯被放在下面一层的一根内芯上，形成更加稳定的、紧压的几何形状。

比较相同圆内芯输入直径的单节距和反向同心绞线，单节距绞线在本质上具有更小的线直径(4.86d相对于5d)，从而具有更高的填充因素(80.3%相对于76%)。

注：填充因素表示线面积与线芯周围环形总面积之比。

必要的挤出材料数量由绞线设计确定；光裸线外径越小，所需的挤出材料越少。图6显示单节距/单向节距线直径是如何在本质上小于反向同心单节距线直径。线越是紧压，外径越小。

外径表面是关键。诸如固体线表面或轧辊形成层之类的光滑外层的空隙少，所以，需要被绝缘填充的空隙少。在比较各种紧压线时就能清楚地看到这点，如图7所示。

线被紧压后，线直径和空隙减小，所需的挤出材料减少。当采用外径小、表面尽可能光滑、稳定和紧密的线时，挤出工艺是最经济、最具生产率的。

传统绞线机的填充因素最多只能达到92%，而轧辊成型绞线机的填充因素能达到96%以上。两种工艺在绝缘成本方面的有效节约大约为2%。

从线拉伸到线最终绝缘，我们已经开展了案例研究，考虑了所有的停车参数。对传统的19线刚性绞线机和轧辊成型绞线机进行比较，每个每年生产3000km 150mm<sup>2</sup>紧压铝线。预计的年节约量被证明为€430,000。

应当记住：生产成本节约与许多因素有关，例如现有生产设施、自己生产还是购买绞线、对输入铜线和铝线的管理和控制、对高速轧辊成型绞线机的一般环境卫生维护和控制在大多数优点条件下，节约能使你极快地回收投资，当然，应当对每个具体的应用进行计算。

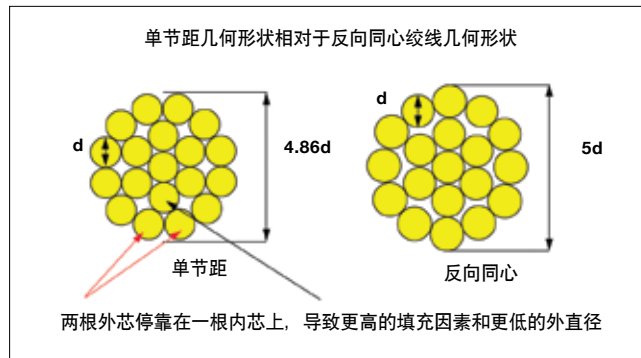


图6

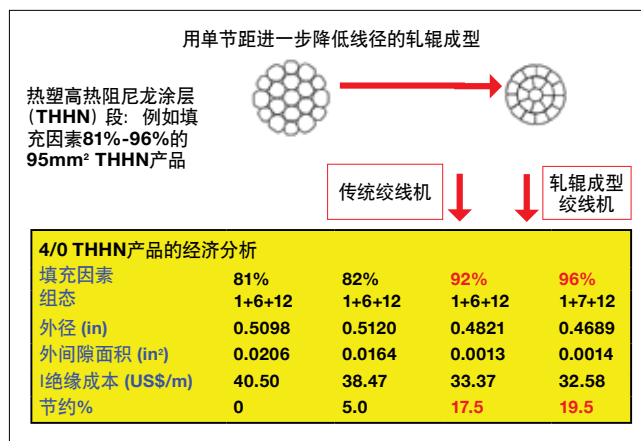
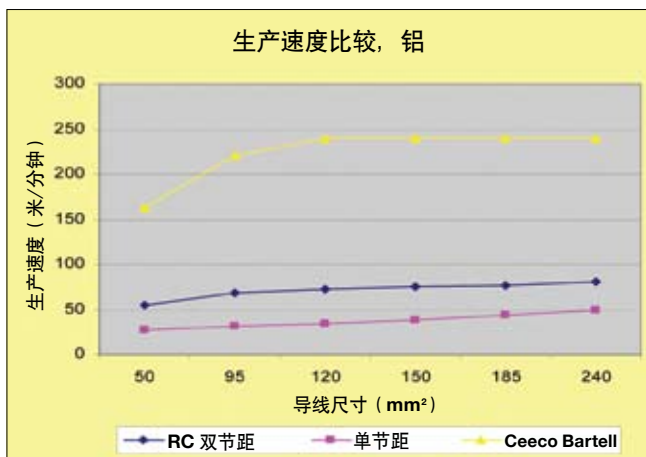


图7

轧辊成型绞线机结合Ceeco Bartell专利的轧辊成型工艺所产生的高性能能使电缆制造商降低成本，但不会影响线产品的性能。意识到这点和其它新型技术、以及先进的规格后，将进一步加强绞线设计的开发，进一步挖掘优化生产绞线生产的潜力。

