

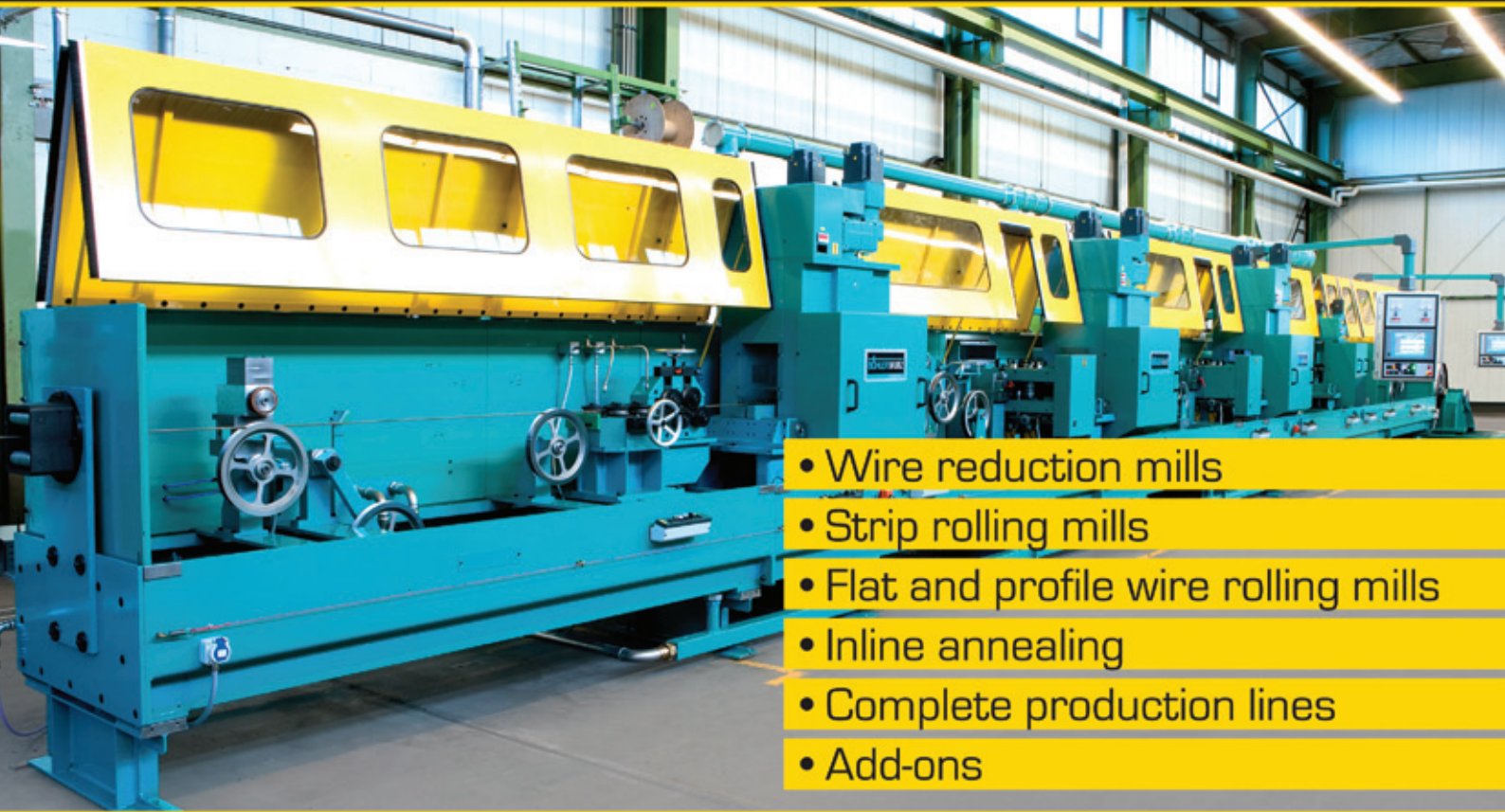
Wires • Cables • Fibre Optics • Springs • Fasteners • Precision Parts



Wire & Cable ASIA 线缆

July 2011
US\$33*

High-precision rolling systems for high-tech products



- Wire reduction mills
- Strip rolling mills
- Flat and profile wire rolling mills
- Inline annealing
- Complete production lines
- Add-ons



Bühler-Würz Kaltwalztechnik GmbH

Hanauer Str. 1-5 • D 75181 Pforzheim
Tel.: +49 7231 6003-0 • Fax: +49 7231 6003-54
E-Mail: info@buehler-wuerz.de

www.wuerz.de

**Well done
is better
than
well said**

Benjamin Franklin

Visit us at:



13 - 15 Sept 2011
Bangkok, Thailand
Booth # H11

Pioneer since more than 50 years of non-contact, in-line measurement, we stand for state-of-the-art solutions for your extrusion process under tight control. And when we say control, we mean control. Our experience and success in this field are the corner stone for modern, price-performance-oriented measuring systems.

When looking for impeccable control in all kinds of extruded cables, plastic/rubber tubing and hoses – Zumbach is your perfect partner. Our cost-effective ODAC®/ UMAC®/ WALLMASTER systems for OD/ID/WALL measurement and control are your optimum guarantee for best results.

Contact us – and get the future under control: askme@zumbach.ch



- Super high rate mode allows up to 15'000 measurements/s
- Up to 8 layer measurement (depending upon materials)
- Rapid die centring and production set-up

Zumbach Electronics

*Switzerland, Argentina, Benelux, Brazil, China,
France, Germany, India, Italy, Spain, Taiwan,
UK, USA*

www.zumbach.com

STIRRUP BENDER **WG-12D**



STIRRUP BENDER **WG-12B-2**



WIRE STRAIGHTENING AND CUTTING MACHINE **GT5-12**



REINFORCING MESH WELDING LINE
GWC2500, GWC2800, GWC3300



WIRE COLD ROLLING MACHINE **LZ-9**



ALMOST 1000 SETS SALES VOLUME.

WE Make Steel Reinforcement Solutions Simple.

TJK MACHINERY CO., LTD.

No. 1, Jingshun Rd., Beichen Hi-Tech Industrial Park, Tianjin, China 300402

Tel: +86-22-26993766

Fax: +86-22-26997888

Website: www.tjkmachinery.com

E-mail: tjk@tjkmachinery.com

Precision rewinding lines for solid and tube wire



No Twist Coiler

- Speed 40 m/s
- Special flyer design for high speed quality coiling
- Take drums of any type
- Minimum footprint - compact design
- Energy saving network
- NTC for SAW-wire available



Semi Automatic Precision Layer Winder

- Speed 35 m/s
- Take wire baskets, plastic/fibre spools, coils
- Servo drive motor operated traverse and dowel system
- Electrical control flange adjustment
- Ergonomically designed for easy operation
- Energy saving network
- Version for SAW-wire available



Fully Automatic Precision Layer Winder

- Speed 35 m/s
- Take wire baskets, plastic/fibre spools
- Servo drive motor operated tooling for precision automatic running
- High efficiency, low maintenance
- Touch screen HMI
- Energy saving network



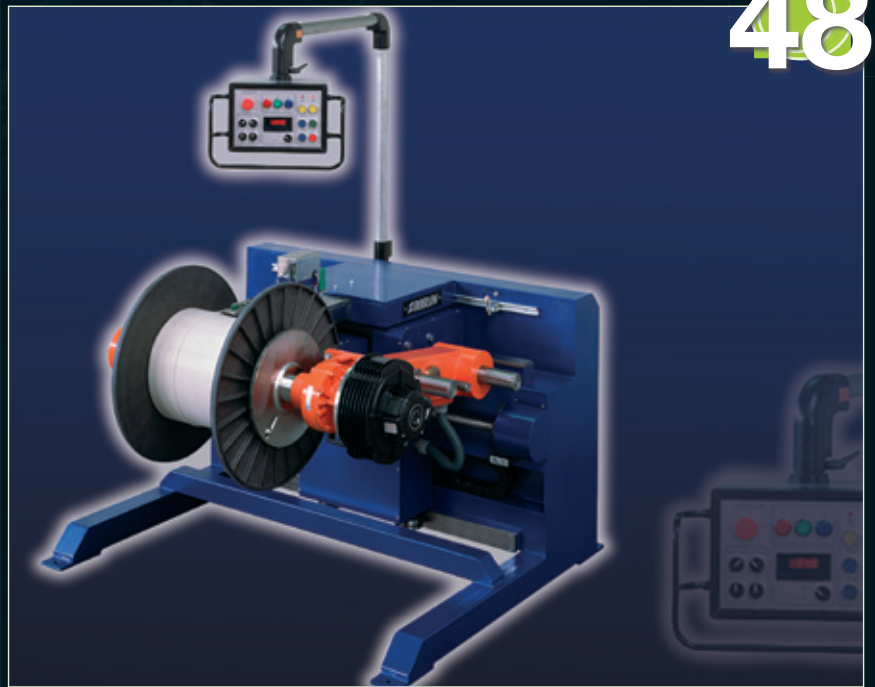
Lämneå Bruk AB
A passion for service.

Lämneå Bruk AB
SE-610 10 Ljusfallshammar
Sweden
Phone +46(0)122 232 00
Fax +46(0)122 232 99
E-mail info@lamnea.se
Internet www.lamnea.se

Contents

in this issue


- 8 Industry News
- 19 行业新闻
- 24 Telecom News
- 28 通信新闻
- 30 From the Americas
- 36 来自美国的消息
- 38 Technology News
- 44 技术与产品
- 48 Payoffs, take-ups
& winding
- 55 放线、收线和卷绕设备
- 58 Reels, spools
& spooling
- 63 卷轴,线轴及绕线
- 75 Editorial Index
- 75 通讯目录
- 75 Advertisers Index
- 75 广告索引

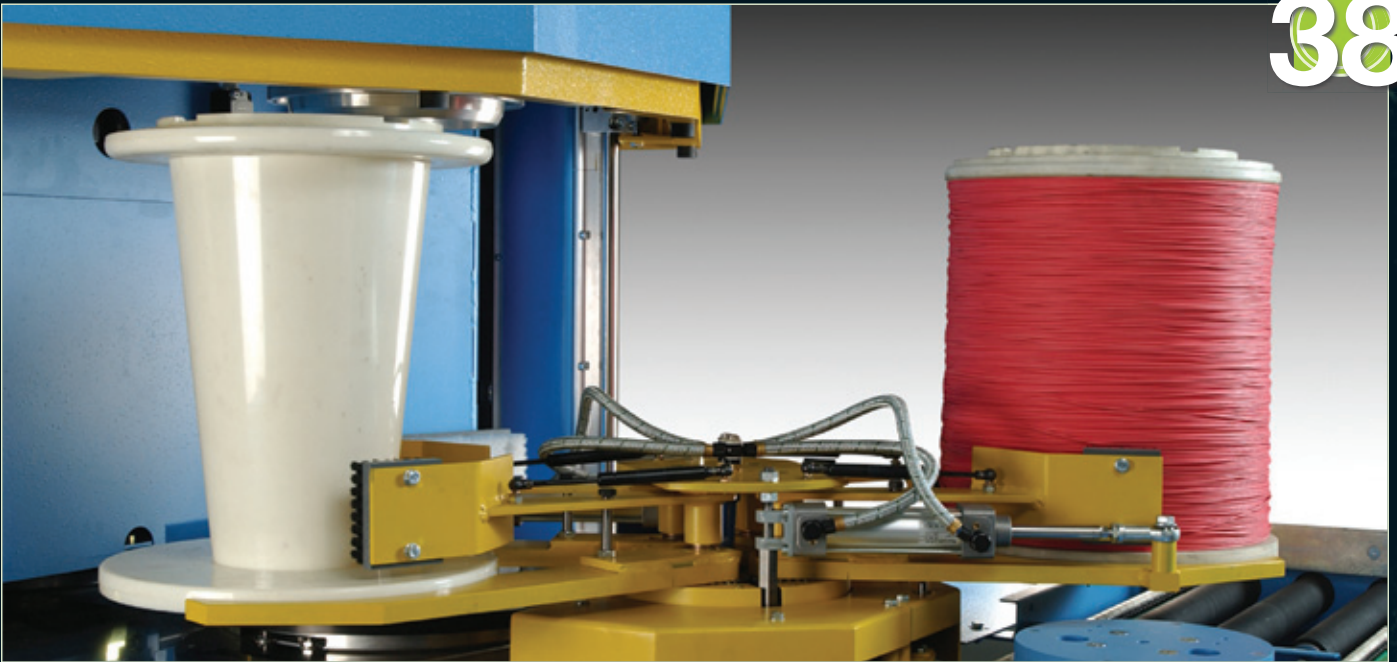


48



58

When you have finished with
this magazine please recycle it  recycle



Technical Articles

65 Analysis of surface flaws on drawn wire and wire breaks by Kazunari Yoshida, Tetsuo Shinohara, Tsutomu Yamashita, and Atsuhiko Tanaka of Tokai University, Japan

71 拉伸线材表面缺陷和线材断裂分析
作者：日本东海大学Kazunari Yoshida、Tetsuo Shinohara、Tsutomu Yamashita和Atsuhiko Tanaka

Editor (编辑):..... Dave Bell

Features Editor – USA

(专栏编辑 – 美国):..... Dorothy Fabian

Editorial Assistant

(助理文字编辑):..... Christian Bradley

Design/Production (设计/制作):..... Julie Tomlin

Production (制作):..... Lisa Benjamin

Translation (翻译经理):..... Tony Zhou

Jianye Yang

Linda Li

Advertising/Marketing:..... Jason Smith

(广告/营销):..... UK and ROW

Giuliana Benedetto

Italy

Hendrike Morriss

Germany, Austria, Switzerland

Doug Zirkle

USA, Canada

Linda Li

中国

Jeroo Vandrevalla

India/Pakistan

Advertisement Coordinator

(广告联络人):..... Liz Hughes

Accounts Manager (财务经理):..... Richard Babbedge

Subscriptions (订阅)..... Liz Hughes

Publisher (发行人):..... Caroline Sullens

Founder (创办人):..... John C Hogg

Europe (欧洲)

Advertising/Marketing & Editorial

(广告, 营销及编辑部)

46 Holly Walk, Leamington Spa

Warwickshire CV32 4HY, UK

Tel (电话):..... +44 1926 334137

Fax (传真):..... +44 1926 314755

Email (电子邮箱):..... wca@intras.co.uk

Website (网站):..... www.read-wca.com

USA (美国)

Advertising/Marketing (广告/营销)

Doug Zirkle

Tel (电话):..... +1 203 794 0444

Email (电子邮箱):..... doug@intras.co.uk

India (印度)

Jintras Ltd – Jeroo Vandrevalla

Subarna (Ground Floor), P21/N, Block A

New Alipore, Kolkata 700 053, India

Tel (电话):..... +91 33 2407 07 01

Fax (传真):..... +91 33 2407 07 00

Email (电子邮箱):..... jeroo@intras.co.uk

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

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

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

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



© Intras Ltd ISSN 0218-3277

True wealth. . .

THERE'S generally always a little more to a story than first meets the eye. Dig a little deeper under the surface and there's a different – and very often – far more interesting angle that can easily be overlooked at first glance.

Take, for example, China's obsession with copper. Look deeper than the numbers involved – they are pretty impressive as it is – and the story becomes seriously interesting. We'll start with those numbers. The demand for the world's oldest mined metal is such that, by 2020, China's consumption will double, accounting for a shade under half the world's copper sales. When I say a shade, I mean 49 per cent.

Statistics like that are the reason companies are investing (see page 17, \$10m investment to double capacity) heavily in the 'red gold'. Then again, it's hardly surprising since the Chinese government announced in 2008 a \$586 billion spending plan 'intensive in copper use'.

Chile, as an example, sold \$9.8 billion of copper to China last year – accounting for 19 per cent of the South American nation's exports and six per cent of its gross domestic product. That is serious mining.

The wealth that comes with China's insatiable desire for the ore is not only confined to the boardrooms and investors either.

A dock hand on the Yangtze River, stating that shipments have risen almost ten times at the port over the past decade, bought two apartments – no doubt brought on by an increase in his working hours.

The real wealth, however, comes at the end of the line. Villagers in Bentang pooled their savings and bought cement poles to string wire for electricity. It took a further six years before they could afford the cables and transformers to bring that electricity.

But a widow living in a wooden house first switched on her eight-year-old refrigerator in 2008, and another villager has three bulbs burning brightly inside his house now, allowing him more time to work, to earn money, to prosper.

Quite simply, that is priceless.

David Bell

Editor



when and *where*



Photo credit: www.bigstockphoto.com 'Wat Arun' Photographer: czardases

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



Lapp-ing up the sun at solar power plant

JJ-LAPP CABLE, a regional business unit of leading industrial enterprise Jebsen & Jessen (SEA), has announced a partnership with Natural Energy Development Co Ltd (NED) in Thailand to provide cables for one of the world's largest thin-film solar power plants.

Many countries in Southeast Asia are looking towards the rapid development of solar power as a renewable energy, including Thailand's Board of Investment. It recently awarded THB 9bn to NED to construct the Lopburi Solar Power Plant, which features the world's largest thin-film solar photovoltaic (PV) facilities.

JJ-Lapp Cable will supply a total of 1,200km of Ölflex® Solar XLR Cable, which will be used to transmit the DC current from the PV panel to the airway box which is extended to the inverter.

Located in Thailand's central province of Lopburi, the plant will have a power generation capacity of 73 megawatts

(MW) in the first phase of construction, and an additional 11 MW in phase two, bringing total generation capacity up to 84 MW.

When completed, it is expected to be one of the world's largest power plants in terms of power generation, ahead of facilities in Germany and Spain, which currently produce 54 MW and 60 MW, respectively. A 280 MW solar power plant is due to be completed in Arizona, USA, by the end of this year.

The plant will comprise half a million solar panels and is expected to reduce carbon emissions by over 1.3 million tons annually. It will also reduce the need for imported fuel by over 35,000 tons a year.

The Lopburi plant is also the first development of its kind to gain assistance from the Asian Development Bank, under the organisation's initiative to provide financial support to alternative energy

projects worldwide to encourage sustainable development and reduce global warming.

"The supply of 1,200km of cables for the Lopburi Solar Power Plant is by far the largest deal in the area of renewable energy for us," said Mr Kongkarn Paseepol, JJ-Lapp Cable (Thailand) area sales manager.

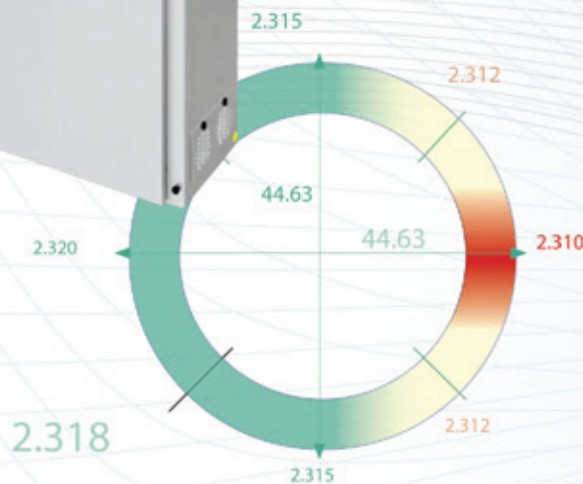
"Our products meet the stringent requirements from our customer that the cable is designed and conforms to TUV's 2 Pfg 1169/08.2007 requirements for cables to be used in photovoltaic systems and a life expectancy of 25 years."

Construction for the solar power plant began in August last year and will be carried out in two phases, with operations starting by the end of 2011.

JJ-Lapp Cable (S) Pte Ltd – Singapore
Fax: +65 686 312 71
Email: info@jj-lappcable.com
Website: www.jj-lappcable.com

» We thrive on providing solutions to keep you ahead of your competitor.«

Dr. Siegmur Lampe, Head of R&D at SIKORA AG



Integrated in insulating and jacketing lines the X-RAY 6000 series measures online the wall thickness, eccentricity, the outer diameter and ovality of cables with a diameter range from 0.7 to 270 mm.

SIKORA
Technology To Perfection

wire Southeast ASIA 2011 attracts strong industry support



www.bigstockphoto.com – Photographer Luciano Mortula 'Bangkok Skyline'

○ Bangkok – home to wire/Tube Southeast ASIA 2011

wire/TUBE Southeast ASIA 2011 is shaping up to be another landmark event for the region's wire, cable, pipe and tube industries.

Exhibitors from more than 20 countries have already confirmed their presence at the event and the organisers are expecting final numbers to tally at more than 300 exhibitors from 30 countries.

National pavilions have also been confirmed from Austria, China, Germany, Italy, the USA, United Kingdom and Taiwan.

Backing up the global nature of the regional event, wire/Tube Southeast ASIA also enjoys strong support from eminent industry organisations, including the International Tube Association (ITA).

ITA president Dr Gunther Voswinckel said: "The ITA is delighted to be the main international sponsor of Tube Southeast Asia, having been a strong supporter of its predecessor Tube Singapore since the very first edition.

"Bangkok is a very important hub for the

region's most important markets and this exhibition provides an excellent platform for suppliers in the tube and pipe industry to establish a presence in Southeast Asia.

"Because of the location of Bangkok at the heart of this part of the world and its accessibility, visitors to the exhibition are attracted from other regions like India, the Middle East and Africa, as well as Australasia."

While Dr Voswinckel feels that the previous Tube Southeast ASIA event in 2009 suffered from the tail end of the global recession, with very positive economic forecasts now coming from Malaysia, Vietnam, Indonesia and Thailand itself, and with growth rates in the range of 5-7% fuelled by major infrastructure projects, the 2011 exhibition should prove to be scheduled at a very opportune time for the industry.

"This exhibition continues to play a great part with its outstanding quality and quantity of visitors," said Ferruccio Bellina, president of the Italian Wire

Machinery Manufacturers Association (ACIMAF).

"Moreover, Thailand is one of the most important industrial countries in Asia with a wide range of companies actively dealing in the wire and cable industries."

Another key supporter is the International Wire & Machinery Association.

IWMA chairman Colin Dawson added: "The IWMA is a long term industry partner to, and sponsor of, the wire Southeast ASIA exhibition since its very inception.

"This support started with wire Singapore before it was relocated to Bangkok in 2007 and renamed wire Southeast ASIA. The new location and title received the full support of the IWMA and its members for very good reasons."

Messe Düsseldorf Asia Pte Ltd – Singapore

Fax: +65 6332 9655

Email: ariane@mda.com.sg

Website: www.wire-southeastasia.com



SUPERMAC INDUSTRIES (INDIA) LTD
AN ISO 9001 CERTIFIED COMPANY

OUR PRODUCT RANGE

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



**PIONEERING INNOVATIVE TECHNOLOGIES AND SYSTEMS
FOR CABLE INDUSTRIES.**



A NAME THAT'S SYNONYMOUS WITH

CABLES
THE WORLD OVER

Head Office

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

Works

Plot No 2 Sector 6, IMT Manesar, Gurgaon Haryana, India
Tel.No.: +91-124-4690500, Fax No.: +91-124-4690501
E-mail.: jasvinder@supermacindia.com

www.supermacindia.com

Galaxy attracts excess offers for A\$120mn fundraising

THE AIM-quoted mining group Creat Resources Holdings Limited (AIM: CRHL) has welcomed a major fundraising completed by ASX-quoted Galaxy Resources Limited, in which it now holds a stake of approximately 11.78%.

Galaxy raised A\$120mn from three major institutional investors, Azure Capital, Morgan Stanley and Helmsec Global Capital, in a raising that attracted strong over-subscription worldwide, including from potential investors in Europe, Asia, the USA and Australia.

It will use the money to ramp up production from its Mt Cattlin spodumene project in Western Australia and to complete the commissioning of its Jiangsu lithium carbonate processing plant at

Zhangjiagang in China, as well as to pay off debt.

CRHL has taken its stake in Galaxy in line with its long-term strategy to diversify internationally as it continues appraisal of exploration assets in Western Tasmania.

Galaxy is now positioned to become a leading integrated player in the rapidly growing market for lithium, heavily in demand as an essential element used in the manufacture of renewable batteries, particularly by the automobile industry.

CRHL's chief operation officer Rex Chow commented, "We offer our congratulations to Galaxy on its successful completion of the new fundraising. We welcome the arrival of more high-quality investors and believe

the additional support they provide will further enhance value for CRHL shareholders."

Galaxy is now set to become a vertically integrated lithium company, from raw-product lithium production through to chemical processing and lithium-ion battery manufacturing.

It expects to complete construction of its Zhangjiagang lithium carbonate processing facility, close to major markets, in time for commissioning later this year. The Jiangsu plant will use feedstock already being produced from the Mt Cattlin mine.

Creat Resources Holdings Limited – Australia

Fax: +61 3 6234 3884

Email: enquiries@creatresources.com

Website: www.creatresources.com



ALWAYS READY FOR EVERY CHALLENGE

BOXY

Mossberg Reel LLC

BOXY S.P.A. - 25010 Remedello (Brescia) ITALY - Tel: +390309579011 - Fax: +39030957244 - boxy@boxy.com - www.boxy.com
MOSSBERG REEL LLC - 30 Martin St. Unit 1A Cumberland - RI 02864-5351 USA - Ph. 1-401-334-2255
Ph. 1-800-426-0063 (USA) Fax 1-401-334-3541 - e-mail: info@mossberg-reel.com - www.mossberg-reel.com



○ Box coiler

Ger's new and second-hand machinery

GER SA, Belgium, specialises in the sale of new and second-hand machinery for wire and cable, for the ferrous and non-ferrous industry.

The company offers for sale single machines and complete plants for steel rod and wire, non-ferrous wire, steel ropes, electrical insulated cables, etc. A large stock of machinery is immediately available or, if the customer doesn't find the equipment they are looking for in the listing, GER will search for the machine needed. Machinery includes rod breakdown machines, fine and intermediate single or multi-wire drawing machines, bunchers, cage and tubular stranders, laying-up machines, armouring machines, drum twisters, extrusion equipment, spoolers, coilers and take-ups.

GER exports worldwide, and sells the machinery in as-is condition or, upon request, reconditioned and modernised. The company's sales department can also provide an estimate for complete, ready-to-use production units. GER also offers brand new electrical control systems, using state-of-the-art drives and components.

Other services include test-runs of the machines before shipment, installation and commissioning of the machines at the customer's plant, and training for the operators.

GER SA - Belgium
Email: ger@ger.be

Fax: +32 87 260 201
Website: www.ger.be



Top Categories LAN / Data Cable Production

2 steps : Pairing line (Triple Twist)



2 steps : Cabling line ("Quali2Twist")



1 step : Group Twisting



High Quality : High-speed Equipment **Made in France**
 Proven & Safe Solutions : Core Business for Many Years
 2 steps : 1 twist ahead / 1 step : up to 1.2 GHz



Your Cable Production Partner

SETIC s.a.s. France - Tel. : +33 4 77 23 25 55 - setic@gauderroup.com - www.gauderroup.com

The continuous extrusion line for Copper & Aluminum



TJ300 continuous extrusion line for copper and aluminum flat wire



TJ350 continuous extrusion line for copper busbar and profile



TJ400 continuous extrusion line for copper busbar and profile



TJ550 continuous extrusion line for copper busbar or for high-speed railway trolley conductor



TJ600 continuous extrusion line for copper busbar and profile



常州艾邦机械科技有限公司

Changzhou AiBang Machinery & Science Technology Co.,LTD

ADD:NO.279 west Huanghe RD.,Xinbei District, Changzhou Jiangsu,China

TEL:+86-519-85960370

FAX:+86-519-85960370 85960371

e-mail: czsbj1004@126.com czabsbj@hotmail.com aibang@czaibang.com

MO:13506124377

http://www.czaibang.com

http://www.aibang.en.alibaba.com

China's prime minister demands commodity savings

IN March Chinese Congress adopted the new Five Year Plan in Beijing.

The plan aims to restructure the Chinese economy, and part of this plan is that China wants to spend less energy in order to save commodities and to protect the environment. China's prime minister, Wen Jiabao, announced that energy consumption should be reduced for every earned Yuan by 16% until 2015.



○ The X-RAY 6120 helps cable manufacturers to assure quality and to reduce material consumption

China enjoys tremendous economic growth but simultaneously faces high inflation.

Commodities and producer prices are rising steadily. Another consequence of the economic upswing is the great demand for labour force, which in reverse leads to an increase of labour cost, followed by higher sales prices.

Therefore, Wen Jiabao's request for dealing carefully with natural resources comes at the right time. The saving of commodities such as crude oil contributes to a reduction of manufacturing costs and strengthens China's competitive capability.

In cable production lines, measuring and control technology offers an opportunity to reduce material

consumption and to protect the environment. The insulation of cables is made of plastic, which in turn is made of crude oil.

With the integration of measuring equipment in their lines manufacturers avoid wall thickness oversize. This means less plastic material is needed to produce the specified cable, and the technology assures quality during the complete production process. Scrap rate will be eliminated, commodities saved and productivity increased.

The following provides an idea of the amount of material and thus crude oil that can be saved in practice. From 1kg of crude oil, around 500g of polyethylene can be recovered (source: German Federal Environment Agency 08/2010).

As energy is also needed for cable production, you can calculate with the relation 2:1, so for 1kg polyethylene you need 2.5l crude oil.

Assuming that a production line runs 275 working days (6,600h/yr) with an extruder output of 600kg/h, over a year this makes up 4mn kg polyethylene. With, for example, an X-RAY 6000 (for wall thickness, eccentricity, diameter and ovality measurement), claimed material savings of at least 5% can be achieved. As a result, 200,000kg of material can be saved. If the price for 1kg of polyethylene is €1, this amounts to a saving of €200,000 per year with one X-RAY 6000.

Taking all cable manufacturers together, with the use of Sikora measuring and control technology they could achieve savings of approximately 1.5mn tons crude oil per year, solely through the reduction of material consumption. This number is equivalent to 6 ultra large crude carriers with a carrying capacity of over 250,000 tons.

For quality control and energy saving at insulating and jacketing lines Sikora offers the X-RAY 6000, the successor of the proven and successful X-RAY 2000 series. The new system fulfils the industrial need for an accurate measurement of wall thickness, eccentricity, diameter and ovality. In

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

The X-RAY 6000 offers a variety of technical innovations that set new standards regarding precision, long operation time and efficiency. Precise measurements are achieved under all line conditions. The technology of the X-RAY 6000 allows a fast centring of the extrusion tools and control of line speed or extruder rpm in consideration of the minimum values. The X-RAY 6000 is able to measure and control up to three layers of different materials.

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

LOW COST machinery
 EUROPEAN experience



www.daloo-machines.com

DALOO

RIGID STRANDING LINES
 for power cable





○ Teknor Apex Asia Pacific Pte Ltd head office

Name establishes a single brand for a large compounding business

TEKNOR Apex Company has established Teknor Apex Asia Pacific Pte Ltd as the corporate name for a leading plastics compounder serving a vast region that stretches from Saudi Arabia to New Zealand.

The new name replaces that of Singapore Polymer Corporation (SPC), an international business based in Singapore that was acquired by Teknor Apex in 2001.

Already bearing the Teknor Apex name as a sister company in China, Teknor Apex Suzhou Advanced Polymer Compounds Co Ltd appointed Stanly L

K Tan as managing director of both enterprises in 2010.

“Combining all of our operations under the Teknor Apex brand represents the culmination of a decade-long process of integration that has created one company in fact – not just in name,” said Mr Tan.

“Whether our customers are based in Saudi Arabia, India, China, or Australia, they now have the assurance of dealing with a single organisation having uniform standards, product designations, business practices, and regulatory approvals.”

Besides the introduction of the new name, another highlight of the company’s exhibit at Chinaplas was the first trade-show appearance of the Sarlink® thermoplastic vulcanizate elastomer business since its acquisition in November by Teknor Apex.

Sarlink compounds are well established in the Asian automotive market, with sales directed from an office in Shanghai.

Teknor Apex Company – USA
Fax: +1 401 725 8000
Email: info@teknorapex.com
Website: www.teknorapex.com

Recognised for cutting emissions

LIHUA International's subsidiaries, Danyang Lihua Electron Co Ltd and Jiangsu Lihua Copper Industry Co Ltd, have achieved ISO 14001:2004 certification for Environmental Management Systems (EMS) by the International Organisation for Standardisation.

These certifications relate to Lihua's CCA and copper wire, copper anode and copper rod products and the associated production processes.

The ISO 14001:2004 standard is intended to help companies minimise the environmental impact of the

production process. The standard includes a set of internationally accepted specifications for environmental management systems created by the International Organisation for Standardisation.

The standards for certification include three major areas: 1 Management systems - systems development and integration of environmental responsibilities into a company's planning; 2 Operations - consumption of natural resources and energy; and 3 Environmental systems - measuring, assessing, and managing emissions, effluents, and other waste streams.

"We have always taken pride in our copper alternative and recycled copper products, and the fact that we utilise manufacturing processes significantly less harmful to the environment than mining, using state-of-the-art filtering, water collection and other systems in our manufacturing facilities," said Jianhua Zhu, chairman and chief executive officer of Lihua.

"We are pleased that the ISO has recognised our commitment to environmental responsibility, and we will continue working to ensure that our operations adhere to the highest possible standards.

"Our goals are to provide best-in-class products to our customers, while taking steps to further reduce the environmental impact of our manufacturing and furthering our leadership among the copper recycling industry."

