

Multi-product Batch Processing Time Maximization Problem

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Abstract

In the plastic bag extrusion process, it is necessary to determine the optimal processing time for batches formed by different products, which are processed simultaneously by the same extruder, but with different processing rates. The batch processing time must be determined in order to meet a series of known constraints, such as the limitation for the quantity produced for each product and for the quantity produced for the set of all products in the same batch. In this paper we present this problem as a new combinatorial optimization problem named Multi-product Batch Processing Time Maximization (MBPTM) problem. We also present a mathematical model for the MBPTM problem and an analytical solution method with polynomial time complexity, which proved to be able to obtain optimal solutions for several benchmarks in a very short time, even for very large instances.

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