#IWCS2016

IWCS

THE
International
Cable • Connectivity
Symposium

Industry Leadership, Innovation
and Professional Development

Final Program & Schedule

65th IWCS Conference • October 2-5, 2016

Rhode Island Convention Center | 1 Sabin St | Providence, RI 02903, USA

INTRODUCTION

WELCOME BACK TO PROVIDENCE!

Your IWCS 2016 International Cable & Connectivity Symposium has a number of exciting enhancements this year that will provide you an excellent learning and networking experience! The Symposium Committee has strengthened our connectivity content and industry presence, providing interaction with Technical and Supply Chain Professionals on the Connectorization of cabling infrastructure. We have several additional Sessions to present new technologies and to promote discussion of ideas and innovations to advance connectivity solutions.

This is the 65th annual IWCS conference, which is a testament to the value that we continue to bring to you and your international cable and connectivity industry colleagues. The vitality of the IWCS is demonstrated through the strong support coming from industry, both in terms of sponsorship and attendance, but also in the rich content for the Technical Symposium portion of the program. Our 2016 program contains over 130 papers and presentations in 18 compelling sessions right through Wednesday afternoon. The Supplier Exhibition continues its two-day program, providing plenty of opportunity and incentive for all attendees to visit the exhibits.

The Executive Track presents important information you need in managing your business. Views of the marketplace and the economy are keys to the planning process. This year's Executive Track program will feature vital industry data of the fiber and copper markets, along with the general economic outlook. Also, presentations will cover insightful perspectives on Connectivity Technology Trends, Critical Infrastructure, Hyper-Scale Data Centers and Sustainability for the Cable & Connectivity Industry.

Valuable door prizes will once again be provided during the Conference. Win a Bose SoundLink® Bluetooth Speaker! All symposium registrants attending the Tuesday Poster Paper Session / Exhibit Hall and the Wednesday afternoon Technical Sessions are eligible to win. Must be present to win!

We recognize that networking is a critical element of any industry gathering, and we plan for plenty of opportunities at IWCS 2016. On Monday, IWCS will host a hospitality hour in the exhibit hall with your Suppliers and Customers. After the exhibits close, the Wire & Cable Industry Suppliers Association® (WCISA) will join us to host a reception to honor our industry's young professionals, new visitors to IWCS and students who are showing interest to join our industry upon graduation. Plan to join us for cocktails and hors d'oeuvres prior to your evening dinner plans.

Thank you, for joining us at IWCS 2016. Our most important goal is to meet all of your expectations for a valuable learning and networking experience. We look forward to meeting you and hearing of any suggestions you have to further improve your IWCS Conference in the years to come!

Interact with us on Twitter throughout the event. #IWCS2016

Professional Development Program

This year, a variety of strong Professional Development Courses will be offered on Sunday, providing a great learning opportunity from renowned industry experts. For the twelfth year, IWCS will present the core courses of Copper 101, Fiber 101 and Materials 101. The three core courses will provide those new to our wire and cable industry with basic technology information. The elective courses will deliver current, leading edge topics geared at providing information on new areas of interest to engineers, scientists, and other W&C professionals. Over time, students completing those courses, along with two electives, will be presented with an IWCS Professional Development achievement plaque. The Courses will commence on Sunday, October 2, 2016 at 8:00am with four concurrent sessions. Three more concurrent sessions will continue at 1:00pm. Scheduling of these courses allows for participants to take up to two courses.

Technical Symposium

The cornerstone of our Conference, the IWCS Technical Symposium is recognized around the world as the premier technology event for the cable and connectivity industry. In our 65th year, we will present well over 120 new and previously unpublished papers on research and development for W&C and connector/interconnect technologies, designs, components, materials, fabrication, performance, testing and applications. Compelling sessions this year also include topics such as Global Codes & Standards, Power over Communications Cable, Fiber Optic Connectors for Harsh Environments, Data Centers and Micro-Cables. Sessions will begin on Monday morning and end late afternoon on Wednesday.

Plenary Session to Showcase IoT Solutions—Impact on Network Demand

The Plenary Session will feature the keynote address, IoT Solutions and the Future Impact on Network Demand / Infrastructure, presented by Scarlett King, MBA, Director of IoT Solutions for Bosch Software Innovations. Scarlett will discuss the hyper-growth for the Internet of Things (IoT) and several key factors that are driving fast-paced implementations. She will highlight several interesting IoT applications and business models for the innovations taking place in smart connected communities, cities, mobility and Industry 4.0, which promises to be a highlight of the 2016 Conference.

The plenary session will also feature recognition for the best papers and presenters of 2015. The session is open to all Technical Symposium registered attendees.

Supplier Exhibition and New Product Presentations

The IWCS Supplier Exhibition will include over 100 exhibits providing interaction among various levels of the Cable & Connectivity Supply Chain, to learn about the wide variety of product technologies and user applications. Also, New Product Presentations provide an opportunity for suppliers to report on new commercial product developments. The schedule for these presentations will be included in the registration package at the Conference. The two day program on Monday and Tuesday will provide plenty of opportunity and incentive for everyone to visit the exhibits and maximize your networking opportunities.

Conference Registration

Registration for all aspects of the IWCS International Cable & Connectivity Conference and Technical Symposium can be accomplished through our web site (www.iwcs.org), by facsimile or mail, or in person at the Conference. Specific information on both registration and hotel reservations is included on the IWCS website.

Monday Night Hospitality

All Conference attendees are invited as our guests to a cocktail reception on Monday, October 3rd, from 6pm–7:30pm, immediately following the Supplier Exhibition. This reception is co-sponsored by Wire & Cable Industry Suppliers Association™ (WCISA) to honor scholarship recipients and students aspiring to join our industry. We hope you will join us to enjoy drinks and light hors d'oeuvres with your colleagues to wind down from a full day, prior to your dinner plans.

IWCS Photography Policy

Attendance at, or participation in, this conference constitutes consent to the use and distribution by IWCS of the attendee's image or voice for informational, publicity, promotional, and/or reporting purposes in print or electronic communications media.

Video Recordings by participants and other attendees during any portion of the conference is NOT allowed without prior written permission of IWCS.

Photographs of copyrighted, confidential and/or proprietary PowerPoint or other Presentation Slides are not to be taken, reproduced or distributed. Do NOT photograph any such images without prior permission of the Author / Presenter

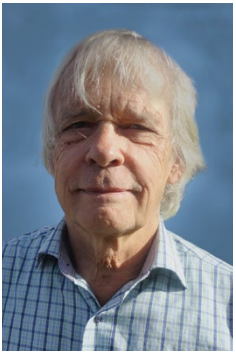
PLENARY SESSION

CEO AND CHAIRMEN

David B. Kiddoo
CEO/Director
IWCS, Inc.
Shrewsbury, PA, USA

ROBERT A. WESSELS, JR.
Chairman of the Board
IWCS, Inc., CommScope Inc
Claremont, NC, USA

AD ABEL
Co-Chairman, IWCS 2016
Symposium Committee
DSM Functional Materials
Hoek Van Holland, The Netherlands



DR. C. BERTIL ARVIDSSON
Co-Chairman, IWCS 2016
Symposium Committee
Fiberson AB
Hudiksvall, Sweden

KEYNOTE SPEAKER

IoT Solutions and the Future Impact on Network Demand / Infrastructure

Scarlett King, MBA
Director of IoT Solutions—Smart Connected Cities and Communities
Bosch Software Innovations, Chicago, IL, USA

Scarlett King is the Director of IoT Solutions—Smart Connected Cities and Communities for Bosch Software Innovations. Involved with a number of innovative projects for connected communities, Scarlett provides strategic development and design solution concepts in areas such as Industrial Manufacturing, Energy Management, Healthcare, Social Data, Telematics and eMobility. Her Business Group for Bosch focuses on leveraging a multitude of IoT / Machine-to-Machine (M2M) technologies and products to deliver impactful ROI results.

As the Keynote Speaker, in this year's Plenary Session, Scarlett will discuss the hyper-growth for the Internet of Things (IoT) market and several key factors that are driving fast-paced implementations. She will highlight some of the interesting IoT applications and business models for the innovations taking place in smart connected communities, cities, mobility and Industry 4.0.

Insights on the rationale motivating organizations to utilize IoT technology, and the scale of those future implementations, will provide perspective on the significant load demands that will be placed on the network IP. Ultimately, you will learn about IoT requirements, pending network IP growth demand, and realization of the need for increased infrastructure to accommodate the future of our society.

Prior to joining Bosch, Scarlett was the Director for M2M / IoT Business Solutions at Numerex Corporation, utilizing these technologies as a means to reducing operational costs for businesses, as well as creating new revenue streams. Scarlett received her Bachelor Degree in Business Management from Thomas More College and went on to achieve her Masters in Business Administration from Miami University of Ohio. She has received numerous special achievement awards for outstanding contributions and innovation.

PROFESSIONAL DEVELOPMENT COURSES

SUNDAY, OCTOBER 2, 2016 – 8:00 AM TO 12:00 PM

Within the program of the IWCS Conference an opportunity is presented to advance the knowledge and education of industry participants through Professional Development Courses, led by industry experts. The offerings include basic concepts in core courses related to copper, fiber and materials. Additionally, courses are offered in the latest technology issues facing the industry, allowing participants to be fully briefed on current issues. For the twelfth year, IWCS will present the core courses of Copper 101, Fiber 101 and Materials 101. Over time, students completing those courses, along with two electives, will be presented with an IWCS Professional Development plaque. The first students to successfully complete the program were awarded such plaques at IWCS in November, 2008. Please check the IWCS website for further or changed offerings in the curriculum, www.iwcs.org.

