Contribution ID: **221** Type: **Contributed Oral**

C2Or4C-03: Lightweight, high-flow valve for cryogenic propellant management on aircraft and spacecraft

Tuesday 20 May 2025 16:45 (15 minutes)

Recent development of hydrogen-powered aircraft and cryogenic-propellant-powered rockets has created demand for smaller, lighter, and lower-power solutions to classic fluid handling problems. Valves, seals, and couplings rated for use with liquid hydrogen and liquid oxygen are critical to enable advanced aerospace system architectures. Creare is helping meet this need through development of our lightweight, high-flow valve designed for cryogenic propellants. Our valve uses a floating seal to provide low flow restriction without the bulky housing typically required of valves with large orifices. We have demonstrated high flowrates (Cv > 200) in a small package (2″ nominal line size) with weight (˜18 lbs) appreciably lower than existing commercial alternatives. Low internal leakage (< 1 sccm) and all-welded construction (zero external leakage) make our device a leading candidate for SWaP-sensitive cryogenic fluid management applications. In this presentation we will provide an overview of our device design, valve scaling for different applications, and share recent performance data gathered at cryogenic temperatures.

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Session Classification: C2Or4C - Cryogenic Components III