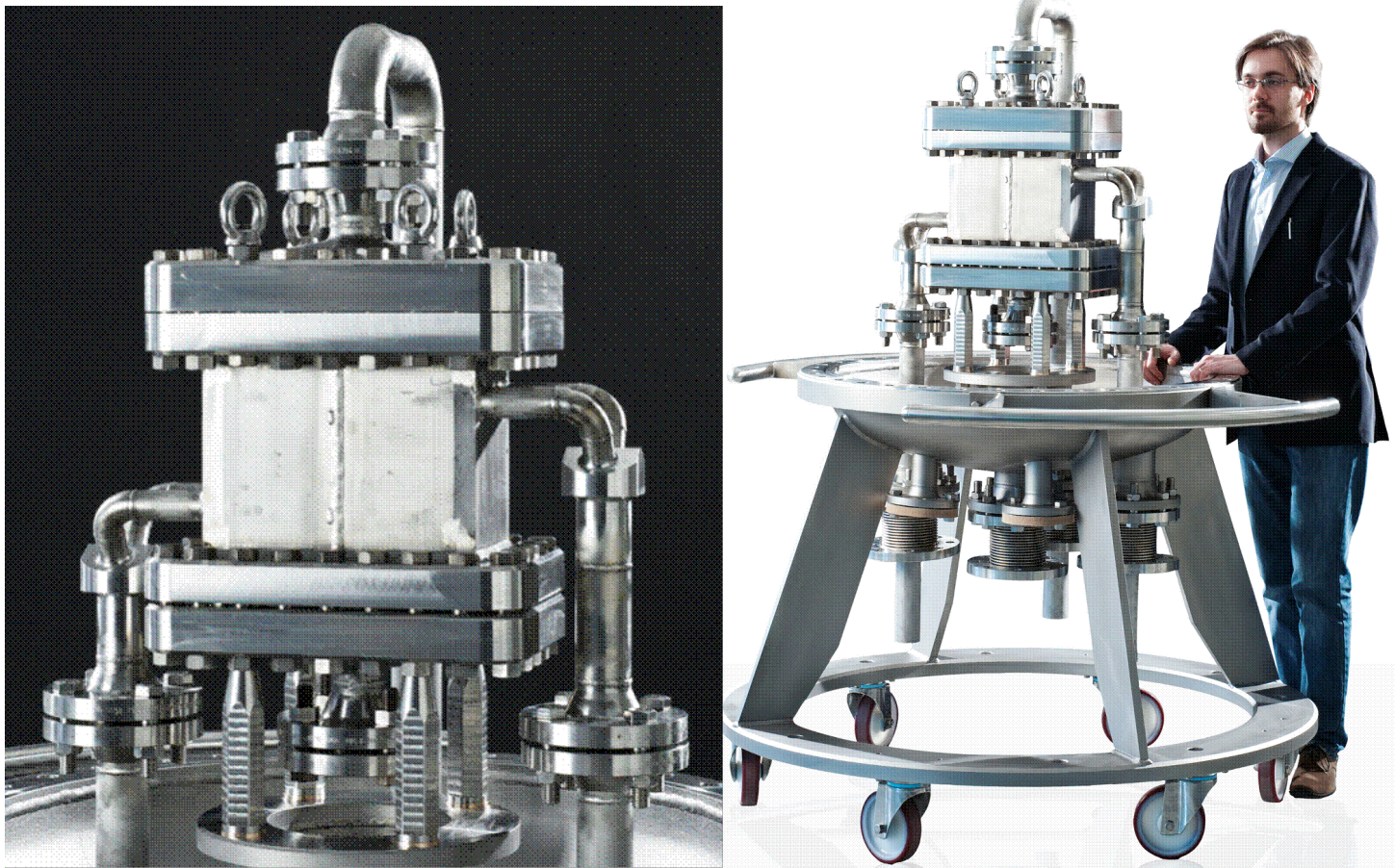




Process intensification by microstructured reactors in on-site fuel production

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Microchannel reactors have shown great promise for conducting fast reactions accompanied by large heat effects due to their outstanding heat transfer performance. This holds equally for applications in catalysis, but the need to integrate a solid catalyst into a microstructure device imposes additional challenges, in particular for larger units. The talk will focus on the development of a microstructure reactor for the high-pressure and high-temperature water gas shift reaction in the context of biomass-derived on-site fuel production. Different catalysts were investigated including Pt on various supports and iron. Catalytic wall coatings and a micro packed bed approach were studied under different reaction conditions. Based on the results a pilot-scale microreactor for 5 Nm³/h throughput was designed and recently built. The micro packed bed approach was applied also to the one-step synthesis of dimethyl ether from synthesis gas.