

ADVANCED TEXTILES EXPO 2023

excitement AND renewal

High points and highlights from Orlando



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2023 SHOW STOPPER WINNERS PAGE 31 With a new name and renewed enthusiasm, Advanced Textiles Expo (formerly IFAI Expo) returned to Orlando for the first time since 2019. The show boasted the highest attendance since that pre-COVID show, boosted in no small part by the return of more international exhibitors and attendees.

The redesigned Emerging Technologies Conference, along with its portion of the show floor, brought together academics and companies looking to drive innovation in the textile industry. Presenters informed attendees on practical matters such as patents and wowed the crowds with discussions of the next generation of low Earth orbit habitats. Advanced Textiles Expo education covered business topics such as tariffs and labor, among other industrytargeted content. Concurrently, show floor demos highlighted everything from cutting and sewing to installing shade sails. All of these features, along with a bevy of networking events, energized this year's expo.

Next year, Advanced Textiles Expo returns to the West Coast, Sept 24–26 in Anaheim, Calif.

REPORT COMPILED BY Cathy Jones, Jesse Madden, Megan Phillips and Janet Preus **SHOW PHOTOGRAPHY** © Mark Skalny Photography (except where noted) All rights reserved

HIGH POINTS AND HIGHLIGHTS

ATA Keynote speaker Jeff Butler discusses how to build a multigenerational workforce

Jeff Butler, founder of Trinity Fix, a tech and consulting company based in Dallas, Texas, that helps organizations create workplaces where employees thrive, says to build a multigenerational workforce, it's important to overcome the "culture clash" between the different generations.

To do this, business owners must change their mindset around different generations and disregard false stereotypes, such as that millennials are lazy and entitled, Butler says. He emphasizes that while these generations have many differences, organizations can use them to their advantage.

Evaluate workplace culture

"Workplace culture is the collection of values and beliefs, so a great question to ask is 'OK, what's our culture and what do the leaders expect of each other? What are the expectations of others? And what's valuable?'" Butler asks. "If you answer those three questions, you can work with just about anyone."

The goal is to realign expectations to meet the needs of the organization and its workers to increase productivity and employee satisfaction.

Areas of discussion around an organization's culture can include work-life balance, work quality, work ethic, salary expectations and communication styles.

Appreciate the differences

Butler also says leaders and employees should learn to understand each other and acknowledge and appreciate each other's differences. He recommends doing activities outside of work, such as going out for a team dinner or volunteering.

"This all comes down to how to see someone outside of just who they are as an employee and more as an individual who has needs, wants and passions just like me," Butler says.



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Leverage existing culture

Finally, companies must leverage the culture they've built. Butler says a good example of this is reverse mentorship, a practice where a recent college graduate mentors a more experienced employee, such as a CEO. This practice utilizes the strengths of both generations: The recent college graduate has the ideas the CEO is looking for, and the CEO has the experience and the resources to implement these ideas.

Ultimately, to create a new culture, Butler says employees must overcome individual differences, get to know each other and learn to use the strengths of each generation to a company's overall advantage.



ADVANCED TEXTILES EXPO 2023 EXCITEMENT AND RENEWAL

BUSINESS

Trade experts answer attendees' concerns

f there's any issue that's variable, it's trade; tariffs and free-trade agreements are enacted, revised or sunset in jurisdictions around the world regularly. Attorneys Nate Bolin from DLA Piper LLP and John Macisso from Albany International Corp. advised people to keep an eye on their short-, medium- and long-term risks of being affected by tariffs and export controls by regularly reevaluating their supply chains and doublechecking the codes used on what they import. Even if a mistake isn't a business's fault, the company that is the importer of record bears the responsibility—and cost—of fixing the problem.

Small firms can lean on their customs broker or freight forwarder, but having a designated point person internally at a business to be in charge of monitoring the rules can help prevent issues and catch errors. For example, if a customs broker doesn't have a complete understanding of the product being shipped, an erroneous code found later could be costly for a business.

The attorneys also advised looking into duty drawbacks if companies have imported portions of a product that is later exported. They could be due refunds or pass savings onto their customers.

