March 2025

PUreview

REPORTING THE WORLD OF POLYURETHANES FOR OUR CUSTOMERS

AVALON® GECKO TPU

Engineered for ultimate grip in footwear

Winners of Fertilizer Coating Challenge revealed

The drive to make vehicles more sustainable

Improving the reliability of mission critical wheels

Innovative applications for spray foam insulation

Polyurethanes: enabling sustainability advancements in footwear

Tony Hankins, President, Huntsman Polyurethanes

Welcome to the latest *PU Review*, which showcases our recent innovations in polyurethanes. This issue, our main feature focuses on a new range of high performing thermoplastic (TPU) materials developed by our Footwear team. Offering new possibilities for soling applications, the AVALON® GECKO TPU portfolio comprises a series of products that provide exceptional grip like a lizard, are very durable, and have been developed with circularity in mind.

The footwear industry is undoubtedly one of the most innovative, fast moving and exciting industries we serve. Over decades we have established strong partnerships with leading brands in the sector's sports, leisure, outdoor and fashion segments – successfully collaborating on countless new product developments.

In recent years, we've seen a notable shift towards sustainability in the footwear industry. The incorporation of eco-friendly materials, such as recycled plastics and organic fabrics, into products is increasing. Innovative manufacturing processes such as 3D printing and other advanced techniques are helping reduce waste and energy consumption. Recycling in-factory waste is now also commonplace. This has been standard practice with TPU for many years. and proof of concept is now in place for recycling our liquid TPU, SMARTLITE® O system (see *PU Review*, May 2024) – the first liquid thermoplastic polyurethane for the footwear industry.

Using AVALON® GECKO TPU for outsoles, alongside a midsole technology such as SMARTLITE® O liquid TPU, can enable the production of a soling unit that could be recycled. This is something both consumers and the industry are looking for. With Huntsman now offering the necessary technology to achieve the end result, whether through mechanical or chemical recycling, the challenge now is for the industry to establish collection, sorting, and segregation processes to enable re-use and/or recycling at end of life.

In addition to focusing on footwear, this issue contains several stories about another highly innovative and fast-moving sector: automotive. We take a look at the industry's drive to circularity. There are articles on a new seating foam, which has a lower carbon footprint, and a new composite resin system for EV battery top covers. There are also several stories, showcasing the use of our thermal insulation technologies in interesting new building projects.

I hope you enjoy reading this issue of *PU Review*. As ever, we welcome your feedback!

Team celebrates inauguration of new Innovation Center in Belgium

In June we inaugurated our new 11,000m² Innovation Center in Tienen, Belgium. The facility enhances our R&D capabilities and the support we can provide to customers in Europe.

The Tienen Innovation Center includes an analytical laboratory, machine halls, and automated product testing areas, enabling comprehensive product innovation from initial ideas through to customer-ready samples.

Home to more than 100 scientists from our Polyurethanes and Performance Products businesses, activities on site help underpin the evolution and application of Huntsman technologies in key markets, including adhesives, coatings and sealants; automotive; elastomers; energy; furniture and bedding; and insulation.

Nearly 300 people, including customers, suppliers and associates, attended the inauguration day, which featured facility tours, R&D demonstrations, and presentations and speeches by the Huntsman leadership team.

Fast facts about Tienen

- 11,000 square-meters
- 1 x world-scale analytical laboratory
- 2 x machine halls
- 1 x fully equipped/automated product testing facility
- 100+ scientists.

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Professors win Biodegradable Fertilizer Coating Challenge

In the last edition of *PU Review*, we outlined details of our Biodegradable Fertilizer Coating Challenge. We also announced that we'd shortlisted a number of applicants, who would be presenting their suggested solutions to our judging panel. We are now pleased to announce the final results.

After reviewing more than forty submissions and evaluating 14 shortlisted proposals in detail, our judges decided to award the $75,000 prize fund to two professors from the University of Western Ontario in Canada.

Professor Elizabeth Gilles from the Department of Chemistry and the Department of Chemical and Bioengineering, and Professor Hugh Henry from the Department of Biology, delivered an excellent proof-of-concept solution based on self immolative polymers.

Also known as SIPs, self immolative polymers are a class of degradable stimuli-responsive polymers that depolymerize from end-to-end upon backbone cleavage or end-cap removal. Conventional degradable polymers break down via a series of random backbone cleavage events that result in progressively smaller chain fragments.

SIPs are different – depolymerizing completely after a single bond cleavage. In addition, the stimulus and depolymerization rate of SIPs can be tuned by changing only the end-cap while preserving the structure and properties of the SIP. End-caps can be incorporated that can be triggered by a wide range of events including changes in pH, temperature, light, or chemical interactions. They can also be engineered to enable gradual polymer degradation in the absence of a stimuli, under neutral conditions.

David Cranfill, Technology & Innovation Director, Polyurethanes Americas at Huntsman, said: "Thank you to everyone that put forward an application for our Biodegradable Fertilizer Coating Challenge. We were overwhelmed by the response received and delighted to read so many excellent submissions. Congratulations to Professor Gilles and Professor Henry. Their proposal delivered on every aspect of our judging criteria, and we look forward to hearing how they will use their prize fund to take forward their work in this field." |

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Challenge objectives

The Huntsman Polyurethanes Biodegradable Fertilizer Coating Challenge was designed to identify novel ways to create biodegradable coatings for controlled release fertilizers.

Across agriculture, coated urea fertilizer pellets have been widely used for many years. These advanced systems gradually release nutrients into the soil, providing optimal conditions for plant growth. However, certain pellet coatings may leave behind trace elements that can persist in the soil for years.

