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International Conference **CabWire World Conference 2011** Congress Center Düsseldorf, Germany 7-8 November 2011

- 1101 **Double twist stranding lines** S Gorgells, Niehoff, Germany
- 1102 **Forming of fluor polymers** K Prem, Rosendahl Maschinen, Austria
- 1103 **Advanced technology in wire & cable manufacturing**
G Albertazzi, SAMP SpA-Sampsistemi Division, Italy
- 1104 **Extended quality control of cable insulation by colour measurement during extrusion** H Scheid, Siebe Engineering, Germany
- 1105 **Improvements in steel industry: cost control; defect reduction; general product improvements; drawability (without acid cleaning); higher tensiles; shorter lead times and innovation**
S Bullas, Tata Steel Europe, UK
- 1106 **Effect of boron alloying on microstructural evolution and mechanical properties of high carbon wire**
E De Moor, Colorado School of Mines, USA
- 1107 **Manufacturing highly loadable helical springs through optimisation of tempering processes in both spring wire and spring production**
R Lux, Ilmenau University, Germany
- 1108 **Optimisation of spring designs**
M Hayes, Institute of Spring Technology, UK
- 1109 **Determining of parameters characterising the functional behaviour of spring steel wire in helical springs** V Geinitz, Ilmenau University, Germany
- 1110 **New developments and trends in automotive wires**
K Probst, Leoni, Germany
- 1111 **Production of PV ribbon for photovoltaic panels: overview of product specifications and comparison of production processes**
I Rogelj, Plasmait, Austria
- 1112 **Latest measuring and control technology for high-voltage cable production** H Prunk, Sikora, Germany
- 1113 **Latest developments in cable design technology** A Shehab, Cimteq, UK
- 1114 **The individual development of shaving technology by Kieselstein**
J Kieselstein, Kieselstein GmbH, Germany
- 1115 **Quality of spring wire** T Voss, Koch, Germany
- 1116 **Strand compaction in steel wire ropes**
A G Stacey, Stonepark Consultancy, UK
- 1117 **Major improvements in galvanising heating systems**
R Branders, FIB, Belgium
- 1118 **Energy Saving** B Lohmueller, Niehoff, Germany
- 1119 **Latest technology for optical fibre coating and identification**
K Descovich, Medek & Schorner, Austria
- 1120 **Integrated solution for pv ribbon application which comprises cold rolling mill, cleaning unit and induction annealer**
S Nixdoff, Buehler-Wuerz Kaltwalztechnik GmbH, Germany
- 1121 **Fighting counterfeit cables** P Smeeth, Approved Cables Alliance, UK
- 1122 **Metal tape forming and welding line for MV, HV & EHV power cables**
E Altmann, Rosendahl Maschinen, Austria
- 1123 **Achieving optimal economy in the production of wire and cables by perfectly produced & reconditioned drawing die tools**
K Eder, Eder Engineering GmbH, Austria
- 1124 **High speed and quality in wire forming processes**
S Fries, Wafios AG, Germany
- 1125 **Fatigue test methods of high value wire products beyond basic static validation** P van Bogaert, Bogimac nv, Belgium
- 1126 **Butt and cross wire welding as exemplified by industrial mesh and fences**
J Gerlitzki, Ideal, Germany
- 1127 **New coldforming technologies for the fastener industries**
J Eisele, Wafios AG, Germany
- 1128 **A new generation of lubricants & accessory products for wire drawing, free from substances that are potentially harmful or dangerous to persons & the environment** G Arrighetti, Technova, Italy

International Conference **Istanbul Cable & Wire 2009** WOW Hotels Conventions Center, Istanbul, Turkey 2-3 November 2009

- 0901 T Manabe, S Yamasaki, Nippon Steel, Japan: **Development of high strength steel wire rod for bridge cable wire with 1870 N/mm**
- 0902 M Hayes, Institute of Spring Technology, UK: **On the risk of fatigue in extension spring hooks**
- 0903 K Liebermann, U Kletzin, P Beyer, Ilmenau University, Germany: **Wiredrawing Machines and their influence on the properties of spring steel wire**
- 0904 D Tan, Sinosteel Zhengzhou Research/Fasten Group, China: **Development of high strength steel wire products**
- 0905 C Coffin, D King, H Depamelaere, W Van Raemdonck, NV Bekaert SA, Belgium: **Evaluation of high temperature behaviour of Zn and ZnAl coatings on core wires and strands for ACSR, ACSS and alike overhead power conductors**
- 0906 M West, I Zoellner, Capegate, South Africa: **Overview of zinc coating monitoring system achievements**
- 0907 Dr H-J Büchner, IKB Deutsche Industriebank AG, Germany, Keynote Speech: **Recovery of the world economy: consequences for capacities and prices of metals**
- 0908 G Arrighetti, Koner SpA, TKT Group, Italy: **A new system for laboratory experimentation for the profile, geometry and degree of finish of a die for optimum wiredrawing of ferrous wires**
- 0909 J Burke, Chemetall, UK: **New technology for lubricating cold extrusion materials and cold heading wire**
- 0910 E Bucci, Henkel Italia SpA, Italy: **Bonderlube FL – a new way to approach surface treatment**
- 0911 L Facchinelli, GCR Eurodraw SpA, Italy: **Integrated one-step high-speed production line for 'low relaxation' PC wire**
- 0912 R Branders, FIB Belgium SA, Belgium: **Quenching in fluidized bed for high carbon wire from 0.6 to 14mm**
- 0913 J Inhelder, FMS, Switzerland: **History, present situation and future trends in ensuring constant and consistent wire tension in stranders**
- 0914 H Cayci, Sarkuysan, Turkey: **Introduction and non-ferrous market overview**
- 0915 M Nordman and J C Bodington, Upeast Oy, Finland: **Aluminium wire rod produced with Upcast technology**
- 0916 W Bachmann, Niehoff, Germany: **Reducing production costs while improving quality – from multiwire to high quality strands**
- 0917 A Tepiroğlu, Sarkuysan, Turkey: **Leonardo power quality initiative – LPQI and Leonardo energy as applied to Turkey**
- 0918 T Journeaux, Prysmian, UK: **Fire performance of cables**
- 0919 P Laurensen, Borealis Polymers NV, Belgium, J-O Bostrom, Borealis AB, Sweden: **High productivity and reliability of XLPE insulated medium-voltage cables**
- 0920 A Molloy, D Lee, Metalube Ltd, UK: **Anti corrosion grease for overhead line conductors**
- 0921 S Harrington, Ceeco Bartell Machinery Systems LLC, Canada: **Reducing cost in manufacturing compact conductors using roll form stranding**
- 0922 G Albertazzi, Sampsistemi, Italy: **New technology in wire production**
- 0923 Stuart Duff, Kuwait Petroleum International Lubricants, Q8Oils, UK: **Productivity, how do you measure it?**
- 0924 S Ozaltun, Er-Bakir, Turkey: **Development of an apparatus for determining the free tin thickness on tin plated copper wire**
- 0925 D Mangold, CeramTec AG, Germany: **Ceramics in the wiredrawing process**
- 0926 T Knych, A Mamala, P Uliasz, AGH University, Poland: **Heat-resistant parameters of AlZr electrical alloy wires for HTLS conductors**
- 0927 K Yoshida, T Shinohara, Tokai University, Japan: **Analysis of surface flow on drawn wire**

International Conference
Wire Bologna 2007
Boscolo Hotel & R+Tower, Bologna, Italy
5-7 November 2007

