Material and Aerostructure Solutions
for Missiles and Launchers

Launching satellites and or weapons into space creates the ultimate performance challenge for composite materials. These performance requirements can be accommodated by Hexcel's wide range of material systems.

Material Performance Requirements:

- Lightweight
- Able to withstand extreme temperature fluctuations
- Able to maintain shape and function
- Sustain high dynamic and vibration loads at launch and re-entry.
- Endure high temperatures for hypersonic systems

Missile and launcher systems use Hexcel carbon and glass fiber prepregs, honeycomb materials, and additively manufactured components.

Hexcel Advanced Composites Used On:

- Solid rocket booster cases
- Fairings and payload doors for launch vehicles and missiles
- Nosecones
- Rocket nozzles.

HEXCEL®

What makes Hexcel
your ideal material and structures solution?

Carbon Fiber

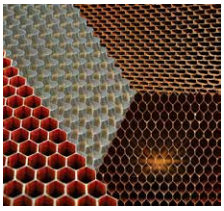
Hexcel offers an extensive line of carbon fiber solutions, including a range of high modulus and high strength carbon fibers, which offer exceptional stiffness-to-weight performance critical for Missiles and Launcher structural applications. Hexcel is the largest provider of intermediate modulus carbon fiber for the Aerospace industry. Hexcel carbon fiber is also used in the making of carbon-carbon material systems which can withstand very high temperatures and are used in nosecone and rocket nozzle applications.

Matrix Systems

Carbon and glass fibers are part of an extensive line of materials including epoxy matrix materials for standard autoclave cure, out-of-autoclave cure, quick cure, and infusion that are offered in woven fabric, unidirectional sheet, and tape form. Thermoplastic matrix systems are available that offer many processing, manufacturing, and repair advantages. Higher temperature matrix systems such as Bismaleimides (BMIs) and cyanate esters (CE) are also available for higher temperature applications.

Engineered Structures

Hexcel has full engineered aerostructures manufacturing to convert Hexcel materials into structural components and assemblies. Honeycomb core can be shaped and formed, composite materials can be constructed, cured, and machined, and assemblies can be bonded and attached. These are all done in certified aerospace manufacturing facilities with full quality inspection and control methods and procedures. Hexcel carries out some of the most demanding aerostructures manufacturing and assembly in the industry.



Honeycomb

Honeycomb is a lightweight core material which is available in a variety of cell sizes and densities, providing a wide range of mechanical and thermal properties. Hexcel honeycomb provides a unique structure made from a variety of web materials including fiberglass, aluminum, and aramid/para-aramid mechanical papers. Hexcel provides the largest variety of structural honeycomb to the aerospace industry. We produce more than 700 varieties with new versions being continually developed to meet customer demands. Honeycomb is an outstanding core material for sandwich structures which are common in missile and launcher systems.

Additive Manufacturing

Hexcel's additive manufacturing technology creates carbon fiber–infused PEKK thermoplastic 3D-printed parts with geometries that do not require attachments or weld points and can be produced on demand. This technology has the benefit of high reproducibility, fast turnover, functional complexity, high durability, and weight reduction and can have a substantial and positive impact on performance while also yielding cost and energy savings. It is qualified for use on several military and commercial aerospace systems. It's chemical and thermal stability and low outgassing make it ideal for systems that will be launched into space.

www.hexcel.com **For more information, contact us at EmergingMarkets@hexcel.com**

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