



High-resistant composites for Europe's re-entry, propulsion and thermal applications

● Košice, Slovakia | 15.07.2026

THE CHALLENGE

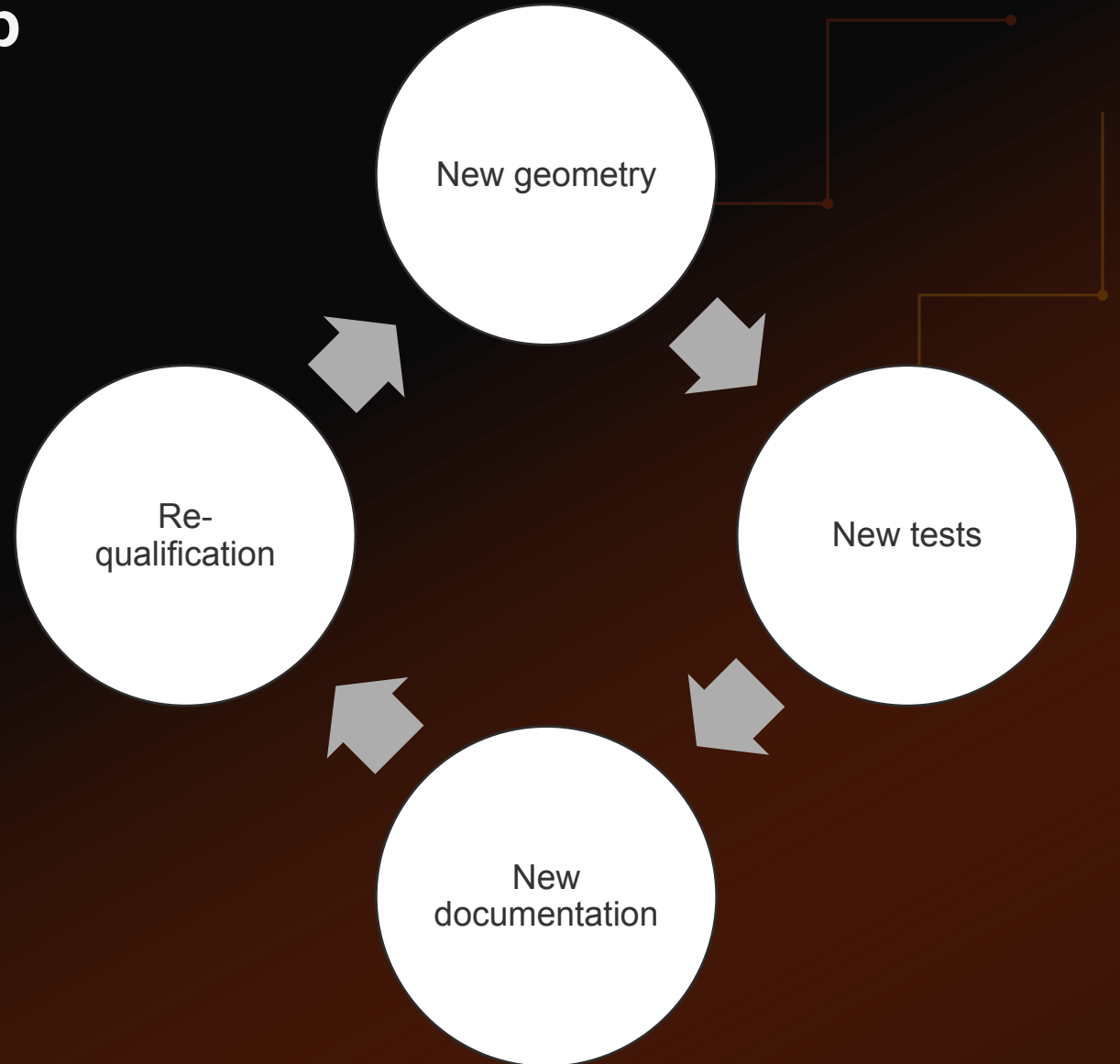
The composite reinvention loop

Every high-temperature vehicle programme becomes a composite material development programme

- Each company/agency develops their own composite material
- No high-resistant composite material is readily available on the European market

11 companies

In Europe identified to currently work on re-entry and propulsion systems



THE CHALLENGE

Developing composite heatshield is complicated

01 Slow

It takes years to develop build and test.

