

**MICROCHANNEL AND FINNED COILS: PERFORMANCE  
COMPARISON IN SINGLE PHASE AND IN CONDENSATION**

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**ABSTRACT**

Tests have been conducted on two microchannel heat exchangers, having different fin spacings (19 and 14 FPI), for single phase flow and condensation. Measurements included coil duty and air pressure drop.

For single phase flow, tests were carried out with chilled water on both microchannel heat exchangers, with and without moisture condensation on fins. With moisture condensation on the 19 FPI heat exchanger, the horizontal configuration yielded an interesting cyclic phenomenon: condensed water accumulated progressively between the fins, and then a sudden draining occurred (blow-off). When the 19 FPI heat exchanger was used vertically, this phenomenon did not happen. Air pressure drop is reduced using the microchannel heat exchanger, and overall heat transfer coefficients show an increase of 30 to 40% over traditional finned coils.

Condensation tests were conducted with R134a and R407C on the 19 FPI microchannel heat exchanger in horizontal tube position. The measured capacity was higher than the capacity achieved with a classical finned coil having the same overall volume (same frontal area, fin spacing and finned thickness), particularly at high air speed. The comparison showed that the use of a microchannel heat exchanger enables an increase in duty of 30 to 70% compared to a traditional plate finned coil, at constant coil face area.