Cable & Connectivity Industry Forum™

by IWCS

2024 PRELIMINARY PROGRAM

Monday, October 14 – Thursday, October 17, 2024 | Providence, Rhode Island, USA

LEARNING | NETWORKING | INSPIRATION

TECHNICAL SYMPOSIUM

SUPPLIER EXHIBITION™

PANEL DISCUSSIONS

PLUS:

A new breakout session fostering discussion on broad trends critical to global connectivity.

"Navigating the Energy Transition: Smart Grid and Broadband Connectivity"

JOIN THE INDUSTRY LEADERS & ADVANCE YOUR CAREER

The IWCS Cable & Connectivity Industry Forum continues to be the premier event for new technologies in cable and connectivity products, processes and applications. Your IWCS Symposium Committee has generated an outstanding high caliber program for the IWCS 2024 Forum at the Rhode Island Convention Center in Providence, Rhode Island, USA. This year's event features schedule enhancements and new event components, including a breakout program to provide an unmatched learning and networking experience.

This is the 73rd annual IWCS Conference, which is a testament to the value that the IWCS mission continues to bring to the international cable and connectivity industry. 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 2024 program includes 13 Technical Symposium Sessions and additional discussions and presentations starting **Monday, October 14 and continuing through Thursday, October 17**. The Supplier Exhibition™ continues its two-day program, providing plenty of opportunity and incentive for all attendees to visit with our industry's premier suppliers.

Please note the new ***Monday–Thursday*** schedule format for this year's event on pages 6–7 and take time to review this Preliminary Program to see the many important topical issues that will be discussed with your colleagues from around the world. Visit iwcs.org for additional information, including event registration which will be available soon, and travel details.

See you in Providence!

NEW FEATURES FOR IWCS 2024!

"NAVIGATING THE ENERGY TRANSITION: SMART GRID AND BROADBAND CONNECTIVITY" BREAKOUT PROGRAM

*Open to everyone with **Full-Access** registration*

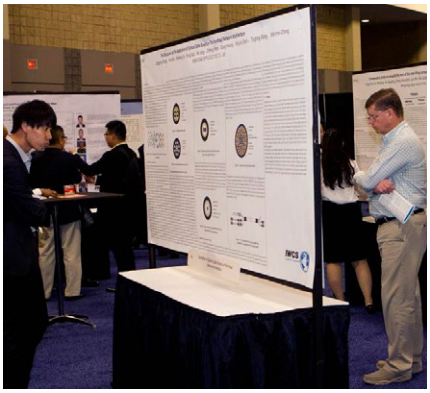
New this year, IWCS is excited to host a breakout program that fosters discussion on broad trends critical to global connectivity. Taking place on Wednesday, the "Navigating the Energy Transition: Smart Grid and Broadband Connectivity" program will feature critical topics such as:

- **5G / Smart Grid Network – Present and Future Deployment Tactics and Policies**
- **Critical Updates on Utility Infrastructure and Smart Grid Reliability & Resilience**
- **The Latest Innovations Affecting Power and Communications Cables**
- **Supply Chain – Impact and Effects of the Future Energy Grid**

SUSTAINABILITY PANEL DISCUSSION | *Open to everyone with **Full-Access** registration*

Following the "Cable Sustainability and Recycling" Technical Session on Thursday will be a panel discussion related to sustainable practices within the wire and cable industry. Be sure to attend this interactive discussion to hear from industry experts about critical global sustainability initiatives.

FORUM HIGHLIGHTS



TECHNICAL SYMPOSIUM | *Open to everyone with **Full-Access** registration* MONDAY, WEDNESDAY, THURSDAY

Your IWCS Symposium Committee has generated an extremely high-caliber program for the IWCS Technical Symposium, the cornerstone of the Cable & Connectivity Industry Forum. The IWCS Technical Symposium is recognized around the world as the premier technology event for cable and connectivity. The Symposium allows attendees to experience over 75 previously unpublished Technical Papers featuring research and development for cabling and connector / interconnect technologies, designs, components, materials, fabrication, performance, testing and applications. The Technical Program will begin on Monday, October 14th with Sessions running simultaneously through Thursday, October 17th.

PLENARY LUNCHEON WITH KEYNOTE | *Open to everyone with **Full-Access** registration* MONDAY

Taking place during lunch on Monday, the Plenary Keynote presentation promises to be a highlight of the 2024 Forum. As we near the event, IWCS will announce the prominent industry leader who will conduct this year's Keynote presentation. During the Plenary Luncheon, we will also recognize the best papers and presenters from last year's event. ***Please note:*** as a result of the revamped event schedule, the Plenary Session now takes place on the first day of the event — Monday, October 14.

WELCOME RECEPTION | *Open to everyone with **Full-Access** or **Supplier Exhibition™ + Reception** registration* MONDAY

Attendees are invited to a networking reception on Monday evening immediately following the first three Technical Symposium Sessions. Enjoy drinks, entertainment, and light hors d'oeuvres while networking with colleagues from around the world. New this year, "Supplier Exhibition-Only" booth staff and attendees may elect to add the Welcome Reception during registration. ***Please note:*** as a result of the revamped event schedule, the Reception now takes place on the first day of the event — Monday, October 14.

PROFESSIONAL DEVELOPMENT COURSES | *Open to everyone who registered for **Professional Development Courses*** MONDAY & TUESDAY

IWCS is offering the annual core Professional Development Courses of Copper 101, Fiber 101, Materials 101 and Extrusion 101 as well as special elective courses. Instructed by renowned industry experts, these courses provide introductory topical information and are geared towards engineers, scientists, and other professionals who are new to the industry, or those who seek a refresher. The "core" courses will commence on Monday morning with four concurrent courses in the morning. The "elective" courses take place on Tuesday morning. Discounted fees are available for attendees who choose to participate in two courses — one "core" course and one "elective" course. ***Please note:*** "Full-Access" registration must be purchased separately to access the Technical Symposium sessions.