5 years¹

To mature a composite component from conception to TRL6

02 Costly

Qualification and testing is the most expensive part

€500K+¹

Per iteration costs

03 Hard to qualify

Thermal, structural and material properties must be validated

100+

tests²
Of arc-jet testing required

¹ https://discovery.larc.nasa.gov/PDF_FILES/2019AO/29_HEEET-1004_DDB_Executive_Summary-signed.pdf.com

² <https://ntrs.nasa.gov/api/citations/20190031964/downloads/20190031964.pdf>

TIMING

Why this matters now



More Missions

European space activity
accelerating



European sovereignty

Need for European
autonomy with current
political situation



More Composite

Demand

Increase in orbital return
market



Supply chain Gap

No general purpose
composites supplier

MISSION

Flexible, High-Performance Composite Materials & Components

Design

We develop a configurable base composite material and adapt its architecture to mission requirements.

Manufacture

We turn the carbon-fiber preform into flight-ready heatshields, rocket nozzles and liners.

Test + Certify

We validate performance through thermal, structural and qualification testing.



SOLUTION

One material, many products



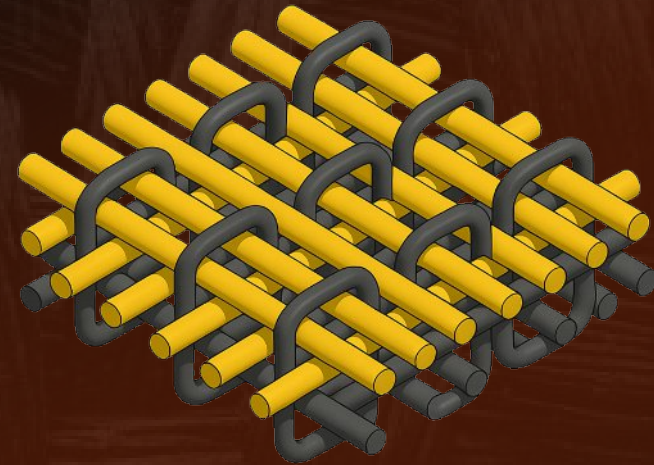
Configurable Material Platform

A **configurable material family**, not a one-off part.

Targeting PICA-class carbon ablator performance with improved geometric adaptability

PYREX

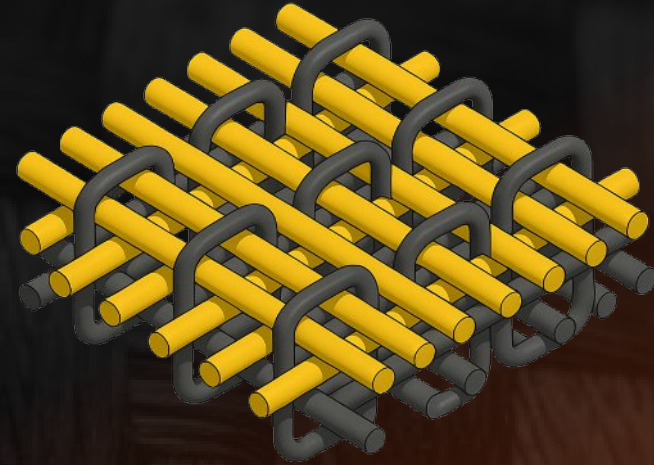
- PYRolitic EXpendable system



APPLICATIONS

One material, many products

PYREX



One platform. Four product lines.

Product Lines

1

Heatshields

Re-entry & hypersonic protection

2

Rocket Nozzles

Solid & liquid propulsion

3

Rocket

Liners

Combustion chamber insulation

4

Other

Applications

High-temperature components

How We Deliver



Material

Configurable composite,
supplied raw



Manufactured Part

Machined, cured, flight-
ready



Testing

Thermal & structural
qualification



Custom

Engineering
Tailored to mission
architecture

SOLUTION

Main Product

PYREX HEATSHIELD

3D woven phenolic resin infused
structure:

