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2026 ISTA Forum USA

Tuesday, April 7, 2026 7:30am - 1:00pm

Pre-Forum Training: ISTA CC 201 Introduction to BioPharma Cold Chain (additional fee)

ISTA CC 201: Introduction to BioPharma Cold Chain Training

The Who, What, Why, Where of Cold Chain

- Basics of a cold chain program
- Attributes of a gold standard cold chain program
- Guiding standards for the industry
- Introduction to the Shipping Qualification Process Flow
- Lessons learned on selecting test labs and suppliers (labs, packaging, recording devices, etc.)

Click here to view the full schedule and rates with and without Forum registration.

Led by expert ISTA Instructor, Carolyn Williamson, ISTA Pharma Committee Officer.

Tuesday, April 7, 2026 8:00am - 5:00pm

Pre-Forum Training: ISTA PDP Certification (additional fee)

Get **ISTA Packaging Dynamics Professional (ISTA PDP) Certified** with this comprehensive in-person training. To receive ISTA's Packaging Dynamics Professional (ISTA PDP) Certification, you must **complete all six PDP courses and pass the corresponding exams.** Take the ISTA PDP Certification exams conveniently online through ISTA's learning platform—complete with full video presentations and course content to help you prepare and succeed. **PDP courses included:**

- **PDP 101:** Principles of Distribution Packaging
- **PDP 201:** Atmospheric & Compression Hazards in Transit
- **PDP 202:** Shock & Drop Hazards in Transit
- **PDP 203:** Vibration Hazards in Transit
- **PDP 204:** Test Laboratory Operations & Instrumentation
- **PDP 205:** Test Procedures & Enhanced Simulation Testing

Click here to view the full schedule and rates with and without Forum registration.

Led by expert ISTA Instructor Larry Dull, this in-person training is a convenient option to becoming a certified ISTA Packaging Dynamics Professional.

Tuesday, April 7, 2026 1:00pm - 5:00pm

Pre-Forum Training: ISTA CC 301 URS to OQ (additional fee)

User Requirement Specification to Operational Qualification Training

The How of Cold Chain – Taking the fundamentals of the first class and putting it into practice

- How to create a robust URS
  - Highlight both major and minor attributes of a URS
- How to design and implement your OQ process
  - Highlight the design qualification tests
  - Execution of an OQ protocol
  - Documentation
    - Test Protocols and Reports
    - Temperature Recording Device Settings
    - Operational SOP/WIs
    - Staff training
    - How to select and implement a pre-qualified shipper
  - Navigating Change Control to Implement your Qualified System
  - Lessons Learned on Implementing a Qualified Shipping System
  - Case Studies

Click here to view the full schedule and rates with and without Forum registration.

Led by expert ISTA Instructor, Carolyn Williamson, ISTA Pharma Committee Officer.

Tuesday, April 7, 2026 1:30pm - 5:00pm

Attendee Check-In

Stop by to check in, pick up your ISTA Forum USA session materials, and collect your name badge. Our team will be ready to welcome you and ensure you have everything you need.

Tuesday, April 7, 2026 4:00pm - 5:30pm

Forum Welcome Reception

Networking Hub

Join us at the ISTA Forum Networking Hub to kick off the event! Enjoy complimentary drinks and snacks while catching up with friends old and new. It's the perfect way to start the ISTA Forum, and we look forward to welcoming you! *Please note: The reception is complimentary for attendees. Guest tickets are available for purchase when registering. Attendees and guests must be 18 years old.*

Tuesday, April 7, 2026 6:30pm - 8:30pm

ISTA Educational Foundation Fundraiser Dinner (additional fee)

Supporting the Next Wave of Packaging Industry Leaders! Join us for a fun evening at the ISTA Educational Foundation Dinner on Tuesday, April 7, from 6:30–8:30 PM at the Carcara Citrus Grove Patio (immediately following the ISTA Forum Welcome Reception). Connect with peers, support student scholarships and research, and help empower the next generation of packaging leaders.

Click here to learn more.

Wednesday, April 8, 2026 7:30am - 8:00am

Attendee Check-In

If you haven't already checked-in, stop by the registration desk to pick up your name badge and event materials.

Wednesday, April 8, 2026 8:00am - 8:30am

Networking Breakfast

Networking Hub

Kick off your day with breakfast in the ISTA Forum Networking Hub—an excellent opportunity to connect with fellow attendees!

Wednesday, April 8, 2026 8:30am - 10:00am

Wednesday Morning | Session 1

8:30am - Welcome & Meet Your Fellow Delegates

Location: Room: Valley of the Sun D/E

A.J. Gruber
ISTA

A.J. will open the TransPack sessions with key information to help you make the most of the event. This is also a great opportunity to meet and connect with fellow attendees as we kick things off together.