Lihua International – China
Fax: +86 511 8631 2040
Email: info@lihuaintl.com
Website: www.lihuaintl.com

\$10m investment to double capacity

Suzuki Garphyttan is doubling its capacity of valve spring wire by adding a second production line in its Chinese unit in Suzhou. With production units in Sweden (head office), USA and China, Suzuki's wire is mainly used in springs for automotive engines and transmission applications. The total investment for increasing production is estimated to be close to US \$10m.

Suzuki Garphyttan – China **Fax:** +86 512 8885 5366
Email: info.cn@sg-wire.com **Website:** www.suzuki-garphyttan.com

New innovations on show

PolyOne, a provider of specialised polymer materials, services and solutions, featured new innovations during Chinaplas 2011 – Asia's largest plastics industry trade show.

Solutions on show include:

Stat-Tech™ Carbon Nanotube Compounds allow manufacturers to produce compact electronic media storage equipment, integrated circuit packaging and semi-conductor devices that are not impacted by electrostatic discharge (ESD) or heat, which could compromise mechanical performance.

OnColor Complete™ Liquid Color Solutions is a revolutionary, eco-conscious liquid colourant system that helps manufacturers eliminate waste, enhance employee safety and decrease environmental impact by combining metering technology with refillable, returnable containers and state-of-the-art liquid colourants in a first-of-its-kind, closed-loop colour delivery system.

OnFlex™ Flame-retardant, Non-phthalate Thermoplastic Elastomers help processors and manufacturers meet sustainability goals and maximise consumer appeal. Developed in response to consumer demand for more eco-conscious alternatives for wire and cable jacketing, insulation and connectors, these formulations provide exceptional visual and tactile aesthetics in a non-plasticised solution.

PolyOne Corporation – USA **Fax:** +1 440 930 3064
Email: info@polyone.com **Website:** www.polyone.com

Qunye QUNYE ELECTRICAL CO.,LTD.

Qunye Spool
 expert
 comparable
 trustable

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

spanning distance with ease...



Standing Machines/ Rigid/Planetary

- 1+6+12+18+24+30'
- 400/500/630 DIN
- Skip/Tabular
- Fork Type/
Cage Type Stranding Machine
- Manual/Batch Loading



Armouring Machines

- 24 Bobbin, 36 Bobbin
- 48 Bobbin, 54 Bobbin
- 72 Bobbin, 90 Bobbin
& 108 Bobbin



* Finished Cable Rewinding Line * Key Components for Extrusion Line, Stranding & Armouring Line

- Take UP/ pay Off Stands (upto 5mts drum size)
- Caterpillar (4 Cylinder to 12+12 Cylinder)
& Capston



Taping Machines for Copper / PVC/Steel/ Cotton

- Tangential Type
- Pad Dia 500/400 mm

Cable Tech Machines (CTM) started its manufacturing plant over two decades back and since then, it has urged on technological advancements with enthusiasm and commitment towards machinery construction. Our team of industrial professionals specializes in the design and construction of rotating machinery for cable manufacturing. The Company's extensive range of machinery and systems offers the most efficient and reliable solutions for the cable industry. Over hundreds of regular buyers worldwide are a guarantee of its performance.

The group has two manufacturing units at premium locations - Delhi NCR & M.P. (Heart of India) with four separate independent sheds equipped with state-of-the-art machinery to manufacture machines for Conductor, cable (HT/LT) & rope industry. It also has an independent high tech machine design and drawing office equipped with US software Networked CAD, CAM, Workstation & fully integrated process are standardized. The Company has further acquired 80,000 sq. mts. area to meet its capacity expansion plans in future.

CABLE TECH MACHINES

INDIA'S LEADING WIRE AND CABLE MACHINERY MANUFACTURER

Office : Plot No - 1485, Sector- 55, Faridabad 121004 INDIA, Telefax: +91-129 2440214, 2440537, 9811010197
Works: Plot No.143, Nangla, Gajipur Road, Faridabad 121004 INDIA, Ph.:+91-129 2480909, 2484466, 2484467
e-mail : info@cabletechindia.com, ctm97@rediffmail.com

www.cabletechindia.com

Skype ID : cable.tech1



○ JJ Lapp 将为泰国世界最大的风力发电场提供电缆

世界最大之一

JJ-Lapp Cable 是领军型工业企业 Jebsen & Jessen (SEA) 的一个区域性业务单元，它宣布在泰国与 Natural Energy Development Co Ltd (NED) 的一个合作伙伴关系，为世界上最大的薄膜太阳能装置之一提供电缆。

东南亚的许多国家都期望太阳能快速发展为一种可再生能源，包括泰国的投资署。最近，它将90亿泰铢合同授予NED，以建设世界上最大的薄膜太阳能光伏装置 - Lopburi 太阳能装置。

JJ-Lapp Cable 将提供1200公里 Ölflex® Solar XLR 电缆，把直流电从PV输送到高架箱，高架箱再延伸到变频器。

装置位于泰国中省份 Lophuri，第一阶段发电能力为73兆瓦，在第二阶段为11兆瓦，总发电能力可达84兆瓦。

装置竣工后，预计将成为世界上最大的可再生能源发电厂之一，领先于德国和西班牙的装置，这些装置目前的发电量分别为54兆瓦和60兆瓦。今年年底，美国 Arizona 将竣工一个280兆瓦的太阳能装置。

装置由50万个太阳能板组成，预计每年将降低130万吨碳排放。它每年还将减少35000吨燃料进口。Lopburi 装置也是在这方面得到亚洲发展银行援助的第一个项

目，组织为全世界利用其它类能源项目自发提供财务支持，鼓励可持续的发展和降低全球变暖。

“为 Lopburi 太阳能工厂提供1200公里电缆，这迄今是我们在可再生能源方面的最大业务，” JJ-Lapp Cable (Thailand) 区域销售经理 Kongkarn Paseepol 说。

“我们的产品满足我们客户严格的要求，电缆设计符合 TUV 的 2 Pfg

1169/08.2007 标准，电缆用于光光伏系统，预期寿命为25年。”

太阳能工厂于去年8月开始施工，分两个阶段执行，到2011年底开始运行。

JJ-Lapp Cable (S) Pte Ltd - 新加坡
 传真: +65 686 312 71
 电子邮件: info@jj-lappcable.com
 网址: www.jj-lappcable.com

投资1000万美元使产能翻番

Suzuki Garphyttan 正在上海外围苏州的中国工厂增加第二条生产线，使其气门弹簧生产线产能翻倍。

Suzuki 的生产工厂设在瑞典（总部）、美国和中国，其线材主要用于汽车引擎和传输应用的弹簧。

Suzuki Garphyttan 是日本 Suzuki Metal 的全资子公司，也是 Nippon Steel Group 的一部分。增产用总投资估计是1000万美元。

近几年里，随着中国汽车生产的强劲增长，中国对气门弹簧的需求增长迅速。该项投资将能够支持这一增长趋势，扩建将于今年第四季度完成。

Suzuki Garphyttan - 中国
 电子邮件: info.cn@sg-wire.com
 传真: +86 512 8885 5366
 网址: www.suzuki-garphyttan.com



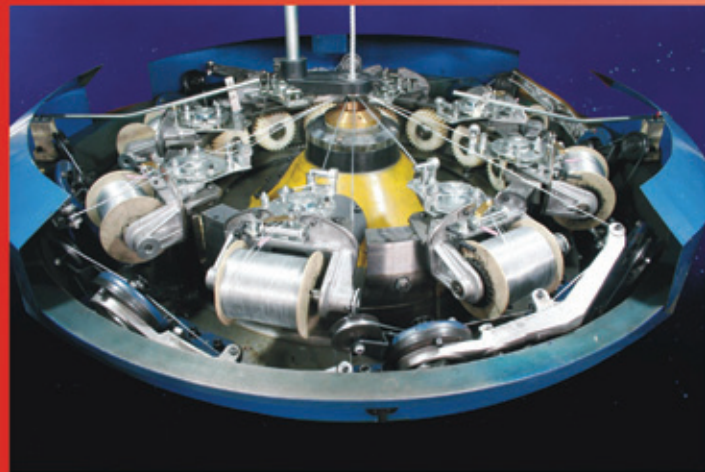
NYDG

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 ≤ 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 ϕ 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 ϕ 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
电话: 0086-21-33896306
33896307 33896308

传真: 0086-21-33896305
http: www.shanghai-nanyang.com
E-mail: sales@shanghai-nanyang.sina.net

wire Southeast ASIA 2011吸引强大的工业支持

wire/Tube Southeast ASIA 2011成为区域性线材和电缆、管道和管件工业的另一个标志性盛会。来自20多个国家的参展商已确认他们参展，组织方预计参展商最终将超过300个，来自30多个国家。已经确认的国家馆来自奥地利、中国、德国、意大利、美国、英国和台湾。

wire/Tube Southeast ASIA是支持全球性质的区域性盛会，它还享有来自杰出工业组织的强大支持，包括International Tube Association (ITA)。

ITA总裁Gunther Voswinckel博士评论道：“ITA很高兴成为Tube Southeast Asia的主要国际发起人，从第一次盛会起，ITA一直是以前Tube Singapore的强大的支持者。孟买是区域最重要市场的一个重要枢纽，这次会展为管道和管件工业供应商在东南亚建立市场提供了一个杰出平台。因为孟买位于世界这个部分的中心，而且方便易达，其它区域的来访者，例如印度、中东和非洲以及大洋洲，也受其吸引而来到这里”

Voswinckel感到：以往2009 Tube Southeast Asia正处在全球经济衰退的末期，现在，从马来西亚、越南、印度尼西亚和泰国本身都带来了非常好的经济预测，受基础设施项目的带动，增长速度范围将为5-7%，2011会展的时机非常好，为工业带来了好机遇。

“会展继续承担着重要角色，拥有很高质量和数量的来访者，”意大利线材设备制造协会(ACIMAF)总裁Ferruccio Bellina说：“而且，泰国是亚洲最重要的工业国家之一，有各种公司活跃在线材和电缆工业领域。”

另一个关键的支持人是国际线材和设备协会(IWMA)。IWMA主席Colin Dawson评论道：“IWMA是长期的工业合作伙伴，而且从一开始就是Southeast Asia会展的发起人。”这种支持始于新加坡，然后是其2007年迁到孟买，并重新命名为wire Southeast Asia。新的地点和名称因其很好的理由而得到IWMA及其成员的完全支持。”

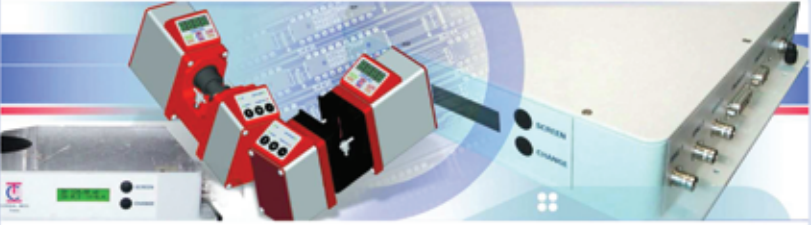
Messe Düsseldorf Asia Pte Ltd – 新加坡
 传真: +65 6332 9655
 电子邮件: ariane@mda.com.sg
 网址: www.wire-southeastasia.com



bigstockphoto.com - Photographer Luciano Mortula

CERSA-MCI

法国赛飒测控仪表有限公司



精细线

- 高精度外径测量
- 可重复性及稳定性: 外径的±0.03%
- 测量范围: 5 - 2000 μm
- 高精度表面质量检测
- 每周64点, 每秒300000周


电缆, 棒材及管材

- 外径、椭圆度及缺陷检测
- 1 - 3 向, 每向20 - 100kHz
- 测量范围: 0.05 - 80mm

光纤

- 在线高精度
- 测试及缺陷检测
- 测量范围: 0.05 - 80mm

Shanghai Potomer International Trade Co., Ltd. Xue Peng Chen
 Rm.1012, No. 11 Lane 258, Yongxing Rd., 200071 Shanghai, P.R. CHINA
 Tel: +86-21-6653 1938



Measure & Control Instrument

CERSA-MCI
 13480 Cabriès, FRANCE
 Tel: +33 4 4202 6044
 Email: sale@cersa-mci.com
 Web: www.cersa-mci.com

中国总理要求商品节约

3月14日，中国人大在北京通过新的5年计划。计划旨在重调中国经济结构，而且，计划的一部分是中国想消耗较少的能源，节约商品和保护环境。中国总理温家宝宣布到2015年，对于每挣的一元人民币，所消耗的能源应当降低16%。

中国享有巨大的经济增长，但同时又面临高通胀。商品和制造商价格持续上涨。经济上扬的另一个后果是巨大的劳动力需求，反过来又导致劳动成本上升，接着是销售价格上涨。所以，温家宝要求小心处理自然资源，这说得正是时候。商品节约，例如原油，有利于降低生产成本，增强中国的竞争力。

就电缆生产线而言，测量和控制技术提供了一个降低材料消耗和保护环境的机会。电缆绝缘材料用塑料制成，反过来说它是原油制成的。随着生产线测量设备的一体化，制造商避免壁厚过大。这意味着生产电缆时少用塑料，技术保证整个生产过程的质量。消除废品率，节约商品和提高生产率。

以下是有关材料数量的一个观点，也就是在实际中可以节约的原油。从1000克原油，大约能回收500克聚乙烯（源自：德国联邦环境保护署08/2010）。因为电缆生产也需要能源，你可以按2:1能计算，所以，1000克聚乙烯需要2.5升原油。



○ X-RAY 6120帮助电缆制造商保证质量，降低材料消耗

假设生产线运行275个工作日（6600小时/年），挤出机输出为600公斤/时，一年将产出400万公斤聚乙烯。例如，使用一个X-Ray 6000（测量壁厚、偏心度、直径和椭圆度），至少节约材料5%。结果，节约

20万公斤材料。如果1公斤聚乙烯价格是1欧元，那么一台X-Ray 6000一年就节约了20万欧元。

把所有制造商算在一起，都使用Sikora测量和控制技术，光从材料消耗计算，他们一年就能节约大约150万吨原油。这个数据相当于6艘运载能力超过15万吨的超大吨位原油巨轮的量。

就绝缘和护套生产线的质量控制和能源节约而言，Sikora继成熟和成功的X-Ray 2000后提供了X-Ray 6000。新的系统满足工业精确测量壁厚、偏心度和直径和椭圆度的要求。结合显示和控制装置ECOCONTROL 6000，测量系统提供生产线自动模式优化控制信息。

X-Ray 6000提供各种技术创新，设定了新的精密度、长期操作时间和效率标准，能够在所有生产线条件下进行精密测量。

X-Ray 6000技术考虑到最小值，允许快速对中挤出工具，控制生产线速度或挤出机转速。X-Ray 6000能够测量和控制三层不同的材料。

Sikora AG – 德国
 传真: +49 421 48900 90
 电子邮件: sales@sikora.net
 网址: www.sikora.net



上海申辰线缆设备有限公司

Shanghai Shenchen Wire & Cable Equipment Co., Ltd

— The Kingdom of Cold Welding Machines



SB-10



SB-1D



SB-11



J2-B



J3-B

Shanghai Shenchen Wire & Cable Equipment Co., Ltd(SCH) is located in the city of Shanghai in China, we are a world wide leader in the manufacture of cold welding machinery. Our products are sold internationally including Germany, Brazil, Britain, Russia, Turkey, India, Indonesia, Malaysia, Thailand, Vietnam, Japan, Korea, Egypt and the USA. Our customer service and products are provided to the highest standards. Our products are approved by Safenet Limited and have conferred the CE certificate.

Our products can weld Copper(Cu)wire from Ø0.06 –Ø25mm, Aluminum (AL) wire from Ø0.08–Ø35mm; and flat strips maximum width 33 mm, minimum thickness 0.45mm.

Website: <http://www.sch.chinacable.com.cn>
 E-mail: schsc8@yahoo.com.cn
 jasonzhong@vnet.citiz.net



Address: Rm. 1804, Bldg. No.1 (Guoke Mansion), Lane 1029, Kongjiang Road, Yangpu District, Shanghai 20093, China.
 Tel: +86 21 65199437 / +86 21 65199438 / +86 21 65187232 Fax: +86 21 65199430

Galaxy吸收1.2亿澳元融资

AIM-quoted矿产集团Creat Resources Holdings Limited (AIM: CRHL)欢迎ASX-quoted Galaxy Resources Limited完成一项重大融资,现在,它持有其中约11.78%的股份。

Galaxy从三个主要机构投资者-Azure Capital, Morgan Stanley和Helmsec Global Capital融资1.20亿澳元,此融资吸引了全球超强认购,包括来自欧洲、亚洲、美国和澳大利亚的潜在投资者。

它将用这些钱来提升其在西澳大利亚的Mt Cattlin spodumene项目产能,并完成其在中国张家港的江苏碳酸锂工厂的试运行,以及偿付债务。

CRHL按照其长期战略,已获得Galaxy的股份,以实现其多样化国际经营,它在继续评价其在西塔斯马尼亚的勘探资产。

Galaxy现在的定位是在快速增长的锂元素市场成为一个领先的一体化公司,锂作为再生电池生产的一种基本元素,尤其是汽车工业,对锂的需求量很大。

CRHL的首席运行长官Rex Chow评论道,“我们祝贺Galaxy成功完成新的融资。我们也欢迎更多的优质投资者的到来,并相信他们提供的附加值将进一步增强CRHL股东的价值。”

Galaxy现在设定的目标是要成为一个垂直一体化的锂公司,从原产品锂生产一直到化学加工和锂离子电池生产。

它期望完成其张家港碳酸锂工厂建设,更加接近主要市场,在今年后期及时试运行。

江苏工厂将使用Mt Cattlin矿场生产的原料。

Creat Resources Holdings Limited - 澳大利亚

传真: +61 3 6234 3884

电子邮件:

enquiries@creatresources.com

网址: www.creatresources.com

新的和二手设备

比利时GER SA专业销售用于线缆、黑色和有色金属工业的新的和二手机械。公司销售生产钢棒、线材、有色线材、钢缆、电气绝缘电缆等的单机和整套装置,备有大量现货,立等可取。如果客户没有发现其希望的设备,GER则将帮其搜寻。机器包括大拉机、细丝和中等单线或多线拉伸机、成束机、笼式和管式绞合机、铺设机、铠装机、鼓式捻合机、挤出机、线轴、线卷和卷绕机。

GER向全世界出口,并销售原态机或按要求提供、经过重调和现代化的设备。公司销售部门还能提供整套、待用生产装置的估价。GER还提供崭新的电气控制系统,采用一流的驱动和元件。其它服务包括机器发运前试运行、在客户现场安装和试车,培训操作人员。

GER SA - 比利时

传真: +32 87 260 201

电子邮件: ger@ger.be

网址: www.ger.be



○ 箱式线卷

对降排的认可

利华国际的分公司丹阳利华电子有限公司和江苏利华铜业有限公司已通过国际标准化组织对其环境管理体系的ISO 14001:2004认证。

这些认证与利华的CCA和铜线、铜阳极和铜棒产品以及相关生产过程有关。

ISO 14001:2004标准旨在帮助公司最小化生产线过程的环境影响。

标准包括一套国际认可的由国际标准化组织创立的环境管理体系规格。

认证标准包括三个主要方面: 1管理系统-系统开发并将环境责任纳入公司计划; 2操作-自然资源和能源消耗; 以及3 环境系统 - 测量、评价和管理气体排放、水排放和其他废物。

“我们对我们的铜方案和再生铜产品一直感到很自豪,而且事实上,我们利用生产过程而造成的环境影响远远低于矿场,我们在我们的生产装置中采用一流的过滤、水收集和其它系统。”利华主席和首席执行官官朱建华(音)说。

“我们很高兴ISO认可我们对环境责任的承诺,而且我们将继续努力,保证我们的操作遵守最高的标准。我们的目标是为我们的客户提供一流的产品,同时采取措施,进一步降低我们生产对环境的影响,进一步提升我们在铜再生工业中的领先地位。”

Lihua International - 中国

传真: +86 511 8631 2040

电子邮件: info@lihuaintl.com

网址: www.lihuaintl.com

新的创新亮相会展

PolyOne是专业聚合物材料提供商,它提供服务和解决方案,在Chinaplas 2011 - 亚洲最大的塑料工业贸易会展中展示了自己的实力。PolyOne的高性能解决方案帮助客户创新,赢得新的业务,改进操作效率。

Stat-Tech™碳纳米管化合物允许制造商生产紧凑的电子媒体储存设备、一体化电路包和半导体装置,不受会影响机械性能的静电放电(ESD)或热量影响。这些材料的可靠的性能帮助客户增加产率,加速循环数和提高生产率。

OnColor Complete™液体颜色解决方案是革命性的环保液体色料系统,帮助制造商消除废品,增加员工安全,降低

环境影响,它首创把计量技术与可靠的可返回容器以及一流的液体色料结合在一起,综合在一个闭路颜色输送系统中。

OnFlex™无邻苯二甲酸盐阻燃热塑性体,帮助处理商和制造商满足可持续发展目标,最大限度地满足客户要求。它的开展源于客户需求,为线材和电缆夹套、绝缘和连接器提供更环保的方案,这些配方使非弹性解决方案具有杰出的可视和触觉美感。

PolyOne Corporation - 美国

传真: +1 440 930 3064

电子邮件: info@polyone.com

网址: www.polyone.com

Amid privacy concerns, the European Commission moves to stiffen enforcement of a directive on telecom data retention

The European Union requires its 27 member states to store telecommunications user data. But several of the nations apply the EU legislation casually – or quietly ignore it. Now, however, they can expect legal pressure for compliance. “Whilst there are no concrete examples of serious breaches of privacy, the risk of data security breaches will remain unless further safeguards are put in place,” an 18th April statement by the European Commission (EC) read. “The Commission will therefore consider more stringent regulation of storage, access to, and use of the retained data.” The decision grew out of irregularities in implementation of an EU directive on data storage across the membership – including a few countries which do not enforce it at all.

As noted by the German international broadcaster Deutsche Welle, Austria and Sweden never passed laws to empower the measure, while Germany stopped enforcement after the country’s Constitutional Court in 2010 overturned its implementation of the EU guideline. Similar action has been taken by Czech and Romanian courts. The EC has already asked the European Court of Justice to place Sweden heavily for its noncompliance. And Cecilia Malmstrom, the EU’s commissioner for home affairs, has said that the directive must be implemented across the bloc. Ms Malmstrom, herself a Swede, told reporters in Brussels, “There can be no exception in this case. The law has to be followed.” (“EU Pressures Skittish Member Nations to Store Telecommunications Data,” 19th April). As noted by David Levitz of Deutsche Welle, the Data Retention Directive was adopted in 2006 following the bomb attacks in Madrid and London. The anti-terrorism measure calls for the storage of certain information derived from telephone calls and e-mails, such as names and addresses of the communicating parties and dates and times of the communications. The legislation does not require that the content of phone calls or e-mails be saved. Under the subhead “Privacy über alles,” Mr Levitz wrote: “Despite threats from Brussels, debate over the directive continues in Germany, where privacy rights and fears often carry more weight than in other EU countries.”

Deutsche Welle provided this background to the German position:

- ① In March 2010, Germany’s Constitutional Court overturned “legal transposition” of the directive on grounds that it violated privacy rights, though the court did not find fault with the European Commission’s guideline itself
- ② The Karlsruhe court also said that German law did not put in place enough hurdles to the state’s access to telecommunications records, and demanded that telecom companies erase the data they had already collected
- ③ Germany’s parliament has yet to agree on new data storage legislation. Justice Minister Sabine Leutheusser-Schnarrenberger, who in March 2010 lodged a complaint with the Constitutional Court against the data retention laws, advocates the so-called “quick freeze” method, which would call for telecommunications data to be stored only in cases where the authorities had concrete suspicions of illegal activity

“Most EU states, however, have deemed that approach an insufficient interpretation of the directive,” wrote Mr Levitz. “If Germany fails to implement the directive of its own accord, Brussels could take legal action to force Berlin to pass new legislation.”

Elsewhere in telecom . . .

- ① With ongoing political unrest in Syria, the government of President Bashar al Assad postponed indefinitely an auction, set for 27th April, of the country’s third GSM network operating license.

As reported by CommsUpdate, after Turkcell’s withdrawal from the field the competition for the third mobile license came down to Saudi Telecom and Qatar Telecom. Earlier, Emirates Telecommunications (Etisalat) also withdrew from contention, citing

dissatisfaction with the condition that the winner pay a 25% revenue share to the Syrian government. If the auction, which carries a minimum reserve of \$122.2 million, is rescheduled, the two bidders left in the process are committed to their bids as submitted.

- ② Claiming a milestone development in fourth-generation (4G) technology integration, China’s ZTE Corp has said it successfully demonstrated the coexistence on a single network of WiMAX and TD-LTE, making ZTE the first company in the telecom industry to showcase this technology. As reported by vision2mobile (21st April), the demonstration was conducted in Beijing together with Malaysia WiMAX operator Packet One Networks (“P1”). ZTE, the developer of P1’s incumbent WiMAX network, says it has proved that its base stations support seamless upgrades from WiMAX to TD-LTE. Michael Lai, the CEO of P1, told the e-newsletter: “Our next step is to become the first company to leverage the power of WiMAX and LTE. The decision to deploy LTE will depend on . . . when operators around the world, such as China and India, begin commercial application of TD-LTE and [make available] LTE devices.”

- ③ For another noteworthy demonstration, this one in Taiwan, Chunghwa Telecom Laboratories, the research arm of Taiwanese operator Chunghwa Telecom, partnered with French equipment manufacturer Alcatel-Lucent in an LTE field trial which apparently has yielded “outstanding results.” As reported by MobileBusinessBriefing (21st April), over a six-month period the partners conducted an “extremely comprehensive and intensive field trial in both 2.6GHz and 700MHz frequency bands,” focusing on radio network performance in terms of coverage and penetration. Alcatel-Lucent also said it had “conducted extensive interoperability testing” with device makers HTC, Quanta, BandRich, Zyxel/MitraStar and WNC/Wistron, using form factors including smartphones, USB dongles, wireless routers and tablet PCs.

The trial, enabled by Alcatel-Lucent’s end-to-end 4G LTE solution, incorporated indoor demonstrations of applications and

Multi-media Advertising Service

1

When you advertise in WCA magazine...

2

We include your advertisement **FREE** in the on-line digital version with a **FREE** email hyperlink from your ad

3

We'll also include your ad **FREE** on the CD version, available issue by issue



More than just a magazine The Complete Package

Contact us today for more information and a personalised quotation :

Tel : +44 1926 334137 - Email : wca@intras.co.uk - Website : www.wireandcableasia.com



services on a variety of LTE-suitable devices, as well as outdoor mobility tests onboard a high-speed train. As reported by TeleGeography (26th April), Alca-Lu confirmed that the tests performed onboard the train achieved transmission speeds of 90Mbps (downlink) and 34.2Mbps (uplink) while the train was travelling at around 281km/hour. The manufacturer noted the "smooth handovers between the base stations" en route.

- ④ In Austria the mobile operators Orange (the France Télécom brand) and T-Mobile Austria have announced a network partnership agreement for the joint use of their 3G infrastructure in rural areas, with potential to reach over six million new customers across the country. According to DerStandard.at, each company expects to realise around \$43.7 million a year in savings from the collaboration, first mooted in February. As noted by TeleGeography (26th April), the merger in the UK of T-Mobile and Orange – which launched with the ambitious slogan "Everything Everywhere" – suggested a template for such alliances in other European countries.

- ④ As Nokia enters an alliance with Microsoft, of the US, through which it obtains the Windows operating system for its smartphone lineup, the Finnish company announced plans to cut costs by nearly 20% over three years. Nokia on 21st April said that it would reduce annual operating expenses in its core devices and services business by \$1.46 billion, to \$6.78 billion, by the end of 2013.

While the cost-cutting initiative will likely mean the elimination of thousands of jobs, Nokia said it was guaranteeing employment to its entire existing workforce through the end of this year. Nokia employees numbered 130,951 as of 31st March, including 59,080 people working for the cellphone business and 71,871 at the networks venture, Nokia Siemens Networks, and the Navteq geographic mapping data unit.

Nokia continues to lose ground to Apple. According to Strategy Analytics, the latest numbers indicate that California-based Apple – already the world's largest smartphone company – has now

overtaken Nokia to become the largest handset vendor in terms of revenue. Apple's revenue from its iPhone rose to \$11.9 billion in the first quarter while Nokia's phone revenue slipped to \$9.4 billion, the research firm said.

- ④ In other news of Apple, it is being sued by Samsung, of South Korea, following its 19th April filing of a lawsuit against the Korean company which turns on the design and user interface of Samsung's Android-powered, Galaxy-branded devices.

According to the Wall Street Journal, rather than challenge Apple on design, Samsung is going to law on points relating to technologies for radio transmission optimisation and power management, error connection, and tethering. The issues between Apple and Samsung are somewhat complicated by their buyer/supplier relationship. Samsung is a key provider of components for such Apple products as the iPhone and iPad.

- ④ AT&T's formal request to the US Federal Communications Commission (FCC) for permission to acquire T-Mobile USA from Deutsche Telekom included a candid acknowledgement by Deutsche Telekom of the American unit's struggle to remain a competitor in the wireless marketplace. In a declaration included with the AT&T filing, Thorsten Langheim, Deutsche Telekom's senior vice president of mergers and acquisitions, wrote, "Despite marketing efforts to improve its standing, T-Mobile USA has steadily lost market share – both nationally and across major markets – over the past two years."

T-Mobile USA is the fourth-largest US mobile operator, behind Verizon Wireless, AT&T and Sprint Nextel. AT&T has agreed to pay Deutsche Telekom \$25 billion in cash and \$14 billion in AT&T shares for the unit. Mr Langheim told Josh Long of Channel Partners (22nd April) that the proposed sale would slash the German company's debt and improve its credit profile. He also said that Deutsche Telekom anticipates having an 8% stake in AT&T and using the cash from the merger to reduce its debt by \$18.95 billion.

- ④ Argentina plans to spend \$2 billion over the next three years on an extension of its fibre optic network. As reported by Shane Romig of Dow Jones Newswires (26th April), the government plans to triple the existing Internet infrastructure by laying 26,000 kilometres of new cable, connecting residents from the southern tip of Tierra del Fuego to the far north of the country.

Pablo Tognetti, the president of Argentina's state-run satellite operator Arsat, told Mr Romig that the programme could reach 50,000km of new cable if the provinces match the fibre laid by the federal government.

ArSAT will develop the network with both public and private investment, then lease it to telecom providers.

- ④ On 26th April it was reported that the Australian telecom giant Telstra had been granted a 90-day extension to the deadline for submitting a plan to separate its retail and wholesale arms, a requirement of the A\$11 billion deal whereby the company would migrate to the National Broadband Network (NBN). Telstra, which has been fully privatised since 2006, was required to submit a structural separation undertaking to the government before 1st April, or within 90 days of the effective date of the Australian Competition & Consumer Commission Act.

However, as reported by Mitchell Bingemann in *The Australian*, Communications Minister Stephen Conroy – who has described the separation of Telstra's retail and wholesale arms as "the holy grail of microeconomic reform" – granted an extension.

Telstra was given until 30th June to work out the final terms of the transfer of its fixed-line monopoly to the NBN. ("Telstra's Forced Break-Up Delayed," 26th April).

Mr Bingemann wrote: "For years, Telstra's rivals have been desperate to see the separation of [its] retail arm from its wholesale network, arguing that Telstra's ability to favour its retail arm by offering cheap access to its dominant wholesale network has severely tilted the competitive playing field in the A\$35 billion-a-year telecommunications sector."

特为中国读者和客户推出中文电子版杂志

NEW

第一步：
选择中文版标签

您的广告可以出现在这里！

NEW : Advertise at the front, ensuring that your advert will be the **first one seen** !

The image shows a stack of magazine covers and a full-page advertisement for Kieselstein Wire Solutions. The Kieselstein ad features a large image of industrial machinery and text in both English and Chinese. The English text includes: "KIESELSTEIN WIRE SOLUTIONS", "Customized Solutions for Wire Drawing and Draw-Peeling Technology", and "Dedicated draw-peeling line in our R&D testing center provides you the unique opportunity to evaluate surface quality on your wire". The Chinese text includes: "KIESELSTEIN 线缆", "定制化的导线拉拔和剥皮解决方案", and "我们研发测试中心专用的剥皮线为您提供独特的机会，让您评估您导线的表面质量".

WWW.READ-WCA.COM!

电子杂志让您快速方便免费的在线阅读最新一期杂志

This screenshot displays the Chinese version of the magazine's content. It features a large image of a wire drawing machine on the left. The main text area contains several articles and advertisements, including:

- 科技新闻** (Tech News)
- 采用新技术的屏蔽技术** (Shielding technology using new technology)
- 各种系列线材设备** (Various series wire equipment)
- 可靠的标志** (Reliable logo)
- 不同断生产设备** (Continuous production equipment)
- 用微软Excel定制报告** (Custom reports using Microsoft Excel)
- 推出新型铜线生产设备** (New copper wire production equipment)

第二步：
阅读中文杂志内容

This screenshot shows the online magazine interface on a computer screen. It features a navigation menu on the left with options for "Home", "1-Chinese", "2-Chinese", and "3-Chinese". The main content area displays the magazine cover and a list of articles, including the "推出新型铜线生产设备" article. The interface is clean and professional, with a clear focus on the magazine's content.

