Reinventing Warmth With Recycled Plastic

When outerwear design changed in the late 1970s – from big puffy jackets to coats with thinner silhouettes – 3M™ Thinsulate™ Insulation was there to help keep the warmth in and the bulk out.

3M Scientists like Ken Cox continued to develop innovative ways to make the insulation warmer and more versatile — but also more sustainable.

“We are always asking ourselves, how can we do a better job of using the resources that are already out there?” asked Ken, lead application engineering specialist at the 3M Thinsulate Global Design Lab.

3M is introducing the first 3M Thinsulate Insulation made with 100% recycled content this fall. It’s designed as a replacement for down and to retain most of its extreme warmth even under damp conditions.

Designed for circularity

The new insulation is part of 3M’s work to help outerwear manufacturers reach their sustainability goals and is part of 3M’s strategic focus on advancing a circular economy that designs out waste, keeps products and materials in use and integrates more renewable raw materials.

The 3M Thinsulate Insulation team has been developing filling for coats made with recycled content for years, but to reach 100%, Cox and his team turned to new ways to use fibers made from recycled plastic bottles.

But it wasn’t just a matter of switching out virgin materials for recycled. The new product still needed to perform. The engineers who have developed Thinsulate test and prove its ability to perform in terms of weight and warmth using thermal imagery and numerous durability tests. This calls upon 3M’s technology expertise in nonwoven materials, polymer processing, adhesives, thermal management and sustainability.

“We’re really good at optimizing how to put the construction of Thinsulate together,” said Mike Mandanas, lab manager, 3M Home Care Division. “We use multiple recycled fibers with different characteristics to be the best-performing product we can design.”

The new product has received the OEKO-TEX® Standard 100 Class I Certificate, signifying that it meets the human-ecological requirements for products for babies and young children. It is also bluesign® approved, which signifies it complies with strict ecological and toxicological requirements of the bluesign® criteria, allowing for production with minimum impact on people and environment.

Adapting to a changing environment

But why the emphasis on recycled materials? Because the public was asking for it.

3M Thinsulate Insulation began introducing 50% recycled product in the 1990s, and over the years demand has increased among customers and consumers for clothing that is better for the planet. Just last year, the team introduced an 83% recycled product.

According to the American Chemistry Council, increasing the amount of plastics recycled is “a critical part of moving toward a more circular economy.” The council’s Plastics Division has set a goal of recycling or recovering all U.S. plastic packaging by 2040.

“Consumers are demanding it more. They want to do good, but the product still has to perform. That’s the most important part,” said Amy Haase, marketing communications with the Home Care Division. “If we can make a product with recycled content that performs just as well as the original, that’s what they’ll choose.”
The sustainability focus doesn’t stop at what goes into warm clothing. 3M manufacturing plants that produce Thinsulate insulation are recycling 100% of their polyolefin waste material, selling it to companies that use it for everything from oil booms to furniture.

“The sustainability portion is still going to evolve,” said Mike. “We’re following the circular economy.”