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Chemical batch plant processing is currently undergoing massive changes in the aims, structure and systematics of production design. As a consequence shorter time-to-market times and faster design planning are required. Industry-driven project in multipurpose batch plant optimization has been established to improve competitive advantages for a company. In this paper we tackle the problems of selecting one appropriate plant line out of many available, additional investment into an existing plant and grassroot design.

We focus on the optimization of process design engineering. In predesign stage, computer aided *multiobjective optimization tool*, developed by our research group, helps in the decision-making. An implementation of the *Tabu Search* algorithm drives the set of software tools and provides a compilation of results.

Superequipment vessel has been defined as an abstract model which is capable of performing any chemicophysical batch operation. The model vessel is transformed into a real equipment unit (for example a reactor) during or after the optimization in order to evaluate performance parameters of a design.

The application of superequipment concept in a single product campaign solves variety of problems:

- *Investment into an existing plant* using our superequipment concept saves considerable efforts and time by applying optimal combination of equipment units for given recipe.
- *Selection of a single plant line* from many production facilities for one campaign by help of superequipment concept delivers time saving possibility of reducing multiple optimization runs to one. Sorted list of proposed Pareto-optimal designs according to productivity and additional multiple objective functions in each of the plants is presented to the decision maker.
- *Grass-root designs* using limited number of superequipment vessels outputs a number of Pareto-optimal and performing designs according to the multiple criteria selection of the user.

The designs obtained by optimization correspond to the requirements of industry experts according to productivity, GMP heuristics, reality checks and more. The superequipment ``chameleon'' vessel algorithm offers the possibility to solve various batch processing problems with one concept.