出于隐私方面的考虑, 欧洲委员会 (EC) 加紧执行电信信息存储指令

欧盟要求其27个成员国存储电信用户的数据。但一些国家漫不经心的执行欧盟法律规则——或者默默地忽略该规则。然而, 现在它们能预感到为让各成员国遵守而施加的法律压力。“由于没有实际严重破坏隐私的案例, 数据安全漏洞的风险仍将存在, 除非进一步的安全措施落位。”4月18日由欧洲委员会做出的声明提道: “委员会将因此考虑对保留数据进行更严谨的存储、访问及应用的规章制度。”该决定产生于成员国执行欧盟在信息保留指令的不规则——其中一些国家根本就没有执行。正如德国国际之声 (Deutsche Welle) 所说, 奥地利和瑞典从未通过法律来授权该措施, 而德国在2010年宪法法庭停止实施欧盟准则后, 德国停止了对该指令的执行。捷克和罗马尼亚法庭也采取了类似举动。欧洲委员会要求欧盟法院严肃对待瑞典的不合作行为。欧盟内务专员 Cecilia Malmstrom 表示指令必须在全联盟内执行。Malmstrom 女士本人是瑞典人, 她在布鲁塞尔告诉记者说: “这次不可能有例外。法律必须被遵守。” (“欧盟力压反复无常的成员国存储电信数据”, 4月19日)

正如德国之声 (Deutsche Welle) 的 David Levitz 所说, 信息存储指令在2006年马德里和伦敦受到炸弹攻击后被正式采纳。反恐措施要求存储从电话和电子邮件中获得的特定信息, 诸如名字和联系方的地址以及数据和联系时间。法律并未要求电话或电子邮件的内容也要保存。在 “关于所有人的隐私” 的副标题下, Levitz 先生写道: “尽管有来自布鲁塞尔的威胁, 在德国关于指令的争论仍在继续, 在德国隐私权和恐惧相比在其他欧盟国家更具影响。”

德国之声为德国的处境提供以下背景资料:

- ① 2010年3月, 德国宪法法院推翻了指令的 “法律换位” 理由是它违反了隐私权, 虽然法院并未找出欧洲委员会指令本身有什么错误;
- ② 卡尔斯鲁厄法院同样宣称德国法律没有对国家登录电信记录设置足够的障碍, 并要求电信公司删除它们已经保存的数据。
- ③ 德国议会已经同意新的数据存储法律。司法部长 Sabine Leutheusser-Schnarrenberger 在2010年3月对宪法法院反对数据存储法案的行为提出指责, 主张所谓的 “快速冷冻” 方法, 即只有政府对违法行为有确凿怀疑的案例中的电信数据进行存储。

“然而, 大多数的欧盟国家认为这是对指令的不适当解释, ” Levitz 先生写道。 “如果德国不能根据自己的协议来执行指令, 布鲁塞尔可能采取法律行动来迫使柏林通过新的法律。”

电信行业的其他事件.....

- ① 由于叙利亚政治的持续骚乱, Bashar al Assad 总统的政府无限期的推迟了4月27日全国第三个 GSM 网络运营执照的拍卖。据 CommsUpdate 报道, 在 Turkcell 退出后, 第三块移动执照的竞争在 Saudi Telecom 和 Qatar Telecom 之间展开。早些时候, Emirates Telecommunications (Etisalat) 也从竞争中退出, 支付中标者25%的年收入给叙利亚政府表示不满。如果这个附有至少1.222亿美金储备的项目拍卖改期, 程序中剩下的两位竞价者将提交他们的竞价作为投标。
- ② 另一个值得注意的展示是在台湾, 中华电信研究所, 台湾运营商中华电信的研究机构, 与法国设备制造商阿尔卡特-朗讯 (Alcatel-Lucent) 在 LTE 合作的现场实验目前已经产生了 “杰出的结果” 。据 MobileBusinessBriefing (4月21日) 报道, 在一个超过半年的时间段内, 合作双方进行了一个 “在

2.6GHz 和 700MHz 两个频段做了极端复杂且密集的现场试验”, 重点关注无线网络在覆盖面和穿透力方面的表现。阿尔卡特-朗讯同样表示它已经与设备制造商 HTC、Quanta、BandRich、Zyxel/MitraStar 和 WNC/Wistron “进行了广泛的联通性测试”, 采用形式包括智能手机、USB 加密狗、无线路由以及掌上电脑。该试验因 Alcatel-Lucent 的端对端 4G LTE 方案而变得可行, 各种适合 LTE 的设备应用和服务在已注册的室内展馆展示, 同时户在高速火车上进行了外移动测试。据 TeleGeography (4月26日) 报道, 阿尔卡特-朗讯确认测试在火车上的表现当火车已大约 281 公里/小时速度行进时, 传输速度的达到了 90Mbps (下行链路) 和 34.2Mbps (上行链路)。制造商指出途中 “在基站之间交接平稳”。

- ③ 由于 Nokia 与美国微软 (Microsoft) 结盟, 通过微软获得智能手机系列的 Windows 操作系统, 这家芬兰公司宣布三年内削减将近 20% 的成本缩减计划。Nokia 在 4月21日称它将削

减其在核心设备和服务业务上的年度经营费用, 削减额度将达到 14.6 亿美元, 到 2013 年年底则将达到 67.8 亿美元。

- ④ 韩国 Samsung 起诉苹果, 这是继 4 月 19 日对韩国公司的诉讼案后, 该公司开放 Samsung 公司的 Android 供电的 Galaxy 品牌的设备的设计和用户界面。根据 Wall Street Journal 报道, Samsung 没有在设计上挑战 Apple, 而是将无线电传输优化及电源管理、错误连接和环绕等技术相关事宜走向法律程序。Apple 和 Samsung 之间的问题在某种程度上被它们的买家/供应商之间的关系复杂化了。Samsung 是 Apple 诸如 iPhone 和 iPad 产品的重要供应商。

- ⑤ AT&T 正式向 US Federal Communications Commission (FCC) 提出向德国电信收购 T-Mobile 美国公司的要求, 包括一份德国电信美国分部的维持无线市场上竞争力的坦诚声明。在一份附有 AT&T 备案的声明中, 德国电信负责并购的资深副总裁 Thorsten Langheim 写道, “在过去的两年里, 尽管提高营销力度以改善状况, T-Mobile 美国公司还是在全国以及各个主要市场上丧失了市场份额。”

T-Mobile 美国是美国第四大移动运营商, 排名在 Verizon Wireless、AT&T、和 Sprint Nextel 之后。AT&T 已经同意为此次并购支付给德国电信 250 亿美元现金和价值 140 亿美元的 AT&T 股票。Langheim 先生告诉 Channel Partners 的 Josh Long (4月22日) 计划中的出售将大幅削减这家德国公司的债务并改善其信用状况。他同样表示德国电信预计将持有 AT&T 的 8% 股份并将并购所得的现金用于偿还其 189.5 亿美元的债务。

- ⑥ 据 4月26日的报道, 澳洲电信巨人 Telstra 已被授予 90 天的延期作为其递交拆分零售和批发机构计划书最后日期, 这是一项 110 亿澳元的交易, 根据此交易公司将移至 National Broadband Network (NBN) 名下。2006 年已经完全私有化的 Telstra 被要求在 4月1日前向政府递交一份结构分离承诺, 或在《澳大利亚竞争及消费者委员会法案》生效之日起 90 天内递交。

然而, 根据在澳大利亚 Bingemann 的报道, 曾将 Telstra 的零售与批发部门的拆分形容为 “微观经济改革的圣杯” 的通讯部长 Minister Stephen Conroy 同意延期。Telstra 可最迟到 6 月 30 日再递交其向 NBN 转交固定电话垄断权 (“Telstra 的强制拆分延迟了”, 4月26日)



Moscow



Shanghai



Bangkok



join the best

w o r l d w i d e

wire Düsseldorf: Innovations go global

Take advantage of the highest calibre expertise of the No. 1 international fair as the show goes global. Draw on international synergies from these leading trade fairs. A cycle of regional events, staged in succession around the globe, responding to local market and customer needs.

Detailed information on the full programme can be found at:

www.wire.de

Messe Düsseldorf GmbH
Postfach 10 10 06
40001 Düsseldorf
Germany
Tel. +49 (0) 2 11/45 60-01
Fax +49 (0) 2 11/45 60-6 68
www.messe-duesseldorf.de



Trouble on a 737

Misaligned rivet holes are found on the Boeing jet that peeled open during a West Coast flight in April

US federal investigators on 25th April announced the discovery of faulty riveting in the roof of a Southwest Airlines plane that tore open during a 1st April flight from Phoenix, Arizona, to Sacramento, California. In its interim report, the National Transportation Safety Board said that a laboratory examination of intact sections of the roof found rivet holes on one layer of the plane's skin that did not line up accurately with an underlying layer.

Another finding by the board was bleed-through of paint from the exterior of the plane into the inside. In the *International Herald Tribune*, Matthew L Wald (reporting from Washington) and Jad Mouawad (in New York) noted the view of experts that this suggests an improperly bound aluminium skin, leading to premature damage from fatigue. ("Rivet Flaw Suspected in Jet's Roof," 25th April).

The board will probably not publish its conclusions about the cause of the rupture, which occurred at 34,000 feet, for some months. But outside experts consulted by the *Herald Tribune* said that the 15-year-old Boeing 737 probably left the factory with flaws.

- ❖ "It means the assembly was wrong, it means the wrong tools were used, it means they were careless in drilling the holes, and maybe the drill was dull," said John J Goglia, an aircraft maintenance expert who is a former member of the safety board.

If the rivet holes on the two pieces of aluminium being fastened together did not line up, that would mean they were egg-shaped instead of round, Mr Goglia said. As two such pieces are pulled in opposite directions when a plane is pressurised and depressurised, round holes would spread the forces evenly around the circumference of the hole. But if the hole is egg-shaped, he said, "they're concentrated in one spot."

- ❖ Robert W Mann Jr, an aviation industry expert in Port Washington, New York, observed that such flaws are unusual. He said: "The key issue is whether this was systemic." He then inquired: "Why weren't the parts rejected?" Mr Mann was also concerned about the paint. "These are not small defects [from] wicking of the liquids," he said. "Paint is not thin. It is pretty substantial." Additionally, he said, if the parts are not perfectly shaped on arrival at the assembly plant "that creates the necessity to redrill, which creates ovalisation" leading to wear on the parts.
- ❖ The *Herald Tribune* said that the safety board would also examine five other Southwest planes found to have cracks. Those five, and the one that ripped open, had all flown about 40,000 cycles of takeoffs and landings. After the incident in flight, Boeing said it did not expect this model of its 737 to require inspection before at least 60,000 cycles. In an emergency order issued days

after the episode, the Federal Aviation Administration ordered airlines flying those planes to check for cracks at 30,000 cycles.

The six planes were delivered from 1994 to 1996. Boeing, in a statement, said it would not speculate about the cause of the incident, but that "[We] remain fully engaged with the investigation."

- ❖ There were several reports of problems with miswired or misassembled planes in the US in the 1990s. Nor is the development of cracks around rivets as airplanes age new to the aviation industry. In April 1988 an Aloha Airlines plane en-route from Hilo to Honolulu, in Hawaii, "peeled open almost like a sardine can," recalled the *Tribune* reporters. But, they wrote, "That plane had 89,000 takeoffs and landings."

Telecom and Technology

Discovery of a location-tracking feature on Apple and Google smartphones prompts a legislator to raise the alarm in Congress

"We need a major hearing that blows the lid off the lack of security and privacy within these phones," Rep Edward Markey told the *Boston Herald*. "I think this is not just a problem with Apple, but a problem that exists throughout the entire industry." A demand for congressional action from Mr Markey, a Massachusetts Democrat and ranking member of the House telecommunications sub-committee, came on the heels of revelations of a hidden location-tracking feature contained in the Apple iOS4 operating system on iPhones and iPads, as well as in devices using Google's Android.

The programs appear to collect information about the user's every move, storing it in a secret file that can be transmitted to a computer or another device. The unencrypted tracking program on the Apple devices was discovered by British researchers, who found that data was sent to unsecured servers throughout the day.

As noted by the *Herald's* Jessica Van Sack, location-based technology is key to the evolution of smartphones, which bank on the programs to enable hot mobile apps such as Yelp and Mapquest. But, she wrote: "The notion that mobile phone companies are tracking customers regardless of whether an app is running – and holding on to the data for extended periods – had privacy advocates seething." ("Representative Ed Markey Hung Up on Privacy," 23rd April).

When the story broke, Google (Mountain View, California) acknowledged that Android phones collect location information for consumers who request it. But the company's statement that any data sent back to Google location servers "is anonymised and is not tied or traceable to a specific user" seemed intended to play down the spyware inference.

Apple (Cupertino, California) maintained silence; but Mr Markey on 21st April wrote to Steven P Jobs, Apple's chief executive, demanding answers.

telecom

power

fiber optic

control

datacom

steel

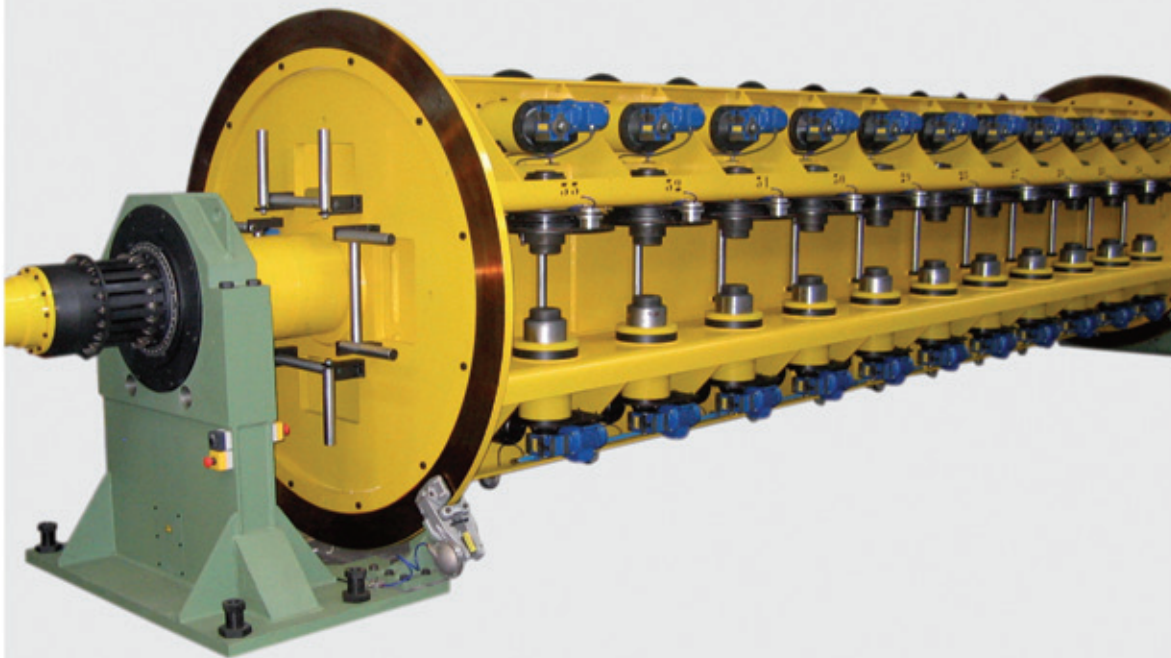
Other available range of products:

Full range of Stranding and Cabling equipment for **Power Cables**

C.M. Caballé, S.A. offers a full range of rotating equipment for conductor stranding, laying up and screening/armouring of power cables:

- Double Twist Strander
- Rigid Strander
- Drum Twister
- Single Twist Strander
- Bow Skip Strander
- Tubular Strander
- Planetary Strander
- SZ Strander

More than 60 years of experience combined with the use of the latest technologies allows Caballé to provide the most suitable equipment for each application maintaining its leadership position in the international market.



Construcciones
Mecánicas Caballé, S.A.

www.cmcaballe.es

Headquarters
Progreso, 293-299
08918 Badalona
Barcelona - Spain
Tel.: +34 93 460 14 13
Fax: +34 93 399 00 08
P.O. Box 97
caballe@cmcaballe.es

Built to Rotate

caballé

power





REELS

Metal reels for wire and cable. Process and transport.

<p>FM Fully Machined</p> <p>FM PRECISE MACHINING. ⚡</p>	<p>SW Single Wall</p> <p>SW PRESSED FLANGES. ⚡</p>	<p>SD Structural Drum</p> <p>SD CHANGEABLE BUSHINGS. ⚡</p>
---	--	--

HANDLING EQUIPMENT

All the necessary accessories for reels and coils.

<p>TA TAKE APART REELS. CUSTOMIZED. ⚡</p>	<p>ROLLING SYSTEM. FOR STRAPPING OPERATION. ⚡</p>	<p>TU/M - TILTING UNIT. FOR REELS OR COILS. ⚡</p>
<p>TL - TILTING DEVICE. FOR REELS. ⚡</p>	<p>RA - REEL AUTOLIFT. AUTOMATIC LIFTER FOR REELS. ⚡</p>	<p>CA - COIL AUTOLIFT. AUTOMATIC LIFTER FOR COILS. ⚡</p>



MANUFACTURING
GMP-Slovakia s.r.o. - Staničná, 109
07651 Pribenik - Slovakia
sales@gmp-slovakia.com
www.gmp-slovakia.com

“No family should ever have their most secret information hacked into by strangers who could be predators,” Mr Markey told the *Herald*. “I think that these security experts who hacked into the iPhone are demonstrating how vulnerable the devices are to being exploited.”

❖ Ms Van Sack observed that global positioning system (GPS)-like mobile technology developed by Boston-based Skyhook Wireless in 2003 is now “baked into” all Apple phones. According to Skyhook co-founder Mike Shean, however, separate Apple technology enables the tracking function.

Marc Rotenberg, executive director of the Washington-based Electronic Privacy Information Center, dismissed any suggestion that the data-tracking capabilities could be an unintended adjunct of location-tracking software. “It is quite clear that Apple made a decision to create this file” and needs to fix the problem, Mr Rotenberg told the *Herald*. “They’ve placed their customers at risk.”

❖ Writing in the “Bits” technology blog of the *New York Times* (22nd April), Miguel Helft noted the possibility of a more benign explanation for the secret data collection. Some security experts told him that they believed Apple collects the data not to track users but to be able to pinpoint a phone’s location more quickly. This saves bandwidth and battery life when the owner of a phone uses location-based navigation and map services.

Many cellphone owners believe that the services that pinpoint their location on smartphones rely on GPS technology. But Mr Helft observed that, more often than not, companies like Google and Apple identify a phone’s location by comparing the names and strengths of nearby Wi-Fi hotspots against a database of Wi-Fi hotspots – the technique pioneered by Skyhook Wireless.

“Apple initially relied on Skyhook’s technology. But, over time, Google and Apple began building their own databases of Wi-Fi hotspots,” Mr Helft wrote. “Google did so with its StreetView cars. And both companies do so by using their customers’ phones as sensors.” As a Google spokesman told the “Bits” blogger: “Phones know where you are, and they need to for many of the services we offer.”

For his part, Steve Jobs has said that, unlike many of its Silicon Valley competitors, Apple takes privacy very seriously. Mr Helft recalled that, last year, the Apple CEO singled out location as an area of particular concern. “Privacy means people know what they are signing up for,” Mr Jobs said. “In plain English and repeatedly, that’s what it means.”

As the US marks time in fifth place, Nordic countries and ‘Asian Tigers’ lead in communications and computing advances

According to the most recent results of a study conducted annually by the World Economic Forum, the United States for the second consecutive year ranked fifth in a comparison of 138 countries on their use of information and communications

technology (ICT). Of the countries that together accounted for 98.8% of the world's total gross domestic product in 2010, Sweden led the pack, followed by Singapore, Finland and Switzerland.

The World Economic Forum, based in Davos, Switzerland, holds that technological progress is the prime mover of innovation, productivity, and efficiency in a nation. The report issued 12th April is the tenth anniversary edition of a project instituted in 2001, following the collapse of the Internet bubble. Some 71 economic and social indicators – among them mobile phone subscriptions, availability of venture capital, and new patents – informed the judging.

Overall, the profile of the United States is uneven in many measures bearing upon economic competitiveness. It ranked 76th in rate of growth in mobile phone subscriptions, 48th in low-cost access to business phone lines, and 24th in percentage of households with a personal computer – behind Bahrain, Singapore and Brunei, among others. Soumitra Dutta, a professor of information systems at the INSEAD business school and a co-author of the study, said the US ranked 52nd in maths and science education.

The Global Information Technology Report 2010-2011 may be read in full on the website of the World Economic Forum: weforum.org. In its introduction, the organisation notes that the report confirms the leadership of the Nordic countries and the Asian Tiger economies “in adopting and implementing ICT advances for increased growth and development.”

Besides Singapore among the leaders, Taiwan was ranked sixth, South Korea 10th, and Hong Kong 12th. Japan was 19th. China ranked 36th and India 48th, falling five places from 2009.

Rounding out the large developing BRIC countries – Brazil, Russia, India, and China – that have set themselves up as an organised economic counterweight to the US, Brazil was 56th and Russia 77th.

❖ The country making the most progress in information and communications technology last year was Indonesia, which ranked 53rd – a jump of 14 places. Among Western nations, Canada was 8th, Norway 9th, Germany 13th, Britain 15th, and France 20th. The two countries at the bottom of the rankings were Burundi and Chad.

Elsewhere in telecom . . .

❖ The North American arm of China Telecom Ltd is strengthening its presence in Canada. As reported in the Toronto Globe and Mail (20th April), Donald Tan, president of China Telecom Americas, said the group has had a Canadian office for more than five years.

But, with an increase in local demand for communication links with China and the Asia-Pacific region, the Markham, Ontario, office in the Toronto area is to become a full subsidiary to serve multinational companies and international telecom carriers.



Huestis Down Draft™ Air Wipe

Our bottom-draining design allows back-to-back coupling of multiple air wipes in line, while maintaining drier product between them. Additionally, the performance of the unit is enhanced as a stand-alone wipe over our original Air Miser™ Air Wipe.

Huestis Industrial machines – our performance is legendary!

For more details or to place an order, call us at 800-972-9222, or email us at sales@huestis.com

HUESTIS INDUSTRIAL
making it affordable™

www.huestisindustrial.com

Air Wipes, Pay-offs, Take-ups, Buncher Pay-offs, Accumulators, Spoolers, Cold Pressure Welders, Cable Jacket Strippers, Custom Machinery

"Some of Canada's most ambitious companies have long been active in China," Mr Tan said. "Many others are beginning to explore the great opportunities China has to offer. These firms need an experienced partner to help them develop and deploy a plan for success in China."

China Telecom Americas has its headquarters in Herndon, Virginia, and offices in several cities throughout the United States. Parent company China Telecom has the world's largest fixed-line telecommunications network, with 174 million telephone subscribers and 65 million broadband customers. It also has 100 million mobile phone subscribers.

Steel

- ❖ Timken Co on 18th April announced that it will increase steel output by 120,000 tons per year at its factories in Canton, Ohio. The company, which makes alloy steels, bearings, and assemblies mainly for auto producers, said that an upgrade at its Harrison plant has boosted output beyond the new mill's rated capacity. Additions to its work force will, Timken said, enable it to further increase output there and at the Faircrest plant. Timken said it has invested more than \$200 million in advanced technology since 2006.
- ❖ Asserting that steel making in northwestern Indiana is critical to the regional and national economy, Rep Pete Visclosky on 6th April testified at an International Trade Commission hearing in Washington in favour of extending tariffs on some imported steel products from Brazil, Russia and Japan.

As reported by the *Munster (Indiana) Times*, Mr Visclosky believes that the American economy is still in a fragile state, and that ending the import duties would encourage foreign countries to "resume their unfair trading practices that cost American jobs."

- ❖ Latrobe Specialty Steel Co (Latrobe, Pennsylvania) is investing some \$3 million in an expansion of its Wauseon, Ohio, plant, which makes edgewire and precision stainless steel wire from steels produced in the Latrobe mill. The company also plans to establish a business to supply titanium wire to fastener manufacturers serving the aerospace market. The search is on for a suitable location in Pennsylvania or Ohio. (*Pittsburgh Business Times*, 8th April).

Automotive

Satisfied employees of foreign-owned non-union car plants in the American South resist recruitment by the United Auto Workers

"We have good communication with management here. Why would you need a union? The only time a union shows up is to collect dues or at election time."

This view, expressed by a worker at a Kia plant opened in 2009 in West Point, Georgia, may be held by many others in foreign-owned automotive plants across the American South. But it is also specific to this man who, for 18 months before he joined Kia in August 2010, had worked for an industrial parts manufacturer that put its people on a one-week furlough every month. The factory job he landed painting Kia Sorrento SUVs has better pay and benefits and no enforced furloughs. His finances, he told Jerry Hirsch of the *Los Angeles Times*, are greatly improved.

From Montgomery, Alabama, Mr Hirsch reported hearing similar stories in town after town along the southern tier of Auto Alley, a corridor that runs north-south from Lexington, Kentucky, to Montgomery. Foreign auto makers – including Honda, Nissan, Toyota (all Japanese-owned); Kia (Korean); and Mercedes-Benz and Volkswagen (both German) – are placing their US factories in this region because of generous state and local incentives "and a workforce famously resistant to unions." ("Who Wants a Union? Not Southern Auto Workers, It Seems," 29th March).

Plants in the South now account for about half of all new vehicle manufacturing in the US, and none of the factories operated by the foreign auto makers in the region has union workers. According to the Centre for Automotive Research, average pay – wages and benefits – is about the same at \$55 an hour for unionised workers in Detroit and those at Toyota's US plants. The other non-union auto makers pay less: Honda, about \$50 an hour, while Nissan, Hyundai, and Kia are at about \$45.

- ❖ These comparisons are largely lost on auto workers in the South who, as Mr Hirsch pointed out, have intense loyalty to the companies that brought high-paying blue-collar employment to small towns and cities starved for jobs. Fairly typical is a man who has what he calls his dream job, correcting small flaws on the sedans coming off the assembly line at the Hyundai factory in Birmingham. One day, two organisers from the UAW knocked on his apartment door, hoping to sign him up for membership in the union. "I said I didn't work at the plant," he told Mr Hirsch. "I just wasn't interested."

Elsewhere in automotive . . .

- ❖ In the first such case to go to trial since Toyota Motor Corp recalled millions of vehicles, starting in 2009, on reports of sudden unintended acceleration, a federal jury in New York on 1st April cleared the Japanese company of the charge that a defect in a 2005 Toyota Scion caused it to suddenly accelerate and smash into a tree.

The jury required less than an hour to deliver the verdict rejecting the plaintiff's view of the accident: that it was caused by a defective floor mat. "We weighed all the evidence and came to the conclusion that there was not a defect with the automobile," said the jury forewoman.

- ❖ Toyota's global production, disrupted by parts shortages from the earthquake and tsunami in Japan in March, is not expected to return to normal until November or December. In April the company announced the extension of production cuts in North America into June, but pledged not to lay off any of the 25,000 workers in its 13 factories in the US and Canada.

Setbacks this year could cost Toyota its spot as the world's top-selling auto maker, taken from General Motors in 2008 and now likely to be given back.

- ❖ The largest of Detroit's "Big Three," General Motors posted first-quarter sales of 592,545 units, some 26% higher than in the same quarter of 2010. As noted by Forbes (1st April), GM has been trying to remake itself as it comes out of private ownership, having gone through with its initial public offering in November 2010. While its stock price has lagged, the company has done well launching new products and managing to keep sales growing. With its electricity-powered Chevy Volt and Chevrolet Cruze compact sedan, GM is targeting American car buyers worried about high gasoline prices.
- ❖ Ford Motor Co posted a 20% rise in its Chinese sales to 53,440 vehicles during March. Recently, the Detroit auto maker announced plans to invest \$1.1 billion in China, notably to raise capacity at its new plant in Chongqing to 650,000 units by 2012. Power train and engine capacity at the plant, operated by Ford's joint-venture partner Changan Automobile Co, will also be increased, from 400,000 units to 750,000 units. As reported by Zacks Equity Research (9th April), Ford's sales in China grew 40% in 2010, largely on higher sales of compacts and subcompacts. Changan Ford sold 403,283 vehicles, an increase of 34% from 2009. Additionally, Ford's commercial vehicle venture in China, Jiangling Motors Corp, reported a remarkable 56% rise in sales to 178,999 units for the year. Ford also had a good year in India. Its sales there almost tripled to 95,395 in 2010, helped by the Figo, its first small car for India
- ❖ In other news of Ford, the company in the week of 11th April resumed production at plants in Louisville, Kentucky; Flat Rock, Michigan; Hermosillo, Mexico; and Genk, Belgium. The facilities had been closed either because of shortages of parts from Japan or to reduce inventory.

International

Texas as "gateway to Cuba"? Not yet – but Houston gets ready

Houston Airport System officials in Texas are evaluating the market potential in charter flights to Cuba after George Bush Intercontinental Airport was named one of the US airports that may offer such flights under limited conditions. Genaro Peña, the air service development director for the system, told the *Houston Chronicle*, "We're going to do everything we can to position Houston as a gateway to Cuba." ("Want to Fly to Cuba?", 8th April).

Until recently, only three domestic airports were authorised to offer charter service to the island nation only 90 miles from Florida, the subject of a US embargo in place for half a century now. But, as noted by the *Chronicle's* Ronnie Crocker, the Obama administration, while retaining the embargo, has ordered the easing of some prohibitions on travel to Cuba. On 24th March, US Customs and Border Protection, a component of the Department of Homeland Security, expanded to 13 the number of airports able to offer the charter service.

Bush Intercontinental and Dallas-Fort Worth International were the only Texas airports on the list. Also authorised are airports in Atlanta, Baltimore, New Orleans, Chicago, Pittsburgh, Tampa and Fort Lauderdale (both in Florida), and San Juan, Puerto Rico. Previously, flights could be arranged only from Miami International, Los Angeles International, and John F Kennedy International airport in New York.

The charter-only flights will be limited to family visits and trips for authorised groups in a small number of specific areas, including agriculture, medicine, education and religious activity. When Mr Peña spoke with the *Chronicle*, no Cuba-bound individuals or group had yet made inquiries of the Houston Airport System.

In brief

- ❖ The Customs and Border Protection agency of the US government operates an extensive radiation screening network at the nation's seaports, airports and border crossings. Installed after the 9/11 terrorist attacks in 2001 to thwart smugglers of nuclear weapons, the system is now being used as well to detect any unusual radioactivity in cargo from Japan.

The heightened scrutiny was ordered for Japanese imports when radiation was reported to be escaping from the Fukushima nuclear power plant, damaged in the earthquake and tsunami that struck Japan on 11th March.

At the Pacific coast port of Oakland, across the bay from San Francisco, ship cargo typically goes through one round of radiation contamination screening before being cleared to leave port. Containers from Japan now get multiple checks, but as of the first week of April no dangerous levels had been detected and no cargo had been detained.

- ❖ The US Justice Department on 7th April asked a federal court for permission to compel London-based HSBC, one of the world's largest banks, to direct its US affiliate to turn over the names of wealthy Indian-American clients suspected of evading taxes through offshore accounts at the bank's affiliate in India.

The request extended to India a widening investigation into private offshore services sold by Swiss and Swiss-style banks that have helped some Americans avoid income taxes by hiding money overseas. Holding a foreign account is legal in the US, but citizens and residents must file annual disclosures with the Internal Revenue Service for accounts with balances higher than \$10,000.

In 2003, the wealth management company Merrill Lynch estimated that there were 200,000 millionaires of Indian origin in the United States. According to court documents, HSBC Bank USA operated offices in New York and Fremont, California, for HSBC India under the name NRI Services. (NRI stands for Non-Resident Indian.) In a statement on the Justice Department request, HSBC said: "While we haven't seen the summons, HSBC does not condone tax evasion and fully supports US efforts to promote appropriate payment of taxes by US taxpayers."

