

首页 → [《中国机械工程学报》最新0A论文](#) → Integrated Manufacturing Cell Formation Technology Orienting Multi-product Type and Variant Volume Production

# Integrated Manufacturing Cell Formation Technology Orienting Multi-product Type and Variant Volume Production

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**Abstract:** What is pursued by multi-product type and variant volume(MPTVV) production is rapid response and quick switching, so that structure of transferring line in manufacturing system is no longer unalterable. Cell formation(CF) algorithm is the key technology of cellular manufacturing system(CMS). Currently, CF methods are mainly extended on the idea of group technology(GT) that covers a lot on analysis of resource capability matching and its algorithm. Various constraints are considered, but seldom utilized comprehensively. Aimed to the problem of manufacturing cell(MC) formation under MPTVV production mode, integrated formation technologies for typical MC as group type of cell(GC), flow type of cell(FC) and inherited cell(IC) are presented based on technical analysis of CF. Oriented to practical production constraints like delivery time, product batch, equipment ability, key machine, key part and machine sharing, etc, an integrated formation model is constructed and internal interrelations of these constraints are analyzed synthetically. Ulteriorly, formation goals of types of MCs and their formation procedures under joint effect of formation constraints and rules are spread. In case study, three highly balanced GC are formed first; then FC formation are implemented based on the same data which indicate good balancing effect of cell load and flow-style production for key tasks; When task is adjusted, a new scheme is constructed on the result of FC configuration by using IC formation method, and more optimal performance of flow-style production is manifested. The proposed comparative study of different type of cells strongly explains the validation of integrated MC formation in support of rapid manufacturing resource transformation under MPTVV production mode.

**Key words:** multi-product type and variant volume production, cell formation, flow style manufacturing cell, inheriting manufacturing cell

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