

Development of a Waste Heat Powered 3-Ton Chiller

Energy Concepts Company is developing a waste heat powered three-ton chiller for the US Army Communications-Electronics Research Development and Engineering Center (CERDEC). The engine exhaust heat powered chiller must operate in 122F desert climates with dry cooling; it must also be lightweight, compact, and efficient. By providing electronics and comfort cooling from exhaust heat instead of engine power, the engine size and fuel supply for forward operating bases can be reduced.

The chiller will use advanced heat and mass transfer components and controls in order to meet the performance, weight and cost targets. Energy Concepts has teamed with the University of Maryland's Smart and Small Thermal Systems Lab to develop and apply microgroove heat exchangers for this application. Additional component and flowsheet enhancements will be incorporated from the ECC industrial and commercial product lines, including compact shell and coil heat exchangers, and a new float valve that is necessary for the extreme range of operating conditions.

A component test stand has been assembled, and testing is underway at our Annapolis, Maryland facility. We will be seeking a commercialization partner to help market this product. Initial target markets include military and transportation sectors (bus air conditioning, refrigerated transport). Future markets will include solar thermal powered chillers for residential/commercial applications. The ideal commercialization partner is a military supplier, with distribution and service channels in place, looking to expand their product offerings.

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