

# ACEX2022

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## **Polymer Engineering in Industrial Applications – Trends and Challenges**

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For a number of years, new challenges have been opened for innovative research activities in applied polymer mechanics. Some decades ago, the focus was directed to material modelling and physical understanding of the mechanical material behaviour of polymers under small or large deformations. Regarding this background, numerous phenomenological and micromechanical models of viscoelasticity and hyperelasticity have been developed and validated using related experimental methods. In this period of time, the research was essentially driven by the scientific interest of the researchers rather than by the industry or the applications. This has changed in the recent past. Nowadays, there is a suitable polymer material for almost every special application in consumer or industrial goods. There are also now many more manufacturing techniques, of which additive manufacturing has a big share. Even in additive manufacturing of polymer parts, there are various methods for the different classes of materials that use different physicochemical effects.

This presentation will discuss current and technically relevant issues that are of enormous importance for the industrial development of modern countries in the future.

At first, current research activities in the field of additive manufacturing of polymers or their corresponding printed components will be presented. The focus will be on material properties and modelling concepts. Another interesting topic of this presentation concerns the dynamic behaviour of elastomer bearings for electric motors in vehicles. The talk closes with the presentation of research results in technical relevant applications of sealings within the aircraft industry.