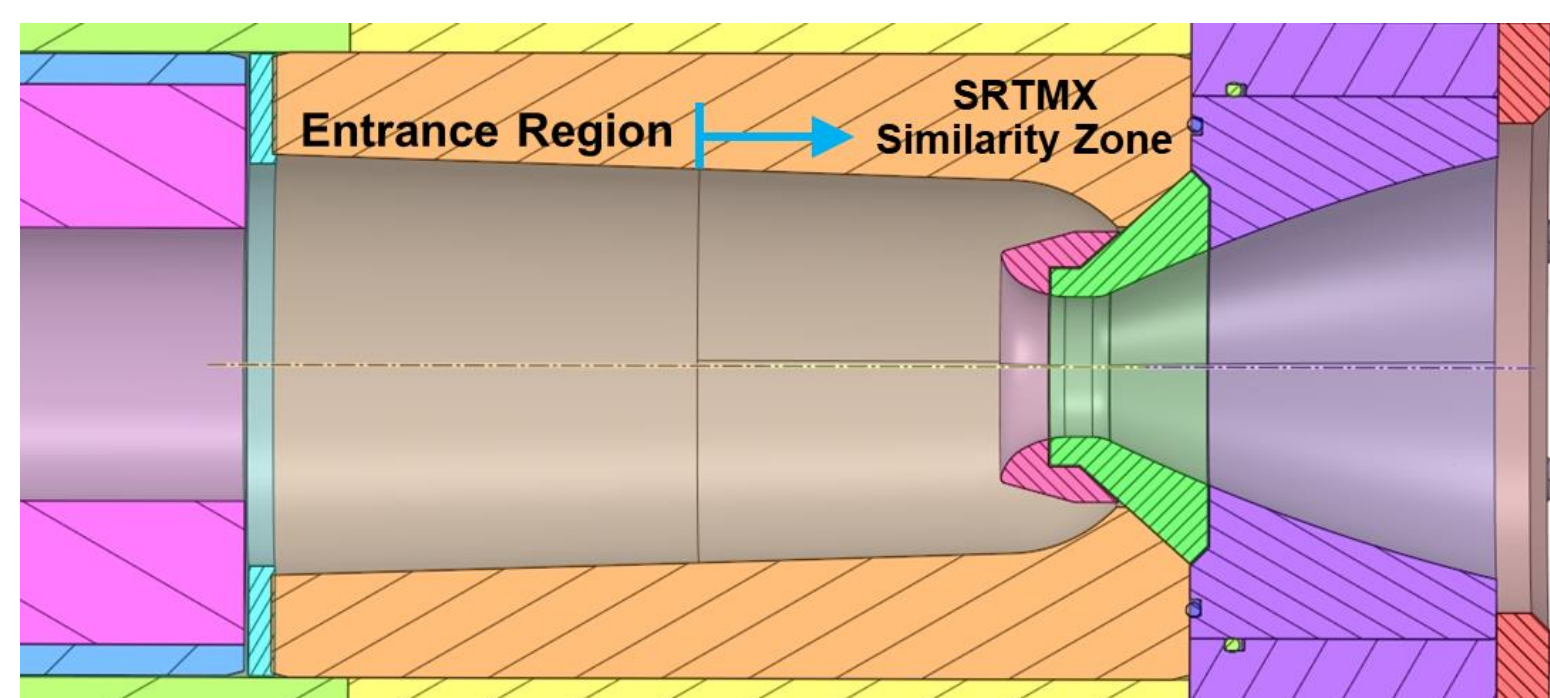


SUBSCALE TEST BED DEVELOPMENT TO SIMULATE SOLID ROCKET MOTOR INTERNAL ENVIRONMENTS FOR MATERIAL CHARACTERIZATION

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Overview and Objectives

- NASA and our Industry partners have identified a need for a mid-size solid and/or hybrid test bed used for material testing
 - Levying DEVCOM capabilities to achieve center goals
- Expand upon current MSFC hybrid/solid rocket motor testing capabilities
 - Longer burn durations
 - Inclusion of large-scale motor features
- Cheaper, faster testbed capable of achieving established minimum exposure of materials in project specific environments
 - Various nozzle geometries and configurations
 - Ability to modify core tooling quickly for different propellant types and burn rates
- All components, including hybrid grains will be manufactured in house.



Subscale Motor Test Beds

Solid Fuel Torch

- 6" diameter hybrid motor, aluminized solid fuel and gaseous oxygen
- 150 to 1500 psi motor pressure
- 10 second duration test



Mid-size Hybrid Motor

- Aluminized solid fuel and gaseous oxygen
- Up to 1500 psi motor pressure
- 20 second duration test
- Tapered grain, submerged nozzle, insulated aft dome region



SRTMX

- Live aluminized solid motor
- Targets SLS Booster pressures
 - Previous tests average pressures 967 psia – 1303 psia
- Insulated live grain segments, insulated aft dome, submerged nozzle, significant instrumentation



Current Status and Future Work

- All metal case components, nozzle tooling, casting cores, and fuel cartridges have been received
- Initial insulation test section has been manufactured and final machining is complete
- Casting of grains and nozzle manufacture pending completion of Critical Design Review
- Test Area modifications in work with initial test planned for October 2023.