The aim of the challenge was to find a coating solution that would balance nutrient release time and biodegradation of the coating – minimizing the build-up of microplastics in soil over time.

New Energy Center at Wilton site in UK boosts green credentials

To provide long-term cost certainty, energy security and resilience at our Wilton facility in the UK, we have invested in a new energy center. Wilton produces several key feedstock materials – such as aniline – which are essential for the manufacture of our upstream differentiated polyurethane systems.

The new center is equipped with the latest steam-raising boilers, compressors, and other heat recovery measures. These technologies enable us to produce 100% of on-site steam requirements and process relevant feedstocks in the most energy efficient way possible.

As well as supporting the long-term supply of vital inputs, the energy center is delivering a 30% reduction in steam production costs year-on-year. Steam boilers are equipped with advanced burner technologies that allows the site to consume plant vent gases alongside natural gas while reducing harmful emissions. As well as supporting the long-term supply of vital inputs, the energy centre is delivering 40% lower CO_2 emissions and a 50% reduction in nitrogen oxide emissions. It is also enabling a 30% reduction in steam production costs year-on-year. |

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Supporting the automotive industry's drive towards sustainability

At Huntsman, discussions with automotive makers (OEMs) have inevitably shifted up a gear over the last few years with more focus on sustainability, carbon footprint reduction and circularity than ever before. *PU Review* spoke to Josh Wimble, Senior Marketing Manager Automotive, Polyurethanes Americas at Huntsman to find out more about these conversations; where material innovation is heading; and the wider challenges that need to be addressed in the design and manufacture of vehicles to ensure the circularity of key vehicle components is achievable, wherever possible.

PU Review (PU R): The drive to make vehicles more sustainable is much-talked about – but achieving this is incredibly complex with standard cars featuring thousands of components. Looking at the various phases of automotive design, manufacture, maintenance and end of life, is there an area where Huntsman is particularly focused?

Josh Wimble (JW): At Huntsman we aim to support sustainability throughout the automotive sector wherever we can, at all points in the vehicle lifecycle. The versatility of polyurethane chemistry can enable us to deliver materials that can offer real benefits from design and production right throughout ownership to end of life. When it comes to automotive design, our MDI-based polyurethanes can be used to create composites that can aid lightweighting while providing the rigidity required for mission critical applications such as battery housing top covers. From a manufacturing perspective, our polyurethanes can help speed up and simplify component production by enabling the use of innovative wet compression molding and spray application techniques that can deliver faster cycle times. The lightweight nature of polyurethane can help improve fuel efficiency and emissions during vehicle usage. Polyurethanes can also enhance the durability and longevity of components from seats and trims to acoustic insulation.

PU R: Have you got any specific examples of products that support greater sustainability in the sector?

JW: Making vehicles more sustainable relies on three things:

- Designing vehicles with longevity and modularity in mind
- Increasing the use of recycled and renewable materials
- Using lightweight and energy efficient materials.

We're active in all of these areas. I'll give you two examples. When it comes to creating more modular components, automotive designers need flexibility and our VITROX® and RIMLINE® composite systems offer just that. With good edge-filling capabilities they can enable the creation of components with a complex shape, designed to fit into specific spaces. In terms of increasing the use of recycled and renewable materials, this is also a definite focus. We are prioritizing the use of feedstocks from post-consumer plastics, bio-circular waste, and bio-based products wherever possible, reducing our reliance on petrochemicals and thereby helping to lower the carbon footprint of cars. A case in point is ACOUSTIFLEX® VEF BIO system. This pioneering bio-based viscoelastic foam technology, developed for molded acoustic applications, contains up to 20% bio-based content, derived from vegetable oils and can lower the carbon footprint of automotive carpet back-foaming by up to 25% compared to existing Huntsman systems for this application*. It can also be used for dash and wheel arch insulation.

PU R: Does integrating more bio-based or recycled content into materials affect their performance?

JW: There is an assumption across a lot of industries that to make a product more sustainable you may have to compromise its quality or durability. At Huntsman we work hard to make sure that's not the case. If we look at ACOUSTIFLEX® VEF Bio system again, tests show that our original, non-bio-based

VEF systems can outclass standard high resilient (HR) foams at lower frequencies (<500 Hz). ACOUSTIFLEX® VEF Bio system can achieve the same magnitude of sound-reducing capability – despite being based on bio-based feedstocks.

PU R: What else is Huntsman doing of note to support sustainability in the sector?

JW: At Huntsman we're proud that all of our automotive technologies can now be made available with attributed mass balance content if required. With ISCC PLUS certification in place, we can attribute a percentage of the bio circular MDI we use in our manufacturing process to help reduce the attributed carbon footprint of customer's products. This is an important step for our business and our customers.

PU R: What about the use of recycled materials in new vehicles. Is the use of 25% recycled content feasible as proposed by the European Commission?

JW: This remains our short-term target. We have solutions in the market today that can include up to 20% bio-renewable and post-consumer recycled material, which can, in turn, help reduce the carbon footprint of polyurethane foam by up to 25%*. These solutions can meet multiple OEM specifications and have been rigorously tested. We are continually working to make improvements on these technologies with our automotive customers.

