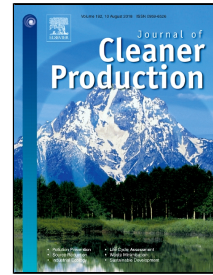


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Abstract

A machine-based power consumption model was developed to cope with a wide variety of machine tool configurations. By focusing on machine components, power consumption can be measured readily and reconfigured per individual component. This research focused mainly on feed drive units of machine tools, and particularly the power characteristics of rotational axes. Although numerous studies have investigated power characteristics, the effects of gravitational force have not been discussed fully. Unlike other axes, power consumption of axes along the gravitational direction is influenced significantly by the movement direction, table position, and even by the machine configuration. In this study, power consumption of a five-axis machine was measured and analyzed. Experimental results showed that power consumption of a rotational axis is

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