- 0721 **“Optimization of strength and forming behavior of SiCr-alloyed oil hardened spring steel wire”** by: Kersten Liebermann, Hans-Jürgen Schorcht, Mathias Weiß, and Ulf Kletzin, Ilmenau Technical University, Germany
- 0722 **“Development of ultra high-strength wire for offshore applications”** by: Andrew Bell, Shaun Hobson, and John Wilkinson, Corus, and Chris O’Connor and Sara Sefton, Bridon International Ltd., UK
- 0723 **“Simulation of temperatures in the wire drawing process”** by: Magnus Jarl and Henrik Överström, Örebro University, Sweden
- 0724 **“Modern machines for production of steel strand and rope with direct cabling and indirect double-twist cabling”** by: Alberto Cervino, GCR Eurodraw SpA, Italy
- 0725 **“One-step coating for cold heading operation”** by: Emilio Bucci and Paolo Giordani, Henkel, Italy
- 0726 **“Critical evaluation of full lock coil ropes in cage and skip winders in a uranium mine based on nondestructive observation”** by: Debasish Basak, Central Institute of Mining and Fuel Research, and Srimanta Pal, Indian Statistical Institute and Dipak Chandra Patranabis, Jadavpur University, India
- 0727 **“Advanced semi-automatic straightening technology”** by: Marcus Paech, Witels Apparate-Maschinen Albert GmbH, Germany
- 0728 **“New developments in Upcast®”** by: Matti Nordman, Upcast Oy, Finland
- 0729 **“Effects of high-pressure descaling and alcohol on the rod surface quality”** by: Selami Elbasi and Halil Göker, Er-Bakir, Turkey
- 0730 **“Copper alloy wires—applications, technical requirements and modern production methods”** by: Bernd Lohmüller, Maschinenfabrik Niehoff GmbH & Co. KG, Germany
- 0731 **“PVC improvement: a new range of eco-compounds”** by: Claudia Attanasio and Laura Colloca, B&B Compounds, Italy
- 0732 **“Large size double-twist stranders for MV cables of up to 61 wires”** by: Giovanni Cecchini-Manara, OM Lesmo SpA, Italy
- 0733 **“Plasma: a clean and cost-effective alternative to chemical and heat treatment”** by: Igor Rogelj, Plasmait GmbH, Austria
- 0734 **“The evolution of lubricant recovery for dry draw operations”** by: Roy Warner, Envirotec Consultancy Ltd., USA
- 0735 **“Steel patenting technology in the manufacture of steel tire cord”** by: Thomas W. Tyl, Tire Wire Technology, LLC, USA
- 0736 **“Zinc-aluminum coating: management of Galfan® lines”** by: René Branders, Le Four Industriel Belge SA, Belgium, and Andrew Stacey, Stonepark Consultancy Ltd, UK
- 0737 **“Wire pull control improvements on skip stranding machines through electrical system”** by: Giovanni Pirovano, Continuous-Properzi SpA, Italy
- 0738 **“Effect of drawing in sigmoidal, concave, convex and conical dies on mechanical properties of high carbon steel wires”** by: Bartłomiej Pikos, Jan W. Pilarczyk, Bogdan Golis, and Rafał Wludzik, Czestochowa University of Technology, Poland, and Jan Krnac, Zelezarny a Dratovny Bohumin, Czech Republic
- 0739 **“The future of wiredrawing”** by: Giancarlo Arrighetti, TKT Group, Italy
- 0740 **“Evaluation of hydrogen embrittlement susceptibility of PC wires”** by: Shingo Yamasaki, Seiki Nishida, Daisuke Hirakami, and Toshimi Tarui, Nippon Steel Corp, Japan
- 0741 **“Test and evaluation of tempered bead wire in the cold drawing process”** by: Chu Shaojun, Xin Cheng, and Zhai Dan, University of Science and Technology Beijing, & Zeng Guozhen and Cao Xiaofeng, Shandong Tianlun Steel Wire Co., Ltd., China
- 0742 **“The advantages and importance of lubricant filtration”** by: Olaf Greshake, Reber Systematic GmbH & Co. KG, Germany
- 0743 **“Precision applied ceramics in the wiredrawing industry”** by: Dieter Mangold, CeramTec AG, Germany
- 0744 **“Non-contact speed and length measurement for wire and cable”** by: Danny Buelens, Proton Products Europe NV, Belgium
- 0745 **“Evaluation of motor winding insulation performance under pulse wave-forms through electrical measurements”** by: Andrea Cavallini, Davide Fabiani, & Gian Carlo Montanari, University of Bologna, Italy
- 0746 **“Technical and technological solutions adopted by Sampsistemi to reduce energy consumption along wire and cable production lines”** by: Enrico Conte, Sampsistemi, Italy
- 0747 **“Cable marking systems and news in optical fiber coating systems”** by: Werner Lichtscheidl, Medek & Schoerner GmbH, Austria
- 0748 **“Concept for material saving and quality optimization on jacketing and insulating lines”** by: Cornelia Fischer, Sikora Italia, Italy
- 0749 **“Fire refined copper rod production in a clean environment”** by: Giulio Properzi and Vladimir Djukic, Continuous-Properzi SpA, Italy
- 0750 **“The construction of a submarine interconnection between Sardinia and the Italian mainland”** by: Fabio Bocchi, Prysmian Cables & Systems, Italy
- 0751 **“The influence of alloying elements on the microstructure of pearlitic steels”** by: Choong Yeol Lee, POSCO, South Korea

Joint IWMA & ITA Seminar
Non-Ferrous Bangkok
Bangkok International Trade & Exhibition Centre,
(BITEC), Thailand
17 October 2007

- 0708 **“The Upcast System – New Developments”** by: M. Nordman, Upcast Oy, Finland
- 0709 **“New Generation of Furnace Technology for Copper Rod Production”** by: Dr H. Bebbler, Induga GmbH, Germany
- 0710 **“Cost-Cutting Heat Treatment of Copper and Copper Alloy Wire”** by: G. Jones, Otto Junker GmbH, Germany
- 0711 **“Copper Alloy Wires – Applications, Technical Requirements and Modern Production Methods”** by: B. Lohmueller, Maschinenfabrik Niehoff GmbH, Germany
- 0712 **“Productivity Savings in the Manufacture of Copper and Aluminium Stranded Conductors Using the Roll Forming Double Twist Process”** by: S. Harrington, Ceeco Bartell, Canada
- 0713 **“Roll Tool Design and Simulation of Forming Process for Welded Tubes and Shaped Wire”** by: A. Sedlmaier, dataM Software GmbH, Germany
- 0714 **“Productivity Improvements with Wire and Tube Drawing Lubricants”** by: S. Duff, Q8Oils, UK & Meiwa Chemical Co, Ltd
- 0715 **“Environmentally Friendly Surface and Heat Treatment for Wire/Tube Plating”** by: I. Rogelj, Plasmait GmbH, Austria
- 0716 **“Innovations in the Field of Non-Ferrous Processing”** by: U. Reipschlaeger, SMS Meer GmbH, Germany
- 0717 **“Bright Annealing in Hydrogen – Economical, Technological and Environmental Advantages”** by: F. Wiesinger, EBNER Industr., Austria
- 0718 **“Energy Saving and Environmentally Sound Melting and Casting Furnace Technology For Copper Casting”** by: Dr H. Bebbler, Induga GmbH, Germany
- 0719 **“The Economical Approach to Producing Pancake Coil Copper Tube”** by: G. Jones, Otto Junker GmbH, Germany
- 0720 **“Technological Trend in Inner Grooved Tube for Room Air Conditioner in Sumitomo Light Metal”** by: H. Morita, Sumitomo Light Metal Industries Ltd, Japan

International Symposium
Dubai Cable Symposium
Dubai World Trade Centre, UAE
27 March 2007

- 0701 **“Rod Breakdown Lines for Copper and Aluminium”** by: H. Melcher, Niehoff, Germany
- 0702 **“Manufacturing of Extra High Voltage Cables - latest techniques in extrusion and curing using either the vertical or catenary tube solution (VCV or CCV)”** by: J. Leppanen, Maillefer, Finland
- 0703 **“Diamond Dies For All – A Refreshing Exercise”** by: J. Cabrera, Temsa Diamond Dies, Spain
- 0704 **“In-Line Quality Control and Reduction of Raw Material for Wire & Cable Industries”** by: D. Frankum, Zumbach, Switzerland
- 0705 **“Productivity Improvements of Hot Rolling Through to Super Fine Drawing”** by: Kuwait Oils, UK
- 0706 **“Multiwire Drawing Lines & Double Twist Bunching”** by: B. Lohmueller and M. Dalal, Niehoff, Germany,
- 0707 **“HFFR Insulation & Sheathing of LV Cables”** by: H. Saastamoinen, Maillefer, Finland

International Conference
“FIRE PERFORMANCE OF CABLES”
Radisson SAS Hotel, Dusseldorf, Germany
15-16 October 2002

- 0201 **Studies of Communication Cable Fires in Hidden Voids in Buildings – New Hazards Revealed** by: Peter Fardell, Fire and Risk Sciences Division, Building Research Establishment, UK
- 0202 **Seven Dials Warehouse Fire. A Practical Example of Cable Fire Hazard** by: David Townsend, Fire Investigator, London Fire Brigade, UK
- 0203 **Cable Fires: Views of the Dusseldorf Fire Brigade** by: Christian Schlich, Dusseldorf Fire Brigade, Germany
- 0204 **Low Smoke Zero Halogen Cables for Fire Situations. Some Installation Experience** by: David Brown, formerly BICC General Cables Ltd, UK
- 0205 **In Search of Flashover** by: JE Robinson, Borealis Polymers NV, Belgium
- 0206 **Euroclasses for Cables – Effects on the Cable Industry** by: Terry Journeaux, Pirelli Cables Ltd, UK
- 0207 **Nanocomposites – A New Concept for Flame Retardant Cables** by: Dr Gunther Beyer, Kabelwerk Eupen, Belgium
- 0208 **New Thermoplastic Elastomer** by: Alfred Gemmel, Nexans Deutschland Industries
- 0209 **Fire Safety Cables – Ceramifying Silicone Rubbers** by: Dr Peter Jerschow, Wacker-Chemie GmbH, Germany

- 0210 Determination of the 'Real Time' Yield of Toxic Gases as Input for the Simulation of People Evacuation**
by: B-A Sultan, Borealis, Stenungsund, Sweden
- 0211 Testing The Fire Performance of Polymers & Cables**
by: David B Kiddoo, AlphaGary Corp., USA
- 0212 Fire Performance Requirements for Communication Cables in Buildings**
by: Arthur Willis, Brand-Rex Ltd, UK
- 0213 Classifying the Fire Performance of Communication Cables**
by: Steve Prescott, Raydex CDT, UK
- 0214 Data Transmission in Fire Performance Cables**
by: Peter Worrall, AEI Cables Ltd, UK
- 0215 Innovations in F.E.P. Foam Production Leads to New C/D Control**
by: Pierre-Yves Bonvin, Maillefer SA, Switzerland
- 0216 Method And Device for the Production Of XLPE Insulated Automotive Wire (Cured Cables)**
by: Werner Lepach, Niehoff, Germany
- 0217 The Impact of FEP in the Manufacturing of Data Communication Cables Using High Speed Backtwist Technology**
by: Sean Harrington, Ceeco, Canada

