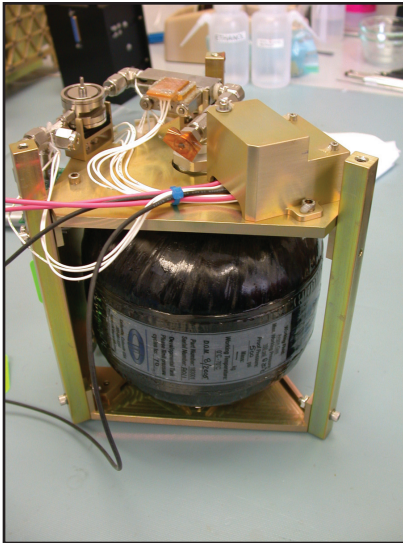


## AFRL DELIVERS LINERLESS COMPOSITE TANKS FOR NANOSAT-3



The University of Texas developed the FASTRAC [formation-autonomy spacecraft with thrust, relative navigation, attitude, and cross-link] nanosatellite (Nanosat-3) to demonstrate technologies that enable formation flying. The Nanosat program entails an annual competition amongst US universities to develop, fabricate, and functionally test small satellites (i.e, nanosats); foster research to enable nanosat technologies; and design experiments that orbiting nanosats can perform. Nanosat-3 requires microdischarge plasma thrusters for maneuvering, and its fuel tanks must contain argon fuel at 100 psi (implying a proof pressure test at 150 psi before integration).

During the university's proof-of-concept tests of the custom aluminum tanks, the dome sections yielded, requiring immediate replacement. With only 6 weeks remaining before full spacecraft integration, the University of Texas contacted AFRL for assistance.

Under a Small Business Innovation Research Phase II contract with AFRL, Composite Technology Development, Inc. (CTD), of Lafayette, Colorado, solved the critical hardware failure problem by designing linerless composite tanks. The composite manufacturing facility at Kirtland Air Force Base, New Mexico—with on-site support from Jackson and Tull Engineering and United Industrial Engineering—manufactured the new tanks.

Within a 6-week time frame, the AFRL/industry team designed the composite tanks and associated tooling; manufactured the tooling; produced 20 tanks (2 flight, 2 backup, and 16 test articles); tested the tanks; and delivered 4 flight articles to the University of Texas for integration into Nanosat-3. The CTD-designed tanks weigh 40% less and have 18% more volume and 12 times the pressure capacity of the custom-built aluminum tanks they replaced. The flight of NanoSat-3 will mark the first use of linerless composite tanks for spacecraft operations.

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### Additional Information

To receive more information about this or other activities in the Air Force Research Laboratory, contact **TECH CONNECT, AFRL/XPTC, (800) 203-6451** and you will be directed to the appropriate laboratory expert. (VS-S-06-08)  
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