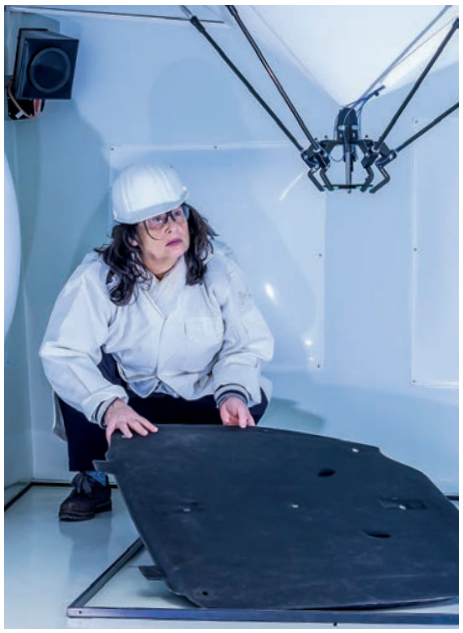
As a team, we are also closely engaged in industry discussions to ensure that future legislation is defined in a way that takes into account all the benefits of recycled content and does not exclude bio-based feedstocks. This includes materials that are non-food-chain competitive that can be recovered from food production or other processes, which may prove more economical and may also reduce the carbon footprint of products more than post-consumer plastic alternatives.

As a provider of solutions that can be made via the segregated-stream introduction of bio-renewable and recycled materials, we would also like to see new standards introduced to endorse mass-balance attribution. This would help further accelerate the adoption of higher levels of alternatives to fossil-based feedstocks in manufacturing.

PU R: What about circularity in the automotive industry, is that really possible given the complex design of cars?

JW: There are challenges, of course, but achieving the circularity of some components is feasible. At Huntsman we are actively collaborating with industry partners to improve the recyclability and recovery of polyurethane materials at the end of a vehicle's life, ensuring as many components as possible can be reclaimed and recycled. However, success in this area is dependent on a wider, holistic approach across the sector – involving material providers but also molders, automakers, recyclers, and others. While companies like Huntsman are capable of developing recyclable materials, the current challenge lies in identifying and recovering these materials at end-of-life. Vehicles built today with recyclable components are unlikely to become available for 'recycling' for 15 years or more**, meaning long-term planning across the entire value chain is essential.

"We are prioritizing the use of feedstocks from post-consumer plastics, bio-circular waste, and bio-based products wherever possible, reducing our reliance on petrochemicals and thereby helping to lower the carbon footprint of cars."



"Tests show that our original, non-bio-based VEF systems can outclass standard high resilient (HR) foams at lower frequencies."

PU R: What do you think will be the most important trends and developments for plastic materials in the automotive industry in the coming years?

JW: As automakers continue to work with material suppliers to explore circularity and carbon reduction, we'll start to see the development of more integrated supply chains that are better equipped to deal with the recycling of vehicles and their components. We'll hopefully see more harmonization of standards globally, offering financial incentives to drive innovation and the faster adoption of circular materials. In support of sustainability the following themes will also, inevitably, remain central.

- Lightweighting to improve fuel efficiency, especially in electric vehicles where there are still range challenges
- Sustainability and recycling – including the increased use of bio-based and recycled plastics
- Adaptations for electric vehicles – e.g., materials that offer better thermal management and fire resistance
- Enhanced aesthetics and comfort – while performance is king, the importance of comfort in vehicles cannot be underestimated.

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** Compared to existing polyurethane systems of Huntsman. Internal LCA study, CML GWP including biogenic CO_2 indicator.*

*** Average age of ELV vehicle reported by Euromoulders.*

New foam can offer consistent comfort with a lower carbon footprint

In recent years, automotive comfort has become a focal point for innovation, driven by consumer demands for a luxurious driving experience that can boost their day-to-day use of vehicles. Advances in expectations and ergonomics mean car seats are now routinely designed to offer enhanced lumbar support, multiple adjustment options, as well as climate control features like heating, cooling, and even massage functions.

RUBIFLEX® HR BIO

In parallel, the industry is also embracing more sustainable ways of working. So, is it possible to achieve comfort while also supporting decarbonization efforts? At Huntsman, the answer to that question is yes – thanks to innovative technologies such as RUBIFLEX® HR BIO system.

This novel foam technology is made with up to 20% bio-based and recycled content and can enable a reduction in the CO_2 footprint of automotive seat foam by up to 25%* – without compromising comfort or quality.

RUBIFLEX® HR BIO system has been developed for use in seat cushions, backrests and headrests typically in the 50kg/m^3 + density range and can provide excellent support, compression sets, hysteresis performance and vibration transmission performance.

With the potential to meet or exceed major automaker specifications and targets in comfort and quality, RUBIFLEX® HR BIO system has low emission and low odor levels. It can also work within existing process and tooling parameters.

Commenting, Josh Wimble, Senior Marketing Manager Automotive, Polyurethanes Americas at Huntsman, said: "The development of RUBIFLEX® HR BIO system is closely aligned with the requirements of OEMs and their suppliers – delivering a density range that can enable a wide range of transportation seating applications. For tier suppliers and molders, our technology can help provide production efficiencies and associated value. For vehicle manufacturers in a variety of industries, our technology can support their low emission and bio content targets."

