Additive Manufacture of Refractory Metal Green Propulsion Thrusters

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High temperature refractory metals are required for a number of high temperature propulsion applications. Refractory metals are expensive, difficult to manufacture with high buy-to-fly ratios, and few vendors. Additive manufacture (AM) is used to produce C103, Molybdenum (Mo), and Tungsten (W) reaction chamber and thrust stand-off as well as Iridium ultra-fine lattice catalysts for integration into 1 N green propulsion thrusters. After printing components underwent post-processing to include heat treatment, surface finish modification, inspection, integration, and testing. Properly utilized AM overcomes existing manufacture limitations by greatly increasing design flexibility, material options, decrease price, decrease lead-time, and increase the commercial supply base.