The Courses will commence on Sunday, October 2, 2016 at 8:00am with four concurrent sessions. Three more concurrent sessions will continue at 1:00pm. The Professional Development Courses will conclude prior to the opening of the IWCS Technical Symposium, allowing attendees to participate both in the Courses and in the Symposium. Lunch will be provided to registrants of the courses on Sunday. Scheduling of these courses allows for participants to take up to two courses.

1. CU101: FUNDAMENTALS OF COPPER CONDUCTORS & METALLIC CABLE DESIGN & APPLICATIONS, **MR553A**

Instructors: Trent Hayes, Senior Engineering Manager, CommScope Incorporated, Claremont, NC, USA

Larry Bleich, Senior Engineering Manager, CommScope Incorporated, Claremont, NC, USA

This course is an introduction to the design and application of copper conductor communications cables. Students will understand how coaxial, twisted pair and twinaxial cables are designed and how they operate upon completing the class. The instructors will provide background material on the history of copper cabling followed by sections on applications, design and construction of cables. Current standards and design examples are also reviewed by the instructors. Materials that are typically used in copper conductor communication cables will be incorporated at a fairly high level into the design exercises.

Industry professionals desiring a basic knowledge of copper cabling systems will find the course of value.

2. FO101: FUNDAMENTALS OF OPTICAL FIBERS & FO CABLE DESIGN & APPLICATION, **MR553B**

Instructor: David A. Seddon, Senior Engineering Associate, Cable Technology, Corning Optical Communications, Hickory, NC, USA

This course will explore several aspects of optical fiber and cable design technology with particular focus on products for communications. It will discuss application considerations to select a product appropriate for a given installation environment and the basic considerations necessary for successful design of optical fiber cables.

The first part of this course will outline the characteristics and fundamental operating principles of optical fibers and the designs of the three basic fiber families (Single-Mode, Multimode and Non-Zero Dispersion Shifted optical fibers). Included will be critical fiber parameters and their impact on system performance. Specific topics will include the Advantages of Optical Fiber, Optical Fiber Manufacturing, Total Internal Reflection, Attenuation, Dispersion, Polarization Mode Dispersion (PMD), Cutoff Wavelength and other optical parameters critical to optical communications.

The second part of this course will explore the functional requirements of optical fiber cables and some of the fundamental design equations which can be used to ensure a cable will meet a given installation or operational requirement. We will also discuss selection of a product appropriate for a given installation environment. Structural differences between cables for indoor, outdoor, and specialty applications will be explored including stranded loose tube cables, central and stranded tube ribbon cables, tight buffered cables and optical power ground wire cables.

The course provides a basic overview of optical fiber fundamentals and optical cable design principles to those new to the fiber optic cables.

3. MA101: SELECTION & USE OF MATERIALS IN WIRE & CABLE, **MR550A**

Instructors: Dr. Mohamed Esseghir, Principal Research Scientist, The Dow Chemical Company, Collegeville, PA, USA

Dr. Anny L. Flory, Research Scientist, The Dow Chemical Company, Collegeville, PA, USA

In this course, the selection and implementation of polymer materials used in the construction of wires and cables will be reviewed. The course will focus on polymer materials utilized in telecommunication cable applications with focus on twisted pair, coaxial, and fiber optic cables. An overview of the materials science essential to the polymer properties and additives employed in cable compounds will be covered

to level-set all attendees. Further, the fundamental characteristics (advantages and disadvantages) of materials will be presented which can be then considered in selecting a material for use in a finished cable construction, with specific sections covering jackets, insulations and fiber optic materials. In addition, the effect of additives on material performance will also be discussed, particularly those that impart ultraviolet resistant and flame retardant properties on the materials.

The course is intended for all wire and cable practitioners including raw material suppliers, cable manufacturers, and end users interested in gaining a broad understanding of applied material selection as it relates to cable performance.

4. ST101: UL INTRODUCTION TO THE CODES AND STANDARDS MAKING PROCESS, **MR550B**

Instructors: Anthony T. Tassone PE, Principal Engineer (PDE) Wire & Cable, Commercial & Industrial, UL LLC, Melville, NY, USA

Dr. C. Bertil Arvidsson, Technical Expert Fiber Technology, Fiberson AB, Hudiksvall, Sweden

In this course, the standard development process for various Standards for wires and cables will be reviewed. The course will focus on the ANSI guidelines for several different US Standard Development Organizations (SDO's) in the US and will also cover the IEC/ISO Standard Development process. There will be focus on the UL/ANSI Standards Development Process including UL's Collaborative Standards Development System (CSDS), the definition of a consensus standard, and how to submit proposals. An overview of the processes for developing ASTM and TIA Standards will also be provided.

The course is intended for all wire and cable practitioners including, cable manufacturers, and end users interested in understanding the Standard's development process as it relates to the requirements for Wire and Cables.

SUNDAY, OCTOBER 2, 2016 – 1:00 PM TO 5:00 PM

5. MA202: THE ART AND SCIENCE OF EXTRUSION FOR WIRE AND CABLE – Part II, **MR553A**

Instructor: Dr. Yimsan Gau, Cable Consulting Services, Princeton, NJ, USA

One of the most critical steps in the fabrication of plastic parts and products and specifically wire & cable is the extrusion process. The process involves the extruder and screw as well as the properties of the materials being extruded. The course presents an overview of the extruder components, the three main functions of the extruder screws, the importance of mixing elements and their design, and the impact of material properties on the extrusion processes. This is followed by a detailed description of the different types of screws, their design concept, their advantages/disadvantages, and the fabrication lines of different type of cables and problems associated with them.

The course also includes two sections on extrusion stability and extrusion optimization. Stable extrusion is critical in controlling the electrical properties, physical properties and the dimensions of the cables. The factors which can lead to unstable extrusion and the two parameters used to monitor extrusion stability, head pressure and melt temperature are reviewed. Optimizing the extrusion process requires a good understanding of the energy input to the extrudate from the motor through the screw, and the energy input from the heated barrel through heat conduction. The energy input from the two sources and the setting of temperature profile on the barrel and die to achieve an optimal flow out of the extruder and die are presented. Simple flow and pressure drop calculations are made to illustrate the modeling flow process in the extruder and die. The three requirements for successful troubleshooting extrusion problems are also covered: step by step approach, good instrumentation and good understanding of the process. In addition, the important polymer properties affecting the extrusion process and performance are discussed along with the typical problems in cable extrusion and new trend in extrusion technology.

The course provides useful reference material to process engineers planning to pursue more advanced studies in wire & cable extrusion, and practical hints and tools to help optimize the extrusion processes.

6. CU207: FUNDAMENTALS OF SIGNAL INTEGRITY (An Introduction to noise and measurements for cable and connectivity engineers), **MR553B**

Instructors: Alistair Duffy, Ph.D., Professor of Electromagnetics, De Montfort University, Leicester, United Kingdom

Kenneth Cornelison, Cable Technology Resources, Cincinnati, OH, USA

The high signaling and clock frequencies used in communications systems means that there are more sources of noise and distortion for modern electronics engineers to consider as part of their circuit design or measurement protocols. This course provides an introduction to Signal Integrity with a focus on the cable / connectivity industry. The course is suitable as a refresher course for experienced professionals but mostly as an essential overview for engineers within the first few years of working in this field and who want to develop an understanding of the essentials of Signal Integrity.

The indicative content is:

- Time and frequency: bandwidth and spectra
- Shannon's law, the evolution of coding schemes and inherent noise sensitivity
- Real components: understanding resistance, inductance and capacitance. Impedance and resonance
- Single ended and differential signaling: differential and common mode
- Ground and power planes are not perfect: switching noise, ground bounce

- Transmission lines in time and frequency. Lossy and lossless. Reflections, dispersion, eye diagrams, jitter, time domain reflectometry
- Crosstalk: Inductive and capacitive coupling
- Scattering parameters and deembedding
- Vias
- Understanding limitations of measuring equipment (rise times and bandwidth of scopes, loading of probes, etc.)

Application impact. Techniques used to manage the impact of noise in communications systems.

7. F0209: THE RELIABILITY OF OPTICAL FIBERS AND PASSIVE FIBER COMPONENTS IN LONG AND SHORT COMMUNICATION NETWORKS, **MR550B**

Instructor: Tarja Volotinen, Tarja's Consulting AB, Hudiksvall, Sweden

The mechanical and optical reliability during the past over 35 years in service are overviewed for optical fibers, splices and passive fiber components. The failure mechanisms that are possible in fibers, and also the methods how they can be decreased or avoided in the networks are presented.

The reliability requirements and survival estimates for communications links, ranging from the thousands of kilometers overseas connections to the short, a-few-meters–hundreds-of-meters datacenter and cloud networks are described. The physical and chemical conditions that the fiber materials and cable structures need to withstand are also described.

The lifetime calculation method (IEC TR62048) and the test methods (the relevant FOTPs, IEC and other standards) to characterize the mechanical properties of the fibers and components are described in detail. Special care is used to understand the strength of the high strength parts and weak spots of optical fibers, and how the test data needs to be analyzed for the lifetime and failure rate estimation in different networks and service environments (chemical and physical).

Furthermore, this course also presents the optical and mechanical worst case failure modes (e.g. attenuation increase, hydrogen aging and fiber glass surface corrosion etc.) that might occur in the case unsuitable materials and manufacturing methods are used. Finally, the typical reliability of fibers in appropriate cable networks, which now provide us all the broad band communication worldwide are presented. – The course is based on the literature data.

This course is designed for engineers of manufacturers, network and system designers and operators.

