# Redesign of liquid aluminum pouring tool based on participatory ergonomics to improve productivity, workload, and musculoskeletal disorders

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Abstrak

This research was conducted at P.T. “ED” Aluminium, Yogyakarta, an industrial aluminum foundry that produces manually operated cooking appliances. The workers complain of muscle pain and fatigue, and of always having to pursue production targets in order to fulfill goods shipment deadlines. Also evident was the unergonomic work system, where the liquid aluminum was often spilled due to workers having to adopt an unnatural work posture when pouring the liquid aluminum into molds. Therefore, the researchers’ aims were to improve the operator’s working posture, reduce the workload, eradicate musculoskeletal complaints, improve time efficiency, and increase productivity by redesigning the liquid aluminum pouring tools using an integrated participatory ergonomics method combined with an appropriate technology (AT) concept. Furthermore, ergonomics intervention was conducted in the redesigning of the pouring tools. The result was an ergonomic liquid aluminum pouring tool. The ergonomics intervention results from use of the newly designed pouring tools allowed for a more natural working posture, improvement in the workload category from heavy to medium, a 26.13% reduction of the workload, and a 19.64% reduction in musculoskeletal disorders. Time efficiency increased by 25.81%, and productivity increased by 26.60%.