International Conference
wire Singapore 2001

**"PROBLEM SOLVING IN WIRE & CABLE
MANUFACTURE & PROCESSING"**

Marina Mandarin Hotel, Singapore
24 September 2001

- 0101 Continuous Rotary Extrusion: Gap Setting & Adjustment**
by: Mr Ken Scott, Holton Machinery Ltd., UK
- 0102 Manufacturing Highest Quality Rod for the Production of Smallest Size Wires**
by: Mr Juan Carlos Bodington, Outokumpu Castform Oy UPGAST, Finland
- 0103 Silanes in Wire & Cable Compounds: Small Amounts, But Great Effects**
by: Dr Helmut Mack, Degussa AG, Germany
- 0104 Factory Wireway Interconnection System: Expedient Installation of Extrusion and Cabling Manufacturing Systems**
by: Neil Chabot and Erik Macs, Thermoplastics Engineering Corporation, USA
- 0105 Prevention is Better than Cure: Graphite-based technology in Continuous Casting of Re-draw Rod for Multi-Wire Drawing Machines**
by: Sir Michael Nairn, Rautomead International Ltd., Scotland
- 0106 Ultrasonic Gauging for Jacketed Cable and Fiber**
by: Philip Young, Beta LaserMike, Malaysia
- 0107 New Binding Technology to Improve Line Speed in Cable Production**
by: Mr Yuh-Schunn SUN, Altin Nahttechnik GmbH, Germany
- 0108 Problem Solving in Wire Drawing Dies, Whenever Die-Tools are Troubling the Proper Wire Drawing Process**
by: Dr Kurt G. Eder, Eder Engineering GmbH, Austria
- 0109 Tube Filling Compounds & Swellable Hotmelts for the Cable Industry**
by: Mr Acyr Borges, Henkel Asia Pacific Ltd., Malaysia
- 0110 Versatile SRL Predictor System**
by: Grant Latimer, Beta LaserMike, Japan

International Conference
wire Singapore '99

**"ECONOMICAL PROCESSING OF
ROD TO WIRE & CABLE"**

Marina Mandarin Hotel, Singapore
18 October 1999

- 9930 A Process for Consistent Quality in Conversion of Cathode to Oxygen-Free Copper Re-Draw Rod**
by: Sir Michael Nairn, Rautomead International Ltd, Scotland
- 9931 Gold Bonding Wire Processing at American Fine Wire Limited**
by: J M Seuntjens, American Fine Wire, Singapore
- 9932 On-line Detection of Recurrent Diameter Flaws (Blisters) in the Magnet Wire Industry using Real-time Simulation of the Blistbuster Laser System, provided by the AMBRA Computer Programme**
by: A Spizzamiglio, Aeroel Srl, Italy
- 9933 MSM 85, New RBD-Drawing Machine with Individually Driven Capstans**
by: H Bauer, Maschinenfabrik Niehoff, Germany
- 9934 The Outokumpu Upcast Process - What's New ?**
by: Lauri Eklin, Outokumpu Castform Oy, Finland
- 9935 New UNITEK Concepts in Crosshead Technology**
by: K Streitenberger, Unitek Maschinenbau- u. HandelsgesmbH, Germany
- 9936 Extrusion Technology for Physically Foamed PE-Dielectrics of RF-Cables**
by: A. Wolf, Uniline Kabelmaschinenbau- u. HandelsgesmbH, Germany
- 9937 A Safe and Effective Approach to Data Cable Sheathing Requirements in the Far East**
by: J Preston, Scapa Polymerics, UK
- 9938 Experience with Dry Waterblocking of Optical and Copper Cables**
by: Stephen W Czupryna, Geca Tapes, Singapore
- 9939 Advanced On-Line Measuring and Analysis Techniques for an Economical Cable Production**
by: Dr Werner Blohm, Sikora Industrieelektronik, Germany

International Conference
"WIRES & CABLES - EUROPE"

Düsseldorf, Germany
26-28 May 1999

- 9901 Mechanical Descaling of Wire Rod and its Relation to the Further Wire Drawing Process**
by: R Vanloot, NV Bekaert, Belgium
- 9902 Influence of Copper Content of Steel on Chemical Descaling and Other Surface Treatment of Wire Rods**
by: B Resiak, Unimetal CREAS, France
- 9903 "Best Available Technologies" in the Wire Industry**
by: Bert Gielen, Bekaert Special Steel Wires, Belgium
- 9904 Recovery of Acid Pickling Solutions in the Wire & Cable Industries**
by: S Quinn, Chem-Resist Group Limited, UK
- 9905 A Global Proposal - Non-Reactive Coatings and Lubricants for Wire Drawing**
by: Mr P Meignan, Condat SA, France.
- 9906 Preparation & Lubrication of Rods & Wires Towards Higher Productivity**
by: H Damm, Traxit International, Germany
- 9907 High Pressure Lubrication for Steel Wire Drawing**
by: J Zunker, Herborn & Breitenbach GmbH & Co KG, Germany
- 9908 Chemical Cleaning and Coating of Wire prior to Cold Forming**
by: Dipl.-Ing. W Gothe, Chemetall GmbH, Germany
- 9909 On Line Diameter Measuring of Ferrous Wire on Dry Drawing Benches. How Laser Gauges Can Achieve this in Harsh Environments**
by: A Spizzamiglio, Aeroel, Italy
- 9910 New Developments of Heat Treatment with Bell Type Furnaces**
by: Dipl.-Ing. Frank Maschler, LOI Thermoprocess GmbH, Germany
- 9911 The New Generation of Wire Cleaning Systems by High-Efficiency Ultrasonic**
by: Dr C Zentgraf, GEO-Umwelttechnik GmbH, Germany
- 9912 Continuous Plasma Fine Cleaning of Wire under Normal Pressure**
by: Dr V Müller CMTM, Germany
- 9913 New Steps in the Galvanising Process - Nitrogen Wiping and Floating Burners**
by: R Branders, FIB, Belgium
- 9914 New Applications on the "Delot Process"**
by: Dr G Sanchez, Delot Process SA, France
- 9915 Improvements in the Productivity & Quality of CAT 6 and CAT 7 Data Cable, Through the Incorporation of Backtwist Technology in the Twinning Process**
by: J P Harrington, Nextrom Technologies, Canada
- 9916 Optical Fibres - The Process of the Products**
by: A P Morris, Optical Fibres, UK
- 9917 Effective Manufacturing Methods for Optical Fibre Premise Cables**
by: K T Aura, Nextrom Oy, Finland
- 9918 Fibre Optics Cables: Principles & Applications to Decrease Optical Loss During the Manufacturing Process**
by: S Altmann, Rosendahl-Frisch, Austria
- 9919 Product Quality and Economic Efficiency in the Manufacturing of Data Transfer and Communication Cables**
by: K Decker, Henrich GmbH, Germany
- 9920 ZeroTwist: A New Way of Producing Communications, Pairs and Cables**
by: Dr. Ing. G Cecchini-Manara, Cortinovis SpA, Italy
- 9921 The UPGAST® Process - Cost Efficient Production of Copper Wire Rod**
by: L Eklin, Outokumpu Castform Oy, Finland
- 9922 On-Line Fast Fourier Transform and Structural Return Loss Analysis During Cable Extrusion**
by: Dr W Blohm, SIKORA Industrieelektronik GmbH, Germany
- 9923 In-Line Monitoring of Sheath Thickness & Integrity for LAN Cables**
by: M Consonni, Zumbach Electronic AG, Switzerland
- 9924 Metallic Tubing for Optical Fibres in Aerial Cables**
by: G Hög, Alcatel Kabel, Germany
- 9925 Recovery of Acid Pickling Solutions in the Wire & Cable Industries**
by: S Quinn, Chem-Resist Group Limited, UK.
- 9926 Unique Plating Process for Special Conductors**
by: J Zunker, Herborn & Breitenbach GmbH, Germany
- 9927 Copper Conductor Production Plant**
by: W Lepach, Maschinenfabrik Niehoff GmbH, Germany
- 9928 Influence of the Quality Parameters of the Bare Copper Conductor on the Production of Data Cable (LAN)**
by: H Bauer, Maschinenfabrik Niehoff GmbH, Germany

International Conference
wire Singapore '97

"POWER & COMMUNICATION CABLES"

Marina Mandarin Hotel, Singapore
19-20 October 1997

- 9730 High Strength Invar® Alloy for High Energy Electric Power Cables**
by: B Boulogne, Imply SA, France
- 9721 The Advancement of Diamond Material Materials for Wire Drawing Die Production**
by: T D Robinson, The Johnson Metal Company, UK
- 9722 Is the Reconditioning of Ultrahard Precision Drawing Die-Tools Still Worthwhile, and How Best is it Done?**
by: Dr K G Eder, EDER Engineering, Austria

