

# Mixed-Integer Nonlinear Programming Models for Optimal Design of Multi-product Batch Plant

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## Problem Statement

In the optimal design of multiproduct batch plants problem, we are given a plant consisting of a number of processing stages  $j$ ,  $j \in J$ , for the production of a number of products  $i$ ,  $i \in I$ . Each product  $i$  has a fixed production target  $Q_i$  that should be manufactured. We are also given and the size factor  $S_{ij}$  and processing time  $t_{ij}$  for each product  $i$  at stage  $j$ , as well as a fixed production horizon time  $H$ . The cost coefficient  $\alpha_j$  and cost exponent coefficient  $\beta_j$  for processing unit  $j$  are also given. The objective is to minimize the total investment cost by choosing the number  $N_j$  and sizes  $V_j$  of processing units for each stage  $j$ , and the batch sizes  $B_i$  and cycle times  $TL_i$  for each product  $i$ .

## Reference

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