8:30am - Welcome & Meet Your Fellow Delegates

Location: Room: Valley of the Sun A/B

Bryan Cardis
Cold Chain Technologies

Bryan will open the TempPack sessions with key information to help you make the most of the event. This is also a great opportunity to meet and connect with fellow attendees as we kick things off together.

9:00am - 2035 Global Packaging Thought-Leader Survey

Location: Room: Valley of the Sun D/E

Brian Wagner
PTIS

Unveiling the 2025-2035 Horizon – Insights from the PTIS Future of Packaging Global Thought Leader Survey

In an era of accelerating disruption, the 2025 edition of PTIS's triennial Future of Packaging Global Thought Leader Survey captures the collective foresight of over 150 curated experts from academia, industry associations, and Fortune 500 leaders across the global packaging value chain. This presentation distills key findings projecting transformative trends from 2025 to 2035, spotlighting the dominance of circular economy principles, regulatory pressures, and recovery infrastructure as top forces reshaping packaging strategies.

Drawing on rigorous foresight methodologies, the survey reveals escalating priorities in sustainability—where reusable, refillable, and compostable solutions outpace traditional recycling—fueled by digital innovations like IoT-enabled packaging and AI-driven supply chains. Attendees will explore actionable implications for CPG, manufacturing, and retail sectors, including risk mitigation in volatile markets, consumer-driven demands for eco-transparency, and opportunities for Horizon 3 innovations that integrate packaging into a holistic, value-creating

ecosystem.

Join us to gain strategic foresight that equips your organization to navigate complexity, foster resilience, and pioneer sustainable growth in the decade ahead.

8:45am - ISTA Pharma Committee Update: Advancing The Industry Through Collaboration

Location: Room: Valley of the Sun A/B

Bryan Cardis
Cold Chain Technologies

Join the ISTA Pharma Committee Officers as they provide insights into the ongoing advancements of the Pharma Committee, offer an overview of the recently developed guidance documents, and outline the committee's upcoming initiatives. The ISTA Pharma Committee is an Ad Hoc Technical Committee comprised of individuals from both supplier partners and Life science end-user organizations involved in the supply chain for temperature-sensitive products. The committee’s goal is to develop and publish peer reviewed technical guidance that addresses relevant needs of the industry as well as provide a forum for industry members to collaborate and share best practices.

9:30am - Agentic AI and the Future of Productivity in Packaging and Distribution

Location: Room: Valley of the Sun D/E

William Green
IBM Corporation

Artificial Intelligence is no longer a distant frontier—it’s a daily partner in how we work, innovate, and solve complex challenges. In this session, Bill Green will introduce you to the evolving landscape of AI, with a focus on the transformative potential of **Agentic AI**—a new paradigm where intelligent agents autonomously plan, execute, and adapt workflows across enterprise environments.

Drawing from IBM’s latest developments in **watsonx.ai**, Bill will explore how Agentic AI is reshaping digital labor, enabling packaging and logistics professionals to automate repetitive tasks, orchestrate complex decision-making, and accelerate sustainability goals. Attendees will gain insights into:

- The foundational building blocks of enterprise AI: data, models, agents, governance, and assistants.
- How Agentic AI differs from traditional automation and chatbots, offering contextual awareness, dynamic skill sequencing, and intelligent orchestration.
- Real-world use cases in supply chain

- The role of secure models in powering safe, performant, and transparent AI solutions tailored for enterprise needs.

Whether you're just beginning your AI journey or looking to scale intelligent automation across your operations, this session will provide a practical roadmap for integrating AI into your value chain.

Wednesday, April 8, 2026 10:00am - 10:30am

Networking Break

Join us in the ISTA Forum Networking Hub for a chance to meet up with fellow attendees and to meet the Forum Sponsors. Beverages included.

Wednesday, April 8, 2026 10:30am - 12:00pm

Wednesday Morning | Session 2

10:30am - Characterizing the Cushioning Performance and Environmental Impact of Void Fill Packaging for E-Commerce Distributions

Location: Room: Valley of the Sun D/E

Jonghun (Jay) Park
Toronto Metropolitan University

William Snyder
Toronto Metropolitan University

Achieving sustainability in protective packaging requires balancing product protection with material efficiency. In e-commerce, where parcel shipments are frequent, lightweight, and handled across multiple stages, packaging must withstand complex combinations of vibration and shock hazards while minimizing environmental impact. Over the past three decades, extensive research has focused on cushioning systems such as expanded polystyrene (EPS), evaluating their cushion curves, shock attenuation, compression strength, environmental durability, and biodegradation performance 1–9 . Sustainable alternatives have also emerged,including starch-based foams, molded pulp, and celium-based packaging, which demonstrate promising impact absorption and compressive strength comparable to EPS. However, these systems are typically custom-engineered to fit a specific product geometry, making them well-suited for standardized industrial goods but less adaptable for the diverse, irregularly shaped items shipped through e-commerce channels. In contrast, void fills offer universal applicability, they conform to varying product sizes and shapes, filling empty spaces within parcels to provide cushioning without requiring customized molds or tooling. Despite their widespread use, void fills remain one of the least characterized components of protective packaging, with limited empirical data on their cushioning efficiency, vibration damping behavior, and life cycle environmental performance. This study addresses that gap through combining laboratory testing under standardized ISTA procedures with a cradle-to-grave Life Cycle
Assessment (LCA) conducted in accordance with ISO 14040 and ISO 14044.