- 9731 **Wire Production for Building Cables**
by: F Goemaere, Bekaert Engineering, Belgium
- 9732 **The Overall Considerations of an Investment for Harness Wires**
by: W Lepach, Maschinenfabrik NIEHOFF GmbH & Co KG, Germany
- 9733 **Extensive On-Line Diameter Measuring in Magnet Wire Industry Provides Outstanding Improvements in Process Efficiency and Product Quality**
by: A Spizzamiglio, Aeroel Srl, Italy
- 9734 **New Manufacturing Technology of Datacom/Telecom Cables with Automatic Colourchange Systems**
by: K Streitenberger, UNITEK Maschinenbau und HandelsgesmbH, Austria
- 9735 **The Use of Halogen Free, Fire Retardant, Low Smoke Materials in LAN and Communication Cables**
by: J Preston, Scapa Tapes (Lindsay & Williams), UK
- 9736 **Recent Developments in Communication Networks in Control System Design for Wire & Cable Machines**
by: A T Pugh, Control Techniques, Singapore
- 9737 **Modern Copper Wire Drawing Lubrication - Theory & Practice**
by: M Donnison, Batoyle Limited, UK
- 9738 **TWINROT - The Most Economic Production of MV and HV Cores on One Line Type**
by: A Brüll, Paul Troester Maschinenfabrik, Germany
- 9739 **Optimised Copper Data Cable Production**
by: E Gauder & C Montusclat, Gauder & Co SA, Belgium
- 9740 **The Universal Catenary Continuous Vulcanising Line for the Production of Rubber Insulated & Sheathed Cables and Medium Voltage XLPE Insulated Cables**
by: Mr K R Storton, Francis Shaw Cable Machinery Ltd, UK
- 9741 **Criteria for Performance in the Stranding and Extrusion of Insulated Conductors**
by: A Blackmore, Ceeco Machinery Manufacturing Ltd., Canada
- 9742 **The Use of OPGW in Data Highways – Considerations on Reliability and Performance**
by: Dr V Waschke, Felten & Guillaume Energietechnik AG, Germany
- 9743 **LAN - Cable / Requirements for the Conductors**
by: A Matuschinski, Maschinenfabrik NIEHOFF GmbH & Co KG, Germany
- 9744 **Simulation of the Wire Straightening Process**
by: M Paech, Witel's Apparate-Maschinen Albert GmbH & Co KG, Germany
- 9745 **New Dimensionally Stable PA12 for Optical Fibre Buffer Tubes in LAN Cables**
by: D Jarvis, EMS-Chemie AG, Switzerland
- 9746 **Applications of Central Tube Designs in Fibre Optic Cables**
by: Dr L Faltin, OEKW, Austria
- 9747 **Flexible LAN Cable Manufacturing Concept: From the Copper to the Finished Cable**
by: M Felder, Nokia-Maillefer, Switzerland
- 9748 **Evolution of Carbon Black in the Power Cable Semiconductive Compounds**
by: Mr Druot, Borealis A/S, Denmark
- 9749 **The Cleanliness Scanning System - A Tool for a Super Clean Concept**
by: H Prunk, Sikora Industrieelektronik GmbH, Germany
- 9750 **Cost Effective Coloration of Thermoplastics Compound for the Wire & Cable Industry**
by: P Francois, Wilson Color, Belgium
- 9751 **Future Trends in Cable Materials**
by: K Barber, Olex Cables, Australia
- 9752 **Compacted Bare Overhead Transmission & Distribution Conductors (Trapwire)**
by: J M Hesterlee, Southwire Company, USA
- 9753 **'ONE-STEP' Silan Processing for Low & Medium Voltage Cables**
by: S Wolf, Rosendahl Maschinen GmbH, Austria
- 9754 **State-of-the-Art Instrumentation for On-Line Monitoring of Category 5 Data Cable Extrusion**
by: C Zingg, Zumbach Electronic AG, Switzerland
- 9755 **Optimising the Optimisation of Category 5/6 Data Cable Through the Use of the Group Twinner and Individual Twinning Machines**
by: J P Harrington, Northampton Machinery Co, UK

International Conference

EuroWire '97

**"TECHICAL ADVANCEMENTS
IN WIRE & CABLE PROCESSES"**

17-19 June 1997

Hotel Schloss Wilhelminenberg, Vienna, Austria

- 9706 **Category 5/6 Data Cable Production: The Selective Use of Individual Twinners and the Group Twinner for Maximum Performance and Return**
by: J P Harrington, The Northampton Machinery Co Ltd, UK
- 9707 **New Manufacturing Technology of Datacom/Telecom Cables with Automatic Colourchange Systems**
by: R Mallinger, UNITEK Maschinenbau und Handelsges mbH, Austria
- 9708 **Recent Developments in Masterbatch Formulation**
by: L Tonnerre, Wilson Color, Belgium
- 9709 **The Use of Optical Fibres in Premise Cables**
by: Kimmo Aura, Nokia Maillefer Oy, Finland

- 9710 **State-of-the-Art Instrumentation for On-line Monitoring of Category 5 Data Cable Extrusion**
by: M Consonni, Zumbach Electronic AG, Switzerland
- 9711 **CATV – Cable Manufacturing with Cascade Extrusion Technology**
by: K Kerschbaum, Rosendahl Maschinen GmbH, Austria
- 9712 **LAN Cable / Requirements for the Conductors**
by: W Lepach, Maschinenfabrik Niehoff GmbH & Co KG, Germany
- 9713 **Extrusion of Flame Retardant Compounds**
by: E Geider, Nokia Maillefer SA, Switzerland
- 9714 **Universal Dielectric Optical Fibre Cable – TOP CABLE**
by: Dr L Faltin, OEKW GmbH, Austria
- 9715 **State-of-the-Art HICON/H₂ – Bell Annealer and its Range of Applications**
by: D Brandstätter, EBNER Industrieofenbau GmbH, Austria
- 9716 **Crosslinkable Polyethylene Compounds and their use in Medium Voltage Aerial Cables**
by: D Wald, Borealis Antwerpen NV, Belgium
- 9717 **Reel Handling, Reel Storage, Reel Management – Concepts to Increase Efficiency & Quality in the Cable & Wire Industry**
by: Dr O Volgger, ROBOTECH Logistiksysteme GmbH, Austria
- 9718 **Work Hardening of Pearlite and Bainite during Drawing of High Carbon Steel Wire**
by: S. Nishida, Nippon Steel Corporation, Japan
- 9719 **An Empirical Model of Twists on Drawn Wire – Using Response Surface Methodology**
by: F Grezda, HC Metaliku, Kosova
- 9720 **WIREMAN – A European Community Funded Project Aimed at the Optimisation of the Wet Drawing Process of Small Gauge High Carbon Steel Wires**
by: G Fabozzi, Pirelli, Italy
- 9721 **Advancement of Diamond Materials for Wire Drawing Die Production**
by: T Robinson, The Johnson Metal Co Ltd, UK
- 9722 **Is the Reconditioning of Ultrahard Precision Drawing Die-Tools still Worthwhile, and How Best is it Done?**
by: H Schmidt & K Eder, Eder Engineering, Austria
- 9723 **The Cooling Process of the Capstans on the Multipass Cold Drawing Lines**
by: A Zinutti, Impianti Industriali SpA, Italy
- 9724 **An Interpretation of the Mechanical Behaviour of high Carbon Small Gauge Wires, Based on Internal Residual Stresses Induced by the Working Process**
by: A M Massai, Pirelli, Italy
- 9725 **Innovation in Wire Production Lines for Increasing the Economy and Productivity**
by: K Decker, Henrich GmbH, Germany
- 9726 **Recovery of Acid Pickling Solutions in Wire & Cable Industries**
by: S Quinn, Chem Resist Group Ltd, UK
- 9727 **The Aeroel's "Blistbuster" System: A New Approach for "Blister" Detection in Magnet Wire Industry**
by: A Spizzamiglio, Aeroel, Italy
- 9728 **The Importance of the Lubricants to the Process in the Deformation Zone and to the Loading of the Tools During Drawing**
by: M Hildebrand, Technical University Mining & Technology Freiberg, Germany
- 9729 **Wires From the AgSnO₂Bi₂O₃ Material Used for the Production of Electronic Contacts**
by: St Ksiezarek, B Beszta, K Rudnicki, J Dziemianko, M Sadowski, W Kazana, K Durst & W Poloczek, Institute of Non-Ferrous Metals, Poland

One Day Seminar

"WIRE PREPARATION, COATINGS & COVERINGS"

11 February 1997

Mere Golf & Country Club, Mere, Cheshire, UK

- 9701 **A New Electrolyte for Wire Tin Plating**
by: H Sodha, Yorkshire Chemicals Plc, UK
- 9702 **Lubrication for Steel Wires**
by: J Zunker, Herborn & Breitenbach, Germany
- 9703 **Innovative Insulation Solution for Zero Halogen Fire Retardant Communication & Power Cables**
by: J Preston, Lindsay & Williams, UK
- 9704 **Developments in the Manufacture of Mineral Insulated Power Cables**
by: O S Johnson, Consultant, UK
- 9705 **Silane Crosslinking of Polyethylene for Improved Products & Processing**
by: L M Panzer & E J Sadler, OSI Specialties (UK) Ltd, UK

One Day Seminar

**"EC MACHINERY – SAFETY DIRECTIVES
FOR THE WIRE & CABLE INDUSTRIES"**

13 February 1996

Wilmslow Moat House Hotel, Wilmslow, UK

- 9601 **An Introduction to the Supply of Machinery Safety Regulations 1992**
by: R D Lawson, Dept of Trade & Industry DTI, London, UK
- 9602 **JIC Wire & Wire Rope Health & Safety Manual and European Standards**
by: S Drake, Tinsley Wire (Sheffield) Ltd, UK

- 9603 **The Dilemma of the Machinery Producer/Importer Regarding the New EEC Directives**
by: T D Robinson, The Johnson Metal Company Limited, UK
- 9604 **Safety & the Machinery Manufacturers Liability**
by: G Owen, Dibb, Lupton, Broomhead (Solicitors), UK
- 9605 **A Users Experience of EC Regulations**
by: P Spence (Safety Officer), Bridon, UK

ACIMAF/IWMA International Conference
“WIRES & CABLES”