People can seek more information via the International Trade Administration's Office of Textiles and Apparel (OTEXA) and the World Trade Organization's list of worldwide tariff rates.

Mergers and acquisitions for the small business owner

With 25 years of experience in mergers and acquisitions (M&A) advisory work, Tammie Miller, managing director at TKO Miller LLC, effectively outlined how small business owners should position their companies to be part of a successful M&A transaction in today's economy.

"We are one year into a sluggish M&A cycle, with transactions and valuations down considerably," Miller says. "Fortunately, the bad news has largely been contained in the technology and consumer sectors."

She points out that lower- to middle-market companies in the United States employ 30% of the workforce and generate one-third of the nation's GDP. However, "about 70% of these businesses will need to be sold in the next decade because their owners will need to retire, and they do not have exit plans."

Her advice to those companies? "Get organized. Make sure your management team is solid and doesn't have any holes. Hire professional advisers—don't skimp—use specialists."

But the most important thing business owners should do is to run a competitive bidding process, which means attracting more than one potential buyer. "Having competition means you have leverage throughout the process. When buyers find something during due diligence, and they always do, they're going to push you to lower the price and you will have nothing to fall back on if you don't have competition." (See page 38 for more on selling your business.)

SUCCESSFUL INTERNSHIP PROGRAMS CREATE A FUTURE WORKFORCE PIPELINE

King Mukherjee, the founder and president of Global Impex USA and an advisory board member of the Emerging Technology Council of ATA, says that internship programs offer many advantages. According to Mukherjee, as the existing workforce rapidly approaches retirement age, it is increasingly important to create access points for the next generation to discover the opportunities the textile industry offers.

"Industry and academia have to come closer together and we need to do more to create successful internship and apprenticeship programs," says Mukherjee, who is also chair of the global business leadership department at College of Saint Benedict and Saint John's University. "But three months is not long enough. It's good to have a nine-month apprenticeship. That's where you really get the benefits of the time and resources. This allows for a rotational scope where they can try all the different aspects of the company—sales, sourcing, marketing, HR."

Mukherjee says the rise of remote work post-COVID has created the ability to have interns and apprentices all over the world. The pool of candidates no longer has to be limited to a specific region or even country, and apps like Zoom and Slack make it possible for participants to collaborate in real time.

Companies are often reluctant to offer internships because of the time and effort involved in them, but Mukherjee says they are vital to the long-term success of an industry. "These internship opportunities create a pipeline that will serve the industry for the next 10, 20, 30 years," he explains.



Live chat: The advantages of conversational marketing

To increase your company's quote requests in just one month, you must prioritize customers' communication preferences, says Nelson Bruton IV.

Bruton, president of Interchanges in Jacksonville, Fla., an organization that helps B2B manufacturers improve website engagement, provided his insights in the session "How to Double Your Quote Requests in 30 Days with Conversational Marketing."

To accommodate customers' preferences, organizations need to provide multiple routes of communication, Bruton says, including a phone number, a form and a live chat.

Bruton suggests the following:

- Think of your website as a digital trade show booth, a place to have conversations with customers that become sales opportunities.
- Be proactive: Have the chat window open automatically so customers don't have to search for it. Adjust the time it takes for the chat window to open according to how long visitors stay on your site.
- Do not erect roadblocks, such as making customers fill out a form before the chat box opens. Live chats without roadblocks receive three to five times more engagement than those with them.
- Response time is critical. There should be no delays and no set expectations for a response time. Aim for an average response time of 20 seconds or less.
- Do not use bots. Despite the rise of chatbots, 70% of consumers prefer human agents to Al, Bruton says, and 95% of customers would rather have personalized live chat support if it guarantees a better customer service experience.

AUTOMATION BRINGS CONSISTENCY, EASES LABOR PRESSURE

Two separate education sessions on automation illustrated the potential and primary challenge in robotics in textiles manufacturing.