11:00am - From Oversimplified to Optimized: Setting New Benchmarks in Medical Package Testing

Location: Room: Valley of the Sun D/E

Sam Upadhyaya
Edwards Lifesciences

Ensuring the integrity and sterility of medical product packaging is a critical requirement for patient safety and regulatory compliance. This study presents an advanced framework for medical package testing designed to meet and exceed the quality and compliance requirements of recognized standards encompassing ISO 11607, ISTA 2A, 3A and ASTM D4169. While complex distribution simulation and validation protocols often receive significant attention, package drop testing—one of the critical subsets of distribution simulation testing—has historically been overlooked, oversimplified, and treated as a routine task. This work reinvigorates its role by applying precision technology and automation to elevate its scientific rigor and relevance. The methodology integrates high-precision instrumentation, automated test systems, and machine vision technologies to deliver quantitative, reproducible assessments of drop impacts. Emphasis is placed on validated, statistically robust protocols supported by real-time data acquisition and traceability systems to ensure compliance with Good Manufacturing Practices (GMP) and risk-based quality management principles. The integration of collaborative robotics and closed-loop control systems minimizes operator variability, enhances throughput, and ensures consistent distribution simulation conditioning during testing. By embracing automation with purpose, this approach does more than replace legacy tools—it reshapes the landscape of packaging science and establishes new industry benchmarks, with Edwards Lifesciences leading the way. Results demonstrate significant improvements in measurement accuracy, process efficiency, and reliability compared to conventional manual methods. This presentation underscores the role of advanced automation and digitalization in establishing a scalable, compliant, and future-ready paradigm for medical package verification testing.

11:00am - White Paper Updates & Breakout Discussions

Location: Room: Valley of the Sun A/B

Bryan Cardis
Cold Chain Technologies

11:30am - Statistical Characterisation of Road-Transport Vibrations for Packaging Test Design

Location: Room: Valley of the Sun D/E

Jesús Francisco Marcos
ITENE

Protective packaging is often specified conservatively because laboratory vibration tests rely on stationary, route-independent profiles that can exaggerate exposure relative to contemporary European road transport. To reduce this gap, short-time variability of road-transport vibrations was quantified from multi-axis field measurements across ten European distribution routes. Moving-RMS series were summarised as histogram-based probability density functions and fitted with three candidate distributions: three-parameter Weibull, offset Rayleigh and log-normal. Fit quality was assessed using R^2, mean-squared error and $?^2$, producing route-specific severity metrics that guide the selection of packaging test levels. Across routes, one distribution consistently captured moving-RMS variability with few parameters, another excelled when tail probability was dominated by rare high-severity intervals, and a third was adequate only for narrow, near-symmetric low-severity regimes.

The fitted amplitude distributions were combined with measured PSDs to generate route-specific, non-stationary profiles that preserve spectral content and reproduce the observed short-time modulation. These models enable estimation of exceedance probabilities and route-specific severity thresholds to support risk-informed selection of vibration test levels and cushioning, with straightforward alignment to established laboratory procedures and test protocols. The outcome is more realistic laboratory excitation, improved correspondence between laboratory and field

performance, and a defensible basis to avoid both unnecessary over-packaging and under-packaging without compromising product protection. Potential applications include automated analytics and reporting, route-aware test selection, predictive risk modelling, and rationalisation of protective-material variants.

Wednesday, April 8, 2026 12:00pm - 1:30pm

Networking Lunch

Enjoy a relaxed lunch in the ISTA Forum Networking Hub—the perfect spot to recharge, share ideas, and spark new connections with fellow attendees.

Wednesday, April 8, 2026 12:00pm - 1:30pm

Women in ISTA Networking Lunch

Connect with like-minded women in the packaging industry. Keep an eye out for the specially reserved tables during lunch – it's the perfect opportunity to connect, collaborate, and celebrate the achievements of women in packaging.

Wednesday, April 8, 2026 1:30pm - 3:00pm

Wednesday Afternoon | Session 3

1:30pm - Networking Trivia!

Location: Room: Valley of the Sun D/E

A.J. Gruber
ISTA

Get ready for some fun networking trivia! Who doesn't love a little friendly competition!

1:30pm - Networking Trivia!

