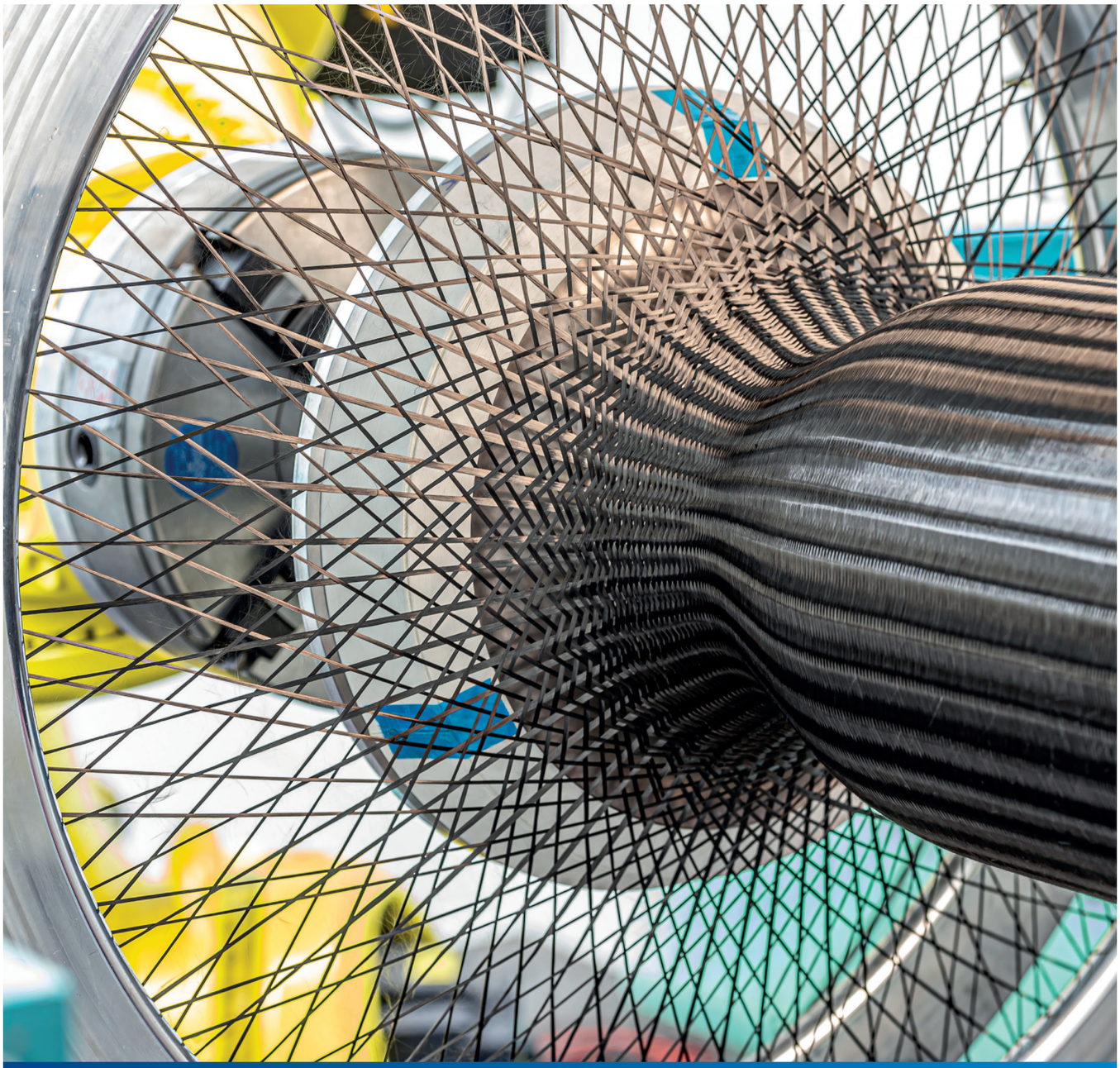
ARIANEGROUP



CERAMIC MATRIX COMPOSITES

LIQUID PROPULSION & HYPERSONICS

- REGENERATIVE COOLED & UNCOOLED STRUCTURES FEASIBLE
- EXCELLENT THERMAL PROPERTIES COMBINED WITH LOW DENSITY
- CUSTOMIZED MATERIALS & COMPONENTS DRIVEN BY CUSTOMER APPLICATION
- HIGH DEGREE OF AUTOMATION
- VARIETY OF INTERFACE SOLUTIONS TO METALLIC STRUCTURES AVAILABLE

Liquid Propulsion & Hypersonics

For decades, ArianeGroup has acquired a **strong heritage on Liquid Propulsion & Hypersonics utilizing the exceptional properties of Ceramic Matrix Composites.** ArianeGroups typical applications of CMCs in this field are upper stage Nozzle, Ramjets, Scramjets, air-inlets an many more.

Key characteristics:

- Regenerative cooled & uncooled structures feasible
- Operation time: short term single use up to long term operation envelope
- Uncooled operation temperature: up to 2,000 °C
- Low density
- High specific strength and stiffness

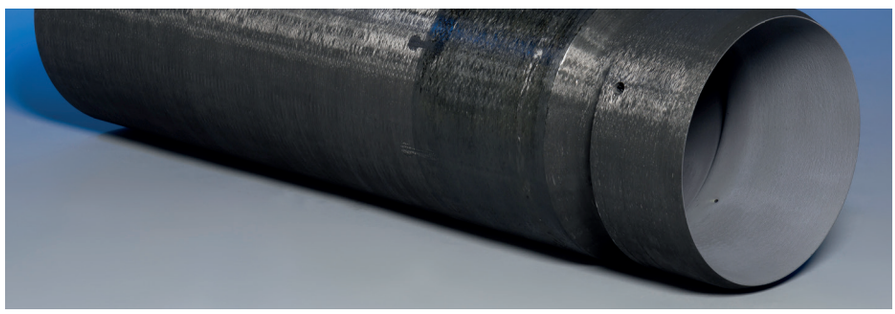
ArianeGroup places strong emphasis on selecting material combinations and manufacturing technologies in a way that results in **the most cost-effective product for the customer.**

Owning all critical manufacturing capabilities of the process chain, allows the necessary **high degree of agility and flexibility** to develop these unique propulsion solutions.

TEXTILE TECHNOLOGIES

HIGH TEMPERATURE TECHNOLOGIES

INFILTRATION & EBC TECHNOLOGIES



Example of a regeneratively cooled CMC Ramjet engine

A UNIQUE EXPERTISE TO MEET OUR CUSTOMERS' NEEDS

On top of mastering high temperature materials and technologies, ArianeGroup offers reliable solutions to its customers thanks to unique competencies in design & engineering as well as mechanical & thermal analysis and testing.

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INFORMATION
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