

过程系统工程

基于公理化设计理论的产品配置建模方法及其在大型化工装备中的应用

孙卫红, 冯毅雄

中国计量学院机电工程学院; 浙江大学CAD&CG国家重点实验室

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摘要 结合产品配置模型信息形成的特点, 提出了基于公理化设计理论的化工装备产品配置建模方法。该方法详细讨论了产品设计过程中功能-结构域间映射, 将具有约束信息的功能要求定义为功能-约束集成单元, 将具有特征信息的设计参数定义为结构-特征集成单元, 通过建立系统数据库和结构-特征集成单元间的特征关系, 构建了基于结构-特征集成单元的化工装备产品配置模型。公理化设计理论的引入, 使得产品配置建模更加科学化, 并使设计者能在众多复杂的方案中快速做出正确的选择。最后以空分装备产品为例, 建立了产品的配置模型。

关键词

[公理设计](#) [产品配置模型](#) [配置设计](#) [大规模定制](#) [化工装备](#)

分类号

Modeling of chemical equipment configuration model based on axiomatic design theory and its application

SUN Weihong, FENG Yixiong

Abstract

By considering the characteristics of information generation of chemical industry product configuration model, a new method of constructing chemical equipment configuration model based on axiomatic design theory was presented. In this method, functional domain mapping into physical domain was introduced, functional requirements with constraints were defined as function constraint integrated component (FCIC), design parameters with feature were defined as structure feature integrated component (SFIC), and the configuration model based on SFIC was constructed by establishing database and the characteristic relationship of SFIC features. Axiomatic design made configuration modeling more scientific, and helped the designer decide more quickly and accurately. Finally, a case study of configuration design for air separation equipment was presented.

Key words

[axiomatic design](#) [product configuration model](#) [configuration design](#) [mass customization](#) [chemical equipment](#)

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通讯作者 冯毅雄 fyxtv@zju.edu.cn

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