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Optimum spacing between grooved tubes : An experimental study

(Article)

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Abstract

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An experimental study on optimum spacing between grooved tubes is reported in this paper. Two grooved tubes having pitch of 10 mm and 15 mm and a plain tube were considered for the heat transfer analysis. The spacing between two tubes with same pitch was varied from 10 mm to 35 mm with a step size of 5 mm. Velocity of air flowing over the tube surfaces was changed from 0.4 m/s to 1 m/s using a blower fan. Based on Nusselt number (Nu) the optimum spacing between the tubes was decided. The optimum spacing between grooved tubes of pitch 10 mm and 15 mm was compared with that of plain tubes. From the experimental analysis it was noticed that with increase in air velocity (increase in Reynolds number) the tube surface temperature reduced irrespective of any tube considered. Nu increased with increase in air velocity for all the tubes. The important conclusion drawn from the present study was that, there exists a limiting spacing (optimum) between the tubes above which no change in Nu was observed. Spacing of 30 mm was found to be the optimum spacing between the tubes irrespective of its surface geometry modifications.

SciVal Topic Prominence

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Prominence percentile: 95.947

Author keywords

Grooved tubes | Grooves | Heat transfer | Nusselt number | Optimum spacing

Indexed keywords

Engineering controlled terms: Air | Heat transfer | Nusselt number | Reynolds equation | Reynolds number

Engineering uncontrolled terms: Air velocities | Experimental analysis | Grooved tubes | Grooves | Heat transfer analysis | Optimum spacing | Surface geometries | Surface temperatures

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