

Lockheed Martin Awarded Contract To Design The Mars Science Lab Aeroshell

Mission to Sustain Legacy of Company's Sophisticated Aeroshell Technology

Lockheed Martin has been awarded a preliminary design and concept study start-up contract by the National Aeronautics and Space Administration's (NASA) Jet Propulsion Laboratory for the Mars Science Laboratory (MSL) aeroshell system. Lockheed Martin and NASA will soon enter negotiations to finalize the value of the contract.

Scheduled for launch in the fall of 2009, the Mars Science Laboratory rover will support the Mars Exploration Program's strategy of "follow the water" and will have the science goals of determining whether the planet was ever habitable, characterizing the climate and geology of Mars, and preparing for human exploration.

Lockheed Martin will design and build the aeroshell system, which includes the composite load carrying structure and the thermal protection system (TPS). The aeroshell is a blunt-nosed cone that will encapsulate and protect the MSL rover from the intense heat and friction that will be generated as the system descends through the Martian atmosphere.

"Lockheed Martin's successful heritage with aeroshells and thermal protection systems spans more than three decades, starting with the Viking missions in the 1970s, and continuing with the Pathfinder, Genesis, Stardust and Mars Exploration Rovers missions," said Jim Crocker, Lockheed Martin Space Systems vice president of Civil Space. "Mars Science Lab will continue to build on the great science yielded by the Mars Exploration Rovers, Mars Odyssey, Mars Global Surveyor and soon Mars Reconnaissance Orbiter and Phoenix Lander."

The MSL heatshield will be the largest ever built at about 4.5 meters (15 feet) in diameter. For comparison, the heatshields of the Mars Exploration Rovers measured 2.6 meters (8.5 feet) and Apollo capsule heatshields measured 3.9 meters (12.8 feet).

Lockheed Martin is also drawing upon this expertise in its bid for NASA's Crew Exploration Vehicle that will utilize a capsule design 5 meters (16.5 feet) in diameter.

The MSL heatshield will be made of a composite structure covered with a thermal protection system composed of the cork silicone super lightweight ablator (SLA) 561v. The backshell will be covered with a similar SLA 561s. The backshell structure provides the attachment points to the rover landing system and parachute system that is deployed after the capsule slows in the Martian atmosphere.

The aeroshell provides protection to the MSL rover through the seven-month cruise to Mars and the fiery entry through the Martian atmosphere. It will also support the parachute and a "sky crane," a structure which will lower the rover to a "soft landing" on the surface of Mars. The MSL rover will be approximately five times heavier than the Mars Exploration Rovers.

Lockheed Martin Space Systems Company is one of the major operating units of Lockheed Martin Corporation. Space Systems designs, develops, tests, manufactures and operates a variety of advanced technology systems for military, civil and commercial customers. Chief products include a full range of space launch systems, including heavy-lift capability, ground systems, remote sensing and communications satellites for commercial and government customers, advanced space observatories and interplanetary spacecraft, fleet ballistic missiles and missile defense systems.

Headquartered in Bethesda, Md., Lockheed Martin employs about 135,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The corporation reported 2005 sales of \$37.2 billion.

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