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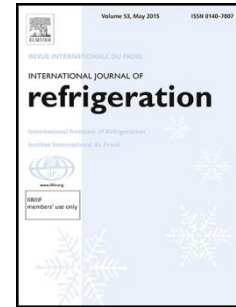
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## Flow Characteristics of Refrigerant and Oil Mixture in an Oil Separator

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### Highlights

- Efficiency and pressure drop in oil separators measured under different conditions
- Efficiency decreased and then increased with increasing refrigerant mass flow rate
- Pressure drop decreased with increasing liquid circulation ratio
- Empirical equations for predicting efficiency and pressure drop in the oil separators are proposed

### ABSTRACT

The efficiency and pressure drop in the oil separator of a multi heat pump system was experimentally investigated. R410A and polyvinylether (PVE) oil were used as the refrigerant and lubricant of the system, respectively. The refrigerant mass flow rate and the liquid circulation ratio were varied between 30 and 150 g s<sup>-1</sup> and between 1.5% and 4.5%, respectively. Five different oil separators were considered, and the measured efficiencies and pressure drops were analyzed with respect to the height and diameter of the oil separators. The analytical results were used to develop empirical equations for predicting the efficiency and pressure drop of the oil separator. The mean absolute percentage errors between the predicted and measured efficiencies and pressure drops for the oil separators were 0.4% and 11.7%, respectively.

**Keywords:** Lubricant, Multi heat pump system, Oil separator, Pressure drop, PVE oil, R410A

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