



## ADVANCED LIGHTWEIGHT MICROCLIMATE COOLING SYSTEM (ALMCS) | TSPID

### OVERVIEW:

The **Advanced Lightweight Microclimate Cooling System (ALMCS)** is a very lightweight, state-of-the-art, man-portable microclimate cooling system designed to provide personal cooling to personnel wearing insulative protective clothing in high heat stress environments.

### DESCRIPTION:

The ALMCS is an electrically driven vapor cycle cooler that circulates a chilled fluid through a heat transfer garment, lined with a network of tubing. Metabolic heat from the wearer is transferred to the fluid, which is pumped to the ALMCS where the heat is rejected. The coolant fluid is re-chilled and re-circulated back to the heat transfer garment. The ALMCS operates on two BA-5590 lithium sulfur dioxide (LiSO<sub>2</sub>) batteries, although a third battery may be added for enhanced performance.

### SPECIFICATIONS:

- Cooling Capacity/Rate (two BA-5590 LiSO<sub>2</sub> batteries): 700 watt-hours/230 watts in a 95°F ambient
- Comfortable cooling delivery temperature: 65-70°F
- Three hour duration on two BA-5590 LiSO<sub>2</sub> batteries
- Weight: 11 pounds (with two batteries)
- Volume: 0.25 ft<sup>3</sup> (6½" × 4⅛" × 16¼")
- Energy Efficient: 4 Amps (two batteries)/ 6 Amps (three batteries) at 24 Volts DC
- Refrigerant: HFC, R-134A (non-ozone depleting)

### STATUS:

The ALMCS is a microclimate cooling research prototype that represents a breakthrough in the development of personal coolers. Significant weight and volume reductions over previous state-of-the-art systems were achieved through the development of a miniature rolling piston compressor and innovative packaging designs. The ALMCS is ready to transition to engineering development.

### POINT OF CONTACT:

#### TSPID Liaison

COMM: (508) 233-5436, DSN 256-5436

E-Mail: nati-amsrd-nsc-ad-b@conus.army.mil



UNCLASSIFIED

rev 12-19-01 | OPSEC 02-024

**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**