Muirhead harnesses protein-based technology for sustainable seat cushions

Muirhead's BioPRO Foam

Muirhead has unveiled BioPRO® Foam, an approach to sustainable comfort by harnessing protein-based technology.

As a proprietary and patented innovation, BioPRO® establishes a new product category, offering a fresh alternative to conventional foams. The moulded cushions made from BioPRO® ensure consistent shape and size, guaranteeing a uniform appearance throughout the cabin.

Made with 20 percent protein content – which replaces the problematic substances and forever chemicals found in traditional seat foam – BioPRO® is more natural and sustainable by design. It is durable and naturally fire-resistant outperforming traditional foam products on both metrics, Muirhead said in its press release.

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The foam is custom-moulded to the customer's exact specifications regarding shape, weight, density and more. As it is moulded rather than cut, this process generates zero waste during production.

From by-product to protein-based innovation

Muirhead has been looking to find alternative uses for hydrolyzed collagen, which is a by-product of our leather-manufacturing process, for a number of years.

During its initial exploration, the supplier noticed that this hydrolysed material could foam and gel and it was also fire-resistant. This sparked the idea to use this collagen to create a superior seat cushion, the press release said.

Not all bio-content is created equal. Many manufacturers claim high bio-content, yet, much of it comes from plant-based polyols that rely on plastic bonding agents. Often, these additives do not integrate into the foam structure, leading to premature breakdown, reduced durability, and compromised performance.

BioPRO® takes a different approach. By chemically bonding 20 percent natural biomass — specifically hydrolyzed collagen sourced from our own manufacturing process —the bio-content becomes an active, functioning part of the foam.

As the third most prevalent natural material on Earth, collagen possesses unique properties that make it an ideal component: it foams, gels, and resists fire under extreme conditions. The result is a high-performance, environmentally sustainable seat cushion alternative that replaces fossil fuel-derived components while significantly reducing carbon emissions in aircraft interiors.

After five years of research, development, chemistry, analysis, rigorous testing and prototyping – Muirhead is proud to present a finished bioprotein product.

"The key aspect is that the tertiary amine groups of the hydrolysed protein are bonded to the other ingredients, forming stable bonds and producing a more functional material," said Dr Warren Bowden, Head of Innovation and Sustainability.

Muirhead BioPRO® Foam will be on display at the Aircraft Interiors Expo 2025 (AIX), at Booth 6E95.

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