
SESSION 1: Mature Aerospace Coolers

Paper 1.3

Tuesday ORAL Session

8:45 AM

Thermal Performance Mapping and Temperature Stability Testing of the Thales LPT9310-HP

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One Thales LPT9310-HP commercial off-the-shelf (COTS) cryocooler with serial number (S/N) 2619 was parametrically performance tested for cold tip temperatures between 33 K and 250 K and heat rejection temperatures between -20°C and 40°C. An equation is developed that predicts heat lift as a function of compressor input power, cold tip temperature and heat rejection temperature for a fixed drive frequency. Additionally, an equation is developed that relates the change in specific power to the difference in drive frequency from the optimal drive frequency for a given set of conditions. An equation is also developed that predicts compressor input power as a function of cold tip temperature, heat rejection temperature and compressor input voltage. Finally, temperature stability test results are described for the cooler driven with an Iris Technology Corporation ICE-G2-200IL cryocooler control electronics.