PLENARY SESSION LUNCHEON

MONDAY, OCTOBER 2, 2016: 12:00 PM – 1:45 PM

BALLROOM A

Registered Technical Symposium attendees only (Seats are Limited)

ANNOUNCEMENTS/GREETINGS

Robert A. Wessels, Jr., Chairman, IWCS, Inc. Board of Directors, CommScope, Inc., Claremont, NC, USA
David Kiddoo, CEO/Director, IWCS, Inc, Shrewsbury, PA, USA

KEYNOTE SPEAKER

Scarlett King, MBA
Director of IoT Solutions – Smart Connected Cities and Communities
Bosch Software Innovations, Chicago, IL, USA
"IoT Solutions and the Future Impact on Network Demand / Infrastructure"

AWARDS AND RECOGNITION

Presented By
Ad Abel, Co-Chairman, IWCS Symposium Committee, DSM Functional Materials, Hoek Van Holland, The Netherlands

JACK SPERGEL MEMORIAL AWARD FOR OUTSTANDING TECHNICAL PAPER

Bulent Kose, Jose Castro, Ph.D., Rick Pimpinella, Ph.D., Yu Huang, Ph.D., Alexander Berian, Asher Novick and Brett Lane, Ph.D.
Panduit Corporation, Tinley Park, IL, USA
"Characterization of Modal Dependence of MMF Chromatic Dispersion for Wideband MMF"

OUTSTANDING POSTER PAPER

Tomohiro Ishimura, Masayoshi Tsukamoto and Yutaka Hoshino
Furukawa Electric Co., Ltd., Mie, Japan
"Development of 2000-Fiber Ultra-High Density Underground Optical Cable"

KITTS-KINGSLEY AWARD FOR BEST PRESENTATION

David Mazzarese, Ph.D.
OFS, Norcross, GA, USA
"Splice Loss Criteria for Outside Plant Cable"

HONORING RETIRING IWCS MEMBER OF THE BOARD OF DIRECTORS

To
Ian Greveling, Corning Communications LLC, Hickory, North Carolina, USA

HONORING RETIRING IWCS MEMBER OF THE SYMPOSIUM COMMITTEE

To
Paolo Marelli, Prysmian Group, Milano, Italy
Presented By
Robert A. Wessels, Jr., Chairman, IWCS, Inc. Board of Directors, CommScope, Inc., Claremont, NC, USA

TECHNICAL SYMPOSIUM

MONDAY, OCTOBER 3, 2016, 8:00 AM – 11:45 AM

SESSION 1: EXECUTIVE TRACK, Ballroom B

Chairperson: Robert M. Canny | TE Wire & Cable, New Jersey, USA

1-1 (8:00): 400 Million Km: Where in the World is All that Fiber Going? – R. Mack, CRU International, Rhode Island, USA

1-2 (8:25): Overview of the Global Insulated Wire & Cable Markets – N. Noor-Drugan, CRU, London, UK

1-3 (8:50): Connectivity Technology Trends and Strategic Growth – C. Mullet, Branison Group, Connecticut, USA

1-4 (9:15): Critical Infrastructure, Data Centers and Cybersecurity – J. Carlini, Carlini & Associates, Illinois, USA

BREAK (9:40-10:10)

1-5 (10:10): Hyper-Scale Data Centers - Designed for the Internet of Things – C. Enman, Dice Corporation, Michigan, USA

1-6 (10:40): Purpose-Driven Sustainable Development for the Cable & Connectivity Industry – C. Barcan, The Vinyl Institute, District of Columbia, USA

1-7 (11:10): Economic Outlook – R. Fry, Robert Fry Economics LLC, Delaware, USA

SESSION 2: SPECIAL APPLICATIONS, MR556

Chairperson: Markus F. Kemmler | Kemmler Consulting GmbH, Alemannenstrasse, Germany

2-1 (8:00): On Fiber Optic Riser Cables' Sensitivity to the Ambient Temperature - M. Komperød, Nexans Norway AS, Halden, Norway

2-2 (8:25): Development of Flame Retardant and Fire-Resistant Optical Cable Based on Ceramic Sheathing Materials - P. Liu, R. Wang, D. Wu, X. Zhang, L. Zhan, B. Luo, D. Shen, S. Wu, M. Xue and J. Wu, Hengtong Optic-Electric Co., Ltd., Jiangsu, P.R. China

2-3 (8:50): Mass Production Results of Submarine Cable Applying "Ultra Low Loss" and "Ultra Large Effective Area" Fiber - D. Masuda, A. Yamamoto and J.C. Aquino, OCC Corp., Kitakyushu, Japan

2-4 (9:15): Acrylate-Based Specialty Optical Fiber Coatings for Harsh Environments - A.A. Stolov, J.A. Wrubel, D.A. Simoff and R.J. Lago, OFS, Connecticut, USA

BREAK (9:40-10:10)

2-5 (10:10): Impact of Cable Material, Optical Fiber Design, and Cable Design on High Temperature Accident Survivability of Optical Fiber Cables - B.G. Risch, Prysmian Group, North Carolina, USA

MONDAY, OCTOBER 3, 2016, 12:00 PM – 7:30 PM

See following events for specific times

PLENARY SESSION LUNCHEON, Ballroom A

12:00 PM – 1:45 PM

Keynote Speaker: Scarlett King | Bosch Software Innovations

See page 8 for details

EXHIBITS, EXHIBIT HALL C

2:00 PM – 6:00 PM

NEW PRODUCT INTRODUCTIONS, EXHIBIT HALL D

2:30 PM – 5:30 PM

Chairperson: Mike Patel | Teknor Apex Co., Rhode Island, USA

(Titles Will Be Posted Onsite)

HOSPITALITY RECEPTION, ROTUNDA

6:00 PM–7:30 PM

TUESDAY, OCTOBER 4, 2016, 8:00 AM – 11:50 AM

SESSION 3: GLOBAL FTTX & INSTALLATION, MR557

Chairperson: Eric R. Logan | Corning Optical Communications LLC, North Carolina, USA

3-1 (8:00): Ducted Optical Cable with Double Sheath for Direct Burial Application - Y. Endo, J. Onishi, K. Tanabe, Y. Iriyama, K. Nakayachi, K. Omoto and Y. Aoyahi, NTT Corp., Ibaraki, Japan

3-2 (8:25): Evaluation of the Transmission Signal Quality of a Temporary Optical Coupler for an Optical Cable Re-Routing Operation Support System - T. Manabe, T. Kawano, T. Kiyokura, T. Uematsu and H. Hirota, NTT Corp., Ibaraki, Japan

3-3 (8:50): Overblowing of Mini-Cables Into A Reduced Diameter Sub-Duct - R. Sutehall, M. Davies and L. Spicer, Prysmian Group, Hants, United Kingdom; and C. Kelly, KN Group, Bucks, United Kingdom

3-4 (9:15): Progress in Floating Sensor Fibers into Steel Tubes - W. Griffioen, Y. Chappuis and S. Grobety, Plumettaz SA, Bex, Switzerland

BREAK (9:40-10:10)

3-5 (10:10): Factors that Influence the Lubrication of Mini-Ducts & the Subsequent Installation Performance of A Mini-Cable - R. Sutehall, M. Davies and J. Bevis, Prysmian Group, Hants, United Kingdom

3-6 (10:35): 200 Micron Reduced Outer Diameter Ultra-Low Loss & Bending Insensitive Fiber - J. Wu, L. Zhang, J. Zhu, H. Zhou, H. Wang, X. Lu, Z. Xiong, R. Wang and R. Matai, Yangtze Optical Fiber and Cable Joint Stock Ltd., Co., Wuhan, China

3-7 (11:00): The Chinese Mode which Promoting the Development of FTTH - C. Wang, T. Liu, B. Hu and H. Zhang, China Academy of Information and Communications Technology, Beijing, P.R. China; M. Xue and L. Gu, Hengtong Optic-Electric Co., Ltd., Jiangsu, P.R. China

3-8 (11:25): Development and Applications of Four-Groove Bow-Type Invisible Optical Fiber Cable - J. Wu, L. Gu, M. Xue and P. Cao, Hengtong Optic-Electric Co., Ltd., Jiangsu, P.R. China; T. Liu and C. Wang, China Academy of Information and Communication Technology, Jiangsu, P.R. China

SESSION 4: FIBER/CABLE MANUFACTURING AND RELIABILITY, BALLROOM B

Chairperson: Ad Abel | DSM Functional Materials, Hoek Van Holland, The Netherlands

4-1 (8:00): Experiments of Optical Fibre Drawing Using UV LED Lamps for Coating Cure - O. Bresser, S. Ning and X. Ju, Twentsche (Nanjing) Fibre Optic Ltd., Nanjing, China

4-2 (8:25): Development of Fiber Optic Cable Surface Defect Detection Technology - P. Cao, P. Liu, D. Wu, X. Zhang, Y. Xie, J. Wu, D. Wei, J. Wu and J. Yuan, Hengtong Optic-Electric Co., Ltd., Jiangsu, P.R. China

4-3 (8:50): High Speed Fiber Drawing: A Resin's Point of View - A. Bogaerds and M. Bulters, DSM AHEAD B.V., Geleen, The Netherlands; H. Cao and P. Shah, DSM Functional Materials Inc., Illinois, USA

4-4 (9:15): More than 80% Energy Efficiency Achieved in Optical Fiber Coating Application Process using UV-LED Lamps and Novel Chemistries - P. Shah, H. Cao, K. Ren, X. Wu, K. Roberts and T. Anderson, DSM Functional Materials, Illinois, USA; J. Zhao, L. Alex and J. Wang, DSM Functional Materials, Shanghai, China; and A. Abel, DSM Functional Materials, Hoek van Holland, The Netherlands

BREAK (9:40-10:10)

4-5 (10:10): Improved Method for Characterization of Long Term Fiber Coating Stability - C.K. Chien, Corning Inc., New York, USA