Dorothy Fabian – Features Editor



波音737客机的遭遇

四月，在一架沿着西海岸飞行的波音飞机上，一颗排列不齐的铆钉发生脱落，留下了洞

美国联邦调查人员于4月25日宣布4月1日西南航空 (Southwest Airlines) 一架航班在从亚利桑那州的菲尼克斯飞往加利福尼亚州的萨克拉门托时机顶发生铆钉脱落事故的调查结果。

在这份临时报告中，国家运输安全委员会声称，在对出现孔洞的整块飞机蒙皮进行实验室测试后，发现此块蒙皮与其下层蒙皮不完全契合。

委员会发现的另一个问题是飞机外层的涂料有渗入内层的情况。在国际先驱论坛报中，Matthew L Wald (报导于华盛顿) 和Jad Mouawad (于纽约) 注意到有一些专家的观点。

他们认为这是由于铝制蒙皮的安装不合理，导致蒙皮提早出现疲劳损伤。(“机顶的可疑铆钉”，4月25日)

委员会也许在几个月内不会就这一于3万4千英尺高空发生破损原因的问题对外公布最终结论。但是国际先驱论坛报所咨询的外界专家认为，这一使用已达十五年之久的波音737飞机在出厂时就已带有问题。

❖ 安全委员会的一位前飞机维护专家John J Goglia如此说道：“这意味着流水线有问题，工具出了错，他们在钻洞的时候太粗心了，也有可能他们用的锥子太钝了。”

Goglia先生说道，如果两块铝制蒙皮之间的铆钉孔在铆接时没有对齐，这就意味着铆钉孔变成了蛋形，而不是圆形。当飞机受到的压力增大或者减小时，两块蒙皮会受到相反的方向作用力拉扯，这时圆形的孔洞能沿着其周长均匀地将力分散。但是如果孔洞是蛋形的，他说道：“作用力会集中于一点之上。”

❖ 一位纽约华盛顿航空港的航空业专家Robert W Mann Jr认为这是个不寻常的错误。他说道：“关键问题在于这次的错误是不是系统性错误。”接着他问到：“为什么这部分问题蒙皮遭到拒收？”Mann先生对于涂料也十分关注。“这些并不是由于液体的毛细管现象所造成的小缺陷。”他说道“飞机的涂料不是稀薄的，反而是相当多的。”另外，他补充道，如果两部分蒙皮在装配工厂内没有达到完美匹配的程度，“那样就必须重新钻孔，这就会导致孔洞变成椭圆形”，最后形成磨损。

❖ 国际先驱论坛报声称安全委员会也将会对西北航空另外五架出现裂痕情况的飞机进行检查。这五架飞机与前述出现破损的那架飞机都已进行过4万次起降。在这次飞行事件后，波音公司声称它们先前认为这一型号的飞机在飞行至少6万次前都不需要检查。在这次事件后，联邦航空管理局发布了紧急事态命令，要求航空公司在这一型号飞机飞行3万架次后就要对其检查。

这六架飞机交货的时间为1994年至1996年。波音在它的一份声明中声称它们不会对事故的起因进行妄加揣测，但是“我们仍旧在全力配合调查。”

❖ 在20世纪90年代期间的美国，有许多份关于飞机装配错误与铺线错误的报告。铆钉处附近出现破裂情况对于航空业而言并不是新鲜事。在1988年，一家阿罗哈 (Aloha Airlines) 航空公司的飞机在从希洛飞往夏威夷，火奴鲁鲁的途中，“就像个沙丁鱼罐头被打开了”论坛报的记者回忆道。但是他们写道，“这架飞机已经进行了8万9千次起降了。”

电信与技术

苹果 (Apple) 与谷歌的 (Google) 智能手机中的地点追踪功能引起了在国会中的立法者的警觉

“我们需要一个重要的听证会来解决这些手机存在的安全性和隐私性问题。”Edward Markey 代表向波士顿先驱报这样说道。“我认为这不仅仅是苹果的问题，这是一个全行业的问题。”安装在苹果iPhone和iPad上的iOS4操作系统以及使用Android系统的谷歌设备存在地点追踪功能一事曝光后，马萨诸塞州民主党议员，同时也是议会通信分委员会的副主席的Markey先生提出了就此问题进行国会议案的提议。这个程序看似在收集用户每一步行动，将其储存于一个能够传到电脑或者其他设备的秘密文件中。一位巴西的研究者发现苹果设备上未加密的追踪系统全天都在将数据资料发送至一个不安全的服务器中。

正如先驱报Jessica Van Sack所写道，定位技术是智能手机进化过程中的关键。这些手机以这些技术为基础从而变得热销，它们中的代表为本地餐馆点评和地图查询。但是她写道：“无论这些程序是否在运行，移动电话公司都能追踪客户方位并且将信息保存一段时间的行为都已激起提倡保护隐私权的怒火。”(“Ed Markey代表在隐私权议案中受挫”，4月23日)

事件曝光后，谷歌(山景城，加利福尼亚州)承认带有Android的手机确实应客户要求收集其地点信息。但是公司表示所有传回谷歌方位服务器的数据都是匿名并且不会被其它特定用户所追踪。这看上去像是在淡化其类似间谍软件的形象。苹果(库比提诺，加利福尼亚州)保持沉默；但是Markey先生在4月21日致信Steven P Jobs, 苹果公司的首席执行官，要求他给出答案。

“没有一个家庭能接受他们最隐秘的信息被一个有可能是窃贼的陌生人所窃取。”Markey先生这样向先驱报说道。“我认为这些侵入iPhone的网络安全专家正向我们表明这些设备是多么容易遭受攻击。”

❖ Van Sack女士观察到全球定位系统(GPS)一正如2003年由在波士顿的Skyhook Wireless公司开发的移动技术一样，现在都已合并移植入了所有苹果电话中。然而根据 Skyhook 共同创始人Mike Shean所说，在将苹果的技术分离后才实现了手机的追踪定位功能。

坐落于华盛顿的电子隐私信息中心的执行总监Marc Rotenberg拒绝接受任何认为数据追踪只是地点追踪软件的无心附属产物这一说法。“很显然，是苹果做出决定创建这份文件的”并且为了解决这一问题，Rotenberg先生这样说道。“他们已经将顾客置于危险境地中。”

当美国排名第五时，北欧国际和“亚洲虎”在通信与计算技术上已处于领先地位

根据国际经济论坛每年所做研究的最新结果，在138个国家使用信息与通信技术能力(ICT)的比较排行中，美国连续第二年名列第五。在2010年占据全世界98.8%国民生产总值的国家中，瑞典位列第一，紧随其后的是新加坡，芬兰和瑞士。在瑞典达沃斯举办的世界经济论坛认为技术进步是一个国家创新力，生产力，效率的主要推动力。报告是于4月12日发表的，这天正是互联网泡沫破灭后于2001年启动的计划10周年纪念日。71项经济和社会指标，它们中有移动电话订阅量，风险投资获得可能性和新专利申请，这些指标证实了判断。

总体而言，美国在许多与经济竞争力息息相关的指标上表现非常不均衡。它在移动电话订阅量中排名76位，在低成本接入商务电



话指数排名48位, 在家庭拥有个人电脑量上位列24位一落后于巴林, 新加坡以及文莱等国。Soumitra Dutta, 一位该研究的共同作者, 同时作为欧洲工商管理学院商学院的信息系统教授, 他说美国在数学和科学教育领域中排名52位。

全球信息技术报告2010-2011版的全文可以在世界经济论坛网站weforum.org上找到。在它的引言部分, 该机构表示北欧国家以及亚洲虎经济体确实在“适应和运用信息通信技术以加快增长与发展领域”具有着领先地位。

除了新加坡位列领先集团中外, 台湾位列第六, 韩国名列第十, 香港为12名, 日本为19名, 中国为36名, 印度为48名, 印度的排名与2009年相比下滑5名。在此将金砖四国的排名补齐, 即巴西, 俄罗斯, 印度与中国, 这四个将自己定位为与美国相平衡的组织经济体。巴西位列56名, 俄罗斯则为77名。

电信行业的其它事件.....

❖ 中国电信的北美分部正在加强其在加拿大的存在感。正如多伦多环球邮报(4月20日版)所报道的, 中国电信北美分公司的总裁Donald Tan说, 集团公司早在五年多前就已在加拿大建立了办事处。但是, 随着中国与亚太地区通信联系的区域需求日渐增长, 位于安大略省万锦市的多伦多地区办事处将成为一家全资子公司以服务跨国公司和国际电信运营商。

钢铁

❖ 铁姆肯公司(Timken Co)在4月18日宣布将在其俄亥俄州坎顿市的工厂提升年产钢铁量12万吨。该公司主营合金, 轴承以及汽车配件。公司声称在经历升级后, 其位于哈里森市的工厂产能已超出额定能力。铁姆肯公司认为额外的劳动力能够增加那里的产出和Faircrest工厂的产出。公司声称从2006年起已在尖端技术上投资了超过2亿美元。

❖ 因认为印第安纳州西北部的钢铁业对于区域和国家经济都是十分重要的, Pete Visclosky代表在4月6日, 于华盛顿举行的国际贸易委员会听证会上表示应对来自于巴西, 俄罗斯, 日本的部分进口钢铁产品予以增收关税。正如明斯特时报(印第安纳州)所报道的, Visclosky先生相信美国经济仍旧处于一个脆弱的状态, 并且这项加收关税的政策会促使外国“减少美国就业的不平等贸易行为。”

汽车业

在美国南部, 在非公会外国汽车制造厂工作的雇员对其工作十分满意, 拒绝联合汽车工会的招揽

“在这里我们与管理层的沟通很好。我们为什么需要工会? 工会只在收会费或者选举的时候才会出现。”

这句话出自于坐落於乔治亚州西点的一家起亚(Kia)工厂的工人之口, 该工厂创办于2009年。这一想法在美国南部外国汽车工厂工人中十分普遍。但是仅就这个男人而言, 在他2010年8月加入起亚的十八个月前, 他一直在为一家每个月强迫工人休假一周的汽车零配件制造厂商工作。他现在的工作是为起亚索伦托运动型多功能车喷漆, 这一工作有着更好的酬劳和福利, 并且不用强制休假。他告诉洛杉矶时报的记者Jerry Hirsch说, 他的收入有了大幅度提高。

在阿拉巴马州的蒙哥马利市, Hirsch 先生报导到, 在由北向南, 从列克星敦, 肯塔基到蒙哥马利的南部汽车工业带, 与之相似的故事在每一个城镇上演着。外国汽车厂商—包括本田Honda, 日产Nissan, 丰田Toyota(三者都是日本厂商); 起亚(韩国); 和梅赛德斯奔驰Mercedes-Benz 和大众Volkswagen (两个皆为德国厂商)—正因优厚的州或者当地刺激政策计划在这一区域建立各自的美国工厂; “并且他们的工人正以抵制工会而闻名。” (“谁要工会? 看起来南部汽车工人不需要” 3月29日)

位于美国南部的汽车工厂生产着大约一半的美国新车, 同时在该区域的外国厂商经营的工厂中没有一个工会工人。根据汽车研究中心的报告, 底特律的工会工人的平均待遇—工资加福利—大约为每小时55美元, 与丰田的美国工厂相同。但其他非公会汽车厂商的待遇较差: 本田, 大约为每小时50美元, 日产, 现代Hyundai, 和起亚大约只有45美元。

汽车业的其它事件.....

❖ 由于从2009年开始, 丰田汽车公司召回出现无故加速的数百万汽车后, 第一个进入法律程序的案件4月1日在纽约进行了宣判。联邦陪审团认定日本公司对于2005年丰田赛恩车因突然加速导致撞树事故不承担责任。陪审团只用了不到一个小时就对原告认为事故是由有缺陷的汽车脚垫所引起的诉求予以驳回。“我们考量了所有证据, 并且得出事故并不是由汽车自身缺陷所引起的这一结论。” 女陪审长这样说道。

❖ 丰田的全球生产能力, 受三月日本发生的海啸部分影响, 在十月或十一月之前无法恢复到正常水平。四月, 公司宣布将在北美持续削减产量至六月, 但是公司保证绝不会解雇其在美国与加拿大13个工厂的2万5千名员工。今年的挫折可能会让丰田让出世界销售额最大汽车厂商的宝座, 这一位置是它在2008年从通用汽车(General Motors)夺得的, 现在看来要还回去了。

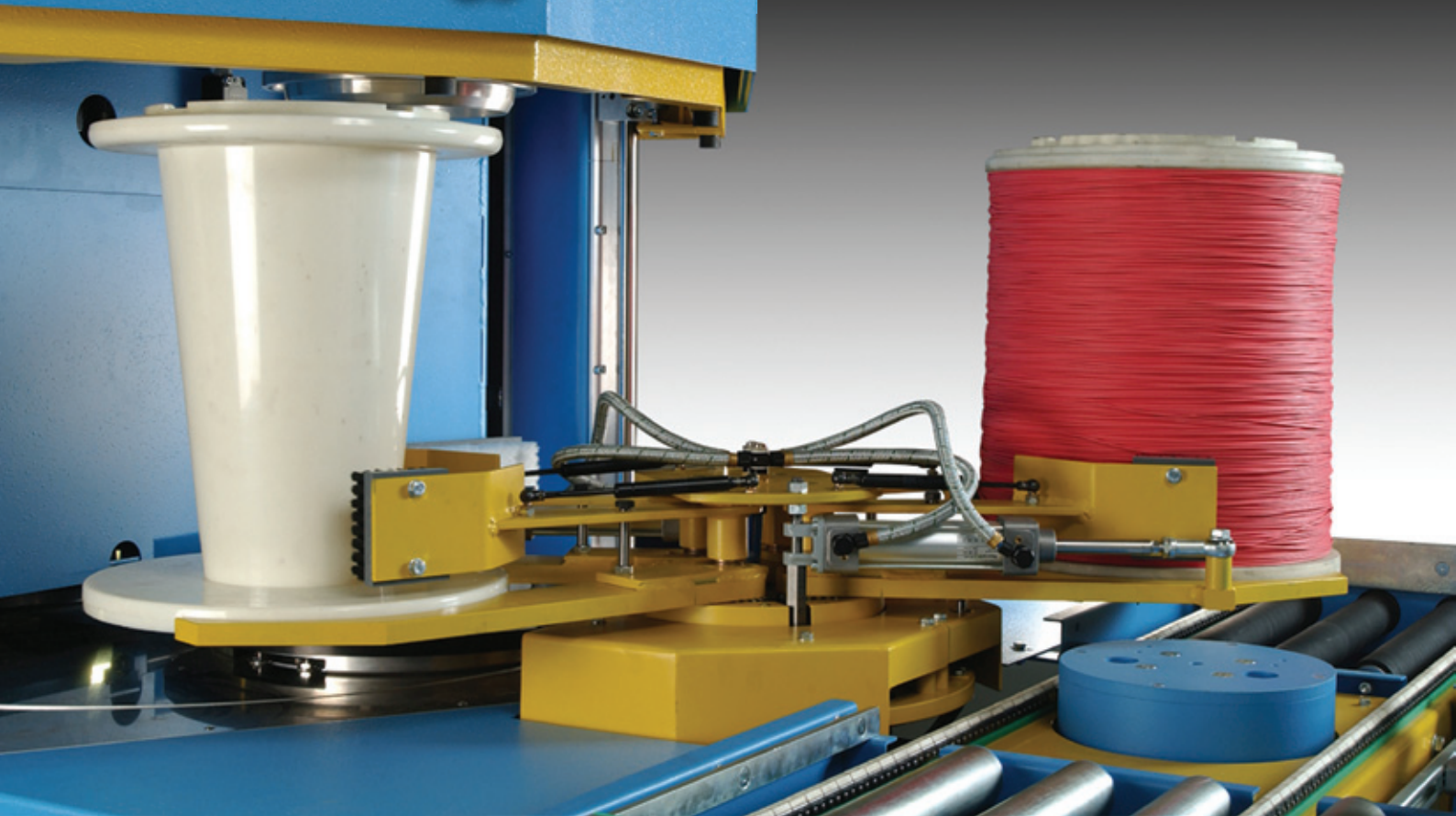
❖ 底特律“三大”中最大的一家, 通用汽车第一个季度销售额为592,545辆, 同比2010第一季度增长26%。正如福布斯(4月1日)所报道的, 通用汽车公司在其脱离私有制后正在重塑自己, 它已经在2010年十一月经历了其初次公开募集。尽管其股价处于停滞状态, 公司已经在推出新产品和保持销售增长方面做得很好了。通过对其电驱动的雪佛兰伏特和雪佛兰克鲁兹小型车的推广, 通用汽车公司瞄准了美国汽车购买者担心高油价的心态。

❖ 福特汽车公司(Ford Motor Co)公布其三月在华销售额增长20%, 达到了53,440辆。最近, 底特律的汽车制造商宣布其在华投资11亿美元的计划, 其中最显著的计划为将在重庆的新工厂产能在2012年时提升为65万辆。由福特的合资伙伴长安汽车有限公司(Changan Automobile Co)所经营的传动系统和发动机设备产能也将提升, 从40万辆提升至75万辆。

短讯

❖ 美国政府的国土安全部现在正在国家的港口, 机场和出入境口构建了一张极大的辐射筛选网络。在2001年911恐怖袭击后安装的这些设备, 原本用来防止核武器非法入境, 现在已经用来检测来自于日本, 可能含有辐射物质的货物。在日本福岛核电站被报道有核物质泄露之后, 对于日本的进口货物的审查已经得到了加强。该核电站在3月11日袭击日本的地震与海啸中遭到了巨大的损害。在横跨旧金山湾的奥克兰太平洋港口, 货船运载的货物在离开港口之前都需要经历一圈辐射物质污染检测。现在来自日本的集装箱需要经历多重检查, 不过在4月的第一周内没有发现危险, 也没有发现被扣留的货物。

Dorothy Fabian — 专栏编辑



○ A filled and an empty NPS spool in an NPS double spooler

Efficient and cost saving wire, strand and cable handling

THE Niehoff Packaging System (NPS) is known in the market as an economical, safe and efficient handling system for wires, bunches, strands, conductors and cables.

Invented and developed by Maschinenfabrik Niehoff in Europe, the NPS has almost entirely replaced all alternative systems such as cardboard barrels, boxes and disposable packaging.

At the end of 2010, more than 425 NPS spooling units have been in operation worldwide. Without the NPS and its numerous advantages automotive harnesses would be much more expensive.

The NPS comprises spoolers which use a patented wire-laying technology and collapsible multi-way ABS plastic spools made in various sizes.

These spools offer a secure, stable and tangle-free package both when full or

partially empty and enable the highest cable pay-off speeds into downstream processes.

The empty NPS spools can be dismantled into two pieces: a flange and a cone/flange which are nested into each other for reduced storage space.

A full NPS spool takes up only one third of the space required by a comparable conventional spool, and needs much less return transport space than traditional spools and packages of the same capacity.

The results are considerable savings in shipping and handling expenses. Upon return to the cable manufacturer NPS spools can be easily and quickly reassembled, refilled and then reused for dozens of cycles.

The NPS works most efficiently and tangle-free for all automotive wire and cable including small cross section

wire like 0.22mm² and 0.13mm². The NPS400/100 spool eg with a flange diameter of 400mm and a traverse width of 100mm is particularly interesting because its package corresponds to the increasingly popular and easy to handle small bundle format (the “40lb” package).

This small package can be manufactured inline with extrusion lines. Several cable manufacturers in Asia have already replaced the hard-to-handle cable rings (“donuts”) with NPS400/100 spools.

One of the most recent NPS innovations is a Radio Frequency Identification (RFID) based spool management system which simplifies spool handling and tracking logistics.

Maschinenfabrik Niehoff GmbH & Co KG – Germany

Fax: +49 9122 977 155

Email: info@niehoff.de

Website: www.niehoff.de

Cable assembly for ZTE'S Far East market

VOLEX Group has been selected by ZTE, a provider of telecommunications equipment and network solutions, as a major cable assemblies supplier to its Far East market via Volex's Suzhou factory.

ZTE will take advantage of Volex's high-speed SFP copper cable assemblies for 2G, 3G and LTE (4G) mobile network solutions, replacing the expensive alternative of a short distance fibre optic assembly without compromising signal integrity or compliance with industry standards for speed of data transfer.

Volex will deliver the majority of ZTE's requirements for these high-speed assemblies at ZTE's Shenzhen facility. The SFP standard can support transmissions of 3.1Gb/s over Ethernet while offering backwards compatibility to 1Gb/s for 2G mobile solutions and low power consumption.

Volex's SFP product has been engineered for use in high-speed data environments such as the telecoms market, including mobile network switching centres and base station sites. Cable assemblies for these applications are relied upon to transmit increasing amounts of data at high speed, whilst maintaining low costs and reducing heat loss.

A major factor in ZTE's decision to choose Volex as the key supplier was its proprietary micro-welding technique, an innovative manufacturing process that ensures consistent high-quality performance for the end product supplied to ZTE's customers. Customer responsiveness, flexible supply chain and ability to deliver with short lead times were also critical factors in ZTE's decision to award the contract to Volex.

Volex Group plc – UK
Fax: +44 20 3370 8831
Email: sales@volex.com
Website: www.volex.com

ZTE Corporation – China
Website: www.zte.com.cn



○ Volex will supply cable assemblies to ZTE

wire Southeast ASIA **Tube Southeast ASIA**

Incorporating: Industry Partner: **ITA**

3rd International Wire, Cable, Tube and Pipe Trade Fairs for Southeast Asia

13 – 15 SEPTEMBER 2011

**VISION
INNOVATION
TECHNOLOGY**

Bangkok International Trade & Exhibition Centre (BITEC),
Bangkok, Thailand

Opening Hours:
 13 & 14 Sept: 10.30am – 6.00pm
 15 Sept: 10.30am – 5.00pm
 Admission is free for business and trade visitors only by registration.

For Enquiries:
 Tel: (65) 6332 9620
 Fax: (65) 6337 4633
 wire@mda.com.sg | tube@mda.com.sg

Register your visit at
 www.wire-southeastasia.com
 or www.tube-southeastasia.com

wire Southeast ASIA 2011

Sponsored by:



IWMA - International Wire & Machinery Association



Italian Wire Machinery Manufacturers Association (ACIMAF)



IWCEA - International Wire & Cable Exhibitors Association

- Austrian Wire and Cable Machinery Manufacturers Association (VÖDKM-AWCMA)
- International Wire and Cable Exhibitors Association - France (IWCEA-France)
- German Wire and Cable Machine Manufacturers Association (VDMK)

Supported by: Industry Partner Association



WCISA
Wire and Cable Industry Suppliers Association

wire / Tube Southeast ASIA 2011

Supported by:



THAILAND
Government & Exhibition Services



Messe Düsseldorf



Tube Düsseldorf



wire Düsseldorf

Messe Düsseldorf / Organizer of:

- Hong Kong Screw & Fastener Council (HKSF)
- Iron and Steel Institute of Thailand (ISIT)
- Japan Spring Manufacturers Association (JSMA)
- Malaysian Iron & Steel Industry Federation (MISIF)
- Steel Wire Association of Malaysia (SWAM)
- Philippine Metalcasting Association, Inc. (PMAI)
- Technology Promotion Association (Thailand-Japan)

Organized by:



Messe Düsseldorf
Asia

Take control of your drying cost savings

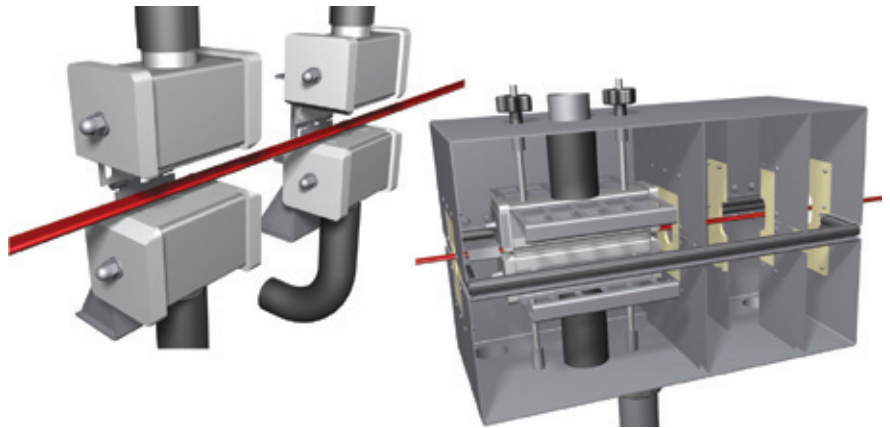
THE removal of the residual moisture film from water-cooled insulated wire/cable and extruded products has been difficult to achieve effectively and consistently.

Air Control Industries' (ACI) new 'Line-Dry' system solves this problem whilst also saving energy and reducing running costs when compared to compressed air nozzle arrangements and other existing blower-driven devices.

When compared to compressed air systems up to 10 fold energy savings can be achieved which potentially equates to saving thousands of pounds every year. Free on-site trials to potential customers in the UK can be arranged to quantify potential savings. ACI's blower powered Line-Dry system can handle products up to 25mm in diameter at speeds of 500m/min. The blower is an ACI variable speed 'multi-stage' unit controlled via a speed controller, which gives flexibility to accommodate different products and line speeds.

Two versions are available, one with the dryer heads enclosed to contain displaced moisture, the other is an open unit.

The enclosed unit has a pair of facing air delivery plenums. These can be adjusted to suit different product



○ ACI's drying heads

diameters and are also sprung to allow flexing to accommodate any product distortions/kinks.

A series of baffles serves to isolate wet and dry areas and guard against moisture being re-deposited on the dried product. The second option comprises two pairs of facing drying heads. These too are sprung to allow for product imperfections. With both versions, the blower and speed controller are mounted on legs and enclosed in an ABS plastic enclosure to prevent moisture ingress. Air is delivered at up to 2.8psi (80in. SWG) at speeds of 8,800m/min (28,900ft/min) at 80°C.

Air Control Industries Ltd – UK

Fax: +44 845 5000 502

Email: matthewforknall

@aircontrolindustries.com

Website: www.aircontrolindustries.com

facebook

You can now keep right up to date with all the latest in the wire and cable industry, simply by signing up to be our friend on Facebook. We update the site weekly, giving you the latest news of all the happenings in the industry, from the serious company buy-outs and mergers to the more light-hearted features.

ANBAO



Hard Drawn Wire on 450-1000kgs Spools



Galvanized Wire Strand



Armoring Wire for Cable



Oil Tempered Spring Wire

Metal Wire: iron wire , galvanized wire , redrawn galvanized wire , Galfan wire , copper coated wire , PVC(PE) coated wire , stainless steel wire , Ultra fine ss wire , cable armouring wire , ACSR wire , spring wire , oil tempered spring wire , staple wire Strand: ACSR strand , guy wire , stay wire , overhead strand (ASTM A475 ASTM A363 ASTM A498 IEC60888)

Anbao(Qinhuangdao) Wire & Mesh Co.,Ltd

Add:33 Qinhuangxi street P.R. China 066000 Tel: +86-335-3893600 Fax:+86-335-3870760

Email:anbao@anbao.com Web: www.anbao.com

EMO

Hannover

19-24.9.2011

www.emo-hannover.de

Lufthansa special – fly to EMO Hannover
Exclusively for EMO visitors from outside of Germany, Lufthansa is offering a discount on many routes. Further information is available at: www.emo-hannover.de/lufthansaspecial_e

 **Lufthansa**



机床加工的世界
The world of metalworking

INFO:

VDW – Generalkommissariat EMO Hannover 2011

Verein Deutscher Werkzeugmaschinenfabriken e.V. · Corneliusstrasse 4, 60325 Frankfurt am Main, GERMANY

Tel. +49 69 756081-0, Fax +49 69 756081-74 · emo@vdw.de · www.emo-hannover.de

State-of-the-art acquisition, processing and display

THE USYS 20 from Zumbach is a state-of-the-art processor and is an ideal and economical solution for one diameter or capacitance measuring point.

The system features real-time, multi-tasking data processing and control. USYS 20 accepts measurements from a broad line of laser diameter gauges of the ODAC® series, covering a diameter or width range from 0.012 to 550mm with a selectable resolution of up to 0.0001 mm.

The processor also accepts capacitance measurements from the Zumbach's CAPAC® systems instead of the diameter gauges.

Key features include:

- Complete system for one measuring point
- Simultaneous display of three measured values
- Industrial, rugged design
- Table top or 19" rack versions
- User friendly control panel with easy menu navigation
- Direct access function keys

- High-contrast LCD monochrome screen (240 x 128 pixels)
- Alarm displays
- Real-time data collection
- Reel and session reports
- DDC – Direct Dynamic Control system

- SRD – Static Regulating Device

○ USYS 20, table top version



Zumbach Electronic AG – Switzerland

Fax: +41 323 560 430

Email: sales@zumbach.com

Website: www.zumbach.com



○ The UG-800 Ultra Precise Fibre Optics Automatic Coiling Machine

Award-winning machines

U Gear Automatic Machinery's UG-800 ultra precise fibre optics automatic coiling machine has already landed two awards – the 2010 17th Taiwan National Innovation Award and the 2010 Industrial Innovation Achievement Award.

The key advancements for this machine include:

Upgrading traditional industries into high-tech industries; the product was catered to traditional wire and cable industry initially and an upgrade to the fibre optics industry is proposed; upgrading the original manual operation into automatic control system with neat and tidy arrangement of fibre optics, without damaging them.

Three patents have already been awarded, the improvement of Coiling Machine (Patent No. M343671); the Fibre Optics Removal Device, applied on the Coiling Machine (Patent No. M343672), and the Tension Control Device, applied on the Coiling Machine (Patent No. M343897)

U Gear Automatic Machinery Co Ltd – Taiwan

Fax: +886 222 405 083

Email: ugear999@gmail.com

Website: www.a1a1a.com

Quality assurance during energy cable production

THERE were more wind power plants built in European seas in 2010 than ever before. More than 300 plants with a total power of more than 880 megawatt were added.

According to the European Wind Energy Association (EWEA), there will be strong investment in the future on the construction of new wind turbines at sea.

Power transmission from offshore wind parks to the mainland is currently being funnelled by undersea cables. These cables have to provide different requirements as well as environment conditions.

Thus, the cable design complies with national and international standards. In order to fulfil these requirements cable manufacturers use measuring and control technology in their production lines.

Sikora offers a range of measuring technology for use in CV-, VCV- or MDCV-lines.

In a CV-line, for example, a CSS 2 (cleanliness scanning system) is installed for real time monitoring and detection of impurities of the polymer melt.

The flow channel between main extruder and the cross head is equipped with sight glasses and an optical CCD camera system, which transilluminates the insulation material.

The system ensures that only pure PE material is used for the cable production and, as a result, a higher electric strength of cable can be achieved.

Sikora's product range for energy cables also includes the Ultratemp 6000, which measures the temperature

of the PE melt during extrusion on a non-contact basis between the extruder screw and the cross head.

Besides temperature determination, the Ultratemp 6000 detects inhomogeneities in the melt. Early cross-linking after screens which may lead to ambers or scorches in the material do not occur, and the device optimises the output of a planned production time.

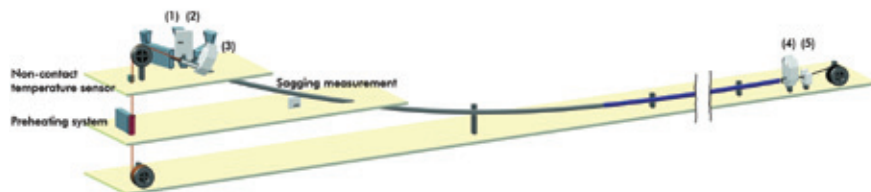
The X-ray measuring system X-Ray 8000 NXT is installed in the moving part of the telescopic tube directly after the crosshead for precise hot measurement of the wall thickness of all three layers (concentricity, diameter and ovality).

Measuring values for centring and control are therefore available immediately after starting up the line. The system is used in catenary and vertical lines. While the X-Ray 8000 NXT provides information for a fast centring and direct control, the X-Ray 8700 NXT supplies precise quality data about the final product.

The X-Ray 8700 NXT measures the diameter, wall thickness and eccentricity, and is suitable for all cable types with solid, stranded or Milliken conductor and with single, double or triple layer insulation.

With the use of the X-Ray 8000 NXT at the beginning of the line for collection of the hot measuring values and the X-Ray 8700 NXT at the end of the line for measuring the cold values, three shrinking values are analysed for every insulation layer of the cable, ensuring an optimum process.

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



○ CV-line (catenary line) with measuring equipment for quality assurance during production of energy cables

wire plating plants



candor

can do wire equipment

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



CANDOR Sweden AB
 Tel: +46 11 21 75 00 Email: info@candorsweden.com
 Fax: +46 11 12 63 12 Website: www.candorsweden.com

ES Essential Solution

30 years of professional skills on bunchers, help you to reach the goal of making good quality wires & cables

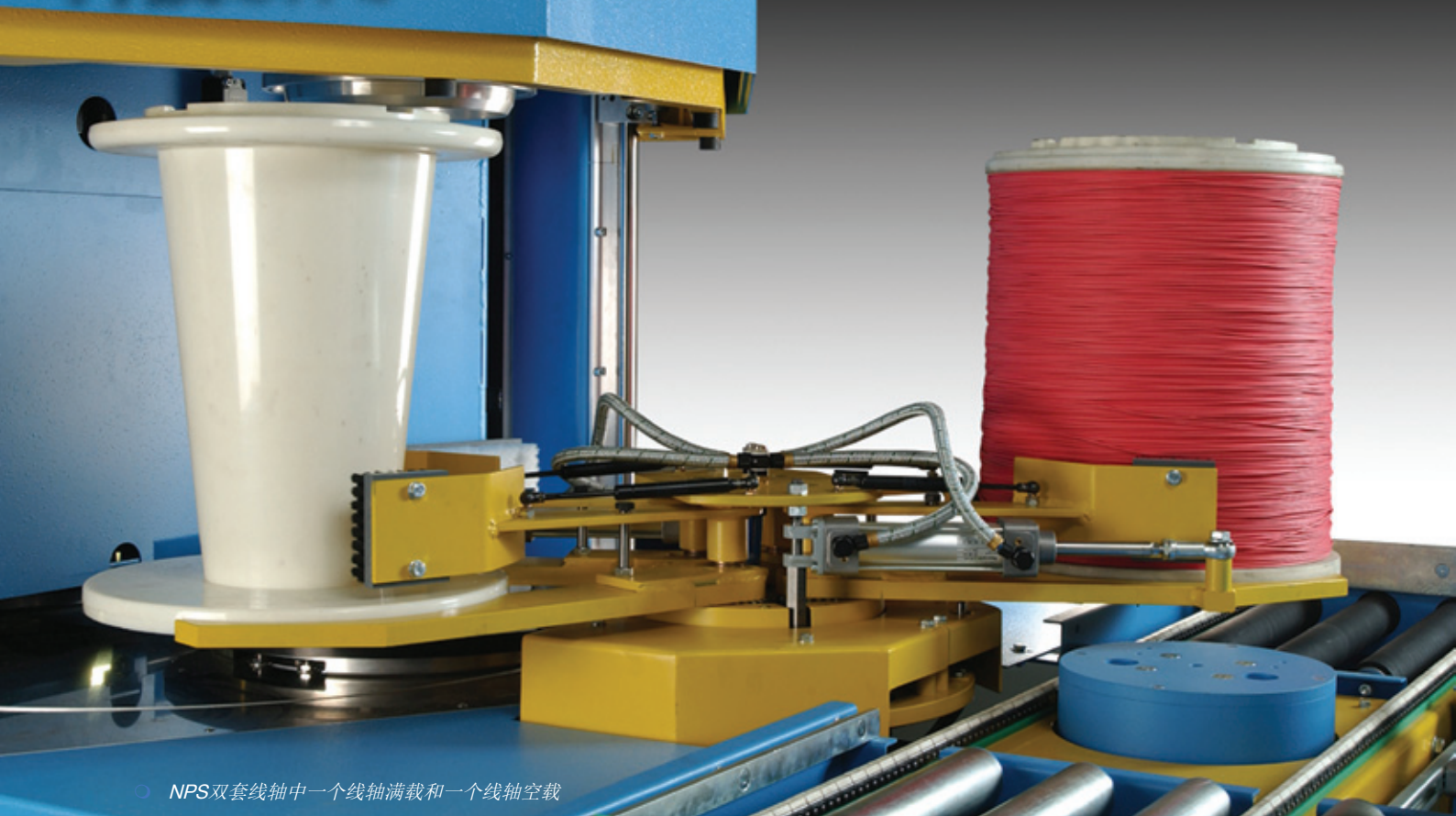


**DOUBLE TWIST BUNCHERS
 LAN CABLE MACHINES
 PAY OFFS**



See more info at:
www.enshiang.com.tw
es.taiwan@msa.hinet.net

ENSHIANG MACHINERY ENTERPRISE CO., LTD.



