Keynote: Paul Motzki, ZeMA, U. des Saarlandes: SMA thermal systems – Novel approach from academia to commercialization

Biography: Prof. Dr.-Ing. Paul Motzki studied Mechatronics at Saarland University, Germany, where he received his PhD in 2018. Since 2022, he holds the professorship „Smart Material Systems for innovative Production“ in the Department of Systems Engineering at Saarland University, while being the Director of the research division “Smart Material Systems” at the Center for Mechatronics and Automation Technology (ZeMA gGmbH). He is co-founder and partner of the young company mateligent GmbH, which transfers the academic R&D in the field of smart materials like SMA or EAP into commercial production.

SMA thermal systems – Novel approach from academia to commercialization

Abstract: University research in the field of elastocalorics (also: thermos-elastics) at Saarland University (UdS) started within a DFG (German Research Foundation) Priority Program in 2012. As a result of this research program, the intelligent Materials Systems Lab (iMSL) at UdS directed by Stefan Seelecke was able to develop and demonstrate the world’s first continuous running elastocaloric system for the direct cooling or heating of air in 2017. This innovative and disruptive technology of using latent heats in phase transitions of shape memory materials to transport heat in a very energy-efficient and climate-friendly way has since been declared the most-promising future alternative to vapor compression systems by the US Department of Energy and the European Commission. To eventually transfer this technology know-how into industry and generate actual commercial products, TRL level of different aspects have to be raised, depending on the potential field of application. This talk will give an overview of the state-of-research of elastocalorics, several popular fields of application and beyond this, present novel innovative mechanisms of technology transfer in this field to drastically accelerate commercialization and shorten time-to-market through a holistic approach addressing the whole value chain of a newly forming and emerging industry.