



PolyUrethane Recycling Towards  
a Smart Circular Economy

# Deliverable

D1.2 1-5g of at least sic CAPU co-monomers based on non-TAD-based chemistries for PU tests

WP1 – CAPU co-monomers

### Project Information

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## Publishable Summary

Within WP1 various non-TAD-based CAPU comonomers were screened on an elastomer level regarding their feasibility in polyurethane foams to enable recyclability of these materials. To identify different potential chemistries previous literature reports of dynamic polymer systems were screened and the most promising ones in terms of (foam-) compatibility, synthetic feasibility and reprocessing performance were consequently incorporated into polyurethane materials. All chemistries were afterwards evaluated regarding the afore mentioned criteria and the best performing were advanced to foam trials within WP4.

The main scientific challenge here was to minimize synthetic effort for the non-TAD based monomers while retaining overall performance and aiming for maximum compatibility with existing polyurethane formulations and monomers. A selection of appropriate CAPU co-monomer building blocks was made in close concertation between UG, WEYL, COV and REC each offering their expertise (scalability, compatibility with foam process etc.).

In total this report describes the investigation of 4 different chemistries and 10 different CAPU comonomers were investigated on elastomer materials within WP1 (mainly by UGent). The study of these covalent adaptable polyurethane (CAPU) networks consequently yielded to advance with one of the investigated chemistries and 3 monomers into more detailed foaming experiments within WP4.