69th International Cable and Connectivity Symposium (IWCS 2020)

Industry Leadership, Innovation and Professional Development

Online
12 - 16 and 19 - 23 October 2020

SESSION 1: EXECUTIVE SESSION
Chairperson: David B. Kiddoo, IWCS, USA
This session is designed for the general management of the cable & connectivity Supply Chain. Important issues facing the industry will be addressed by expert Speakers in a provocative Session which will be followed by a panel of industry technology leaders.

1-3: Global Economic Outlook: R. Fry, Robert Fry Economics, Delaware, USA...3
1-4: Executive Panel Session: Transformation in 2025 (or Sooner!): Our Future Connected World: T. Redshaw, Verizon; M. Beesley, Cisco; A. Bosch, Prysmian Group; M. Kurk, CommScope...4, 6, 8, 9

PLENARY SESSION WITH AWARDS
The Plenary Session will feature a Keynote Presentation by a distinguished business and thought leader in the global cable and connectivity industry. We will also recognize the best papers and presenters from IWCS 2019 in Charlotte, North Carolina, USA.

Keynote: Technology, Architecture and Supply Chain Needs to Drive Success in Our 2025+ Business, Use Case and Competitive Landscape Realities
Speaker: Michael Beesley, VP/CTO of Cisco Systems, Mass-Scale Infrastructure Group, California, USA...N/A

SESSION 2: POLYMER & ADDITIVE MATERIALS
Chairperson: Charles Glew, Cable Components Group, USA

2-1: Ethylene Copolymer Modifiers for High Performance Low Smoke PVC Compounds Deterioration: P. Brigandi and B. Chaudhary, Dow, Pennsylvania USA; X. Jiang, and H. Brown, Dow, Texas, USA; W. Whelchel and D. Zhang, Dow, Delaware, USA...10
2-2: Fire Retardant LSZH Cable Compounds – Synergy Between Metal Hydroxides and Melamine Poly (Metal Phosphates): D. Temples, H. Liu, Y. Bourgeois, D. Reee, and A. Isarov, Huber Engineered Materials, Georgia, USA...19
2-3: How to Formulate HFFR Compounds for Cables Based on Natural Magnesium Hydroxide (MDH): C. Cardelli, iPOOL s.r.l., Pisa Italy; S. Bayramin, SILMA SRL, Poggio a Caiano, Italy...N/A
2-4: High UV-Stabilized Compounds for Colorable Outdoor Fiber Optic Cable Jacket Applications: W. Miao and H. Xu, Dow, Shanghai, China; M. Esseghir, Dow, Pennsylvania, USA...30

2-5: Micro Masterbatches - Improved Dilution in Cable Extrusion Processes: E. Xirinachs and L. Parent, Delta Technic, Sant Celoni, Spain...37
2-7: Durable and High Contrast UV Laser Markings in PTFE Wire Insulations: S. Abiodun and R. Costa, Technetics Group, Texas, USA...46

SESSION 3: OPTICAL CONNECTIVITY
Chairperson: Ben Waite, Fiber Optic Center, Inc., USA

3-1: Latest Research Regarding Fiber Broadband: M. Render, RVA LLC, Oklahoma, USA...N/A
3-2: Spring Force Requirements for MPO Connectors: S. Lutz, D. Childers, D. Schoellner, and M. Hughes, US Conec LTD, North Carolina, USA...51
3-3: Detection Technique for Connector Immersion Based on OTDR with Multiple Wavelengths: A. Nakamura, N. Honda, and H. Oshida, NTT Access Network Service Systems Laboratories, Tsukuba, Japan...56
3-4: Fiber Cleaver Designed Fail-Safe for Mechanical Splice Type Field Mountable Optical Fiber Connector: R. Koyama, Y. Abe, M. Takaya, and K. Katayama, Nippon Telegraph and Telephone Corp, Tsukuba, Japan...60

SESSION 4: HIGH SPEED TRANSMISSION FOR SHORT REACH APPLICATIONS I
Chairperson: Durgesh S Vaidya, OFS, a Furukawa Company, USA