4-5 October 1995

Hotel Sheraton, Florence, Italy

- 9512 **A Progress in Steel Wire Drawing and Rolling – its Simplicity as Seen Through the Eyes of the T-0-M**
by: A Rossi - OTT, France and Redaelli Tecnica, Italy
- 9513 **Simulation of Back-Pull Wire Drawing**
by: G Ricci, Institute of Engineering Science, Urals, Russia
- 9514 **Microrolling Technology Success in Welding Wire Production**
by: A Ossani, Continuus SpA, Italy
- 9515 **The Effects of Centrifugal Forces in Steel Cord Forming – Theoretical Modelling and Practical Applications**
by: A M Massai, Società Pneumatici Pirelli SpA, Business Unit Steel Cord Figline Valdarno (Florence) & M Chiarelli & A Frediani, Aerospace Engineering Dept., University of Pisa, Italy
- 9516 **Residual Stress in Steel for Springs – Italian Only**
by: E del Giudice, Seconda Università di Napoli, Italy
- 9517 **A Dynamic Model of Multi-Pass Wire Drawing, Intermediate Wire Drawing for Tyre Cord**
by: Dr B Kartak, Urals State Technical University, Russia
- 9518 **A New Tungsten Carbide Die for Dry and Wet Wire Drawing**
by: G Bellina, Koner SpA, Italy
- 9519 **Modern Die Tool Working Technologies**
by: Dr K Eder, Eder Engineering GmbH, Austria
- 9520 **Multi-wire Drawing Machine**
by: S Bourkine, Urals State Technical University, Russia
- 9521 **Measuring, Controlling & Testing**
by: A Spizzamiglio - Aeroel Srl, Italy
- 9522 **Best Diamond Die Profile for Best Wire Quality**
by: T Van Rooij, PDT Diamond Tools BV, Netherlands
- 9523 **Residual Stresses in Scalped and Grooved Products**
by: Dr M Hildebrand, Institute of Metal Forming, Frieberg, Germany
- 9524 **Study of the Corrosion Behaviour of Brass Coated Steel Cords by Using Electrochemical Techniques**
by: L Fedrizzi, F Deflorian, S Rossi & P L Bonora, Material Engineering Department University of Trento, Italy, & D Poggi, Società Pneumatici Pirelli SpA, Business Unit Steel Cord - Figline Valdarno (Florence), Italy
- 9525 **A New Wire/Rubber Adhesion System**
by: G Orjela, Pirelli Coordinamento Pneumatici SpA, Italy, M Ciparrone & F Pavan, Società Pneumatici Pirelli SpA, Business Unit Steel Cord - Figline Valdarno, Italy, P Boden, ME&MD Dept, University of Nottingham, UK, and F Tommasini, TASC Laboratory, Consorzio INFM, Italy
- 9526 **MHD (Magneto-hydrodynamic) Zinc or Alloy Application by the DELOT Process**
by: P Gill Gimak Machinery, France
- 9527 **Fibre Optic Cables: Developments for the Use in Mixed Structures for Power Cables or for Optical Overhead Ground Wires (OPGW)**
by: A Borroni, De Angeli & G Civili, Proteos Srl, Italy
- 9528 **Robotics, Logistics and Reel Management**
by: O Volgger, Robotech Logistiksysteme GmbH, Austria
- 9529 **The Influence of EC Environmental Laws in Relation to Packaging Wire & Cable Materials and the Solutions**
by: W Lepach, Maschinenfabrik Niehoff GmbH, Germany
- 9530 **New Version of Laser Diffraction Sensors for In-Line Diameter Measurement of Fine and Very Fine Wires**
by: J Fardeau, Cersa, France
- 9531 **Measuring, Controlling & Testing**
by: G Garlisch, Sikora Industrieelektronik GmbH, Germany
- 9533 **Design and Development of Helicallly Attached Optical Fibres for Use with Existing High Voltage Earth Wires**
by: I Knight, BICC Cables, UK
- 9534 **Laser Welded Metallic Shields for Cables and Tubes**
by: B Bulschek, SWISSCAB E Kertscher SA, Switzerland
- 9535 **Impact of Recent Developments in MV/HV Compounds Technology on Cable Manufacture**
by: Dr A Campus, Borealis NV, Belgium
- 9536 **Conical Crosshead for Wire Coating Application**
by: D Schläfli, Nokia-Maillefer SA, Switzerland

One Day Seminar

“ADVANTAGES OF NON-CONTACT TECHNOLOGY DRIVES & CONTROL SYSTEMS FOR WIRE & CABLE PRODUCTION”

14 February 1995

Wilmslow Moat House Hotel, Wilmslow, UK

- 9501 **The Integrated Approach to Measurement and Control Systems**
by: Mr K Robson, Beta Instrument Ltd, UK

- 9502 **Drive and Regulation Technology for Wire Drawing Machines**
by: Mr P Krüger, Herborn + Breitenbach GmbH & Co KG, Germany
- 9503 **Infra-red Telemetry - Its Applications & Advantages to the Wire Industry**
by: A Domone, Azdec Ltd, UK
- 9504 **DTC - Direct Torque Control and its Application to Wire Manufacturing**
by: J Schofield, ABB Industrial Systems Ltd, UK
- 9505 **Digital Image Processing - A New Technique for Geometrical Measurement**
by: R Schmald, Dibicon Messtechnik GmbH, Germany
- 9506 **Contactless Electronic Data Transmission System**
by: Mr Bernard Van Severen, Bekaert Engineering, Belgium
- 9507 **The Practical Benefits of Automated Control and Monitoring of Wire Processes**
by: Mr Alan Robinson, Tascomp Ltd, UK
- 9508 **AMKASYN - A High Performance Solution in Drives and Controls**
by: Dr G Vogt, AMK - Arnold Müller GmbH & Co KG, Germany
- 9509 **A Cost-Effective Management Data Acquisition System for the Wire and Cable Industry**
by: Mr D Robinson, Electronic & Programming Systems Ltd, UK
- 9510 **The Principles of Operation of AC (flux) vector Drives and Comparison with other Variable Speed Technology**
by: M Hartley, Eurotherm Drives, UK
- 9511 **Integral On-Line Quality Control in Cable Production**
by: Mr M Brunner, Zumbach Electronic AG, Switzerland
- 9512 **Latest Improvements in Laser Diffraction Sensors (LDS)**
by: Mr J F Fardeau, CERSA, France

International Conference

“MELT TO WIRE AND CABLE PRODUCTION”

22-23 June 1994

Hotel Orbis Forum, Krakow, Poland

- 9410 **Cladded FE-CU Wires Produced by Mechanical Plating**
by: S Ksiezarek, B Besztak, Instytut Metali Niezelaznych, Poland
- 9411 **Meeting the Needs for High Performance Conductors in the 21st Century**
by: J Burns, Temco Ltd, UK & L Laakso, Outokumpu Poricopper Oy, Finland
- 9412 **New Concepts and Designs in Tandemisation of Wire Drawing and Extrusion Lines**
by: W Lepach, Niehoff Maschinenfabrik KG, Germany
- 9413 **Copper and Aluminium Wire Drawing Lubricants**
by: D Lee, Metalube Ltd, UK
- 9414 **Process Control Techniques for the Cable Industry**
by: R Riedel, Beta Instruments Europe NV/SA, Belgium
- 9415 **Development of Ceramic Superconducting Wire**
by: T Holst, NKT Research Center A/S, Denmark.
- 9416 **Added Value Color and Additive Concentrates can Reduce Coloration Costs**
by: P Francoise, Wilson Color SA, Belgium
- 9417 **Longitudinal Water Blocking of Telephone Cables using Combined Hot and Cold Filling Systems**
by: W Heinrich, SKET Schusermaschinenbau, Germany
- 9418 **Selection of Wire Drawing Dies from Rod to Superfine Wires**
by: J Cabrera, Industrias Esteves SA, Spain
- 9419 **Production Programme of Krakow Cable Company - Computerized System of Technology Design for Wire Production**
by: A Wojtowicz & S Nowak, Kabel Krakow, Poland
- 9420 **The HICON/H2 (R) Bell Annealer for Heat Treating Steel, Copper and Copper Alloy with Lowest Surface Contamination**
by: D Brandstätter, Ebner-Industrieofenbau, Austria
- 9421 **High Quality and High Speed Laying Up and Taping Techniques on Current Planetary and other Stranding Equipment**
by: S Harrington, Northampton Machinery Co Ltd, UK
- 9422 **Installation, Start Up and Acceptance Test of Modern Cable Machinery**
by: M Germata, Technokabel, Poland
- 9423 **The Behaviour of Material and Forming Tools in Wire Drawing**
by: W Lehnert, M Hilderbrand, Bergakademie Freiberg, Germany
- 9424 **Moisture Cross Linkable Ethylene Vinyl Copolymers for Wire and Cable Insulation Compounds**
by: B Tot, K Lien, Neste Chemicals, Belgium
- 9425 **New Developments in Double Twist Stranding/Cabling**
by: E Gauder, Gauder/Setic SA, Belgium
- 9426 **Measurement & Controlling Devices for the Wire & Cable Industry**
by: J Schulrath - Sikora Industrieelektronik GmbH, Germany
- 9427 **High Productivity in Loose Tube Cabling Processes**
by: K Aura, Nokia Maillefer, Finland
- 9428 **Rationalisation of Stranding**
by: B Hützen, Stolberger Maschinenfabrik GmbH, Germany
- 9429 **Today's Manufacturing Technology for Telephone Cores**
by: B Bulschek, SWISSCAB E Kertscher SA, Switzerland
- 9430 **The Benefits of Precise Lubricant Selection & Technical Service in the Copper Wire Industry**
by: S Duff, Germ-Allcard Specialised Lubricants, UK
- 9431 **Cable Machinery Produced by Krakow Cable Company**
by: M Köhler, Kabel Krakow, Poland
- 9432 **An In-Line Diameter and Shape Monitoring System for Copper & Steel Rod Production**
by: M Brunner, Zumbach Electronic AG, Switzerland

