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Focus on IFA's work

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Handling aids reduce exposure in masonry work

Problem

The handling of heavy loads in conjunction with an unfavourable body posture may lead to back complaints and exacerbate existing disorders. Employees in construction vocations often perform such tasks associated with stress upon the back. During masonry work in particular, these tasks include the lifting and carrying of heavy blocks, and the moving of blocks in a posture with the trunk strongly bent. The trend towards greater efficiency has led to the widespread use of blocks of increasing size and thus also weight.

Handling aids by means of which blocks can be laid without considerable physical exertion are an ergonomic solution to this problem. A field study was conducted by the Institutions for Statutory Accident Insurance and Prevention (BGs) in the Building Trade in order to determine the reduction in stress which could be achieved by the use of handling aids, and whether their use gave rise to specific new stresses.

Activities

The Ergonomics division of the council of the BGs responsible for the Building Trade examined the use of handling aids (mini cranes/bricklayer's platforms) for the laying of building blocks on 15 construction sites from a medical/ergonomic and a technical/economic perspective. The IFA was involved in order to measure the stress arising during work on a construction site on which a mini crane was employed.

Recording of body posture and handled load weight during masonry work with the use of a mini crane as a handling aid

The stress upon the employee was measured by means of the IFA's CUELA system for computer-assisted measurement and long-time analysis. This personal system records posture and motion data during a working shift by means of sensors attached to the clothing. Sensor soles for measurement of the ground reaction forces are inserted into the work shoes. Information on the weight of loads actually lifted can thus be recorded, in addition to the body posture.

A simple biomechanical model enables the disk compression forces in the region of the lower lumbar spine to be estimated.

Results and Application

The data recorded during work with handling aids were compared to measured values obtained in masonry construction at an earlier point by means of the AEB observation method based upon *Fleischer*. It was shown that the physical stress upon the workers was reduced considerably where handling aids were employed in place of conventional construction techniques. Firstly, employees assume an upright posture much more quickly, which considerably reduces the proportion of work performed in bent body postures. Secondly, the force required for lifting the loads is reduced. The handling aids were not found to give rise to new stress situations.

The results are being processed by the council of the BGs responsible for the Building Trade such that small companies in particular, who lack the resources for in-house innovation, will be able to introduce these new technical developments in masonry work at manageable risk and predictable expense.

Area of Application

All enterprises within the construction sector

Additional Information

- Council of the BGs responsible for the Building Trade, Ergonomics Council, “Model workplace – handling aids in masonry work” project
- www.ergonomie-bau.de

Expert Assistance

IFA, Division 4: Ergonomics – Physical environmental factors

Literature Requests

IFA, Zentralbereich

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