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Determining the optimal index of heat stress in foundry, die casting and road construction industries using FAHP-Topsis

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Abstract

Introduction: Heat stress is one of the harmful risks in casting and die casting industries, which can not only cause work-related diseases but also can impair the performance and safety of workers. Since the indicators that are used to evaluate heat stress are very different, it is very difficult to choose a suitable index. The aim of this study was to determine the optimum heat stress index in foundry, die-cast, and road construction industries using FAHP and Topsis methods.

Material and Method: In order to determine optimum heat stress index in foundry, die-cast, and road construction industries, first, the prioritization criteria were defined by experts (including ease of measurement, measurement accuracy, comprehensiveness, time, cost, and correlation). Then, considering these criteria, the best heat stress index was determined based on experts' opinions and using FAHP and Topsis methods.

Result: The results of this study suggest that given the current conditions and criteria, WBGT and P4SR is the best indices for foundry, die casting and construction.

Conclusion: The results showed that according to comprehensiveness, accuracy and correlation criteria, the WBGT index is considered as the best indicator of heat stress assessment in foundry, die-cast and road construction industries. Moreover, the HSI ranked in the last place due to the complexity and cost of its calculation.

Key words: *CET, FAHP-Topsis, Heat Stress, HIS, P4SR, WBGT*

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