

**DEVELOPMENT OF A REUSABLE LUNAR ENVIRONMENT ELECTRICAL CONNECTOR, THE DUST TOLERANT CONNECTOR.** S. J. Indyk<sup>1</sup>, B. S. Mellman<sup>1</sup>, S. N. Tomasco<sup>1</sup>, K. F. Bywaters<sup>1</sup>, N. W. Traden<sup>1</sup>, and K. A. Zacny<sup>1</sup>. <sup>1</sup>Honeybee Robotics, 6406 Ivy Ln, Suite 105, Greenbelt, MD, 20770. (Contact: sjindyk@honeybeerobotics)

The Honeybee Robotics, Dust Tolerant Connector (DTC), solves the problem of a reusable electrical connector, capable of enduring the rigors of the lunar environment. Lunar regolith is infamously abrasive and detrimental to mechanism. The passive technology utilized in the DTC can contain and clear away regolith from the electrical connectors, ensuring a repeatable and reliable electrical connection for transferring power and data. Presented here is the design and development of a flight capable DTC configuration which was tested under relevant lunar vacuum, thermal, and regolith environmental conditions. Discussed are the challenges addressed by the DTC to enable astronaut or autonomous robotic interactions to reuse an electrical connection in the lunar environment. Also addressed are applications and challenges for implementation with various ISRU solutions and the needs for standardization of electrical interfaces.



Figure 1. TRL 6 DTC undergoing dirty TVAC testing

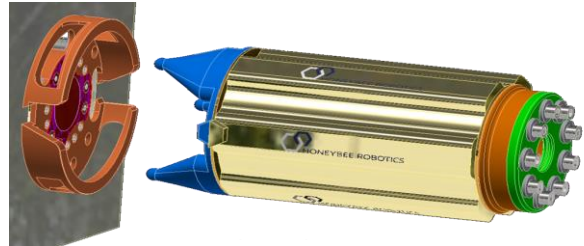


Figure 2. Next generation DTC with improved mechanism packaging

**References:** [1] J. Herman et al. (2011) Aerospace Conference [2] Kris Zacny, *Moon*, pp.235, 2012. [3] Jason Herman et al., "Dust-Tolerant Connector Development for Lunar Surface Systems", *2009 AIAA Space Conference Proceedings*, September 14–17, 2009. [4] S. Sadick, J. Herman, D. Roberts. (2010). Dust-tolerant Electrical Connector (US8011941B2)