Closing the Pharmaceutical Loop — Trial Results on Multi-Material Medical Plastics

ARCUS Greencycling Technologies operates a non-catalytic, continuous and fully electrified pyrolysis process that converts mixed, contaminated and multi-material plastic waste into pyrolysis oil for use as steam cracker feedstock and other applications.

The pharmaceutical industry faces a circularity challenge at both ends of its value chain. Some of its used plastic streams are practically unrecyclable today: drug delivery devices such as insulin pens combine several polymers with elastomers and metal in a single unit; single-use bioprocessing bags — increasingly replacing stainless steel tanks in specialty and small-batch production — are multilayer films with silicone tubing attached and process residues remaining inside. Mechanical recycling of these materials is not practised today and is unlikely to become viable at scale, due to technical limitations and high cost of cleaning and separation. Both streams are growing and both could be collected through defined and largely closed channels, but the corresponding collection systems do not exist yet — a prerequisite that still has to be established. At the same time, the industry needs recycled content of a purity and traceability appropriate for pharmaceutical applications.

Together with leading pharmaceutical manufacturers, ARCUS has processed both streams in pilot and industrial-scale trials. Easily detachable parts were removed by the suppliers; residual silicone remained and the material was processed without any washing step. The presentation reports feedstock characterisation, process behaviour, oil yields and oil quality, and concludes that chemical recycling can be a solution for these waste streams.

Contact ARCUS Office:

Sabrina.wild@arcus-greencycling.com

+49 (0)175 738 95 98

The speaker for the session will be Mr. Julian Odenthal, CFO.