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ON THE WAY TO DIGITALIZATION OF COATING INDUSTRY

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Europe is on its way to implement digitalization in industrial product and process design. One important aspect of this action is to support optimal materials design based on modelling, simulation and decision support services, as well as to provide corresponding systems and workflows for industrial end-users. Protection of metallic structures against aggressive environments by coating systems providing a barrier is one particular challenge. These coatings may also contain active elements, which protect metallic surfaces even in the case of coating degradation or damage, i.e. against corrosion. The efficient design and development of future environmentally friendly and sustainable corrosion protection call for new approaches to reduce development cycles, save resources and maintenance costs by providing long-term durable coating systems. These issues can be solved effectively by using modelling approaches (both data-driven and physics-based) aiming at identifying optimal compositions and structures of coatings, as well as predicting their behaviour under various service conditions. The implementation and deployment of a coherent digital platform that ensures an interoperable integration of innovative materials modelling tools is one promising way to handle these challenges. In order to facilitate knowledge transfer towards industrial end users, the platform should integrate additional services, like materials design methodologies and open pre-defined workflows as best practice examples. The authors will present their preliminary works on this spectrum of industrial challenges, which are in the focus of the ongoing H2020 VIPCOAT project (Virtual Open Innovation Platform for Active Protective Coatings Guided by Modelling and Optimization, www.vipcoat.eu, Grant Agreement No 952903). The general ideas and aims of the project, as well as some modelling and decision-making approaches in the area of active protective coatings, will be demonstrated and discussed.

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