Location: Room: Valley of the Sun A/B

Bryan Cardis
Cold Chain Technologies

Get ready for some fun networking trivia! Who doesn't love a little friendly competition!

2:00pm - Building Transit Hazard Knowledge Through Research

Location: Room: Valley of the Sun D/E

Brian O'Banion
ISTA

Research remains at the forefront of ISTA’s efforts to continue delivering current, and relevant tools the packaging industry can use to design effective packaged-product systems for transit.

Updates will be provided on ISTA’s research to establish a standard methodology to generate draft test blocks for shock and vibration from field data, as well as research conducted through the ISTA Advocate Research & Value Delivery Program and ISTA-funded research grants.

Gain insights on all the new resources ISTA is developing that will help you and your company design effective packaging that minimizes product damage and optimizes resource usage.

2:00pm - Development and Evaluation of a Simplified Multi-Axis Vibration Test Apparatus

Location: Room: Valley of the Sun D/E

Ian Skinner
Rochester Institute of Technology

Luke Ross
Rochester Institute of Technology

Derek Moelbert
Rochester Institute of Technology

Joe Byrnes
Rochester Institute of Technology

This project aims to develop a simplified, cost-effective 2-degree-of-freedom (2DOF) vibration test apparatus that induces rotational motion while mounted on a standard vertical-only Lansmont vibration table. The system will use a pivot-spine structure with elastomeric or spring components of varying stiffness (k) to enable off-vertical axis movement. The research will assess the apparatus's ability to simulate transport-induced motions using both field and lab evaluations.

2:20pm - Enhancing Sentiment Analysis and Deep Learning for Packaging Damage Detection in Distribution

Location: Room: Valley of the Sun D/E

Jordan D'Amario
Michigan State University

This project seeks to bridge the gap between consumer insights and packaging innovation. The enhanced AI framework will provide more precise identification of packaging failure points related to distribution, a deeper understanding of consumer interactions with packaging, a refined sentiment analysis model capable of detecting nuanced consumer emotions, and a scalable AI approach that integrates text and image-based data for a holistic evaluation of packaging performance. The project builds upon the 2024 Forum presentation but introduces significant advancements. While the earlier work focused primarily on sentiment analysis of Amazon reviews to highlight packaging issues, this new phase incorporates deep learning for image-based damage detection and emotion-aware sentiment analysis. These enhancements will allow for a more robust, multi-dimensional evaluation of packaging performance during distribution, using both text and image data from consumer feedback.

2:40pm - Evaluating Sustainable Materials for Transport of Live Ornamental Fish in Insulated Shipping Containers

Location: Room: Valley of the Sun D/E

Payton Moore
University of Florida

Gloria Mai
University of Florida

This project addresses the need to identify potential sustainable alternatives to expanded polystyrene foam (EPS) insulated containers used for shipping live ornamental fish. Florida's ornamental aquaculture industry, the largest in the nation with $172 million in sales in 2021, relies heavily on EPS for its insulation and structural stability. However, increasing legislative restrictions on EPS due to environmental concerns, coupled with fluctuating availability and rising costs, could pose a significant challenge to ornamental fish producers. This project evaluates the performance of alternative packaging materials using mechanical and thermal tests. This introductory project aims to generate key results to help the long-term resilience of Florida's ornamental aquaculture industry in an evolving regulatory landscape.

Wednesday, April 8, 2026 3:00pm - 3:30pm

Networking Afternoon Break

Networking Hub

Join us in the ISTA Forum Networking Hub for a chance to meet up with fellow attendees and to meet the Forum Sponsors. Beverages and Snacks included.

Wednesday, April 8, 2026 3:30pm - 5:00pm

Wednesday Afternoon | Session 4

3:30pm - Full Warehouse Automation at Walmart: Transforming Packaging for an Automated Future

Location: Room: Valley of the Sun D/E

Jim Thomson
Walmart

Walmart's scale and omnichannel strategy demand a supply chain that is faster, smarter, and more resilient. To meet these expectations, Walmart is deploying automation across its next-generation distribution centers, leveraging advanced systems from Symbotic, Knapp, Witron, and proprietary Walmart Automation technologies. These facilities integrate robotics, automated storage and retrieval systems (AS/RS), and AI-driven orchestration to handle millions of cases with unprecedented precision and throughput.

This presentation will explore how automation—from receiving and storage to picking, palletizing, and outbound—reshapes packaging requirements and industry standards. Automation introduces new dynamics that packaging engineers must address: tighter dimensional tolerances for robotic gripping, reinforced corrugate strength for high-speed conveyance, and standardized labeling for machine vision systems. Packaging that once accommodated manual handling must now withstand automated sequencing, and rapid sortation without compromising product integrity.

