Abstract

Designing a Circular Economy for Passenger Car Tires

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Circular Economy represents a major challenge, particularly in the elastomer world. In previous times, the quality of recycled rubber was rather poor, limiting its application range and quantities. New technologies for higher quality recycled elastomers need to be developed in order to make reuse of tire rubber for new tires a reality.

A challenging technology is devulcanization of rubber. In the strict sense of the word, this is reversion of the vulcanization, leading to a material with the same property profile as the starting one. In the case of tires, the challenge is to develop a universal generic procedure suitable for the different polymers and compounds used in these products. Another issue is the application of the devulcanized rubber: processing as well as compounding have to be adjusted to achieve the best properties, including maximum improvement of the lifetime of the blend of devulcanized and virgin rubber.

A complicating factor is, that tire development continues in parallel with new technologies; in particular the (partly) replacement of well known carbon black as reinforcing filler by the new silica-silane technology for the tire tread. Important properties as wear, rolling resistance and wet grip have improved considerably, leading to a better fuel economy of the vehicles and a longer life time of the tires.

An overview is presented of latest developments in car tires elastomer recycling, with special emphasis on achievements and limitations in view of the parallel developments in tire technology.