

## Abstract

The purpose of this work is to decrease the level of muscle fatigue from work of employees in a sample ceramic tile factory. The study was started by interviewing 41 employees in the quality checking and packaging division of the factory. The employees reported that the major muscular problem was found in the waist and lower back areas of the body with the percentage of 10.1% and 9.3%, respectively. In order to reduce the muscular fatigue, the posture analysis (RULA: Rapid Upper Limb Assessment) was performed with five employees in the division to explore and investigate the risk factors of muscular fatigue. The averaged grand score of RULA was  $6.4 \pm 0.55$ . That was very high and needed to improve the workstation immediately. After an improvement of the workstation by changing the traditional chair with fixed height to adjustable height one, readjusting the workstation layout, and adding the defective tile automatic ejector, the averaged score of RULA decreased to be  $3.20 \pm 0.45$ .

The study on the factors related to lighting environment of the quality checking workstation was carried out by using the experimental design with two important factors, the color of example tile background and the reflected light intensity at the area of employee eyes. Four colors (white, black, gray, green yellow) were used to combine with two ranges of light intensity near the employee eyes. The five employees were tested under eight different conditions resulting from the combination of the two factors mentioned above. It was found that the light intensity at the employee eyes significantly effect on the quality checking efficiency. The decrease in the reflected light intensity level contributes the increase in the efficiency of tiles quality checking.

After improved the workstation and lighting condition, it was found that the averaged time to stop working per day decrease from 43.5 minutes into 22.4 minutes or 48.5%. That increased the total quantity of tiles sorting to be  $65.9 \text{ m}^2/\text{day}$  or 2.19% when compared with the traditional working condition.