4-1: Standards, Technology, Market, Industry Trends and Future Direction for MMF: J. Kamo, G. Choudhury, Y. Sun, R. Lingle, and R. Shubochnik, OFS, Georgia, USA...64
4-2: Performance Evaluation and Modeling of 400GBASE-SR8 in a U.S. Air Force Data Center: J. Castro, B. Kose, and R. Pimpinella, Panduit Corp, Illinois, USA; C. Craig and J. Busby U.S. Air Force 480th ISR Wing, Virginia, USA; S. Snyder, NAWCAD, Special Comm Missions Solutions, Maryland, USA; E. Tirona and C. Wang, UT Services, Virginia, USA; T. Crouse, BAE Systems, Virginia, USA...74
4-3: Estimation of the Multipath Interference (MPI) Optical Penalty in Multimode VCSEL Transceivers: J. Castro, R. Pimpinella, B. Kose, P. Huang, and B. Lane, Panduit Corp, Illinois, USA...77
4-5: Effects of Modal-Chromatic Dispersion Compensation in 400GBASE-SR8 Channels: J. Castro, R. Pimpinella, B. Kose, P. Huang, F. Jia, B. Lane, Panduit Corp, Illinois, USA...86
SESSION 6: HIGH FIBER COUNT - HIGH DENSITY CABLES
Chairperson: Eric Whitham, OFS, USA

6-1: Ultra High Density Loose Tube Cable Incorporating Rollable Ribbon: G. Wei Hangzhou, Futong Communication Technology Co., LTD, Hangzhou, China...131

6-2: New UHFC Cable Solution with Freeform Ribbons for Easy Installation: F. Sato, Sumitomo Electric, Yokohama, Japan...134

6-4: 6912F Ultra High Density Optical Cable with 200µm Fiber 16F Rollable Ribbon: T. Gonohe, T. Yasutomi, K. Matsuura, and N. Okada Furukawa Electric Co., LTD, Kameyama, Japan...141

6-5: 3,000-Fiber Optical Cable Using 200µm Fiber: Y. Tsujimoto, N. Yamashita, A. Namazue, K. Osato Fujikura LTD, Sakura, Japan...145


SESSION 5: NOISE AND SHIELDING IN TWISTED PAIR CABLE
Chairperson: Markus Kemmler, Kemmler Consulting GmbH, Germany

5-2: Measuring Shield Integrity for Twisted Pair Cabling Systems: H. Pandya and X. Zhu, AEM, Singapore...90

5-3: Alien Crosstalk versus Coupling Attenuation: D. Hess, Cord Data, Pennsylvania, USA...95

5-4: Twisted Pair Ethernet Applications at Lengths Greater than 100m: M. Dodds and B. Marchant, Berk-Tek LLC, Pennsylvania, USA...105

5-5: EMC of Ready-Made Connecting Devices (RMCD): B. Mund, BDA Connectivity GmbH, Asslar, Germany; K. Hemmerlein, Federal Network Agency, Berlin, Germany...111

5-6: Detecting Electromagnetic Disturbances on Transmission Lines using Time Reversal: A. Raguso, H. Sasse, and A. Duffy, De Montfort University, Leicester, United Kingdom...119

5-7: Procedures to Overcome Spurious Effects in the Measurement of RF Communication Cables: L. Van Rysselberghe, W. Klein, R. Gigon, B. Dardel, and V. Arbet-Engels, AESA Cortaillod, Colombier, Switzerland...125

SESSION 7: INSTALLATION & SPECIALITY APPLICATIONS I
Chairperson: Markus Kemmler, Kemmler Consulting GmbH, Germany

7-1: Blowing Cables in Ducts Fixed at Regular Intervals: W. Griffioen, Plumettaz, SA, Bex, Switzerland...171

7-2: Efficient Photo Inspection of Manholes for Smart Maintenance with Object Detection Technique: M. Wada, R. Katsumura, H. Shimabara, and T. Aihara, NTT East, Tokyo, Japan...179

7-3: Selection of End Treatment for Different Overhead Conductors in Breaking Load Test: X. Qian, Y. Miao, M. Wu, W. You, S. Xie, and J. Chen, Jiangsu Zhongtian Technology Co., LTD, Nantong, China...187

7-4: Installing High-Density Optical Fiber Cable in a Conduit Experiencing Freezing Conditions: A. Sakurai, Y. Maruo, Y. Yamada, H. Izumita, and H. Tanioka, Nippon Telegraph and Telephone Corp Tsukuba-ic, Ibaraki, Japan...190

7-5: Research on Large Core OPGW Technology Based on Large-Capacity Communication Requirements in Different Countries: W. Lu, Y. Xu, S. Xie, J. Chen, and L. Cai, Jiangsu Zhongtian Technology Co., LTD, Nantong, China...196

SESSION 8: OPTICAL CABLE MANUFACTURING
Chairperson: Markus Kemmler, Kemmler Consulting GmbH, Germany

8-3: Roller Type Automatic Induction Cable Drum Monitoring Device: L. Shi, H. Tan, Y. Ma, and B. Ju, Hengtong Cabos E Tecnologia LTDA, Poasou Alegre, MG, Brazil...206

