
SESSION 1: Mature Aerospace Coolers

Paper 1.5

Tuesday ORAL Session

9:15 AM

Ball Kodiak Cryocooler System Design, Development, Qualification and Performance

*R. Taylor, B. Buchholtz, D. Glaister, Y. Kim, A. Contreras,
D. Oenes, Ball Aerospace, Boulder, CO; C. Fralick, D. Mansfield,
Sunpower, Athens, OH*

Over the past five years Ball has developed numerous low-cost, high performance cryogenic cooling systems for current and future cryogenic space payloads. To meet industry demand for high efficiency, low-cost, and high lift space rated cryocooler systems, Ball has recently developed the Kodiak Cryocooler System that provides industry leading efficiency/capacity in a turn-key product offering. The Ball Kodiak Cryocooler System includes a TRL9 Low Exported Vibration Cryocooler Assembly (CCA) mated to a TRL8 Sunpower DS-30 cryocooler, TRL6 Ball Modular Advanced Cryocooler Control Electronics (MACCE), flight harnesses, cold-tip thermal strap, and enhanced heat rejection interface. An Engineering Development Unit (EDU) of the Kodiak system has successfully been through qualification and characterization testing and the flight build has commenced for a government customer for a flight program of record. This paper discusses the design, development, qualification and thermodynamic and EFT (Exported Force and Torque) performance of the EDU Kodiak Cryocooler System and improvements implemented for the Flight System.