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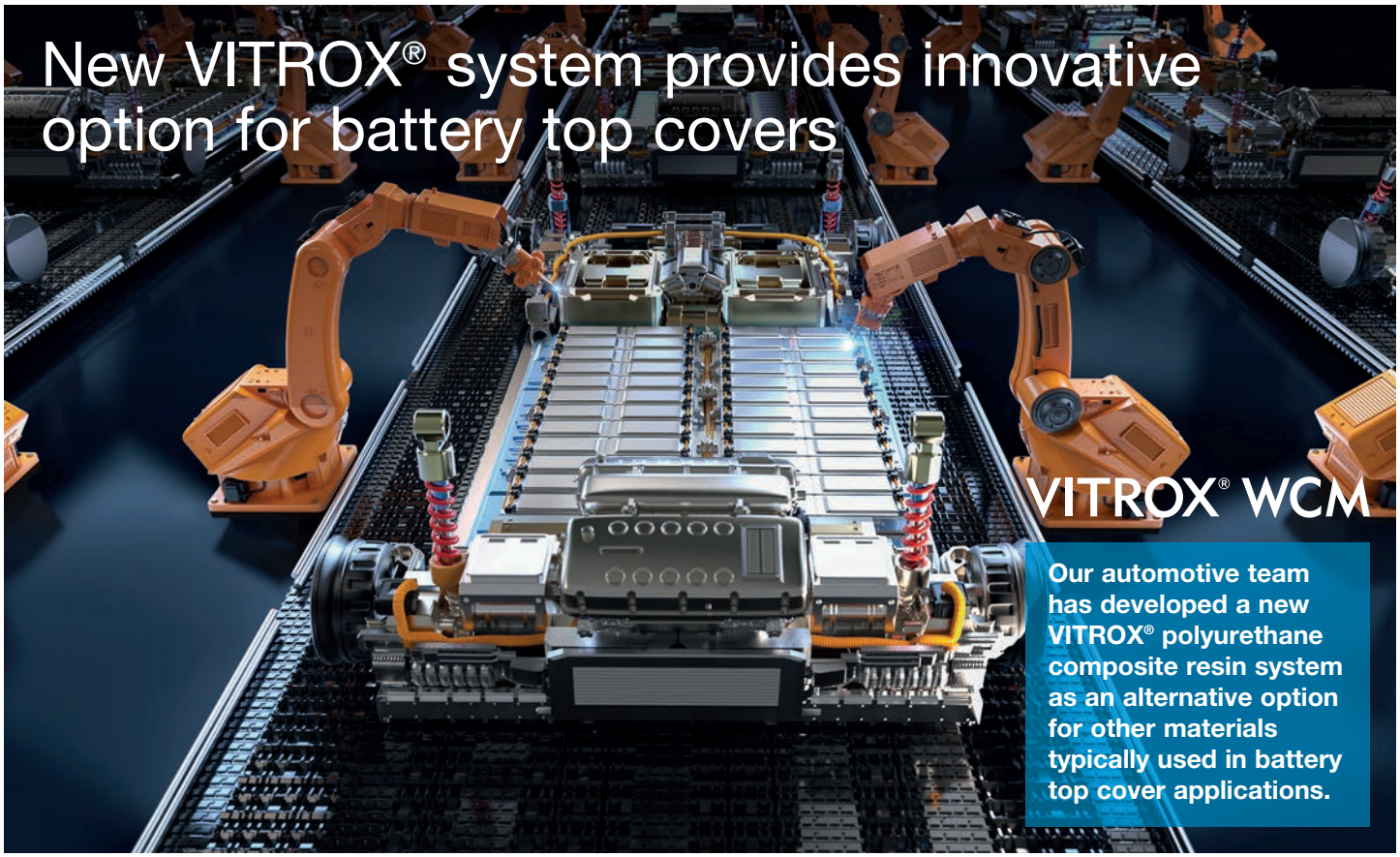
** Depending on the source of the bio-based raw material, comparison with Huntsman incumbent technologies. Cradle-to-gate. Data calculated with Gabi LCA for Expert 2023-2CML 2001, Aug. 2016. Production: Huntsman's Geismar production site specific input/output flow data 2021. Reference system is based on 1 kg of liquid components for foamed seat at recommended ratio. Preliminary results – pending peer review completion.*

New VITROX® system provides innovative option for battery top covers



As the automotive sector's reliance on lithium-ion batteries has increased, the requirements for housing batteries have become more complex – but effective thermal insulation and lightweighting have remained top priorities for specifiers.

To support advances in the sector, the automotive team at Huntsman has been working on an advanced polyurethane-based technology that can be used as a potential alternative to mica and metal in battery top cover applications.

Created in close liaison with a global Tier-1 supplier to the automotive industry, VITROX® WCM polyurethane system has been developed to provide improved thermal resistance alongside the structural performance needed for mission critical battery housing applications.

The new polyurethane system can help protect batteries against thermal events when used in battery lids. Thermal shields made using the technology can have the potential to withstand abrasive impact from overheated particulates.

In addition, thermal shields made using VITROX® WCM system are easy to process using compression spray or wet compression molding techniques. Flexible processing of VITROX® WCM system via these kind of manufacturing methods can help to create composite parts in complex shapes with short cycle times.

Commenting, Irina Bolshakova, Global Marketing Director Automotive at Huntsman, said: "Incumbent solutions for battery housing structures – such as mica and metal – can require complex sourcing, processing and assembly steps and use multiple materials to meet required performance standards. While using multiple layers of different materials can provide the thermal and structural functionality required, it can take up more space, reducing the amount of room available for energy storage and in vehicle trunks and boots."

"These multicomponent solutions also require complex assembly techniques and the use of additional components for joining and adhesion, which can impact costs and the overall weight of final parts. We took all of this into consideration with the development of VITROX® WCM system – creating a solution that can help deliver what is required mechanically but is also lightweight."