○ NPS双套线轴中一个线轴满载和一个线轴空载

高效节约成本的线材、线卷和电缆处理

Niehoff Packaging System (NPS)是市场上著名的公司，它拥有一个经济安全有效的线材、线束、线卷、导体和电缆的处理系统。

NPS由欧洲Maschinenfabrik Niehoff发明和开发，几乎完全代替了所有的其它类似系统，例如纸板桶、盒子和一次性包装。到2010年底，全世界已有425多个NPS线轴装置投入运行。没有NPS及其许多优点，汽车线束将昂贵得多。

NPS由各种线轴组成，采用了专利的排线设技术以及可伸缩多路ABS塑料线轴，具有各种尺寸。这些线轴提供安全稳定无缠绕包装，不管在满载或部分承载时都是如此，使下游工序能以最高的电缆放线速度运行。

空的NPS线轴能拆卸成两部分：一个法兰和一个锥体/法兰，它们套在一起，以降低储存空间。满载的NPS线轴所占的空间只是传统线轴的1/3，而且，与传统线轴和包装相比，同样的容量，其返回运输空间要小的多。

结果，大大节约了船运和搬运开支。在返回到电缆制造商后，NPS线轴能容易

快速地再组装、再加载和再利用达好几十次。

对于所有的汽车线材和电缆，包括小横截面线材，例如0.22mm²和0.13mm²，NPS的工作效率非常高，而且不发生纠缠。

例如，有一个直径400mm、横向宽度100mm的法兰的NPS400/100线轴尤其令人感兴趣，因为它的包装设计就是为了应对日益受欢迎的、易于搬运的小型线束（“40lb.”包装）。

这种小型包装能够挤出生产线同时运行。亚洲的若干电缆制造商已经用NPS400/100线轴更换了难以搬运的电缆环（“面包圈”）。

在NPS最近的创新中，有一种基于线轴管理系统的无线电频率识别（RFID），它简化了线轴搬运和跟踪系统。

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

一流的采集、处理和显示

Zumbach的USYS 20是一流的处理器，也是单直径或电容测量点的一种理想经济的解决方案。系统的特点在于实时、多任务数据处理和控制。USYS 20接受ODAC®系列各种激光直径测量仪的测量，直径或宽度范围为0.012-550mm，可选分辨率，可达0.0001mm。处理器还接受Zumbach的CAPAC®系统而不是直径测量仪的电容测量。

关键特性包括：

- 完整的单测量点系统
- 同时显示3个测量值
- 适用于严酷工业环境的设计
- 桌面或19"机架型
- 友好用户控制面板，具有方便的菜单导航
- 直接接入功能键
- 高对比度LCD单色屏幕（240 x 128像素）
- 报警显示
- 实时数据收集
- 卷盘和记录报告
- DDC-直接动态控制系统
- SRD-静态调节装置

Zumbach Electronic AG - 瑞士
传真: +41 323 560 430
电子邮件: sales@zumbach.com
网址: www.zumbach.com

高速SFP电缆组件用于ZTE远东市场

Volet Group plc是电气和光学互连定制解决方案的全球合作伙伴，它被电信设备和网络解决方案提供商ZTE选中，通过Volet在苏州的工厂，成为ZTE在远东市场的一个主要的电缆组件供应商。ZTE将利用Volet的2G、3G和LTE（4G）移动网络解决方案的高速SFP铜缆组件优势，替代昂贵的短距离光纤组件，同时不损失信号完整性或数据传输速度工业标准符合性。ZTE深圳工厂的这些高速组件的大部分均由Volet交付。SFP标准能支持以太网3.1Gb/s传输，同时对2G移动解决方案和低能耗的反向兼容性达到1Gb/s。Volet的SFP产品已经设计用于高速数据环境，例如电信市场，包括移动网络切换中心和基站现场。依靠这些应用的电缆组件来传输不断增加的高速数据量，同时保持低成本，降低热损失。ZTE决定选择Volet为关键供应商的主要因素在于其专有的显微焊接技术，这是一种创新的制造工艺，保证提供给ZTE用户的最终产品具有一致的优质性能。对用户的响应、灵活的供应链和快速交付能力，也是ZTE决定选择Volet签订合同的关键因素。



Volet将ZTE提供电缆组件

Volet Group plc – 英国
电子邮件: sales@volet.com

传真: +44 20 3370 8831
网址: www.volet.com

ZTE Corporation – 中国

网址: www.zte.com.cn

能源电缆生产质量保障

2010年在欧洲海域建造的风力发电装置多于以往任何时候，增加了30多个共计880兆瓦以上的发电装置。根据欧洲风能协会(EWEA)，未来将投入更多资金在海上新建风力发电机。目前主要通过海底电缆将电力从海上发电场输送到陆地，这些电缆必须满足各种要求和环境条件，因此，电缆设计要符合国家和国际标准。

为了满足这些要求，电缆制造商在其生产线上采用测量和控制技术。Sikora提供各种用于CV-、VCV-或MDCV-装置的测量技术。例如，在CV生产线上安装CSS 2（清洁度扫描系统）来实时监测和检测熔融聚合物的杂质。在挤出机

和挤出头之间的熔体通道内配备视镜和光学CCD摄像系统来监测绝缘材料。系统保证只有纯净的PE材料才能用于电缆生产，结果，电缆达到了更高的电力强度。

Sikora的能源电缆产品范围还包括Ultratemp 6000，它在挤出期间无接触测量挤出机螺杆和挤出头之间的PE熔体温度。除温度检测外，Ultratemp 6000还检测熔体不均匀性，这样就不会在滤网后发生早期交链，导致材料泛黄和发焦，而且，这个装置还优化了计划生产时间的输出。在挤出头后的伸缩管移动部位安装X-射线测量系统X-Ray 8000 NX来精密热测量三层壁厚（同心度、

直径和椭圆度）。所以，在生产线启动后，就可立即获得对中和控制测量值。系统用于垂链和垂直生产线。X-Ray 8000 NXT快速提供对中和直接控制信息，而X-Ray 8700 NXT精密提供最终产品质量数据。X-Ray 8700 NXT测量直径、壁厚和偏心度，并适合于所有电缆类型：实心、绞合或分割导体，单层、双层或三层绝缘。在生产线开始处采用X-Ray 8000 NXT后，能收集热测量值。在生产线末端采用X-Ray 8700 NXT后，能测量冷值，分析电缆每个绝缘层的三种收缩值，保证优化的工艺。

Sikora AG – 德国
传真: +49 421 48900 90
电子邮件: sales@sikora.net
网址: www.sikora.net

节约成本的水冷绝缘线材/电缆和挤出产品的干燥

直到现在，依然难以有效和一致地去除水冷绝缘线/电缆和挤出产品上的残余水膜。Air Control Industries' (ACI) 新型'Line-Dry'系统解决了这个问题，与压缩空气喷嘴布置和其它现有鼓风机驱动的装置相比，还节约了能源，降低了运行成本。与压缩空气系统比较，节约高达10倍的能源，相当于每年节约成千上万英镑，可以在英国为潜在客户安排免费实验，定量确定潜在的节约。

ACI的由鼓风机驱动的Line-Dry系统能以500米/分钟的速度处理直径高达25毫米的产品。鼓风机是一种ACI变速'多级'装置，由一个速度控制器控制，它具有灵活性，能容纳不同的产品和线速度。可提供两种版本，一种具有封闭式干燥头，能包含被去除的水分，另一种是一种开放式的。

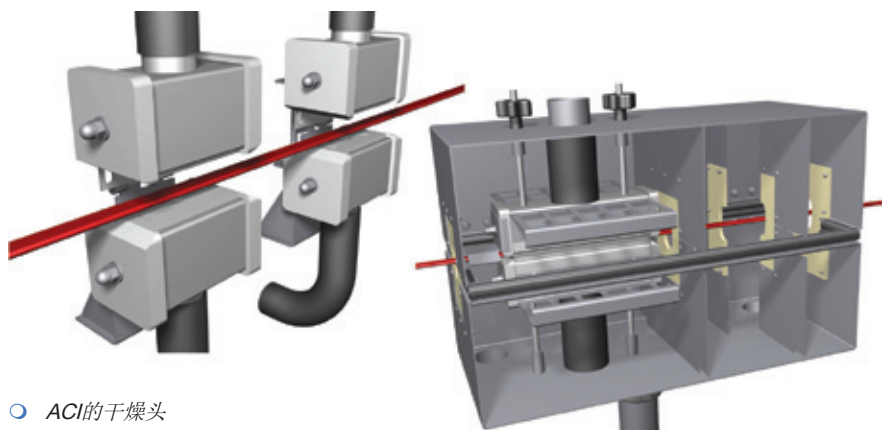
封闭式装置有一对空气输送室，能调节它们，以适合不同的产品直径，也可以弯曲它们，以容纳任何产品变形/扭转。还有一系列的挡板，以隔离湿的和

干的区域，防止被置换出来的水分重新附着在已经干燥的产品上。第二种方案由两对表面干燥头组成，它们也弯曲，容纳产品的缺陷。

采用这两种方案后，鼓风机和速度控制器被安装在支撑上，并封闭在一个ABS塑料护罩内，防止水分侵入。所供的空

气压力可达2.8psi (80in SWG)，80°C，速度为8,800m/min (28,900ft/min)。

Air Control Industries Ltd – 英国
传真: +44 0845 5000 502
电子邮件: matthewforknall@aircontrolindustries.com
网址: www.aircontrolindustries.com



ACI的干燥头

GIMAX^{g r o u p}

EXPERIENCE, KNOWHOW AND RELIABILITY IN THE HANDLING OF FERROUS & NON-FERROUS WIRE

Solutions for solid
and tubular welding wires
(MIG/MAG, flux cored,
stainless steel, aluminium,
bronze, titanium)





RESPOOLING



POLIDIGITAL

Extremely flexible semi-automatic precision layer respooling, with versions available for sub-arc wire and for spoolless coils. Digital control with multilanguage touch screen user interface, possibility of ethernet or modem connection, and highest degree of flexibility in terms of wire or spool types and sizes.

ROBOBINA

Totally automated precision layer respooling, designed for high speed and maximum production. Capable of handling plastic and fibre spools as well as wire baskets. No operator required. Digital control with multilanguage touch screen user interface and possibility of ethernet or modem connection.

DRUM PACKING



DRAWING, COPPERING, SHAVING, CLEANING

INF-2 PAIL PACKER

Highly versatile, no-twist coiling of wire into drums. Round, square, octagonal drums, up to 1000kg.

INF-4 PAIL PACKER

High speed no-twist coiling of wire into drums. Extremely compact unit. Round, square, octagonal drums, up to 1000kg.

INF-6 PAIL PACKER

No-twist coiling of large diameter wire.



WET DRAWING & COPPERING for steel wire.
WET DRAWING, SHAVING & CLEANING for aluminium wire.



Photo courtesy Roblon AIS

Payoffs, take-ups and *winding*

Almost every feature of a leading brand of wire pay-off is described as “adjustable” or “selectable.”

The units offer vertical or horizontal configuration, forward or reverse motion; they also are said to adapt to the various handling requirements of heavy, medium and fine wire of virtually any metal content. For every coil, spool, reel, bundle and pancake, there is an ideal payout method, path and resistance level.

The machinery maker claims readiness to establish and accommodate them all.

Likewise committed to the distortion-free transfer of wire, suppliers of take-up and winding equipment are no less alert to the call for flexibility.

In a widening universe of wire types and sizes, of new rugged and delicate and exotic materials, they know that demand grows apace for machines that do it all.

Versatile take-up and payoff systems by Niehoff

The wire and cable machinery developed by Maschinenfabrik Niehoff covers nearly all wire and cable manufacture operations and includes a large range of take-up and payoff systems. Of particular note are the S-series single spoolers and the ARH tangential payoffs.



○ The new design single spooler type S 631

The compact S 631 and S 801 spoolers with integrated dancers are suited as take-up systems for multi-wire drawing lines. A swivelling traversing roller assembly eliminates the need to turn the wire bundle before the take-up. The result is high quality spooling which assures that the wires can be efficiently further processed at high speeds. The spoolers feature traverse and spool drives using AC servo motors and a hydraulic-pneumatic spool lifting table. The spoolers cover wires ranging from 0.15mm up to 1.60mm (34½ ... 14 AWG) and work at speeds up to 40 and 36m/s respectively (S631/7,900 fpm; S801/7,100 fpm).

The ARH 630 and ARH 800 tangential payoffs with separate drive are designed for the non-twisting pay-off of individual wires, parallel wound wires as well as bundles and also well suited for the manufacture of high-quality and geometrical strands.

A pneumatic dancer maintains constant wire tension, an MMI display is combined with back a tension indicator and an empty spool detection system. The ARH payoffs are available in single (left or right hand operations) or double payoff versions.

They are designed to handle individual wires with a diameter of 0.4mm to 1.41mm (26 ... 15 AWG) and bundles with a cross-section of 0.157mm² to 6.00mm² (25½ ... 9 AWG) with corresponding maximum line speeds of up to 300m/min (1,000 fpm).

Maschinenfabrik Niehoff GmbH & Co KG – Germany
Fax: +49 9122 977 155
Email: info@niehoff.de
Website: www.niehoff.de

Ajex & Turner Wire Dies Co.
 QUALITY-INNOVATION & EUROPEAN KNOWHOW
 IN COLLABORATION : TURNER & STOTT LTD. UK

- PCD, Natural & Mono Wire Dies
- Tungsten Carbide Dies & Bush
- Stranding Dies & Compacting Dies
- Wire Guides & Dies (PCD, ND & TC)
- Enamelling Dies in all shapes

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

For further details, please contact:
 A-53, G. T. KARNAL ROAD, DELHI-33 (INDIA)
 Tel.: 0091-11 27427994-95-96
 Fax: 0091-11-23940226 / 27452640
 Mob: 0091-98 110 78882
 E-mail: ajexturner@gmail.com • sales@ajexturner.com
 Website: www.ajexturner.com

Roller

DONGJIAN CHANGKONG ELECTRICAL AND MECHANICAL ASSEMBLY CO., LTD
 THERMAL SPRAYING
 Add: Beitian Village Houjie Town Dongguan Guangdong
 TEL: 86-0769-38869345/85813376
 /85822023/85581543
 FAX: 86-0769-85581559
 http://www.cy-ck.com E-mail: ckyt180163.com

Optimising production facilities

The current upturn in demand for medium and high voltage cables and umbilicals for the offshore energy and general subsea markets is a promising step forward in the current economic climate.

Nevertheless it presents manufacturers with a number of logistical challenges during the production, storage and deployment of cables of such long lengths and heavy weights.

One key concern is optimising efficiency. If the business can implement streamlined and efficient manufacturing processes, utilisation can be maximised and profitability and competitiveness will increase as a result.

Meltech is able to offer a wide range of solutions to help customers optimise their production facilities with an equipment range embracing different configurations depending on the load:

- portal and gantry type coilers offering up to 125Te capacity
- fixed or movable under-roller configurations offering up to 400Te capacity
- fixed cable coiling machinery offering up to 500Te capacity
- carousel-type cable storage equipment for even higher loads



○ Tethering rope coiling system with a capacity of 118Te, suitable for rope, umbilical and cable coiling

In addition, the company's engineering experience enables it to design, construct and install the machinery at customers' premises, integrating it seamlessly with current manufacturing processes such as extrusion, cabling and armouring. In some cases Meltech is also able to hire out this equipment on rolling term contracts, allowing organisations to convert a potentially substantial capital investment into a revenue expense.

In line with providing both off-the-shelf and bespoke products, Meltech also offers a full range of tensioners, cable engines and other ancillary equipment, working closely with customers to put together a comprehensive solution that best meets their specific requirements.

Meltech has a large product portfolio to address many different winding and coiling applications for all sizes of wire, cable, fibre optic and plastic extrusions. For example, the company offers automatic (and semi-automatic) cut, snag and spool changeover at up to 1,000m/min for certain product types, resulting in neatly wound finished spools.

Meltech Engineering Ltd – UK Fax: +44 1254 680175 Email: sales@meltech.co.uk Website: www.meltech.co.uk

rautomead

**Continuous
Casting
Technology**

www.rautomead.com

Rautomead Limited
PO Box 100, Dundee, DD1 9QY
Scotland, UK

Tel: +44 (0)1382 622341
Fax: +44 (0)1382 622941
email: sales@rautomead.com

rautomead

**Advancing
Metals
Technology**

www.rautomead.com

Rautomead Limited
PO Box 100, Dundee, DD1 9QY
Scotland, UK

Tel: +44 (0)1382 622341
Fax: +44 (0)1382 622941
email: sales@rautomead.com



Moscow



Shanghai



Bangkok



join the best

w o r l d w i d e

wire Düsseldorf: Innovations go global

Take advantage of the highest calibre expertise of the No. 1 international fair as the show goes global. Draw on international synergies from these leading trade fairs. A cycle of regional events, staged in succession around the globe, responding to local market and customer needs.

Detailed information on the full programme can be found at:

www.wire.de

Messe Düsseldorf GmbH
Postfach 10 10 06
40001 Düsseldorf
Germany
Tel. +49 (0) 2 11/45 60-01
Fax +49 (0) 2 11/45 60-6 68
www.messe-duesseldorf.de



Tension control at the forefront of cable and wire production

In applications where payoff or take-up stations need to work efficiently and reliably, FMS tension control equipment can provide the necessary precision. The system equipment package consists of force measuring rollers and corresponding electronics, and can be configured to almost any tension measurement or control task.

RMGZ force measuring rollers are available in a range of configurations:

RMGZ100 – These sensors are used to measure the tension in thin cables, wires and fibres. The product is suitable where space is limited, and is available in six nominal force ratings (6N to 300N).

RMGZ300 – This dedicated measuring roller family was developed specifically for use in higher rpm rotating applications where the special design effectively compensates for centrifugal and Coriolis forces. It is available with a force rating ranging from 50N to 1,000N.

The **RMGZ400/600/800** series sensors utilise an enhanced bending beam principle. These products are available with a nominal force rating of 60N to 4,000N, while the 800 series are used to measure the tension in heavy ropes and cables with tensions up to 8,000N.

All variants of the RMGZ force measuring rollers offer an overload protection of ten times the nominal force. The sensors are constructed of stainless steel and include an aluminium cover for corrosion resistance.



○ Clockwise from top-left: RMGZ100, RMGZ300, RMGZ400/600/800 and RTM X2 electronics

The new Radio Transmitted Tension Monitoring System RTM X2 forms a fully consistent system with above described force measuring rollers. RTM X2 has been developed to monitor and control tension in individual wires and strands on rotating machines. The system can be used in either a stand-alone configuration or integrated with an existing PLC, and is suitable for use by OEMs on new machinery or by integrators/end-users when upgrading existing machines.

FMS Force Measuring Systems AG – Switzerland

Fax: +41 44 850 60 06

Email: info@fms-technology.com

Website: www.fms-ag.ch

Wide range of solutions...

Euro Extrusion Srl offers a wide range of take-ups and winding solutions, combined with the most updated technologies.



○ Just part of the solution from Euro Extrusion

Highlights include:

- Dual reel take-up with semi-automatic transfer type AS 630 800 1000
- Reel flange maximum diameter mm 630 800 1000
- Reel flange minimum diameter mm 400 600 800
- Reel maximum width mm 475 475 780
- Reel maximum weight kg 300 400 800
- AC motor power kW 4+4 5+5 6+6

Main technical specifications:

- Cable transfer and cutting without slowing down of the line, with manual or automatic driving by length and speed gauge
- Movable guide cable unit
- Bobbins automatic eject system

Siemens driving panel type OP77A including:

- Setting of the reel width
- Line speed display
- Length setting with acoustic signal
- Reels parameters setting
- Alarm display and signal

Optional equipment:

- Loading of the empty reels, unloading of the full ones, by means of two lifting carriages provided with hydraulic pump
- The carriages for loading and unloading the reels can be replaced by pallet trucks

For all additional information, please contact:

Euro Extrusion Srl – Italy

Fax: +39 0331 669 221

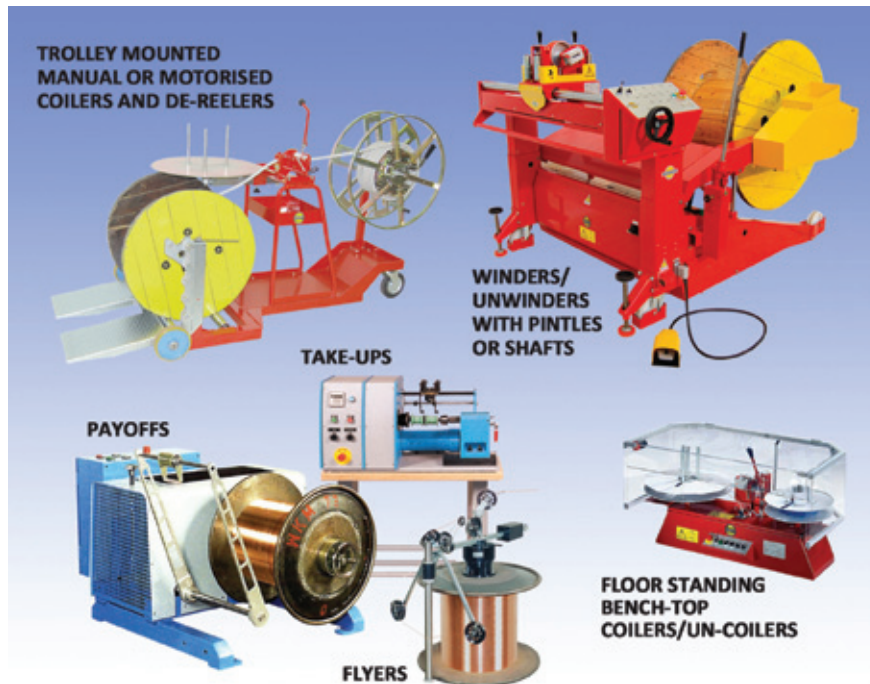
Email: info@euroextrusion.it

Website: www.euroextrusion.it

Payoffs, take-ups and winding

As a major supplier to the industry since the early 1960s, Techna offers a comprehensive range of payoffs, take-ups and winding equipment, from small, stand-alone units for the one-man operator handling just a few kg on small diameter coils, to cutting-edge technology for handling weights of up to 6,000kg and reel sizes up to 2,600mm Ø, with a series of manual, semi-automated and fully automated machinery.

The Mobac – Techna range includes single and multiple payoff frames, flyers for insertion into bobbins, flyers with tension control, high-speed flyer payoffs, coil payoffs, payoff baskets, tangential and driven-tangential payoffs, spoolers, winders, and dancer accumulators, together with a comprehensive range of accessories and spares.



○ Products from Techna's range

Flyers are available with various braking systems such as rolling friction braking, centrifugally controlled braking, combined rolling friction and friction braking, magnetic particle brakes and hysteresis brakes which are silent and operate without any physical wear (braking forces are created by magnetic fields, not friction), making them suitable for use in payoff flyers due to their smooth torque, regardless of any rpm variations. An extensive product range, for varying spool sizes and weights, provides flexibility and choice from basic, low-cost, to highly complex systems.

The Meccanica Nicoletti – Techna range provides a comprehensive choice of equipment covering virtually every winding and unwinding requirement. Ranges include basic manual or motorised stands, bench or trolley-mounted units handling coils/reels of varying sizes and capacities from 400mm Ø and 30kg weight, to 800mm Ø and 100kg weight. For larger reels and coils, semi- and fully-automated equipment can handle coils from 1,000mm Ø and 700kg, and reels from 1,600mm Ø (2,000kg) up to 2,600mm Ø (6,000kg). Optional elements include cable measuring and cutting equipment, pump lift, cable towing equipment, variable speed drives, retractable coiling heads and other accessories designed to provide wide customer choice, from basic to sophisticated machine configurations.

Complementing these products is a wide range of modular vertical storage racking that enables efficient utilisation of floor space and cable storage, from small diameter coils/reels of just a few kg, with up to five levels achieving bay heights of 5m, each accommodating up to 7,000kg (10,000kg special), and reel diameters up to 2,500mm.

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

Fax: +44 1923 219 700
Website: www.techna.eu

Z DONGGUAN ZHANGLI MACHINE FITTINGS CO., LTD

Ceramic coated wiredrawing cones and pulleys.

Steel Cones & Ring with Tungsten carbide coating.

Unique shaped ceramic and zirconia products.

Combined ceramic idler pulley

Address: Jiangbei Dashadun Industrial Zone of Wusha, Changan Town, Dongguan City Guangdong, China
Tel: 86-769-85415700, 87094491 Fax: 86-769-87094490
Website: www.dgzhangli.com
Email: zlf@changan.net

AdwanteK ADWANTEK TECHNOLOGIES CO., LTD

Capacitance Monitor

- Suitable for microcoax, coax, LAN, and HDMI Cables
- High accuracy 0.1pF/m, measurement range 1-400pF/m
- Not influenced by PH value of water, line speed
- With interface RS485

High Frequency Inductive Preheater

- For copper, ferrous, nickel alloy conductor wire
- Operating frequency: 4.5KHz
- Wire diameter: 0.1-2.5mm
- Maximum line speed: 1600m/min
- Maximum Preheating temperatures: 300°C
- Automatically control
- Maximum power: 10KW

High Frequency Spark Tester

- Frequency: 3KHz
- Output Voltage: 0.0-15.0KV
- Accord with BS5099 and UI1581
- Line speed reaches to 2000m/min

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

Perfect winding with Roblon precision take-ups

At this year's wire Southeast Asia, Roblon will present its range of industrial fibres and cable machines.

The Roblon take-ups offer precision winding. When fitted with a precision unit for winding of round and rectangular materials they ensure perfectly wound reels. The take-up is ideal for production of cables sensitive to indents and pressure from overlapping cable layers on the reels.

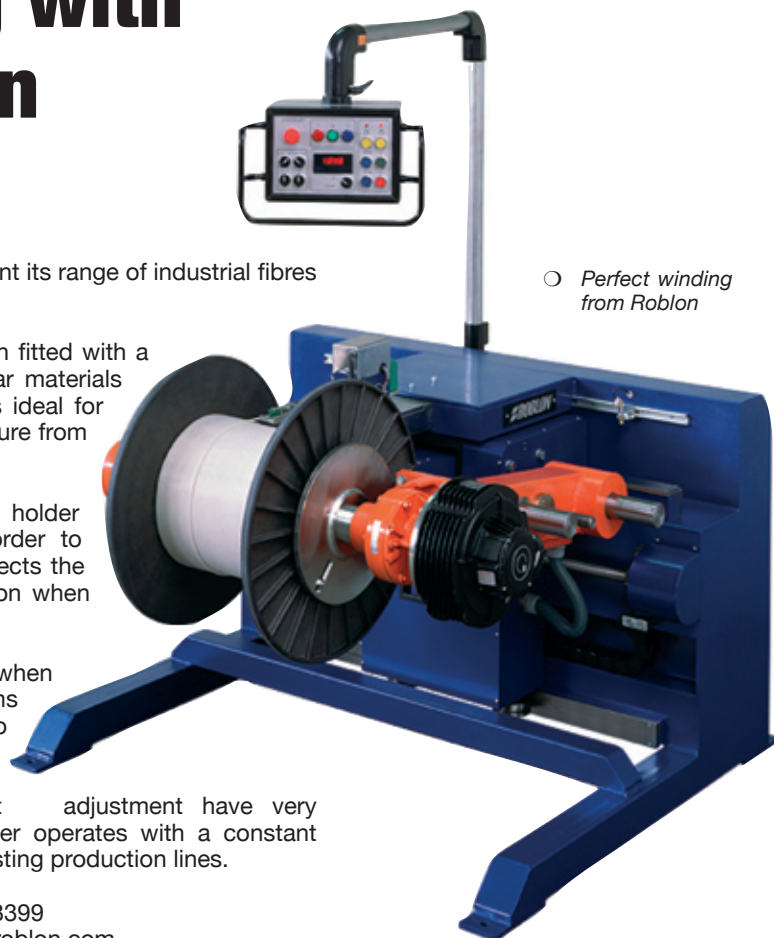
When the reel is traversing, the sensitive die holder automatically controls the traversing speed in order to obtain a correct position of the dies. A sensor detects the flanges of the reel and changes traversing direction when the dies reach the flanges.

This means no settings of end stops even when changing reel size. During operation the lifting arms adjust the horizontal position of the drum in order to maintain a constant winding point.

The traversing reel and automatic height adjustment have very little influence on the product. The take-up winder operates with a constant tensile force and is easily integrated into new or existing production lines.

Roblon A/S – Denmark
Email: info@roblon.com

Fax: +45 9620 3399
Website: www.roblon.com



○ Perfect winding from Roblon

Full range of take-ups and payoffs



○ Production of driven column-type payoffs, used on turntables for vertical stranders for production of umbilicals and subsea cables

Queins & Co is a leading manufacturer of heavy duty payoffs and take-ups, and provides the industry with a wide range of this equipment.

Queins' product range covers column-type, cantilever-type, bridge-type, self-traversing portal-type, heavy rotating take-ups and payoffs for power- and telecommunication cables as well as for steel wire ropes.

Also offered are fork-type rotating take-ups for direct pull applications. Standard models for reel sizes between 2,600mm (98") and 4,500mm (177") will shortly be available.

Standard sizes for take-ups and payoffs are manufactured in a range from 3 to 300 tons of drum weight.

