

Occupational Heat Stress Condition According to Wet Bulb Globe Temperature Index in Textile Processing Unit: A Case Study of Surat, Gujarat, India

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Abstract : Thermal exposure is a common problem in every manufacturing industry where heat is used in the manufacturing process. In developing countries like India, a lack of awareness regarding the proper work environmental condition is observed among workers. Improper planning of factory building, arrangement of machineries, ventilation system, etc. play a vital role in the rise of temperature within the manufacturing areas. Due to the uncontrolled thermal stress, workers may be subjected to various heat illnesses from mild disorder to heat stroke. Heat stress is responsible for the health risk and reduction in production. Wet Bulb Globe Temperature (WBGT) index and relative humidity are used to evaluate heat stress conditions. WBGT index is a weighted average of natural wet bulb temperature, globe temperature, dry bulb temperature, which are measured with standard instrument QuestTemp 36 area stress monitor. In this study textile processing units have been selected in the industrial estate in the Surat city. Based on the manufacturing process six locations were identified within the plant at which process was undertaken at 120°C to 180°C. These locations were jet dyeing machine area, stenter machine area, printing machine, looping machine area, washing area which generate process heat. Office area was also selected for comparison purpose as a sixth location. Present Study was conducted in the winter season and summer season for day and night shift. The results shows that average WBGT index was found above Threshold Limiting Value (TLV) during summer season for day and night shift in all three industries except office area. During summer season highest WBGT index of 32.8°C was found during day shift and 31.5°C was found during night shift at printing machine area. Also during winter season highest WBGT index of 30°C and 29.5°C was found at printing machine area during day shift and night shift respectively.

Keywords : relative humidity, textile industry, thermal stress, WBGT

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