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NASA'S ADVANCED SOLID ROCKET MOTOR

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ABSTRACT

The Advanced Solid Rocket Motor (ASRM) will not only bring increased safety, reliability and performance for the Space Shuttle Booster, it will enhance overall Shuttle safety by effectively eliminating 174 failure points in the Space Shuttle Main Engine throttling system and by reducing the exposure time to aborts due to main engine loss or shutdown. In some missions, the vulnerability time to Return-to-Launch Site aborts is halved. The ASRM uses case joints which will close or remain static under the effects of motor ignition and pressurization. The case itself is constructed of the weldable steel alloy HP 9-4-0.30, having very high strength and with superior fracture toughness and stress corrosion resistance. The internal insulation is strip-wound and is free of asbestos. The nozzle employs light weight ablative parts and is some 5,000 pounds lighter than the Shuttle motor used to date. The payload performance of the ASRM-powered Shuttle is 12,000 pounds higher than that provided by the present motor. This is of particular benefit for payloads delivered to higher inclinations and/or altitudes. The ASRM facility uses state-of-the-art manufacturing techniques, including continuous propellant mixing and direct casting.