



## RECENT PROGRESS IN THE PROCESSING AND CHARACTERISATION OF HYBRID FOAMS - HYBSCH

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Hybrid foams are a new innovative class of foamed materials. The technological approach of hybrid foams aims to combine the material properties of its individual material partners (polymers, ceramics or metals) into complex parts that offer freedom of design by combining the properties on the material level. The paper presents recent results of the research work carried out in the area of hybrid foam processing technology and in the area of achieved material properties of hybrid foams made out of polymer foams in combination with metal structures.

The technology developed uses in principal two approaches. The first technology uses a combination of particulated foams via sintering two different foam particle materials. The second technological approach uses open-cell host foams made out of ceramic or metal materials, which are then filled with particulated polymeric foam before sintering the polymer foam particles.

Results presented in the area of technology development focus on the progress made in the development of the mould filling technology with particulated foams made out of polymers and metals, avoiding demixing due to the density gradient. Filling studies in a transparent mould, as well as the latest results from the filling nozzle development are discussed. Mechanical properties measured on test samples achieved with this improved filling technology are presented. The effects of the different densities of the particle materials used are discussed. The obtained results indicate an interesting potential to use the hybrid foams in crash elements, which achieve a gradient energy absorption based on the severity of the impact.