Queins & Co GmbH KG – Germany
Fax: +49 247 230 14
Email: info@queins.com
Website: www.queins.com



Photo courtesy Roblon AIS

放线、收线和卷绕设备

一种先进的线材放线设备品牌的几乎每一项性能都被描述为“可调节”或“可选择”，这些设备能提供立式或卧式组态、前进或后退运动；据说它们还适合于重型、中型、细型任何金属线材处理要求。对每个线卷、线轴、线圈、线束、线盘来说，都有一个理想的放线方式、途径和阻力水平。设备制造商声称一切准备就绪。

制造商同样还承诺无变形输送线材，卷绕和缠绕设备供应商不必再担忧灵活性问题。他们知道对这种适用于各种线材类型和尺寸、新型耐用、精致和特异材料的万能设备的需求在迅速增长。

Niehoff公司推出多功能收、放线设备

Maschinenfabrik Niehoff开发的电线电缆机械几乎包括了所有的线缆生产业务，其产品有系列广泛的收线放线设备。特别引人注目的是S系列单独绕线机和ARH切线放线机。

紧凑型S 631 和 S 801绕线机带有集成调节辊，适合作为收线设备用于多线拉伸生产线。穿越可旋转压辊组使得收线前无需打开线束。高质卷绕保证电线有效地进行下一步高速加工。

缠绕机带有横向和缠绕驱动器，使用交流伺服电机和液压气动缠绕升降台。缠绕机加工的电线尺寸范围从0.15毫米到1.60毫米 (34½ ... 14 AWG)，加工速度分别达到40和36米/秒 (S631/7,900英尺/分; S801/ 7,100英尺/分)。

ARH 630和ARH 800切线放线机具有单独的驱动器，设计用于单独电线、平行缠绕电线和线束的非绞合放线，同时也适合于生产高质几何绞线。

气动调节辊保持电线张力恒定不变，MMI显示屏与背部张力指示器以及空线轴检测系统相结合。ARH放线机有两种类型，单个放线（从左手到右手操作）和双放线。

这些设备用于处理单个电线的直径从0.40毫米到1.41毫米(26 ... 15 AWG)，线束横截面积从0.157平方毫米到6.00平方毫米 (25½ ... 9 AWG)，与之相应的最高线速度达到300米/分(1,000英尺/分)。

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

传真: +49 9122 977 155
网址: www.niehoff.de



○ S 631新型单独缠绕机

优化生产设施

当前中高压电缆、离岸能源市场和一般海底电缆需求回升，在当前经济形势下前景看好。尽管如此，在生产、储存和铺设如此长而重的电缆过程中，生产商也面临诸多运输挑战。

问题的关键所在就是要提高效率。如果企业能够实现精简和高效的制造工艺，利用率达最大化，那么利润和竞争力也将随之增强。

Meltech能够提供广泛的解决方案，帮助客户优化生产设施，根据负载能力提供相应配置的设备。

- 门户和龙门式卷取机能力高达125Te
- 固定或移动下辊配置能力高达400Te
- 固定电缆卷取机能力高达500Te
- 传送带式电缆存储设备具有更高的负载能力

此外，该公司的工程技术经验能够根据客户需求设计、制造和安装机器，与当前生产工艺，诸如挤压、



○ 118Te系绳盘绕设备，适用于绳索，连接电缆盘绕

广泛的解决方案

Euro Extrusion Srl应用当今最先进的技术，提供广泛系列的收线和缠绕解决方案。

重点包括:

- 双卷筒卷取和半自动传输型 AS 630 800 1000
- 卷筒法兰最大直径630 800 1000 毫米
- 卷筒法兰最小直径400 600 800 毫米
- 卷筒最大宽度475 475 780 毫米
- 卷筒最大重量300 400 800 公斤
- 交流电机功率4+4 5+5 6+6 千瓦

主要技术规格:

- 电缆传输与切割，不放缓生产线，通过长度和速度仪手动或自动传动
- 可移动引导线装置
- 线轴自动退出系统

西门子传动板OP77A 包括:

- 设置卷筒的宽度
- 线速度显示
- 长度设置与声信号
- 卷筒参数设置
- 报警显示和信号

可选设备

- 空卷筒装载，满卷筒卸载，液压泵提供两种升降运输车。
- 装载和卸载卷筒的运输车可以用托盘车来代替。

如需了解其它信息，请联系:

Euro Extrusion Srl – 意大利
传真: +39 0331 669 221
电子邮件: info@euroextrusion.it
网址: www.euroextrusion.it

成缆和铠装无缝整合。在某些情况下，Meltech还能够长期出租设备，使得企业将潜在的大量资金投入转变成营业支出。

除了提供现成和定制产品，Meltech还生产产品齐全的张紧轮、电缆引擎和其它配套设备，与客户紧密合作，建立一个全面的解决方案，以满足客户的各种特殊需求。

Meltech产品系列空前广泛，为所有尺寸的电线电缆、光纤和塑料挤压提供不同的缠绕和卷绕。

比如，公司提供自动/半自动切割，某些产品的粗加工和线轴转换速度高达1,000米/分，因此能够整齐缠绕成品线轴。

Meltech Engineering Ltd – 英国
传真: +44 1254 680175
电子邮件: sales@meltech.co.uk
网址: www.meltech.co.uk

Roblon精密收线机完美缠绕

在今年的东南亚线材展上, Roblon向来宾呈现了系列工业光纤光缆机械。

Roblon收线机提供高精度缠绕。安装的精密装置用于缠绕圆形和矩形材料, 确保完美缠绕卷轴。如果对缩进和卷轴上重叠电缆层的压力敏感, 该收线机将是理想的选择。

当卷轴横向移动, 敏感的模架自动控制横过速度, 以获得模具准确定位。当模具接触到法兰时, 传感器探测卷轴的法兰, 改变运行方向。

这意味着即便改变卷轴尺寸也不需要设置停盘。在操作过程中, 起重臂调整工字轮的水平位置, 从而保持缠绕点恒定。

进给轴和自动高度调整对产品的影响很小。收线卷取机工作时拉力固定, 很容易与新的或现有的生产线整合。

Roblon A/S – 丹麦
电子邮件: info@roblon.com

传真: +45 9620 3399
网址: www.roblon.com



○ 来自Roblon的完美缠绕

放线, 收线和缠绕设备

Techna公司创建于20世纪60年代初, 作为业界主要供应商, 提供综合系列的收线机、放线机和缠绕设备, 从小到一个人在只有几公斤重的小线圈上操作的小型独立装置, 到加工重6,000公斤、线轴直径达2,600毫米的系列手动、半自动、全自动切割技术机械。

Mobac – Techna系列包括单个和多个放线架, 插入到线轴的飞轮, 张力控制飞轮, 高速飞轮放线机, 线圈放线机, 放线篮, 切向与驱动反切放线机, 卷绕机, 缠绕机, 调节蓄能器, 以及规格齐全的零配件。

飞轮带有各种制动装置, 比如滚动摩擦制动系统, 离心控制制动系统, 结合滚动摩擦和摩擦制动, 磁粉制动器和磁滞制动器, 这些制动设备无噪音, 没有任何物理磨损(磁场产生制动力, 不是由摩擦产生), 因其平滑扭矩, 所以适用于放线飞轮, 不受转速变化的影响。公司产品丰富, 满足不同尺寸和重量的线轴, 客户可灵活选择从基础的低成本装置到高度复杂的系统设备。Meccanica Nicoletti – Techna系列设备几乎涵盖了所有的缠绕和展开要

求。产品包括基本手动、电动架, 工作台和推车式装置, 操作的线轴/卷轴尺寸范围从直径400毫米到直径800毫米, 重量从30公斤到100公斤。对于较大的卷轴和线圈, 半自动和全自动设备能够操纵的线圈直径最小1,000毫米(重700公斤), 卷轴最小直径1,600毫米(2,000公斤), 最大直径达2,600毫米(6,000公斤)。

备选设备有电缆测量和切割, 水泵扬程, 电缆牵引设备, 变速驱动器, 可伸缩的卷绕头以及其它配件, 旨在为客户提供广泛的选择, 从基本的到精密的机器配置。

与以上产品互补的是一系列模块化垂直存储货架, 能够有效利用地面空间, 电缆储存从小直径几公斤重到5层5米间格高度的线圈/卷轴, 每个最多容纳7,000公斤(10,000公斤特例), 卷轴直径达到2,500毫米。

Techna International Ltd – 英国
传真: +44 1923 219 700
电子邮件: sales@techna.co.uk
网址: www.techna.eu

各种送卷超然和送卷设备

Queins & Co是一个重型送卷和缠绕设备领军型制造商, 为工业提供这种设备的各种型号。Queins的产品范围包括电力和通讯电缆以及钢丝钢缆用柱型、悬臂型、桥式、自动横越门户型、重型旋转缠绕和送卷设备, 还提供包括直接拖拉用叉式旋转缠绕, 并能迅速提供介于2600mm (98")和4,500mm (177")的标准型线卷设备。缠绕和送卷标准型设备范围是3吨到300吨的线鼓。

Queins & Co GmbH KG – 德国
传真: +49 247 230 14
电子邮件: info@queins.com
网址: www.queins.com



○ 正在连接缆线和海底电缆立式综合机转台上进行生产的被动式柱型送卷

电线电缆生产前沿的张力控制

在线缆生产过程中, 收、放线机需要高效稳定运行, FMS张力控制设备能够提供必要的精确需求。整套设备包括测力辊和相应的电子设备, 能够配置几乎所有的张力测量和控制任务。

RMGZ测力辊多种配置可供选择:

RMGZ100 – 这些传感器用于测量薄电线、电缆和纤维的张力。该产品适合空间有限, 具有六个额定压力值(6N到300N)。

RMGZ300 – 该系列测量辊专门用于较高转速旋转, 其特殊设计能有效补偿离心力和科氏力。力测量范围从50N到1,000N。

RMGZ400/600/800系列传感器使用增强弯曲梁原理, 额定力范围从60N到4,000N, 800系列用于测量重型绳索和电缆的张力, 最高测量值达8,000N。

各种不同的RMGZ测力辊提供超过额定力十倍的超载保护。传感器为不锈钢构造, 包括一个抗腐蚀铝盖。

新型无线传输力检测系统RTM X2与上述测力辊组成完全一致的系统。开发的RTM X2用于旋转机上单独电线、绞线的张力监控。该系统可用于任何一个独立配置, 或与现有的PLC结合使用, 非常适合于OEMs新机器和集成商/终端用户升级现有机器。

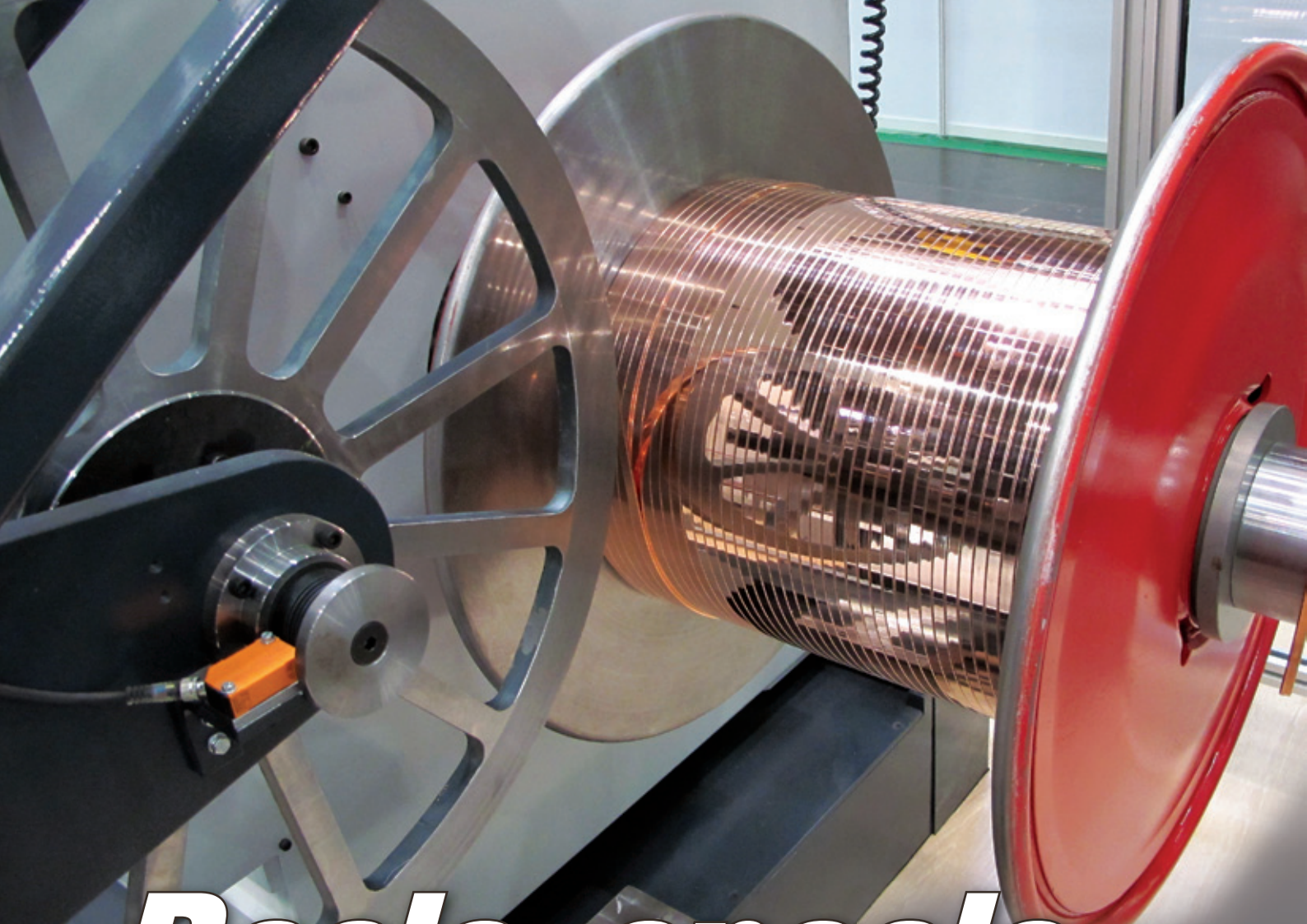
FMS Force Measuring Systems

AG – 瑞士

传真: +41 44 850 60 06

电子邮件: info@fms-technology.com

网址: www.fms-ag.ch



Reels, spools and spooling

A common denominator of these topics (as with those treated on p48 — “Payoffs, Takeups, Winding”) is slack: a property with no physical presence but a formidable capacity for mischief when it occurs in the wire making process.

The jams that result from inefficient tensioning – from poor coordination of diameter and weight changes with the acceleration and deceleration of reel, spool, or bundle – will bring a high-speed line to a halt as readily as any of the more obvious threats

to productivity. They are no less subversive of profitability.

That reels, spools, and spooling, and their integration into project management, occupy a worry-free zone in a state-of-the-art wire mill is due largely to the quality of the companies active in that area, including those reviewed here.

Where there is no tolerance for slackness (ie remissness, infidelity to appointed service), slack will be of negligible concern.

Reels of steel

GMP Slovakia produces steel reels and handling equipment at a manufacturing department located in Pribenik, Slovakia – a strategic position in the heart of Europe close to main international seaports.

The company uses both traditional and high technology machinery, including welding robots, CNC turning machines, and 1,000 ton presses. The company is able to supply standard and innovative products, and to answer the most particular customer's requests.



○ Drums of all sizes are available from GMP Slovakia

GMP Slovakia's range of products includes standard reels: for buncher and one way, for drawing and stranding, reinforced double flange for steel wire drawing process, strong construction for steel wire process, for copper and aluminium process, but also drums for cable and rope process in reinforced version for process or for transport in lightweight version.

A large range of take-apart reels is available, starting from the TA/SCS with single central screw and TA/Z reel with bronze collar. The patented Easycoil reel automatically releases the flange below without any operator intervention, and can also be used as a coil lifter if supplied in Plus version.

GMP Slovakia also supplies units to tilt and lift reels and coils, and special lifters for large drums.

GMP Slovakia Sro - Slovakia
Email: sales@gmp-slovakia.com

Fax: +421 56 628 0216
Website: www.gmp-slovakia.com

Complete knock down reels

Cabrol, India, is a manufacturer of collapsible corrugated steel cable reels for dispatch/shipping purposes. The company, which has two manufacturing units in India, exports its reels to all parts of the world.

The company has manufactured reels up to 4,500mm diameter with a loading capacity of 35 metric tons. Its expertise lies in manufacturing reels in complete knock down (CKD) condition. These CKD reels can be easily assembled and dismantled, as an effective solution to recycle the reels.

Cabrol has a standard design for reels, and also manufactures according to NEMA standards or clients' requirements. The company manufactures more than 1,800 reels per month. It has recently opened a US marketing office, SCR Holdings LLC, in Houston, Texas.

Shah Fabricators Pvt Ltd (Cabrol) – India
Fax: +91 22 2897 3672
Email: info@cabrolindia.com
Website: www.cabrolindia.com

SCR Holdings LLC – USA
Fax: +1 281 476 7409
Email: info@scrholdings.com
Website: www.scrholdings.com



GUANBIAO ELECTRICAL MACHINERY CO.,LTD
WIRE-DRAWING MACHINE

GUANBIAO ELECTRICAL MACHINERY CO.,LTD
TEL:+86-769-85253803/85253982 FAX:+86-769-88920895
E-mail:info@guanbiao.com market@guanbiao.com
HTTP://www.guanbiao.com/dgguanbiao.en.alibaba.com
ADD:Humen Town Dongguan City China

INVESTMENT OPPORTUNITY

By a big wire ropes industry, at the center of Europe

A partner for installing wire drawing project is sought

PO BOX 0302
Wire & Cable ASIA magazine and EuroWire magazine,
46 Holly Walk, Leamington Spa,
Warwickshire CV32 4HY



杰创·东方
JCDOFAMA

Visit our booth
F2-B20
Shanghai Wireshow 2011



The Leader of
Chinese Wire & Cable
Machinery Industry



杰创·东方
JCDOFAMA



- ◆ Copper & Copper Scrap CCR Line
- ◆ Aluminium Alloy Rod CCR Line
- ◆ Copper Rod Upward Casting Line
- ◆ Copper & Alloy Rod Cold Rolling Mill

- ◆ Continuous Lead Sheathing Extruder
- ◆ Continuous Extrusion Machinery
- ◆ Copper Rod Breakdown Machine
- ◆ Resistance Annealer

- ◆ Aluminium & Alloy Rod Breakdown Machine
- ◆ Dual Spooler
- ◆ Medium Wire drawing Machine
- ◆ Fine Wire Drawing Machine



MEMBER
ACCREDITED BY IWCA
MEMBER

德阳杰创线缆机械有限责任公司
Deyang Jiechuang Wire & Cable Machinery Co., Ltd.
Taihuashan Road North, Tianyuan, Deyang, Sichuan 618000, China
Tel: +86-838-2802628, 2823685 Fax: +86-838-2800877
website: www.jcdofama.com e-mail: jcdofama@163.com

Protecting your wire. . .

On any continuous wire drawing machine, the wire has to be either to be wound on the reels, spools or take-up drums.

Even the payoff equipment can be a source of feeding of wire. This equipment acts as the hands of the machine, with high drawing speeds and a series of blocks and panel lines and the productivity levels can be enormous.

Much of the capital cost and the materials handling of a wire drawing system lies in payoffs, take-up equipment, dead block coilers, etc.

This equipment has become more important with the increase in the drawing speed and the machine running with modern AC variable frequency drive control panels.

Of the many products handling wire, perhaps the most misunderstood group of machines is spoolers.

Before selecting the spooling machine as a manufacturer we have to consider maximum time allowable for starting and stopping, along with special features such as tension requirements and range of spool sizes, layer winding, random winding, spool mounting, etc.

These spools can vary from smaller size to heavier sizes for thicker wires. Even double spoolers are gaining popularity because of the elimination of down time of equipment.

A double spooler is capable of transferring the wire from the full spool to an empty spool automatically without stopping, and during the transfer the wire will be sheared.

The main advantage of a dead block coiler is to get heavy continuous wire coils and drawing the wire uninterrupted on the wire drawing machine.

The use of dead block permits coils to be removed with complete safety regardless of wire speed or coil weight without interrupting the operation of the drawing machine.

Drum pack coilers are used for packaging various types of high and low carbon wire in hard cardboard/fibre drums. Since this innovation, it is easy to handle and provides protection for the wire. The grades of wire which often require use of drum pack coilers are welding wire, stapling, stitching wire and other gauges of wire which require production in transportation.

The drum pack unit is in conjunction with the wire drawing machine and operates at the same speed as the drawing equipment.

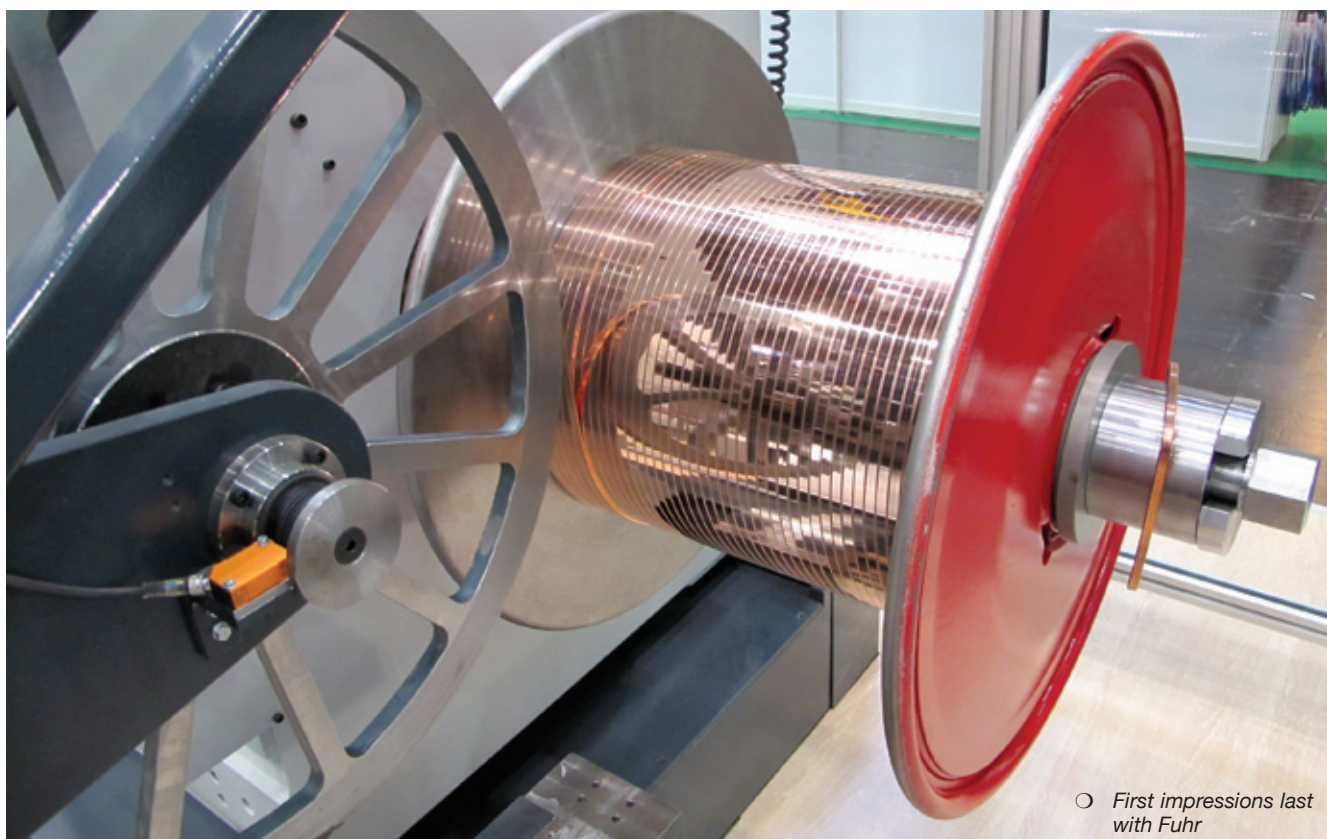
Assomac Machines – India
Email: info@assomacmachines.com

Fax: +91 120 2866 508
Website: www.assomacmachines.com



○ A drum pack coiler from Assomac

New standard of spooling machines



○ First impressions last with Fuhr



Parasacchi
Since 1945

Plastic spools and injection moulding of plastic materials



plastic spools for :
electrical cables
welding wires
copper wires
synthetic yarns
fine wires
enamelled copper wires

parasacchi@parasacchi.it
www.parasacchi.it

Producers of flat and shaped wires usually supply their products on reels. When it comes to delivery, the customer's first impression is the optical appearance of the winding quality.

A perfect layer-wise winding is associated with a perfect product. Therefore, in today's wire production the winding quality has gained a high level of importance.

But it's not only these facts that are important: A low quality of layer winding can indeed be of major impact on the product quality. When wires are confusedly wound on reels, it also has a bad influence on quality aspects such as straightness, torsion and surface.

Moreover, a tangled winding can result in difficulties or even wire breakage when customers try to unwind the material from the reels.

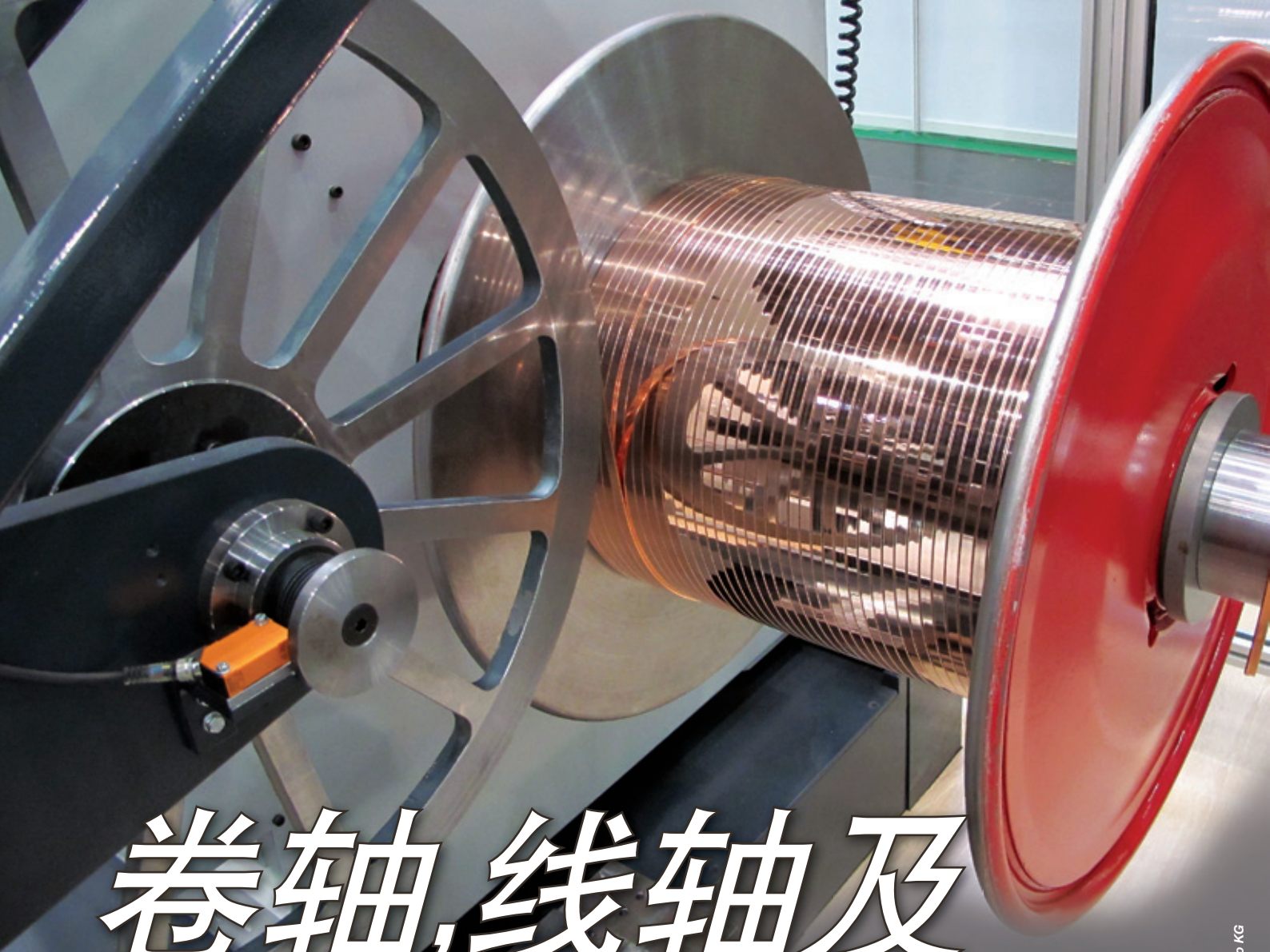
As a producer of wire rolling mills, Germany-based company Fuhr has a long tradition in designing and building layer winding machines. Fuhr offers a wide range of spoolers in cantilever and pintle design for gross weights from 200kg to 10 tons.

The machines are prepared to either be used with reels made of plastic, wood and steel or to create coreless coils by the means of collapsible reels.

The common design base of these spoolers is the concept of a traversing spool and a fixed wire line. The traversing is computer controlled. The software provides special features to optimise the laying, especially in the reversing points such as edge stop, angle offset and spike. For standard applications the software is self-optimising.

The software controls the spool with highest precision, but it needs a precise wire guiding in addition. Fuhr has developed two guiding systems to cover the wide range of wires – one for strips and one for rectangular and special shapes.

Karl Fuhr GmbH & Co KG – Germany
Fax: +49 523 484 9850
Email: mail@karl-fuhr.com
Website: www.karl-fuhr.com



卷轴, 线轴及 绕线

众所周知, 围绕放线、收线、绕线的共同话题就是松弛, 松弛虽没有实际产出, 但在电线生产过程中造成的破坏性极强。其干扰来自低效拉伸, 以及线轴、卷轴或线束加速减速时直径和重量发生变化却协调不力, 从而导致高速生产线中断影响生产力。显而易见, 松弛是企业盈利的障碍。

线轴、卷轴及绕线, 将其与项目管理相结合, 在先进线材轧机生产中就无后顾之忧, 主要归功于这些公司在该领域采取的措施, 包括质量的审查, 保证没有丝毫松弛 (即松懈, 不忠于指定服务, 视松弛微不足道)。

保护您的电线

在任何一台连续拉丝机上,线材都将缠绕在线盘、卷轴或收线轮上。甚至放线设备也可能是送丝源。

该设备作为机器的手,高速拉丝,以及系列拉丝卷筒和板式生产线,将带来生产力水平的大幅提高。

拉丝设备的材料加工和成本消耗多数取决于收、放线设备和缓冲板卷取机等。随着拉丝速度的提高,机器应用现代交流变频驱动控制面板运行,该设备也显得越来越重要。

在诸多电线加工生产设备中,也许最不为理解的就是绕线机。生产商在选择绕线机前必须考虑允许启动和停止时间的最大化,以及张力要求,线轴尺寸范围,层绕,随机缠绕,线轴安装等一系列因素。

这些线轴能随着电线厚度从小型尺寸变化到重型尺寸。由于消除了向下型设备,就连双线轴也越来越受到青睐。双线圈能够自动将电线从满线圈传送到空线圈上,在传输过程中电线自动切割,没有任何中断。

缓冲板卷取机的主要优势在于拉丝机连续拉丝无中断,从而获得重型连续线卷。使用缓冲板后,线圈可安全取下,不用去管拉丝速度和线圈的重量,也不会中断拉丝机的运作。

鼓包卷取机运用硬纸板或纤维工字轮包装各种高低碳电线。此项创新,为电线处理和保护带来了方便。通常要求使用鼓包卷取机的电线包括焊丝、装订线、缝合线和其它需要在运输中生产的标准电线。鼓包卷取机和拉丝机整合,运行速度与拉丝机同步。

Assomac Machines – 印度 传真: +91 120 2866 508
电子邮件: info@assomacmachines.com
网址: www.assomacmachines.com



○ Assomac生产的鼓包卷取机

钢卷轴

斯洛伐克GMP生产钢卷轴和加工设备,其生产基地位于具有战略地位的欧洲市中心,毗邻主要国际港口。公司将传统与高科技机械相结合,诸如焊接机器人、数控车床和千吨压机等,因此能够提供标准与创新产品,满足客户最特定的需求。斯洛伐克GMP产品系列包括标准卷轴:一方面用于束线,拉丝和绞线,钢丝拉伸强化双法兰,钢丝、铜、铝加工时坚固结构,同时,也应用于强化和轻量级运输所需线缆和钢丝绳的工字轮。公司也提供广泛系列的拆卸卷轴,从中央单螺杆TA/SCS到带有铜领的TA/Z卷轴。专利产品Easycoil卷轴能自动释放法兰,下方无需任何操作员干预,在Plus模式下,也可用作线圈的升降。另外,斯洛伐克GMP也生产倾斜与提升线轴、线圈的设备,以及大型工字轮使用的特种升降机。

GMP Slovakia Sro - 斯洛伐克 传真: +421 56 628 0216
电子邮件: sales@gmp-slovakia.com 网址: www.gmp-slovakia.com



○ GMP Slovakia 可提供各种规格的线盘

完全易拆卸线盘

印度Cabrol公司为发货/运输生产可折叠波纹钢缆线盘。公司在印度有两家工厂,生产的线盘销往世界各地。

公司生产的线盘直径高达4,500毫米,承载能力35公吨。

其专业性在于在完全能拆卸(CKD)条件下生产线盘。这些CKD线盘易于装卸,是重复使用线盘的有效解决方案。

Cabrol公司可生产标准设计线盘,也可按照NEMA标准或客户的要求定制生产。

公司生产能力达到1,800线盘/月,最近在美国,休斯敦,得克萨斯州开设了营销办事处-SCR Holdings LLC公司。

Shah Fabricators Pvt Ltd (Cabrol) – 印度
传真: +91 22 2897 3672
电子邮件: info@cabrolindia.com
网址: www.cabrolindia.com

SCR Holdings LLC – 美国
传真: +1 281 476 7409
电子邮件: info@scrholdings.com
网址: www.scrholdings.com

Analysis of surface flaws on drawn wire and wire breaks

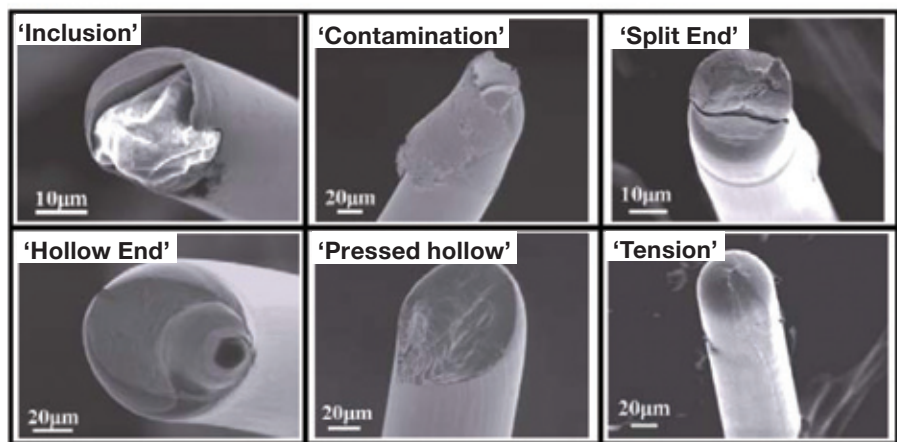
By Kazunari Yoshida, Tetsuo Shinohara, Tsutomu Yamashita and Atsuhiko Tanaka of Tokai University, Japan

Abstract:

Using experiments and finite element method (FEM) analysis, this paper examines whether surface cracks on wire rods grow or are removed during drawing.

The deformation behaviour of V-shaped, concave, and U-shaped transversal cracks were observed upon repeated drawing.

The authors clarified the conditions under which these transversal cracks are removed in order to achieve a surface condition similar to that of the area without cracks.



