

Accepted Manuscript

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PII: S0094-5765(17)31369-3

DOI: [10.1016/j.actaastro.2018.01.064](https://doi.org/10.1016/j.actaastro.2018.01.064)

Reference: AA 6694

To appear in: *Acta Astronautica*

Received Date: 28 September 2017

Revised Date: 20 January 2018

Accepted Date: 31 January 2018

Please cite this article as: H. Wu, C. Lai, F. Sun, M. Li, B. Ji, W. Wei, D. Liu, X. Zhang, H. Fan, Carbon fiber reinforced hierarchical orthogrid stiffened cylinder: Fabrication and testing, *Acta Astronautica* (2018), doi: 10.1016/j.actaastro.2018.01.064.

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Carbon fiber reinforced hierarchical orthogrid stiffened cylinder:**Fabrication and testing**

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Abstract: To get strong, stiff and light cylindrical shell, carbon fiber reinforced hierarchical orthogrid stiffened cylinders are designed and fabricated. The cylinder is stiffened by two-scale orthogrid. The primary orthogrid has thick and high ribs and contains several sub-orthogrid cells whose rib is much thinner and lower. The primary orthogrid stiffens the bending rigidity of the cylinder to resist the global instability while the sub-orthogrid stiffens the bending rigidity of the skin enclosed by the primary orthogrid to resist local buckling. The cylinder is fabricated by filament winding method based on a silicone rubber mandrel with hierarchical grooves. Axial compression tests are performed to reveal the failure modes. With hierarchical

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