Key discussion points include:
• Automation Architecture: How Walmart's automated ecosystem creates a seamless, high-throughput environment that reduces dwell time and labor dependency.
• Packaging Implications: Why automation demands precise carton dimensions, consistent case weights, and ISTA protocol updates to mitigate risks such as robotic clamp pressure and automated drop hazards.
• Industry Ripple Effect: The cascading impact on suppliers, testing laboratories, and packaging material innovation

as automation becomes foundational to retail logistics.

Attendees will gain insight into Walmart's automation roadmap and collaborative opportunities to develop packaging solutions that thrive in an automated supply chain. By aligning packaging design with automation capabilities, the industry can unlock efficiencies that benefit retailers, manufacturers, and consumers alike.

3:30pm - The Impact of Refrigerant Geometry and Combination on the Thermal Performance of ISCs

Location: Room: Valley of the Sun A/B

William Pelletier
University of Florida

Lucas Avery
Illuminate

The size and configuration of refrigerants play a critical role in determining the thermal performance of insulated thermal shippers (ISCs). While total refrigerant mass (ice packs, PCMs, etc.) defines the ISC's potential to absorb or release thermal energy based on the environment temperature, the surface area-to-volume ratio influences the rate of heat transfer and its phase change. Because of differences in total exposed surface area, a combination of smaller ice packs may melt more rapidly and deliver faster initial cool in but may also lead to shorter temperature hold times than a single large refrigerant pack with the same total mass.

The presence of air gaps, variable placement, and uneven surface contact alters heat transfer pathways and can result in non-uniform temperature distribution within the packaging system. Therefore, optimizing cold-chain performance requires consideration not only the total refrigerant mass but also pack size, geometry, and spatial distribution inside the container. The results of thermal experiments studying these factors will be presented.

4:00pm - Live Benchmarking Breakout: Packaging Insights

Location: Room: Valley of the Sun D/E

A.J. Gruber
ISTA

Join us for an interactive benchmarking session featuring live polling to gain real-time insights into best practices, sustainability strategies, damage rates, emerging trends, and the role of technology in optimizing packaging solutions. Compare your approach with industry peers and discover ways to drive smarter, more sustainable packaging decisions.

4:00pm - End-User Panel Discussion

Location: Room: Valley of the Sun A/B

TBD TBD
TBD

Wednesday, April 8, 2026 5:30pm - 7:30pm

Forum Sponsor Exhibition Reception

Networking Hub

Relax and enjoy hors d'oeuvres and drinks as you network and learn about the Forum Sponsors products, services, and innovative solutions. This reception is always a great time and even includes a chance to win a raffle prize!
Please note: The reception is complimentary for attendees. Guest tickets are available for purchase when registering. Attendees and guests must be 18 years old.



Thursday, April 9, 2026 8:00am - 8:30am

Networking Breakfast
Networking Hub

Kick off your day with breakfast in the ISTA Forum Networking Hub—an excellent opportunity to connect with fellow attendees!

Thursday, April 9, 2026 8:30am - 10:00am

Thursday Morning | Session 5

9:00am - Draft Test Blocks for Drop Testing from Field Data: Profile Generation and Verification

Location: Room: Valley of the Sun D/E

Elin Akerlund
RISE Research Institutes of Sweden AB

Prashanth Srinivasa
RISE Research Institutes of Sweden AB

The aim of transport testing in the laboratory is to help design and evaluate the packaging. For this, the test protocol has to be representative of conditions encountered during transport and be able to reproduce the damages. This study will present the results of the analyses of field data of drop/shock collected from decoy packages transported in USA and China.

The aim of the study has been threefold: (a) review of the existing reduction techniques for converting shock/drop data into laboratory test protocols, (b) propose a suitable workflow for translating field data into laboratory test protocols, (c) verify the proposed new test protocols against existing protocols and where possible against the field data.

To this end, we first evaluate the field data based on the existing ISTA data analysis guidelines (based on Sheehan's method). We conclude that this results in rather harsh test profiles that is not representative of real world conditions. We propose modifications and generate profiles which could better represent the field data. These profiles are then verified in the laboratory setting using decoy packaging similar to the ones used during field data collection. This is done partly by comparing the damage incurred by the packages when tested with the generated profiles (including

ISTA 3A), and partly by comparing the damage observed in the laboratory to that in the field. The damage evaluation utilises RISE damage coefficient method that provides a somewhat objective means of comparing the damage incurred during testing of the different profiles.