EXECUTIVE SESSION | *Open to everyone with **Full-Access** registration* TUESDAY

The Executive Session is designed for the general management of the cable & connectivity industry supply chain companies. Important issues and economic trends facing the industry in these uncertain times will be addressed by expert speakers. You will not want to miss this provocative and insightful session happening Tuesday morning.

SUPPLIER EXHIBITION™ | *Open to everyone with **Full-Access** or **Supplier Exhibition™ Only** registration* TUESDAY & WEDNESDAY

The IWCS Supplier Exhibition™ allows over 70 exhibitors to display cutting-edge products and network with attendees from around the world. Visit the exhibition to experience a wide variety of product technologies and user applications. Don't miss the special Supplier Spotlight Presentations which provide additional opportunities to learn about the latest product innovations and services from the suppliers of our industry.

Event details are subject to change. View the most up-to-date information at iwcs.org.

2024 ATTENDEE REGISTRATION FEES

Register online at:
iwcs.org/register

	SUMMER SPECIAL	ADVANCED	REGULAR
	Before August 1, 2024	August 2 through September 15	**After** September 15 (including on-site)
FULL-ACCESS + DIGITAL PROCEEDINGS Technical Symposium, Executive and Plenary Sessions, Welcome Reception, and Supplier Exhibition/Supplier Spotlight Presentations			
Individual	$1,175	$1,400	$1,700
5 pack	$5,500	$6,500	–
10 pack	$10,500	$12,000	–
Individual (One Day Only)	$700	$850	$1,075
Speaker (One Individual Per Technical Paper)	$450	$450	$1,700
Academic/Student*	$25	$25	$25
SUPPLIER EXHIBITION™ ONLY Supplier Exhibition/Supplier Spotlight presentations			
2 Days (Tuesday ***and*** Wednesday)	$100	$100	$125
1 Day (Tuesday ***or*** Wednesday)	$55	$55	$75
WELCOME RECEPTION This add-on is geared toward exhibitors and Supplier Exhibition-only pass holders (Reception is included with full-access registration)			
Monday Evening Welcome Reception	$100	$100	$125

PROFESSIONAL DEVELOPMENT COURSES			
One Course	$500	$550	$600
Two Courses (Choice of **1** "core" and **1** "elective")	$750	$825	$900

Notes:

- Students must be able to show current proof of academic status.
- Prices are quoted in US Dollars.
- Companies participating in the 2024 Supplier Exhibition™ receive complimentary Full-Access registration for one individual (per 10' x 10' booth).
- Cancellation: Forum registration or course cancellations must be received in writing by August 17, 2024 and are subject to a $50 processing fee. After this date, no refunds are granted. However, substitutions are permitted.
- VISA, MC & AMEX accepted. Credit Card payment requires a 4% processing fee.

Questions?

Email or call Michelle Melsop at mmelsop@iwcs.org or +1.571.265.3657

SUPPLIER EXHIBITION™

The Forum provides many unique professional networking and social opportunities for industry colleagues. A key part of the event experience is the Supplier Exhibition™, which allows industry suppliers to exhibit their products and services to event attendees. It also includes Supplier Spotlight presentations where latest product developments and industry trends are showcased by exhibitors. The Exhibition is located and scheduled so that the traffic from the entire Forum is encouraged to meet with exhibitors. Forum attendees wishing to visit only the Exhibition can do so for a nominal fee or as invited guests of exhibitors, provided that they have registered in advance.

PRELIMINARY LIST OF EXHIBITING COMPANIES:

- AdvanSix
- ADVARIS
- AGC Chemicals Americas, Inc.
- Amaral Automation / AESA Cortaillod
- **American Polywater ***
- Arkema Inc.
- Artofil bv
- ASI Silica Machinery
- **ATK Flame Retardant Materials Company ***
- Aurora Material Solutions
- Aversion Technologies, Inc.
- Avient Corporation
- BASF Corporation
- Cable Components Group/Gendon Polymer Services
- Carris Reels
- CBC Metals Processing
- Chase Corporation
- Chroma Color Corporation
- Clinton Instrument Company
- Commission Brokers Inc
- Conneaut Industries, Inc
- Covestro LLC
- DELESUN Inc.
- **Dejinchang Optoelectronics Technology (Thailand) Co.,Ltd***
- DeWAL Industries/Rogers Corp.
- EuroWire/Wire & Cable ASIA Magazine
- Excelitas Technologies Corp.
- Fabpro Polymers
- Fiber Optic Center
- Fil-Tec, Inc.
- Gem Gravure Company Inc
- GEON Performance Solutions
- Graham Engineering Company, LLC
- **Guelph Twines Ltd. ***
- Guill Tool & Engineering
- Herkula
- Huber Engineered Materials
- **Hueson Wire and Cable ***
- Huestis Machine Corporation
- **Hyesung Cable & Communication Inc. ***
- **HS Hyosung Advanced Materials ***
- **Industrial Equipment and Solutions of Florida LLC ***
- Info-gel
- **InnoVites B.V. ***
- Kinrei of America
- KN Manufacturing Solutions
- Kuraray America, Inc.
- LLFLex
- Lloyd & Bouvier Inc.
- M Holland
- Madem-Moorecraft Reels USA, Inc.
- Maillefer Extrusion Oy
- Melos GmbH
- Mexichem Specialty Compounds, Inc./ Alphagary
- Miltec UV
- **Mitsubishi Chemical Group ***
- Nabaltec AG
- **Narwal Exports***
- OCS Optical Control Systems GmbH
- OptEM Engineering Inc.
- Orion
- Photon Kinetics
- **PolyChem Alloy Inc ***
- **Polytec ***
- Proton Products
- REELEX Packaging Solutions, Inc.
- **Rialto Cables Pvt. Ltd. ***
- Roblon US, Inc.
- Rosendahl Nextrom
- **Runaya Private Limited ***
- Saint-Gobain Tape Solutions
- Service Thread
- Shaowu Yonghe Jintang New Materials Co., Ltd.
- Shresht Composites Inc.
- SIKORA
- Submarine Telecoms Forum
- Syensqo
- Syscom Advanced Materials
- TDC
- Teknor Apex
- Tensor Machinery Ltd.
- **TESTMACH INTECH LLP ***
- The MGS Group
- Thermoplastics Engineering Corp.
- UL Solutions
- WACKER Chemical Corporation
- Wardwell Braiding Co.
- Web Industries
- Wire & Cable Technology International (WCTI)
- Wire & Plastic Machinery Corp.
- Wire Association International/Wire Journal
- Zumbach Electronics Corp.