Sean Harrington因这篇文章而获得2010年HW Bennett有色金属奖，这篇文章发表于09年伊斯坦布尔线缆会展。此次发表幸得大会组织者IWMA。

图5: 生产速度比较



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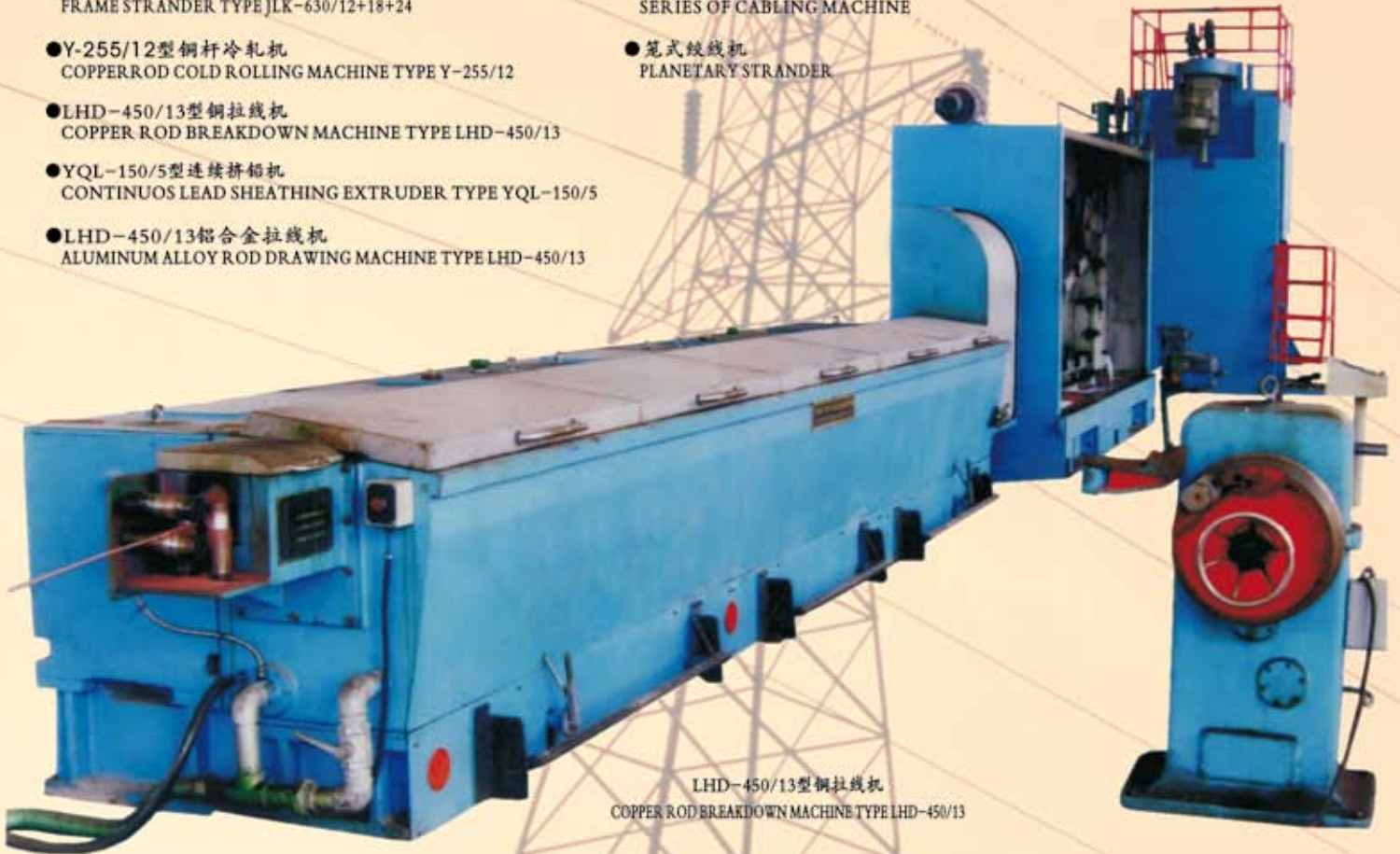
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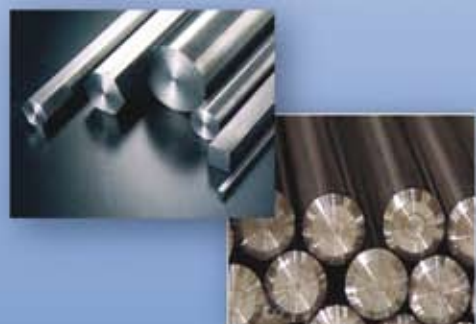
# SHENG CHYEAN

## 省權實業股份有限公司

### Cold Draw Bar Equipment (Ferrous and Non Ferrous)



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The machine can be manufactured according to customer's requirement.

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