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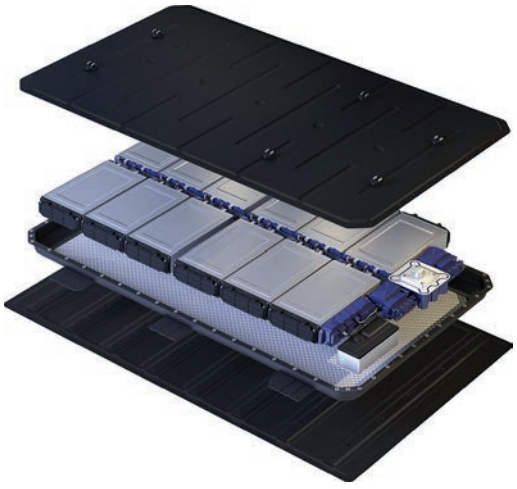
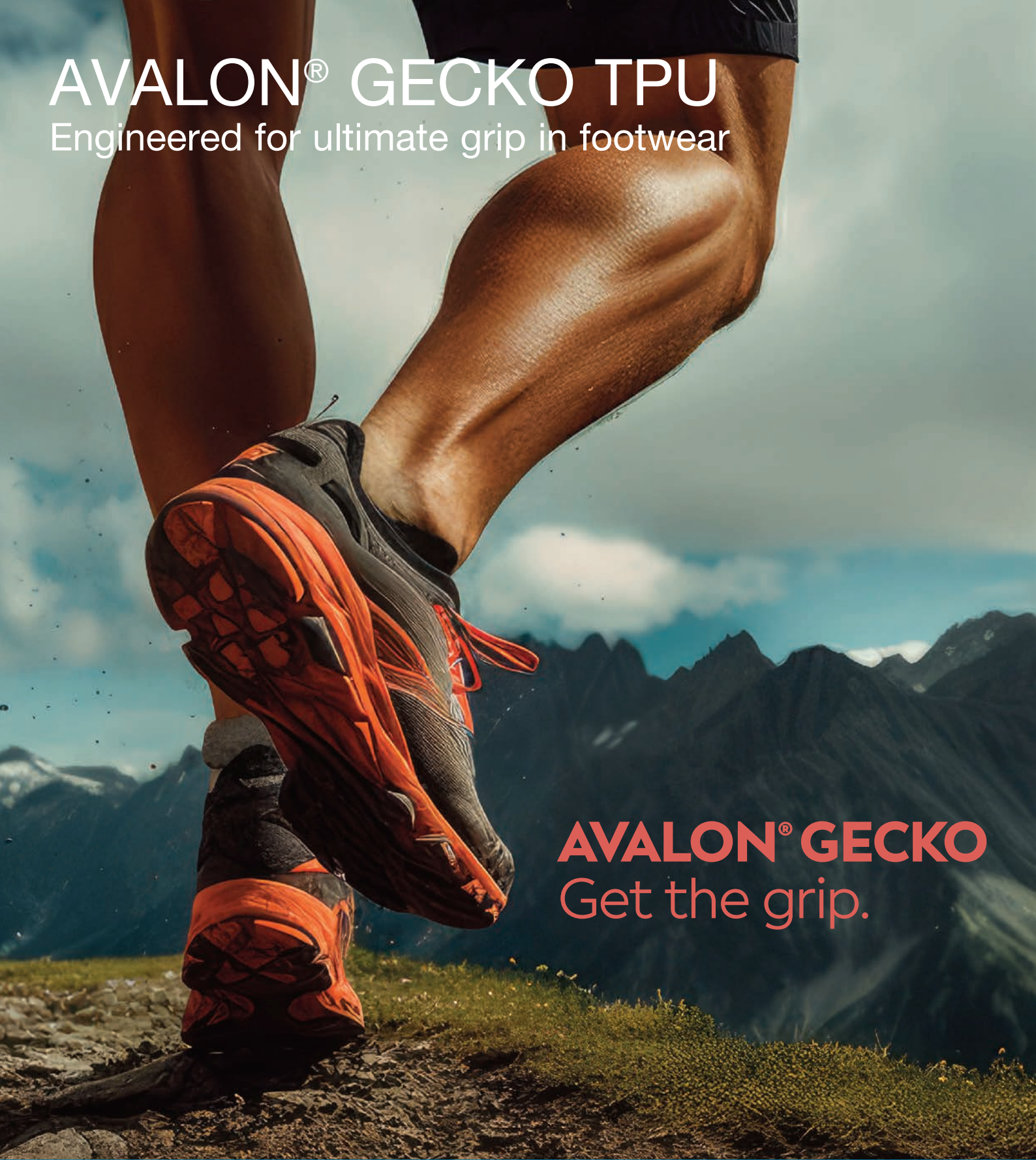
Huntsman has been working on an advanced polyurethane-based solution developed to be used as an alternative solution to mica and metal in battery top cover applications.



AVALON® GECKO TPU

Engineered for ultimate grip in footwear



Our Footwear team recently launched a new range of high performing thermoplastic materials, which offer new possibilities for soling applications. Unveiled at the Northwest Materials Show in Portland, Oregon, the AVALON® GECKO TPU portfolio offers a series of products that have exceptional grip and durability and have been developed with circularity in mind.

Tailor made for use in high performance soling applications, the range includes an extrudable grade for creating super thin outsoles and a product that can be foamed to produce a very low density and super soft material with a unique touch and feel.

Drawing inspiration from the extraordinary grip of geckos, products in the AVALON® GECKO TPU portfolio offer comparable slip performance to rubber in both wet and dry conditions. A great choice for outsoles for running, hiking and safety shoes, the new portfolio contains products that are soft (shore 60-65A) yet highly durable with excellent abrasion resistance.

The extrudable GECKO grade, AVALON® 6053 AG TPU represents a major step forward in footwear – enabling the creation of outsoles that are up to 50% thinner and lighter than conventional outsoles, without compromising quality, performance or durability. The injectable AVALON® 6044 AG grade has been developed to offer fast cycle times for improved productivity.

