



Two-stage process: Recycling of mixed composite plastic waste with a high volume fraction of polyurethanes (PU)

PROJECT DESCRIPTION

NEVEON has developed a cutting-edge process to recycle unsorted PU materials containing admixtures and adhesions of polyolefins and biomass. This approach can handle damp, wet, and heavily soiled materials, making it a highly efficient and versatile solution.

The process involves Hydrothermal Carbonation (HTC), in which PU materials and biomass are broken down chemically at high temperatures and adiabatic pressures, leading to the conversion of these materials into carbonaceous products. During the HTC process, polyolefins melt and disperse evenly throughout the reaction mass, reducing the volume of input materials by 90%. Toluene diamines (TDA) can also be separated after the HTC process.

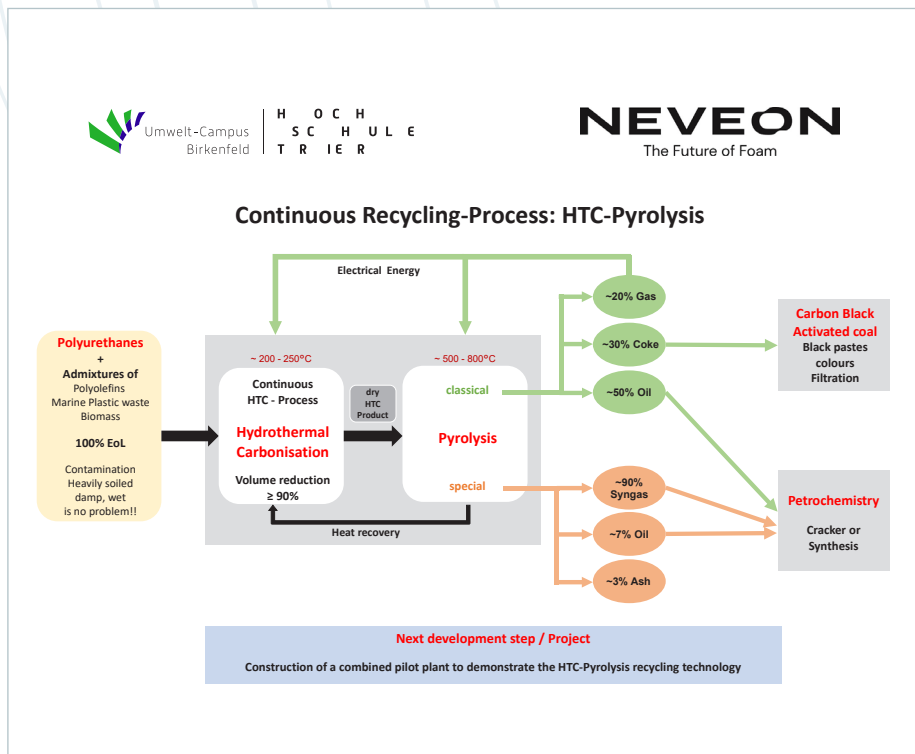
The resulting intermediate product is dry, compact, free-flowing, and transportable, making it an ideal input for the following pyrolysis process. Depending on the pyrolysis technology used, the output can be oil, coke, and gas, or largely synthesis gas. Oil and synthesis gas are valuable products for Petrochemistry, while coke can be used to produce carbon black and activated coal.

PROJECT IMPACT

The HTC-Pyrolysis recycling technology can be used in a field where currently no feasible recycling process is available.

Current chemical recycling processes for main PU products, such as EoL-mattresses, rely on producing re-polyols. However, these approaches require clean and well pre-sorted feedstock, which is not feasible for many PU composite materials and PU-elastomers used in industries like automotive and furniture. This is particularly true for larger parts of EoL-mattress waste, such as the mattress covers, or shredder light fractions accumulating in special metal recycling centers. Most of these materials cannot be treated so far and have to be incinerated – and here is where the HTC-Pyrolysis technology comes in.

NEVEON's innovative solution enables the recycling of PU materials that were previously impossible to treat. By breaking down the materials at high temperatures and adiabatic pressures, they are converted into valuable carbonaceous products, which can be further used as feedstock in petrochemical industry.



ABOUT NEVEON

NEVEON is a leading, global, integrated foam company offering outstanding flexible and composite polyurethane foams for a huge range of applications, from the comfort segment through the transportation sector to a limitless variety of specialty applications. NEVEON is part of Greiner and with its products pursues the goal of contributing to the enhancement of the quality of life worldwide.

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