*** New Exhibitor**

2024 SCHEDULE AT A GLANCE

Subject to change. Visit iwcs.org/schedule for the most up-to-date event schedule

Eastern USA	Monday, October 14	Tuesday, October 15	Wednesday, October 16	Thursday, October 17	Eastern USA
8:30 AM	*Core* **Professional Development Courses** 8:30 AM–12:30 PM **MA101: Selection & Use of Materials in Wire & Cable** **EX101: The Art & Science of Extrusion Machinery for Wire and Cable** **CU101: Fundamentals of Copper Conductors & Metallic Cable Design and Applications** **FO101: Fundamentals of Optical Fibers and FO Cable Design and Application**	**Executive Session** 8:30 AM – 12:00 PM *Elective* **Professional Development Courses** 8:30 AM–12:30 PM **MA211: Basics of Fluoropolymers and Their Use in Various Cable Applications** **FO212: Advances in Optical Fibers and Their Applications** **FO215: Understanding Optical Fiber Coatings**	**Session 4** Materials/ Additives - Part 1 8:30 – 11:25 AM	**Session 5** Data Center & Edge Applications 8:30 – 11:25 AM	**Session 8** Special Applications and Fiber Modeling 8:30 – 11:50 AM	**Session 9** Rural Broadband and Cable Design 8:30 – 11:50 AM	**Session 10** Cable Sustainability and Recycling 8:30 AM – 12:00 PM	8:30 AM
8:55 AM								8:55 AM
9:20 AM								9:20 AM
9:45 AM			**Coffee Break** 9:45– 10:10 AM		**Coffee Break** 9:45– 10:10 AM			9:45 AM
10:10 AM							*Industry Innovation Session:* **Advancements in Sustainability & Recycling** 10:10 AM – 12:15 PM **SOFIA Introduction** **Panel Discussion with Q&A**	10:10 AM
10:35 AM			**Supplier Exhibition™** 10:00 AM–2:00 PM Exhibit Hall					10:35 AM
11:00 AM								11:00 AM
11:25 AM			**Supplier Spotlights** 12:00 PM–1:30 PM Exhibit Hall - Innovation Annex	**Lunch Concessions Available** 11:30 AM–1:30 PM Exhibit Hall - Innovation Annex				11:25 AM
11:50 AM							**Lunch on Your Own 12:00–1:00**	11:50 AM
12:15 PM								12:15 PM
12:40 PM	**Plenary Luncheon** *with awards and Keynote presentation* Ballroom A 12:45 – 2:30 PM							12:40 PM
1:00 PM								1:00 PM
1:25 PM								1:25 PM
1:50 PM								1:50 PM
2:15 PM								2:15 PM
2:40 PM	**Session 1** Codes & Standards 2:45 – 5:15 PM **Session 2** Design, Testing, and Applications for Copper Ethernet, PoE, and Energy Cables 2:45 – 5:15 PM **Session 3** Advancements in Microduct Cable Technology 2:45 – 4:50 PM		**Session 6** Materials/ Additives - Part 2 2:00 – 4:55 PM	**Session 7** Material and Design for Optical Fiber Cable 2:00 – 5:50 PM	**Session 11** Emerging Trends in Optical Connectivity 1:00 – 2:40 PM	**Session 12** Optical Fiber Cable Manufacturing 1:00 – 3:05 PM	**Session 13** Outdoor Power Delivery and Utility Applications 1:00 – 3:05 PM	2:40 PM
3:05 PM								3:05 PM
3:30 PM			**Coffee Break** 3:10– 3:35 PM					3:30 PM
4:55 PM								4:55 PM
4:20 PM		**Supplier Exhibition™** 12:30 – 6:00 PM Exhibit Hall *Refreshments 5:00 – 6:00 PM*						4:20 PM
4:45 PM		**Supplier Spotlights** 1:00 – 4:00 PM Exhibit Hall - Innovation Annex **Poster Paper Session** 4:00 – 6:00 PM Exhibit Hall - Innovation Annex						4:45 PM
5:10 PM								5:10 PM
5:35 PM								5:35 PM
6:00 PM+	**Welcome Reception** 5:30 – 7:00 PM							6:00 PM+

Part 1 5G / Smart Grid Network – Present and Future Deployment Tactics and Policies 8:30 – 9:45 AM

Part 2 The Latest Innovations Affecting Power & Communications Cables 10:10 – 11:25 AM

Part 3 Supply Chain – Impact and Effects of the Future Energy Grid 2:00– 3:10 PM

Part 4 Critical Updates on Utility Infrastructure & Smart Grid Reliability & Resilience 3:35– 4:55 PM

BREAKOUT: Navigating the Energy Transition: Smart Grid and Broadband Connectivity 8:30 AM - 4:55 PM

PROFESSIONAL DEVELOPMENT COURSES

This year, a variety of strong Professional Development Courses will be offered, providing a great learning opportunity from renowned industry experts. IWCS will present the annual core courses of Copper 101, Fiber 101, Materials 101 and Extrusion 101. The four core courses will provide those new to our cable & connectivity industry with basic technology information. Additionally, the elective courses will deliver current, leading edge topics geared at providing information on new areas of interest to engineers, scientists, and other cable & connectivity professionals. Additional elective course options will be added soon.

