



Fourteenth International
Aluminum Extrusion Technology Seminar & Exposition

Aluminum Extrusion: At the Intersection of Technology, Innovation & Design

Aluminum Extruders • End Users and OEMs
Suppliers of the Industry • Aluminum Metal Producers

ET27.us

April 26 – 29, 2027

Rosen Shingle Creek Resort
Orlando, Florida USA



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ET27.us

What is ET?

The ET Seminar is the longest running and most respected technical conference for and about the aluminum extrusion industry – and you should be a part of it!

ET '27 is a comprehensive technical event that addresses nearly every aspect of aluminum extrusion production, equipment, applications, finishes, sustainability, and more.

- **100+ Technical Sessions**
- **100+ Exhibitors at ET Expo**
- **4 In-Conjunction Workshops**
- **1,200+ Delegates**
- **nETworking Events: develop, expand and enhance your industry connections**
- **Extrusion Showcase and Automotive Spotlight**

Experience the latest research, technology and innovations at ET '27 – an educational conference – *like no other in the global aluminum industry!*

Who Will Attend?

The ET Seminar is for anyone who uses, specifies or produces aluminum extrusions. The quality programming spans three days and delivers the latest developments from the brightest minds of industry, business, and academia. ET attracts professionals from nearly every corner of the operation.

nETworking at ET

Develop, expand and enhance your connections, business success and career growth by engaging in nETworking at ET '27. ET is the ideal place to share ideas, find solutions, and confront challenges with industry peers.



Bring Your Team to ET '27 and Save!

Invest in your people—both seasoned professionals and emerging talent—by sending a team to ET '27. Your investment will deliver value long after the event, and companies registering 5 or more delegates can take advantage of the ET Team Discount. Registrations and payment must be submitted together. If cancellations reduce attendance below 5 delegates, the standard registration rate will apply.

The discount is valid for ET '27 registrations only, and delegate substitutions may be made at any time. Send five or more people from your company to ET '27 and **save \$75 per person.**

All personnel must be registered and paid at the same time to qualify for the Team Discount. See the registration form for details.



Be a Part of the Global ET Event

On behalf of the ET '27 Seminar Committee, we invite you to attend ET '27 and partake of all that ET Week has to offer. Developed and expanded over 50+ years for international aluminum extrusion industry professionals, the ET '27 program of education, technical sessions, ET Expo marketplace, Extrusion Showcase/Automotive Spotlight, and nETworking with peers is unrivaled in the breadth and depth of quality content shared by the best and brightest minds in our global industry. ET happens only once every three years, so don't miss this opportunity to share challenges, explore technologies and celebrate innovation among friends and colleagues – together at ET '27!

Join Us in Orlando, Florida!

Travel and Lodging

The Location

Orlando, Florida is a top meeting destination and the perfect backdrop to ET '27. Located in Central Florida, Orlando has convenient global access via Orlando International Airport (MCO). The Rosen Shingle Creek Resort is just 12 miles, or 15 minutes, from the airport.

Orlando offers plenty of fun and excitement beyond ET '27. Extend your stay to enjoy its arts, theater, and music, along with world-class theme parks, dining, and entertainment—there's something for everyone.

Transportation

As a Universal Orlando Partner Hotel, Rosen Shingle Creek provides complimentary scheduled daily shuttle service* to nearby parks, including Universal Orlando Resort™, SeaWorld® Orlando, and Aquatica®.

*** Reservations must be made at the Rosen Shingle Creek lobby at the Universal desk for the complimentary shuttles.**

Rosen Shingle Creek Resort

The Rosen Shingle Creek Resort, an independent, full-service luxury hotel, is the official hotel for ET '27. The resort is located on Universal Boulevard, east of the Orange County Convention Center.

The Aluminum Extruders Council has reserved a block of rooms for ET '27 delegates and exhibitors at the special rate of U.S. **\$239/night** (single or double, plus taxes and fees).

This event will be in demand, so reserve your room as early as possible and **no later than Thursday, April 2, 2027**, at 5:00 PM Eastern Time (UTC-5). After that date, rooms may be offered at the prevailing rate, which is likely to be higher.



Rosen Shingle Creek Resort

9339 Universal Boulevard
Orlando, Florida 32819 USA

Toll Free Reservations: 1.866.996.6338

*Please mention **ET '27** or **Booking ID 95761** when making reservations by phone.*

Online Reservations: AECmeets.org

Deadline: by April 2, 2027 (5:00 PM Eastern Time UTC-5)

International Guests

Generally, all international travelers require a visa to enter the United States. The ET Foundation recommends that you **apply for your visa as soon as possible in advance** of your scheduled trip to avoid processing delays.

Letter of Invitation

If required for travel to the U.S., a letter of invitation can be supplied only after you have registered for ET '27 and payment has been received in full. Details regarding obtaining an invitation letter can be found on the ET '27 website at **ET27.us**.



**Scan the QR Code
For Online
Registration!**



ET Expo: *The Marketplace & Connection Hub*



The ET Expo is the meeting and marketplace of the ET Seminar. It's where providers of aluminum extrusion products, equipment and services connect directly with decision makers to learn about the latest innovations, ideas and solutions.

ET Expo: Another Learning Opportunity

The ET Expo is another place where you can learn and connect. Knowledgeable exhibitors are there to answer your questions, offer solutions and share ideas.



ET Expo Exhibitors

At press time, the companies listed below are scheduled to exhibit at the ET Expo during ET '27. For an up-to-date list of exhibitors, visit **ET27.us**.

Abtex, LLC
ABD Equipment Co., LTD
AFC-Holcroft
Albarrie
Almex USA, Inc.
Alsan - Alvarez Schaer SLU
Aluminum Anodizers Council
Aluminum Extruders Council
AMCOL Corporation
American Plating Power
Azon USA, Inc.
Baraldi / Chem Arrow
Belco Industries
Bloom Engineering Co., Inc.
Bosch Rexroth Corp.
Bulk Chemicals, Inc.

Butech Bliss
Castool Tooling Systems
Combilift Ltd.
Cometal Engineering SPA
Compes International
Die Cleaning Equipment and Supply LLC
Dunaway
Ellwood
Emmebi Srl
EngView Systems
Euroimpianti Srl LLC
extrutec GmbH
Foy, Inc.
Fromm Packaging Systems
Gemini Group
Granco Clark, Inc.
Hycast AS

Inductotherm Heating & Welding LTD
Innerspec Technologies
iNOEX LLC
Interlub
Kautek Solutions S.L.
Kintner, Inc.
Laubinger + Rickmann GmbH & Co. KG
Macrodyne Technologies Inc.
MARX GmbH & Co. KG
Novatec Innovation Solutions
Otto Junker GmbH
Palm Technology, Inc.
Perfection Servo
Precimeter Inc.
Precision Saws Inc.

RIA Cast House Engineering GmbH
Save Intelligent Equipment Co. Ltd.
SAT (Surface Aluminum Technologies Srl)
Schupan Aluminum & Plastic Sales
Secat, Inc.
Seco/Warwick Corporation
SMS Group
Soluciones Tecnicas Pafer S.L.
Surventis
Thermika Systems Inc.
Tuff Temp Corp.
UBE Machinery Inc.
Wagstaff, Inc.
Youngstown Phoenix
Zmag America, Ltd.

ET Expo Hours*

Tuesday, April 27 1:00 p.m. – 6:30 p.m.

Wednesday, April 28 10:00 a.m. – 7:00 p.m.

Thursday, April 29 10:00 a.m. – 3:30 p.m.

*Hours are subject to change. For an updated exhibitor list, as well as an interactive floor plan featuring product and service details and links to company websites, visit **ET27.us**

Extrusion Showcase

Located near the ET Expo, the Extrusion Showcase displays innovative and inspiring aluminum extrusion applications from leading companies and designers. Here you'll see winning designs from the Aluminum Extrusion Design Competition from professional designers and students studying design and engineering from schools around the world. Professional applications from various markets including building and construction, automotive, industrial, recreation, consumer and more are displayed.



Automotive Spotlight

Visit the nearby Automotive Spotlight display to see where and how aluminum extrusions are used throughout the vehicle to help save weight, improve performance and increase manufacturing efficiency.



Program Highlights

ET '27 offers a well-rounded program created to expand and elevate your understanding of the aluminum extrusion process, applications, and design.

