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An 'enormous' push to find PFAS replacements in manufacturing



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Liz Harriman from the Toxics Use Reduction Institute, left, Bianca Hydutsky of Chemours and Jay West of the American Chemistry Council take part in an Oct. 18 panel at an SPE conference on PFAS,

Baltimore — As scrutiny of fluorinated PFAS compounds increases, plastics companies using them as aids in manufacturing or as additives like flame retardants say pressure is rapidly growing to phase them out.

"I'd say in the last six months there's been an enormous change," said Mike Goode, chief commercial officer for FRX Polymers Inc., a Chelmsford, Mass., maker of flame retardants, addressing a recent industry conference. "They're all looking at replacing it ... and that's because certain really well-known brand owners are asking for it."

Goode, whose company makes non-PFAS replacement products, named electronics maker Apple, e-commerce giant Amazon and energy management firm Schneider Electric, although he said Schneider may be more exploratory than the others.

Goode and others at an Oct. 18-19 Society of Plastics Engineers conference, Per- And Polyfluoroalkyl Substances (PFAS) in the Plastics Industry, cautioned that the scientific and performance questions are complex, with drop-in replacements sometimes hard to find.

But scrutiny is growing, including in the packaging market.

"I don't know how many brands are here [at the conference] but the few that I know, that I've worked with, they have already made up their minds for packaging – they told us to change," said Roberto Nunez, director of market development at Baerlocher USA, a unit of the German additive maker. "They told that to film companies, to suppliers. You have no choice. The only question is how or what cost."

Nunez gave a presentation at the conference on PFAS-free polymer processing aids that Baerlocher had developed, where he also discussed market trends.

Fluorinated PPAs are used in manufacturing of blown film, wire and cable, and pipe to help molten polymers flow quickly against metal dies and molds, and they perform well, he said.



Nunez

"The bottom line is these fluoropolymers, for these applications for packaging, perform wonderfully," Nunez said. "It's not easy to replace them. We have to have the performance."

Evaluating replacements

The conference, held over two days in Baltimore, included speakers from the Environmental Protection Agency discussing EPA's far-reaching regulatory agenda around PFAS, such as proposing new standards for drinking water and regulations limiting PFAS discharges from chemical and plastics plants.

The 2022 federal infrastructure law included \$10 billion for grants for drinking water cleanup. As well, earlier this year, DuPont, Chemours, Corteva and **3M** agreed to pay

more than \$11 billion to settle water contamination lawsuits.

PFAS chemicals are widely used in consumer products, including as nonstick coatings on pots and pans and to make stain- or water-resistant additives for carpets and clothing, as well as in firefighting foams and as manufacturing aids and flame retardants.

The conference sessions were peppered with questions about evaluating the performance and cost of PFAS replacements in manufacturing operations, but it also included a warning about societal costs, from an academic center working on PFAS alternatives.

"We're also spending billions and billions of dollars trying to clean up water supplies, and that doesn't even begin to clean up the soil," said Liz Harriman, deputy director of the Toxics Use Reduction Institute at the University of Massachusetts Lowell. "Every single day we add more fluorinated compounds to our environment, to our drinking water, to our built environment, and so we want to slow and eventually stop that kind of contribution."

There are places today where fluorinated chemicals are needed, speakers said, pointing to their key role in making products vital to national competitiveness and green technologies, including in computer chips and in batteries for electric vehicles.

"We're seeing people right now looking at where to invest," said Bianca Hydutsky, global technology director for advanced performance materials for Chemours. "If the U.S. wants to have less dependence on foreign chips or materials for the EV industry, we need to understand how to do that."

Still, Harriman urged the industry to work on nonfluorinated replacement chemicals in key industries, like finding polyvinylidene fluoride alternatives in batteries.

"There's a lot of talent, not just in this room but in the whole plastics supply chain," Hydutsky said. "I would be willing to bet we could come up with ways of producing energy storage that doesn't necessarily need PVDF, that we could come up with clean energy systems that don't need fluorinated refrigerants. It's not going to happen overnight."

As well, speakers from the American Chemistry Council and companies argued that regulators should distinguish between much-needed fluoropolymers, which are inert and don't break down, and the PFAS compounds like PFOA and PFOS that have been targeted for strict drinking water and environmental limits.



Goode

Regrettable substitutions

Goode, from FRX Polymers, said the companies they sell products to are worried about the potential health impacts of replacements.

"This phrase we've heard a lot of times: regrettable substitution. They're all so scared of making that mistake," Goode said, noting that some chemicals that could be replacement flame retardants have drawn questions from European regulators about whether they're endocrine disrupters.

A speaker from medical device maker Boston Scientific appealed to the plastics engineering community to work with them on finding fluoropolymer replacements, even if that could be very difficult in some cases.

"From an alternatives perspective, there is no silver bullet; we can't just pick another polymer and throw it in there," said Gene Storbeck, a process development engineer who discussed the company's use of fluoropolymers in catheter tubing and devices for use inside the body.

Still, he said Boston Scientific wants to find alternatives: "We want to challenge the fluoropolymer status quo," he said.

With all the push for replacements among processing aids, Nunez told the conference it's an opportunity for an image-challenged plastics industry to help address public concerns over use of PFAS, or forever chemicals.

"Just to be clear, I love plastic, and not just because I'm a chemist but because of the value it brings to society, but we're in trouble," he said, adding that he thought finding more sustainable replacements could be an opportunity for the industry.

"I think it's also important for the image of the plastics industry to be able to say, in this circumstance, we can do it," Nunez said.