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Mass Spectrometry of 3D-printed plastic parts under plasma and radiative heat environments W.F. RIVERA, C.A. ROMERO-TALAMAS, E.M. BATES, W. BIRMINGHAM, J. TAKENO, S. KNOP, University of Maryland, Baltimore County — We present the design and preliminary results of a mass spectrometry system used to assess vacuum compatibility of 3D-printed parts, developed at the Dusty Plasma Laboratory of the University of Maryland Baltimore County (UMBC). A decrease in outgassing was observed when electroplated parts were inserted in the test chamber vs. non electroplated ones. Outgassing will also be tested under different environments such as plasma and radiative heat. Heat will be generated by a titanium getter pump placed inside a 90 degree elbow, such that titanium does not coat the part. A mirror inside the elbow will be used to throttle the heat arriving at the part. Plasma exposure of 3D printed parts will be achieved by placing the parts in a separate chamber connected to the spectrometer by a vacuum line that is differentially pumped. The signals from the mass spectrometer will be analyzed to see how the vacuum conditions fluctuate under different plasma discharges.

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