Title: Fabrication of Flex Joint Utilizing Additively Manufactured Parts

Abstract: The Selective Laser Melting (SLM) manufacturing technique has been utilized in the manufacture of a flex joint typical of those found in rocket engine and main propulsion system ducting. The SLM process allowed for the combination of parts that are typically machined separately and welded together. This resulted in roughly a 65% reduction of the total number of parts, roughly 70% reduction in the total number of welds, and an estimated 60% reduction in the number of machining operations. The majority of the new design was in three SLM pieces. These pieces, as well as a few traditionally fabricated parts, were assembled into a complete unit, which has been pressure tested. The design and planned cryogenic testing of the unit will be presented.