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# Parametric study of a laboratory scale cooling tower for different packing materials, and mass flow ratio Water-Air

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**Abstract:**This work deals with the design of a laboratory scale cooling tower. Different materials of splash type packing were used, wood, acrylic plastic, ironand aluminum, as well as a film type packing made of acrylic material. The performance of the tower was assessed at different mass flow ratios of water to air, water inlet temperature and different packing materials of the tower.It was found that the tower efficiency decreases when the mass rate ratio of liquid to gas L/G increases. The tower efficiency decreases when the inlet water temperature decreases implying that the tower has a better performance when cooling water at high temperatures. High values of thermal conductivities in the packing results in low tower efficiencies. Low thermal conductivity materials (K<0.2W/m$^o$C) increase the tower efficiency around 4.9% to 9.3% when compared with high thermal conductivities materials (K>80.2 W/m$^o$C), operating the tower in the range of L/G from 0.22 to 1.1.
**Keywords :** Cooling tower, efficiency, tower packing.

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