MA101: SELECTION & USE OF MATERIALS IN WIRE & CABLE

This core 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.

INSTRUCTORS:

Dr. Paul Brigandi, *Application Development Leader*
Dow, USA

Yixuan Song, *Associate TS&D Scientist*
Dow, USA

DESCRIPTION:

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.

FO101: FUNDAMENTALS OF OPTICAL FIBERS & FO CABLE DESIGN & APPLICATION

This core course provides an overview of optical fiber fundamentals and optical cable design principles to those new to the fiber optic cables.

INSTRUCTOR:

Mario Tooley, Corning Optical Communications, USA

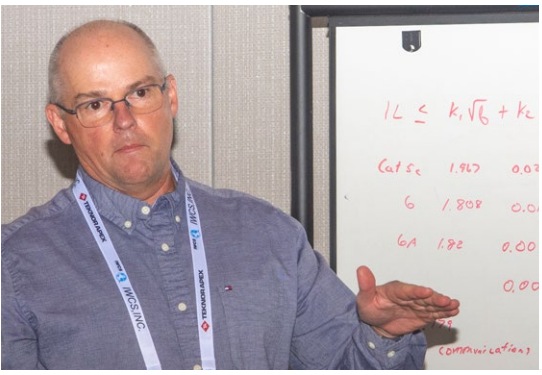
DESCRIPTION:

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 key differences between Single-Mode and Multimode 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. The course 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.

PROFESSIONAL DEVELOPMENT COURSES



EX101: THE ART AND SCIENCE OF EXTRUSION MACHINERY FOR WIRE AND CABLE

This core course focuses on the basic analysis of identifying potential machinery bottlenecks due to the extrusion group and identifies solutions to improve productivity and product quality.

INSTRUCTOR:

Dr. Stéphan Puissant

Design of Extruders; **Samp srl**, Italy; *Assistant Professor in Polymer Processing;* **InSIC**, France

DESCRIPTION:

The complete extrusion process is complex and involves a lot of machines having each a different function. The heart of the process being extrusion, we focus in this course on the extrusion group, i.e. extruder and cross head (distributor and tooling).

The single screw extruder seems to be a very simple machine. However, the extrusion process is complex as it is governed by interacting laws from different mechanical engineering fields i.e., thermodynamics, flow mechanics, properties of solid and molten polymers etc. Therefore, in a first step, the physical characteristics (viscosity, conductivity, melting) of polymers used in extrusion are presented. These properties will be the keys to understand the functioning of the thermoplastics extrusion process.

The material basis being covered, the focus will shift on the functioning of the single screw extruder. There the 3 functional zones of the extruder are introduced. For each zone, we will see its functioning in relation to material properties. This mechanism having been described, we will obtain some hints of the optimal screw designs (for some broader plastic families!), so as solutions which may be used to solve problematic issues.

After being plastified (molten), the polymer is given its final shape by some extrusion head. In this part, the basics of distributor design according to the materials are presented. After discussing the effects of distributor geometries, we will also compare different tool designs.

For each of the different items (extruder, X-head, even cooling) covered in the course, we will try to give some practical hints in addition to a more theoretical approach.

CU101: FUNDAMENTALS OF COPPER CONDUCTORS & METALLIC CABLE DESIGN & APPLICATIONS

This core course provides an introduction to the design and application of copper conductor communications cables.

INSTRUCTORS:

Trent Hayes, *Engineering Director*
CommScope, Inc., USA

Jason Huffman, *Senior Director of Broadband Cable R&D*
CommScope, Inc., USA

DESCRIPTION:

An introduction to the design and application of copper conductor communications cables. Students will understand how coaxial, twisted pair and twin axial 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.

PROFESSIONAL DEVELOPMENT COURSES

MA211: BASICS OF FLUOROPOLYMERS AND THEIR USE IN VARIOUS CABLE APPLICATIONS

This elective 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 and processing.

INSTRUCTORS:

Dr. Bianca Hydutsky, *Senior Technology Manager*
The Chemours Company, USA

Fred Johnston, *Senior Scientist*
The Chemours Company, USA

Robert Young, *Technical Fellow*
The Chemours Company, USA

DESCRIPTION:

In this course, we will review the selection and implementation of fluoropolymers utilized in various wire and cable constructions. The unique high temperature and desirable electrical properties of these materials make them well suited for a variety of high-performance constructions especially in data transfer where higher operating frequencies and greater bandwidth is of great interest. The different types of fluoropolymers will be highlighted providing a comparison of properties to assist in the selection of the material(s) most suited for the desired end-use application. A general overview of the processing of fluoropolymers will be also reviewed with an emphasis on understanding the extrusion conditions and configurations best suited for the material and construction of interest.

FO212: ADVANCES IN OPTICAL FIBERS AND THEIR APPLICATIONS

This elective course is designed for industry professionals who are interested or involved in the selection of fiber types and connectivity solutions for data center and enterprise applications.

INSTRUCTOR:

Dr. Scott Bickham, *Development Fellow*, **Corning Optical Communications**, USA

DESCRIPTION:

Low-loss optical fibers were first fabricated over fifty years ago, and many types of fibers have been developed in conjunction with transceiver technology to enable deliver an ever-increasing amount of bandwidth over longer distances. This course will summarize some of the key developments in optical fiber technology that have enabled high-capacity data transmission in applications ranging from data centers to fiber-to-the-X to undersea communication systems. After presenting a brief refresher on the basic properties of optical waveguides, the course will discuss some of the key attributes of single-mode fibers, including attenuation mechanisms and the tradeoff between cutoff wavelength, bend loss and mode field diameter. The second section of the course will focus on multimode fibers and how the designs have evolved to deliver high modal bandwidth in conjunction with low macrobend loss to enable significant reductions in the sizes of the cables, hardware and equipment that are deployed in data centers. The course will conclude with an overview of the types of fibers that are being considered for co-packaged optics and other applications which will require high bandwidth density.

FO215: UNDERSTANDING OPTICAL FIBER COATINGS

This elective course is designed for wire and cable professionals who are interested in the chemistry and physical properties of coatings used to protect optical fibers from external forces and extreme temperatures.

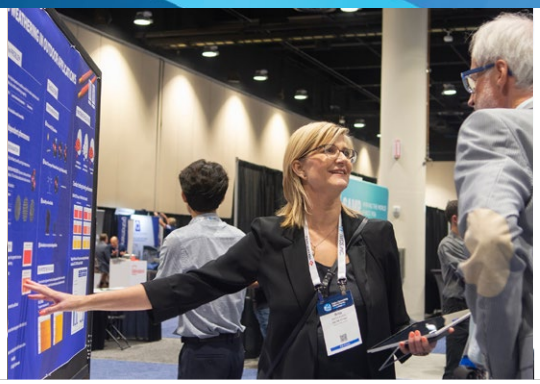
INSTRUCTOR:

Dr. Eric Urruti, *Head of R&D, Coating & Adhesives, and Head of R&D Fiber Optic Materials & UV*, **Covestro,** USA

DESCRIPTION:

Coatings are an integral part of an optical fiber. Understanding the capabilities of the chemistry as well as the physical properties is important to understanding the manufacturing of the fiber and cable, as well as the field performance. This course will discuss the fundamentals of the most commonly used technology, UV-cured acrylates. The first section will focus on the basic chemistry required, including photochemistry, and key components such as photoinitiators and sensitizers. The second part will discuss the components of typical coatings, and their specific functions in coating. The third section will focus on physical properties, how they are determined and their significance to performance. This will include discussion on microbending and how coatings are integral to protecting the fiber from external perturbations, strip force and pullout force and their significance, as well as temperature cycling. Finally we will discuss some specialty coatings with a focus on low index as well as high temperatures.

TECHNICAL SYMPOSIUM SESSIONS


PLENARY SESSION LUNCHEON: Keynote & Awards

Monday, October 14, 12:45 – 2:30 PM

Taking place during lunch on Monday, the Plenary Keynote presentation by Dr. Massoud Amin, the "Father of the Smart Grid" promises to be a highlight of the 2024 Forum.

The Convergence of Energy and Data: Powering & Connecting the Grid of the Future; Dr. Massoud Amin, Chairman, President, and Chief Executive Officer, Energy Policy & Security (EPS) Associates

Session 1: CODES AND STANDARDS

Chairperson: Dmitriy Bodik, UL Solutions, USA

Monday, October 14, 2:45 – 5:15 PM

- **Maximizing Production Efficiency: The Crucial Role of Coding and Marking Expertise in the Cable Market;** Ryan Friend, LEIBINGER
- **Optimizing Fire Safety Assessments: the Transition from LOI To HRR;** Thomas Schelling, Huber Advanced Materials
- **The Benefits of Serialized, Scannable Labels for Cabling;** Thomas Knychalski, Legrand
- **Update on Revisions to UL's Certification Documents;** Paul Knapp, UL Solutions
- **FRNC Materials Degradation Study - Accelerated Aging Laboratory Tests vs Natural Weathering in Different Climatic Zones;** Klaudia Wiśniewska, Corning Optical Communications
- **Single Pair Ethernet for Building Automation;** Peter Fischer, BKS Kabel-Service AG

Session 2: DESIGN, TESTING, AND APPLICATION FOR COPPER ETHERNET, POE, AND ENERGY CABLES

Chairperson: Ed Fenton, Daikin America, USA

Monday, October 14, 2:45 – 5:15 PM

- **Modeling of Twisted Pair Cable and Insulation Materials for PoE Applications;** Paul Brigandi, Dow
- **Effect of Clock Frequency and Rise Time in Digital Electricity (DE) Transmission up to 2000m;** Solomon Girma, Superior Essex
- **Single Pair Cable Bandwidth-Length Product;** David Hess, Cord Data
- **Single-Pair Ethernet Cable Data Rate and Reach Simulation;** Juliusz Poltz, OptEM Engineering Inc.
- **Simulation & Measurement of EMC of SPE Connectors & Assemblies;** Bernhard Mund, bda connectivity GmbH

Session 3: ADVANCEMENTS IN MICRODUCT CABLE TECHNOLOGY

Chairperson: Jeff Barker; Prysmian, USA

Monday, October 14, 2:45 – 4:50 PM

- **Ultra High-Density Microduct Cables with Freeform Ribbons and Applications;** Shuhei Nakayama, Sumitomo Electric Industries, Ltd
- **864F 200u Flexible Ribbon Cable for 16mm Microduct;** Eric Anderson, Prysmian
- **How Sustainable is Cable Blowing?;** Willem Griffioen, Plumettaz S.A.
- **FTTH Indoor Cables: How to Achieve a Comparable Rating of their Jetting Performance;** Michael Heinz, Corning
- **Selection of Optical Fibre Cable for FTTR Cabling;** Cheng Liu, Fiberhome Telecommunication Technologies Co. Ltd

EXECUTIVE SESSION

Chairperson: David B. Kiddoo; IWCS, USA

Tuesday, October 15, 8:30 AM – 12:00 PM

The Executive Session is designed for the general management of the cable & connectivity industry supply chain companies.

