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论文

侧风环境下自然通风湿式冷却塔周向进风变化规律

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摘要:

研究了自然通风湿式冷却塔底部周向进风随着外界侧风变化的规律, 整个研究在一个热态模型冷却塔试验台上进行.研究表明: 无风时, 塔底周向进风是均匀轴对称的, 即塔内填料各处的传热传质性能也是轴对称分布的.但侧风环境下, 外界侧风破坏了冷却塔底部周向进风的轴对称分布规律, 侧风风速大于0.2m/s时各处进风越不均匀.与无风工况相比, 当侧风风速为0.5m/s时, 迎风面进风口风速为无风时的1.875倍, 而背风面进风口风速仅为无风时的30%.因此, 外界侧风影响了进入塔内的总体通风量, 恶化了塔内的传热传质性能.

关键词: 侧风; 湿式冷却塔; 进风; 传热传质性能

Circumferential inflow air distributing rules in a natural draft wet-cooling tower under crosswind conditions

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Abstract:

The circumferential inflow air on the bottom of a natural draft wet-cooling tower were studied under windless and crosswind conditions. The entire research was conducted in a closed lab with a thermal state cooling tower model. The research showed that the circumferential inlet wind was well proportioned and axisymmetric under windless conditions, that is, the heat and mass transfer performance through fillings zone was also axisymmetric. The axisymmetric distribution of circumferential inlet wind velocity was destroyed under crosswind conditions. This phenomenon was very obvious when environmental crosswind velocity was more than 0.2m/s. When the environmental wind velocity was about 0.5m/s, the circumferential inlet wind velocity in windward sidewas about 1.875 times the windless conditions, while the circumferential inlet windvelocity in leeward side was about 0.3 times the windless conditions. Thus, the environmental crosswind affected the airflow rate entering into the cooling tower, and then deteriorated the heat and mass transfer performance.

Keywords: crosswind; wet cooling tower; air inlet; heat and mass transfer performance

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