ET Technical Exchange is the Best in Class

ET is first and foremost a technical conference where the aluminum extrusion industry professionals share their research, pushing the industry to new heights. The Technical Sessions are the heart of the ET program, with **more than 100** sessions divided into seven topic-specific tracks so you can attend the sessions that are of most interest to you and your team. Start planning your visit now! *(The list of abstracts start on the next page.)*



The General Session introduces you to ET Week with a wealth of information for all delegates.

The ET '27 program, covers nearly every aspect of aluminum extrusion – it will educate, inspire, challenge, and excite.

The General Sessions, scheduled for Tuesday morning and Thursday afternoon, provide a wealth of information for all delegates. **The Best Papers of ET '27** will be presented at the General Sessions, giving all delegates a chance to see the Best Papers presented by the award-winning authors. The winners of the 2027 Aluminum Extrusion Design Competition will be reviewed, and you can see the winning entries in person at the Extrusion Showcase during the week.

Opening General Session

The Opening General Session will include a wealth of information for the aluminum extrusion industry, including Best Paper presentations, awards presentations and more. ET will feature an enhanced General Session to make sure you get the most out of ET.

ET '27 Best of Track Paper Presentations

Four award-winning Best of Track papers will be presented during the Opening General Session, giving all delegates an opportunity to hear directly from the authors and experience some of the conference's most outstanding research and technical insights.



Presentation of Awards

The authors of the ET '27 Best Papers will be presented with their awards during the Opening General Session. In addition, the ET Chairman's Award is presented to a company that has participated in the ET Seminars over the years and made significant contributions and a positive impact on ET and the aluminum extrusion industry.

Maurice H. Roberts Award of Excellence

The Maurice H. Roberts Award of Excellence is presented to a worthy recipient who has demonstrated a significant positive impact on the global aluminum extrusion industry, who gives freely of their time and experience, and has made a personal contribution to the industry and is an inspiration to others.

Closing General Session

ET '27 Best of Track Paper Presentations

Three of the Best of Track papers will be presented by the award-winning authors during the Closing General Session, giving all delegates a chance to see and hear the very best research and information at ET '27.

Best Paper of ET '27 Presentation

The award-winning author(s) of the best overall paper at ET '27 will present their research for all delegates to experience the knowledge-sharing at ET!

Closing Session/Panel Discussion

A closing session panel discussion will feature industry expert panelists to address and discuss the hottest topics of today's global aluminum extrusion industry.

ET'27: Technical Sessions

The following pages contain the abstract titles and authors for the proposed papers submitted for presentation* at ET '27 (Refer to note at right.)

Papers will be presented in seven concurrent topic-specific tracks over three days. Contributions from the international aluminum extrusion community and end users of aluminum extrusions provide a well-rounded program that reflects a wide range of issues.

NOTE:

*The publication of abstracts **will not guarantee** that the authors' papers have been accepted for publication in the ET '27 Proceedings or for presentation at the ET '27 Seminar. Check back often to **ET27.us** for updates and changes to the program.

Follow the QR code next to each Track to go directly to the abstracts online for details.

BP: ALLOYS & BILLET PROCESS TRACK



BP015

Density Matters: Quantifying the Remelt and Sustainability Benefits of High-Density Aluminum Scrap Bales

John D. Lee, Logemann Brothers Company; University of Arizona Department of Engineering Capstone Sponsor, USA

BP021

Sustainable Manufacturing of 6060 Aluminum Alloys: Balancing Recycled Content with Performance

Evangelos Giarmas, Anastasia Kotsiaridi, Stavros Arvanitis, Alumil S.A., Production Division; **Helen Kamoutsi** and **Gregory Haidemenopoulos**, Department of Mechanical Engineering, University of Thessaly, Greece

BP023

Optimizing Aluminum Recycling: AI-Powered Insights into Delacquering and Dross Management

Myrsini Ntemi, Ilias Gialampoukidis, Stefanos Vrochidis, and Ioannis Kompatsiaris, CDXi solutions; **Evangelos Giarmas** and **Anastasia Kotsiaridi**, Alumil Group, Greece

BP031

The Effect of Dispersoid Type on the Hot Deformation Performance of a 6005A Alloy

Eli Harma and **Paul Sanders**, Michigan Technological University, USA

BP032

Development of CRM Samples for Testing of TiBAl Composition

Veerendra R, Jindal Aluminium Ltd., India

BP046

Effect of Iron Content and Ingot Structure on AA6063 Performance in the Context of Scrap Recycling

Nick Parson, Rio Tinto, Canada; and **Jerome Fourmann**, Rio Tinto, USA

BP054

Effectiveness of Zr Additions to 6XXX Extrusion Alloys

Ali Elashery, Norwegian University of Science and Technology (NTNU), Norway; **X-G. Chen**, University of Quebec; and **Nick Parson**, Rio Tinto, Canada

BP055

Advanced Aluminum Melting Enabled by AI-Based Process Control and Intelligent Assistance

Giovanni Battino, Presezzi Extrusion S.p.A., Italy

BP059

Preventing Fatalities during the Loading/Unloading of Trucks

Alex Lowery, Wise Chem LLC, USA

BP064

The Effect of Small Mn and Cr Additions on the Ductility of Air-Cooled Extrusions of Al-Mg-Si Alloys

Jostein Røyset, **Eva Mørtsell** and **Ulf Tundal**, Hydro Aluminium Research and Technology Development; **Eila Bergene**, Department of Physics, Norwegian University of Science and Technology (NTNU); and **Trond Furu**, Norsk Hydro, Corporate Technology Office, Norway

BP066

Extrudability, Microstructure and Properties of Fibrous 6005A Aluminum Alloys

Jostein Røyset, **Martha Indriyati**, **Eva Mørtsell** and **Ulf Tundal**, Hydro Aluminium Research and Technology Development, Norway

BP068

Effect of Inverse Segregation on Skin Thickness in DC Cast Aluminum Billet

Seif Badawy, **Yahya Mahmoodkhani** and **Steve Coates**, Signature Aluminum Canada Ltd., Canada

BP075

A Microstructural Assessment of High Fe Content 6063 Aluminum Alloys

Emrah Ozdogru, **Isik Kaya**, **Aybars Guven**, **Aleyna Gumussoy** and **Hilal Colak**, Tri Metalurji, Turkey

BP078

Effect of Secondary Aluminum on Inclusion and Mechanical Performance in EN AW 6082 Alloy used in Extrusion Process

Tanju Çeliker, **Harun Uslu**, **İlhan Karabiyik** and **İrfan Eker**, ONAT Alüminyum SAN. TİC. A.Ş., Turkey

BP081

Improved Mechanical Properties and Corrosion Resistance in 6005 by Ti and V Additions – from Nano- to Macro Scale

Jostein Røyset, **Eva Mørtsell** and **Ulf Tundal**, Hydro Aluminium Research and Technology Development; **Hedda Øye** and **Randi Holmestad**, Norwegian University of Science and Technology (NTNU); **Sigurd Wenner** and **Calin Marioara**, SINTEF Materials and Nanotechnology, Norway; and **Helen Weykamp**, Hydro Aluminium Metals, USA

BP084

Recrystallized vs. Non-Recrystallized Alloys for Crash Applications

Endre Hennum, **Jon Møretro** and **Ulf Tundal**, Hydro Aluminium AS, Norway

BP089

The History and Development of Aluminum Dross Processing

David Roth, GPS Global Solutions, USA

BP095

The Balance between Extrudability and Grain Structure Stability in Fibrous 6XXX Alloys

Alex Poznak, **Martha Indriyati** and **Ole Runar Myhr**, Hydro Aluminium Research and Technology Development; and **Trond Furu**, Norsk Hydro, Corporate Technology Office, Norway

BP100

Effects of Scandium Microalloying on the Performance of 1xxx and 3xxx Extrusions

Alyaa Bakr and **X. Grant Chen**, University of Quebec; and **Paul Rometsch**, Rio Tinto Aluminium, Canada

BP102

Increasing Cast House Throughput with Advanced Casting Technology

Nicholas Shaber, Wagstaff Inc., USA

BP103

Differentiating Extrusion Exit Temperature and Solvus Temperatures in AA6xxx Alloys

