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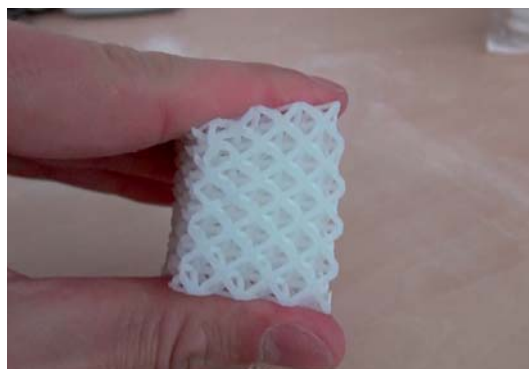
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Customised production of TPU parts by selective laser sintering 221

Additive preparation processes impress lay people just as much as the professionals. In contrast to processes which remove materials, such as drilling, cutting and grinding, through additive fabrication, parts come in to being layer by layer. It is perhaps this phenomenon, which reminds us of natural growth, which gives such an engaging character to processes like 3D printing, stereolithography and Fused Deposition Modelling. At the same time, those technologies appear trend-setting; the idea of watching complex components appear overnight out of a CAD drawing on a relatively simple machine, using only just as much raw material as the part needs to occupy its own volume, from a material- and energy-efficiency point of view, shows the way.

As soon as manufacturers realise that additive preparation dispenses with the need for moulds and tooling and offers virtually limitless design freedom, the revolution in plastics processing may no longer be hindered. Economic cycles will become more regional, decisions about siting of raw-material production units will have to be taken differently, and the development of the production of goods will be democratised [1].



J. FRAHN, K. LAMPRECHT, E. RICHTER

Tailor-made thermoplastic vulcanisates (TPVs) in food contact applications and for use in medical devices 224

This article provides an overview of the tailor-made adjustment of thermoplastic vulcanisates (TPVs), focussing on the special demands of more sophisticated products, for example in contact with food and potable water as well as for medical devices. The legal requirements in Europe for food contact applications with regard to the new topics in the EU 10/2011 regulation for "Plastic Food Contact Materials" and the implication of the German recommendations by the Federal Institute for Risk Assessment (BfR) are outlined. Furthermore, a description of the Food and Drug Administration (FDA) regulations and the escapers for food contact applications with TPVs are provided together with an overview of the requirements for contact with potable water. The article continues with the impact of limited raw material selection on food contact applications and how the excellent properties of TPVs are nevertheless realised for these grades. Following this, examples for TPV applications with food contact are presented and the advantages that TPVs offer for these applications. Finally, the demands for TPV materials when used for medical devices are outlined.



TPEs for paving and roofing applications and beyond 230

K. SIPKENS

TPE compounds in medical applications 232

Since the introduction of TPEs in the 1960s on the market there is continuous growth in applications and market penetration. The market for medical and pharmaceutical applications, however, was approached reluctantly. Main reasons for this are the by nature conservative behaviour of this market area and the immense costs involved for changing materials for existing products. In the last decennium the acceptance of new materials increased considerably, also but not mainly, initiated by the widely grown suspicion of softened PVC.



Actega DS promotes medical TPE grades 234

E. PRITIKIN, K. CAI

New TPEs as alternatives to PVC in medical tubing 236

Tests and full-scale production trials conducted by Teknor Apex over a three-year period have established the Medalist MD-500 range of medical-grade thermoplastic elastomers as a practical alternative to PVC in tubing. The compounds are now in commercial use by medical device manufacturers. This article will present information on how Medalist MD-500 elastomers compare with PVC in every phase of manufacture and end use typical for tubing, from extrusion through everyday handling by healthcare workers.



U. BAHNER, A. DOZEMAN

Medical applications – the big challenge for TPE-S? 239

Thermoplastic elastomers will more and more often find their way into the medical market. What are the main drivers for this trend? Can TPE replace thermoset rubber and in which applications? Since the early 1970s, the Dutch TPE manufacturer Wittenburg B. V. is engaged with the development and production of thermoplastic elastomers in the field of medical and pharmaceutical products. Using the example of medical stoppers and closures, we describe below the current market situation, the requirements and the advantages of TPEs in this special market.



R. ELLER

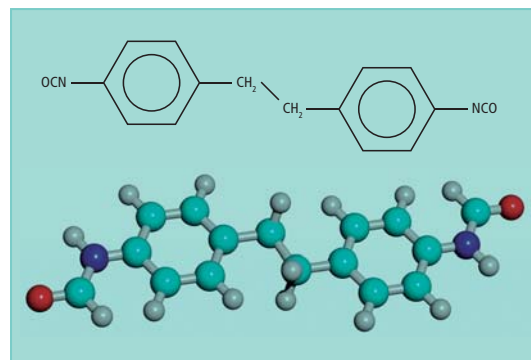
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The technical performance range of the TPEs continues to broaden and is contributing to market growth, especially for the SBC type TPEs (SBC-TPEs) and olefinic TPVs (o-TPVs). The performance envelope of the super-TPVs (s-TPVs) is also widening as properties are improved and new polymer combinations are added. The shift in manufacturing from the West to Asian countries, especially China, has not only shifted the focus of the TPE marketplace but introduced new concepts of tailoring quality to a wider range of market tiers than are encountered in the more developed Western economies. Sustainability concerns are adding bio-TPEs to the range of TPE offerings.

C. PRISACARIU

Thermal response of model segmented copolyurethane elastomers and the correlation with the physical structure (part 1)..... 244

Thermal behaviour has been studied for well characterized model thermoplastic polyurethane elastomers (TPUs), in order to shed light on the physical processes involved in such materials under the influence of temperature. Particular aspects were followed on how the TPUs thermal responses vary with composition, with the aim of improving understanding of the relationship between molecular/supramolecular architecture at the nm-scale and thermal behaviour in such systems. The role of the hard segment structure on the TPUs was investigated. Two hard segments were compared, based on the model rigid 4,4'-methylene bis(phenyl isocyanate) (MDI) non-crystallizing and on the flexible 4,4'-dibenzyl diisocyanate (DBDI) crystallizing in the presence of suitable chain extenders. The present study combines these and other selected aspects from reviewed literature on recent developments on the thermal response of model TPUs and the correlation with their physical structure.



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