8:30am - Pharma Industry Update

Location: Room: Valley of the Sun A/B

TBD TBD
TBD

9:00am - Reevaluating Retention Factors for Long-Term Stacking Strength Prediction

Location: Room: Valley of the Sun A/B

Khadijeh Shirzad
Eli Lilly and Company

Jeffrey Chida
Eli Lilly and Company

Accurately predicting the long-term stacking strength of corrugated packaging is essential for maintaining performance throughout storage and transportation. Most existing retention factors were developed decades ago under material compositions and distribution conditions that differ greatly from those in modern supply chains. Contemporary corrugated boards, often containing higher levels of recycled fiber, exhibit different strength-retention behaviors when subjected to humidity, vibration, and sustained load. This study introduces a framework for developing customized stacking-strength retention factors calibrated to current distribution and storage environments. The resulting retention-factor framework reflects the performance of present-day corrugated materials under realistic supply-chain conditions and can be broadly applied to improve stacking-strength prediction and optimize packaging design for enhanced reliability.

9:30am - Mitigating Cargo Risk Through Packaging

Location: Room: Valley of the Sun D/E

Mara McDaniels
Allianz Commercial

9:30am - Qualification Process for Temperature-Controlled Trailers Under Extreme Freezing Conditions

Location: Room: Valley of the Sun A/B

Mirta Reyes
Johnson & Johnson

This study qualified a 40-ft Freezer Container for ultra-low temperature pharmaceutical transport through **Operational Qualification (OQ)** and **Performance Qualification (PQ)** phases. The container, equipped with a redundant NMF-372-02 refrigeration system, was evaluated for its ability to maintain a set point of ?45°C within an operational range of ?55°C to ?35°C.

OQ testing included thermal mapping under empty and full-load configurations, compressor switchover, genset transition, open-door recovery, and power failure scenarios. Results confirmed stable temperature control during

normal operations, with rapid recovery after stress events. Simulated product sensors remained within range throughout, ensuring no impact on product integrity.

PQ testing involved four live shipments between Ireland and Netherlands. All interior and product-simulating sensors maintained temperatures within specification during transit. Excursions occurred only during door openings for unloading and inspection, not during shipment. Visual inspection of 300 bottles confirmed zero defects. A single deviation related to sensor ice accumulation did not affect product temperatures. Procedural updates were recommended to minimize door-open times.

Conclusion: Combined OQ and PQ results demonstrate that the Freezer Container reliably maintains ultra-low temperatures under controlled and real-world conditions, supporting its qualification for pharmaceutical distribution requiring stringent temperature control.

Thursday, April 9, 2026 10:00am - 10:30am

Networking Break

Networking Hub

Join us in the Networking Hub for a chance to meet up with fellow attendees and to meet the Forum Sponsors. Beverages included.

Thursday, April 9, 2026 10:30am - 12:00pm

Thursday Morning | Session 6

10:30am - Latest Updates on ISTA Digital and Education

Location: Room: Valley of the Sun D/E

Matt Thompson
ISTA

Explore the latest enhancements to ISTA's digital cloud platform, including improved distribution mapping and the launch of ISTA Connect—a new collaboration tool for real-time project sharing. Matt will also share updates on ISTA's expanded education programs, including PDP certification, Cold Chain Packaging (CC 101), and new Test Procedure Training courses. A schedule of upcoming live virtual training events will also be shared.

10:45am - Google's Open Source Random Vibration Test of Off-the-Shelf Data Center Hardware Project

Location: Room: Valley of the Sun D/E

Ken Leung
Google Inc.

The rise of AI has brought significant complexity and miniaturization to data center hardware. Components in servers and switches are now smaller, denser, and structurally more intricate. As cloud services and AI become central to everyday life, hardware failures due to shock and vibration can have real-world consequences.

AI is also expanding into fields like edge computing, autonomous vehicles, and robotics. Hardware designed for data centers may soon power these technologies, making shock and vibration testing critical to their long-term reliability.

For more than 7 years, Google Cloud has been investigating real world random vibration conditions, trying to come up with the most accurate random vibration profiles for shock and vibration testing of Google's data center hardware, and the best way to understand their failure modes. This work was released as a part of Google's *Open Source Random Vibration Test of Off-the-Shelf Data Center Hardware* project, which includes:

- Google's world wide field data measurement, analysis, and lab replication methods
- State of the art 3D strain, motion, deformation, and pressure measurement techniques for data center hardware
- High-speed microscopic motion analysis of critical microelectronics components
- Margins and fatigue analysis in the context of global transport and handling

This project was launched at the 2024 OCP Global Summit, and shared through the project's GitHub repository. The project aims to encourage future collaboration and make random vibration testing universally accessible and useful to the broader community.

11:15am - The Convergence of Sustainability Targets and Regulations: How Packaging Must Evolve

Location: Room: Valley of the Sun D/E

James Raw
Smithers

Various regions around the world and individual states are implementing new guidance and regulations around packaging sustainability. Drawing from the perspectives of retailers, brand owners, and packaging companies, this presentation will explore several key regulations, such as the EU Packaging and Packaging Waste Directive (PPWD), extended producer responsibility (EPR) obligations, and post-consumer recycled (PCR) content initiatives. The discussion will also review how these changes are affecting the supply chain and testing requirements for a wide variety of packaging applications.

