Summer School on Polymeric Networks
for Sustainable Development

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How to Unlock the Industrial Uptake of Reprocessable Thermosets through Dynamic Covalent Chemistry?

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Dynamic covalent chemistry (DCC) allows the development of thermally (re)processable and recyclable polymer networks, which is a highly attractive feature for new generations of thermoset materials and composite materials.

However, despite a huge surge in academic interest where soon almost any imaginable DCC platform may have been applied in a thermoset formulation, dynamic or reversible covalent polymer networks have so far found only few industrial applications. This lecture will provide a perspective on the main strategies for the application of DCC in the design and development of bulk thermoset materials and presents some of the key hurdles for their industrial implementation.

The polymer design strategies and associated chemistries will be placed into the perspective of how ‘close to market’ their development pathway is, thus providing a roadmap to achieve high-volume breakthrough applications.

Besides a general outline, this presentation will highlight a number of our actual research efforts to overcome remaining limitations for the industrial implementation of this new generation of reprocessable thermoset materials, mainly based on smart chemical design.