- **Optical Cable Demand Recovery – When?;** Natalie Noor-Drugan, CRU
- **Metallic Wire & Cable Trends – Energy Convergence;** Aisling Hubert, CRU
- **Global Transition in Copper Grid Supply and Deployment;** John Gross, Copper Journal
- **Global Economic Outlook;** Robert Fry, Robert Fry Economics
- **Supply Chain Demands and Dynamics for Smart Data & Limited Energy Infrastructure Deployment;** Kate Fegley-Lummus, Superior Essex

POSTER SESSION

Chairperson: Alistair Duffy, Faculty, De Montfort University, UK

Tuesday, October 15, 4:00 – 6:00 PM

- **Few-Mode EDFAs in SDM Systems: Modal Gain, Noise Figure and Bit Error Rate Performance;** Hesham Youssef, Telecom Egypt | SubOptic Foundation
- **Optical Fiber vs Copper Solutions;** Karla Celada Vazquez, Legrand
- **Selective Launch Capability Enables Automated Production Testing of Multicore Optical Fibers;** Barry Gill, Photon Kinetics, Inc.
- **Structures and Tribological Performance of PEKK Reinforced by Yttria-Stabilized Zirconia Composite Designed for Tribological Application;** Alamin Mohammed, Centre for Advanced Laser Manufacturing (CALM), School of Mechanical Engineering, Shandong University of Technology

TECHNICAL SYMPOSIUM SESSIONS

POSTER SESSION CONTINUED

- **Analysis and Improvement on Optical Fiber Breaking During Optical Cable Manufacturing;** Zhan Langlang, Hengtong Optic-Electric Egypt Co., S.A.E
- **Excess Fiber Length Optimization in Polypropylene Round Drop Optical Fiber Cable in Air Blown Application;** Arun Gupta, Sterlite Technologies Ltd
- **Application Research of Flexible Optical Fiber Cabling Solution in Communication Room;** Pan Xiukun, Hengtong Optic-Electric Co., Ltd
- **Optimization of Shrinkage and Protrusion on Optical Fiber Ribbon Cable;** Bo Feng, Yangtze Optical Fibre and Cable Joint Stock Limited Company | Wuhan University of Technology
- **Research on the Production Process of G.654 Fiber Ribbon Cables;** Junhong Liu, Yangtze Optical Fibre and Cable Joint Stock Limited Company
- **The Influence of the Distribution State of Optical Fibers in Stranded Loose Tube Optical Cables on their Additional Attenuation;** Shi Kang, State Key Laboratory of Optical Fiber and Cable Manufacture Technology, Yangtze Optical Fibre and Cable Joint Stock Limited Company
- **Effect of Temperature on Fiber Strain of Optical Cable;** Kesen Yang, State Key Laboratory of Optical Fiber and Cable Manufacture Technology, Yangtze Optical Fibre and Cable Joint Stock Limited Company
- **Evaluating Asset Confiscation's Effectiveness in Managing Submarine Cable Consortiums' Financial Uncertainties: A Comprehensive Simulation Study using Monte Carlo Approach;** Tanjil Ahmed, Summit Communications Ltd
- **Research and Optimization of Water Penetration Performance on All-Dry Optical Cable;** Bo Feng, Yangtze Optical Fibre and Cable Joint Stock Limited Company | Wuhan University of Technology
- **AI in Vision Quality Inspection Systems;** Patrick Jones, Taymer International

NEW! All-Day Breakout Program: NAVIGATING THE ENERGY TRANSITION: SMART GRID & BROADBAND CONNECTIVITY

Wednesday, October 16, 8:30 AM – 4:55 PM

5G / Smart Grid Network – Present and Future Deployment Tactics and Policies

- ***Panel discussion*** featuring: Panduit, Google Fiber, and National Telecommunications and Information Administration (NTIA)
- ***Presentation:*** **Middle Mile Networks: The Digital Economy Enabler in Rural America;** Jose Castro, Panduit

The Latest Innovations Affecting Power & Communications Cables

- ***Panel discussion*** featuring: EPRI, Prysmian, UL Solutions, & Superior Essex
- ***Presentation:*** **Feasibility Analysis on Fiber Optic & Primary Power Hybrid Cable Concepts;** Jay Herman, Electric Power Research Institute (EPRI)

Supply Chain – Impact and Effects of the Future Energy Grid

- ***Panel discussion*** featuring: CRU, Prysmian, and The Copper Journal

Critical Updates on Utility Infrastructure and Smart Grid Reliability & Resilience

- ***Panel discussion*** featuring: Alabama Power, Energy Policy & Security (EPS) Associates, and QuantaWatt
- ***Presentation:*** **Green Valley Underground Power Distribution Case Study;** Holly Campbell Joiner, Alabama Power

Session 4: MATERIALS AND ADDITIVES - PART 1

Chairperson: Thomas Schelling; J.M. Huber Corporation, USA

Wednesday, October 16, 8:30 – 10:55 AM

- **Numerical Simulation of Extrusion Process: A Powerful Tool to Save Time and Money;** Hend Bahloul, MSP (Material Service and Processing)
- **The Next Generation Liquid Stabilization Solution for MV & HV XLPE Cables Produced by Direct Peroxide Injection;** Jiong Yu, SI Group
- **Increasing Demand for Crosslinked Halogen Free Flame Retardant Compounds for Solar Application;** LeeAnn Chen, Orbia Polymer Solutions - Alphagary
- **Study of Plasticizers Migration in EVA-based LSZH Cable Jackets under Damp Heat Aging Conditions;** Pan Xiukun, Hengtong Optic-Electric Co., Ltd
- **The Influence of Oil Absorption of Halogen-Free Flame Retardant Materials on their Mechanics;** Pengcheng Zeng, Yangtze Optical Fibre and Cable Joint Stock Limited Company
- **Study on Effect of Multiple Extrusion Recycling on the Structure and Properties of High-Density Polyethylene;** Pan Xiukun, Hengtong Optic-Electric Co., Ltd