○ Figure 1: Types of wire breaking

1 Introduction

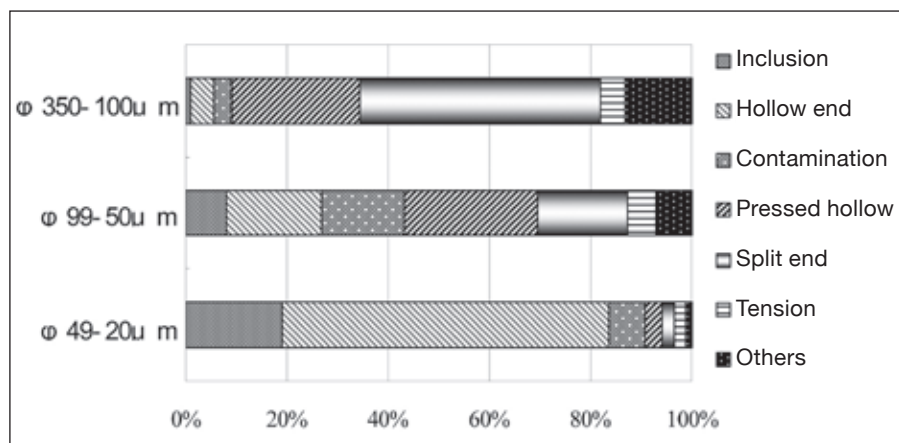
The diameter of wires and bars produced by drawing varies from about 10 μ m to 100mm. For any diameter of wire, breaking during drawing has a direct effect on productivity.

Also, flaws on the surface of wires often cause fatigue breaking, the deterioration of mechanical properties, and loss of commodity value.

This is why surface flaws are the most common complaint of users. Furthermore, finer and longer wires have recently been requested for use as the bonding wires of semi-conductors and in medical devices. Therefore, wire breaking and surface flaws are problems that must be solved.

Many researchers have investigated the optimal die shape to reduce drawing force, measures to prevent wires from internal cracking (through the formation of central burst defects or cupping), the optimal lubricant, measures for reduction of residual stress and so forth.

Useful findings have been obtained, but there have been few studies of measures to prevent wire breakage and on the effects of inclusions and surface flaws on wire drawing^{1,4}.

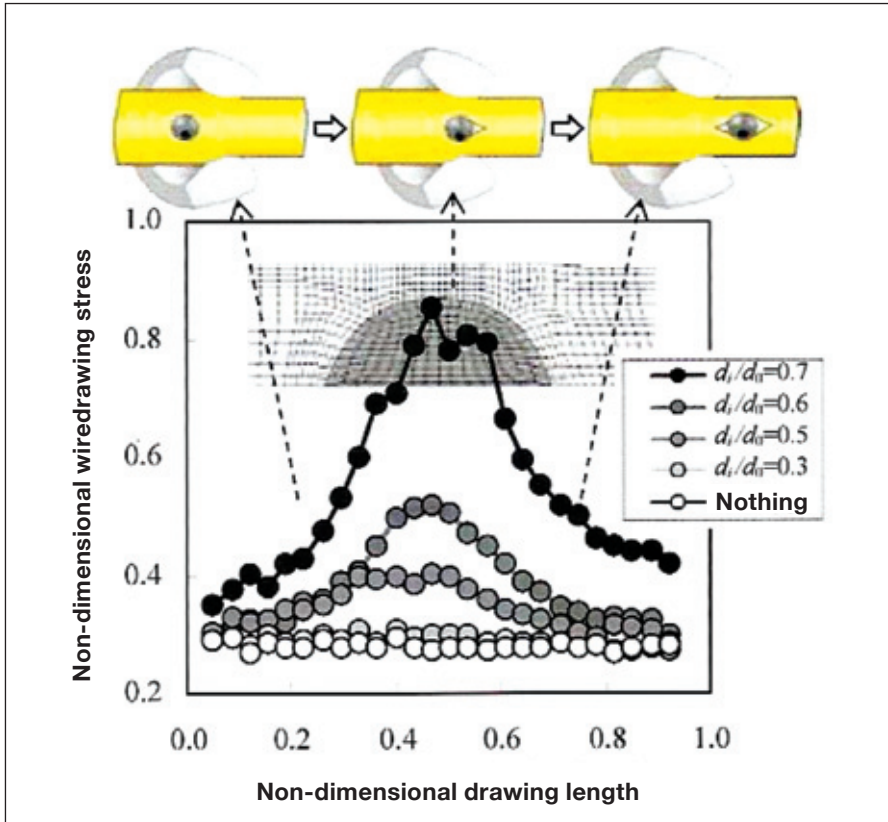


○ Figure 2: Percentages of causes of wire breaking during drawing of superfine gold wires

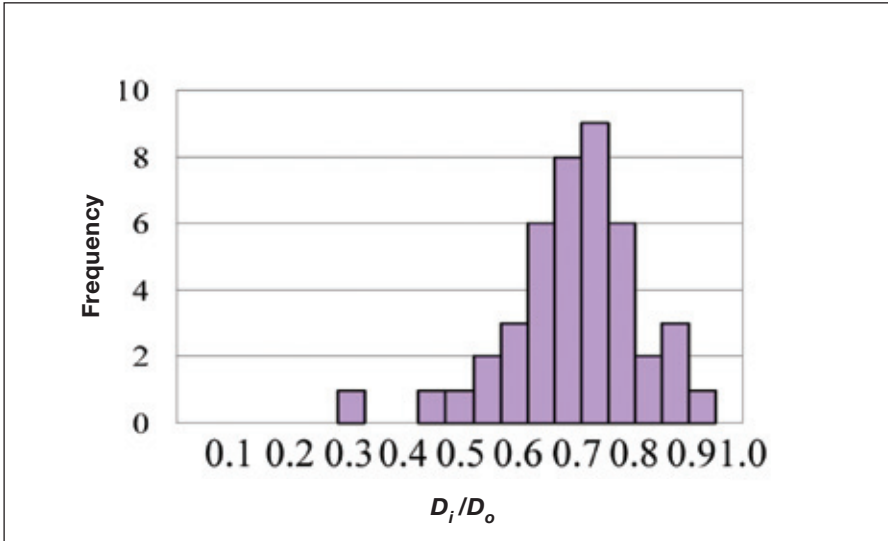
In this study, the causes of wire breakages in drawn wires of different diameters were examined. Analyses of wires with surface flaws and inclusions were performed experimentally and by a finite element method (FEM) to determine whether surface flaws and inclusions cause wire breakages or remain as surface flaws when drawing is repeated.

2 Types of wire breakage caused by drawing

Recently, the occurrence of wire breaking during drawing has greatly decreased due to reduced particulate segregation



○ **Figure 3:** Variation of drawing stress when inclusion passes through die (examined by FEM(R/P=10%))



○ **Figure 4:** Frequency of wire breaking vs D_i/D_o

and fewer inclusions in bars and wires brought about by effective material cleaning and because of the improvement of drawing conditions. However, the finer the diameter of a wire, the higher the frequency of occurrence of wire breakage during drawing. There are several causes of wire breaking (Figure 1).

Two types of breaking are caused by inclusions. One occurs when inclusions are found on the fracture surface, and the other, called “hollow end” breaking, occurs when traces of concave inclusions are found but the inclusions themselves are not found. Two types of breaking are caused by foreign materials introduced during a process

other than the casting process. One is called “contamination” breaking, when foreign materials are found on the fracture surface, and the other is called “pressed hollow” breaking, when no foreign materials are found.

Additionally, “split end” breaking is considered to be caused by surface flaws, and “tension” breaking is caused by applying a stress stronger than the wire strength⁵.

Types of wire breakage that occur when gold bonding wires are drawn were examined.

Figure 2 shows the frequency of occurrence of each type of wire breaking, with the diameters of the drawn wires divided into three groups, 100-350 μm , 50-99 μm and 20-49 μm ⁴.

Figure 1 and Figure 2 show that surface flaws, foreign materials and the occurrence of excessive drawing stress caused by seizing are causes of wire breaking.

However, many of the causes of wire breaking for wires with a diameter of less than 50 μm are speculated to be due to inclusions inside wires that form during casting⁵.

Considering the above it can be concluded that for wires to be resistant to breaking during drawing they should have no surface flaws and any inclusions be as small and as few as possible.

3 FEM analysis of drawing of a wire with inclusions or foreign materials

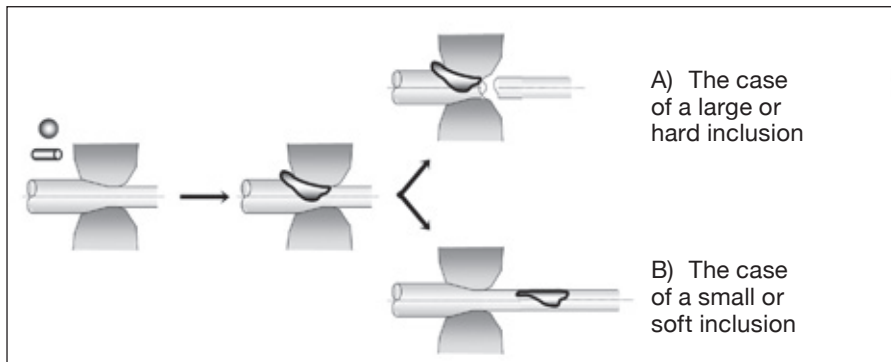
3.1 Effect of inclusions inside a wire

Most inclusions in wires are hard materials. The results of the analysis of inclusions on the fracture surfaces of wires by Energy Dispersive Spectrometer (EDS) showed that many of them were Al_2O_3 or SiO_2 , and the rest were foreign materials formed by abrasion of the die and equipment. Therefore, assuming that there are inclusions of alumina and foreign materials inside wires, an FEM analysis of wire drawing was carried out.

The ratio of inclusion size to wire diameter, D_i/D_o , was set to vary from 0.3 to 0.7. The material constants and drawing condition for FEM are shown in Table 1. The changes in drawing stress on the inner side of the die were examined by FEM analysis, using wires with various sizes of inclusions.

Mechanical constants for gold	
Young's modulus	80GPa
Poisson's ratio	0.44
Work-hardening curve	$\sigma=475\epsilon^{0.07}$
Material condition for inclusion	
Material	Al_2O_3 , SUS304
Young's modulus	300, 194GPa
Poisson's ratio	0.23, 0.30
Yield stress	4.3, 0.205GPa
Die half angle, reduction	$\alpha=7^\circ$, R/P=10%
Friction factor	0.05 μ m

○ **Table 1:** Condition of materials and drawing for FEM



○ **Figure 5:** Schematic diagram of wire breaking caused by foreign material

The results are shown in Figure 3. It was found that drawing stress moves rapidly upwards when an inclusion passes through the die.

It can be seen that the higher the ratio of inclusion size to wire diameter, D_i/D_o , the more the drawing stress rises.

In the case of a wire with an inclusion for which D_i/D_o is 0.7, the drawing stress reaches the strength of the wire.

This means that there is a high probability that the wire will break. Taking the safety factor into account, it is thought that there is a danger that the wire breaks when D_i/D_o is higher than 0.4.

The sizes of inclusions were measured at the fracture surface when gold wires with the diameters of 20-50 μ m were drawn.

Figure 4 shows the frequency of wire breaking for different values of D_i/D_o . This figure suggests that there is a danger of wire breakage if D_i/D_o is 0.3 or higher, and the highest frequency of wire breakage is when D_i/D_o is approximately 0.7.

3.2 Effect of foreign particles

In some cases foreign materials are present on the wire surface during drawing, or foreign materials may enter the die via the lubricant.

These foreign materials are mainly formed by erosion of the wire or of the die or equipment, or may originate from dust in the air.

Depending on the shape and hardness of the foreign material wire breakage, as shown in Figure 5, may occur.

As an example, Figure 6 shows scanning electron microscope (SEM) images and EDS photographs of a wire after drawing with foreign materials on the wire surface.

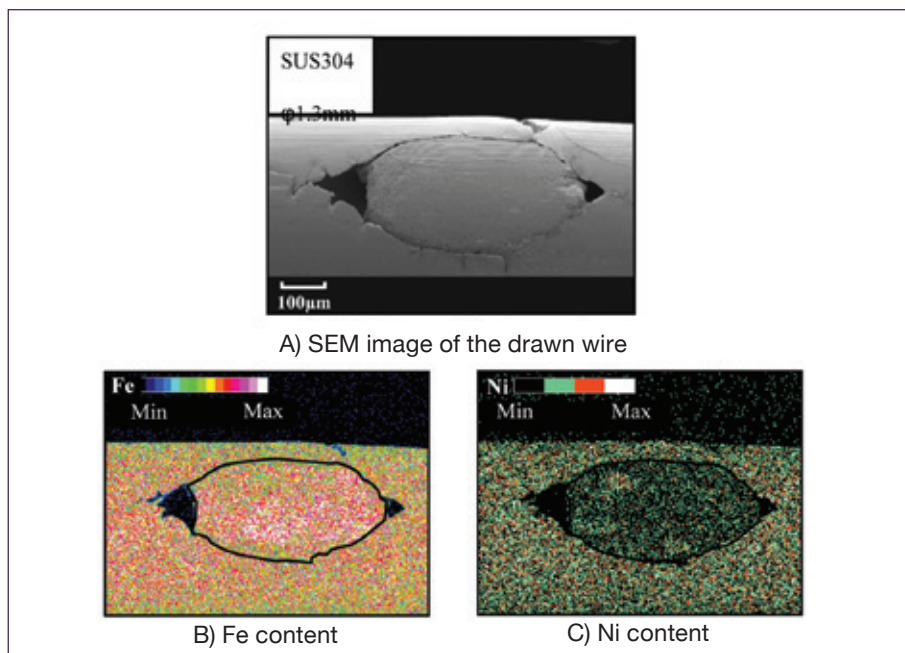
The material of the wire is austenite stainless steel.

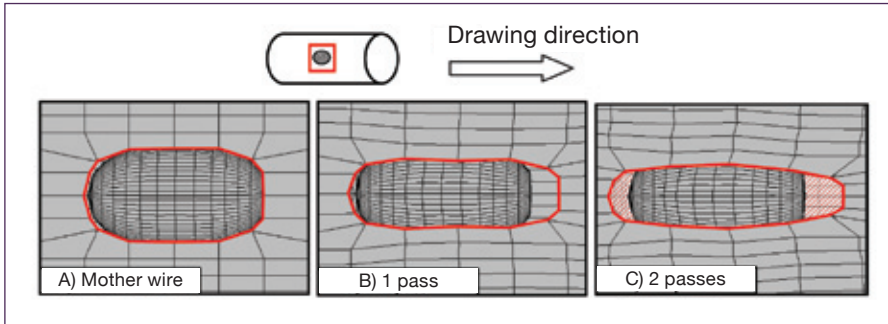
Analysis by EDS revealed that the foreign material was composed of iron carbide, which included a scarce Ni component.

The size was 0.53x0.27mm, and D_i/D_o was about 0.2. It is presumed that the wire did not break because of the low value of D_i/D_o .

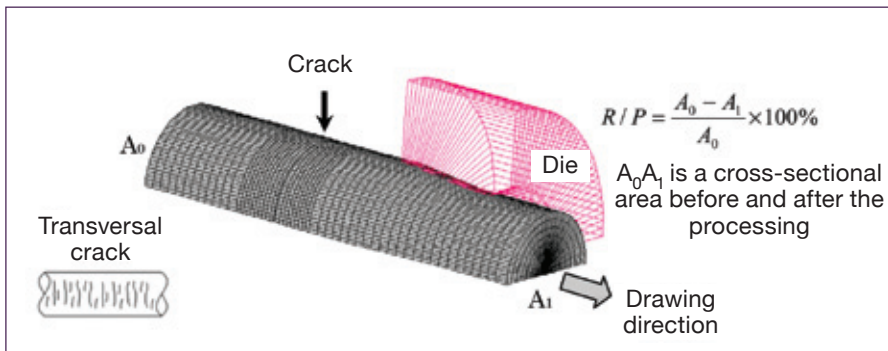
Figure 7 shows the results, gained by FEM analysis, of drawing a wire with a foreign material near the wire surface. At the interface of the foreign material and the wire, they are bonded mechanically. Upon repeated drawing, stress acts on the interface and causes separation at the interface, generating an empty space.

○ **Figure 6:** SEM image and componential analysis of wire with foreign material





○ **Figure 7:** Mesh deformation after repeated drawing of wire with foreign material on the surface examined by FEM



○ **Figure 8:** Drawing model of wire

Appearance	Name	Morphology and features
	Scab	Foliate mark; rod surface is rubbed bare
	Transversal crack	Crack perpendicular to rolling direction
	Bump	Scale-like cracks on surface
	Scratch	Concave crack due to scratching in rolling direction
	Rolled in material	Dent resulting from pressing against foreign substances such as metal chips
	Over-filled	Defect resulting from continuous indenting in rolling direction

○ **Table 2:** Classification of surface cracks on wire rod⁷

Three dimensions FEM code MSC/Marc Mentat 2008r1 was used in this study. The results of FEM analysis are consistent with the experimental results.

Regardless of whether the foreign material is located in or on the wire, it does not undergo deformation because of its hardness, even if drawing is repeated.

This leads to a high value of D_i/D_o , increasing the drawing stress and increasing the chance of wire breakage.

4 Analysis of a wire drawing with surface cracks

Surface cracks develop on rods or wires because of mishandling during casting, hot rolling, drawing or transport, or because of the improper winding of wires⁶.

The surface cracks that develop on wire rods during upstroke rolling are classified as shown⁷ in Table 2; however, there is no clear solution to this problem. In particular, only a small number of studies have reported on surface cracks formed during drawing⁸⁻¹¹.

In this study, wire rods that developed circumferential cracks during casting and rolling are used as mother wires and drawn repeatedly. The growth and removal of these cracks are examined in the experiments and by FEM analysis.

Stainless steel (SUS304) rod wires were mechanically scratched in the axial direction using a lathe and analysed by experiments and FEM.

Rod wires that were mechanically marked to form V-shaped, concave, and U-shaped cracks in the circumferential direction were used as specimens.

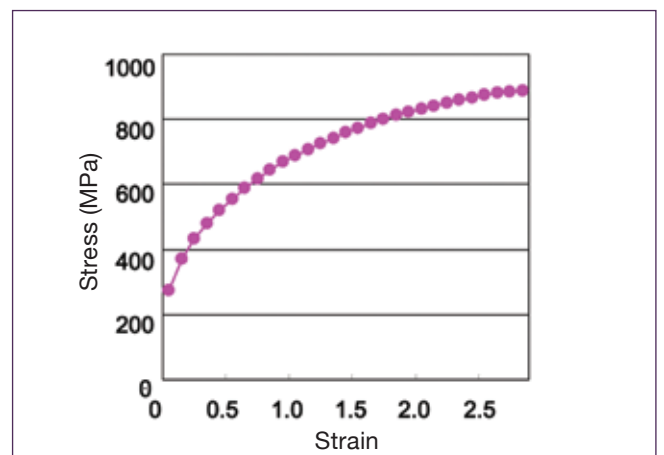
FEM software, MSC/Marc Mentat 2008 R1, was used in this study. Figures 8 and 9 and Table 3 show the model used in the FEM analysis, its material constant and the parameters of the V-shaped crack, respectively. Coefficient of friction(μ) was set at 0.05.

Moreover, the model was assumed to be axis-symmetric in the FEM analysis to save calculation time.

4.1 Comparison of results of experiment and FEM analysis

A crack with a depth of $h=0.8\text{mm}$ (8%) was cut on an 8mm diameter wire and the change in its shape was experimentally and analytically examined after each drawing pass. The initial crack on the mother wire was asymmetrically V-shaped.

○ **Figure 9:** Work hardening diagram of tested stainless steel wire



The shape of the initial crack was observed using a microscope, and a mother wire with a crack of the same shape was modelled in the FEM analysis. It is clear that the FEM analysis result agrees with the experimental result.

As shown in *Figure 10*, the crack appears to be removed because side AB is pushed up into the wire; however, side BC of the crack is tilted so that it overhangs side AB, forming an overlapping crack (defect).

The three-pass drawing of a mother wire with a surface crack was repeated in the experiment and FEM analysis. The obtained crack deformation behaviour for each drawing pass is also shown in *Figure 10*.

4.2 FEM analysis of U-shaped crack deformation behaviour during repeated drawing

Next, a wire with a U-shaped crack was modelled and the drawing process was similarly analysed by finite element analysis.

Figure 11 shows examples of crack deformation behaviour for 10mm diameter wires with a crack of breadth (a)=0.73mm and depth (h)=0.10mm (1%) and with a crack of a =0.73mm and h =0.60mm (6%) during repeated drawing at $\alpha=6^\circ$ and R/P=20%.

As shown in *Figure 11*, under condition I, the bottom of the crack rises during repeated drawing, and thus the surface crack is removed after the first pass.

Under condition II with the greater depth, however, the right side of the crack is tilted so that it overhangs the left side and forms an overlapping crack (defect), indicating that the crack cannot be removed by drawing.

Moreover, a deep crack develops in the wire although it appears to be small.

Namely, the behaviour of the U-shaped crack during drawing depends on the depth (h). The results for the concave and U-shaped cracks were compared.

An overlapping defect develops from the concave crack, regardless of the depth (h), whereas for the U-shaped crack the depth (h) serves as a parameter; that is, the crack with a shallow (h) is removed, but the crack remains on the wire when (h) is greater.

It is considered that the shape of both sides of the crack significantly affects its removal under condition I in *Figure 11*.

5 Conclusion

Wire breakage was investigated using experimentation and finite element method analysis.

A focus was on wire breakages caused by the presence of a foreign substance, in or on the wire, or by transversal cracks that develop on the surface of wires due to the effect of fatigue, inclusions or surface flaws.

The obtained results are summarised below:

- 1) Surface flaws, foreign materials and excessive drawing stress generated by seizing are the causes of wire breaking. However, many of the causes of breakage in wires with a diameter of 50 μ m or less are speculated to be due to the presence of inclusions that are formed during casting

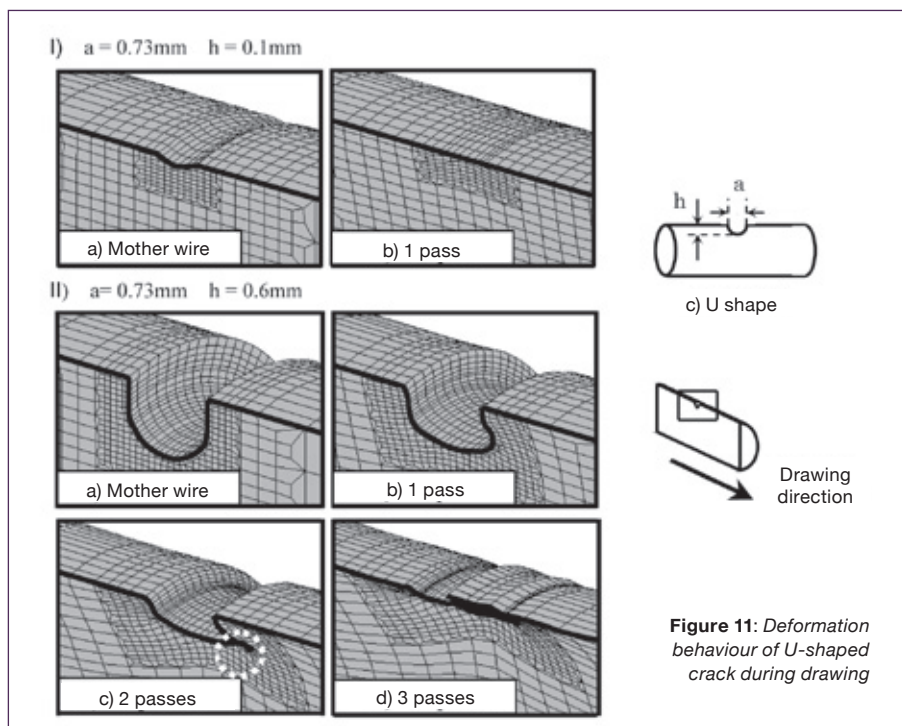
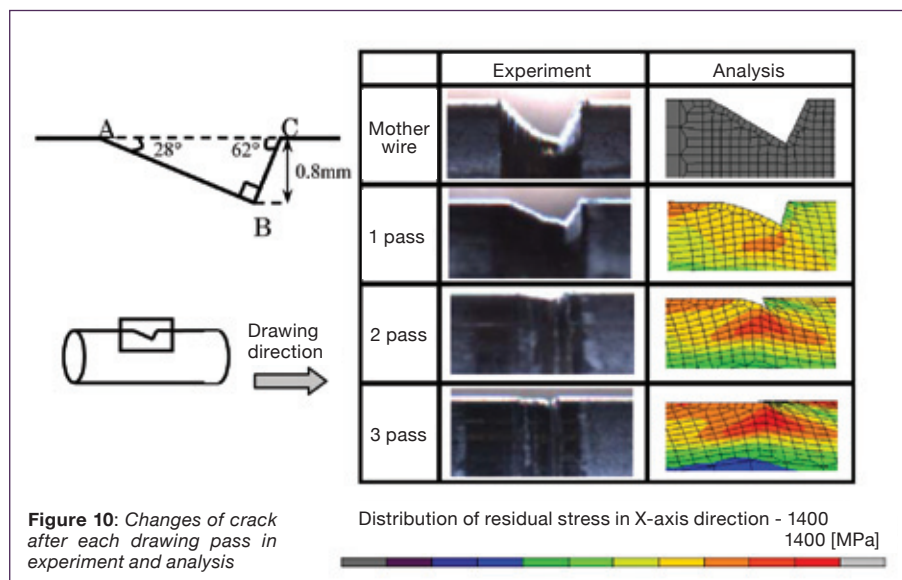


Figure 11: Deformation behaviour of U-shaped crack during drawing

Parameters of crack	
Shape-related parameter	V-shaped, concave shaped, U-shaped cracks
Depth (h)	0.10, 0.35, 0.60, 1.0mm
Breadth (a)	0.73, 0.93, 1.15, 1.40mm
Angle (θ)	60°, 70°, 80°, 90°, 100°, 110°, 120°
Direction	Circumferential direction
Material condition for wire	
Material	SUS304
Young's modulus	206GPa
Diameter	10mm, 8mm
Die half angle, reduction	$\alpha = 6^\circ$, R/P=20%
Friction factor	0.05 μ m

○ **Table 3:** Parameters of crack

- 2) It is thought that there is a danger of wire breakage when D_i/D_o is 0.3 or higher, and that the highest frequency of wire breakage is where D_i/D_o is approximately 0.7. This was found to be because drawing stress moves rapidly upward when an inclusion passes through the die
- 3) The result of FEM analysis agrees with the experimental result; therefore, it is possible to estimate crack deformation behaviour by FEM analysis to predict the state after drawing
- 4) The mechanism underlying the removal of a crack in a wire rod is the rise of the bottom of the crack during drawing
- 5) The behaviour of a U-shaped crack during drawing depends on the depth (h)
- 6) Where there is a greater depth, however, the right side of the crack is tilted so that it overhangs the left side and forms an overlapping crack (defect), indicating that the crack cannot be removed by drawing. Moreover, a deep crack develops in the wire, although it appears to be small

- 10 The Japan Society for Technology of Plasticity, Drawing, Corona Co, Ltd p 14 and p 69
- 11 K Yoshida and Y Shinohara, Prediction of Surface Micro-Defects in Plate Rolling, No 9690, Current Advances in Materials and Processes, 2004, pp 11-14

This paper was presented at Istanbul Cable & Wire '09. It is reproduced here by kind permission of the IWMA and WAI.

References

- 1 H Tanaka et al, "Analysis of copper wire breaks," Furukawadenko-jihou, Volume 59, 1976, pp 91-98
- 2 J Togasi et al, "An analysis of copper wire breaks during drawing," Furukawadenko-jihou, Volume 66, 1979, pp 25-32
- 3 T Yamasita and K Yoshida, "Classification of wire breaks and countermeasures in superfine gold wire drawing," Wire Journal International, March 2005, pp 180-184
- 4 T Yamasita and K Yoshida, "Analysis and prevention methods for wire breaks in ultra-fine gold wire drawing," Wire Journal International, March 2007, pp 200-203
- 5 K Yoshida, "FEM analysis of wire breaks in drawing of superfine wire with an inclusion," Wire Journal International, March 2000, pp 102-107
- 6 The Japan Society for Technology of Plasticity, Drawing, Corona sha Co Ltd 1990, pp 68-73
- 7 Standardization Committee of the Iron and Steel Institute of Japan, Definition of surface crack for steel rods, 1987
- 8 T Shinohara and K Yoshida, Iron and Steel, Volume 90, No 12, 2004, p 31
- 9 T Shinohara and K Yoshida, "Effect of rolling and drawing of rod wires on removal of surface cracks", Wire Journal International, Volume 37, 2004, pp 52-57

Tokai University
Shonan Campus
 4 1 1 Kitakaname,
 Hiratsuka-shi,
 Kanagawa, 259 1292 Japan
Tel: +81 463 58 1211

拉伸线材表面缺陷和线材断裂分析

作者：日本东海大学Kazunari Yoshida、Tetsuo Shinohara、Tsutomu Yamashita和Atsuhiko Tanaka

摘要

本文采用实验和有限元素法（FEM）分析来检测线棒表面裂纹在拉伸过程中是否增长或被去除。通过重复拉伸观察了V-型、凹型和U型横向裂纹的变形行为。作者说明了去除这些横向裂纹、使表面状况达到类似于无裂纹区域状况的条件。

1. 前言

拉伸产生的线材和棒材直径变化范围在10微米到100毫米之间。对于任何线材直径，拉伸发生断裂是对生产力的一种直接影响，而且，线材表面缺陷常造成脆性断裂，机械性能恶化、商品价值损失。这就是为什么用户经常投诉表面缺陷的原因。而且，最近已有用户要求将更细和更长的线材用于医疗装置的半导体焊接线，所以，线材断裂和表面缺陷是必须解决的问题。

已有许多研究者研究了降低拉伸力的最佳模具形状，以防线材发生内部裂纹（由于形成中心断裂缺陷或纵裂纹），还研究了最佳润滑剂 - 降低残余应力的措施，等等。已经获得了有用的发现，但对防止线材断裂的措施、杂质影响和表面缺陷的研究却很少^{1,4}。

本研究检测不同直径被拉伸线材的线材断裂原因。对具有表面缺陷和杂质的线材进行了实验分析，并通过有限元素法（FEM）来确定表面缺陷和杂质是否会造成线材断裂或在重复拉伸过程中仍然是表面缺陷。

2. 拉伸造成的线材断裂类型

最近，由于进行了有效的材料清洗，改进了拉伸了条件，从而减少了棒材和线材中的微粒隔离和杂质，使得拉伸时发生线材断裂的情况大大降低。但是，线材直径越细，拉伸时线材断裂频率就越高。

造成线材断裂的原因有几种（图1）。杂质会造成两种类型的断裂：一种发生在断裂表面有杂质时，另一种被称为“空心端”断裂，发生在有微量内凹杂质时，但未发现杂质本身。

有两种断裂是由加工期间引入的外来物质而不是铸造工艺造成的：一种被称为“污染”断裂，此时在断裂表面发现外来物质，另一种被称为“冲压空心”断裂，此时没有发现外来物质。另外，“分离端”断裂也被视为由表面缺陷造成的，而且“张力”断裂是由施加的应力强于线材强度造成的⁵。

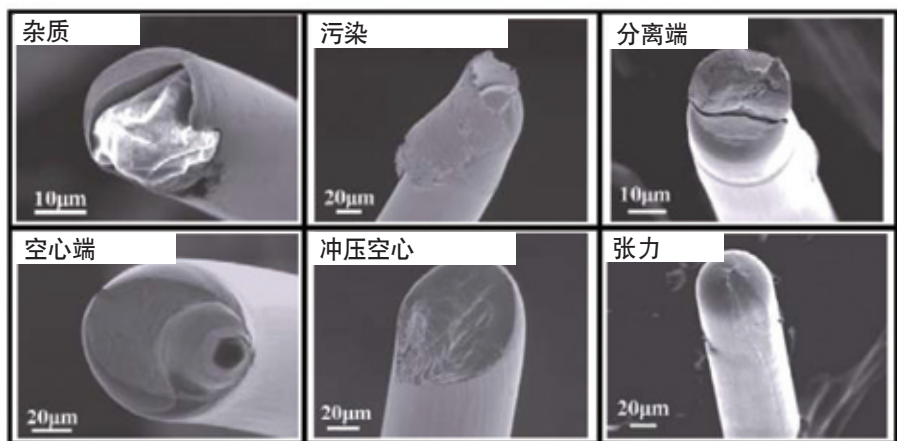


图1: 线材断裂类型

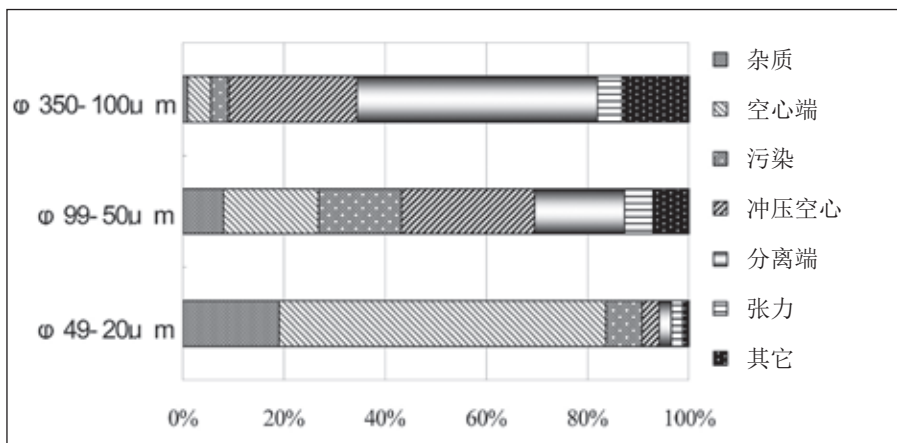


图2: 拉伸黄金超细丝时线材断裂原因百分比

还检测了拉伸黄金焊接线时出现的线材断裂类型。图2显示发生每种类型的线材断裂的频率，此图中，将被拉伸线材直径分为三组：100-350微米、50-99微米和20-48微米⁴。

