

News Release

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BASF at Simac – Endless possibilities of combining design, performance, and sustainability for footwear

- **Step towards a net-zero emissions with the Reduce, Recycle, Rethink approach**
- **Innovative coating technologies for highly flexible substrates**
- **Additive manufacturing – a game changer for the footwear industry**
- **Infinergy® – more comfort for business shoes**

Sustainable PU systems, TPU and E-TPU, 3D printed molds, functional coatings, and the comfort of a sneaker for dress shoes – all these solutions for the footwear industry will be presented by BASF at Simac. The international machinery and technology exhibition for shoes, is being held in Milan from September 22-24. In hall 14, booth G 40, visitors will be given insights into sustainable footwear solutions, high performance materials and coating solutions for shoe soles.

Footwear innovations for circular economy

Future-oriented footwear materials are inconceivable without sustainability. Sustainability is a main pillar of BASF's strategy and an integral part of all business decisions. That is why BASF invests around 2 billion a year in research and development and drives the development of new products that make a significant contribution to sustainability. BASF's approach to a circular economy in footwear consists of three fields of action: Reduce, Recycle, Rethink. At the show, BASF experts will give a deep insight into this approach and present sustainable material solutions for polyurethane systems and thermoplastic polyurethanes.

The main goal is to reduce the consumption of fossil resources and thus CO₂ emissions. Elastopan® N (PU systems) and Elastollan® N (TPU) contribute to this, as they are partly based on renewable raw materials such as sugar, corn or castor oil. These bio-based plastic solutions are available in various densities and degrees of hardness and are suitable for all applications in the footwear sector.

In addition, BASF's integrated production system enables the substitution of fossil by renewable feedstock derived from bio-waste. This concept, called the BASF biomass balance approach, can be compared to green electricity: When alternative energy sources (e.g., wind and solar energy) are fed into the power grid, the output of the end product, electricity, remains unchanged. Similarly, at BASF: the biobased or recycled raw materials are fed into the production network at the beginning and then further processed in many steps, e.g., into plastics. This principle offers the advantage that greenhouse gas emissions are reduced, and fossil raw materials are saved, while product quality and properties remain the same. For customers in the footwear industry, this also means that the product design and the processing for shoes do not have to be adapted. This concept can be applied to BASF's complete range of PU systems, TPU and E-TPU for footwear.

To achieve the ultimate goal of a circular economy, we need to rethink the production and use of footwear in general. This is the task that Italian designer Linda Lipari, together with designer Pierpaolo Righetto and students from Calzaturiero Politecnico (the School of Footwear Design and Technology) dedicated themselves to during the recent design competition, namely "design in the sign of sustainability". The basis for the students' various creative interpretations is the designers' "RE2.0" sole design. RE implies Restart, Rethink, Recreate, Reconquer the world. The students' unique shoe creations, combinations of design, performance, and sustainability, will be presented at the BASF booth.

Highly elastic soft touch coatings

Furthermore, BASF will present innovative coatings technologies for highly flexible substrates from our Coatings division. These solutions protect, functionalize and color flexible surfaces. They set new standards in design opportunities, individualization and enable BASF's customers to optimize their processes.

As NovaFlex valure™, BASF markets reverse-coated substrates which can achieve unique optical and haptic properties by combining paint formulation, texture, and carrier material. NovaCoat-D combines in-mold coating and release coating in a new

way. Besides its demold properties, the coating provides protection against sunlight, scratches, and dirt. Thanks to its many years of expertise, BASF can offer a wide range of colors and effects and bring in additional functionalities for e.g., shoe uppers and sole.

3D Printing – from molds and tools to completely printed shoes

From 3D printed molds and tools to completely 3D printed shoes – Additive Manufacturing can be a real game changer for the footwear industry. At Simac 2021, BASF 3D Printing Solutions GmbH with its brand Forward AM presents 3D printed molds and lasts through which development cycles can be shortened tremendously. On top of this, visitors will see completely 3D printed high heels and barefoot shoes as well as midsoles manufactured with latticed designs which enable new ways of cushioning, shock absorption and comfort and which can be tuned to the customer's specific needs. Lattice designs can be challenging for traditional manufacturing methods but are easy to produce in Additive Manufacturing. So, they perfectly showcase how 3D printing supplements traditional manufacturing methods and how customers benefit from BASF's cross-technology solutions. This will also be highlighted by a new solution for the shoe industry – presented for the first time at Simac – which combines 3D printing with Infinergy® material.

Infinergy® - the comfort of a sneaker for business shoes

Infinergy®, is the expanded thermoplastic polyurethane (E-TPU) and leading high-performance responsive material by BASF. The closed-cell, elastic particle foam combines the properties of TPU with the advantages of foams, making it as elastic as rubber but lighter. It provides exceptional cushioning. Initially it was designed for the world of sports. Since 2015 Infinergy® is used in the midsole of safety shoes and setting new standards for cushioning and comfort in shoes. These standards are now transferred to business and casual shoes. Professionals who are constantly on the go can now benefit from Infinergy® in particular as it returns the energy in each step, reducing fatigue and dampening shock on joints. Infinergy® offers a natural cushioning effect at the heel and middle part of the foot in the sole. The responsiveness and rebound allows more comfort in movement which is a real relief for professionals battling long-standing hours at work and commute.

More information www.footwear.basf.com

More information to circular economy and mass balance approach of BASF:

<https://www.basf.com/global/en/who-we-are/sustainability/we-drive-sustainable-solutions/circular-economy.html>

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About BASF's Performance Materials division

BASF's Performance Materials division encompasses the entire materials' know-how of BASF regarding innovative, customized plastics under one roof. Globally active in four major industry sectors – transportation, construction, industrial applications and consumer goods – the division has a strong portfolio of products and services combined with deep understanding of application-oriented system solutions. Key drivers of profitability and growth are our close collaboration with customers and a clear focus on solutions. Strong capabilities in R&D provide the basis to develop innovative products and applications. In 2020, the Performance Materials division achieved global sales of €5.63 bn. More information online: www.plastics.basf.com.

About BASF 3D Printing Solutions

BASF 3D Printing Solutions GmbH, headquartered in Heidelberg, Germany, is a 100% subsidiary of BASF New Business GmbH. It focuses on establishing and expanding the business under the Forward AM brand with advanced materials, system solutions, components and services in the field of 3D printing. BASF 3D Printing Solutions is organized into startup-like structures to serve customers in the dynamic 3D printing market. It cooperates closely with the global research platforms and application technologies of various departments at BASF as well as with research institutes, universities, startups and industrial partners. Potential customers are primarily companies that intend to use 3D printing for industrial manufacturing. Typical industries include automotive, aerospace and consumer goods. For further information please visit www.forward-am.com.

About BASF

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. More than 110,000 employees in the BASF Group contribute to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF generated sales of €59 billion in 2020. BASF shares are traded on the stock exchange in Frankfurt (BAS) and as American Depositary Receipts (BASFY) in the U.S. Further information at www.basf.com.