4-6 (10:35): New ITU-T Optical Fiber and Cable Reliability Supplement - D. Mazzarese, OFS, Georgia, USA

SESSION 5: COPPER CABLES – MEASUREMENTS & MODELLING, MR555

Chairperson: Eduardo Garza | Hitachi Cable America, Inc., New Hampshire, USA

5-1 (8:00): Investigating Common-Mode to Differential-Mode Conversion in a Four Pair Twisted Pair Cable - E.C. Arihilam, H.G. Sasse and A.P. Duffy, De Montfort University, Leicester, United Kingdom; P. Cave, Excel Networking, Birmingham, United Kingdom; and J. Withey, Fluke Networks, Berkshire, United Kingdom

5-2 (8:25): Higher Order Mode Suppression in Triaxial Cells - B. Mund and R. Damm, bedea Berkenhoff & Drebes GmbH, Asslar, Germany; I. Lucicanin and D. Pouhè, Reutlingen University of Applied Sciences, School of Engineering, Reutlingen, Germany; and T. Schmid, Rosenberger HF-Technik, Fridolfing, Germany

5-3 (8:50): Design and Assessment of Cavity Perturbation Method for Dielectric Constant Measurement - F. Akinnuoye, H. Sasse and A. Duffy, De Montfort University, Leicester, United Kingdom; and P. Cave, Excel Networking, Birmingham, United Kingdom

5-4 (9:15): Unbalanced Transmission Channel Model Simulation for CAT7A Ethernet Cable - B. Li and A. Duffy, De Montfort University, Leicester, United Kingdom

BREAK (9:40-10:10)

5-5 (10:10): NEXT between Screened Twisted Pairs - J. Poltz, OptEM Engineering Inc., Alberta, Canada

5-6 (10:35): 3D Electromagnetic Modeling Challenges in Designing Next Generation Ethernet Components - E. Ebrahimi, Brand-Rex Ltd., Glenrothes, United Kingdom; A. Bhattacharya, CST UK Ltd., Nottingham, United Kingdom

SESSION 6: MATERIALS FOR CABLE & CONNECTIVITY APPLICATIONS, MR556

Chairperson: Dr. Mohamed Esseghir | The Dow Chemical Company, Pennsylvania, USA

6-1 (8:00): Solutions to Improve Optical Fiber Cables Flame Retardancy - M. Maritano, P. Marelli, V. Scrima and G. Colombo Serri, Prysmian S.p.A., Milano, Italy; and M. Garcia S. Emeterio, Draka Comteq Iberica Slu., Maliaño, Spain

6-2 (8:25): Novel Intumescent Halogen Free Flame Retardant Compounds with Lower Heat Release, Reduced Smoke and Toxicity as Measured in ASTM E1354-15a Using the Cone Calorimeter and Bombardier SMP 800C - P.P. Lorigan, T & T Marketing, Inc., Pennsylvania, USA

6-3 (8:50): Flame Retardancy of Wire and Cable Formulations - Fact or Fiction - T.M. Cooke and R.S. Mathur, Albemarle Corp., Louisiana, USA

6-4 (9:15): Cu-Ag-Zr Conductor Alloy Development: From Lab Scale to Mass Production - S. Burk, Isabellenhütte Heusler GmbH & Co. KG, Dillenburg, Germany

BREAK (9:40-10:10)

6-5 (10:10): Evaluation of Foaming Technology for Data Cable Insulations - A. Flory, G. Sun, M. Esseghir and C. Kmiec, The Dow Chemical Co., Pennsylvania, USA

6-6 (10:35): Alternative Physically Foamed Insulation Concepts for Higher Category Data Cable - A. Watson, Borealis Polymers NV, Mechelen, Belgium; K. Miller, Brand-Rex Ltd., Fife, United Kingdom; and A. Kontro, Borealis AB, Stenungsund, Sweden

6-7 (11:00): The Future of Material Selection Criteria for Power over Local Area Networks - R.W. Speer and C.A. Glew, Cable Components Group, LLC, Connecticut, USA; S. Lee and R. Ozisik, Rensselaer Polytechnic Institute, New York, USA

6-8 (11:25): Perfluorinated Polymers with Improved Thermal Performance - M. Emad, Solvay Specialty Polymers, New Jersey, USA; M. Bassi, G. Besana, P. Colaianna and M. Mirenda, Solvay Specialty Polymers, Milano, Italy

TUESDAY, OCTOBER 4, 2016, 10:00 AM – 6:00 PM

EXHIBITS, GRAND HALL

"Bose SoundLink® Bluetooth Speaker" – drawing in Poster Session area @ 5:30 pm (must be present to win)

TUESDAY, OCTOBER 4, 2016, 1:00 PM – 4:00 PM

SESSION 7: FIBER & CABLE MEASUREMENTS, BALLROOM B

Chairperson: Hélio J. Durigan | Furukawa Industrial S.A., Curitiba, Brazil

7-1 (1:00): Implementation of Wavelength Selective Filter for NG-PON2 - T. Hashimoto, K. Terakawa and Y. Kajihara, NTT Corp., Ibaraki, Japan

7-2 (1:25): Highly Sensitive Monitoring of Progressive Microbending Loss Using 1-um-Band Mode-Detection OTDR - Y. Koshikiya, K. Okamoto, A. Nakamura, H. Watanabe and T. Manabe, NTT Corp., Tsukuba, Japan

7-3 (1:50): Estimating Attenuation for Installed Singlemode Fiber Links Using Statistical Methods - D. Mazzarese, OFS, Georgia, USA

BREAK (2:15-2:45)

7-4 (2:45): Cabling and Splicing Performance of an Ultra Low Loss, Optimized Effective Area Fiber for Terrestrial Long Haul Applications - P. Weimann, R. Norris, B. Ward, D. Mazzarese, A. McCurdy and Y. Liang, OFS Fitel, LLC, Georgia, USA; P. Borel and B. Pálsdóttir, OFS Fitel, LLC, Brøndby, Denmark

7-5 (3:10): Splice Loss Rules and Results for Single-Mode Fibers Deployed in Terrestrial Long Haul Networks - D. Mazzarese, T. Liang, J. Hartpence and B. Ward, OFS, Georgia, USA

7-6 (3:35): Predicting Losses in Installed Links using Monte Carlo Method - S. Hopland, Telenor Norway, Oslo, Norway

SESSION 8: COPPER CABLES – PERFORMANCE & DESIGN, MR555

Chairperson: Daniel Winkler | LEONI Cable Inc., Michigan, USA

8-1 (1:00): RF Immunity Study of Category 6a Cables - K. Cornelison, Industry Consultant, Ohio, USA; and E. Garza, Hitachi Cable America, New Hampshire, USA

8-2 (1:25): EMC Performance and Alien Crosstalk Conformance for Cat8 Cables - P. Fischer, V. Arbet-Engels and D. Gigon, AESA Cortaillod, Colombier, Switzerland

8-3 (1:50): Raising the Bar on Patch Cord Performance in the Real World - R. Ivans, UL, LLC, New York, USA

BREAK (2:15-2:45)

8-4 (2:45): Study at the Influence of Different Paring Method and Their Effect on Coupling Attenuation - J.A.S. Martins, M.T. Souza, T.C. Fukui, P.M. Ito, S.A. Joly and H. Durigan, Furukawa Industrial Electrica S.A. Elétricos, Paraná, Brazil

8-5 (3:10): Small Form Factor Corrugated Wireless RF Coaxial Jumper Cable Design - L.L. Bleich and A.N. Moe, CommScope, Inc., North Carolina, USA

8-6 (3:35): Thermal Analysis of Buried Multiple Power Cables Loaded from Different Sources for Optimal Placement by Using Finite Element Analysis - S. Gaikwad, P.R. Watekar, P. Vasani and A. Aggrwal, Sterlite Technologies Ltd., Maharashtra, India

SESSION 9: FIBER OPTIC CONNECTORS FOR HARSH ENVIRONMENT, MR556

Chairperson: Robert A. Wessels, Jr. | CommScope, Inc., North Carolina, USA

9-1 (1:00): Water Proof Optical Connector for FTTH - D. Takeda, S. Takahashi, K. Fujiwara and K. Takizawa, Fujikura Ltd., Chiba, Japan; and S. Kato, AFL Telecommunications Ltd., South Carolina, USA

9-2 (1:25): Waterproof Optical Connector Having Compatibility to Various Optical Connection Interfaces - J. Fukui and Y. Suzuki, SEI Optifrontier Co., Ltd., Kanagawa, Japan

9-3 (1:50): Development of a Cleanliness Specification for Lensed Multimode Fiberoptic Connectors - M. Kadar-Kallen, CommScope, Inc., Pennsylvania, USA; T. Berdinskikh, Celestica International Inc., Ontario, Canada; C. Chen, Foxconn Interconnect Technology, California, USA; D. Wilson, Fiber QA, Connecticut, USA; T. Coughlin, Molex, Illinois, USA; and K. Tayama, Juniper Networks, California, USA

BREAK (2:15-2:45)

9-4 (2:45): Fiber Optic Expanded Beam Graded Index (GRIN) Lens Contacts for Harsh Environment Connectors - D.A. Parker, ODU-USA Inc., California, USA; and S.M. Franzl, ODU-GmbH & Co. KG, Muehldorf-Am-Inn, Germany

9-5 (3:10): Advancements in High Density, Expanded Beam Interconnects for On-Board Optic Architectures - M. Hughes and S. Lutz, US Conec Ltd., North Carolina, USA

TUESDAY, OCTOBER 4, 2016, 4:00 PM – 6:00 PM

POSTER SESSION, EXHIBIT HALL D

Chairpersons: Eric Whitham, OFS, Georgia, USA | Professor Alistair Duffy, De Montfort University, Leicester, United Kingdom