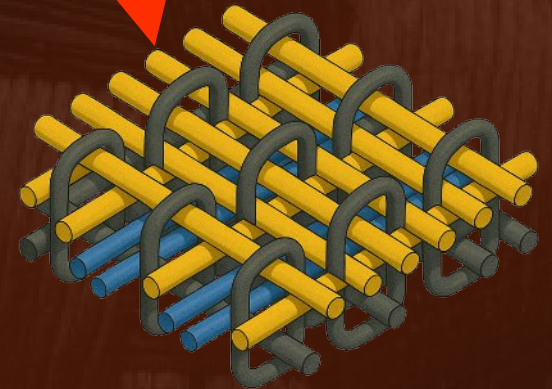
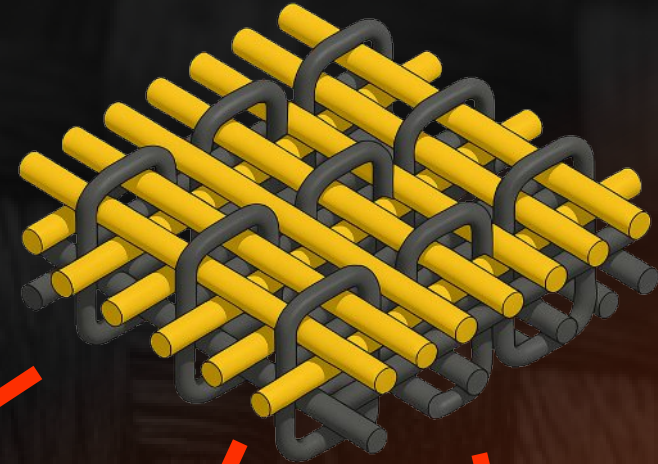
- ▶ Light
- ▶ Tough
- ▶ Modular



Structural



Insulating

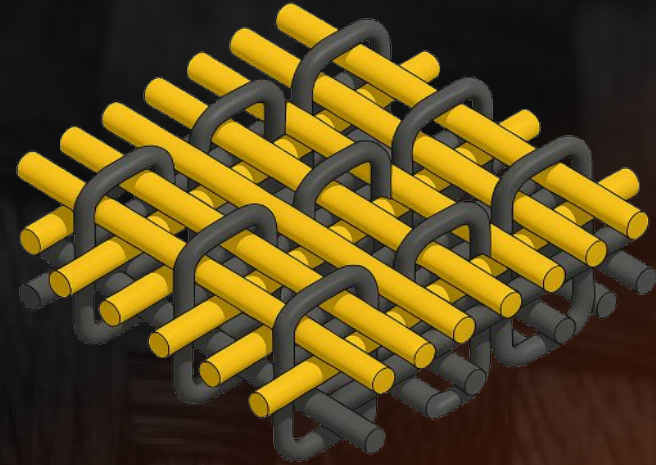


Cooling

SOLUTION

Main Product

PYREX HEATSHIELD



Currently in development:

