LanzaTech

On presents the first ever shoe made from carbon emissions in partnership with LanzaTech, Borealis and Technip Energies

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Swiss sports brand On presents the first shoe made from carbon emissions, called Cloudprime. This is a significant moment in On's journey to move away from petroleum-based resources by creating a new foam material called CleanCloud™, made using carbon emissions as a raw material. On is the first company in the footwear industry to explore carbon emissions as a primary raw material for a shoe's midsole, specifically EVA (ethylene vinyl acetate) foam, that could also be used in other shoe parts and products in the future.

On's ambitions are high: The sports brand born in the Swiss Alps envisions a future where every On product is fossil free and fully circular. CleanCloud™ is the result of five years of dedicated work, which began with finding the best possible partners. This collaborative approach is key to overcoming the challenges of developing this complex technology at a commercial scale.

"Holding the first-ever shoe made of carbon emissions in my hands is a huge milestone – not only for On, but for the whole sports industry", explains Caspar Coppetti, Co-Founder and Executive Co-Chairman of On. "Five years ago, this was barely a dream. Imagine what can happen in the future as we unlock the potential of alternative carbon sources with further research and in collaboration with the best partners."

CleanCloud™ is the result of a pioneering supply chain partnership with some of the most innovative companies in biochemicals, process and material innovation, including LanzaTech, Borealis and Technip Energies. LanzaTech is using a combination of cutting-edge genetic engineering, state-of-the-art biotechnology, artificial intelligence, and innovations in mechanical and chemical engineering to manufacture chemicals using a process that soaks up waste carbon rather than emitting it.

"Today we continue our journey to show the world that recycled carbon is a resource rather than a liability" says Jennifer Holmgren, CEO of LanzaTech. "As we increasingly convert pollution into the products we use in our daily lives, we will reduce the need to extract more carbon from the ground! The partnership between On, Borealis,Technip and LanzaTech will change how the world thinks about sourcing carbon, enabling us to bend the carbon curve, keep our skies blue, and create a sustainable future for all."

Technip Energies is a leading engineering and technology company for the energy transition and in this consortium in charge of the process of dehydrating ethanol to the gas ethylene, which is a monomer and the most important building block of widely used plastics.

Bhaskar Patel, SVP Sustainable Fuels, Chemicals & Circularity at Technip Energies: "Technip Energies is proud to be supporting On in this exciting project to make CleanCloud™ a reality. The application of our Hummingbird@ technology to produce bio-ethylene is one step to a more sustainable future. We look forward to working with the On team to scale up and help bring CleanCloud™ to the world."

Borealis is a leading provider of advanced, circular and renewable plastic solutions and essential in creating high-performance, easy-to-process EVA foam for CleanCloud™. This collaboration clearly underlines Borealis'commitment to a net zero future and fully aligns with its EverMinds™ ambition of accelerating circularity through partnerships.

Lucrèce Foufopoulos, Borealis Executive Vice President Polyolefins, Circularity and Innovation & Technology: "Borealis is thrilled to be part of this unique value chain collaboration. With our creative partners On, LanzaTech, and Technip Energies we are proud to co-create circularity in carbon, and decouple plastic from its reliance on fossil-based resources. Through innovation and collaboration, we continue re-inventing essentials for sustainable living."

This is how it works: Technology from LanzaTech captures carbon monoxide emitted from industrial sources like steel mills before being released into the atmosphere. Once captured, these emissions enter a patented fermentation process. Thanks to specially selected and naturally occuring bacteria, the carbon rich gas ferments naturally and is converted to ethanol. This natural fermentation process is similar to that of conventional alcohol production – e.g., beer brewing. The ethanol is then dehydrated to create ethylene by Technip Energies, which is then polymerized by Borealis to become EVA (ethylene vinyl acetate) in a form of solid small plastic pellets – the versatile and lightweight material that On starts working with to create a performance foam for shoes.

On's ambition is to bring the CleanCloud™ technology to as many consumers as possible in the near future. "We believe that On can be an agent for positive change through enabling and accelerating the scale up of sustainable technologies such as CleanCloud™", says Caspar Coppetti.

Driven by the same spirit of sustainable innovation, On is collaborating with circular start-up Novoloop on the CleanCloud™ outsole, by utilizing the world's first chemically upcycled TPU from post-consumer plastic waste. The outsole was put under rigorous lab and athlete testing, meeting specifications comparable to fossil derived TPUs with a significant carbon footprint reduction. For the upper, On is collaborating with the young French start-up Fairbrics to create a polyester-based textile made from carbon emissions.

Learn more about On's sustainability journey in the On Impact Progress Report.

High-res images are available via this link as well as further images from Borealis here.