



ARES UPPER STAGE ENGINE

Gas Generator Duct Manufacturing Technology Demonstrator Delivered: The direct metal laser sintered gas generator duct manufacturing technology demonstrator has been completed and delivered to Marshall Space Flight Center where it will undergo a number of inspections before proceeding to the test stand for hot-fire testing.



Figure 1 – The gas generator manufacturing technology demonstrator duct ready for testing.

The duct is produced using an emerging technology that uses a laser to sinter (bond using heat or pressure without melting) 20 micron layers of powdered metal together to form a finished part. The technology is being evaluated as a way to reduce the cost of complex parts.

Liquid Oxygen Turbopump Exhaust Duct Completed: Production has been completed on the liquid oxygen turbopump exhaust duct. After final inspections are conducted, the duct will be shipped to Pratt & Whitney Rocketdyne.



Figure 2 – The liquid oxygen turbopump exhaust duct ready for inspection.

This exhaust duct is the first of three major hot-gas system components to be produced by Arrowhead Products for Engine 10001. The remaining two components are expected to be delivered by April 2011.

**The Ares Projects look forward to
the launch of STS-133, Space Shuttle Discovery, planned for late
February.**