

Development Motor - 2 Ground Test

August 31, 2010







ARES DEVELOPMENT MOTOR - 2

The five-segment Ares motor for NASA's next-generation launch vehicle, features a design derived from the four-segment Space Shuttle reusable solid rocket motor.



53 Design Objectives — 764 Instrumentation Channels

Development Motor - 2 (DM-2) is the second full-scale, full-duration test of an Ares fivesegment reusable solid rocket motor Cold condition motor to achieve reduced propellant mean bulk temperature (PMBT) to **Cold Conditioning** obtain performance data on the propellant grain design and delivered motor ballistic characteristics at lower bounds of certification limit Obtain performance of field joints at lower bounds of temperature exposure (shrouding) PBI-NBR Insulation Obtain data on capability of thermal barrier system on forward field joint with intentional flow feature (demonstrate robustness of joint **Field Joint** configuration) Obtain performance data on the Cowl environmentally friendly insulator in the entire motor, including the aft dome Nozzle Obtain performance data on the redesigned nozzle cowl and 15-degree aft exit cone for structural and thermal requirements Obtain vibration, acoustic and heat flux data to support definition of motor-generating **PBI-NBR** Insulation external loads for the Ares Launch Vehicle Aft Dome **Predicted Performance** Countdown

Action Time (sec)	125.6
Max Chamber Pressure (psia)	937.4
Chamber Gas Temp (°F)	5,630
Maximum Thrust (vacuum) (lbf)	3,537,000
Total Impulse (vacuum) (lbf-sec)	366,750,000
Loaded Propellant Weight (lbm)	1,380,300





T+2 min CO₂ Quench