Autor(en) des Beitrags:
Strasser, H.; K.-W., Müller

Titel des Beitrags:
Favorable movements of the hand-arm-system in the horizontal plane assessed by electromyographic investigations and subjective rating

Abstract:
A study was carried out in order to analyze the influence of different movement directions on muscular strain of the hand--arm system when handling light weights. 11 female subjects had to perform a one-handed lifting task in the horizontal plane, moving repetitively objects of approximately 0 kg and of 1 kg on a table. Thirteen different directions in the frontal area had been provided. Electromyographic activity (EA) was continuously recorded from 8 muscles of the left hand--arm--shoulder system and the upper trunk. All data were standardized by the activity arising under maximum voluntary contractions (MVC). The EA-values were separated into static and dynamic components. Before the test, the subjects had to assess their preference of each direction. After each working direction the actually felt strain was rated on a scale. Both static and dynamic components of the muscular activity show a strong dependence on the moving direction. The directions around 30° (measured from the body plane) cause less than half of the muscular load in comparison with directions between 90° and 160°, which are often found in real work situations. When moving the weight of 1 kg EA-values up to 30

Relevance to industry
The repetitive handling of light weights is often found in industrial workplaces, as for example in supermarket checkouts and in assembly-lines. The layout of these workplaces normally refers to static anthropometric data and not to the dynamics of the movements. Especially the direction of the
movements is an important parameter for the muscular strain. Almost half of the static strain and a considerable part of the dynamic strain of some relevant muscles can be reduced if the workplaces are reconstructed according to the findings of this study.

Zeitschriftentitel:  
International Journal of Industrial Ergonomics

Jahr:  
1999

Band:  
23

Heft / Issue:  
4

Seiten:  
339--347

Volltext / DOI:  
http://doi.org/10.1016/S0169-8141(98)00050-X

Occurences:  
· Einrichtungen > Fakultäten > Fakultät für Maschinenwesen > Institut für Produktionstechnik > Lehrstuhl für Ergonomie (Prof. Bengler) > 1999

entries: