



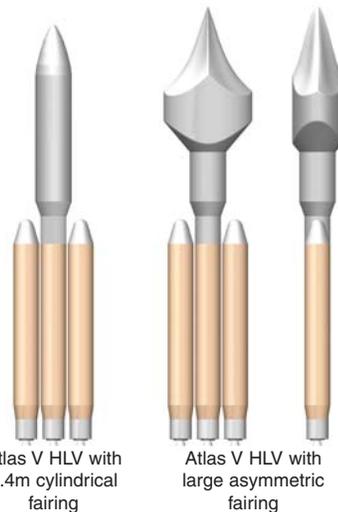
MAXIMIZING PAYLOAD LAUNCH CAPABILITY THROUGH INNOVATIVE DESIGN

ATA's patent-pending large asymmetric fairing was developed under a Phase I and Phase II SBIR with the Air Force Research Laboratory (AFRL) at Kirtland, NM. The asymmetric fairing was designed to accommodate very large payloads on the Atlas V HLV while maintaining structural requirements and current control authority limits of the launch vehicle.

An optimal design was achieved through the use of an innovative Computational Fluid Dynamics (CFD)-based geometric optimization, composite structural tailoring, and novel manufacturing methods. The design was validated through correlation with subscale wind tunnel testing. The final design is a composite sandwich structure that meets or exceeds strength, buckling, flutter, thermal, and acoustic requirements and does not require significant modifications to existing launch pad integration facilities. The geometry, methods, and processes have wider applicability to the whole range of launch vehicle sizes and can increase the payload capabilities of each by offering fairings which are tailored specifically to existing control capability.

FEATURES AND BENEFITS:

- ▷ Accommodates very large asymmetric payload geometries while operating within existing engine thrust vector control and launch vehicle structural capabilities
- ▷ Fits within existing vertical integration facilities
- ▷ Increases available payload volume by up to 100%
- ▷ CFD-optimized design performance verified through extensive wind tunnel testing of scale model
- ▷ Design and manufacturing approach scalable to wide range of launch vehicles sizes and architectures
- ▷ Can significantly reduce launch costs by allowing geometrically large but lightweight structures to be launched on smaller launch vehicles than currently possible
- ▷ Lightweight, all-composite construction
- ▷ Detailed manufacturing and integration plan developed



Atlas V HLV with 5.4m cylindrical fairing

Atlas V HLV with large asymmetric fairing

	5.4m Atlas V HLV PLF	Large Asymmetric PLF
Static payload envelope (m)	ø4.6 x 12.2h	9.3w x 10h x 4.3d
Available payload volume (m ³)	203	400
Fairing Length (m)	26.5	29.2
Construction	Composite sandwich	Composite sandwich
Mass (kg)	4,394	5,965

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