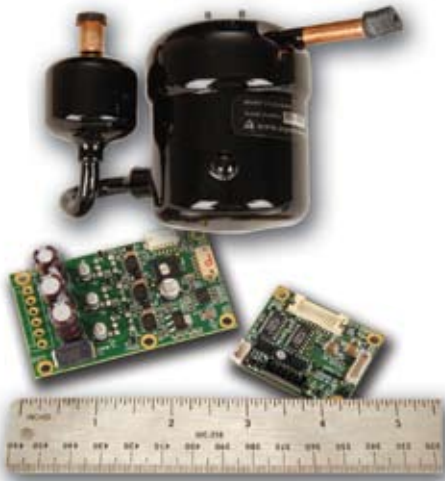


Compact–Light–Rugged Cooling Systems for Extreme Applications



Aspen Systems, Inc. Prototyping

Developing Compact Refrigeration
Systems to Your Specifications

At a Glance

Aspen Systems has the technology, staff and experience to develop field-ready environmental control units to your specifications.

- MIL-STD-810; MIL-STD-461; MIL-STD-464; MIL-STD 1275 compliant systems
- To Your Specifications
- On Schedule
- Below Ambient Temperature Cooling
- Air, Liquid, or Direct Refrigerant Cooled Systems
- Ground, Airborne, Shipboard
- Systems to cool Standard Rack Mount Electronics, Hardened Electronics, Lasers, Radar, Avionics, Rack Mounted, VITA Based Systems
- Heat Dissipation Can Be Remote From Electronics

We will work with your engineering team to develop new vapor compression based refrigeration cooling systems to meet your specifications. With over 140 years of combined experience of our team in developing advanced refrigeration systems, condensers, and evaporators, Aspen is the ideal go-to company for resolving your thermal management needs.

Cooling Systems for COTS Electronics

Many military programs are specifying COTS electronics to take advantage of their performance, low cost, and rapid time for fielding. Meeting the requirements of these COTS electronics for cooling air at below ambient temperature has been an ongoing problem for thermal engineers. Aspen has developed a series of vapor compression based miniature environmental control systems that are mobile, and can be integrated into existing transit cases and vehicles to meet COTS thermal requirements.

ECU-*CHILL*[™] can be installed in the door or side wall of an electronics enclosure to maintain desired internal case temperatures.

These light weight, portable vapor cycle systems are based on Aspen's miniature compressor and control system, shown at the top of the page.

The refrigeration based ECU's and the components shown on the back page represent a significant breakthrough in cooling technology for mobile electronics systems. ECU-*CHILL*[™] is in production and shipping and the prototype SATCOM-OTM ECU will be field tested soon. These systems are representative of breakthrough ECU technology that can be applied to other electronics cooling applications.



ECU-CHILL™ Refrigeration Based Environmental Control Unit, (ECU)



Prototype Vapor Cycle SATCOM-OTM Antenna Cooler



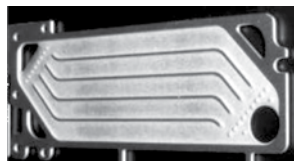
Aspen's Miniature Compressor



Personal Cooling Systems



Liquid-Liquid Evaporator



Liquid-Liquid Evaporator

Prototyping

Aspen Systems has been developing miniaturized cooling systems for well over 15 years. Applications ranging from refrigerant cooled cold plates kept at 25°C in a 71°C ambient environment to the MIL Qualified 550 watt ECU-CHILL™ system that maintains a 125°F internal environment in a 125°F outside ambient temperature have been developed. Systems weighing as little as 3 pounds have been developed for personnel cooling applications. The Aspen team has developed ECU's for air cooled, refrigerant cooled, and liquid cooling applications for a wide variety of applications, including all types of electronics systems including batteries, COTS electronics, and specialized laser systems.

System Integration

Aspen Systems' team is ready to rapidly produce prototype and field ready cooling and environmental control units that meet military environmental specifications for operation on moving ground vehicles and airborne systems.

The development team at Aspen Systems has expertise in heat transfer, refrigeration system development and design, and can rapidly determine the optimal approach to thermal management design and system integration for your toughest applications.

For more information on how we can help you meet your thermal management requirements, contact us at (508) 481-5058 (119) or visit www.aspensystems.com



Prototype Laser Cooling System



Evaporator and Condenser



Water Chiller for Eurofighter Pilot Cooling



Pump, Evaporator, Valve Assembly