Sumit Gahlyan, Madhuker Kishan, Pankaj Wanjari, P Mohanraj, and Deepu Sankar, Hindalco Industries Limited, India

BP106

Thermal Management of Strengthening Elements in an AA6110 Alloy

Alex Poznak, Hydro Aluminium Research and Technology Development; **Tracy Berman, Qianying Shi, Tim Woike, and John Allison,** University of Michigan; and **Edward Cole,** Hydro Extrusions USA LLC, USA

BP111

6063 Recycled Alloy Specification Compatible with Anodizing under Japanese Industrial Standard

Takeshi Saito and Scott Rogers, Hydro Aluminium Asia, Singapore; and **Malgorzata Halseid,** Hydro Aluminium Metal, Norway

BP114

A Sustainable Al-Mg-Si Extrusion Alloy as a Functional Alternative to EN AW-6060

Annica Crispin, Ronnie Pettersson, and Alexis Skubich, Hydro Extruded Solutions AB, I&T, Sweden

BP118

Improved Billet Casting Consistency and Safety through Automation

Nicholas Shaber and Jacob Kerbs, Wagstaff Inc., USA

BP120

Upcycling Real-World Post-Consumer Aluminum Scrap into Seamless Tubing for Structural Automotive Components

Devesh Chouhan, Brian Milligan, Nicole Overman, Tanvi Ajantiwalay, Matthew Olszta, Jens Darsell, Timothy Roosendaal, Alan Schemer-Kohm, and Scott Whalen, Pacific Northwest National Laboratory, USA

BP121

Advances in Cast Aluminum Round Ingot Inspection

David Mann and Borja Lopez, Innerspec Technologies, USA

BP123

Extruded Profiles from Low-Carbon Footprint Billets of 6xxx-Series Manufactured from Recycled Materials

Bartlomiej Plonka, Boguslaw Augustyn, Dawid Kapinos, Piotr Korczak and Konrad Zylka, Lukaszewicz Research Network – Institute of Non-Ferrous Metals; and **Piotr Benisz,** Extral Sp. z o. o., Poland

BP139

Effect of Thermal Cycles on Dispersoid-Aging Precipitate Interactions and Abnormal Grain Growth in AA2xxx Alloys

Sumit Gahlyan and Manu Saxena, Hindalco Industries, Limited, India

BP142

Internally Heated Refractory for Stable Molten Aluminum Temperature Control in Billet Casting

Nicholas Tebbe, Wagstaff Inc., USA

BP143

Industrial Qualification of Online Phased Array Ultrasonic Testing for Full-Volume Inspection of Aluminum Cast Logs

Manu Saxena and Sumit Gahlyan, Hindalco Industries Limited, India

BP151

Development of High-Strength – Corrosion – Resistant AA6XXX Alloys

Nicholas Nanninga and Alex Fryman, Secat, Inc., USA

BP153

Lead-Free Machining: Casting and Microstructural Refinement of 2033 Alloy

Aybars Guven, Emrah Ozdogru and Isik Kaya, TRI Metalurji, Turkey

BP154

Post-Consumer Scrap in Automotive Aluminum Extrusions: Balancing Sustainability, Mechanical Performance and Quality

Bala Jayachandran and Jeff Victor, Hydro Extrusion USA LLC, USA

BP160

Stirring Efficiency in a Two-Chamber Furnace – Numerical Assessment of Electromagnetic Stirrer Positioning

Simon Lille, ABB Metallurgy, Sweden

BP177

The Development of Autonomous Scrap Charging and Skimming System

Jorge Fernandez, RiA Cast House Engineering LLC, USA

BP178

The Billet-Extrusion Knowledge Divide: a Roadmap to Improvement

Johnny Pangborn, Metalstar Consulting LLC; and **JD Schloz,** Schloz Technologies, USA

BP182

Integrated Alloy and Process Design of an Advanced AlMgSi System for Automotive Crash Management

Arif Hussain, Gulf Extrusions LLC, United Arab Emirates

BP183

Influence of Alloy Chemistry and Processing Parameters on the Extrudability of 6xxx Aluminum Alloys

Arif Hussain, Gulf Extrusions LLC, United Arab Emirates

BP198

Black Billets – a Study into the Cause and Impact this Condition has on the Extrusion Process

Robert Matuska, Shape Corp., USA

BP199

A Historical Review of the Development & Material Performance Challenges of Aerospace Aluminum Alloys

Robert Matuska, Shape Corp., USA

BP215

Constitutive Modeling and Simulation of Aluminum 6xxx Alloys for the Extrusion Process

Muhammad Sajjad, Eystein Vada and Helen Weykamp, Hydro Aluminium Metal, Norway; **Mike Heemstra and Brian Losey,** UACJ Automotive Whitehall Industries Inc.; **Madi Kehoe, Veronica North, David Abraham, and Ken Gryc,** Michigan Technological University, USA

BP222

Evaluation of Post-Homogenization Cooling Paths in Al-Zn-Mg-Cu Alloys

Isik Kaya, Emrah Ozdogru, Aybars Guven, Aleyna Gumussoy, TRI Metalurji, Turkey

BP229

Effects of Billet Casting Technology for an Indirect Extrusion Press

Eskild Hoff, Hydro Aluminum Metals USA LLC, USA

BP230

An Overview of the Post Processes of the Aluminum

Hanif Hamzah, Press Metal Aluminium Holdings, Malaysia

BP231

Billet Defects in the Casting Practices

Hanif Hamzah, Press Metal Aluminium Holdings, Malaysia



ET'27: Technical Sessions

EE: EXTRUSION EQUIPMENT TRACK



EE016

Precision Lubrication for Enhanced Extrusion Performance

Sergio Vazquez del Mercado,
Ricardo Ivan Ocaranza Trujillo,
Christopher Rivera Cisneros,
Interlub Group, Mexico

EE017

Stains on the Surface of Extruded Light Profiles: Optimization of the Quench Box Performance

Pawel Kazanowski, Dubai Extrusions Investments, LLC, United Arab Emirates

EE025

Circular Skid-Based Logistic System

Raffaele D'Andrea, Emmebi Srl, Italy; and
Brad Stevens, Alspex Extrusions, Australia

EE047

Overcoming Emissivity Variation Challenges in Infrared Pyrometry for Accurate Billet Temperature Measurement

Omid Madani, Williamson Corporation, USA

EE050

CYRUS AI Surface Inspection: from Detection to Decision

Eva Kesiosoglou and **Dimitris Katsikas,**
D-Cube Immersive Solutions, Greece

EE051

A New Modular Concept for Measuring and Calibration of Extruded Profiles

Philipp Hettich and **Norbert Meinikmann,**
Laubinger + Rickmann GmbH & Co. KG,
Germany; and **Martin Hartlieb,**
Miami International Inc., Canada

EE060

A Cooperation Story: a Vendor and Extruder Working Together to Find the Right Solution when Upgrading Equipment

Chris Ebnet, Alexandria Industries; and
Cristiano Baiano, Cometal North America, USA

EE073

Restoration of a 30-Year-Old Die Oven

Sutanay Parida, National Aluminium Products Company S.A.O.G., Oman

EE088

High-Strength T77 Aging for the Improvement of Corrosion Resistance, Controlled Retrocession and Re-Aging

Tomasz Kaczmarczyk, Seco/Warwick, USA

EE090

Extruding CO2-Free with the Highest Energy Efficiency, High-Velocity Convection Furnace with Induction Heater

Jan Guenter, Extrutech GmbH, Germany

EE091

Modern Induction Technology with an Energy Efficiency of up to 79%

Michael Werner, Extrutech NA, USA

EE092

Second Generation of Integrated Simulation Software for Modern Profile Quenchers

Jan Guenter, Extrutech GmbH, Germany

EE108

Hydraulic Powerpack Upgrade for Hot Log Shear

Sutanay Parida, National Aluminium Products Company S.A.O.G., Oman

EE109

Log Furnace Modification for Easy Maintenance

Sutanay Parida, National Aluminium Products Company S.A.O.G., Oman

EE110

Press Puller Air Compressor Modification to a Standard Model

Sutanay Parida, National Aluminium Products Company S.A.O.G., Oman

EE119

Lifecycle Service Solutions to Sustain Extrusion Line Reliability

Mike Wahl, SMS group GmbH, USA

EE129

Developing and Implementing a Survey Billet for Auditing Billet Heating Equipment in Aluminum Extrusion

