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论文

钛合金整体结构件加工关键技术研究

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摘要:

针对钛合金材料的难加工性, 以及大飞机制造中钛合金整体结构件尺寸大、结构复杂、变形大等工艺难题, 对钛合金整体结构件加工技术的研究现状、存在的问题及发展趋势进行了系统分析. 阐述了钛合金加工对刀具材料、结构、微刃处理等关键刀具技术的要求及发展趋势; 论述了钛合金整体结构件加工过程中应着重加强的工艺理论研究, 主要包括走刀方式与走刀路径、基于切削稳定性工艺的参数优化、变形控制、变形校正等, 〔JP2〕还对工艺参数与表面质量完整性的关系进行了分析, 以期对钛合金整体结构件高效高精度加工的理论研究和工程实践提供指导.

关键词: 钛合金; 航空整体结构件; 高效高精度

Study of key technologies of titanium monolithic components machining

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Abstract:

Aimed at the difficult-to-machine property of titanium alloys, as well as large dimension, complicated construction and large distortion of titanium monolithic component used in large commercial airplanes, research actuality, existing problems and development trends of titanium alloys machining were analyzed. Requirements and the developing trends of titanium tooling techniques such as tool materials, tool structure, and micro edge treating et al were elaborated. Titanium fabrication technologies were discussed which should be reinforced and include type and path of cutting, parameters optimization based on cutting stability, and distortion control and correcting, et al. The relationship between milling parameters and surface integrity was also analyzed. The purpose of this work was to provide a guideline for theoretical research and engineering application.

Keywords: titanium alloy; aviation monolithic component; high efficiency and precision

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