SESSION 9: OPTICAL FIBER & DESIGN
Chairperson: Ad Abel, DSM Functional Materials, The Netherlands


9-7: Reduced-Clad G.657.B3 Fiber with Ultra-Low Bending Loss: M. Raadikoemar, L. Yang, P. Li, L. Zhang, Z. Xiong, X. Lan, and J. Luo, Yangtze Optical Fibre and Cable Joint Stock Limited Company, Wuhan, China...213

SESSION 10: OPTICAL CABLE I
Chairperson: Wayne Kachmar, Technical Horsepower Consulting LLC, USA
10-3: 288F Mid-Span Access Cable Consisting of Gel Free 24F Loose Tube: Y. Park, Y. Goo, J. Lee, and C. Kim, Gaon Cable, Jeonju, Republic of Korea...233
SESSION 11: HIGH SPEED TRANSMISSION FOR SHORT REACH APPLICATIONS II
Chairperson: Durgesh S Vaidya, OFS, a Furukawa Company, USA
11-1: Impact of Multimode Connector Return Loss on 400G Cloud Scale Data Center Links: E. Parsons, M. Kadar-Kallen, G. Gibbs, and J. Young, CommScope, Texas, USA...237
11-4: Reaches for 100G per Wavelength over Worst-Case MMF Channels: J. Castro, Panduit Corp, Illinois, USA; R. Pimpinella, B. Kose, P. Huang, B. Lane, and A. Carena, Politecnico di Torino, Turin, Italy; R. Gaudino, G. Rizzelli, P. Torres Ferrera, and A. Nespol, Links Foundation, Turin, Italy...251
11-5: 100G/400G Transmission over Extended Reach of Multimode OM5 Fiber Cable: Y. Sun and J. Deborlotti, OFS Fitel LLC, Georgia, USA; R. Lingle, J. Kamino, R. Shubochkin, OFS Fitel LLC, Massachusetts, USA...256
SESSION 12: CABLE CODES, STANDARDS & PROCESSES
Chairperson: Dmitriy Bodik, UL LLC, USA
12-1: Mass and Energy Balances for the EN 50399 Cable Flammability Test: A. Freeland, Corning Incorporated, New York, USA...261
12-2: Untangling the Changes – An Update on Revisions to UL’s Certification Documents: A. Tassone and S. Stene, UL LLC, California, USA...267
12-3: Updates in Optical Fiber, Ribbon and Cable Standards and Test Methods: P. VanVickle, Sumitomo Electric Lightwave, North Carolina, USA...271
12-4: Using Deep Learning Algorithm to Enhance Rubber Formulation for Better Quality Flexible Cables: Y. Lin, Walsin Lihwa Corporation, New Taipei City, Taiwan...276
12-5: Artificial Intelligence Based Process Assistant Automates Buffering Process Control: M. Lahti, J. Hanhirova, and S. Orhanen, Maillefer Extrusion, Vantaa, Finland...286
12-6: Smart Manufacturing Needs Smart UV Curing: The Intelligent Irradiator and Advanced Monitoring System Work to Deliver Less Downtime: W. Johnson, Heraeus Noblelight America LLC, Virginia, USA...294
12-7: Band Inspection for High Speed Fiber Coloring Lines: P. Jones, C. Girdwood and M. Fondyga, Teymer International, Ontario, Canada...298
SESSION 13: CABLE DESIGN AND APPLICATION
Chairperson: Trent Hayes, CommScope, Inc., USA
13-1: Back to the Future with 10Mb/s Ethernet Again: P. Jones, Cisco Systems, California, USA...306
13-2: Preliminary Study on Optimization of High Frequency Standing Wave of Semi Flexible Cable: H. Zhang, X. Li, W. Shi, Z. Yue, and P. Kang, Zhongtian Radio Frequency Cable Co, LTD, Nantong, China...321
13-4: Shielded vs Unshielded Cables in Power Over Ethernet: D. Bhatt, S. Khan, H. Prasad, and V. Tella, Sterlite Technologies LTD, Dadra, India...330
13-5: Artificial Intelligence in Thermal Rating to Improve Monitoring of HV Power Cables: F. Ainhirn, Graz University of Technology, Graz, Austria...334
SESSION 14: RELIABILITY AND NETWORK MANAGEMENT
Chairperson: Guy Castonguay, Corning Optical Communications LLC, USA

14-1: Traffic Monitoring Technologies for Optical Cable Transfer in Optical Access Networks: Y. Enomoto, S. Shimazu, H. Kawata, and T. Ebine, Nippon Telegraph and Telephone Corp, Tsukuba, Japan...340


