

National Aeronautics and
Space Administration



Hot-fire Testing of Additively Manufactured C-18150 (CuCrZr) Combustion Chamber Liner

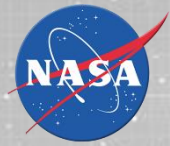
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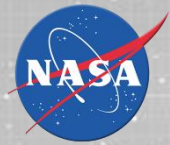
MARSHALL
SPACE FLIGHT CENTER



Additively Manufactured (AM) Liners Fabricated

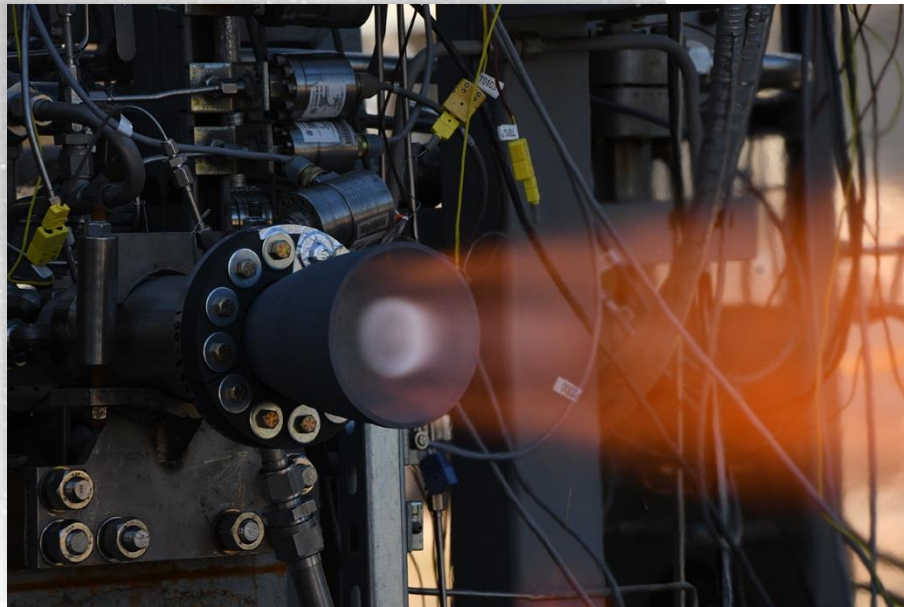
- (4) Additive Manufactured Combustion Chamber Liners 3D printed and completed HIP and thermal processing
(1) Liner in the as-built condition and (3) liners bead blasted prior to further processing



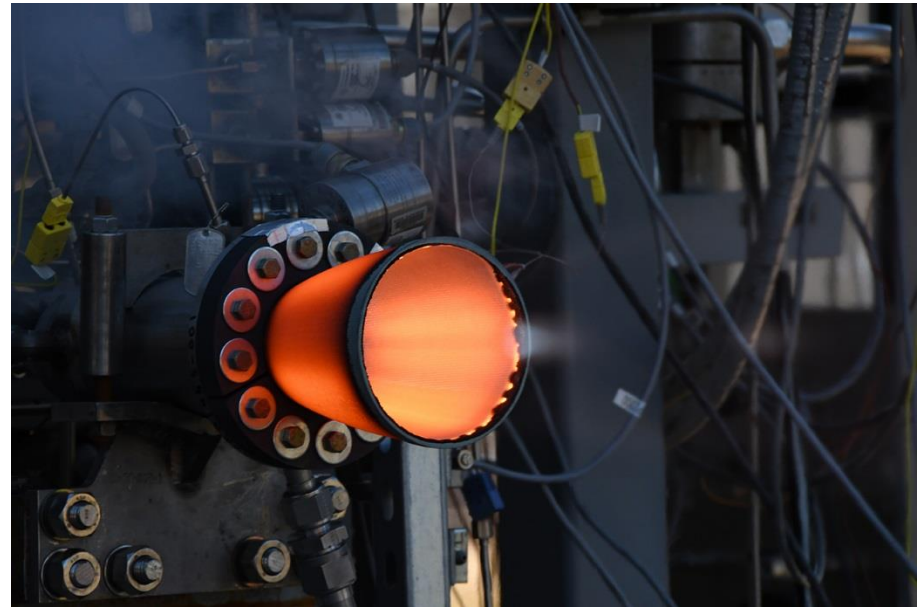


Hot-Fire Testing

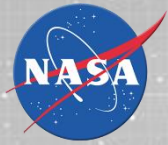
- Completed hot-fire testing at MSFC Test Stand 115 as part of Carbon-Carbon nozzle extension testing fabricated by Orbital ATK
 - LOX/Hydrogen environment with 3.5 O/F Mixture Ratio
 - Accumulated 1443 seconds of hot-fire time and 9 starts
 - Completed tests up to 180 seconds
 - Liner performed as predicted and no observed erosion



Engine Start



Main Stage



C-18150 Liner Post-Test (1443 sec)

