LINCOLN OPERATIONS

Advanced Composites

OTS FACILITIES | **LINCOLN, NE**

LOCATION OVERVIEW

Lincoln Operations is a world-class designer, developer, and manufacturer of advanced composite structures primarily for the defense and aerospace market. Lincoln Operations specializes in composite design and prototype production that we can efficiently scale to low and/or high production quantities, to ensure we deliver the best product that fully meets our customer's requirements.

Products are manufactured using the latest in fibers and resin formulations to develop the lightest weight, and highest performing composite structures in the market today. Our mandrel technology allows us to get our first parts built and tested quickly; we continue to evaluate the industry needs and respond quickly to those demands. In 2019, Lincoln Operations opened the doors to their new 50,000 square foot manufacturing expansion, building on our rate capabilities.

As part of General Dynamics Ordnance and Tactical Systems Precision Systems group, Lincoln Operations' key product areas include aircraft, missile, and space structures including rocket motor cases, pressure vessels, external fuel tanks, drive shafts, bomb bodies, and launch tubes. Located in Lincoln, Nebraska, the operation houses approximately 300,000 square feet of manufacturing, lab and office space.

Today, and every day, General Dynamics is focused on efficient design and the highest quality, in order to continue DELIVERING THE BEST TO THE BEST ®

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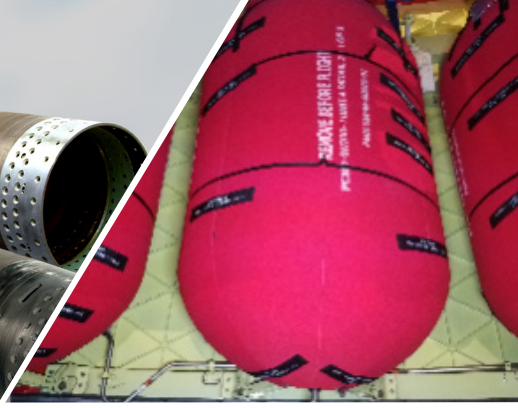


Key Process Capabilites

Filament Winding:

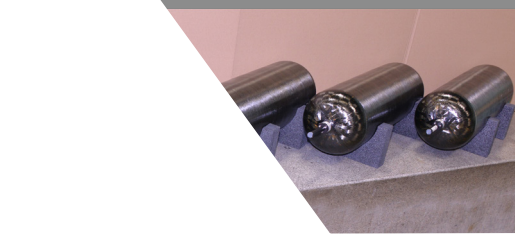
Filament winding is the process of winding fiber filaments onto a permanent or removable mandrel to create a high strength, cost-effective composite product. The process can utilize various fibers and resins. Selection is made based on performance needs and cost.

Resin Formulation and Precision Fiber Impregnation:

Lincoln Operations has developed several cost-effective, resin formulations that resist aerodynamic heating. In a wet winding process, fibers are coated as they pass through a resin bath on the winding machine. In the pre-impregnated process, a spool of fiber is precisely coated with resin in a dedicated impregnation work center. The resulting pre-preg product is specifically sized, stored and combined with other spools at the winding machine.

Design, Analysis and Developmental Testing:

Computer-aided planning and structural analysis tools are used to design and verify the performance of products and tooling prior to fabrication. Developmental capabilities include material characterization, sub-element verification, destructive testing and non-destructive testing. Sophisticated electronic modeling capabilities allow Lincoln Operations to predict performance and develop alternative designs, collaborating closely with the customer to choose the most appropriate and cost-effective method and materials for the product.



Fast Facts

Key Product Areas:

- Composite high-performance and low-weight rocket motor cases
- Domestically produced and qualified composite pressure vessels for the aerospace market
- Low weight launch tubes
- Low weight and high strength drive shafts
- Composite structures

Key Processes:

- Filament winding
- Resin formulation and impregnation
- Design and analysis
- Development and production testing

Materials:

- Fibers: carbon, aramid and fiberglass
- Resins: high temperature epoxy, bismaleimide
- Liners: aluminum, titanium, rubber, Inconel ®

www.gd-ots.com
11399 16th Court North, Suite 200, St. Petersburg, FL 33716
727 578 8100

LINCOLN OPERATIONS
4300 Industrial Avenue
Lincoln, NE 68504
402 464 8211

GENERAL DYNAMICS
Ordnance and Tactical Systems