The "holy grail" of apparel automation, says Graham Page of Alchemy X LLC and formerly of VF Corporation, is the materials handling process. It's challenging for robots because of the variation in thickness, assembly type (woven, knit, nonwoven), drape, stretchiness, porosity, softness, mass, fragility, coatings and flexibility of textiles. Different approaches are needed based on a piece's specs. For example, a thicker woven such as denim may be able to be picked up with vacuum grippers, but for a machine to pick up finer fabrics, the machinery may use special needle heads. Same robots, just different tooling needed per project.

Automation can assist companies in easing their labor crunch and save the humans for higher-skilled positions, says Frank Henderson of Henderson Sewing Machine Co. Using robots doesn't work for every task but is effective for high-volume items and 3D sewing on a curve, such as automotive head rests, dashboards and door panels. Consistency in manufacturing is an advantage as well as a quicker, more precise quality control inspection. Henderson used airbag manufacturing as an example of where human eyes have a higher error rate than machines—and how defective airbags were costly for Takata Corp.

"We can make this stuff here," Henderson says, and avoid the overpurchasing that creates so much inventory (and landfill) waste and long lead times to cross an ocean.

Though it's difficult for a public company to be innovative, Page says, "Long supply chains kill creativity."



ADVANCED TEXTILES EXPO 2023 EXCITEMENT AND RENEWAL



DEEP DIVE WORKSHOPS

The importance of emotional intelligence training and improvement

Melissa Furman, Ph.D., consultant and owner of Career Potential LLC in Augusta, Ga., says developing and improving the emotional intelligence (EI) of an organization's employees is the key to a thriving workplace.

EI is the ability to identify, use, understand and manage emotions to relieve stress, communicate effectively, empathize with others and defuse conflict. Normally, EI is developed when someone is in their early to mid-20s, but Furman says millennials are developing EI at a slower pace than the previous generations, including baby boomers and Generation X.

For some leaders, specifically Gen X, this can be discouraging, but Furman says it's necessary to teach employees, especially millennials, emotional skills because they will soon make up 75% of the workforce.

Developing employees' EI also coincides with developing professional skills. "What goes along with emotional maturity is professional maturity because they're not going to develop emotionally unless they develop professionally, and they're not going to develop professionally unless they develop emotionally," Furman says.

The important thing to remember about EI is that it is situational and changes over time with age, work and experience. Like physical training, it is a skill that needs to be practiced consistently. Furman says it takes around nine months to improve or develop EI.

While insight into a potential employee's EI sounds helpful, Furman recommends waiting to give employees an EI test until after they're hired to create an action plan for improving areas of EI where they scored too low or high.

Furman recommends the Multi-Heath System's EQ-i[®] 2.0 test, which generates a total EI score with five composite scores of distinct aspects of emotional and social functioning:

- Self-perception: emotional self-awareness and self-regard.
- Self-expression: emotional expression, assertiveness and independence.
- Interpersonal: interpersonal relationships and empathy.
- Decision making: problem-solving and impulse control.
- Stress management: flexibility, stress tolerance and optimism.

Mastering leadership for the modern sales team

Toby Payne, a sales trainer and consultant for Sandler Systems LLC, offered a number of valuable insights and tips for successfully building and leading a modern sales team. Starting with an overview of the four "sales leadership hats" that business owners and managers must successfully wear—training, coaching, mentoring and supervision—Payne broke down how to discover a sales team's motivations and set it up for success.

One of the key elements of that process involves learning how to effectively coach the team. According to Payne, one of the most important elements of coaching is the environment in which it takes place. "The coaching environment must be open and honest so both parties can communicate openly," he says. "Trust is crucial. The physical and mental environment must be comfortable to support candid conversations."

Payne also explored the workforce challenges employers face. He says that one of the biggest problems is that companies often don't prioritize hiring. "They wait until there's a fire, meaning someone leaves the company, before they start the process of recruiting new talent."

Payne says that companies often don't have a reliable process in place for the selection process. "The biggest sell any salesperson makes is in their interview, and so often, employers make the mistake of what I call 'falling in love' with a candidate based on a single interview," he explains.

