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KEY WORD : METAL PLATE-SHEARS / PHYSICAL EFFECTS

SOMSAK KANAPRASERTKUL : A COMPARATIVE STUDY ON EFFECTIVENESS AND PHYSICAL EFFECTS OF 4 TYPES OF STRAIGHT TYPE METAL PLATE-SHEARS ON THE ARM MUSCLES OF THAI ADULTS. THESIS ADVISOR : DHEPPANOM MUANGMAN, B.A.,M.D.,M.P.H.,Dr.P.H., PANUPAN SONGCHAROEN, B.Sc.,M.D.,CERT.(Orthopaedics), SOMPONG THONGCHAI, M.Sc.(Technology of Environmental Management), 103 p. ISBN 974-589-214-9

This study was carried out to evaluate how physical effects in terms of muscular fatigue due to force requirement on precision were influenced by type of plate-shear. Four types of Wiss plate-shears were used; M-5R type with 4 fulcrums, thumb & fingers support, spring grip, and long shaft; AC-1 type with 4fulcrums, thumb & fingers support, spring grip, and short shaft; AC-1P type with 4 fulcrums, spring grip, and straight & short shaft; W5 type with 1 fulcrum and grip span. It was studied with 22 subjects, 10 male and 12 female.

The experimental result indicated that male subjects used 46.52% of their maximal grip force and female subjects used 59.65%. The male subjects produced more than five times as long a cutting distance as the females. Reduction of handgrip MVC indicated a more pronounced fatigue 20.34%in women than in men. Productivity (in cm cut per min) was rather strongly related to anthropometric data, force developed in cutting, and maximal grip force. Thus in a multiple regression analysis using productivity as dependent variable, relationship values were 0.85 ($R^2 = 0.72$), 0.80 ($R^2 = 0.65$), and 0.82 ($R^2 = 0.68$) respectively. The types of plate-shears which were preferred in descending order of preference, were M-5R, AC-1, AC-1P, and W5. In conclusion, the physical effects were influenced by types of plate-shears significantly at 95% of level of confidence.