Session 5: DATA CENTER AND EDGE APPLICATIONS

Chairperson: Eric Whitham; OFS, USA

Wednesday, October 16, 8:30 – 11:25 AM

- **Fiber Optics Links for Artificial Intelligence Computing and Networks;** Mabud Choudhury, OFS
- **Extended Transmission Multimode Fiber for Wavelength Range from 850nm to 910nm in High-Speed Data Center and AIML Applications;** Hao Dong, Corning Optical Communications
- **Chromatic Dispersion of Single Mode Fibers for 800G and 1.6 Transmission;** Earl Parsons, CommScope
- **Multimode Polymer Waveguide Interconnect Systems for On-Board Applications;** Bulent Kose, Panduit Corp.
- **Effects of Fiber System Topology on Network Latency;** Michael Dodds, Leviton Manufacturing Co., Inc.
- **Big Things Do Come in Small Packages;** Eric Hyland, Legrand

Session 6: MATERIALS AND ADDITIVES - PART 2

Chairperson: Thomas Schelling; J.M. Huber Corporation, USA

Wednesday, October 16, 2:00 – 4:55 PM

- **Low Carbon Footprint ADSS Cble;** Lucas Nogueira, Prysmian Cabos e Sistemas do Brasil S.A.
- **Increasing Demand for High Voltage Cable, Selection of Polymer, Carbon Black to its Cable Construction;** Priya Rakshit, Orbia Polymer Solutions - Alphagary
- **Carbon Black and Conductivity in Medium and High Voltage Cables;** Scott Brewer, Orion Engineered Carbons SA
- **Next Generation PVC Elastomers with Superior Low Temp Performance;** Qiming He, Teknor Apex Company, USA
- **Preliminary Investigation of a High Thermal Stability Polyimide for Magnetic Wire Coatings;** Brian Knapp, Akron Polymer Systems
- **Gallium, Germanium, and their Implications in the Energy Transition;** Daniel Smith, Nest Technical Services, Inc.

TECHNICAL SYMPOSIUM SESSIONS

Session 7: MATERIAL AND DESIGN FOR OPTICAL FIBER CABLE

Chairperson: Bulent Kose, Panduit Corp., USA

Wednesday, October 16, 2:00 – 4:55 PM

- **Development of Indoor / Outdoor Cables with Robust Structure;** Daisuke Hikima, Fujikura Limited.
- **Fine Tuning of the Surface Energy of the GFRP Rods Used in Optical Fiber Cable Sheathing;** Chaithanya PV, Runaya Private Limited
- **Application of a Swellable Water Blocking Fiber Coating for Fully Dry Micro Loose Tube Solution;** André Steghuis, BV Twentsche Kabelfabriek TKF
- **Enhancing Fiber Optic Cable Identification in Miniaturized Environments: The Role of Specialized Masterbatch;** Jesús Trenado, Delta Tecnic
- **Influence of Coating Properties on the Quality of Optical Fibre Cables;** Onno Bresser, TKH Group NV
- **Fast Curing Next Generation Primary Coating Technology Providing Improved Consistency in Optical Fiber Performance and Draw Tower Process;** Grant Sheridan, Covestro LLC
- **Mitigated Inking Impact of Next Generation Optical Fiber Coatings, While Maintaining Robust Draw Processing Capability;** Xiaosong Wu, Covestro LLC
- **Novel Optical Fibers for Sensor and Laser Systems;** John Ballato, Clemson University

Session 8: SPECIALTY APPLICATIONS AND FIBER MODELING

Chairperson: Ben Waite, Fiber Optic Center, Inc., USA

Thursday, October 17, 8:30 – 11:25 AM

- **A Comprehensive Mechanism for Capacity Restructuring in Subsea Fiber Spectrum Sharing;** Tanjil Ahmed, Summit Communications Ltd.
- **Using Generative AI (Large Language Model) Technology to Design Static and Dynamic Submarine Cables;** Yung-Chen Lin, Walsin Lihwa Corporation
- **Optical Cable Sense Solution for Perimeter Security;** Lucas Nogueira, Prysmian Cabos e Sistemas do Brasil S.A
- **CPR Reaction and Resistance to Fire Testing of Low Smoke, Zero Halogen Tight-Buffer Breakout Cables for Deployment in Nuclear Power Plants;** Brian Risch, Prysmian
- **Automatic Alignment Method for Free-Space Optical Communication;** Paul Huang, Panduit Corp.
- **Temperature Cycling Simulation Using Finite Element Analysis;** Henry Rice, Proterial Cable America
- **New Formula for Calculation of Dependence of Microbending Sensitivity on Coating Geometry and Material;** Onno Bresser, TKH Group NV

Session 9: RURAL BROADBAND AND CABLE DESIGN

Chairperson: Mike Gimblet, Corning Optical Communications, USA

Thursday, October 17, 8:30 – 11:25 AM

- **Study on Remote Operated Optical Fiber Switching Node Using Power-over-Fiber Technique;** Akihiro Kuroda, NTT Access Network Service Systems Laboratories
- **Analysis of Fiber Shrinkage Phenomenon in Flat Drop Optical Cables;** Junehyong Kim, Hyesung Cable & Communication Inc.
- **Micro Unit Cable with Low Loss and Bend Insensitive Fiber;** Eunjeong Yang, LS Cable & System
- **Cable Designs for Rural Broadband Applications;** Joseph Lichtenwalner, Corning
- **LoadSafe Dielectric Round Drop with FastAccess for Aerial Application;** Sebastian Olszewski, Corning Optical Communications
- **Development of Optical Fiber Cable for On-Road Surface Wiring;** Akihiro Yanagida, NTT Corporation
- **Development of Optical Fiber Cable Suitable for Simple Installation on Road Surface;** Masataka Tabuse, Furukawa Electric Co., Ltd.