Ultimately, having a work culture that promotes what Payne calls "effective accountability" is crucial. "It's the glue that ties commitment with results," he says. "If there is a lack of accountability, there will be unclear actions, creative avoidance, making excuses. But if you have accountability, everyone is on the same page, there is team support and positive pressure, you can talk about consequences instead of excuses and have better coaching conversations."

SPECIAL ADVERTISEMENT

FROM THE ORLANDO SHOW FLOOR

Whether you're looking to enhance your post-Expo experience or are seeing these companies for the first time, use the information below from Advanced Textiles Expo exhibitors to learn more about the products and services they provide.













ADVANCED TEXTILES EXPO 2023 EXCITEMENT AND RENEWAL

EMERGING TECHNOLOGIES

Hybrid solutions for flexible electronics

What drives every new class of wearables?" Greg Nevolo asks. "Materials science plus imagination," he answers. Nevolo, who works in product innovation for Goleta, Calif.-based ACI Materials Inc., addressed the challenges in his presentation, "Low-Cost, High-Volume Wearables," and explained the solution his company has developed. (See also page 32.)

Of three main hurdles—connectivity, manufacturing in volume and integrating functionality into the product—connectivity is "the single biggest issue," he says. The company's solution combines conformable, stretchable inks and flexible electronics in fabrics with an "intimate contact" connector. It took nine months of development across two teams and needed 17 steps to manufacture it.

"They thought it would be easy," he says. "It really wasn't."

But these flexible, hybrid electronics in textiles now offer the potential for low-cost, high-volume production that can drive rapid prototyping and "infinite form factors," he says.

Screen printing is, at present, the best method for applying conductive inks in the manufacturing process. But that process is, once again, fraught with "many moving parts with many suppliers." What's required is "a marriage of all ecosystem components."

Even with the myriad challenges in truly scaling up production, Nevolo believes that "the future is here." Inks and fabrics are pushing boundaries, and he encouraged his audience to "embrace the challenges," to "reimagine connections and substrates" and to "create new methods of prototyping and manufacturing."



IARPA COMMITS MAJOR FUNDING TO WEARABLES RESEARCH

D awson Cagle, Ph.D., program manager for the Intelligence Advanced Research Projects Activity (IARPA), presented a description of a relatively new project for IARPA with a memorable name: SMART ePANTS (Smart Electrically Powered and Networked Textile Systems). The project's goal is to develop sophisticated new smart systems in wearables that can see, hear and locate.

"How are we going to do this?" Cagle asks. "We're going to spend \$96 million. The industrial world is tied by cost, but maybe now we will have the capability."

Not only are the size and scope of the project significant for the smart textiles industry, "It's the first time we've done a research program in clothing," Cagle says. "This is something the textile community should be preparing for. The need for computers in textiles exists."

But Cagle is not talking about the current system, which requires a small computer in the form of a "puck" to which the wearable system must be attached. "To expand the market, we need electronics that act like clothing," he says. This includes developing yarn-based computers. To achieve these lofty goals, a few "miracles" have to occur, Cagle says, especially computation and data storage the currently rigid pucks. "Without a major renovation of this, we will get no further," he says.

Why is the intelligence community doing this? Because officers, such as those working for the FBI or as chemical weapons inspectors, work in dangerous environments to gather information. "You want to do it in the safest way possible," he says.

More information is available at iarpa.gov/research-programs/smart-epants.



The move to digitize engineering in textile products

C aitlin Knowles, Ph.D., an e-textile device engineer with AFFOA, moderated a panel on digital engineering of textile products that featured Graham Sullivan, CEO of SEDDI Inc., a supplier of newly created digital data and design development tools for the garment industry, and Matthew Trexler, Ph.D., director of materials science innovation research with Under Armour[®].

Advanced textiles production currently relies on physical prototype iteration, and producers simply do not trust digital representations. "The apparel industry is stuck in the past; executives don't understand the problem," Sullivan says. But concerns about the environmental costs of wasteful practices in the fashion industry are mounting.

The amount of material that ends up in landfills in the prototyping process alone is "something we find unacceptable," Trexler says.

"Digitalization is the solution to a more sustainable future for fashion," says Sullivan. Although digital product creation has been available for some time, the digital product development component has been missing—as well as the ability of all digital information to be easily shared and used among participants, including those using more traditional methods.

