

基于主轴电动机电流的微孔钻削在线监测技术

李雪 杨兆军 贾庆祥 孙艳红

南京工程学院

关键词: 微孔钻削 主轴电动机电流 在线监测

摘要: 以主轴电动机电流为监测对象研究微孔钻削的在线监测。以50支直径为0.5 mm的高速钢麻花钻为样本,在数控高速精密微孔钻床上,对钻削H62黄铜时微钻头折断的主轴电动机电流对应的电压极限值进行了检测,经过参数估计和假设检验,得出了主轴电动机电流对应的电压极限值服从三参数威布尔分布的结论,并建立了基于可靠性的主轴电动机电流对应的电压监测阈值的确定方法。选取不同可靠度水平进行了在线监测实验,并与普通钻削比较。当选取可靠度水平为0.99时,在钻头利用率相同的情况下,钻头的折断率由40%下降到0。This paper studied the on-line monitor of micro-hole drilling based on electrical current of the principal axis electromotor. Taking 50 high speed steel twist drills with the diameter of 0.5 mm as the samples, the high-point voltage value corresponding to electrical current of the principal axis electromotor was monitored when the micro-drill was broken during drilling H62 brass. Through parameters estimating and tentative proving, the results that the high-point voltage value obeys three parameters Weibull distribution were gained, and the access method of the monitored voltage thresholds corresponding to electrical current of the principal axis electromotor was built up. Finally, the experiments of on-line monitoring were carried out with different reliable levels. The results showed that the drill breaking ratio of decreased from 40% to 0 when reliable level was selected to be 0.99 and the drill utilization ratio was the same.

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