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论文与报告

中厚板热轧生产调度优化方法

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摘要
中厚板热轧生产调度, 是一个有优先约束、等待时间和缓冲容量有限的单机调度问题. 用AON (Activity-on-node)网络对问题进行描述, 提出并证明了面向单机调度问题的AON网络平衡定理, 根据平衡定理, 建立了以轧机利用率最大为优化目标的非线性约束优化数学模型, 并利用优化软件LINGO进行求解. 计算实例表明, 所提出的数学优化方法, 与现有的启发式方法相比, 能够获得更好的优化目标, 所得到的生产调度方案, 生产节奏稳定, 更有利于组织生产.

关键词 中厚板热轧 AON (Activity-on-node)网络 非线性约束优化 单机调度
分类号

Optimization Method for Plate Hot Rolling Production Scheduling

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Abstract
Scheduling steel plate hot rolling is a typical single-machine scheduling problem subject to multiple constraints including precedence constraints and limited waiting time and finite buffer capacity. To describe the steel plate hot rolling scheduling problem with an AON (Activity-on-node) network, an equilibrium principle is formulated for single-machine scheduling problems on the AON networks. Subsequently, a nonlinear constrained optimization model is built for steel plate hot rolling scheduling problems, which maximizes utilization of the rolling mill and is solved by software LINGO. Numerical computations indicate that the hot rolling scheduling method is more effective than the heuristic methods available in reaching optimal production schedules that may significantly improve production stability and efficiency.

Key words Plate hot rolling AON (Activity-on-node) network nonlinear constrained optimization single-machine scheduling

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