In addition, all AVALON® GECKO TPU grades offer adhesive-free bonding when paired with other TPU midsole materials and, thanks to their compatibility, can be mechanically recycled with minimal impact on material performance*. They can also be easily coloured and engineered to create different textures and surface finishes.

Matthew Canoy, Global Marketing Director PU Elastomers at Huntsman, said: "The development of AVALON® GECKO TPU represents a significant advancement towards achieving circular footwear. Developed to be dependable, durable, and with circularity in mind, AVALON® GECKO TPU materials ensure that sustainability and high performance are in lock step with one another, with no compromises. The feedback we've received from customers that have tested AVALON® GECKO TPU products has been incredibly positive. We are excited to launch the range and continue our conversations with footwear brands that want to get a gecko-like grip in their soling applications."

To help ensure ultimate design and production versatility for its customers, three grades of AVALON® GECKO TPU are currently available:

AVALON® 6044 AG – an opaque, injectable grade that is ideal for safety shoes

AVALON® 6053 AG – a transparent, extrusion grade optimized for running applications

AVALON® 6055 AG – a transparent, injectable grade for exceptional wet slip performance.

***PU Review* spoke to Peter Chiang, Senior Marketing Manager, Footwear APAC. He gave us the lowdown on the new AVALON® GECKO TPU range and its development.**

PU Review (PU R): Thanks for speaking to PU Review. Can you start by explaining why you have developed AVALON® GECKO TPU?

Peter Chiang (PC): For a long time, rubber has been the go-to outsole material in the footwear industry. This is particularly true in the sports segment where its unique performance combination of abrasion and slip resistance have proved ideal for shoes where there is a lot of movement and friction. This includes running and fast-paced indoor court games such as basketball. Rubber outsoles are also commonly used in safety applications where preventing slips and falls is paramount. With the footwear industry increasingly concerned with recyclability, we decided to develop a thermoplastic polyurethane solution with circularity in mind that could compete with rubber – at all levels.

PU R: What was the biggest challenge in the development of AVALON® GECKO TPU?

PC: The biggest hurdle was achieving the right balance between slip performance, which usually requires a softer material, and strong abrasion resistance, which tends to rely on harder systems. It is also important to minimize the difference between slip performance in dry and wet conditions, as the interface is commonly when falls can occur. We also kept in mind the desire of many brands for a transparent material and the ability to reduce material usage significantly.

PU R: Do you need to process AVALON® GECKO TPU in a particular way?

PC: The two injectable grades of AVALON® GECKO can be processed on standard machinery, which is configured to run with injection grade TPU. The extrudable grade is more of a novelty for the footwear sector – but can still be used on conventional extrusion equipment. This product enables the production of outsoles that are much thinner and lighter than traditional outsoles but can still deliver the necessary performance properties and abrasion resistance needed for intense applications.

PU R: How would a customer pick between the three grades?

PC: It obviously depends on requirements, but we've built flexibility into the AVALON® GECKO TPU range, with three grades available that cover most outsole needs across sports and safety applications. Plus, the Huntsman team is always on hand to offer further guidance as needed. AVALON® 6044 AG is optimised for work boots and safety shoes and is opaque. AVALON® 6053 AG – our extrusion grade – is ideal for running applications where being lightweight is a key requirement. It's also transparent, enabling some great design possibilities. While AVALON® 6055 AG, which is also transparent, is a great choice for hiking boots, offering advanced wet slip performance.

PU R: In common with other industries, there is lots of talk in the footwear sector about what to do with shoes at the end of their life. As such, the idea of creating shoes from a single material is a hot topic. Is the launch of AVALON® GECKO TPU able to support this ambition?

PC: Absolutely. Using AVALON® GECKO TPU for outsoles, alongside a midsole technology such as SMARTLITE® O LTPU, would enable the production of a soling unit that could be recycled. Circularity is becoming more important. This is being driven by changes in regulations, but also consumer expectations. Recycling in-factory waste is already standard practice for TPU and proof of concept is in place for SMARTLITE® O LTPU. The bigger challenge is for the industry to put in place collection, sorting, segregation and, eventually, processes to enable recycling at end of life that can be scaled up.

PU R: What happens to the performance of AVALON® GECKO and SMARTLITE O LTPU systems when they are recycled?

PC: This was uppermost in our mind when developing both products. The use of recycled SMARTLITE® O LTPU back into conventional injection grade TPU has been extensively tested and we've confirmed it can be used at a ratio of up to 50% to virgin TPU to produce a product with good properties. The same is true for AVALON GECKO TPU – which can be regranulated and remolded with minimal impact on material performance*.

PU R: What other key trends are you seeing in the footwear sector?

PC: Circularity is the hot topic right now. In the future, there will be more pressure to stop sending footwear to landfill so infrastructure and processes will need to be put in place to enable re-use and/or recycling. Huntsman has developed the necessary technology to achieve the end result, whether through mechanical or chemical recycling. We also develop durable products which are designed to last longer and maintain performance when compared to many alternatives. There is also a clear drive towards further lightweighting of footwear, especially in the running segment. This could be achieved either through using less material (while maintaining performance) or eliminating components (by combining some functional materials). In some segments, there is a convergence of requirements while still upholding the specifications. For example, the protective shoes segment is looking more towards lightweight and comfort while leisure footwear is adopting the sports running look and feel.

For more information about AVALON® GECKO TPU, go to www.avalon-gecko.com or email: simone_richter@huntsman.com

AVALON® GECKO
Get the grip.