P-1: Development of the Novelty G.654 Optical Fibers for Long-haul Terrestrial Optical Fiber Communication - J. Yuan,W. Chen, Z. He and G. Zhang, JiangSu Hengtong Optic-Electric Co., Ltd., Jiangsu, P.R. China

P-2: Maintenance Techniques for Splice Protections of Gas-Filled Copper Cable - T. Okamoto, M. Okada, K. Mine and K. Uehara, NTT East, Tokyo, Japan

P-3: Print Length Verification for Cable - C. Girdwood and A. McCloskey, Taymer International Inc., Ontario, Canada

Continued on page 14

CONFERENCE AT A GLANCE

Sunday 10/2

7:00a–8:00a
Instructors' Orientation
Breakfast, **MR551B**

8:00a–12noon
Professional Development Courses

1. CU101: Fundamentals of Copper Conductors & Metallic Cable Design & Applications **(MR553A)**
2. FO101: Fundamentals of Optical Fibers & FO Cable Design & Application **(MR553B)**
3. MA101: Selection & Use of Materials in Wire & Cable **(MR550A)**
4. ST101: UL Introduction and the Codes & Standards Making Process **(MR550B)**

Coffee Break 9:45a

12noon–1:00p Lunch
Instructors & Students Only

1:00p–5:00p
Professional Development Courses

5. MA202: The Art & Science of Extrusion for Wire and Cable Part II **(MR553A)**
6. CU207: Fundamentals of Signal Integrity **(MR553B)**
7. FO209: The Reliability of Optical Fibers & Passive Fiber Components in Long and Short Communication Networks **(MR550B)**

Coffee Break 2:45p

Monday 10/3

6:00a–1:30p
Exhibit Setup
(Exhibit Hall C)

7:00a–8:00a
Speakers' Orientation
Breakfast, **Ballroom C**

Session 1 **(Ballroom B)**	Session 2 **(MR556)**

Coffee Break **9:40–10:10**

Executive Track	Special Applications

Plenary Session with Awards (Lunch Included)
Keynote Speaker: Scarlett King, MBA
Bosch Software Innovations
(Ballroom A) 12:00p–1:45p

Exhibits **2:00p–6:00p**
Refreshments **5:00p–6:00p**
(Exhibit Hall C)

New Product Introductions
2:30p–5:30p
(Exhibit Hall D)

Reception **6:00p–7:30p**
(Rotunda)

Tuesday 10/4

7:00a–8:00a
Speakers' Orientation
Breakfast, **MR551**

Session 3 **(MR557)**	Session 4 **(Ballroom B)**	Session 5 **(MR555)**	Session 6 **(MR556)**

Coffee Break **9:40–10:10**

Global FTTX & Installation	Fiber/ Cable Mfg & Reliability	Copper Cable - Measurements & Modeling	Materials for Cable & Connectivity Components

12noon–1:00p
Lunch On Own

Session 7 **(Ballroom B)**	Session 8 **(MR555)**	Session 9 **(MR556)**

Coffee Break **2:15–2:45**

Fiber & Cable Measurements	Copper Cable - Performance & Design	Fiber Optic Connectors for Harsh Environment

Poster Paper Session
(Exhibit Hall D)
4:00p–6:00p
"Bose SoundLink® Bluetooth Speaker" drawing ~ **5:30p**
must be present to win

Exhibits
10:00a–6:00p
Exhibit Hall C
Refreshments
5:00p–6:00p

Wednesday 10/5

7:00a–8:00a
Speakers' Orientation
Breakfast, **Ballroom C**

Session 10 **(Ballroom B)**	Session 11 **(MR555)**	Session 12 **(MR556)**	Session 13 **(MR557)**

Coffee Break **9:15–9:45**

Next Generation Special Fibers	Powering Over Communications Cables	Commercial Applications of Cable Materials	Fiber Optic Connectors

11:30a–12:30p
Lunch On Own

Session 14 **(Ballroom B)**	Session 15 **(MR555)**	Session 16 **(MR556)**

Coffee Break **1:45–2:15** "Bose SoundLink® Bluetooth Speaker" drawing -must be present to win

High Density Fiber Optic Cables	Codes & Standards	Manufacturing & Processing Technologies

P-4: The Failure Mechanism Investigation and Lifetime Evaluation of OPGW - L. Chen, Q. Qi, Q. Yu, G. Hu and C. Liu, FiberHome Telecommunication Technologies Co., Ltd., Hubei, P.R. China

P-5: Design of the Development of the Reliability and Flexibility of the Metropolitan Optic Distribution Network - Xuhu, Jiangsu Hengtong Optical Network Technology Co., Ltd., Jiangsu, P.R. China

P-6: Straight, Pre-Annealed, Enlarged End Optical Fiber Furcation Tube for Easy Fiber Insertion, and Enhanced Operating Performance - K. Nardone, Hitachi Cable America Inc., New Hampshire, USA

P-7: The Electromagnetic Wave Shielding Performance of HES Cable - G. Park, J. Yuk and J. Lee, GAON Cable Co., Ltd., Gunpo, South Korea

P-8: The Influence Factors on Optical Cable's Water Seepage and Corresponding Solutions - B. Zhang, Z. Liu, Y. Zhang, Y. Zhang, Z. Wang, S. Liu and H. Song, Xi'an Xigu Fiber Optica Communication Co., Ltd., Shaanxi, P.R. China

P-9: The High Performance and Reliability Characteristics of 80-135 µm Polarization Maintaining Optical Fiber - W. Luo, Y. Liu, C. Du, Y. Ke, T. Zhang and Q. Lei, Ruiguang Telecommunication Technologies Co., Ltd., Wuhan, P.R. China

P-10: A New Drop Cable for FTTH - G. Suo, H. Song, Y. Zhang, Z. Liu, W. Zhang, J. Song and Y. Zhu, Xi'an Xigu Fiber Optic Communication Co., Ltd., Shaanxi, P.R. China

P-11: Development of New Type Uni-Tube ADSS Cable - J. He, J. Cai, X. Lu, X. Su and Z. Xiong, Yangtze Optical Fibre and Cable Joint Stock Ltd., Co., Hubei, P.R. China

P-12: Discussion on the Application of Nylon Sheath Cable in Anti-Rodent - J. Wu, P. Liu, D. Yang, Y. Wang, T. Li, J. Yuan, P. Cao, and B. Zhang, Hengtong Optic-Electric Co., Ltd., Jiangsu, P.R. China

P-13: Recent Wire and Cable Technology of Korea by Using Carbon Materials - H.C. Yang, A.R. Choi, M.S. Gang and U.K. Park, LS Cable and Systems Ltd., Gunpo-si, Republic of Korea

P-14: Measurement of Raman Gain Coefficient in 200 Micron G657.A1 Fiber - A. Maity, N. Bezawada, S. Mogal and P.R. Watekar, Sterlite Technologies Ltd., Maharashtra, India

P-15: Processing Techniques of OAM-EDF Used in Long-Distance Orbital Angular Momentum Modes Propagation - L. Yan, C. Du, W. Luo, C. Chan, W. Li and J. Zhang, FiberHome Telecommunication Technologies Co., Ltd., Wuhan, China

P-16: Development and Application of High Temperture Resistant Optical Fibre Cable in Steam Pipeline Monitoring Field - Q. Qi, G. Hu, K. Fu and C. Liu, FiberHome Telecommunication Technologies Co., Ltd., Hubei, P.R. China

P-17: Effects of the Overlap of Double Leaky Coaxial Cable on Channel Capacity of MIMO Wireless Communication System - Z. Xu, Y. Lan, R. Zhao and D. Huang, Zhongtian Radio Frequency Cable Co., Ltd., Nantong, China

P-18: Study on Acceptance Criteria for OPGW and ADSS Optical Cable Mechanical Performance Test - J. Zhou, J. Chen and L. Cai, Jiangsu Zhongtian Technology Co., Ltd., Jiangsu, P.R. China

P-19: A Robust Anti-Rodent Cable with Light Weight - J. Xie, Y. Zhou, Y. Xiao and Z. Luo, Yangtze Optical Fibre and Cable Sichuan Co., Ltd., Sichuan, China; and Z. Xiong, State Key Laboratory of Optical Fibre and Cable Manufacture Technology, Hubei, China

P-20: Effect of Silicone Processing Aids on the Mechanical Properties of Flame Retardant Polyolefin Compounds - P. Cao, Y. Sun, X. Cheng, C. Huang, C. Wang, Y. Jian and L. Tao, Hengtong Optic-Electric Co., Ltd., Jiangsu, P.R. China

P-21: Research of Macro-Bending Loss of Insensitive Bending-Loss Multimode Optical Fiber - Z. Wang, J. Hu, Z. Liu, S. Cao and L. Wu, Zhongtian Technology Fibre Optics Co., Ltd., Jiangsu, P.R. China; and X. Xu, Zhongtian Technology Advanced Materials Co., Ltd., Jiangsu, P.R. China

P-22: The Evolution of Trunk Cables with Eight Fiber Units - R.E. Sistare, W.C. Hurley, and T.L. Cooke, Corning Optical Communications, North Carolina, USA

P-23: Long Term Response of Various Singlemode Optical Fiber Designs to Gamma Radiation Exposure - B.G. Risch, Prysmian Group, North Carolina, USA; G. Pickrell, D. Homa, M. Kozinski, R. Wenneman, D. Malta and Z. Newton, Virginia Polytechnic Institute and State University, Virginia, USA

P-24: The Application and Design for Leakage Cable in CBTC System - R. Zhao, Y. Lan, Z. Wen and D. Huang, Zhongtian Radio Frequency Cable Co., Ltd., Jiangsu, P.R. China; and J. Hong, Jiangsu Zhongtian Technology Co., Ltd., Jiangsu, P.R. China