Matt Morell, Pennex Aluminum, USA

EE157

Quench System Solutions for High-Quality Aluminum Extrusion

HongJie Mai, Save Intelligent Equipment Co., Ltd., China

EE165

The Secret to Avoiding Costly Downtime: Hydraulics Near Log Ovens are Grim Reaper Looking to Cause Serious Downtime

James Johnson, Bonnell Aluminum, USA

EE168

GOTA: a Dedicated Software Tool for Quench Analysis and Cooling Plans Design in Aluminum Extrusion

Pau Vial Serrat, Kautech Solutions R+D Department, Spain

EE169

Autonomous Mobile Robots as Enabler of Next-Generation Aluminum Extrusion Plants for Flexible Manufacturing

Pau Vial Serrat, Kautech Solutions R+D Department; **Andreu Corominas,**
Beta Robots, Spain

EE170

Accurate Heating of Aluminum Billets before Extrusion: a Permanent Magnet Furnace Approach

Pau Vial Serrat, Kautech Solutions R+D Department, Spain

EE171

Towards Fully Automated Aluminum Extrusion Lines: Automation-Oriented Developments in Handling Equipment

Pau Vial Serrat, Kautech Solutions R+D Department, Spain

EE172

Log Pre-Heating in the Year 2030 – What's Next in Log Furnace Technology

Carsten Dede, SMS group, USA

EE179

promex MAX 800/1100 – Very Large Aluminum Profile Measurement at the Press

Bjorn Biehler, Alexander Daniker and
Julia Wachter, ASCONA GmbH, Germany;
and **Brad Allen,** iNOEX LLC, USA

EE180

Streamlining promex Profile Measurement with AIRE!

Bjorn Biehler, Alexander Daniker and
Julia Wachter, ASCONA GmbH, Germany; and
Brad Allen, iNOEX LLC, USA

EE184

Controls Modernization of a One-of-a-Kind Indirect, Piercing Extrusion Press

Steve DeMar, HBT Americas, LLC, USA

EE188

Cost Benefits for Lubrication Optimization

James Dyla, AMCOL Corporation, USA

EE196

Revolutionizing Quench Control with Real-Time Adaptive Cooling Curve System

Mike Horan and **Alireza Alizadeh,**
Danieli Breda, Italy

EE233

Using Digital Twins to Optimize Press Modernizations

Michael Kramer, Bosch Rexroth Corporation, USA

EE234

The Future of Extrusion Die Cleaning: the Next Generation Process

Marcello Rossi and **Giovanni Cheldi,**
HEATAL SRL, Italy

EE235

Application of Nondestructive Examinations and Risk of Press Component Failure based on Diversity of Press Design

Richard Manganello, Carlesa NDE Services, USA

EI: EXTRUSION DESIGN & INNOVATION TRACK



EI041

Framing the Future: Redefining Aluminum Extrusions as Scalable Systems for Indian Public Infrastructure

Abhay Agarwal, Bhoruka Extrusions Private Limited, India

EI085

Elimination of Human Entry during Aluminum Billet Unloading from Shipping Containers

Sutanay Parida, National Aluminium Products Company S.A.O.G., Oman

EI094

Correlation of Material Testing to Component Testing of Transversely Loaded Automotive Energy Absorption Extrusions

Justin Clark, Shape Corp., USA

EI141

Knowing What is Shipped: Characterizing Extruded Profiles

Jeffrey Victor and **Michael Tozier**, Hydro Extrusions USA, LLC, USA

EI144

Balancing Thermal Performance and Extrudability in Aluminum Heat-Sink Profiles – A Numerical Optimization Study

Mads Iddberg, SINTEF; and **Anders Nesse**, Hydro Aluminium Extrusions, Norway

EI191

Advanced Wide-Thin Extrusion of Aluminum Profiles: Process Capability Enhancement and Industrial Potential

Jiaxin LV, The Hong Kong Polytechnic University, China

EP: EXTRUSION & DIE PROCESS APPLICATION TRACK



EP013

Preparation: Structuring Your Extrusion Data to Power Effective Applied Extrusion Analytics

Craig Werner, Intelligent Extrusion LLC, USA

EP022

Advancing Thermal Precision in Aluminum Extrusion: Decoupling Billet and Container Dynamics

Shah Imani, **Dan Dunn** and **John Cullum**, Castool Tooling Systems, Canada

EP026

Recommended Ways to Reduce Coring in Aluminum Extrusion Process

Ajai Pratap Singh, Jindal Aluminium Ltd., India

EP028

Impression Marks in Aluminum Extrusion Due to Die Bearing Transition and Section Thickness Variation

Jitendra Rai, Jindal Aluminium Ltd., India

EP029

Optimizing Billet Length for Enhanced Extrusion Press Utilization

Vinit Jha, Jindal Aluminium Ltd., India

EP033

Process Improvements to Mitigate Pitting Marks on Anodized Material

Veerendra R, Jindal Aluminium Ltd., India

EP035

Minimizing Streaking Defects and Impression Marks on Aluminum Extrusions

Raghavendra Kulkarni, Jindal Aluminium Ltd., India

EP037

Total Process Control in the Aluminum Extrusion Plant for Effective Quality Improvement

Pradip Saha, Technical Fellow, USA

EP070

Control of Peripheral Coarse Grain (PCG) in 6061 Aluminum Alloy Extruded Rods

GNS Narayana, Jindal Aluminium Ltd., India

EP071

Pros and Cons of Baffle Die Rings in Aluminum Extrusion

Sutanay Parida, National Aluminium Products Company S.A.O.G., Oman

EP072

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Sutanay Parida, National Aluminium Products Company S.A.O.G., Oman

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Tony Da Silva, XtruAdvance, Canada; and **Vinicius Dessotti**, XtruAdvance, Brazil

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Effect of Natural Aging and Deformation on the Properties of 6xxx Extrusion Alloys

Lei Pan, **Paul Rometsch**, **Nick Parson**, Rio Tinto Aluminium, Canada; and **Jerome Fourmann**, Rio Tinto, USA

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Walt Sorensen, Bonnell Aluminum, USA

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Live Limit Diagram: a New Way to Optimize Extrusion Processes via Applied Extrusion Analytics

Craig Werner, **Aaron Williams** and **Miguel Santana**, Intelligent Extrusion; and **Johnny Pangborn**, MetalStar Consulting LLC, USA

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Lucas Itchue, **Bala Jayachandran**, **Jeffery Victor**, and **Danni Xie**, Hydro Extrusions USA, LLC, USA

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Jan-Philipp von Weschpfennig and **Werner Hahnel**, Kind & Co., Edestahlwerk GmbH & Co. KG, Germany; and **Raymon Fryan**, Lake Park Tool and Machine, Inc. USA

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Nikhil Yellakara, Hydro Aluminum Metals USA LLC, USA; **Adrian Lervik**, Hydro Aluminum Metal, Norway; and **Charles Wright**, International Extrusions, USA

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Using Oven Surveys in Our Operations: Application of Standards for Compliance and Excellence

Johnny Pangborn, Metalstar Consulting LLC, USA

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Lei Pan, **Leticia Marin de Andrade** and **Paul Rometsch**, Rio Tinto Aluminium, Canada; and **Jerome Fourmann**, Rio Tinto, USA

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Craig Werner, **Aaron Williams** and **Miguel Santana**, Intelligent Extrusion LLC, USA

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Craig Werner, **Aaron Williams** and **Miguel Santana**, Intelligent Extrusion LLC, USA

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Craig Werner, Intelligent Extrusion LLC; **Johnny Pangborn**, Metalstar Consulting LLC; **Jerome Fourmann**, Rio Tinto, USA; **Richard Dickson** and **Danny Dunn**, Castool Tooling Systems, Canada

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Arif Hussain, Gulf Extrusion LLC, United Arab Emirates

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Improving Pre-Processing of Aluminum Chips for Solid-State Recycling by Hot Extrusion

Leo Hendriok, Fabian Esterl, Benjamin Klusemann, and Noomane Ben Khalifa, Institute for Production Technology and Systems, Leuphana University Luneburg; and **Benjamin Klusemann and Noomane Ben Khalifa**, Institute of Material and Process Design, Helmholtz-Zentrum Hereon, Germany

