**Title:** A review of organic rankine cycles (ORCs) for the recovery of low-grade waste heat

**Author(s):** T. C. Hung, T. Y. Shai, and S. K. Wang

**Published:** Energy Vol 22 No. 7 pp 661-667

**Keywords:**

From the abstract: “Isentropic fluids are most suitable for recovering low-temperature waste heat. Freons and their alternatives have been studied and shown similar system responses in ORCs.”

The thermophysical properties of working fluids are compared and presented in Table 1. It is apparent that dry and isentropic organic fluids generally have much lower relative enthalpy drops during expansion than the water-steam misture. Therefore, a single-stage turbine is usually used in ORC.

Unlike water, most organic fluids suffer chemical decomposition and deterioration at high temperatures and pressures.

It appeared that system efficiency did not seem to vary significantly with turbine inlet pressure for the working fluids studied; though working pressure increases did yield modest efficiency gains. System efficiency was also shown to be reduced by higher condenser outlet temperatures. It was posited that ambient temperature conditions may be a driver for this finding.