

## THREE-STAGE IMPLEMENTATION OF A NOVEL ZIEGLER-NATTA TYPE CATALYST FOR POLYPROPYLENE COPOLYMERS – A CASE STUDY

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A change in catalysts used to manufacture polypropylene (PP) has been taking place amid almost universal silence. Ziegler-Natta (ZN) catalysts with phthalic acid ester as internal donor are gradually being replaced by alternative systems. This step, which is driven more by brand-owner requirements than by chemical regulations, is hardly mentioned by the large PP manufacturers such as Borealis, LyondellBasell and Sabic.

Introducing new catalyst types for PP production is a challenging task especially when complex copolymers are concerned, where aspects of process stability as well as product performance need to be considered. A three-stage approach is followed at Borealis for the implementation of a novel ZN catalyst with a non-phthalate internal donor: Bench scale polymerizations are performed to establish a composition-dependent property baseline, product design is optimized in view of process limitations in pilot scale and the collected results are implemented in full scale production. High-impact heterophasic copolymers for advanced packaging and technical applications are used as a case study for the introduction of the catalyst, focusing on structure-property relations in these two-phase materials.

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