11:45am - Advancing ISTA Standards: Protocol Updates and Emerging Test Innovations

Location: Room: Valley of the Sun D/E

Eric Hiser
ISTA

Discover the latest developments shaping ISTA’s testing landscape. This session will cover significant protocol updates, including a revised 3E compression formula, enhanced flexibility for executing 3H, and improvements to retailer-specific tests such as 6-Sam’s, 6-Amazon.com-Over Boxing, and 6-Amazon.com-SIOC. We’ll also introduce new test initiatives designed to meet global distribution challenges—covering inbound e-fulfillment, regional protocols for Europe and India, and advanced approaches for window & appliance shipments. Gain insights into how these changes and innovations will help your organization design resilient, efficient packaging solutions for today’s dynamic distribution environments.

11:00am - University Educational Outreach Panel Discussion

Location: Room: Valley of the Sun A/B

TBD TBD
TBD

Thursday, April 9, 2026 12:00pm - 1:30pm

Networking Lunch

Enjoy a relaxed lunch in the ISTA Forum Networking Hub—the perfect spot to recharge, share ideas, and spark new connections with fellow attendees.

Thursday, April 9, 2026 1:30pm - 2:45pm

Thursday Afternoon | Session 7

1:30pm - ISTA Awards: Celebrating Achievements in Transport Packaging

Location: Room: Valley of the Sun D/E

A.J. Gruber
ISTA

We're proud to honor individuals who have made outstanding contributions to the transport packaging industry. Four prestigious awards will recognize achievements that inspire and educate others, driving progress and improving our world through transport packaging.

- R. David Lebutt Award
- Bernard McGarvey Award
- Emerging Leaders Award
- Outstanding Student Award

2:00pm - When Reuse Becomes Sustainable: Finding the Environmental Breakeven Point in Produce Distribution Packaging

Location: Room: Valley of the Sun D/E

Jay Singh
California Polytechnic State University

Prasanna Katragadda
Trayak, Inc.

As the packaging industry moves toward more circular systems, companies face a key question: When does reusable packaging actually become more sustainable than single-use alternatives? This study addresses that question by identifying the environmental breakeven point for reusable plastic containers (RPCs) compared to single-use corrugated packaging used in fresh produce distribution.

Using life cycle assessment (LCA) tools aligned with ISO 14040 standards and the EcoImpact-COMPASS platform, the research evaluates packaging systems across their entire lifespan, from raw material production and manufacturing to transport, washing, return logistics and end-of-life. The analysis captures multiple impact categories, including energy use, greenhouse gas emissions, water consumption, and material resource demand.
The results reveal that the environmental performance of reusable systems depends heavily on operational factors such as the number of reuse cycles, return logistics efficiency, washing energy, and regional recycling infrastructure. By identifying where and when RPCs reach their breakeven point, the study provides a practical decision framework for companies considering reusable packaging programs.

These findings help stakeholders make informed, data-driven choices that balance sustainability goals with cost and supply chain efficiency ensuring that reusable systems deliver measurable environmental benefits without adding unnecessary complexity or burden.

2:30pm - Improving Unit Load Stability with Acceleration Sled Testing: A Case Study

Location: Room: Valley of the Sun D/E

Dave Leinberger, LPDP, CPP-F
ABF Freight

Luke Venechuk
ABF Freight

Shipping products without damage in the less-than-truckload (LTL) environment can be challenging. This is especially true when shipping tall, unstable products unitized only by stretch film and a pallet. When a large manufacturer contacted ABF's Packaging department looking to upgrade their flatbed freight to suit LTL shipping, a plan was made to meet at Virginia Tech's Center for Packaging and Unit Load Design and test using their new pallet acceleration sled. This case study shares the testing used to validate in-transit unit load stability, improvements that were made to the packaging, as well as the capabilities and limitations of the test equipment.

2:00pm - Improving The Thermal Stability of Three Commodity Plastics For Pharmaceutical Packaging To Mitigate Heat-Induced

Location: Room: Valley of the Sun A/B

Hethson Mwinkum
Michigan State University

Stephanie Ihejirika
Michigan State University

Background: Heat-induced degradation of polymeric packaging materials can lead to the formation of leachables, posing risks to the safety and stability of packaged products. This study aims to mitigate thermal degradation by incorporating suitable additives into common packaging polymers used in the pharmaceutical industry: HDPE, LDPE, and PP. The additives were selected to modify the polymers' melting and degradation behavior, thereby reducing leaching potential during product processing and storage.
Methods: DSC was used to evaluate thermal transitions specifically the onset, peak melting temperatures, and enthalpy of fusion to assess the influence of additives on the polymers' crystallinity and stability. TGA will subsequently be conducted under oxygen and nitrogen atmospheres to examine the thermal stability and decomposition behavior of the modified materials.
Results: Preliminary DSC results revealed enhanced thermal properties across all modified polymers. Modified HDPE exhibited onset temperatures of 125-128 °C and peak melting temperatures of 138-139 °C, with enthalpy values of 195-215 J/g, indicating improved crystalline stability. LDPE with additives samples displayed onset around 115-116 °C and peak melting between 120-125 °C, with enthalpy ranging from 105-125 J/g. PP and its additive-modified forms

