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BIOMECHANIC / RICE-BAG-CARRYING TASK

PHAIROAT LADAVICHITKUL : A BIOMECHANICAL MODEL TO PREDICT SAFE
WEIGHT FOR RICE-BAG-CARRYING TASK. THESIS ADVISOR : PROF. KITTI
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This thesis mainly aims to construct a forecasting model of safe weight for rice-bag-carrying task by using Biomechanic Dynamic model. The 10 male rice-bag-carriers were tested in the Sagittal plane. The tested factors are the weight of rice-bag at 25, 55, 100 and 125 kg. and the height of dropping rice-bags at shoulder-to-knee and shoulder-to-chest levels.

The results show that the weight of rice-bags and the height of dropping rice-bags have a significant impact on the backbone. A predictive model was developed to determine safe carrying weight from the circumference of chest, the circumference of calf, the strength factor and the body weight. The first two factors are positively related to the weight of rice-bag while the latter two factors are negatively related. In comparing the compressive force on the backbone base on both the static and the dynamic calculations, it was found that the former gave lower maximum compressive force than the latter one. So the result from static calculation is not suitable for representing actual compressive force.

This thesis is not only to develop Ergonomic study especially in Biomechanics, but also to be a guideline for designing the work environment for labourers in order to prevent accident. Moreover this is a pilot research. To be further developed in order for the model to be used with the general population. The result may be used for the authorities to establish policies or to enact labour law.

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ปีการศึกษา.....2542

ลายมือชื่อนิสิต.....
ลายมือชื่ออาจารย์ที่ปรึกษา.....
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....