P-25: A Study of Tube Deformation under Bend and Tension - J. Lei, Corning Optical Fiber and Cable (China), Beijing, P.R. China; and L. Andrey, Corning Modeling & Simulation (Russia), St. Petersburg, Russia

P-26: Development of Low Friction, Low Shrinkage, Low Smoke, Zero Halogen Cable - A. Abbas, A. Fahd and N.P. Pausan, CommScope, Rhyl, United Kingdom

P-27: Air Blown Cables for Enhanced Blowing Performance - S. Kumar, V. Shukla, K. Sahoo, P. Pardeshi and G. Castillo, Sterlite Technologies Ltd., Silvassa, India

P-28: Determining the Tensile Performance of Optical Fiber Cable with Increasing Fiber Count by using Monte-Carlo Simulations - P.R. Watekar, S. Gaikwad, K. Sahoo and G. Castillo, Sterlite Technologies Ltd., Maharashtra, India

P-29: The Application of Pulsed Laser Welding in Optical Unit Splicing - B. Zhang, X. Wang, C. Hao, J. Chen, R. Xu, L. Zhang, C.J. Brow, S. Ma and D. Wu, Hengtong Optic-Electric Co., Ltd., Jiangsu, P.R. China

P-30: A New Structural Totally Dry Optical Fiber Cable Via Co-Extrusion Technology for Double-Layer Loose Tube - P. Liu, D. Wu, J. Wu, J. Yin, Z. Ju and J. Yuan, Hengtong Optic-Electric Co., Ltd., Jiangsu, P.R. China

WEDNESDAY, OCTOBER 5, 2016, 8:00 AM – 11:25 AM

SESSION 10: NEXT GENERATION SPECIAL FIBERS, BALLROOM B

Chairperson: Dr. C. Bertil Arvidsson | Fiberson AB, Hudiksvall, Sweden

10-1 (8:00): Design, Fabrication and Measurement Research of Four LP-Mode Fibre – J. Wu, L. Zhang, H. Zhou, R. Zhang, P. Li, L. Zhang, J. Li, S. Chen, H. Wang and R. Wang, Yangtze Optical Fiber and Cable Joint Stock Ltd., Co., Wuhan, China

10-2 (8:25): Investigation on the Performance of G.654.E Optical Fiber Cable Used in Transcontinental Backbone Network - B. Zhang, J. Yuan, Y. Liu, P. Liu, D. Wu, J. Wu and J. Yin, Hengtong Optic-Electric Co., Ltd., Jiangsu, P.R. China

10-3 (8:50): Low Attenuation and Large Aeff Optical Fibers Optimized for Long-Haul Application - T. Nunome, K. Nagasu, T. Shoji, K. Okada, D. Sega, R. Maruyama, I. Ishida, A. Namazue and S. Matsuo, Fujikura Ltd., Chiba, Japan

BREAK (9:15-9:45)

10-4 (9:45): G.654 Fibre and Cable Evaluation for Terrestrial High Bitrate Transport Application - S. Shen, G. Wang, Y. He, S. Wang and C. Zhang, China Unicom, Beijing, P.R. China

10-5 (10:10): High Speed Short Wavelength Division Multiplexing Transmission over Next Generation Wideband Multimode Optical Fiber - Y. Sun, K. Scott, A. McCurdy, J. Kamino, A. Swartz, R. Lingle, Jr. and D.S. Vaidya, OFS, Georgia, USA; R. Shubochkin and D. Braganza, OFS, Massachusetts, USA; M. Chow and J. Wynia, Dell, California, USA; T. Gray, W.J. Fan, K. Wade, D. Gazula, G. Landry and J. Tatum, Finisar Corp., Texas, USA; and S. Koehler, Finisar Corp., California, USA

10-6 (10:35): Bend-Insensitive Wideband OM4 Multimode Fiber for Wavelength Division Multiplexing Systems - R. Wang, R. Huang, X. Hu, J. Zhu, H. Wang and R. Wang, Yangtze Optical Fiber and Cable Joint Stock Ltd., Co., Wuhan, China

10-7 (11:00): Next Generation Wideband Multimode Fiber for High-Speed SWDM Datacom Links - R. Shubochkin, D. Braganza and D. Mazzarese, OFS, Massachusetts, USA; Y. Sun, K. Balemarthy, R. Lingle, Jr., J. Kamino and D. Vaidya, OFS, Georgia, USA

SESSION 11: POWERING OVER COMMUNICATIONS CABLES, MR555

Chairperson: Steven A. Galan | Underwriters Laboratories, Inc., New York, USA

11-1 (8:00): Data/Comm Cables- What's New in the 2017 NEC - S. Kaufman, CableSafe, Inc., Georgia, USA

11-2 (8:25): Power over LAN Cable - Keeping Pace with this Key Powering Strategy - R. Ivans, UL, LLC, New York, USA

11-3 (8:50): Evolving Methods of Evaluating Cable Heating - W. Hopkinson, CommScope, North Carolina, USA

BREAK (9:15-9:45)

11-4 (9:45): Impact of Installation Geometry on Temperature Rise due to Power over Ethernet - B. Marchant, Berk-Tek LLC, Pennsylvania, USA

11-5 (10:10): Implications of Higher Data-Rate Ethernet Over Prior Standard Twisted-Pair Data Cabling - D.C. Hess, CORD DATA, Pennsylvania, USA

SESSION 12: COMMERCIAL APPLICATIONS OF CABLE MATERIALS, MR556

Chairperson: Mehdi Emad | Solvay Specialty Polymers, New Jersey, USA

12-1 (8:00): Development of a New High Performance Liquid Antioxidant Solution, LOWINOX® FAST XL, Suitable for Use in Pre-Compounded XLPE - M. Moody, W. Ebenezer, J. Hill and C. Rider, Addivant, Manchester, United Kingdom; and D. Labbe, P&M Cable Consulting LLC, Geneva, Switzerland

12-2 (8:25): TPV Based Insulation for Medium Voltage Applications - A. Magri, A. Galanti and S. Dossi, Mixer SpA, Ravenna, Italy; and C. Cardelli, IPOOL Srl, Pistoia, Italy

12-3 (8:50): New Generation of ETFE for High Temperature Durable Cable - Class F(200C) ISO6722 and LV-112 and GMW15626 - M. Yodogawa, P.J. Spencer, M. Abe, S. Aida and M. Ataku, AGC Chemicals Americas, Inc., Pennsylvania, USA

BREAK (9:15-9:45)

12-4 (9:45): New Low Friction Cable Coating - W.J. Clatanoff, D.K. Larson, C.A. Kipke and L. Cao, 3M Communication Markets Division, Texas, USA

12-5 (10:10): Development and Qualification of a High Performance Zero Halogen Primary 90°C Wet Rated LV Insulation System - J. Freestone, D.G. Roberts and A.P. Marconi, SACO AEI Polymers Inc., Wisconsin, USA; M.E. Slevin, SACO AEI Polymers, Sandwich, United Kingdom

SESSION 13: FIBER OPTIC CONNECTORS, MR557

Chairperson: Guy Castonguay | Corning Optical Communications, LLC, Arizona, USA

13-1 (8:00): A New Factory Splice-On Fiber Optic Connector with High Performance and Reliability by Machine Automation - Y. Lu and S. Zimmel, CommScope, Minnesota, USA; and D.Z. Chen, Verizon Communications, Texas, USA

13-2 (8:25): Time Dependent Strength of Crimp Joints Over Polyetherimide - L.E. Parkman III, Corning Optical Communications LLC, Texas, USA

13-3 (8:10): Cable Strength Member to Connector Analysis - W. Kachmar, Technical Horsepower Consulting LLC, Vermont, USA

BREAK (9:15-9:45)

13-4 (9:45): Highly Precise MT Ferrule Enabling Single-Mode 32-Fiber MPO Connector - F. Uehara, M. Ohmura, K. Ohtsuka and T. Sano, Sumitomo Electric Industries, Ltd., Yokohama, Japan

13-5 (10:10): Novel High-Density Pre-Connectorized Cable Joining Technique for Single-Mode Optical Fiber Cables using New 84-Fiber MT Connectors - R. Koyama, K. Saito, C. Fukai, M. Kihara and T. Kurashima, NTT Corp., Ibaraki, Japan

13-6 (10:35): Multi-Core Fiber Indoor Cable with Manufactured Mini-Connector - T. Sakamoto, K. Saito, T. Matsui, K. Nakajima and T. Kurashima, NTT Corp., Ibaraki, Japan

WEDNESDAY, OCTOBER 5, 2016, 12:30 PM – 3:55 PM

AFTERNOON SESSION COFFEE BREAK (1:45 – 2:15)

"Bose SoundLink® Bluetooth Speaker" – drawing in Session Room Lobby (must be present to win)

SESSION 14: HIGH DENSITY FIBER OPTIC CABLES, BALLROOM B

Chairperson: Eric Whitham | OFS, Georgia, USA

14-1 (12:30): The Evolution & Challenges of Dielectric Optical Microcables For High Capacity Optical Fiber in Brazilian Market - J.C.V. da Silva, F.G. Corcini and R. Thomas, Prysmian Cabos e Sistemas do Brasil S.A., Sorocaba, Brazil; B.N. Aires, J.G.D. de Aguiar and C.F. Rodrigues, CPqD - Centro de Pesquisa e Desenvolvimento em Telecomunicações, Campinas, Brazil

14-2 (12:55): Advanced Optical Characteristics of SZ-Stranded High-Density 1000-Fiber Cable with Rollable 80-Optical-Fiber-Ribbons - M. Kikuchi, J. Kawataka, H. Izumita, T. Kurashima and Y. Yamada, NTT Corp., Ibaraki, Japan