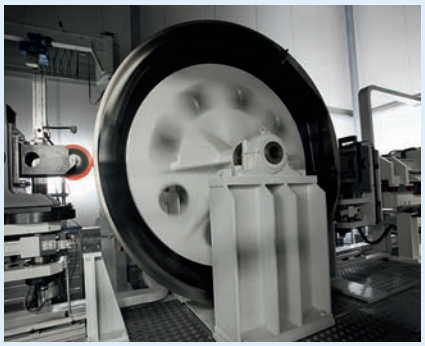
AVALON® 6044 AG is optimised for work boots and safety shoes and is opaque. AVALON® 6053 AG – our extrusion grade – is ideal for running applications where being lightweight is a key requirement.

** Tests performed by Huntsman on outsoles produced using regranulated AVALON® GECKO TPU showed no signs of degradation in performance. The ability to perform mechanical recycling is dependent on end of life take-back programs and a recycling ecosystem being in place.*

Huntsman helps RÄDER-VOGEL develop new generation of anti-static wheels

Elastomers experts at Huntsman have been working closely with the team at wheel and castor manufacturer RÄDER-VOGEL to develop a new generation of polyurethane-based, anti-static PEVOTEC® wheels. The wheels, which utilize Huntsman's TECNOTHANE® hot cast elastomers, have been designed for use in industrial applications where the use of trolleys, carts, automatically guided vehicles (AGVs) is vital to the smooth running of operations – and where static can prove problematic.

RÄDER-VOGEL®
FOR BETTER WHEELS AND BETTER SERVICE



Since 1946, RÄDER-VOGEL has been developing wheels and castors to meet the ever-evolving demands of different markets – from individual customer-specific items to standardized large batches. Under its PEVOTEC® range, RADER-VOGEL offers wheels that can be used under extreme operating conditions. Depending on the task at hand, the team will select different wheel materials – adapting chemical and physical properties to suit requirements.

The build-up of static on wheels can prove problematic in busy manufacturing or production environments.

- The accumulation of static charge on wheels can result in uncomfortable and sometimes painful shocks to personnel handling equipment or moving carts.
- It can damage the electrical components of a vehicle.
- Static on wheels can also attract and hold dust and particles. This can cause a contamination issue in specialist fields including semiconductor manufacturing, pharmaceuticals, and biotechnology.
- Dust build-up can also lead to less traction and cause automated equipment to malfunction – leading to costly downtime.

Using Huntsman's TECNOTHANE® materials, RÄDER-VOGEL has developed a range of PEVOTEC® anti-static wheels that can help reduce these issues, with a variety of options available ranging from 55 to 97 Shore A hardness. The materials also give RÄDER-VOGEL the flexibility to tailor make customized solutions for customers to meet specific needs. Initially, RÄDER-VOGEL will be targeting the new range of wheels at four application areas including:

- Warehousing and logistics for automated guided vehicles that move thousands of products
- Space-saving automated car park systems in cities where vehicles are parked using lifts
- Clean rooms where wheels are used in trolleys and overhead pulleys
- Mining for lift shafts that must function with no risk of sparks that could ignite coal dust.

Huntsman and RÄDER-VOGEL have a long history of working together that dates back more than 25 years. Commenting, Martin Schäfer, Sales Director Export & Special Applications – Materials Handling at RÄDER-VOGEL said: "As ever, we are grateful to the team at Huntsman for their willingness and enthusiasm to innovate in conjunction with our team. Together, we have a track record for pushing the boundaries of what's possible in the world of wheels and castors. This project is no different. Working side by side, we've developed a novel range of anti-static wheels that are set to offer huge benefits across a range of industries. As Industry 4.0 continues to drive new levels of automation and productivity, our wheels can help improve the reliability and lifetime of mission critical equipment."

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Shipping containers insulated with spray foam for Newcastle United fan zone

The Huntsman Building Solutions team in the UK has recently helped repurpose a series of shipping containers – giving them a new lease of life ahead of their installation in a special fan zone adjacent to Newcastle United's football ground – St James' Park.

The containers – which have been insulated with a closed-cell spray foam technology – are housed in a new area of the football club called the St. James' STACK. Fitted together, the containers provide a thriving food, drink and entertainment area for supporters visiting matches at St. James' Park. The STACK is now a bustling midweek leisure and social destination – featuring six bars, and ten street food units, plus a stage and big screens for live entertainment and broadcasting sporting events.

The Huntsman Building Solutions team worked closely with local authorised contractor, VP Foam Spray, to insulate the containers using HEATLOK® HFO Pro closed-cell spray foam. The foam was applied to the metal surface of the containers before they were boarded over the top.

Insulating with HEATLOK® HFO Pro spray foam can help significantly improve the thermal efficiency and weather resistance of the containers. As well as enhancing the containers' functionality, the foam can also contribute to energy savings and environmental sustainability.

VP Foam Spray is a Huntsman Building Solutions authorized installer and an expert in this application – providing the highest standard of service and quality for spray foam insulation in the UK. With the conclusion of the St James' Park STACK project, the two companies hope to work together on other schemes employing insulated containers in the near future.

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The containers provide a thriving food, drink and entertainment area for supporters visiting matches at St. James' Park.

New low conductivity microcell insulation technology supports China's green building innovation

China's construction industry is responsible for more than half of the nation's carbon emissions, underscoring the need for the sector to adopt innovative products that can help reduce energy usage and the carbon output of buildings.

To help tackle this challenge, Huntsman has developed a new low conductivity microcell insulation technology, which utilizes TEROL® aromatic polyester polyols, comprising both pre-consumer and post-consumer sources of recycled PET (polyethylene terephthalate). The outcome is an insulation solution that can effectively reduce the carbon footprint by up to 30% compared with insulation that doesn't contain TEROL® polyols.