One Day Seminar
"ROD SELECTION & SUPERFINE WIRE DRAWING"

15 February 1994

Wilmslow Moat House Hotel, Wilmslow, UK

- 9401 **Rod Selection for Drawing - Sample Testing Versus Process Control**
by: G R Dawson, Rodco Ltd, UK
- 9402 **The Problems of Material Defects in Superfine Wire Drawing**
by: Dr F Mackie, BICC Cables Wreham, UK
- 9403 **Dies for Superfine Wire Drawing**
by: J Cabrera, Industrias Estevas SA, Spain
- 9404 **Contirod® - At UM in Olen and its Selection for Special Applications**
by: Mr Raskin, Union Minière - Business Unit Copper MHO Olen, Belgium
- 9405 **Rod Requirements for Steel Cord Filaments**
by: J Lombaerts, Bekaert Engineering, Belgium
- 9406 **Copper Separation from Cable Scrap with Electrostatic Separators**
by: Dr R Köhnlechner, Hamos Electronic GmbH, Germany

International Conference

WIRE & CABLE - HONG KONG

16 November 1993

Hong Kong Conference & Exhibition Centre

- 9310 **Measurement and Controlling Devices for the Wire and Cable Industry**
by: D Dinter, Sikora Industrie Elektronik GmbH, Germany
- 9311 **Approaches to Increasing the Performance in the Manufacture of Telephone Cable while using the SZ-Stranding Process**
by: Dr Franz, Mr Godau, SKET SMM GmbH, Germany
- 9312 **SYNDIE PCD and MONODIE - A Product Review**
by: M O Nicolls, De Beers Industrial Diamond, UK
- 9313 **Automatic Coiling Line for Electrical and Telephone Cables, Economic and Manufacturing Problems and Solutions**
by: S Parma, PS Costruzioni Srl, Italy
- 9314 **Modern Instrumentation and Multi-Task Process Control Systems for the Cable Industry**
by: Mr Sives, Beta Instruments Co, UK
- 9315 **Multi-Purpose Stranding Technique for Optical Cables**
by: G McKay, SWISSCAB Asia, Hong Kong
- 9316 **Upcast - The Process, Equipment and Know-How of Making High Quality Copper Wire Rod for Cable and Enamelled Wire Industry**
by: S Pietilä, Outokumpu Castform Oy, Finland
- 9317 **Development and Manufacture of Power Cables on Large Double Twist Machines**
by: S Harrington, Northampton Machinery, UK
- 9318 **The Cortinovis Development of Monobitorsion Machine for High-Speed Stranding of Both Wire and Flexible Conductors**
by: Dr S Cortinovis, Cortinovis SpA, Italy
- 9319 **Colouration of Plastics in Telecommunication Cables: A Very Demanding Application of Colour Concentrates**
by: Mr Van Hove, Wilson Color SA, Belgium
- 9320 **Elastomeric Alloys for Wire & Cable Applications**
by: C Gustin, Advanced Elastomer Systems, Belgium
- 9321 **Automatic Special Cable Production - A Challenge for the 90's**
by: E Kertscher, SWISSCAB E Kertscher SA, Switzerland
- 9322 **The Spoolless Wire and Cable Plant - Dream or Reality?**
by: W Lepach, Maschinenfabrik Niehoff GmbH & Co KG, Germany
- 9323 **Fully Automatic Re-Spooling Unit for Welding Wires - SDA-300-A**
by: H Brinkman, Herborn & Breitenbach GmbH, Germany
- 9324 **New Frontiers in the Production of Nails and Screws**
by: Dr H Birkmann, Wafios Maschinenfabrik GmbH & Co KG, Germany
- 9325 **The Automatic Square Wire Braiding Machine VF75 for Wire Netting in Double Spiral**
by: H Herold, Draweba-Maschinenbau GmbH, Germany
- 9326 **Steel & CO2 Welding Wire - A Newly Developed Drawing Technology**
by: Mr Kalweit, SKET Drahtziemaschinenwerk Gröna GmbH, Germany
- 9327 **New Developments in Wire Mesh Welding Lines**
by: Dipl Ing R Knaus - EVG, Austria

One Day Seminar

LUBE-TECH

18 February 1993

Wilmslow Moat House Hotel, Wilmslow, UK

- 9302 **Filtration and Drawing Emulsions**
by: A Johnson, Schönauer GmbH, Germany
- 9303 **Oil Save and Initiative for the 90's**
by: N Pearson, Castrol UK Ltd, UK
- 9304 **Lubricant Dust and Waste Reduction**
by: R Koster, Turco Products Ltd, UK
- 9305 **The Use of Ultrafiltration for Disposal of Soluble Oil Emulsions**
by: D Lee, Metalltube Ltd, UK
- 9306 **Duty of Care - How it Affects You**
by: C Quigley, Waste Control Office, Walsall Environment & Consumer Service Dept, UK

One Day Seminar
SPOOLS, PACKAGING AND HANDLING TECHNIQUES

18 February 1992

Wilmslow Moathouse Hotel, Wilmslow, UK

- 9201 **Benefits of Reelless Packages for Wire and Cables**
by: S Janko, Henrich GmbH, Germany
- 9202 **Design of Reel Handline Systems**
by: G Krammer, Rosendahl Maschinen GmbH, Austria
- 9203 **Application and Handling of Dividable Machine Spools for the Production of Precision Layer - Wound Coils**
by: J Zunker, Herborn & Breitenbach GmbH & Co KG, Germany
- 9204 **Reels and Environment - Partners or Enemies?**
by: Van de Perre, NV De Clerck, Belgium
- 9205 **The Spoolless Wire & Cable Plant - Dream or Reality?**
by: W Lepach, Maschinenfabrik Niehoff GmbH & Co KG, Germany
- 9206 **Production Integrated Material Flow Systems for Cable & Wire Reels**
by: Dr O Volgger, Robotech Logistiksysteme GmbH & Co KG, Germany
- 9207 **Ergonomics in Handling Systems**
by: J Verhaeghe, NV Bekaert SA, Belgium
- 9208 **Automatic Spooling for Fine Wire Drawing**
by: G Worthington, National Standard Co Ltd, UK
- 9209 **Economics in Automatisation of Coil Winding**
by: A Freeman, Construzioni Meccaniche Srl, Italy

International Congress

"COMPUTER CONTROL SYSTEMS FOR WIRE & CABLE PRODUCTION"

October 1991

Eurogress, Aachen, Germany

- 9101 **CAMLIN, a User Friendly Computer System for Automation of Cable Extrusion**
by: R Bruggmann, Capnet SA, Switzerland
- 9102 **Computerised Administration and Production within the Cable Industry**
by: Sren Kjaer, Strom Hansen A/S, Denmark
- 9103 **Wire Enamelling Machine for Hot Melt - The Technology of the Future**
by: Ing. H Berthold, MAG Maschinen-und Apparatebau GmbH, Germany
- 9104 **Example for Automation in Cable Manufacturing**
by: A Deschenaux, Nokia-Maillefer, Switzerland
- 9105 **New Hot/Cold Diameter Control System with Integrated SPC (Statistical Process Control) Computation and Computer Dialog**
by: G Hentschel, Zumbach Electronic GmbH, Germany
- 9106 **Trends and Tendencies of Development in the Field of Stranding Machine Drive and Process Control**
by: Dr-Ing. R Kurz, SKET Schwermaschinenbau Magdeburgh GmbH, Germany
- 9107 **UNIVERO - Twin Rotor, Computer Controlled Unilay Screening and Stranding Machine**
by: W Klebl, Kabelmetal Electro GmbH, Germany
- 9108 **Colomat - Computer Programmable 8 Colour High Speed Bandmarker**
by: H Staschewski, Kabelmetal Electro GmbH, Germany
- 9109 **New In-Process Non-Contact Diameter Measurement and Networked Data Management and Analysis**
by: Ing. A Castaldini, Marposh SpA, Italy
- 9110 **Automation Conceptions for Material Flow in Cable and Wire Industry**
by: Dr O Volgger, Robotech Logistiksysteme, Austria
- 9111 **The Cable Orchestrator - Integrated Production and Process Control for Wire & Cable Manufacture**
by: N Kingsley, Eurotherm Systems, UK
- 9112 **Planning and Control of Manufacturing Using Computer Systems**
by: N G Norton BSc, C Eng M I Prod EMBPICS, UK
- 9113 **The Pirelli System for Managing Cabling Processes Using Networked PC's**
by: R Golding, T North, Pirelli General Plc, UK
- 9114 **Acquisition of Operational Data, Quality and Productivity Assurance by Using Drawing Machine Computers**
by: P Krüger, Herborn Breitenbach & Co KG, Germany
- 9115 **Direct Information Software to Improve Management, Control and Quality**
by: M Hurst, Hi-Draw Group, UK
- 9116 **Intelligent Sensors for Computer Control Systems - a Case for Local Control**
by: K Robson, Beta Instruments Europe NV, Belgium
- 9117 **A Project for Integrated Monitoring Systems to Improve Product and Plant Availability in Wire Production**
by: Dr A Grabner, Institut Dr Förster, Germany
- 9118 **Automation in the Wire & Cable Industry with the Assistance of PLC**
by: W Lepach, Maschinenfabrik Niehoff, Germany
- 9119 **Automation and Programme Control of Stranding Lines**
by: V Holly, Stolberger Maschinenfabrik, Germany

IWMA EXTRUSIONS SEMINAR

England, 1990

- 9001 **Factors Affecting the Design of Flame Retardant Cables**
by: M J Dale Sterling Greengate Cable Company, UK
- 9002 **Extrusion Characteristics of Silane Crosslinked Polyethylene**
by: Lars Erik Ahlstrand, Neste Polyeten AB Slenungsund, Sweden

- 9003 **A Colour Changing System for Electrical Wire Installations**
by: C Cohen, Fairex, France
- 9005 **New Developments At Biwater Machinery**
by: C Livesey, Biwater Machinery Limited, UK
- 9006 **The Triple Cross Head**
by: B A Thorne for Paul Troester Maschinenfabrik - Hannover, Germany
- 9008 **On-Line Measuring and Quality Control Instrumentation for the Wire and Cable Industry**
by: Leigh Greenham (Ing) Beta Instrument Co Ltd, UK
- 9009 **Know Your Extruder - and Get Best Results Out of it**
by: B Bulushek, SWISSCAB E Kertscher SA, Switzerland

NEW TECHNOLOGIES IN WIRE AND CABLE PRODUCTION

October 1990

Noga Hilton Hotel, Geneva, Switzerland

- 9011 **Production of the New Type Stressed Strands with Enlarged Capability of Anchorage**
by: L Madarász, "4 December" Wire Works, Hungary
- 9012 **New Developments on Combined Drawing Machines**
by: E Paraskevas, Kieserling Ziehmaschinen GmbH, Germany
- 9013 **Multistrand Steel Wire & Drawing**
by: B Kartak BI Voronin, Urals Polytechnik Institute USSR
- 9014 **Advanced DC Drives**
by: N Vivian, Control Techniques Plc, UK
- 9015 **Theoretical Fundamentals of Modern Wire Drawing Technologies**
by: Dr H W Lehnert, Bergakademie Freiberg, Germany
- 9017 **Developments in Direct Water Cooled Wire Drawing Machines - "Veetrac and Deetrac"**
by: Dr J W Pamplin, Marshall Richards Barcro Ltd, UK
- 9018 **Copper and Copper Alloy Coating of Steel Wires by the High Speed Hot Dipping Process**
by: J-L Brelin, M Kornmann Battelle Research Centre, Switzerland
- 9019 **The HICON/H2 R Bell Annealer for Steel Wire**
by: H Lochner, Ebner Industrieofenbau, Austria
- 9020 **Hot Dip Galvanised Wire and its Corrosion in Aqueous Atmospheres**
by: S Besli, Celik Halat Ve Tel Sanayii AS, Turkey
- 9021 **Quality Control in the Production of Wire, Strands and Cables**
by: Dr G Philipp, Maschinenfabrik Niehoff GmbH, Germany
- 9022 **On-line Measuring and Quality Control Instrumentation for Wire, Cable and Tube Extrusion Processes**
by: Dr Ing Buelens, Beta Instrument Co Ltd, UK
- 9023 **New Laser Sensors for Wire Diameter Measurement**
by: J F Fardeau, C.E.R.S.A., France
- 9024 **Direct Information Software to Improve Management, Control and Quality**
by: M J Hurst, Hi-Draw Group, UK
- 9025 **Tool Wear Monitoring Realises Adaptive Control of Wire Drawing**
by: B Nilsson, the Royal Institute of Technology, Sweden
- 9026 **Rationalisation in the Cable Industry**
by: F Kertscher, SWISSCAB E Kertscher SA, Switzerland
- 9027 **Linear Low Density Polyethylene for Sheathing Applications**
by: R Bostwick, G D Brown & J D Umpleby, Union Carbide Chemicals, Switzerland
- 9028 **S Z Cabling for Power Cable Production - Experience and New Developments**
by: Dr Ziemkack, Joachim Schmidt, Kabelmetal Electro, Germany
- 9029 **New Economical Way to Produce High-Quality Telecommunications Wires and Cables**
by: J Heinonen, Nokia-Maillefer, Switzerland
- 9030 **New Packaging System for Wire & Cable**
by: W Lepach, Maschinenfabrik Niehoff, GmbH, Germany
- 9031 **Advances in Silane - Crosslinking Technologies of Polyolefins**
by: D C Varall and W K Wong, Exxon Chemicals, Belgium
- 9032 **Rod by Levitation Casting Process**
by: H R Lowry, Showa Electric Wire & Cable Co Ltd, USA
- 9033 **Fibre Optic Ribbon Cable Production, a New Approach to Produce High Fiber Count Cables**
by: B Bulushek, SWISSCAB E Kertscher SA, Switzerland
- 9034 **Operational Experience with the New Design Mini Copper Rod Plant System - CONTIROD**
by: Dr E Buch - Mannesmann Demag Sack, Germany
- 9035 **Optical Fibre Cable Filling Compounds**
by: F V Arnold, Dussek Campbell Ltd, UK
- 9036 **Applications of Moisture Crosslinkable Ethylene-Silane Copolymers**
by: L H Gross, S Szanislo & J D Umpleby, Union Carbide Chemicals, Switzerland
- 9037 **Microbial Problems in Wire Drawing Emulsions**
by: I Charters, Germ Allcard Specialised Lubricants, UK
- 9038 **Copper Rod From Recycled Scrap: Latest Properzi-La Farga Technology**
by: R C Reuter, Continuous - Properzi Co, Italy & O Guixa Arderiu La Farga-Lacambra, Spain
- 9039 **Shaved CCR Redraw Rod for Welding and Mechanical Engineering Applications**
by: A Mateos, Ph Tavernier Aluminium Pechiney, France
- 9040 **Experiences of the Test and Operation of a New Steel-Cored Aluminium (Koral)**
by: J Gedai/I Barkoczy, 4 December Wire Works, Hungary

WIRE BREAKS SEMINAR

February 1988

Cheshire, UK

- 8801 **Wire Breaks When Drawing Copper**
by: T Hardman, Prescott Rod Rollers, UK
- 8802 **Lubrication Formulation - After Sales Service - The Most Important Raw Material**
by: K Glossop, Batoyle Ltd, UK
- 8803 **Methods of Improving Lubricant Performances in Rod and Wire Mills - Non Ferrous**
by: D Lee, Hunting Lubricants & Specialised Products Ltd, UK
- 8804 **Wire Drawing with Natural & Polycrystalline Diamond**
by: M Jennings, De Beers Industrial Diamond Div, UK
- 8805 **A Practical Guide To Natural & Polycrystalline Diamond Die Maintenance**
by: R Roscoe, British Diamond Wire Die Co Ltd, UK
- 8806 **Hard Metal Dies in the Steel Wire Industry & the Effect of Die Shape on Wire Breaks**
by: L Milan & M A Stephens, Danite Hard Metals Ltd, UK

International Congress

SCANWIRE '85

"IMPROVED PRODUCTION AND PROFITABILITY IN WIRE AND CABLE MANUFACTURE"

May 1985

Copenhagen, Denmark

- 8501 **How Wire on Large Spools Improves Productivity**
by: B Stenlund, Sandvik AB, Sweden
- 8502 **Detection of Lubrication Failures in Wire Drawing**
by: B Nilsson, Lulea University of Technology, Sweden
- 8503 **On Line Stress Relieving of Hard Drawn Steel Wire**
by: P Viola, Impianti Industriali, Italy
- 8504 **Some Practical Applications of Microprocessors to Wire & Cable Machinery**
by: M Hurst, Hi-Draw Engineering Ltd, UK
- 8505 **Hot Extrusion of Stainless and Special Steels**
by: J Middleton, Osborne Steel Extrusions Ltd, UK
- 8506 **The Drawing of Wire At Elevated Temperatures**
by: Dr N Loh, Nanyang Technological Inst., Singapore and Prof D H Sansome, Technoform Sonics Ltd, UK
- 8507 **Continuous Annealing of Carbon Wire in Fluidised Bed Furnaces**
by: W Crowle, Industrial Combustion & Equipment Ltd, Canada
- 8508 **Direct Wire Cooling System**
by: P Petkovic, OTT, France
- 8509 **Descaling of Low Carbon Steel Wire Rod**
by: K-E Olsson, Svenskt Stal AB, Sweden
- 8510 **User Implications of Developments in Rod and Wire Technology**
by: N McBroom, P Bobbet, R Chippen, Allied Steel & Wire Ltd, UK
- 8511 **Application of Modern Technologies in Wire Drawing Machine Engineering To Maintain High Product Quality and Machine Efficiency**
by: J Zunker, Maschinenfabrik Herborn KG, Germany
- 8512 **The Rod Rollers Contribution to the Lowering of Production Costs in the Wire Industry**
by: D T Parkinson, the Templeborough Rolling Mills Ltd, UK
- 8513 **Production of Aluminium Clad Steel Wire by the Conform Process**
by: Dr R Parkinson, Babcock Wire Equipment, UK
- 8514 **Higher Productivity in Wire & Cable Plants by Using a Realtime Production Monitoring System**
by: R Schuerch, Zellweger Uster AG, Switzerland
- 8515 **Computerisation in the Production of Power Cables As Viewed by a Cable Producer**
by: B Jeppesen, NKT Power Cables Division, Denmark
- 8516 **Production Systems for Tinned Copper Wire**
by: W Lepach, Niehoff Maschinenfabrik, Germany
- 8517 **Practical Aspects on the Processing of Aluminium for Low Voltage Power Cables**
by: S Slevolden, AS Norsk Kabel, Norway
- 8518 **Automated Extrusion Lines**
by: J-P Steudler and R Rahm, Maillefer SA, Switzerland
- 8519 **The GELEC Process**
by: H Lowry and A Klein, General Electronic Co, USA
- 8520 **New Developments for Overhead Conductors**
by: F Claes, Lamitref Aluminium, France
- 8521 **CAM - As A Tool in Cable Manufacturing**
by: C M Smit, NKF Kabel BV, Netherlands
- 8522 **The Properzi Micro Mill for Non Ferrous Applications**
by: G Properzi, Continous Properzi Co, Italy
- 8523 **The Use of Syalon Ceramic Die Inserts in Extrusion and Drawing Processes**
by: N Cother, Lucas Cookson Syalon Ltd and F Wilson, Delta Extruded Metal Ltd, UK
- 8524 **The State of the Art in Copper Wire Drawing Lubricants**
by: E Nicol, Germ Lubricants Ltd, UK
- 8525 **Single Crystal & Polycrystalline Diamond Dies for Wire Drawing**
by: G Finnigan, De Beers Industrial Diamond Die Div (Pty) Ltd, UK
- 8526 **Developing Better & More Consistent Profiles for PCD Wire Drawing Dies**
by: Dr K Eder, Siegfried Eder GmbH, Austria

