

## Designing of cradle-to-cradle loops for elastomer products

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One of the emerging topics in elastomer technology is Circular Economy. In the past, the quality of recycled rubber was rather low, limiting the application range and quantities. New technologies for higher quality recycled rubber need to be developed in order to make cradle-to-cradle loops for e.g. tires a reality.

An innovative technology is devulcanization of rubber. In the strict sense of the word, this is the reverse of the vulcanization process, leading to a material with the same property profile as the starting one. This process can be developed for specific rubber compositions in terms of polymer, filler and crosslink type. However, in the case of tires, the challenge is to develop an universal procedure suitable for the different polymers and compounds in this product. Another issue is the application of devulcanized rubber: processing as well as compounding have to be adjusted to achieve the best properties, including maximum improvement of lifetime of the blend of recycled and virgin rubber.

The development of tailored devulcanization processes and application practices will be covered for two different case studies: tires and roof sheeting. Besides, the challenges in product design-for-recycling and for the recycling technologies will be discussed.