One of the key advantages of the low conductivity insulation technology is its microcell structure, which helps it achieve a low thermal conductivity rating of ≤0.019W/(m²·K), compared with a typical rating for rigid polyurethane foam of 0.024 W/(m²·K).

The technology is used for the exterior insulation layer in concrete sandwich panels and its enhanced performance possibilities can help developers significantly reduce, and even eliminate, the use of interior insulation – thereby simplifying the building construction process. The stable molecular structure of the core material also ensure it achieves Grade B1 fireproof rating – the highest possible rating for organic materials.

Use of the technology is already delivering remarkable results. Successfully commercialized, the low conductivity microcell insulation technology has recently been used in several residential projects in Shanghai, including Poly's C&D Impression Qingcheng and Tongji's Panlongli.

Benefits seen to date, across multiple projects, include a reduction in wall thickness by 50mm; a decrease in incremental costs of precast construction by RMB 90 per square meter; and an increase in the usable area of buildings of approximately 1%.

These results show the technology helping to deliver a wider range of benefits across the construction sector – as well as contributing to its long-term energy and carbon reduction goals.

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HBS spray foam technologies help Groupe Valco with challenging project

In Montréal's bustling urban environment, Groupe Valco faced a challenging yet rewarding task: renovating the foundation of a commercial building with precision and innovation.

Renowned for their expertise in insulation and waterproofing, Groupe Valco collaborated with Huntsman Building Solutions to utilize advanced materials like HEATLOK® Soya HP spray foam and COATLOK™ polyurea coating.

These high-performance products provided a resilient and durable solution and are helping to set new standards in modern construction.

Groupe Valco is a leading specialist in urethane and cellulose insulation as well as sprayed polyurea waterproofing. Their commitment to quality and efficiency has earned them a strong reputation. For the project in Montréal, Huntsman Building Solutions' HEATLOK® Soya HP spray foam and COATLOK™ polyurea systems proved advantageous compared to traditional tacked membranes, offering advanced waterproofing and insulation properties that can help protect various building components, including foundations, roofs, and walls.

Addressing traditional foundation issues

The building's original foundation relied on a traditional tacked drainage membrane, which was intended to prevent water infiltration, but can harbor hidden issues post-installation. These latent problems can lead to costly repairs with a risk that the membrane's integrity can be compromised by the weight and movement of the concrete during pouring.

Groupe Valco's solution involved a two-stage process. First, HEATLOK® Soya HP spray foam was applied to correct imperfections in the concrete, providing a solid base for further protection. Next, a layer of COATLOK™ polyurea was sprayed over the foam, creating a seamless and durable barrier that significantly enhances the foundation's waterproofing and longevity.

Overcoming urban construction challenges

In dense urban settings like Montréal, traditional excavation methods are often impractical. Groupe Valco tackled this issue by applying their waterproofing membrane directly to the adjacent structure from an elevated position, avoiding the need for extensive digging. This innovative approach allowed them to complete the project efficiently despite space constraints.

The combined application of HEATLOK® Soya HP spray foam and COATLOK™ polyurea resulted in a foundation that is structurally sound but also thermally efficient and resistant to moisture. This project stands as a testament to Groupe Valco's ability to transform traditional construction challenges into opportunities for innovation, setting a new benchmark for foundation waterproofing in urban environments.

Maxime Duzyk, Senior Global Director, Building Science & Engineering at Huntsman Building Solutions, said: "Through this successful collaboration, Groupe Valco and Huntsman Building Solutions have demonstrated that advanced materials and innovative techniques can elevate both the form and function of modern construction. This Montréal project showcases how cutting-edge solutions can address today's building challenges while paving the way for future standards in the industry."

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Open-cell spray foam insulation product sets new standard for fire safety

The team at Huntsman Building Solutions has developed a new open-cell spray polyurethane foam insulation, designed specifically for use in unventilated attics and crawl spaces that has excellent fire resistance properties.

Icynene® Xpress 55 is a low-density system that offers a new standard in Appendix X compliant open cell spray foam. Part of the company's I-Series, the new product exceeds stringent fire-test requirements from the International Building Code and complies with the AC-377 Appendix X. If a fire occurs, the insulation is designed to discontinue propagating a flame once that flame is removed from the spray foam.

In addition, Icynene® Xpress 55 offers an R-value of R-3.7 at 1" and R-13 at 3.5". The 0.5 pound spray foam provides excellent adhesion to a wide variety of substrates, as well as between layers. It can also help reduce outside noise and pollution; does not deteriorate or decompose; and is compliant with the International Residential Code (IRC), International Energy Conservation Code (IECC), California CA 01350 Low VOC, Intertek, and ICC ES.

Commenting on the launch, Doug Brady, President of Huntsman Building Solutions, said: "Icynene® Xpress 55 is the newest addition to our Icynene® Series line of high-performance spray foam insulation products. This open cell solution is noteworthy as, once applied, no ignition barrier is required if the attic will be used for the service of utilities only." |

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ICYNENE® XPRESS 55

Forthcoming events and technical presentations

2025

JEC World 2025 – Paris, France (4-6 March)

European Coatings Show – Nuremberg, Germany (25-27 March)

Chinaplas – Shenzen, China (15-18 April)

Heating Engineering Construction and Efficient Operation – Fuzhou, China (16-18 April)

LIGNA – Hannover, Germany (26-30 May)

The Battery Show Europe – Stuttgart, Germany (3-5 June)

EUROPUR and EURO-MOLDERS Annual Conference – Alicante, Spain (4-5 June)

Polyurethane Technology International Forum 2025 – Shanghai, China (25-27 June)

PUtech Eurasia 2025 – Istanbul, Turkey (26-28 November)

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