



Fast-drying, isocyanate-free resin systems - towards more sustainable, high performance coatings

The ACURE™ technology is based on Real Michael Addition (RMA) chemistry and was developed as a high solids 2K coatings system suitable for a broad range of applications on metal, primer, concrete, wood and plastic substrates. From a sustainability perspective, this RMA-based platform technology already offers several advantages. First of all, RMA is an isocyanate-free curing mechanism, and tin-based catalysts are not required in the paint formulation. Furthermore, RMA-based topcoats can be easily formulated at VOC contents below 250 g/L. As curing occurs at or even below room temperature, energy consumption can be reduced significantly compared to classical 2K polyurethane systems, which are often baked at 60 °C. In addition to the solvent-borne ACURE system, the water-borne ACURE AQ technology was successfully developed.

As a next step in the development of the RMA technology platform, the possibilities of using bio renewable monomers as starting materials for the RMA binder resins were investigated. Novel malonate-functional polyesters from biobased and potentially biobased monomers were developed and cured through the base-catalyzed carbon-Michael addition reaction with acryloyl-functional oligomers. Both drop-in monomers such as fully biobased diethyl malonate and alternative raw materials such as isosorbide and vegetable oils were introduced. Isosorbide-based polyesters show improved wet adhesion on epoxy-amine primers, while vegetable oil-containing resins provide improved coating appearance due to better flow and levelling. This study demonstrates that biobased malonate resins, having renewable contents up to 53%, offer attractive performance benefits in 2K RMA paints. It is anticipated that, with the development of additional fully biobased polyols, renewable contents in excess of 80% can be achieved.

During the lecture at CoSI 2021, which had sustainability as an overarching theme, both the biobased SB ACURE resins and the WB ACURE AQ system were highlighted.

[ACURE™ – Game Changing New Resin Chemistry for Coatings \(acure-coating-resins.com\)](https://www.acure-coating-resins.com)