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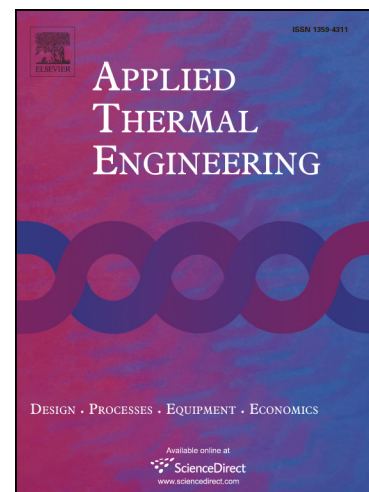
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Heat transfer and pressure drop characteristics of wet air flow in metal foam with hydrophobic coating under dehumidifying conditions

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Abstract

The heat transfer and pressure drop characteristics of wet air flow in the metal foam with hydrophobic coating was investigated experimentally, and were compared with those in uncoated metal foam to analyze the influence of hydrophobic coating. The experimental conditions include the inlet air temperatures of 27°C-35°C, the inlet air relative humidity of 30%-90%, the air velocities of 0.5-1.0 m/s, the copper foam PPI of 5-40. The results show that, the heat transfer coefficient of wet air in metal foam with hydrophobic coating is 5%-34% larger than that in uncoated metal foam under dehumidifying conditions, while the pressure drop in hydrophobic metal foam is larger by 1%-95% than that in uncoated metal foam. The comprehensive performance of metal foam with hydrophobic coating under dehumidifying condition is better than that of uncoated metal foam at relative humidity of 30% and 50%, but is worse at relative humidity of 70% and 90%.

Key words: Metal foam; Hydrophobic; Heat transfer; Pressure drop; Dehumidifying condition;

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