图1和图2显示因表面缺陷、外来物质、因卡死造成的过度拉伸应力而造成的线材断裂。但猜测直径小于50微米的线材发生断裂的许多原因源于线材铸造期间形成的线材内部杂质⁵。根据以上考虑，可以得出结论，对于能够阻止拉伸时发生断裂的线材，它们应当没有表面缺陷和任何杂质，应当是尽可能小和少。

3. 对含有杂质或外来物质的线材拉伸的FEM分析

3.1 线材内部杂质的影响

线材中的大多数杂质是硬的物质。线材断裂表面杂质能谱仪（EDS）分析结果表明：它们中有许多是Al₂O₃或SiO₂，其余的是与模具和设备摩擦时形成的外来物质。

所以，假设线材中有铝杂质和外来物质，对线材拉伸进行了FEM分析，设定杂质大小与线材直径比 D_i/D_0 为0.3到0.7。FEM的材料常数和拉伸条件如表1所示。

FEM分析检测了大小杂质不同的各种线材在模具内侧拉伸应力的变化。结果如图3所示。发现杂质通过模具时拉伸应力快速上升。可以发现：杂质大小和线材直径比 D_i/D_0 越大，拉伸应力上升越多。如果线材含有杂质，其 D_i/D_0 是0.7，那么拉伸应力达到线材强度，这意味着线材断裂的可能性很高。考虑到安全系数，认为 D_i/D_0 比高于0.4时有线材断裂的危险。当拉伸直径为20-50微米黄金丝时，测量了断裂表面杂质大小。图4显示了不同 D_i/D_0 比时的线材断裂频率。这个数据表明： D_i/D_0 为0.3和以上时，线材有断裂的危险，当 D_i/D_0 接近0.7时断裂频率最高。

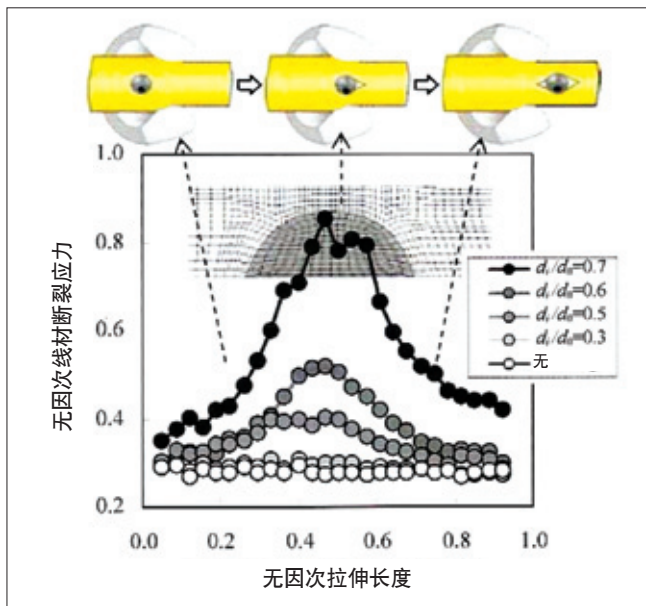


图3: 杂质通过模具时拉伸应力的变化 (由FEM (R/P=10%) 测量)

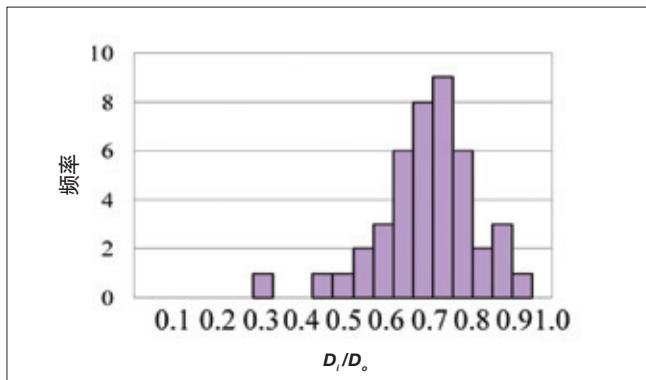
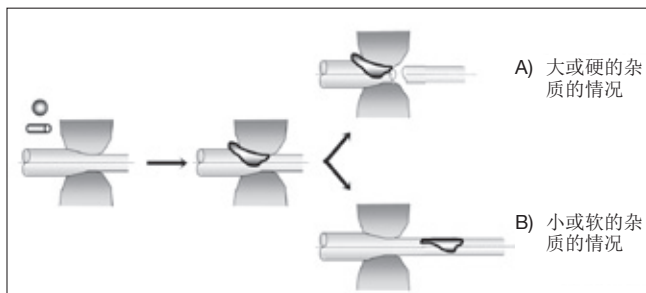


图4: 线材断裂频率与 D_i/D_0 的关系

图5: 外来物质造成的线材断裂示意图



3.2 外来颗粒的影响

在有些情况下，在拉伸时，外来物质存在于线材表面，或者外来物质可能通过润滑剂进入模具。这些外来物质主要由线材或模具或设备侵蚀形成，或可能源于空中灰尘。根据外来物质形状和硬度，可能发生的线材断裂如图5所示。

例如，图6显示线材表面有外来物质的线材拉伸后的扫描电子显微镜 (SEM) 图像和EDS照片。线材材质是奥氏体不锈钢。

EDS分析表明：外来物质由碳化铁组成，它包括微量Ni成分，大小是 $0.53 \times 0.27 \text{mm}$ ， D_i/D_0 约为0.2，假设线材因为 D_i/D_0 低而没有断裂。图7显示了拉伸表面附近有外来物质的线材时的FEM分析结果。

在外来物质和线材的内表面，它们是机械熔接。在重复拉伸后，应力对内表面产生作用，并造成界面分离，产生空的空间。

此研究使用了三维FEM MSC/Marc Mentat 2008r1。FEM分析结果与实验结果一致。不管外来物质是否在线材内部或表面，它都因为硬度而不发生变形，即使重复拉伸也是如此。这导致一个高的 D_i/D_0 值，增加了拉伸应力，也增加了线材断裂的机会。

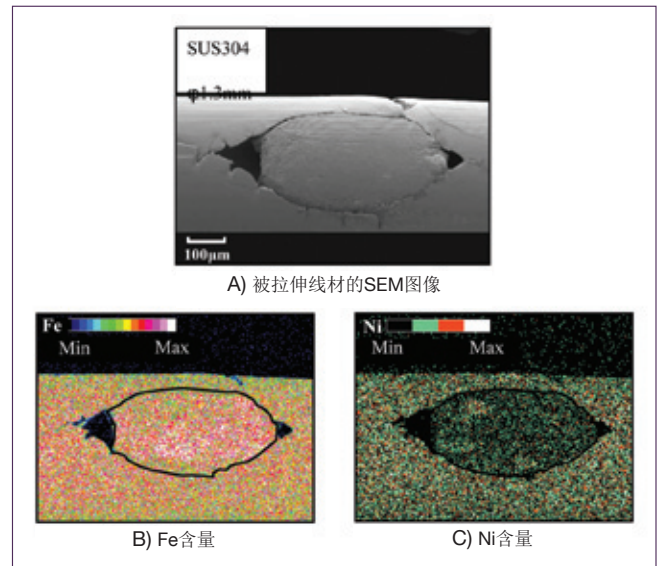


图6: 含外来物质的线材的SEM图像和成分分析

表1: FEM检测用的材料和拉伸条件

黄金机械常数	
杨氏模量	80GPa
泊松比	0.44
加工硬化曲线	$\sigma = 475e^{0.07}$
杂质的材质条件	
材质	Al_2O_3 , SUS304
杨氏模量	300, 194GPa
泊松比	0.23, 0.30
屈服应力	4.3, 0.205GPa
模具半角, 减少	$\alpha = 7^\circ$, R/P=10%
摩擦系数	0.05 μm

4. 表面有裂纹的线材拉伸分析

铸造、热轧、拉伸或运输操作失误造成的、或因卷绕不当造成的线材和棒材上的表面裂纹将进一步发展⁶。

线棒在升程轧制期间造成的表面裂纹的分类如表2所示⁷；但对这个问题没有明确的解决方案。尤其是，只有少量研究报告了拉伸形成的表面裂纹⁸⁻¹¹。

在此研究中，铸造和轧制时形成的具有圆周裂纹的线棒被用作母材，并被重复拉伸，实验检测了这些裂纹的增长和去除，并进行了FEM分析。

用车床在轴向机械划痕不锈钢（SUS304）线棒，并用实验和FEM进行分析。在棒线上作机械标记，在圆周方向形成V型、内凹和U型裂纹，用作样品。

FEM软件MSC/ Marc Mentat 2008 R1, 此研究使用了FEM软件MSC/Marc Mentat 2008 R1。在此研究中，图8、图9和表3分别显示了FEM分析所使用的模型、其材料常数和V型裂纹参数。

将摩擦系数（ μ ）设定为0.05。而且在FEM分析中假设模型是轴对称的，以节约计算时间。

4.1 实验和FEM分析结果比较

在一根8毫米直径线上刻一个深度 $h=0.8\text{mm}$ （8%）的裂纹，在每个拉伸通道后，实验和分析检测其形状变化。母材线材上的初始裂纹为不对称V型。

用显微镜观察了初始裂纹形状，在FEM分析中建立了具有相同形状裂纹的母线材模型。显然，FEM分析结果与实验结果一致。如图10所示，裂纹看来被去除，因为AB侧被向上推入线材，但是，裂纹的BC侧背却倾斜，从而挂在AB侧，形成一个叠加裂纹（缺陷）。

在实验中和FEM分析中重复对具有表面裂纹的母线材进行三通道拉伸。每个拉伸通道获得的裂纹变形行为如图10所示。

4.2 重复拉伸时U型裂纹变形行为的FEM分析

接着，建立具有U型裂纹线材的模型，并用有限元素分析队拉伸过程进行了类似的分析。

表2: 线棒表面裂纹分类⁷

外观	名称	形态和性能
	结痂	叶状标志；棒表面为擦裸
	横向裂纹	裂纹垂直于轧制方向
	凸块	表面鳞状裂纹
	划痕	轧制方向划痕造成的内凹裂纹
	轧入材料	金属屑之类的外来物质冲压造成内凹
	过度填充	轧制方向连续内凹造成的缺陷

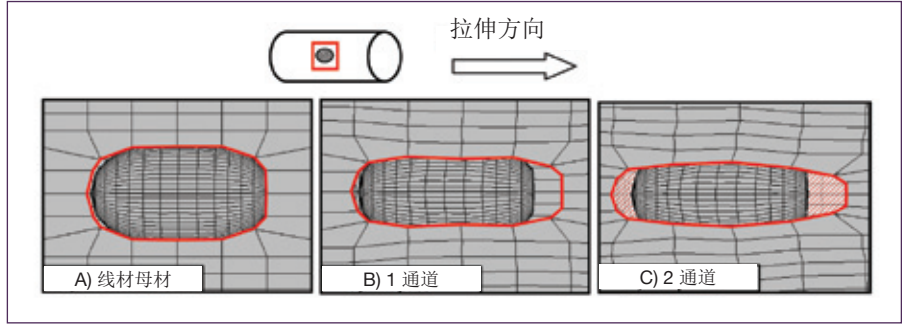


图7: FEM检测的表面含外来物质的线材经重复拉伸后的丝网变形

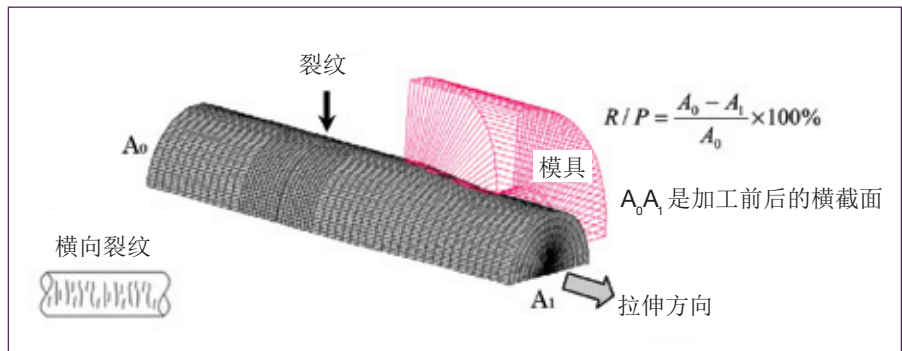


图8: 线材拉伸模型

图11显示在 $\alpha=6^\circ$ 、 $R/P=20\%$ 重复拉伸10毫米直径线材时，其上面宽度 $(a)=0.73\text{mm}$ 、深度 $(h)=0.10\text{mm}$ （1%）的裂纹以及 $a=0.73\text{mm}$ 、 $h=0.60\text{mm}$ （6%）的裂纹的变形示例。

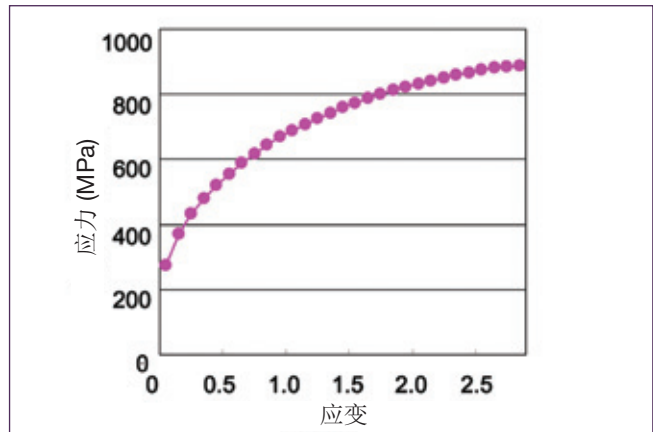
如图11所示，在条件I情况下，裂纹底部在重复拉伸时上升，这样，表面裂纹在第一通道后被去除。

在条件II情况下，裂纹更深一些，但裂纹右侧倾斜，与左侧重叠，形成重叠裂纹（缺陷），说明拉伸不能去除裂纹，而且，尽管裂纹看上去比较小，但向纵深发展。也就是说，U型裂纹在拉伸时的表现取决于深度 (h) 。

比较了内凹和U型裂纹的结果。重叠缺陷从内凹裂纹开始发展，不管深度 (h) 是多少，因为U型裂纹深度 (h) 是一个参数，即去除了有内凹的裂纹，但当 (h) 较大时，裂纹仍在线材上。

在图11条件I下，裂纹两侧形状对裂纹的去除具有重大影响。

图9: 被测不锈钢丝加工硬化图



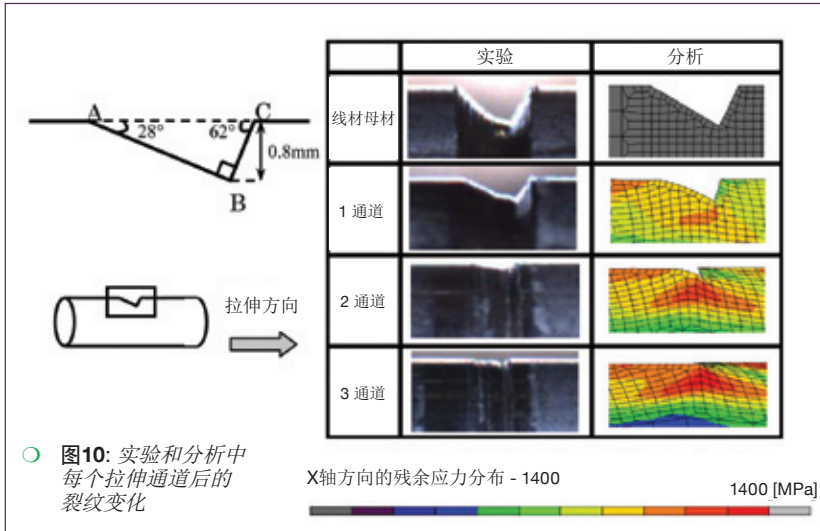


图10: 实验和分析中每个拉伸通道后的裂纹变化

X轴方向的残余应力分布 - 1400

1400 [MPa]

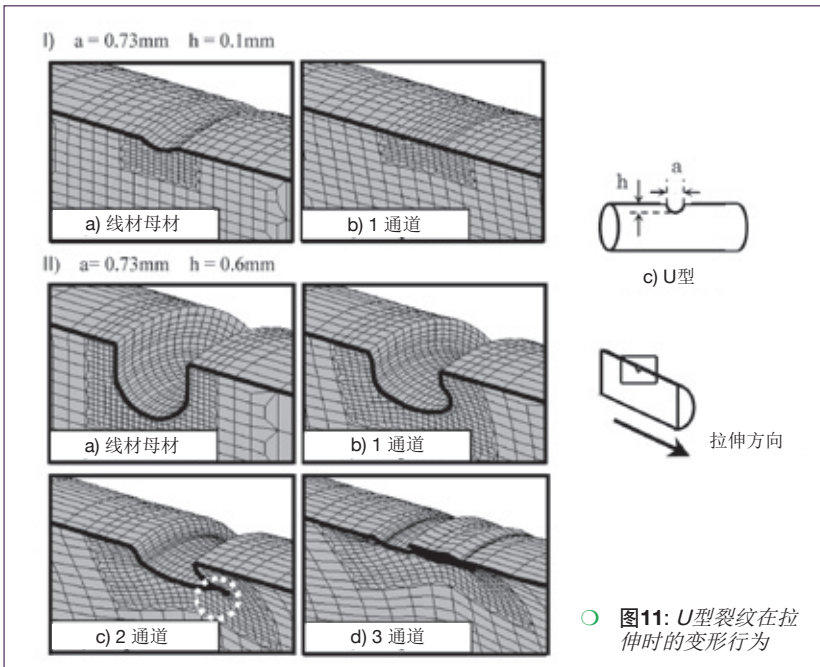


图11: U型裂纹在拉伸时的变形行为

表3: 裂纹参数

裂纹参数	
与形状相关的参数	V型、内凹型、U型裂纹
深度 (h)	0.10, 0.35, 0.60, 1.0mm
宽度 (a)	0.73, 0.93, 1.15, 1.40mm
角度 (θ)	60°, 70°, 80°, 90°, 100°, 110°, 120°
方向	圆周方向
线材材质条件	
材质	SUS304
杨氏模量	206GPa
直径	10mm, 8mm
模具半角, 降低	$\alpha=6^\circ$, R/P=20%
摩擦系数	0.05 μ m

5. 结论

采用实验和有限元素法分析调查了线材断裂, 着重于线材表面或内部的外来物质造成的线材断裂、或由于脆性效应、杂质或表面缺陷而在线材表面发展的横向裂纹造成的线材断裂。对获得的结果小结如下。

- 1) 表面缺陷、外来物质和因卡死产生的过度拉伸应力是线材断裂的原因。但由于铸造时造成的杂质, 对直径50微米或以下线材断裂的许多原因是猜测的。
- 2) 当 D_i/D_o 比为0.3或以上时, 有线材断裂的危险, 而且, D_i/D_o 约为0.7时线材断裂频率最高。发现这个是因为杂质通过模具时拉伸应力快速上升。
- 3) FEM的结果与实验结果一致。所以, 通过FEM分析有可能估计裂纹变形行为, 预测了拉伸后的状态。
- 4) 线材棒裂纹的去除机理在于拉伸时裂纹底部的上升。
- 5) 拉伸时U型裂纹的表现取决于深度(h)。
- 6) 但在裂纹深度较大的地方, 裂纹右侧倾斜, 与左侧重叠, 形成重叠裂纹(缺陷), 说明拉伸不能去除裂纹, 而且, 深度裂纹在线材中发展, 尽管看上去是小的。

6. 参考文献

- 1 H Tanaka et al, "Analysis of copper wire breaks," Furukawadenko-jihou, Volume 59, 1976, pp 91-98
- 2 J Togasi et al, "An analysis of copper wire breaks during drawing," Furukawadenko-jihou, Volume 66, 1979, pp 25-32
- 3 T Yamasita and K Yoshida, "Classification of wire breaks and countermeasures in superfine gold wire drawing," Wire Journal International, March 2005, pp 180-184
- 4 T Yamasita and K Yoshida, "Analysis and prevention methods for wire breaks in ultra-fine gold wire drawing," Wire Journal International, March 2007, pp 200-203
- 5 K Yoshida, "FEM analysis of wire breaks in drawing of superfine wire with an inclusion," Wire Journal International, March 2000, pp 102-107
- 6 The Japan Society for Technology of Plasticity, Drawing, Corona sha Co Ltd 1990, pp 68-73
- 7 Standardization Committee of the Iron and Steel Institute of Japan, Definition of surface crack for steel rods, 1987
- 8 T Shinohara and K Yoshida, Iron and Steel, Volume 90, No 12, 2004, p 31
- 9 T Shinohara and K Yoshida, "Effect of rolling and drawing of rod wires on removal of surface cracks", Wire Journal International, Volume 37, 2004, pp 52-57
- 10 The Japan Society for Technology of Plasticity, Drawing, Corona Co, Ltd p 14 and p 69
- 11 K Yoshida and Y Shinohara, Prediction of Surface Micro-Defects in Plate Rolling, No 9690, Current Advances in Materials and Processes, 2004, pp 11-14

Tokai University
Shonan Campus
 4 1 1 Kitakaname,
 Hiratsuka-shi,
 Kanagawa, 259 1292, Japan
 电话: +81 463 58 1211



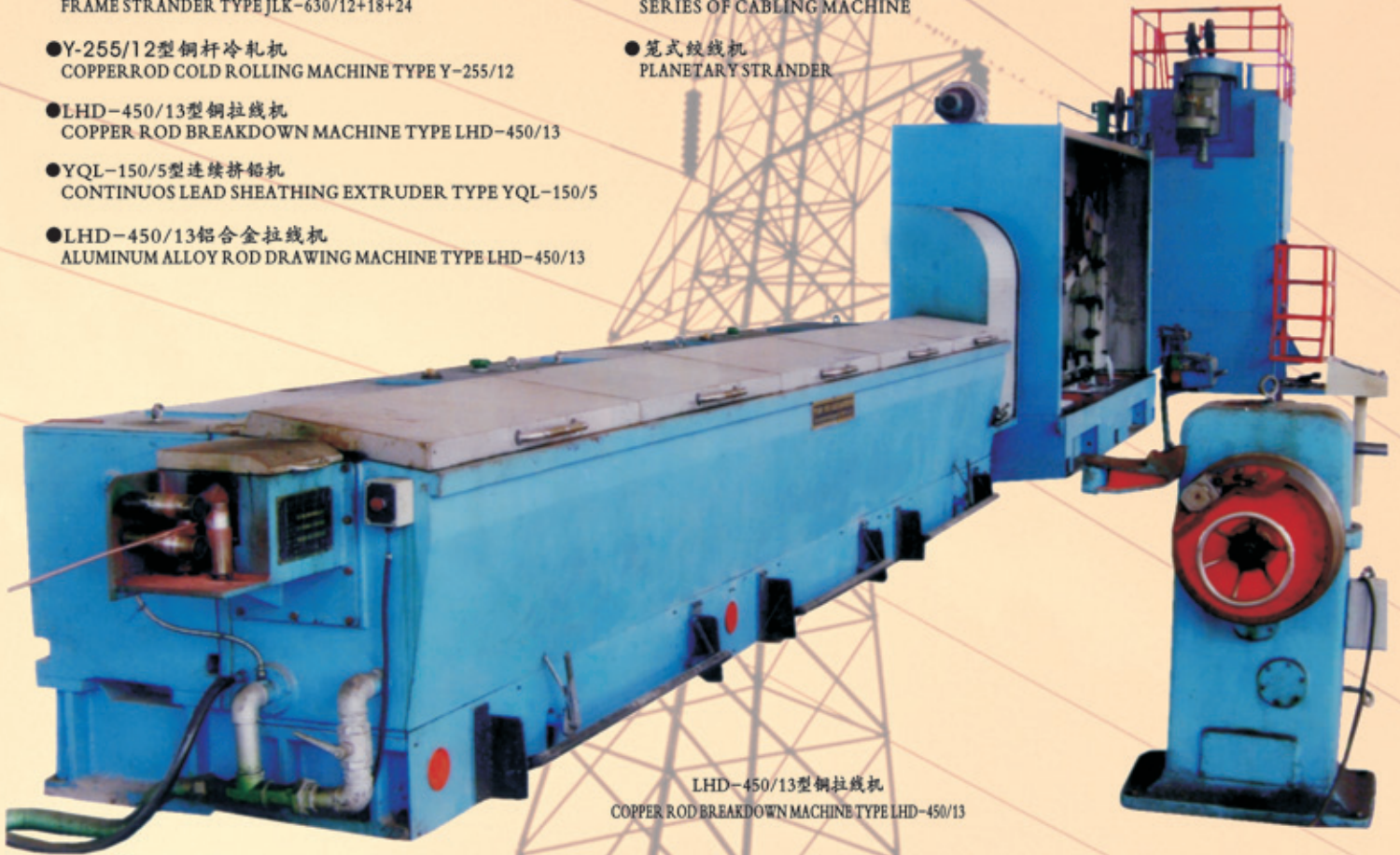
伊東新 (德陽) 纜纜設備有限公司

ITO-SIN (DEYANG) WIRE & CABLE EQUIPMENT CO., LTD.

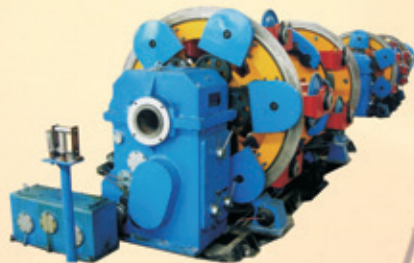
专业制造:

PROFESSIONAL MANUFACTURE:

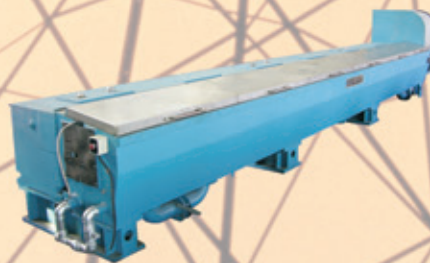
- 双盘收线机
DUAL TAKE-UP
- 管式绞线机
TUBULAR STRANDER
- 铝杆复绕机
ALUMINUM ROD REWINDER
- JLK-630/12+18+24型框式绞线机
FRAME STRANDER TYPE JLK-630/12+18+24
- Y-255/12型铜杆冷轧机
COPPER ROD COLD ROLLING MACHINE TYPE Y-255/12
- LHD-450/13型铜拉线机
COPPER ROD BREAKDOWN MACHINE TYPE LHD-450/13
- YQL-150/5型连续挤铅机
CONTINUOUS LEAD SHEATHING EXTRUDER TYPE YQL-150/5
- LHD-450/13铝合金拉线机
ALUMINUM ALLOY ROD DRAWING MACHINE TYPE LHD-450/13
- LGZ-1500/Y型铝杆连续铸造轧生产
ALUMINIUM ROD CONTINUOUS CASTING & ROLLING LINE TYPE LGZ-1500/Y
- LHD-450/13型铜拉线机退火装置
ANNEALER FOR COPPER ROD BREAKDOWN MACHINE TYPE LHD-450/13
- 上引法无氧铜杆连续铸造生产
COPPER ROD UPWARD CONTINUOUS CASTING LINE
- 成缆机系列
SERIES OF CABLING MACHINE
- 笼式绞线机
PLANETARY STRANDER



LHD-450/13型铜拉线机
COPPER ROD BREAKDOWN MACHINE TYPE LHD-450/13



成缆机系列
SERIES OF CABLING MACHINE



LHD-450/13铝合金拉线机
ALUMINUM ALLOY ROD DRAWING MACHINE TYPE LHD-450/13



YQL-150/5型连续挤铅机
CONTINUOUS LEAD SHEATHING EXTRUDER TYPE YQL-150/5



公司地址、四川工厂地址: 德阳市八角工业园区桂江街
 电话: (0838) 2603520 传真: (0838) 2601065
 上海工厂地址: 金山区山阳镇朱山路363号
 电话: (021) 57244217 传真: (021) 57244317
 上海办事处地址: 交通西路129弄5号101室
 电话: (021) 56085484 传真: (021) 56095586

ADD: BAJIAO INDUSTRIAL ESTATE, DEYANG,
 SICHUAN 618000, CHINA.
 TEL: +86 838 2601060/2823721, FAX: +86 838 2601065
 website: www.ito-sin.com
 E-mail: xsl@itosin.cn, mail@itosin.cn
 Guangzhou office Tel: +86 20 87376167 Fax: +86 20 87376165
 Shanghai office Tel: +86 21 56085484 Fax: +86 21 56095586



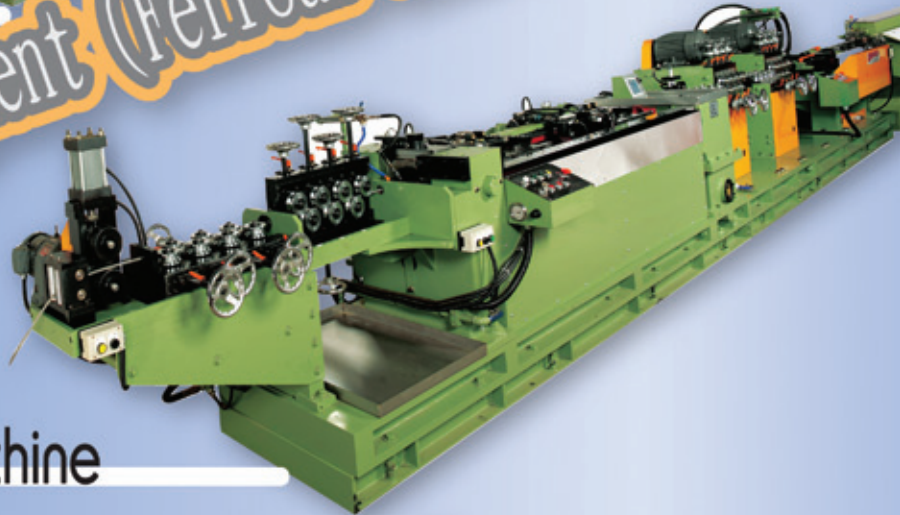
13 - 15 Sept 2011
BITEC • Bangkok • Thailand

Hall 104 - E25

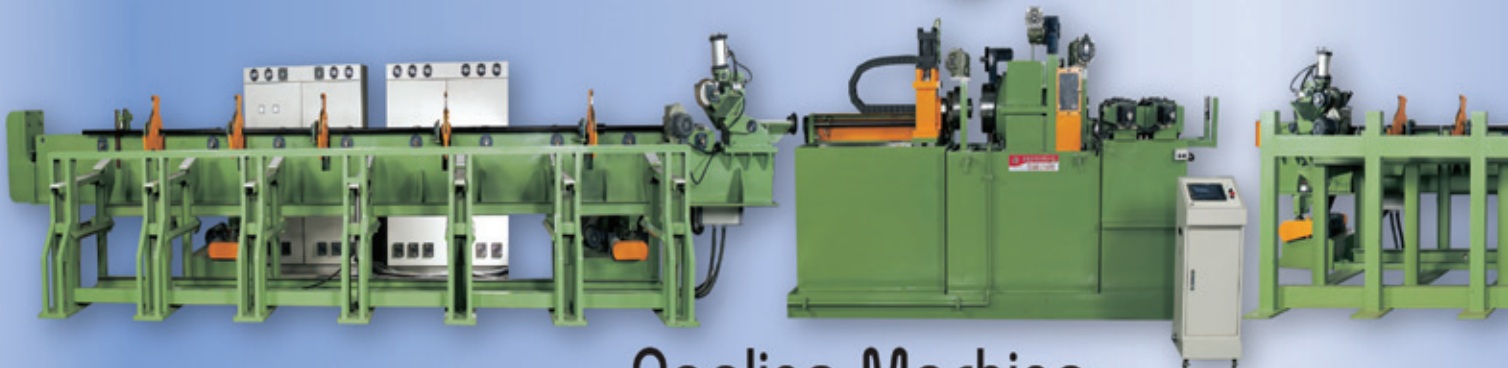


Flat Rolling Mill

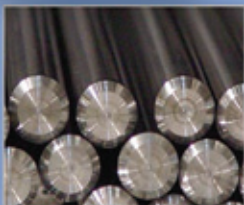
Cold Draw Bar Equipment (Ferrous and Non Ferrous)



Combined Drawing Machine



Peeling Machine



SHENG CHYEAN

省權實業股份有限公司

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

可依照客戶需求規格製作

Website: www.tw-sc.com.tw Youtube: <http://goo.gl/byedy>

Email: chyuan168@mail2000.com.tw

Tel: +886-4-7588533 Fax: +886-4-7588500

Address: No. 217-1, Yu-Pu RD., Yu-Pu Village, Hsienhsi, Changhua, Taiwan

