

## **Scheduling with Multiple Common Due Windows Assignment and General Position-Dependent and Resource-Dependent Processing Times**

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### **Abstract**

In this paper we consider multiple common due windows assignment and single-machine scheduling problems with general position-dependent and resource-dependent processing times simultaneously. Multiple common due windows, an extension of single common due window, allow a job to fit one from multiple common due windows. We assume that the number of common due windows to be assigned to the jobs is given. Two resource allocation models are examined, namely the linear resource consumption model and the convex resource consumption model. The actual processing time of a job is a function of its scheduled position in a sequence and its resource allocation. We aim to determine jointly the optimal common due window positions and sizes, the set of jobs assigned to each common due window, the optimal resource allocations, and the optimal schedule for minimizing an objective function which includes earliness, tardiness, common due windows assignment, makespan, and resource consumption costs. We provide some properties of the optimal schedule for the problem and propose polynomial time algorithms for all the problems considered.

*Keywords:* Scheduling, multiple common due windows assignment, position-dependent processing time, resource-dependent processing time.