

65th International Cable and Connectivity Symposium (IWCS 2016)

Industry Leadership, Innovation and
Professional Development

Providence, Rhode Island, USA
2 - 5 October 2016

ISBN: 978-1-5108-3738-6

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2016) by International Wire and Cable Symposium (IWCS)
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact International Wire and Cable Symposium (IWCS)
at the address below.

International Wire and Cable Symposium (IWCS)
644 Shrewsbury Commons Ave
PMB #350
Shrewsbury, PA 17361
USA

Phone: +1 717 993 9500

www.iwcs.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

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

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

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

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

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 5

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

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

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 8

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 18

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 23

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 27

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 35

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 43

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 47

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 53

3-4 (9:15): Progress in Floating Sensor Fibers into Steel Tubes - W. Griffioen, Y. Chappuis and S. Grobety, Plumettaz SA, Bex, Switzerland 59

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 67

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 73

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 76

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 85

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 92

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 99

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 106

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 111

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 118

4-6 (10:35): New ITU-T Optical Fiber and Cable Reliability Supplement - D. Mazzaresse, OFS, Georgia, USA 124

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. Arihilar, 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 126

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. Pouchè, Reutlingen University of Applied Sciences, School of Engineering, Reutlingen, Germany; and T. Schmid, Rosenberger HF-Technik, Fridolfing, Germany 133

5-3 (8:50): Design and Assessment of Cavity Perturbation Method for Dielectric Constant Measurement - F. Akinuoye, H. Sasse and A. Duffy, De Montfort University, Leicester, United Kingdom; and P. Cave, Excel Networking, Birmingham, United Kingdom 140

5-4 (9:15): Unbalanced Transmission Channel Model Simulation for CAT7A Ethernet Cable - B. Li and A. Duffy, De Montfort University, Leicester, United Kingdom 150

BREAK (9:40-10:10)

5-5 (10:10): NEXT between Screened Twisted Pairs - J. Poltz, OptEM Engineering Inc., Alberta, Canada 156

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 160

SESSION 6: MATERIALS FOR CABLE & CONNECTIVITY APPLICATIONS, MR556

Chairperson: Dr. Mohamed Essegir | 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 165

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 172

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 177

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 184

BREAK (9:40-10:10)

6-5 (10:10): Evaluation of Foaming Technology for Data Cable Insulations - A. Flory, G. Sun, M. Essegir and C. Kmiec, The Dow Chemical Co., Pennsylvania, USA 188

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 193

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 201

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. Miranda, Solvay Specialty Polymers, Milano, Italy 220

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 225

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 228

7-3 (1:50): Estimating Attenuation for Installed Singlemode Fiber Links Using Statistical Methods - D. Mazzaresse, OFS, Georgia, USA 234

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. Mazzaresse, A. McCurdy and Y. Liang, OFS Fitel, LLC, Georgia, USA; P. Borel and B. Pálsdóttir, OFS Fitel, LLC, Brøndby, Denmark 241

7-5 (3:10): Splice Loss Rules and Results for Single-Mode Fibers Deployed in Terrestrial Long Haul Networks - D. Mazzaresse, T. Liang, J. Hartpence and B. Ward, OFS, Georgia, USA 249

7-6 (3:35): Predicting Losses in Installed Links using Monte Carlo Method - S. Hopland, Telenor Norway, Oslo, Norway 253

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 259

8-2 (1:25): EMC Performance and Alien Crosstalk Conformance for Cat8 Cables - P. Fischer, V. Arbet-Engels and D. Gigon, AESA Cortailod, Colombier, Switzerland 267

8-3 (1:50): Raising the Bar on Patch Cord Performance in the Real World - R. Ivans, UL, LLC, New York, USA 274

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 278

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 284

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 289

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 296

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 302

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 307

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 314

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 319

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 320

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 325

P-3: Print Length Verification for Cable - C. Girdwood and A. McCloskey, Taymer International Inc., Ontario, Canada 329

- 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 332
- 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 337
- 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 340
- P-7:** The Electromagnetic Wave Shielding Performance of HES Cable - G. Park, J. Yuk and J. Lee, GAON Cable Co., Ltd., Gunpo, South Korea 344
- 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 Optics Communication Co., Ltd., Shaanxi, P.R. China 348
- 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 353
- 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 358
- 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 363
- 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 368
- 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 374
- 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 378
- 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 381
- P-16:** Development and Application of High Temperature 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 384
- 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 387
- 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 392
- 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 397
- 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 402
- 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 407
- 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 411
- 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 416
- 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 421
- 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 427
- 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 433
- 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 439
- 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 443
- 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 448
- 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 453

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 457

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 460

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 464

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 470

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 476

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 485

10-7 (11:00): Next Generation Wideband Multimode Fiber for High-Speed SWDM Datacom Links - R. Shubochkin, D. Braganza and D. Mazzaresse, OFS, Massachusetts, USA; Y. Sun, K. Balemorthy, R. Lingle, Jr., J. Kamino and D. Vaidya, OFS, Georgia, USA 489

**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 495

11-2 (8:25): Power over LAN Cable - Keeping Pace with this Key Powering Strategy - R. Ivans, UL, LLC, New York, USA 500

11-3 (8:50): Evolving Methods of Evaluating Cable Heating - W. Hopkinson, CommScope, North Carolina, USA 504

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 511

11-5 (10:10): Implications of Higher Data-Rate Ethernet Over Prior Standard Twisted-Pair Data Cabling - D.C. Hess, CORD DATA, Pennsylvania, USA 516

**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 525

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 531

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 538

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 541

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 547

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 551

13-2 (8:25): Time Dependent Strength of Crimp Joints Over Polyetherimide - L.E. Parkman III, Corning Optical Communications LLC, Texas, USA 555

13-3 (8:10): Cable Strength Member to Connector Analysis - W. Kachmar, Technical Horsepower Consulting LLC, Vermont, USA 562

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 567

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 572

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 576

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 581

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 588

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 594

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 600

14-5 (2:40): Ultra-High-Fiber-Count and High-Density Slotted Core Cable with Pliable 12-Fiber Ribbons - F. Sato, K. Okada, T. Hirma, K. Takeda, R. Oka and K. Takahashi, Sumitomo Electric Industries, Ltd., Yokohama, Japan 604

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 610

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 615

15-2 (12:55): Low Smoke Halogen Free (LSHF) - What Does It Mean? - R. Bellassai, UL, LLC, New York, USA 618

15-3 (1:20): Protecting the Cable and Connectivity Industry from the Abuses of California Prop 65 - W. Hall, Venable, District of Columbia, USA 629

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 635

15-5 (2:40): Optical Connectivity and Passive Components Standardization in the International Electrotechnical Commission (IEC) – D. Mazzarese and G. Sandels, OFS, Georgia, USA 651

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 658

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 662

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 668

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 673

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 676

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 681

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 687