- 8527 **Recent Developments in the Production of the Ultimate Low Flammability, Low Toxicity, Low Smoke Cable**
by: D Gill, AEI Cables, UK
- 8528 **Gear Pump Extrusion with Colouration**
by: V Holt, General Engineering Radcliffe Ltd, UK
- 8529 **Recycling of Thermoplastics in the Cable Industry**
by: J Marcher and I Garre, NKT, Denmark
- 8530 **General Aspects of European Fibre Optics**
by: S Isaksen, NKT Elektronik, Denmark

International Conference
“CASTING & FORMING”
 November 1984
 Montreux, Switzerland

- 8401 **The Manufacture of Copper Clad Aluminium Rectangles and Profiles by Hydrostatic Extrusion**
by: T J Hawksley & D R Wheeler, National Standard Co Ltd, UK
- 8402 **Process Control in the Drawing of Tungsten and Molybdenum Wires for Use in Lighting Applications**
by: G Leaver, G L Consultants, UK
- 8403 **Performance and Quality of Small Copper Rod Lines**
by: R C Reuter, Continuus Spa, Italy
- 8404 **Data Logging in the New Small Scale Krupp/Hazlett Copper Rod Plant**
by: F Siegmeier, FDK Krupp GmbH, Germany
- 8405 **The Gelec Process for Low Cost Continuous Casting**
by: H R Lowry, General Electric Company, USA
- 8406 **Continuous and Batch Heat Treatment of Non Ferrous Rod, Wire & Profiles with Fluidised Bed Furnaces**
by: R McKenzie, Rosin Engineering Co Ltd, UK
- 8407 **Continuous Casting & Rolling of Engineering-Grade Aluminium Alloy Redraw Rod**
by: B Lelievre & P Gaschignard, Aluminium Pechiney, France
- 8408 **Manufacture of Transformer Strips by the CONFORM Process**
by: W Bronvall, AB Elektrokopper, Sweden
- 8409 **Breaks in Drawn Copper Wire**
by: P B McAllister, BICC Research & Engineering Ltd, UK and T H Hardman & D R Groombridge, Prescott Rod Rollers Ltd, UK
- 8410 **Developments in the Continuous Casting of Some Copper Based Alloys**
by: S R Cochrane, Rautomead Ltd, UK and Dr R W Johnson, College of Technology, Dundee, UK
- 8411 **Conform Casting of Profiles by the Castex Process**
by: B Maddock, Holton Machinery Ltd, UK

One Day Seminar
“SHOP PRACTICES”
 February 1983
 England

- 8302 **New Thoughts on Die Making Machinery**
by: Dr Kurt Eder, Siegfried Eder GmbH, Austria
- 8303 **A New Technique for Recutting and Polishing Diamond and Synthetic Diamond Wire Drawing Dies Above 0.2mm dia**
by: R Roscoe, British Diamond Wire Die Co Ltd, UK
- 8304 **Hard Metal Dies in the Wire Industry**
by: L S Milan, Danite Hard Metals Ltd, UK
- 8305 **Experiences of Synthetic Diamond Dies and Maintenance at Sieverts Kableverk - Sweden**
by: Thor Groneqvist, Consultant, Sweden

International Conference
“OFFSHORE APPLICATIONS”
 June 1983
 Aberdeen, England

- 8307 **Review of SERC Research Programme for Wire Ropes in Offshore Applications**
by: Dr C R Chaplin, University of Reading, UK
- 8308 **Offshore Applications for Ropes of Kevlar**
by: N O'Hear, Dupont De Nemours International SA, Switzerland
- 8309 **Prediction of Elastic Properties of Large Strands and Cables**
by: R E Hobbs and M Raoof, Imperial College London, UK
- 8310 **Interference - Its Influence on Wire Rope Behaviour**
by: D M Sharp, British Ropes Ltd, UK
- 8311 **Acoustic Emission of Steel Wire Ropes**
by: Dr J Taylor and N F Casey, University College Cardiff, UK
- 8312 **Recent Developments in Non-Destructive Testing of Steel Wire Ropes for Offshore Applications**
by: A N Gray and R Rajan, University of Aberdeen, UK
- 8313 **Single Contact Testing and Lubrication of Wire Ropes**
by: R G Margetts and Dr H A Spikes, Imperial College London, UK
- 8314 **Mechanisms of Lead Transfer in Resin Socketed Terminations**
by: Dr C R Chaplin and P C Sharman, University of Reading, UK

- 8315 **Design Development and Testing of a New Generation of Power Cables for Offshore Drilling Rigs**
by: H R Lowry, H T Vaum and A F Wu, General Electric Co, USA
- 8316 **Fluid Dynamic Problems in Cables Used for Remotely Operated Vehicles**
by: M Every, British Hydromechanics Research Association, UK
- 8317 **Flambic Cables for Fire Risk Areas**
by: D Todd, BICC General Cables Ltd, Leigh, UK
- 8318 **Wire Products for Downwell Applications**
by: P Timiney and I Roberts, British Ropes Ltd, UK

International Conference
“AUTOMATION AND ROBOTICS”
 October 1983
 Aachen, Germany

- 8319 **Automation in the Wire Industry**
by: Werner Lepach, Maschinenfabrik Niehoff KG, Germany
- 8320 **CAM - A Tool of Cable Manufacturing**
by: C M Smit and J S Van Galen, NKF Kabel BV, Netherlands
- 8321 **Attendance and Management of Lines for Cable Insulation or Sheathing by Micro Computers**
by: E Remaud, EMS Extrusion, France
- 8322 **Automation on Process Control for Extrusion Lines**
by: H Ortigies, Sikora Industrie-Elektronik GmbH, Germany
- 8323 **Automatic Reel Transport and Storage in Cable Manufacture**
by: O Sylvanne, Nokia Cable Machinery, Finland
- 8324 **Recent Improvements in Machinery for Wire Weaving and Emphasis on Crimping and Loom Feeding**
by: A E Barnes, Austen Barnes Advanced Technology, Canada
- 8325 **Continuous Manufacture of Mineral Insulated Cable**
by: D Gill, AEI Cables Ltd, UK
- 8326 **Colour Coding Line for Optical Fibres**
by: F Schatz and H Roderburg, Kabelmetal Electro Grabil, Germany
- 8327 **Management and Control Systems by Micro Computers on Rotating Machines - Stranding and Twisting**
by: R Sudrie, MMC Brondel, France

International Conference
“CABLES”
 May 1981
 Paris, France

- 8101 **The Production of MV HV Cross-Linked Polyethylene Cables by the 'Sioplas' Technique**
by: A E Williamson, B A Schultze & A Clarke, AEI Cable Ltd, UK
- 8102 **Uses of Microprocessor Technology in Cable Control Applications**
by: John Kyriakis & J Street, Beta Instruments Co Ltd, UK
- 8104 **Bunching of Small Copper Cords and Cables. Production Characteristics and New Developments**
by: G Peene, Bekaert Engineering BV, Belgium
- 8105 **Development of the Fully Fitted Telephone Cable**
by: F C Elliott & Dr H H Monk, Dussek Campbell Ltd, UK
- 8106 **Recycling of Cable Waste**
by: Hans Ahlstrom, Rapid Recycling AB, Sweden
- 8107 **The Combined Works of VET - SKET Magdeburg a Major Producer of the Complete Cable Works**
by: M Gensicke, SKET - Magdeburg, Germany
- 8108 **Approaches in Reducing Smoke Evolution of DuPont Elastomers**
by: H Whitlock, DuPont UK Ltd
- 8109 **Optical Fibres in Overhead Power Line**
by: A Wells, Telephone Cables Ltd, UK
- 8110 **Application of 'Conform' in the Manufacture of Sectored Conductors**
by: Roy Molyneux, Babcock Wire Equipment Ltd, UK
- 8111 **Co-ordination Between Electrical Cable Design and Manufacturing Equipment**
by: G Bowie, Consultant, UK
- 8113 **The Problems of Quality in Pairs and Quads of Telephone Cables**
by: R Lemaires, Etudes Et Fabrication, France

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