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Process Design for Microstructure and Property Control for Crash Extrusion Profiles
Gautam Wagle, Sumit Gahlyan, Raviprasada Kasat, Dhurandas Fulzele, Sudharshan Ravichandran, Hindalco Industries Limited, India

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Gautam Wagle, Aakansha Mhatre, Kuldeep Patidar, P Mohanraj, Jaison George, Ritesh Warange, Sumit Gahlyan, Hindalco Industries Limited, India

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Learning from Failure through Value-Chain Collaboration

Esma Senel, Randi Morkrid, Anders Nordeide, Hydro Aluminium Metal, Technology Development, Norway; and **Micah Lobdell**, Hydro Aluminum Technology Center, USA

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Productivity Improvement using Extrusion Dies with HPIT Technology

Rolf Beckert, WEFA Inotec GmbH, Germany; **Jan Svoboda**, WEFA Bohemia, spol s, Czech Republic; **Dawid Wanat**, Grupa Kety SA, Poland

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Johnny Pangborn, Metalstar Consulting LLC; **Richard Dickson**, Dickson Kingdom; and **Matt Wille**, Alexandria Industries, USA

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Contributions of the Past: Award-Winning ET Papers and Industry Impact of Oddvin Reiso and His Team

Johnny Pangborn, Metalstar Consulting; **Greg Lea**, EGA America; **Eskild Hoff**, Hydro Aluminum Metals USA, USA; and **Ulf Tundal**, Hydro Aluminium Metal, Norway

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Influence of Bearing Condition on the Formation of Surface Streaks in Extruded Aluminum Profiles

Enrique Calvo Ordonez, Independent Aluminum Extrusion Professional, France

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Peripheral Coarse Grain Depth Control for Automotive Extrusions

Saurabh Sedha, Jerome Fourmann and Nick Parson, Rio Tinto, USA; **Jean-François Béland**, National Research Council Canada's (NRC) Aluminium Technology Centre (ATC) and National Research Council Canada, Canada; **Lei Pan and Paul Rometsch**, Rio Tinto Aluminium, Canada, and Rio Tinto, USA

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Tomás Beltran and Jose Fernando García, Alvarez-Schaefer, SLU, Spain

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Danny Dunn and Richard Dickson, Castool Tooling Systems, Canada; and **Nicholas Noecker**, International Extrusions Inc., USA

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Mark West, Pennex Aluminum, USA

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Demonstrating Scalability of Shear Assisted Processing and Extrusion (ShAPE) towards Industrial Application

Brandon Taysom, Brian Milligan and Scott Whalen, Pacific Northwest National Laboratory, USA

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Understanding the Discrepancy between VDA Bendability and Component Performance in High-Strength 6xxx Extrusions

Bala Jayachandran, Andrew Wheeler, Aminah Williamson and Mike Tozier, Hydro Extrusions USA LLC, USA

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Influence of Extrusion Temperature and Speed on Productivity and Surface Integrity of AA6063 Alloys

Gebre Kirstos Gebreamlak Berhe, Filmon Gebrehiwet Surafiel, Gebremedhn Berhe Wureata, Meresa Kindeya Gesese, Arsema Fisseha Yaye, Gebreslassie Gebremedhn Gebremariam, Tekhaf Aluminium, Ethiopia

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In-Line Induction Solution Treatment for Forced-Air Quenching of Drawn Aluminum Tubes

Donnie Hudson and Steve James, Alfiniti Inc., USA

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Smart Hydraulic Health Monitoring & Reliability Programs for Extrusion Presses

Todd Allison, The Oilgear Company, USA

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Simulating the Effect of Extrusion Process Variation on Mechanical Strength

Eystein Vada, Ole Runar Myhr and Helen Weykamp, Hydro Aluminium Metal; **Nick Noecker, Charles Wright, Don Campbell**, International Extrusions Inc., USA

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Optimization of Butt-End and Run-Out Length for Material Yield Improvement in Aluminum Extrusion

Gebre Kirstos Gebreamlak Berhe, Gebremedhn Berhe Wureata, Filmon Gebrehiwet Surafiel, Meresa Kindeya Gesese, and Gebreslassie Gebremedhn Gebremariam, Tekhaf Aluminium, Ethiopia

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Positive and Negative Impacts of Nitriding on Aluminum Extrusion Dies: How to Improve Quality and Lower Tooling Cost

Jack Kalucki, Nitrex Metal, Canada

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A Practical Framework for Evaluating New Extrusion Projects before Quotation and Tooling Commitment

Enrique Calvo, Independent Aluminum Extrusion Professional, France

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Die Life: an Examination of the Current State of Die Practices in the Extrusion Industry

Hanif Hamzah, Press Metal Aluminium Holdings, Malaysia

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Thermal Cycle during Aging of Bundled Aluminum Extrusions and Effect of Profile Geometry and Packing

Yahya Mahmoodkhani, Steve Coates, Seif Badawy, Signature Aluminum Canada Ltd., Canada



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Surface Defects in Aluminum Extrusions and Their Impact on Downstream Surface Treatments

Thilanka Hettiarachchi, Savonia University of Applied Sciences, Finland

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Green Methanol Production using Byproduct Hydrogen from Aluminum Anodizing Processes

Thilanka Hettiarachchi, Savonia University of Applied Sciences, Finland

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The Use of Aluminum Sulfate (Alum) in Wastewater Treatment

Rebecca Robbins, Bonnell Aluminum, USA

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Benefits of Using Trivalent Chrome on Aluminum Extrusions Compared to Chrome Chromate and Chrome Phosphate

Justin Girard and *Ted McElroy*, Bulk Chemicals, Inc., USA

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Weathering of Anodized Aluminum

Pinakin Patel, Techevon LLC, USA

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Regular vs. Low Ammonia Acid Etch: Effects on Manufacturing Operations

George Oh, Quaker Houghton, USA

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Anodizing of Recycled Aluminum Across Markets and Process Routes

Malgorzata Halseid, *Jan Tore Gundersen*, *Anders Nordeide*, Hydro Aluminium Metal, Norway; *Takeshi Saito*, Hydro Aluminium Metal, Singapore; and *Annica Crispin* and *Magnus Gustavsson*, Hydro Extrusions, Sweden

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Corrosion Behavior of Recycled 6xxx Alloys: Filiform and Intergranular Corrosion Testing in Lab and Field

Malgorzata Halseid, *Jan Tore Gundersen*, *Helga Steenson* and *Cristina Espezel*, Hydro Aluminium Metal, Norway

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Effects of Extrusion Process Parameters on Aluminum Alloys for Surface Treatment (Anodizing – Qualanod Specs)

Abdul Mobin Mohammad and *Arif Hussain*, Gulf Extrusions LLC, United Arab Emirates

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Microstructural Effects of Ti Inclusions on Anodic Film Integrity in AA6xxx Products

Sumit Gahlyan, *Akshay Deshpande*, *Dhurandas Fulzele*, *Aakanksha Mhatre* and *Raviprasada K*, Hindalco Industries Limited, India

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Engineering the Future of Aluminum Finishing: High-Performance Anodizing and Conversion Technologies

Ilya Ostrovsky and *Birgit Fassbender*, Chemetall GmbH, Germany; *Andrea Monti*, Chemetall Italia, Italy; *Ruben Martinez*, *Raynier Castillo* and *Iris De Graeve*, Vrije University Brussel, Research group of Sustainable Materials Engineering, Belgium

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Modeling the Effect of Welding Cycles on Heat Affected Zone Softening of AlMgSi Alloys

Anders Nesse, Hydro Extrusions; *Ole Runar Myhr*, Hydro Aluminium; *Trond Furu*, Norsk Hydro, Corporate Technology Office, Norway

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Development of an Optimized Venturi Nozzle for Enhanced Powder Coating Performance – a Lean Manufacturing Initiative

Sutanay Parida, National Aluminium Products Company S.A.O.G., Oman

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Reducing a Project Timeline and Accelerating ROI – How a New Coating Line Design can Streamline Industrial Projects

Andrea Trevisan, S.A.T. (Surface Aluminium Technologies) s.r.l., Italy

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Base Metal Microstructural Impact on the Appearance of Electrolytic Coloring