"People need to see and feel apparel products," Trexler says. There are new tools, but "there's not one unified way to do it. ... The people that are doing this work can do things on the fly that computers can't do. Software can do a pattern, maybe, but there's this chain of tools that can't talk to each other."

Therein lies a problem that Sullivan's company intends to solve, with "the ability to collaborate and share," he says.

Light capture with a twist

The newly named Emerging Technologies Conference opened with a presentation by Mridula Nair, Ph.D., a research fellow with the Eastman Kodak Company, well known for its pioneering work in photography and film. While Nair discussed "light capture," she focused on KODALUX Fabric Coating, the company's technology for capturing light to block it.

She noted that the company's expertise with lightblocking using textiles springs from its historical involvement. "We know something about textiles," she says. The essence of KODALUX is that it doesn't let the light escape, by scattering, reflecting and absorbing it.

Opacity can be customized from one formulation for light filtering to room darkening to total blackout. Its single-layer blackout coating is made without the carbon found in other products, which can escape and tarnish the fabric.

She also says that it's a greener coated product, as the solvent is recycled, and it uses minimal wash water with no surfactant. The manufacturing process has lower energy requirements overall with minimal waste.

This technology has the potential to add functionalities in the future, such as the ability to block heat and sound, in addition to light.

LCP FIBER'S MYRIAD ROLES ON EARTH AND IN SPACE

The session "LCP Fiber and Space Exploration" started off with a literal bang as presenter Matt Reid from the Vectran[®] Fiber Division of Kuraray America Inc. showed a video of an ultimate burst pressure test on a one-third scale model of an inflatable space habitat. The Large Inflatable Flexible Environment (LIFE^{**}) habitat will be part of Orbital Reef, a commercial space station under development by Sierra Space, Blue Origin and ILC Dover, among others.

Reid discussed the properties of liquid crystal polymer (LCP) fiber and how it compares to para-aramid fibers, such as Kevlar[®], and high modulus polyethylene (HMPE), such as Dyneema[®]. LCP fiber has characteristics of both other types, but the crystalline structure is what makes it so strong and able to replace steel in some applications, such as portable hangars for the military. Other applications include tethers, inflatable tunnel plugs, slings, aerostats, mooring ropes and protective firefighting gear. It actually gets stronger at -62 C (-79.6 F), Reid says, and was part of the airbag systems that landed rovers on Mars.

"It's not inexpensive as a fiber, but it really performs in some critical areas," he says. "LCP works where other fiber technologies fail."

SPECIALTY FABRICS

The benefits of solar shading

Solar shading is a possible alternative to electricity usage, especially air conditioning, says Anders Hall, president of the European Solar Shading Organization (ES-SO) and founder of Shade Academy, an online platform for sharing knowledge and experiences around solar shading.

Due to increasing temperatures because of climate change, electricity usage from air conditioning is expected to quadruple by 2050. Hall says solar shading has the potential to prevent this increase. Solar shading involves the use of automated or manual external and/ or internal shading, such as blinds, curtains, awnings or canopies, that manages the entry of solar heat and light to maintain a thermally and visually comfortable indoor space. For example, extending shading could be used to cool the building in the summer or to warm the building in the winter.

The system receives realtime input, such as wind speed or temperature, and can adjust automatically based on preset requirements established by tenants or manually through cords, chains, switches or a remote. Hall recommends automated systems, as manual systems are generally used less frequently.

Hall says solar shading has a variety of benefits, such as increasing the health and welfare of building occupants, reducing energy consumption and increasing productivity by reducing glare. It can also have acoustic properties.

THE MOON'S CHALLENGES FOR NEW SUITS

D riving the development of new space suits for upcoming NASA and commercial space flights are differences between the moon's equatorial region of many Apollo missions and the exploration of the south pole in upcoming Artemis flights. These issues include temperatures and mission durations.

Evelyne Orndoff from NASA Johnson Space Center spoke in one session on the thermal challenges. As part of a separate panel, Jason Smith from Aegis Aerospace Inc. and Chyree Batton of Axiom Space addressed suit and textile testing and development.

