

## **LOW TEMPERATURE / SMALL CAPACITY ORC SYSTEM DEVELOPMENT**

**Joost J. Brasz**

Danfoss Turbocor Compressors Inc.  
Syracuse University Center for Advanced Systems and Engineering (CASE)  
2-286 Center for Science and Technology  
Syracuse, NY 13244-4100, USA  
E-mail: [jbrasz@turbocor.com](mailto:jbrasz@turbocor.com)  
Web-page: <http://www.turbocor.com/>

### **ABSTRACT**

This presentation will review some recent developments that have resulted in commercial introductions of smaller capacity and lower temperature Organic Rankine Cycle systems. The availability of new working fluids in general and HFC245fa in particular allowed the utilization of existing air-conditioning compression and heat exchanger components that were already mass-produced to be used for ORC power generation. This allowed power recovery from waste heat streams that were previously considered too low in temperature or too small in capacity to be economical.

Advances in high-speed direct-drive motor/generator and inverter technology have the potential to further improve the performance and reduce the turbine footprint for small capacity ORC systems. The variable speed operation capability that comes with this technology allows optimum turbine efficiency at off-design conditions, an important benefit for lower temperature ORC applications.

The search for new refrigerants with low global warming potential in the air-conditioning industry has resulted in the near-term availability of a number of new ORC working fluids that offer interesting possibilities for even lower temperature and smaller capacity ORC systems.