14-3 (1:20): Ultra-High Density Optical Fiber Cable with Rollable Multicore Fiber Ribbon - M. Tsukamoto, T. Miura, Y. Hoshino and T. Gonda, Furukawa Electric Co., Ltd., Mie, Japan; K. Imamura and R. Sugizaki, Furukawa Electric Co., Ltd., Chiba, Japan

BREAK (1:45 – 2:15)

14-4 (2:15): Development of Wrapping Tube Cable with Spider Web Ribbon Using Fiber Based on ITU-T G652 D - T. Kaji, S. Moriya, A. Murata, K. Yamashiro and K. Osato, Fujikura Ltd., Chiba, Japan

14-5 (2:40): Ultra-High-Fiber-Count and High-Density Slotted Core Cable with Pliable 12-Fiber Ribbons - F. Sato, K. Okada, T. Hirama, K. Takeda, R. Oka and K. Takahashi, Sumitomo Electric Industires, Ltd., Yokohama, Japan

14-6 (3:05): Non-Metallic Self-Supporting 48-Fiber High-Density Aerial Distribution Optical Cable - G. Taki, Y. Takahashi, A. Namazue and K. Osato, Fujikura Ltd., Chiba, Japan

SESSION 15: CODES & STANDARDS, MR555

Chairperson: John Gavilanes | Lapp USA, Inc., New Jersey, USA

15-1 (12:30): UL Standard Revisions and Proposals, Harmonization Activities - A.T. Tassone, UL, LLC, New York, USA

15-2 (12:55): Low Smoke Halogen Free (LSHF) - What Does It Mean? - R. Bellassai, UL, LLC, New York, USA

15-3 (1:20): Protecting the Cable and Connectivity Industry from the Abuses of California Prop 65 - W. Hall, Venable, District of Columbia, USA

BREAK (1:45 – 2:15)

15-4 (2:15): The Serious Fire Safety Implications of Counterfeit Cables Installed in Building Network Infrastructure - D. Kiddoo, Communications Cable and Connectivity Association (CCCA), Maryland, USA; and A. Tassone, UL, LLC, New York, USA

15-5 (2:40): Optical Connectivity and Passive Components Standardization in the International Electrotechnical Commission (IEC) – D. Mazzarese and G. Sandels, OFS, Georgia, USA

SESSION 16: MANUFACTURING & PROCESSING TECHNOLOGIES, MR556

Chairperson: David Braun | Teknor Apex Company, Rhode Island, USA

16-1 (12:30): Development of Single-Crystal Wire and Cable - H.C. Yang, M.S. Kang and H.S. Choi, LS Cable and Systems Ltd., Gunpo-si, Republic of Korea; S.E. Park and S.Y. Jeong, Pusan National University., Miryang, Republic of Korea

16-2 (12:55): Analysis of LAN Cable Manufacturing Processes When Submitted to New Projects Using Statistical Tools – ANOVA - M.T. De Souza, T.C. Fukui, J.A. Martins, P.M. Ito, S.A. Joly and H. Durigan, Furukawa Industrial S.A., Paraná, Brazil

16-3 (1:20): Exploring the Limits of Buffering Process for Both Standard and Micro Tubes - M. Lahti and S. Orhanen, Maillefer Extrusion Oy, Vantaa, Finland

BREAK (1:45 – 2:15)

16-4 (2:15): How Atmospheric Plasma Surface Treating Enables Ink Jet Printing on Wire and Cable - S. Bauer, M. Plantier and G. Quinsey, Enercon Industries Corp., Wisconsin, USA

16-5 (2:40): New UV-LED Lamps for Optical Fiber Production - K. Takase, Z. Komiya and H. Uchida, JSR Corporation, Ibaraki, Japan; M. Gojyuki, K. Shito and N. Kamigaki, Hoya Candeo Optronics Corp., Saitama, Japan

16-6 (3:05): Design of UV-LED Coating System and Process Improvement For Optical Fiber at High Draw Speed - W. Zhao, Q. Yuan, Z. Yue, S. Lu, J. Cheng, R. Matai and C. Yan, Yangtze Optical Fibre and Cable Joint Stock Ltd., Co., Hubei, China

16-7 (3:30): In-Line Real-Time Surface Roughness Measurement of Insulated Wires and Cables and How Manufacturers Can Use It for Improved Product Quality and Increased Production Output - J. Säily, FocalSpec, Ltd., Georgia, USA

CONFERENCE INFORMATION

ON-SITE REGISTRATION SCHEDULE

Registration will be held at the **Rhode Island Convention Center, 5th Floor**, during the following hours:

Saturday…..…..Oct 1, 2016…….3:00 pm to 6:00 pm

Sunday……Oct 2, 2016……7:00 am to 5:00 pm

Monday……Oct 3, 2016……6:00 am to 6:00 pm

Tuesday……Oct 4, 2016……7:00 am to 6:00 pm

Wednesday…..…..Oct 5, 2016……7:00 am to 3:00 pm

All conference attendees must register and obtain a badge. Badges must be worn for access to all IWCS events.

DRESS CODE: BUSINESS CASUAL

Pictures (camera/cell phone), Videotaping or electronic recording during this conference is not permitted.

EXHIBIT HALL SCHEDULE

(Ballroom C)

All Registered Attendees

Tuesday, Oct 3, 2016…… 2:00 pm to 6:00 pm

Wednesday, Oct 4, 2106……..10:00 am to 6:00 pm

HOSPITALITY RECEPTION MONDAY

Co-Sponsored with WCISA (www.wcisaonline.org)

Special Recognition to Scholarship Recipients and Colleagues New to our W&C Industry!

(Rotunda, 5th floor)

6:00 to 7:30 pm

LUNCH

Sunday, Oct 2, 2016, **MR551**

Professional Development Course Instructors & Students Only with Badge & Course Ticket—12:00noon to 1:00pm

Monday, Oct 3, 2016, **Ballroom A**

Plenary Session – Registered Technical Symposium attendees only (seats are limited).

SPEAKER'S / INSTRUCTOR'S ORIENTATION BREAKFAST

On the day of your presentation, you are requested to attend a Speaker's Orientation Breakfast as follows:

Instructors Only: Sunday (7:00 to 8:00 am) – **MR551**

Speakers: Monday and Wednesday (7:00 to 8:00 am) – **Ballroom C.** Tuesday (7:00 to 8:00 am) – **MR551.** During breakfast, you will have the opportunity to review the procedures for your oral presentation. In addition, group photo of the session presenters with the chairperson will be taken. Afterwards, you will be directed to the room where you can review your PowerPoint® presentation.

Note: No presentations will be uploaded onsite without the permission of your Session Chairman.

******* NEXT YEAR'S DATES for the 66th International Cable & Connectivity Symposium *******

October 8-11, 2017

Gaylord Palms, Kissimmee, Florida, USA

2016 IWCS SPONSORS

PARTNER LEVEL

Cable Components Group (CCG) designs, engineers and manufactures extruded products for wire and cable, fiber optic cables and industrial non-wovens for filtration. CCG's 6-LAN™ crosswebs are foamed and include patented designs for Category 6, 6e, and 6A LAN cables. CCG compounds FluoroFoam®, a patented chemical foaming agent of fluorinated ethylene propylene (FEP) for use in insulations, tapes and 6-LAN crosswebs. Foamed fluorine-based products are particularly suited for the evolving Power Over Ethernet (POE) standards. These standards require enhanced thermal stability materials and foamed FEP insulation offers a safety margin with a 200°C rating. CCG is now vertically integrated and is focusing on compounding fire retardant and foamable materials for both in-house extrusion and for sale as compounded pellets designed for copper wire & cable and fiber optic cabling. The newly installed equipment includes two Buss Kneaders and two twin-screw compounding lines. The following fluor-opolymers (FEP, MFA, PFA, ECTFE, ETFE and PVDF), polyolefins (FRPP, FRPE, LSHFPP and LSHFPE), and engineered resins (PEEK, PPS, PSU, PPSU and PES) are the focus of CCG's material development and innovation pipeline.

We are a world leader in titanium technologies, fluoroproducts and chemical solutions. We are a new company with over 200 years of history, created from the DuPont performance chemicals businesses.

CommScope is a global leader in connectivity solutions for communications networks. We provide infrastructure solutions for wireless, business enterprise, residential broadband and carrier wire line networks with industry-leading brands such as Andrew®, SYSTIMAX® and HELIAX®. Founded in Hickory, North Carolina more than 30 years ago, CommScope and its worldwide team of more than 13,000 employees create infrastructure solutions for communications networks in more than 130 countries.

With more than 160 years of science and engineering knowledge, Corning Incorporated creates keystone components for high-technology systems in consumer electronics, mobile emissions control and life sciences. Our Optical Communications segment delivers connectivity to every edge of the network, from optical fiber, cable, hardware & equipment to fully-optimized solutions.

Royal DSM is a global science-based company active in health, nutrition and materials. By connecting its unique competence in Life Sciences and Materials Sciences DSM is driving economic prosperity, environmental progress and social advances to create sustainable value for all stakeholders simultaneously.

DSM Functional Materials, operating as a Business Unit within the Performance Materials cluster of Royal DSM N.V., is a leading developer of high-performance functional coatings and composite materials. Our portfolio includes DeS-olite® and Cablelite® UV-curable coatings, inks and matrix materials for the manufacture of optical fiber and cable, and Somos® materials for additive manufacturing,. DSM and its associated companies deliver annual net sales of about €10 billion with approximately 25,000 employees. The company is listed on Euronext Amsterdam.

The Lapp Group first established in Stuttgart, Germany has been a manufacturer of Wire and Cable since the company's inception over 50 years ago. Since that time, the Lapp Group grown through their worldwide locations to accommodate customers on a global scale. As evidenced by their several testing laboratories the Lapp groups dedication to research and development has established them as the global innovator to the wire and cable industry.

