

Determination of Maximum Acceptable Weight of Handling in Combined Manual Materials Handling Tasks

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Abstract

A study on combined manual materials handling tasks performed on floors under three frequency levels was conducted. Eight male subjects participated in the study. The maximum acceptable weight of handling, including lifting, carrying for 3 m, lowering, and walking 3 m back at either 1, 2, or 3 per minute was determined. The subject then performed the same tasks for 10 minutes. The V_{O_2} , heart rate, and rating of perceived exertion for whole body strain were measured. The results showed that the effects of frequency on the maximum acceptable weights of handling, heart rate, and V_{O_2} were statistically significant ($p < 0.01$). As the frequency level decreased from 3 to 1 per minute, the maximum acceptable weights of handling increased from 7.21 to 9.10 kg. The V_{O_2} , on the other hand, decreased from 713.2 to 462.5 ml per minute. The heart rate decreased from 103.8 to 93.0 beat per minute. The effects of frequency on RPE was, however, not significant. The implication of this study was that frequency should be regarded as one of the major job factors in designing MMH tasks as it affected both physiological responses of the subjects. High frequency resulted in both higher physiological measures for the subjects under our experimental conditions. This is consistent with the findings in the literature.

Keyword : manual material handling, frequency, V_{O_2} , RPE, heart rate