SESSION 15: INSTALLATION & SPECIALTY APPLICATIONS II
Chairperson: Hélio Durigan, Furukawa Electric LatAm S.A., Brazil


15-2: Submarine High-Count Fiber Cable: S. Nakayama, D. Masuda, and J. Aquino, OCC, Kitakyushu, Japan...370

15-3: Measurement of the Max Allowable Push Force for Cables to be Installed by Blowing: W. Stoecklein, Corning Optical Communications, Berlin, Germany...374

15-5: Safety-Grade Optical Fibre Cables in Nuclear Power Plants: C. Liu, Fiberhome Telecommunication Technologies Co., LTD, Wuhan, China...381

15-6: Compact Directly Buried Cable for Rural Road Backbones: L. Nogueira, T. Happen Bianchini, M. Nardi, R. Cruz, S. Joly, H. Durigan, Furukawa Electric LatAm S.A., Curitiba, Brazil...388


SESSION 16: OPTICAL FIBER MANUFACTURING & MEASUREMENT
Chairperson: Yoshihiro Arashitani, Furukawa Electric Co., LTD, Japan

16-2: Crystallization of Preforms in the Process of Fiber Drawing: Y. Xu, J. He, M. Ji, and F. Li, Jiangsu Etern Optical Fiber Technology Co., LTD, Suzhou, China...397

16-5: Evaluation of Optical Fiber Spooling: Q. Shen, P. Dong, G. Zhang, C. Hao, Z. Zhou, and Z. Han, Jiangsu Hengtong Optical Fiber Technology Co., LTD, Suzhou, China...401

16-6: Cure Behavior of Optical Fiber Coatings with UV-LED: H. Uchida, K. Kobayashi, T. Nakajima, and N. Shinohara, JSR Corporation, Tsukuba, Ibaraki, Japan...406

16-7: Optical Arrangement and Power Consumption for UV LED System Designs in Standard Draw Tower Configuration: R. Manikkam, D. Leonhardt, and W. Harper, Heraeus Noblelight America, Maryland, USA...413

16-8: Kinetic Study on Cure Speed of Optical Fiber Coatings by Draw Tower Simulator: H. Cao, DSM Energy Curing Solutions, Illinois, USA; M. He, E. Urruti, and J. Jansen, DSM Material Science Center, Geleen, Netherlands...420

SESSION 17: OPTICAL CABLE II
Chairperson: Jeff Barker, Prysmian Group, USA


17-4: Higher Rigidity of Optical Fiber Inner Cable with Spiral Structure: H. Hirota and K. Katayama, Nippon Telegraph and Telephone Corp, Ibarakiken, Japan...432

17-5: Water Permeability of Fiber Ribbon Cable: B. Feng, A. Liu, H. Yan, and Z. Liu, Yangtze Optical Fibre and Cable Joint Stock Limited Company, Wuhan, China; R. Liu, Hubei Institute of Metrology and Testing Technology, Wuhan, China; L. Zhou, Qianjiang Branch of Hubei Institute of Measurement Technology, Wuhan, China...438

17-6: Loose Tube Cables with 24F Dry Tubes: M. Wojtczak-Michalska and S. Olszewski, Corning Optical Communications Polska, Strykow, Poland; M. Emmerich, Corning Optical Communications, Berlin, Germany...443

17-7: Structured Cabling Making a Comeback with High-Speed, Low-Latency Data Center Deployments: T. Harpel, B. Conroy, J. Young, R. Tellas, A. Sekhavat, and D. Eckell, Communications Cable & Connectivity Asso (CCCA), Maryland, USA...448
SESSION 18: OPTICAL SPICING
Chairperson: Michael Gurreri, CommScope, Inc., USA


18-2: Splice Compatibility of Contemporary and Installed Base Fibres: O. Bresser and S. Ning, Twentsche (Nanjing) Fibre Optics LTD, Nanjing, China...457

18-3: Investigation of Gainers and Exaggerated Losses in Field Splices with G.652 Fibres: S. Hopland, Hopland MarinInstall, Oslo, Norway...464

18-4: Advantages of Ribbon Cable and Mass Fusion Splicing for Lower Fiber Count Applications: D. Duke and L. Mays, AFL, South Carolina, USA...N/A

18-5: Mass Fusion Splicing Technology for Enhanced Optical Fiber Cable Installation Productivity: D. Duke and L. Mays, AFL, South Carolina, USA; R. Hasegawa and H. Kamitani, Fujikura Ltd., Sakura, Japan...470