Session 10: CABLE SUSTAINABILITY AND RECYCLING

Chairperson: Paul Brigandi, Dow, USA

Thursday, October 17, 8:30 – 9:45 AM

- **Understanding FEP Volatilization at High Temperatures via TGA: A Path Toward Sustainable and Efficient Manufacturing;** Bo Xu, Superior Essex
- **Sustainable Options in Polyethylene Cable Jacket Materials;** Brian Risch, Prysmian
- **Fluoropolymer Sustainability and Responsible Manufacturing to Support Cable and Connectivity;** Bianca Hydutsky, The Chemours Company

Industry Innovation Session: ADVANCEMENTS IN SUSTAINABILITY & RECYCLING

Chairperson: Bianca Hydutsky, The Chemours Company

Thursday, October 17, 10:10am – 12:15 PM

Sustainable Optical Fiber Industry Alliance (SOFIA)

Hear from members of SOFIA, which is an industry initiative focused on promoting sustainability throughout the optical fiber and cable value chain through increased collaboration.

- ***Panel discussion*** featuring: Nextrom, Borealis, Heraeus, Umicore, Teijin Aramid, and Covestro

Advancements in Sustainability & Recycling

During this panel discussion with Q&A, industry experts will discuss sustainable material selection (performance & safety), transparency, responsible manufacturing (raw materials / emissions / energy credits) and supply chain circularity / recycling within the Cable & Connectivity Industry

- ***Panel discussion*** featuring: Chemours, Dow, Covestro, Teknor Apex, Prysmian, Teijin Aramid, Fluoropolymer Resources Lab, and Performance Fluoropolymer Partnership

TECHNICAL SYMPOSIUM SESSIONS

Session 11: **EMERGING TRENDS IN OPTICAL CONNECTIVITY**
Chairperson: Mike Gurreri, CommScope, Inc., USA

Thursday, October 17, 1:00 – 2:45 PM

- **A Study of End-Face Geometry and Visual Inspection of a Very Small Form Factor Ferrule;** Samuel Field, US Conec, Ltd.
- **Pre-Connectorized Multi-Core Fiber Cable for Easy Installation;** Takayoshi Mori, NTT Corporation
- **Connectivity Advancement Trends for Quantum Technology & Its Applications;** Bernard Lee, SENKO Advanced Components
- **A Very Small Form Factor Connector Solution Designed for Space Constrained Applications;** Jeff Hendrick, US Conec, Ltd.

Session 12: **OPTICAL FIBER CABLE MANUFACTURING**
Chairperson: Robert Elkins, Corning Optical Communications, USA

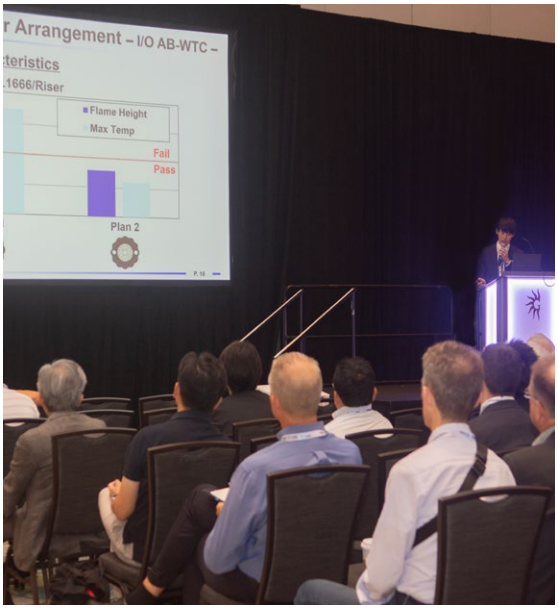
Thursday, October 17, 1:00 – 2:45 PM

- **Enhancing Efficiency and Quality in High-Speed Optical Cable Manufacturing through AI-Driven Process Control;** Jussi Hanhirova, Maillefer Extrusion Oy
- **The Influence of Extrusion Temperature on the Tensile Performance of Flat Optical Cables;** Pengcheng Zeng, Yangtze Optical Fibre and Cable Joint Stock Limited Company
- **Research and Analysis of G.657 Fibre Bending Loss Measurement;** Lubin Deng, State Key Laboratory of Optical Fibre and Cable Manufacture Technology | Yangtze Optical Fibre and Cable Joint Stock Limited Company
- **Application of G654E Fiber in Air-Blown Microcable for Backbone Network;** Pan Xiukun, Hengtong Optic-Electric Co., Ltd
- **Overview of Rare Earth Doped Fibers, Applications and Fabrication;** Richard Tumminelli, Fiber Optic Center

Session 13: **OUTDOOR POWER DELIVERY AND UTILITY APPLICATIONS**
Chairperson: Jon Mello, Teknor Apex, USA

Thursday, October 17, 1:00 – 3:10 PM

- **EV Charging: Forced Air-Cooled Charging for DC Fast Chargers;** Joseph Iamartino, Marmon Electrical
- **Electrifying Aerospace: Challenges, Regulations, Performance, and Future Needs in High Voltage Wiring for eVTOL Aircraft;** Michael Traskos, Lectromec
- **A Study on Reinforcement Method Using Reinforcing Piles for Corrosion of Road Surface Boundaries of Steel Utility Pole;** Wataru Kokubo, NTT Corporation
- **Dynamic Line Rating Robust Validation, Enhancement and Field Demonstration in New England with Changing Weather and Offshore Wind Integration;** Junbo Zhao, University of Connecticut
- **Extraction of Equipment from Point Cloud Data for Automation of Heavy Equipment;** Yusuke Sakurahara, NTT Corporation



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