Jude Runge, CompCote International, Inc.; *Jacqueline Cook*, Reliant Aluminum Products, LLC; *Medha Veligatla* and *Shiqi Zheng*, Eurofins EAG Laboratories; and *Justin Kessler*, Bearcat Anodizing, USA

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Improving Corrosion Resistance of Coated Recycled Aluminum

Alberto Abad, Alvarez-Schaer, SLU, Spain

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Precision Cross-Cut Sawing for Aluminum Extrusions: Advancing Fabrication Accuracy and Throughput

Martin Koeb, Precision Saws, USA; and *Christian Bischofberger*, Briganto, Austria

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A Brilliant Future for Aluminum, Thanks to AI, Automated Racking of Profiles, and New Decoration Technologies

Walter Dalla Barba, Italteco Solutions, Italy

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The Repair with Additive Manufacturing

Tommaso Pinter, Almax Mori, Italy

RD048

Thermomechanical Simulation of Seam Welds in the Extrusion of Hollow AA6XXX Profiles

Roni Rountree, *Charles Yurgel* and *Wojciech Misiolek*, Lehigh University; *Hannah Mason* and *Paul Rottmann*, University of Kentucky; *Randall Bowers* and *Nicholas Nanninga*, Secat, Inc.; *Dallas Sousek*, Gordon Aluminum Industries, Inc., USA

RD058

Digitalizing the Heart of Extrusion Technology

Praaveen Hewage, Extrumind AS, Norway; and *Craig Werner*, Intelligent Extrusion LLC, USA

RD065

Effects of Heat Treatment Temperature on Mechanical Properties of AA6082 Aluminum Alloy Extrusions

Mungu Kang, *Sangjun Lee*, *Jaehyung Lee* and *Sangcheon Park*, Hyundai Motor Company; and *Su-Hyeon Kim*, Korea Institute of Materials Science, Republic of Korea

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The Correlation between Tensile Properties and Hardness in Extruded Aluminum Profiles

Yahya Mahmoodkhani, *Seif Badawy* and *Steve Coates*, Signature Aluminum Canada Ltd., Canada

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Mitigation of Streaking Line Appearance on Aluminum Extrusions through Finite Element Analysis

Lasindu Gayashan, Phoenix Middle East for Precision Dies LLC, Sri Lanka

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New Insights into Charge-Weld Integrity in Aluminum Extrusion: A Hybrid Experimental – Numerical Approach

Eren Can Sariyarlioglu and *Torgeir Welo*, Norwegian University of Science and Technology (NTNU), Norway

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Osamu Kanechika, Proterial, Ltd., Japan

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Process Parameter Optimization of PVD Coatings Applied to Die Steels for Extrusion Applications

Onder Ayer and *Candan Toraman*, Trakya University; *Ismail Karakaya*, EksenAL Aluminum Extrusion Die Technologies; and *Aybars Guven*, TRI Metalurji, Turkey

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Quenching Simulation: an Essential Tool for Extrusion Process and Profile Geometry Control

Bernard Bourqui, M-TD SA, Switzerland;
Olivier Rey, M-TD SA, France; and
Jerome Fourmann, Rio Tinto, USA

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Numerical Prediction of Static Recrystallization and Thermal Distortion for PCG Suppression in Aluminum Extrusion

Hyungsop Yoon, Hyundai Motor Company;
Changsun Jang and **Hotaek Kwak**,
CAE Technology, Republic of Korea; and
Denis Tretyakov, QForm Group FZ LLC,
Russian Federation

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Cost-Effective Additive Manufacturing Concepts for Extrusion Dies

Nicolas Dietz, **Rolf Beckert** and
Joachim Maier, WEFA Inotec GmbH;
Johannes Bruckwilder, Boest Alpine Additive
Manufacturing Center GmbH, Germany;
Jerome Fourmann, Rio Tinto, USA;
Paul Rometsch, Rio Tinto and
Jean-François Béland, National Research
Council Canada's (NRC) Aluminium Technology
Centre (ATC), Canada

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Evaluation of Die Cooling for Automotive Extrusions

Nicolas Dietz, **Rolf Beckert** and
Joachim Maier, WEFA Inotec GmbH;
Jerome Fourmann, Rio Tinto, USA;
Paul Rometsch, Rio Tinto and
Jean-François Béland, National Research
Council Canada's (NRC) Aluminium Technology
Centre (ATC), Canada

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Commercial Scaling of the Shear Extrusion Process: from Laboratory Concept to Industrial Reality

Jason Adams, **Massimo Di Ciano**,
Jeff Skinner, **Zach Pursell**, and
Eric Dinksy, Atomic13, USA;
Thomas Wagner, **Andre Schulze**,
Hans-Juergen Middelkamp, **Malte Ringhandt**,
and **Valentin Losada**,
SMS group GmbH, Germany

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Investigating the Effect of Die Sonication during Extrusion of Aluminum Hollow Profiles on Process and Products

Tamara Thomas and **Verena Merklinger**,
HTWG Konstanz – University of Applied
Science; **Joachim Maier** and **Tamara Thomas**,
WEFA Inotec GmbH; **Maik Negendank**, Forming
GmbH; **Nico Laengst**, Augsburg University of
Applied Sciences; and
Soeren Mueller, Extrusion R&D Center (FZS),
TU Berlin, Germany

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Probabilistic Surrogate Modeling of Microstructure Evolution in Hot Extrusion of the Aluminum Alloy AA6082

Tim Dubsclaff and **Fabian Esterl**, Institute for
Production Technology and Systems,
Leuphana University Luneburg;
Falk Dorn, Institute of Material and Process
Design; and **Noomane Ben Khalifa**,
Helmholtz-Zentrum Hereon, Germany

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The Effect of PCG Layer Thickness on Bendability of Al-Mg-Si Alloys

Sheida Nikkhah and **Warren Poole**,
The University of British Columbia;
Nick Parson and **Paul Rometsch**,
Rio Tinto Aluminium, Canada

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The Influence of Cu Additions on Al-Mg-Si Extrusion Alloys

Warren Poole, **Paul Rometsch**, **Yinghui Bao**,
The University of British Columbia; and
Nick Parson, Rio Tinto Aluminium, Canada

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Coupled 1D-3D Numerical Approach for Predicting Nitrogen Cooling Effects in Multi-Billet Hot Extrusion

Sara Di Donato, **Nicola Lai** and
Lorenzo Donati, Department of Industrial
Engineering (DIN), Alma Mater Studiorum
University of Bologna; **Riccardo Pelaccia** and
Barbara Reggiani, Department of Sciences and
Method for Engineering (DISMI) University of
Modena and Reggio Emilia;
Tommaso Pinter, Almax Mori; and
Marco Negozio, Dipartimento di Ingegneria
dei Sistemi e delle Tecnologie Industriali (DISTI),
University of Parma, Italy

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Numerical-Experimental Assessment of Process Parameters & Die Design on Longitudinal Seam Weld of Hollow Extrusions

Divyansh Sisodia, **Vipin A**,
Haribabu Boda, **Gautam Wagle**,
Hindalco Industries Limited, India

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Enabling Circularity in Extrusion: a Comparative Study of Primary and Secondary AA6082 for Digital Twin Simulations

Nicola Lai, **Sara Di Donato**, **Lorenzo Donati**,
Department of Industrial Engineering (DIN),
Alma Mater Studiorum University of Bologna;
Riccardo Pelaccia, **Barbara Reggiani**,
Department of Sciences and Method for
Engineering (DISMI) University of Modena and
Reggio Emilia; **Marco Negozio**, Dipartimento
di Ingegneria dei Sistemi e delle Tecnologie
Industriali (DISTI), University of Parma, Italy;
Christian Hannemann and **Nadja Berndt**,
Fraunhofer IWU, Germany

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Thermomechanical Simulation and Microtensile Evaluation of Charge Welds in Extrusion of Hollow AA6XXX Profiles

Roni Rountree, **Charles Yurgel** and
Wojciech Misiolek, Lehigh University;
Hannah Mason and **Paul Rottmann**,
University of Kentucky; **Randall Bowers** and
Nicholas Nanninga, Secat, Inc.; and
Dallas Sousek, Gordon Aluminum
Industries, Inc., USA

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A Multi-Defect Digital Twin Framework for Aluminum Profile Extrusion Based on Finite Element Modeling