Lapp products are used throughout the world in automotive plants, machine tools, instrumentation, medical electronics, telecommunications, robotics, industrial automation, transportation, general industrial control systems, and numerous other applications.

Mexichem Specialty Compounds

Developer and manufacturer of compounds including specialty vinyl alloy SMOKEGUARD®, halogen-free MEGO-LON®, and thermoplastic elastomer (vinyl, olefinic, styrenic) GARAFLEX®. Manufacturing sites in the US, UK, Mexico and Columbia.

ODEN TECHNOLOGIES

We believe that a complete, actionable picture of process data empowers manufacturers to be more efficient. Oden Technologies delivers an end-to-end data acquisition and analytics platform so manufacturers can have complete transparency into their production. Diagnose quality and capacity constraints in minutes. See trends over time by product, shift, line, or factory. Understand the nuances of your OEE and factory operations in order to constantly improve.

ofs
A Furukawa Company

OFS is a world-leading designer, manufacturer and provider of optical fiber, optical fiber cable, FTTX, optical connectivity and specialty photonics products. Our manufacturing and research divisions work together to provide innovative products and solutions that traverse many different applications as they link people and machines worldwide. Be-tween continents, between cities, around neighborhoods, and into homes and businesses of digital consumers we provide the right optical fiber, optical cable and components for efficient, cost-effective transmission.

OFS's corporate lineage dates back to 1876 and includes technology powerhouses such as AT&T and Lucent Technologies (now Alcatel-Lucent). Today, OFS is owned by Furukawa Electric, a multi-billion dollar global leader in optical communications.

Headquartered in Norcross (near Atlanta) Georgia, U.S., OFS is a global provider with facilities in Denmark, Germany, Russia and the United States.

Prysmian Group

Prysmian Group is world leader in the energy and telecom cables and systems industry. With sales of some 7 billion (pro-forma 2010 Prysmian/Draka) and 22,000 employees across 50 countries and 98 plants, the Group is strongly positioned in high-tech markets and provides the widest range of products, services, technologies and know-how. In the Energy sector, Prysmian Group operates in the business of underground and submarine power transmission cables and systems, special cables for applications in many different industrial sectors and medium and low voltage cables for the construction and infrastructure industry. In the Telecom sector, the Group manufactures cables and accessories for the voice, video and data transmission industry, producing optical fibres, optical cables and connectivity. Prysmian is listed on the Milan Stock Exchange in the Blue Chip index.

TEIJIN
Human Chemistry, Human Solutions

Teijin Aramid is the leading global supplier to the OFC market of aramid reinforcement fiber solutions. The product portfolio includes a versatile high modulus aramid fiber product line, a waterblocking high modulus aramid fiber prod-uct line and a range of aramid ripcords and binder yarns. Teijin Aramid works closely with our partners in the industry to arrive at the most cost-effective and reliable solutions. Teijin Aramid is now introducing the new ultra high modulus Twaron UP D3200 product for ADSS OFC applications. In addition, a superior HMPE tape product, Endumax, with exceptional dimensional stability is launched is launched for reinforcement of small diameter premises and indoor OFCs.

UL

Underwriters Laboratories has the expertise, testing capability, brand recognition and global presence needed to provide a full portfolio of wire and cable testing services for Fire Safety, Performance Verification, Component Cabling and Compound Performance to the industry. Our investigation services are supported by one of the most comprehensive Follow-Up Programs in the third-party certification industry that helps users, specifiers, distributors and manufacturers identify cabling products that meet nationally recognized safety requirements as well as industry specifications for performance and quality.

Dow Electrical & Telecommunications, a supplier of insulation and jacketing materials to the telecommunications industry for over 40 years, is growing and diversifying through its unique capability to translate end-user unmet needs into tangible material science solutions.

Solvay Specialty Polymers provides a diversified portfolio of high-performance materials to the wire and cable industry, worldwide. Designed to meet the most challenging requirements of cable manufacturers, building owners, engineers and equipment designers, the company's broad-based offering in this wide market segment is targeted at innovative, profitable and sustainable applications in areas from telecommunications, oil and gas, automotive, aerospace and military to industrial engineering and consumer electronics.

Solvay's broad product portfolio for the wire and cable industry comprises above all fluoropolymers, ultra-high performance polymers, sulfone polymers and cross-linkable compounds. Each of these product families offers a unique combination of electrical, chemical mechanical and thermal properties.

Teknor Apex Company, a supplier of thermoplastic compounds to the wire and cable industry offers a full range of RoHS-complaint, UL-Recognized extrusion and molding compounds.

Web Industries is a global leader in specialty film extrusion and a pioneer in producing foamed and fibrillated tapes. Our wire and cable product portfolio includes the SuperBulk® cable filler family as well as identification, isolation, and binder tapes. We use our proprietary systems and best-practice methodologies to deliver high-quality, next-generation cable components that are found in some of the world's most advanced wire and cable products. We combine end-to-end design, development, converting, and manufacturing services with innovative thinking and creative problem solving to help our partners speed products to market, reduce costs, and maximize product success.

WCISA® (Wire and Cable Industry Suppliers Association®) is a nonprofit corporate membership association with 95 North American suppliers of machinery, materials and accessories used for making all types of wire and cable. Members are based in or have an established subsidiary in North America. WCISA's mission is to promote its member's products and services by providing its members with representation, networking/social opportunities and services at wire and cable trade events and conferences. WCISA also offers a scholarship program to high school graduates, employees and interns that are affiliated with WCISA member companies. WCISA is active as an exhibitor, supporter and/or outing organizer, at wire and cable trade events and conferences throughout the world, including the IWCS Conference. Details can be found at www.wcisaonline.org, including information on becoming a WCISA member.

Official Magazine of the IWCS Conference™.

GOLD LEVEL

Heraeus

Heraeus Noblelight America is the leading supplier of UV curing systems for optical fiber, wire and cable manufacturing worldwide. Heraeus' modular microwave-powered UV lamp technology is recognized for its stability and long operational life, making it ideal for these demanding applications. Heraeus' DRF/DRC lamp systems have been designed specifically for optical fiber, coloring, ribbon, wire and cable manufacturing with the patented back reflector housing. And Heraeus' VAM mounting systems enable the precise alignment of multiple in-line lamps such as those installed on a fiber drawing tower. Heraeus' experience in curing systems for the optical fiber and cable industry is unmatched.

Heraeus Noblelight GmbH with its headquarters in Hanau and with subsidiaries in the USA, Great Britain, France, China and Australia, is one of the technology- and market-leaders in the production of specialty light sources and systems. In 2015, Heraeus Noblelight had an annual turnover of 158.3 Million and employed 828 people worldwide. The organization develops, manufactures and markets infrared and ultraviolet emitters, systems and solutions for applications in industrial manufacture, environmental protection, medicine and cosmetics, research, development and analytical measurement techniques.

HITACHI
Inspire the Next

Hitachi Cable America, Inc., (Hitachi) located in Manchester, New Hampshire, U.S.A., is a leader in the manufacture of high-performance communication cables for applications such as 10-Gigabit Ethernet, Industrial Ethernet, DAS, VOIP, POE, CCTV, robotics and WiFi. Cables are designed and built for a variety of applications and environments such medical, industrial, educational, military, oil & gas, mining and other harsh environments. Product customization is also available.

Lubrizol

Lubrizol is one of the largest manufacturers of thermoplastic polyurethane with over 50 years of innovative specialty TPU development. Our Estane® engineered polymers for wire and cable jacketing can help extend product life through excellent abrasion and cut through resistance, high flex life, low temperature flexibility, and flame retardancy.

MILTEC UV
26 Years of Excellence

Miltec UV is the leading manufacturer of high performance UV curing systems and spare parts used in optical fiber draw towers for coating, coloring, and cable marking. For over 20 years, we have provided the industry with superior quality and service, fulfilling the needs of both domestic and international markets.

DONOR LEVEL

LEONI

LEONI is a global supplier of wires, optical fibers, cables and cable systems as well as related services for the auto-motive sector and further industries. LEONI develops and produces technically sophisticated products from single-core automotive cables through to complete wiring systems. LEONI's product range also comprises wires and strands, standardized cables, special cables and cable system assemblies for various industrial markets. The group of companies, which is listed on the German MDAX, employs about 75,000 people in 32 countries and generated consolidated sales of EUR 4.5 billion in 2015.

SICCET
Your Special Cables Solutions

Siccet is a family run business in Northern Italy that produces special cables. It was founded in 1977 and over the years thanks to continuous innovation in production processes and investing in research into new materials, it has become established and grown as a reliable, flexible, dynamic and always customer oriented company, providing the most suitable and best service solution.

Focus has always been on the high-quality production of thermocouple cables, compensating/extension cables and RTD cables. The experience gained in such critical fields of application, allowed Siccet to expand its production of special cables over time into other areas where critical environments require high performance (e.g. the energy sector and Oil & Gas).

WONDERFUL

Wonderful Hi-Tech is headquartered in Taiwan, with 10 manufacturing sites across China, Thailand and Vietnam, and sales offices in Asia, North America and Europe. Established in 1978, Wonderful Hi-Tech has become one of the leading manufacturers and providers of electronic wire and cable in Taiwan. In our second stage of development from 1995 to 2000 we committed strong investments in the area of LAN cable and RF coaxial cable technology. We have subsequently obtained global Cat 6A and Cat 7A certifications. Our products have been certified by numerous international standards agencies, with Wonderful Hi-Tech becoming a leading global cable supplier. We serve you with the highest sincerity, continuing to improve the quality of our production and developing new products, so as to prosper and grow with you.

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