

Perancangan rotasi kerja operator pengecoran PT. Alpha Austenite yang mengalami Heat Exposure selama proses Bronze Casting = Designing work rotation for foundry operators of PT. Alpha Austenite subjected to Heat Exposure during a Bronze Casting process

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Abstrak

Pengecoran merupakan proses kerja utama pada pekerjaan Bronze Casting yang memiliki berbagai macam bahaya, seperti paparan panas (heat exposure), bahan kimia berbahaya, kontaminan udara, bahaya pekerjaan manual, kebisingan, getaran, paparan logam cair, serta bahaya dari pabrik dan mesin. Diantara bahaya tersebut, heat exposure merupakan bahaya paling signifikan melihat pengecoran memiliki pekerjaan utama peleburan menggunakan tungku dengan suhu tinggi dalam durasi yang panjang. Operator pengecoran yang mengalami heat exposure melebihi batas memiliki risiko terkena heat-related illnesses, cedera, hingga kematian. Sebagai kegiatan utama dalam Bronze Casting, perlu dibentuk metode kontrol panas untuk menghindari risiko tersebut dengan cara merancang rotasi kerja yang memiliki objektif untuk meminimalisir paparan panas yang diterima oleh operator. Perancangan akan diawali dengan pengukuran WBGT Index tiap jenis kerja yang dilakukan, metabolic heat yang dihasilkan subjek, serta batas paparan panas yang dapat diterima oleh suatu individu dalam bentuk Recommended Exposure Limit (REL). Rotasi Kerja kemudian disusun menggunakan metode program linear dan memperoleh hasil yang mampu memastikan tiap operator pengecoran bekerja pada ambang batas REL pada tiap tempat kerja. Hasil rancangan rotasi kerja merupakan solusi tanpa biaya yang dapat meminimalisir risiko heat-related illnesses pada operator pengecoran PT. Alpha Austenite dalam proses kerja Bronze Casting.

.....Foundry is the main work process in Bronze Casting, which has various hazards, such as heat exposure, hazardous chemicals, air contaminants, manual work, noise, vibration, exposure to molten metal, as well as hazards from factories and machines. Among these hazards, heat exposure is the most significant as foundry mainly consists of smelting using a high temperature furnace for an extensive duration. Foundry operators who experience heat exposure exceeding the limit, have a risk of getting heat-related illnesses, injury, and even death. As the main activity in Bronze Casting, it is necessary to provide a method of heat control to prevent risks by designing a work rotation with an objective to minimize heat exposure received by the operator. The design will begin with measuring WBGT Index for each type of work, metabolic heat produced by each subject, and the heat exposure limit that can be tolerated by an individual in the form of Recommended Exposure Limit (REL). Work rotation is then designed using linear programming method and obtained results that can ensure each foundry operator is well within the REL threshold at each workplace. Results of the work rotation design is a non-monetary solution that are able to minimize the risk of heat-related illnesses for foundry operators in PT. Alpha Austenite during Bronze Casting work process.