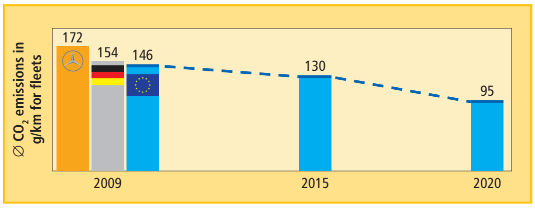
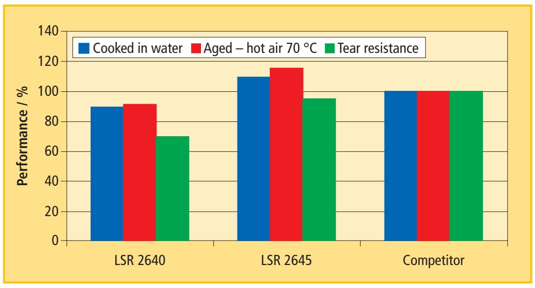
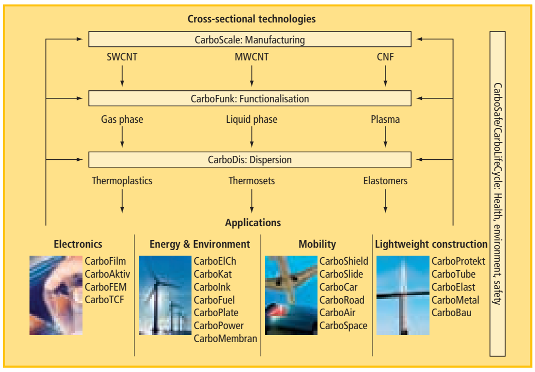
The CO_2 legislation of the European Union poses an enormous challenge for the automotive industry. Since high f nes will be levied for every additional g/km of carbon dioxide emitted, the automotive industry is taking a wide array of measures. Along with increasing the eff -ciency of the classic internal combustion engines, great stock is also being placed in reducing the weight. Modern polymeric materials will play a pivotal role here and the problems will only be solved with intelligent materials. The paper discusses not only the opportunities existing already, but also the diff culties and challenges being faced. Current developments still have a long way to go and will call for a great deal of perseverance, since the currently favoured systems still have to prove their technical as well as f nancial viability.



In the global elastomers market, silicone elastomers continue to be a niche with approximately 1.5 % of the global demand in rubber. However silicones grow faster than many industries and economies. Due to megatrends including aging population, for healthcare applications, environmental awareness in automotive and energy or consumer perception and legislation for example in consumer good applications. While silicones have an almost universal set of physical properties for rubber applications, based on material cost considerations they are often not immediately selected - instead of judging by system costs. Successful silicone elastomer applications can be achieved, when engineers understand the silicone product features and creatively apply their benef ts for new applications and designs. This paper will help to position silicone elastomers vs. functionally competing materials including rubber materials like FKM, ACM, EPDM or natural rubber and metal in a spring or thermoplastics and glass in optical applications. Examples show how specif c properties of silicone elastomers lead to successful new applications winning against functional competition.



Carbon nanotubes (CNT) were discovered several decades ago and have been the focus of intensive scientif c and technical research in an extremely wide range of f elds ever since. Due to their outstanding properties and exciting combinations thereof, they set the scientif c community af re with enthusiasm. However, the transfer of CNT synthesis from the laboratory to production on an industrial scale took a great deal of time, so that CNT only recently became available in commercially relevant quantities and qualities at competitive prices. Despite the multitude of potentially highly promising scientif c and industrial applications for CNT, the actual use of CNT-based materials has remained far behind expectations. In addition to the technical and application-based challenges along the value chain, issues with regard to complex intellectual property landscapes as well as potential safety issues pose obstacles to market penetration. The Innovation Alliance Carbon Nanotubes – Inno.CNT (www.inno-cnt.de) was founded in order to focus on solutions for the above described challenges. With 90 partners in industry and academic research, this cluster of 27 crosslinked projects is developing fundaments for technologies and applications for CNT-based materials. As an interdisciplinary collaborative network of public and private entities, Inno.CNT currently has a total budget of EUR 90 million for a period of six years, roughly half of which is supported by the German Federal Ministry of Education and Research. Within the Alliance, twenty-two projects focus on sustainable applications in the areas of energy/environment, mobility, lightweight construction, and electronics. Three projects are dedicated to basic technologies regarding the manufacture, functionalization, modif cation and dispersion of CNT. Finally, two platform projects are considering safety issues throughout the various phases of CNT product lifecycles.



In processing thermoplastic composite tapes by automated tape laying or winding, it is benef cial to heat the mold surface in order to obtain a reliable and stable placement of the f rst tape layer. Different heating methods are known for example from injection molding, which generally can also be applied in the case of tape laying or winding. Requirements can be for example a short heating duration, a good temperature uniformity on the mold surface, and low costs of the heating system. Thus, a comparison of both conventional mold heating methods, e. g. via heating channels and novel heating devices like ceramic heating elements, has been carried out. In part 1 of the present article, a general review is given on mold heating methods containing advantages, disadvantages, and the maximum temperature which can be reached. In part 2 of the paper, a detailed analysis of selected comparison parameters will follow.