exhibited higher onset (140-152 °C) and peak melting temperatures (160-165 °C), indicating greater structural order and heat resistance.
Discussion: These results demonstrate that additive incorporation effectively enhances polymer thermal resilience, suggesting a viable strategy for mitigating heat-induced extractables formation. Ongoing TGA analysis will provide complementary insight into the materials' degradation and oxidative stability

Thursday, April 9, 2026 3:00pm - 3:30pm

Networking Break

Join us in the ISTA Forum Networking Hub for a chance to meet up with fellow attendees and to meet the Forum Sponsors. Beverages and snacks included.

Thursday, April 9, 2026 3:15pm - 5:00pm

Thursday Afternoon | Session 8

3:30pm - Field Vibration Data to Accelerated Test Profile Framework

Location: Room: Valley of the Sun D/E

Changfeng Ge
RIT - Packaging Science Program

This presentation segments truck vibration data into shock-only events and random vibration, to address brittle failure caused by instantaneous shock and fatigue damage caused by random vibration. Shock data is used to compute a Shock Response Spectrum (SRS) and synthesize a corresponding acceleration-time history for lab equipment to produce shock input. The remaining vibration data is stitched to produce a Power Spectral Density (PSD) and a Fatigue Damage Spectrum (FDS) for accelerated vibration test.

4:00pm - Prediction Modeling of Pallet Overhang on Box Compression Strength

Location: Room: Valley of the Sun D/E

Hiral Rajendrakumar Makwana
Virginia Tech

Accurate prediction of box compression strength (BCT) loss resulting from pallet overhang is critical for maintaining the integrity of corrugated packaging in global logistics. This study presents an expanded empirical analysis and predictive modeling framework to quantify the impact of pallet overhang on BCT. An integrated dataset that combined data from previous research with newly conducted experiments was developed to capture a broad range of box configurations, board types, and overhang conditions. Corrugated boxes fabricated from three board grades were tested under standardized conditions following TAPPI 804. A space-filling design systematically varied box dimensions and overhang magnitudes along the width, length, or both sides. The combined training dataset included 2,723 compression tests. An additional 600 compression tests from thirty commercial box designs formed an independent validation set used to evaluate model performance. A multiple linear regression model was developed, yielding an R^2 of 0.867 on training data, and 0.707 on validation data, with normally distributed residuals. Box height and edge crush test (ECT) values exhibited minimal influence within the studied ranges, while overhang magnitude, box perimeter and board type were the significant predictors of strength reduction. To further enhance predictive accuracy and capture nonlinear effects, different machine learning (ML) algorithms were evaluated. Cross validation was conducted for each of three best ML models to mitigate overfitting. These validated ML models provide packaging professionals with data driven tools to predict BCT loss due to pallet overhang, enabling sustainable,

reliable and optimized packaging system design.

4:00pm - Group Breakout Discussions

Location: Room: Valley of the Sun A/B

TBD TBD
TBD

4:30 - Future-Focused: ISTA Forum USA Interactive Wrap-Up

Location: Room: Valley of the Sun D/E

A.J. Gruber
ISTA

Join us for an interactive wrap-up session where your input matters! Through live polling, we'll explore real-time insights into key challenges, research needs, best practices, sustainability strategies, damage rates, and emerging trends in optimizing packaging solutions. Be part of the conversation that drives insight and collaboration across the transport packaging community.

4:45 pm - Closing Remarks

Location: Room: Valley of the Sun A/B

Bryan Cardis
Cold Chain Technologies

Thursday, April 9, 2026 5:00pm - 5:15pm

Annual Meeting of ISTA Members

Join Nora Crivello, ISTA Global Board Chair, and A.J. Gruber, ISTA President & CEO, at the Annual Meeting of ISTA Members. Together, they will deliver board member updates, financial and membership reports for 2025, and share ISTA's strategic focus for 2026. This is an open meeting.

Thursday, April 9, 2026 6:30pm - 8:30pm

Forum Closing Celebration Dinner

Celebrate the closing of the 2026 ISTA Forum at one of Phoenix's most eclectic venues—**The Duce**—for an evening of great food, drinks, games, and music. Unwind and connect with friends at this exclusive celebration in a truly unique setting. **Transportation will be provided and a Forum name badge is required for entry**. *The reception is*

complimentary for attendees, and guest tickets can be purchased during registration. All attendees and guests must be 18 years or older.