

The batch scheduling model for dynamic multi-item, multi-level production in an assembly job shop with parallel machines

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Abstrak

Most classical scheduling approaches deal with single products, single machines, and static manufacturing environments. In real-world manufacturing systems, however, scheduling can be assigned for multi-item production on multimachines in a dynamic environment in which unexpected new orders may be received. This paper focuses on scheduling problems in an assembly job shop with parallel machines that produce multi-item multi-level products. Models were developed for due date fulfillment and due date assignment in static and dynamic conditions, with the objectives of minimizing total actual flow time, while considering the defect rate at each stage of the process. The insertion technique was used in the scheduling process; insertion can be performed in batch operations at all available positions on all machines. A hypothetical case of job shop scheduling problems associated with multi-item, multi-level production on parallel machines was studied, and the computational results demonstrated the validity of the proposed algorithms.