

## Unit specific event based model for short-term scheduling of multipurpose batch plants with heat integration

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### **Abstract**

Over the past few decades, energy saving has been playing a vital role in batch processing facilities with respect to sustainable development. Scheduling and heat integration of multipurpose batch plants is a popular methodology at present in the processing environment due to its adaptability to flexible market conditions. With the increasing trend in high value and low volume products in chemical industry such as food, pharmaceutical industries and fine/specialty chemicals, development in the field of optimization techniques with and without heat integration has been intensified for multipurpose batch plants. With an aim to reduce the energy requirement, various mathematical models were proposed for scheduling and heat integration of multipurpose batch plants using a continuous time representation [1][2]. In this work, a unit specific event based model using three index is proposed for short-term scheduling of multipurpose batch plants with direct heat integration, which is formulated as a mixed integer linear programming (MILP). The proposed model is applied to two examples cited in literature and the results are compared to see the performance of this model with respect to efficiency and flexibility. In comparison to Chen and Chang (2009)<sup>[3]</sup> model, the proposed model is computationally superior and can give optimal objective value with minimal number of event points, continuous and binary variables.

### **References:**

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- 3.Chen, C. L and Chang, C. Y. "A resource-task network approach for optimal short-term/periodic scheduling and heat integration in multipurpose batch plants." *Applied Thermal Engineering* 29.5-6 (2009): 1195-1208.