The temperatures in the permanently shaded areas at the lunar south pole are as low as around -200 C (-328 F) and 54 C (130 F) in sunlit areas, colder than at the equator. The Apollo missions were short, measured in hours spent on the moon's surface, all under a



This two-layer boot prototype—the final will have nine layers—was on display at NASA's booth. The organization seeks to replace the Ortho-Fabric with one that better handles the abrasive lunar dust. Image: Cathy Jones

day in total. But a permanent south pole presence will require a suit of a robust textile composite able to be exposed much longer—the identity of that composite is still being determined.

The lunar dust, or regolith, consists of sharp silicone shards, and it changes in polarity. During the day the regolith has a positive charge that reverses at night, so research is being done on surface properties of materials, Ordoff says. Because there is no atmosphere and less gravity, the sticky dust that's sent into a plume upon landing on the moon can take up to a month to settle to the surface. Batton says that research is exploring coatings that repel the dust, and Smith notes that a future test will expose different textiles to that plume of dust for about two weeks.

Ordoff says that new suits need to allow more range of movement than in the past, and any coatings affect drape. Modern space suits also need to come in additional size configurations—and, says Batton, referring to Axiom's business goals, be produced cost-effectively.

The first upcoming Axiom suits will likely be a combination of new and legacy materials among their 11 layers, Batton says, because of the time frames needed to certify new materials for use in space. For example, initially they'll still use the tried-and-true liquid cooling tubing layer that keeps the astronaut from overheating. "Luckily for us there is precedent in humans on the moon," she says.

Advanced EXPO Shows Stopper

Il the best from Orlando: The 12th annual Show Stopper competition was created to showcase the best of the best in the industry, from fabrics and equipment to hardware, services and end products.

Designed to recognize the most popular new products each year from exhibitors, the Show Stopper Awards acknowledge the newest, most innovative, useful, exciting, effective, efficient and economical entries as well as the most environmentally sound products at the show. Entries were submitted by exhibitors and displayed on the show floor, with winners selected by a committee of industry experts.

A list of all the 2023 Show Stopper participants can be viewed online at AdvancedTextilesExpo.com/ showstopper.



End Products

Renegade Plastics' Tarps and Drop Cloths Renegade Plastics | renegadeplastics.com

Renegade Plastics has introduced a line of 100% recyclable medium- to heavy-duty tarps and drop cloths made from a low-carbon coated fabric free from lead, phthalates, dioxins, PFAS and heavy metals. Made from an eco-friendly fabric that offers maximum UV stability while standing up to inclement weather conditions.

Equipment and Tools

CRC-Sensor DITF | ditf.de

The CRC-Sensor is a new contactless low-cost sensor principle that can detect defects in the conductive properties of running yarns during production. This makes it possible to directly detect faults occurring in the process with regard to the electrical properties of smart textiles and to reject faulty parts early in the process chain without additional expense.





Fabrics, Fibers and Films

RL27A Carbon-Network Mesh Fabric Apex Mills | apexmills.com

RL27A Carbon-Network Mesh Fabric is manufactured with 12% carbon within a base of 88% polyester material. Used in static dissipation, this conductive, capacitive fabric is used in clean rooms and consumer goods.

Hardware, Findings and Accessories

1,0 Bar Waterproof and Airtight Zipper TIZIP | tizip.com

There are several factors to consider when selecting a waterproof zipper, including durability, ease of use and cost. When it comes to extreme requirements with heavy professional use, there is now a new high-performance option: the world's first 1,0 bar watertight and airtight polymer zipper.





Services to Manufacturers

Quilted Marine Vinyl Panels Featuring Sunbrella® Horizon® Trivantage® | trivantage.com

Trivantage will now offer prefabricated marine seating panels, helping fabricators cut down on cost and turnaround time. These will be available only to fabricators. The panels are made of the popular marine vinyl fabric choice Sunbrella® Horizon® Capriccio and are paired with matching solution-dyed polyester thread for a classic look and long-lasting performance.