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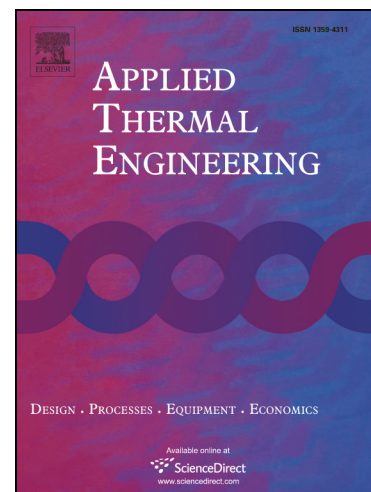
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A novel low-resistance tee of ventilation and air conditioning duct based on energy dissipation control

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Abstract: The local components represented by the split-flow tee are essential parts of ventilation and air conditioning systems in buildings. The structure of the split-flow tee has not changed in 50 years, and it offers significant energy-saving potential. Therefore, this work introduces a novel low-resistance split-flow tee based on energy dissipation control and engineering practice analysis. The tee's resistance performance is compared with five other traditional tees, under different flow ratios and aspect ratios. The effects of resistance reduction are verified by means of experiments and the existing literature. This study demonstrates that the novel tee constantly maintains the least resistance under different flow ratios (5:1 to 1:3) and aspect ratios (4:1 to 1:4), compared with five other traditional tee types. Moreover, the resistance can be reduced by 42% compared with the traditional tee. The use of the novel tee reduces energy dissipation intensity, and the energy dissipation area is pushed away from the main flow area.

Keywords: ventilation; air conditioning; energy conservation; split-flow tee

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