Nikolay Biba, MICAS Simulations Ltd., United Kingdom

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Optimization of Press Quenching Parameters for High-Strength AlMgSiMnCu Extrusions

Artunc Sari, **Batuhan Yanik**, **Ibrahim Bat**,
Ismail Turan, **Gorkem Ozcelik**, ASAS Aluminum, Turkey

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Simulation-Driven Design of Liquid Nitrogen Cooling Channels for Hot Extrusion Dies

Riccardo Pelaccia and **Barbara Reggiani**,
Department of Sciences and Method for
Engineering (DISMI) University of Modena and
Reggio Emilia; **Tommaso Pinter**,
Almax Mori; **Lorenzo Donati**, Department
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Studiorum University of Bologna, Italy;
Ioannis Theodoridis, **Evangelos Giarmas**,
Stavros Arvanitis, Alumi S.A., Production
Division, Greece

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From Trial and Error to Digital Optimization: a Multi-Objective Approach to Extrusion Die Design

Riccardo Pelaccia and **Barbara Reggiani**,
Department of Sciences and Method for
Engineering (DISMI) University of Modena and
Reggio Emilia; **Tommaso Pinter**, Almax Mori;
Sara Di Donato, **Nicola Lai** and **Lorenzo Donati**,
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Mater Studiorum University of Bologna;
Marco Negozio, Dipartimento di Ingegneria
dei Sistemi e delle Tecnologie Industriali (DISTI),
University of Parma, Italy

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Integrated Experimental and Advanced Simulation Models for Digital Twin of Industrial Extrusion Process

Abdelilah El Oirzadi, **Paolo Groff**,
Moreno Brambilla, Phoenix International S.p.A.;
Riccardo Ruggieri and **Alessandro Marchesi**,
Hydro Extrusion Italy s.r.l., Ornago; **Sofia Lina
Cavallo**, **Sara Di Donato** and **Lorenzo Donati**,
Department of Industrial Engineering (DIN),
Alma Mater Studiorum University of Bologna;
and **Barbara Reggiani**, Department of Sciences
and Method for Engineering (DISMI) University
of Modena and Reggio Emilia, Italy

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Hot-Extruded Carbon Aluminum Composites for Electrification and Energy-Efficient Infrastructure

V.N.B. Prasad Sodisetty, *Obieda Altarawneh* and **Michael Kennedy**, *Institute for Sustainable Energy and the Environment, Ohio University*; **Frank Kraft**, *MetalKraft Technologies LLC*; **Yahya Al-Majali**, *Department of Mechanical Engineering, Ohio University, USA*; and **Pawel Kazanowski**, *Dubai Extrusions Investments LLC, United Arab Emirates*

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Integrating Microstructure Prediction into Die Design for Improved 6XXX Mechanical Performance

Jean-François Béland, *National Research Council Canada's (NRC) Aluminium Technology Centre (ATC)*; **Paul Rometsch**, *Rio Tinto Aluminium, Canada*; and **Nick Parson**, *Rio Tinto, USA*

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Friction Extruded Enhanced Conductivity Ultra-Conductive Aluminum Wires and Industrial Scalability

Brandon Taysom, **Reza E. Rabby**, **Areesa Trevino**, **Tej Poudel Chhetri**, **Tyler Tueller**, **Das Hrishikesh**, **Keerti Kappagantula**, *Pacific Northwest National Laboratory, USA*

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Comparing Butterfly and Porthole Hollow-Profile Dies for AA7003 Extrusions

Mustafa Can Uzun and **Torgeir Welo**, *Norwegian University of Science and Technology (NTNU), Norway*

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Elevated-Temperature Mechanical Response of 6XXX Aluminum Alloys during Press Quenching

Jean-François Béland, *National Research Council Canada's (NRC) Aluminium Technology Centre (ATC)*; **Paul Rometsch**, *Rio Tinto Aluminium, Canada*; and **Nick Parson**, *Rio Tinto, USA*

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Effect of Sample Geometry and Testing Rig on Measured Mechanical Properties

Eystein Vada, **Helen Weykamp** and **Alex Poznak**, *Hydro Aluminium Metal*; and **Jeff Victor**, *Hydro Extrusion USA LLC, USA*



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Safety in Aluminum Extrusion

Hans van Leerdam, *AL Solutions SL, Spain*

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Connecting Aluminum Market Dynamics and Pricing to Sustainability Goals in the North American Extrusion Industry

Grace Asenov, *Fastmarkets, United Kingdom*

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The Money Left on the Table: You're Already Doing R&D – Here's What You're Losing by Not Recognizing It

Tony Da Silva, *XtruAdvance*; **Drazen Kostelski** and **Mohamed Parpia**, *Ryan, LLC, Canada*

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Sustaining Continuous Improvement in Manufacturing: Shifting from Activity to System Design

Thilanka Hettiarachchi, *Savonia University of Applied Sciences, Finland*

SM044

Best Practices for Continuous Improvement of Safety Programs through the Use of Leading Indicators

Rebecca Robbins, *Bonnell Aluminum, USA*

SM053

The Hidden Constraint

Mutassem Daaboul, **Mohammed Alsawaf**, **Mahmoud Salhen**, **Rasha Othman**, and **Hassan Eldeeb**, *CANEX Aluminum, Egypt*

SM062

New Extruder Working with Customers to Improve Extrusion Productivity and Quality to Lower Shared Costs

Steve Brenneman, *Aluminum Insights*; and **Eskild Hoff**, *Hydro Aluminum Metals, USA*

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The Green Future of the Aluminum Industry

Yair Levin, *Profal, Israel*

SM098

Academia – Industry Partnership: How have Both Benefited over the Decades and What Roles have ETs Played?

Wojciech Misiolek, *Lehigh University*; and **Craig Werner**, *Intelligent Extrusion LLC, USA*

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A Practical Approach to Synchronize Shop Floor Activities with ERP in Aluminum Extrusion Plants

Sutanay Parida, *National Aluminium Products Company S.A.O.G., Oman*

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Transforming Extrusion Processes with Intelligent Vision Systems & Predictive AI Tools

Raffaele D'Andrea, *Emmebi Srl, Italy*

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Building Factory Fitness: a Model for Extrusion Performance Improvements

Stig Tjoetta, *Hydro Aluminium Metal, Norway*

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Implementing Continuous Learning at an Extruder: Changing the Culture

Jeffrey Victor, **Guy Davenport** and **Tim Roberts**, *Hydro Extrusion USA LLC, USA*

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Bonnell Aluminum Carthage Plant RCA (Root Cause Analysis)

Aaron Callis, **Jordan Hamblen** and **Rafael Campos**, *Bonnell Aluminum, USA*

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Arvida Aluminium Recycling Center: a New Opportunity for Primary Billets Production with Recycled Content

Vincent Goutiere and **Agathe Tshpiana**, *Rio Tinto Aluminium, Canada*; **Jerome Fourmann**, *Rio Tinto, USA*

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On Large-Size Extrusion Press Investments: a Multi-Level Model for Assessing the 'Cost of Flexibility'

Geir Ringen and **Torgeir Welo**, *Norwegian University of Science & Technology (NTNU), Norway*

SM175

Bonnell Aluminum's 'Raising the Bar' Journey Continues through Implementation of Operator Care Program

Ray Moore, *Bonnell Aluminum, USA*

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Attracting and Developing Talent and Skills in the Aluminum Extrusion Industry

Duncan Crowdis, *Alexandria Industries*; and **Lynn Brown**, *Aluminum Extruders Council, USA*

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Action Over Analysis: Effectuation for Problem-Solving at Aluminum Extrusion Plants

Pawel Kazanowski, *Dubai Extrusions Investments LLC, United Arab Emirates*

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Explaining Extrusion Quality Control to Discrete Part Production Customers

Steve Coates, *Signature Aluminum Canada Ltd., Canada*

SM211

This Should Work, Rarely Does

Steve Coates, *Signature Aluminum Canada Ltd., Canada*

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Defining Our Modern Metal

Sam Muhamed, **Thomas Leary** and **Debra Weston**, *The Aluminum Association, USA*

In-Conjunction Education at ET '27

In-conjunction workshops and courses from aluminum industry organizations provide a convenient value-added learning experience to ET '27. Add one or more of these practical seminars to your registration during ET Week – on **Monday, April 26, 2027**. Register early as space is limited; registration is in addition to your ET '27 registration and includes a continental breakfast, lunch and all course materials. For complete course information and program details, visit **ET27.us**.

