Transition from batch to continuous processes for campaign production of paints and varnishes in a multi-product plant

M. Watts[1], M. Wengerter[1], M. Lettau[2], H. Nieder[2], S. Scholl[1]

[1]Technische Universität Braunschweig, Institute for Chemical and Thermal Process Engineering, Braunschweig, Germany;

[2]AURO Pflanzenchemie AG, Braunschweig, Germany

At AURO Pflanzenchemie AG, Germany eco-friendly materials are used to produce sustainable paints and varnishes. Customer orders of these products differ on a wide scale from kg to tons and are prepared in batch vessels of multiple scales to produce different quantities. To ensure short customer delivery times a complicated and inflexible production planning is needed. Furthermore, cleaning of production vessels is time and labor-intensive and produces large streams of wastewater. A transition from batch to continuous processes presents the opportunity to improve the production of paints and varnishes, minimizing waste streams and allowing a more flexible just in time production [1, 2]. Moreover, to enable multi scale production for different products a promising approach seems a continuous multi-product plant.

This contribution provides a systematical approach for a process transition from batch to continuous processing, beginning with a characterization of the batch production for the product line-up [3]. All batch recipes are divided into modules with specific process tasks like mixing and dispersing of viscous process streams containing a high amount of solids (pigments). Further, process modules are evaluated in experiments, e. g characterization of phase behavior and viscosity. Therefore, different paints and varnishes can be produced in a multi-product plant by combining modules for a specific product. The modular production process can be reproduced in a process flow diagram that is used to develop a measuring and control strategy to ensure constant product quality. Critical quality criteria for a continuous production of paints and varnishes are shown and evaluated on specific process modules and further for the whole process.

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