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Particle Foams – Ways to Improve the Product Quality

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Polypropylene particle foam (EPP) achieves an ever larger value compared to other polymeric foams such as PU, EPS and EPE. Moulded articles of EPP are mainly characterised by properties like excellent impact energy absorption, small residual deformation good chemical resistance and the possibility of complete recycling. EPP already applies within the area of packaging for industrial goods and much more in the automotive branch. Common products, like protection for side impacts, sun visors, column and door covers, tool boxes and bumper inserts are made from this material.
Besides the raw material of the foam, many properties of the shaped foam parts depend mainly on the process parameters of the moulding process whose main effects and influences are discussed. Currently this process is realised in moulding presses by steam chest moulding. Within this process mainly the mould-filling, the steaming/sinter-steps of the moulding and the cooling of the mould affect considerably the characteristics of the shaped foam parts such as density, mechanical strength, surface-quality or welded connection of the particles. Aim of the adjustment of the process-parameters is to achieve good qualitative properties on one hand and to fulfil the mechanical requirements on the other hand.
Furthermore, new ways and developments of processing technologies for manufacturing shaped parts of particle foams are discussed. Due to the limitations of the standard process new particle foam technologies consider aspects like less energy consumption, better product and surface quality and also composite materials like the combination of foams and textiles or foils. To reach this advances new mould-concepts with less steam consumption and alternative steam-transmission are considered. For better surface-quality Technologies for the back foaming of textiles or foil and in mould skinning of foam-parts are discussed.