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Milliken Scrubs PFAS from Fibers and Finishes

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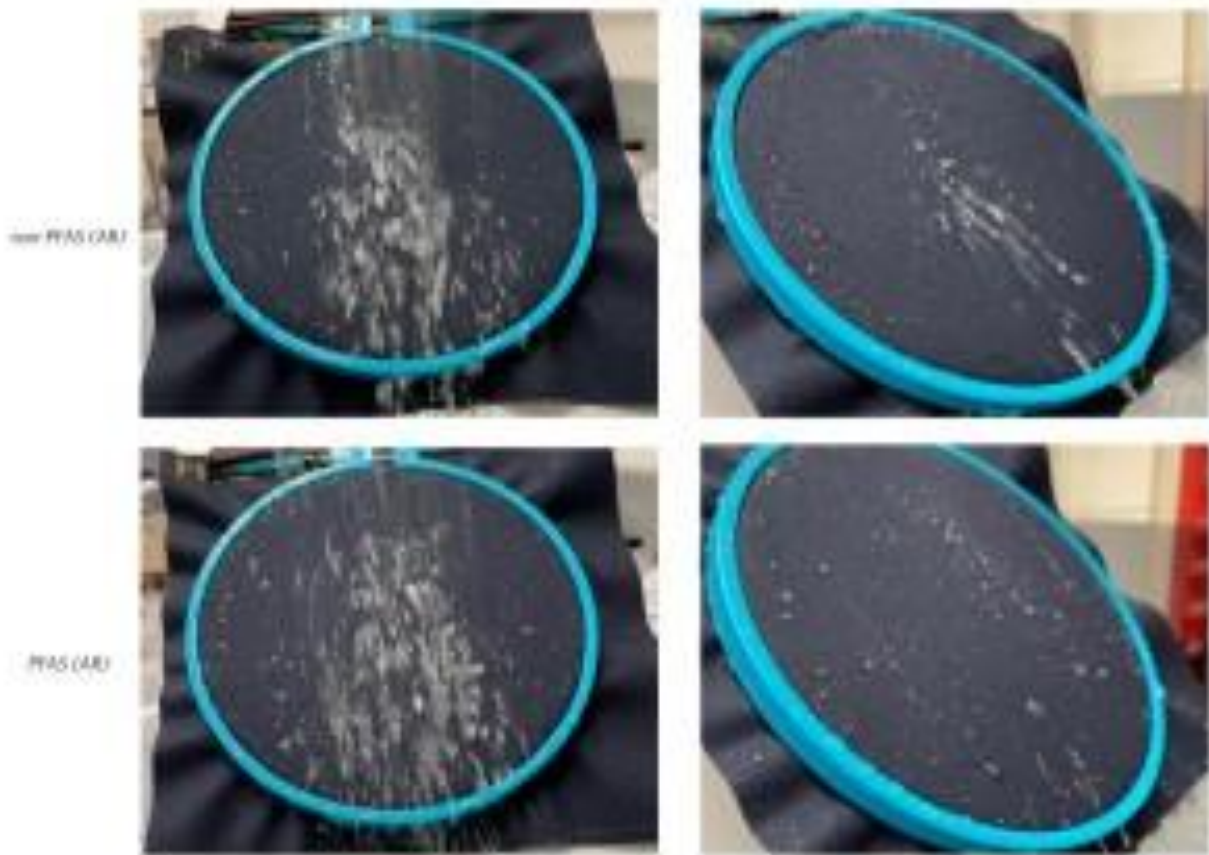
MILLIKEN HAS ACHIEVED ITS GOAL OF NIXING PFAS FROM ITS FIBERS AND FINISHES PORTFOLIO. COURTESY

[Milliken & Co.](#) has eliminated per- and poly-fluoroalkyl substances—a family of chemicals known collectively as [PFAS](#)—from its product lines, making it the first U.S. multi-market textile manufacturer to do so.

The South Carolina company said it was working to overhaul its textile fibers and finishes portfolio in early 2022, but the work began more than three years ago, according to Jeff Strahan, director of research, compliance and sustainability at [Milliken](#)'s textile division. The [writing has been on the wall for PFAS](#) for some time, with the Environmental Protection Agency (EPA) fingering the group of substances for its link to adverse effects in people and persistence in plants, animals and waterways.

The agency's October 2021 [PFAS](#) Strategic Roadmap outlined timelines for new policies that it believes will safeguard public health and the environment from these "forever chemicals." In February, President Biden's bipartisan infrastructure bill set aside \$2 billion to address PFAS water contamination, with funds currently allocated to communities in New Jersey, Oregon and Wisconsin. Massachusetts State Rep. Kate Hogan has introduced legislation that would ban the presence of PFAS in different product categories by 2026, and [California](#) Governor Gavin Newsom signed the Safer Clothes and Textiles Act into law last fall, compelling textile and apparel makers to phase out PFAS by 2025.

With both federal and state governments bearing down on PFAS, Milliken has been working to phase them out altogether, Strahan said. "Wayne Gretzky was so good at hockey because he went where the puck was going to be, not where it is," he said. "Milliken looked ahead and said, 'Where's the puck going to be?' And there's going to be no PFAS on that puck."



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The textile division segmented its portfolio into three areas: durable water repellency (DWR), soil release, and oil repellency. Non-PFAS DWRs have been a market focus for

some time, and alternatives are readily available from suppliers, Strahan said. Soil release chemistry is trickier. “That’s the project that took three to four years of dedicated R&D resources, and then development, to bring to production,” Strahan said. “That was a challenge.”

Milliken tested the chemistry at its on-campus Rapid Prototype Center (RPC) in small-batch trials on up to 18 inches of fabric. These in-house studies gave the company confidence in new soil release applications before sending them to Milliken textile plants for full-scale testing. Milliken said the proprietary technology is not an alternative to every soil-repellant finish application, but the solutions are equivalent or superior in performance to previous PFAS-based finishes.

Developing new solutions has been a collaborative process. “We have a good relationship with our suppliers and a lot of them they’ve been very proactive,” Strahan said. “Not every innovation has to come from within your four walls.”



MILLIKEN RAPID PROTOTYPE CENTER (RPC). COURTESY

But after vetting chemical producers for a PFAS-free alternative to provide oil repellency, Milliken came up empty-handed and discontinued that line of business. “No one’s close; it’s just not there,” Strahan said. The fundamental science of oil repellency depends on fluorine, an element of PFAS. Applications have to hold up against oil, and withstand dyeing and washing without the loss of performance. These fabrics are often

used for heavy-duty uniform applications for oil & gas, military, and other demanding jobs.

Customer reactions to the company's decision to abandon PFAS have been mixed, with varying legislative and scientific literacy across Milliken's portfolio, Strahan said. Some clients are aware of, and developing contingency plans for, impending [regulations](#), while others have been reluctant to move away from solutions made with PFAS due to concerns about whether the new solutions will meet their customers' specifications.

But the current "patchwork" of state government actions could be superseded by the new EPA regulations surrounding drinking water, which will "essentially make [PFAS] illegal to use without having extremely onerous purification techniques that don't really exist at scale right now, and would be price prohibitive," he added.

Though the company stopped making products using PFAS at the end of last year, it will take some time to complete final deliveries and see them totally exit the pipeline. Many clients have already transitioned to [Milliken](#)'s PFAS-free alternatives. "Some markets and [companies](#) are very well educated; they really know their stuff. They see where the hockey puck where is going to be, and so they've been supportive of our exit," Strahan said.