Monday • April 26, 2027

AEC Extrusion Excellence: Applied Fundamentals for Aluminum Extruders

8:00 a.m. – 5:00 p.m.

This intensive one-day course combines theory and practice that presents the fundamental engineering approach to the aluminum extrusion process from billet production through the press to the runout table. This course will benefit those new to the industry, as well as experienced production personnel. The Extrusion Excellence Course has benefited hundreds of past attendees with topics covering Extrusion Alloys, Aluminum Billet Metallurgy, Extrudability, and much more.



Fee: \$495 AEC members / \$895 Non-members

AEC Finishing Workshop

8:00 a.m. – 5:00 p.m.

This must-attend event will provide the latest information about pretreatment, equipment, coating and finishing processes for the aluminum extrusion industry. The program will deliver a wealth of information specific to aluminum finishing, including liquid and powder painting. The condensed one-day workshop includes a full day of general sessions offering ideas and problem-solving techniques, roundtable discussions, and a series of interactive Field-Testing Stations. Take home solutions, ideas and suggestions to make an immediate impact on your own finishing department operations.



Fee: \$495 for AEC members / \$895 for Non-members

Process Analysis and Optimization

8:30 a.m. – 5:00 p.m.

Taught by the renowned Team from the Manufacturing Technologies Group, Lorenzo Donati and Sara Di Donato from University of Bologna, Barbara Reggiani and Riccardo Pelaccia from University of Modena and Reggio Emilia, and Marco Negozio from University of Parma, Italy, share their expertise for extruders and die makers to optimize die design, improve welding phenomena in extrusion dies, increase die life, and analyze the final microstructure of extruded profiles. Topics include introductions to practical and analytical extrusion concepts, material flow and friction in direct extrusion, die failure modes, die life prediction, and much more.

Fee: \$595 per person



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

AAC Anodizing Essentials Class

8:30 a.m. – 5:00 p.m.

This class provides more than the fundamentals of anodizing – It is designed to increase the knowledge and ability of anyone involved in the anodizing process. Anodizing Essentials details the foundation of quality anodizing, taking the learner through the entire process – beginning with the metallurgical properties of aluminum alloys from effective racking and pretreatment to anodizing, focusing on oxide structure and properties, through to post-treatment, dyeing and sealing, to the final rinse. This comprehensive class is ideal for those who need to know what happens when one anodizes aluminum, and the best practices for success, whether new to the anodizing line, selling anodized material or specifying anodizing for an application.



ALUMINUM
ANODIZERS
COUNCIL™



Fee: \$495 AAC members / \$895 Non-members



ET27.us

REGISTRATION FORM April 26 – 29, 2027 • Orlando, Florida USA

Use this form for individual or team registrations. Only those registered may attend scheduled functions. Registration fee includes all as-registered program sessions, entrance to ET Expo, one copy of the ET '27 Proceedings (Digital ONLY) per registered delegate (non-exhibitor), and scheduled networking and meal functions. (PAST Printed ET Proceedings will be available for purchase after ET.)

Fees U.S. Funds only	PREMIUM RATE by DEC. 18, 2026	EARLY RATE by FEB. 15, 2027	STANDARD RATE FEB. 16, 2027
☐ Individual	\$ 1,495	\$ 1,545	\$ 1,645
☐ Team *	\$ 1,420	\$ 1,470	\$ 1,570
☐ Spouse	\$ 350	\$ 350	\$ 350
☐ Exhibitor	\$ 688	\$ 688	\$ 688

* **TEAM DISCOUNT:** Companies sending 5 or more delegates will qualify for the Team Discount. All registrations and payment must be sent together. If cancellation occurs, and fewer than 5 delegates attend, the appropriate fee will be charged. Discount applies to ET '27 registrations only. Delegate substitutions may be made at any time.

Step 1: Company Information

Complete this section for individual delegates and team registrations.

Company _____

Mailing Address _____

City, State/Province _____

Zip/Postal Code _____ Country _____

Telephone _____ Fax _____

☐ I have dietary Restrictions: Halal _____ Kosher _____

☐ Opt Out: Do not send my information to any third party.

☐ Please check here if you require additional assistance during the event. (Staff will contact you.)

Step 2: Delegate Information

Complete this section for each delegate who will be attending. Individual email addresses MUST be provided for registration confirmation purposes.

Please use a separate sheet for additional names, if necessary.

JOB CODE	First Name	Last Name	Job Title	Email	ET '27 Fee	Event # & Fee	Event # & Fee	Subtotal
						\$	\$	\$
						\$	\$	\$
						\$	\$	\$
						\$	\$	\$

(For 5 or more registrations, please photocopy this form.) * Email addresses must be provided for confirmation purposes.

Step 3: Payment Information

Payment Grand Total: \$ _____

Payment total above must accompany registration form; registration is not complete until payment in full is received.

Send completed registration form and payment to:



AEC / ET '27

1930 Innovation Way, Suite 232
Libertyville, IL 60048 USA

Secure Fax: 847.238.3859

METHOD OF PAYMENT

☐ Check enclosed (make check payable to Aluminum Extruders Council; U.S. Funds drawn on a U.S. bank only)

☐ Wire transfer (include complete registration total and applicable bank fees in U.S. Dollars)

Contact us at mail@ETFoundation.org for wire transfer instructions.

Printed Name on Card _____

Signature _____

Billing Address (if different than above) _____

Please fax completed form to the following secure fax line: 847.238.3859

Card Number _____

Exp. Date _____ V-Code _____

In-Conjunction Educational Workshops and special events will be offered as optional add-on events during ET '27.

EVENT #	FEE
Monday, April 26	
1 AEC Extrusion Excellence Course	\$495/AEC Members/Monday \$895/Nonmembers
2 AEC Finishing Workshop	\$495/AEC Members/Monday \$895/Nonmembers
3 Process Analysis & Optimization	\$595/Monday
4 AAC Anodizing Essentials Class	\$495/AAC Members/Monday \$895/Nonmembers

Please include ONE JOB CODE (Step 2) to indicate your PRIMARY job responsibility next to your name.

EXTRUDERS ONLY

- 11 Executive Management
- 12 Plant Manager
- 13 Research & Development
- 14 Metallurgist
- 15 Designer
- 16 Engineer
- 17 Sales & Marketing
- 18 Quality Assurance
- 19 Die Maker/Corrector
- 20 Production
- 21 Finishing
- 22 Fabrication
- 23 Casting/Remelt
- 24 Packaging/Shipping
- 25 Plant Engineer
- 26 Financial
- 27 Safety
- 28 Environmental
- 29 Other

SUPPLIERS ONLY

- 31 Executive Management
- 32 Research & Development
- 33 Equipment Designer
- 34 Engineer
- 35 Sales & Marketing
- 36 Installer
- 37 Other

END-USERS ONLY

- 41 Executive Management
- 42 Research & Development
- 43 Product Designer
- 44 Engineer
- 45 Sales & Marketing
- 46 Manufacturing/Promotion
- 47 Other

OTHERS

- 51 Educator
- 52 Student
- 53 Non-Profit Organization
- 54 Researcher
- 55 Media/Press
- 56 Other

*NOTE: Do not email your form with credit card information. For your protection, all credit card information should be sent via our secure fax. You may also mail your payment. Any registration forms sent via email will not be processed and will be automatically deleted. For convenience and greater security, register online at ET27.us.

Questions?

Contact the ET Foundation:
847.526.2010
or mail@ETFoundation.org

CANCELLATION POLICY: Registration fees will be refunded only if written notice is received on or before April 13, 2027. A 20% administrative fee will be deducted from the refund amount. No refunds will be given for registration received after April 13, 2027. Delegate substitution may be made at any time.

(3- or 4-digit verification code)



1930 Innovation Way, Suite 232
Libertyville, Illinois 60048 USA

Aluminum Extrusion: At the Intersection of Technology, Innovation & Design

April 26 – 29, 2027

Rosen Shingle Creek Resort
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100+ Technical Sessions

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nETworking • In-Conjunction Workshops and more!**

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