

## CLOSED-LOOP RECYCLING PILOT PROJECT FOR SINGLE-USE FACEMASKS

Due to COVID-19, use of billions of disposable facemasks is raising environmental concerns especially when they are discarded in public spaces, including parks, open-air venues and beaches. Apart from the challenge of dealing with such huge volumes of essential personal healthcare items in a sustainable way, simply throwing the used masks away for disposal on landfill sites or in incineration plants represents a loss of valuable feedstock for new material.

Recognizing the challenge, Fraunhofer, SABIC, and Procter & Gamble join forces in closed-loop recycling pilot project to explore how used facemasks could potentially be returned into the value chain of new facemask production.

### VALUE CHAIN PARTNERS AND MATERIAL SOLUTIONS

As part of the pilot, P&G collected used facemasks worn by employees or given to visitors at its manufacturing and research sites in Germany. Although those masks are always disposed of responsibly, there was no ideal route in place to recycle them efficiently. To help demonstrate a potential step change in this scenario, special collection bins were set up, and the collected used masks were sent to Fraunhofer for further processing in a dedicated research pyrolysis plant.

At Fraunhofer the masks were first automatically shredded and then thermochemically converted to pyrolysis oil.

The pyrolysis oil was then sent to SABIC to be used as feedstock for the production of new PP resin. The resins were produced using the widely recognized principle of mass balance to combine the alternative feedstock with fossil-based feedstock in the production process. Mass balance is considered a crucial bridge between today's large scale linear economy plants and the more sustainable circular economy of the future, which today is operated on a smaller scale but expected to grow quickly.

Finally, to close the loop, the PP polymer was supplied to P&G, where it was processed into non-woven fibers material.

### SABIC'S ACTIVE COLLABORATION WITH THE VALUE CHAIN DEMONSTRATES THE FEASIBILITY OF CLOSED-LOOP RECYCLING FOR SINGLE-USE FACEMASKS



#### CLOSED-LOOP RECYCLING PILOT PROJECT FOR SINGLE-USE FACEMASKS

- P&G collected post-consumer facemask in-house
- FRAUNHOFER converted masks into pyrolysis oil
- SABIC used the alternative feedstock to produce certified circular polymers
- P&G produced nonwovens for new masks

The high-quality circular PP polymer obtained in this pilot demonstrates that closed-loop recycling is achievable through active collaboration of players from across the value chain. The circular material is part of [SABIC TRUCIRCLE™ portfolio](#), aimed at preventing valuable used plastic from becoming waste and at mitigating the depletion of fossil resources. The entire closed loop pilot project from facemask collection to production was developed and implemented within only seven months. The transferability of advanced recycling to other feedstocks and chemical products is being further researched at Fraunhofer CCPE.

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