⚙️ Design Levers

1

Weave Pattern

Twill, satin, plain

2

Z-Binder Content

Through-thickness density

3

Thickness

2-50mm range

4

Porosity/Density

Target 0.2-0.6 g/cm³

🔧 Manufacturing Process



Preform

3D weaving



Impregnation

Resin infusion



Curing

Controlled pyrolysis

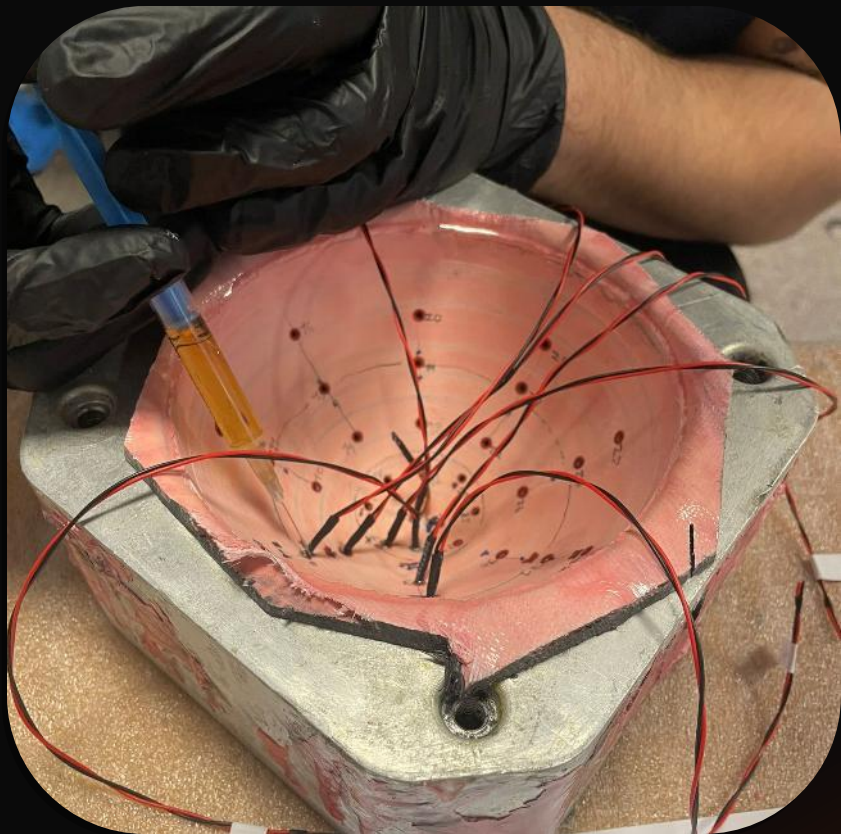


Characterize

Test & document

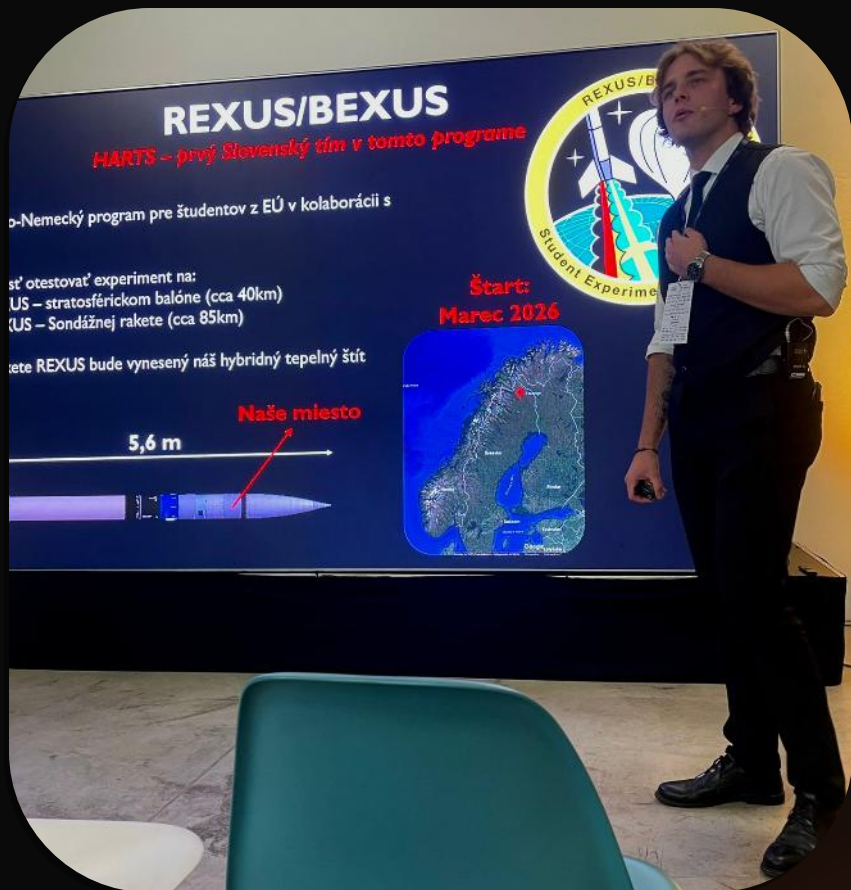
CREDIBILITY

HARTS heritage: We Built It



CREDIBILITY

HARTS heritage: We Presented It



How we solve the problem

It is simply **easier** for an agency/company to outsource high-resistant composite development to ZORA



- ZORA has the tools and the know how

THE TEAM

The ZORA Team

Patrik Rychtarčík

CEO

Lukáš Hudáček

COO

Emanuel Ungero

CTO

Martin Konečný

Lead - Materials & Manufacturing



Company Status

 Incorporated in Slovakia



Part of the first ESA BIC Slovakia cohort

THANK YOU!

**Build the Future of High-Performance
Composites With Us:**

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<https://zora-reentry.com>