Development of enhanced 3D printed packings for scale-up of distillation columns: a successful case study

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Abstract

This publication presents a general approach for the enhancement of packings using 3D printing. Within a joint research project of the Ulm University, the Technical University of Munich and BASF SE, the presented methodology is used to develop miniaturized, scalable distillation columns for process development and scale-up applications. Therefore, a combination of design, computational fluid dynamics, 3D printing and experiment is used to overcome current limitations in the design of structured packings. The packing to be developed should have a high, constant separation efficiency independent of the F-factor at the target diameter of 20 mm. Based on a 3D printable version of the Rombopak 9M, an improved structure is introduced using the proposed methodology. This packing is an intermediate step, but already exhibits a higher, more constant separation efficiency and an improved reproducibility. This publication acts as proof of concept for this methodology.

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