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超声振动载荷下合金的疲劳寿命性能研究

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STUDY ON THEFATIGUELIFE BEHAVIORS OF ALLOYS UNDER ULTRASONIC FATIGUELOADING

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摘要 应用超声共振试验技术研究了三种工程常用合金(Ｕｄｉｍｅｔ５００,１７４ＰＨ和Ｔｉ－６Ａｌ－４Ｖ)在超声振动载荷(ｆ＝２０ｋＨｚ,Ｒ＝－１)下的疲劳寿命性能,并与常规疲劳载荷(ｆ＝２０－５０Ｈｚ,Ｒ＝－１)下材料的有关性能做了对比分析。研究结果表明,材料的超声疲劳寿命性能与其动态振动特性、机械响应以及载荷体制有关。

关键词： 超声 疲劳 损伤 应变率 频率效应

Abstract： The fatigue life behavior of three widely used engineering alloys(Udimet 500,l7-4 PH and Ti-6Al-4V)under ultrasonic fatigue loading are studied(f=20kHz,R=-1).It is shown from experimental and analytical results that fatigue life characteristics of materials at ultrasonic fatigue frequency depend mainly upon the dynamic vibration features and the mechan-ical responses of materials and the different exciting regimes,

Keywords： ultrasonic fatigue damage strain rate frequency effect

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