DEMISABLE KRYPTON TANK – FINAL PRESENTATION

Clean Space Days
ESTEC – 30.06.2026

AGENDA

1. About Peak Technology
2. Project Overview
3. Development Progress
4. Summary and Outlook

01

ABOUT PEAK TECHNOLOGY

PEAK TECHNOLOGY AT A GLANCE

CORE COMPETENCE

Ultra-light, high-precision components — produced with Formula 1 development speed and space-grade reliability, powered by fully in-house production and a relentless passion for excellence.

TIME

COST

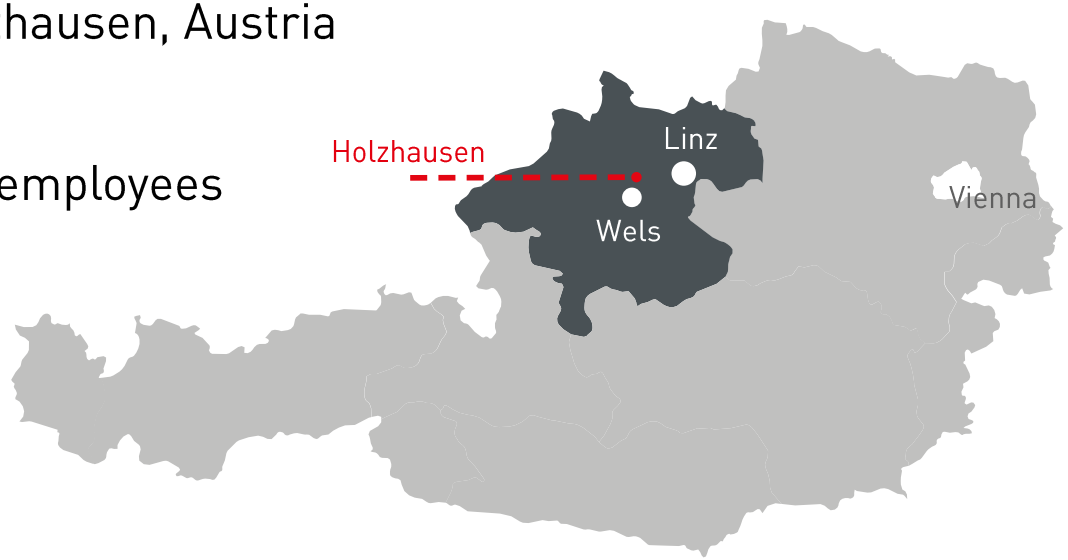
QUALITY

LOCATION

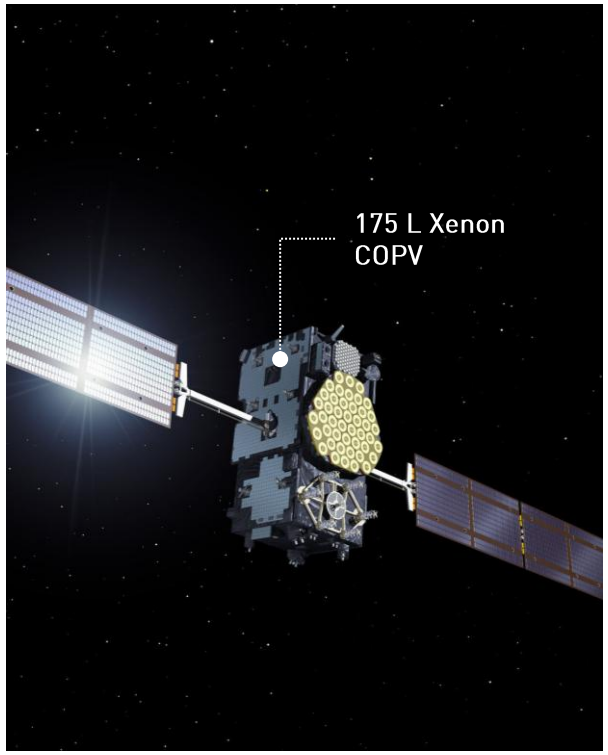
Holzhausen, Austria

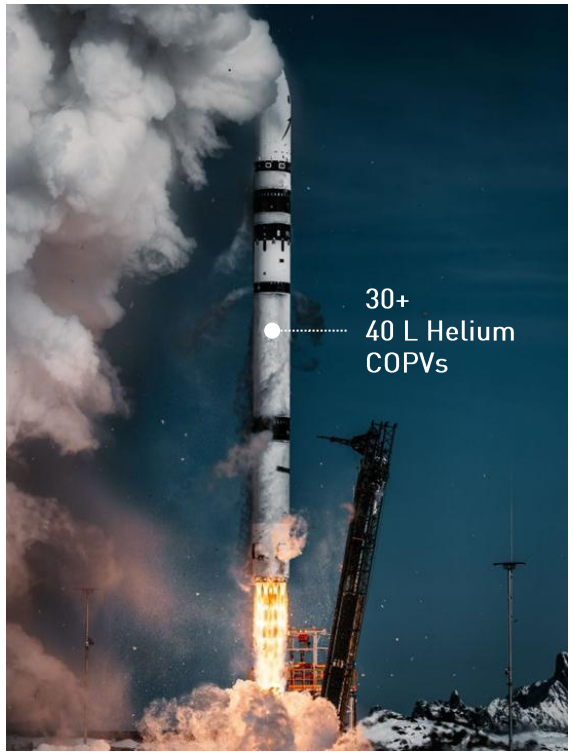
TEAM

150 employees



COPVs FOR SPACE APPLICATIONS





Composite Overwrapped Pressure Vessels (COPV) for Spacecraft and Launchers:

» Electric propulsion storage
» Propellant tank pressurization

02
PROJECT OVERVIEW

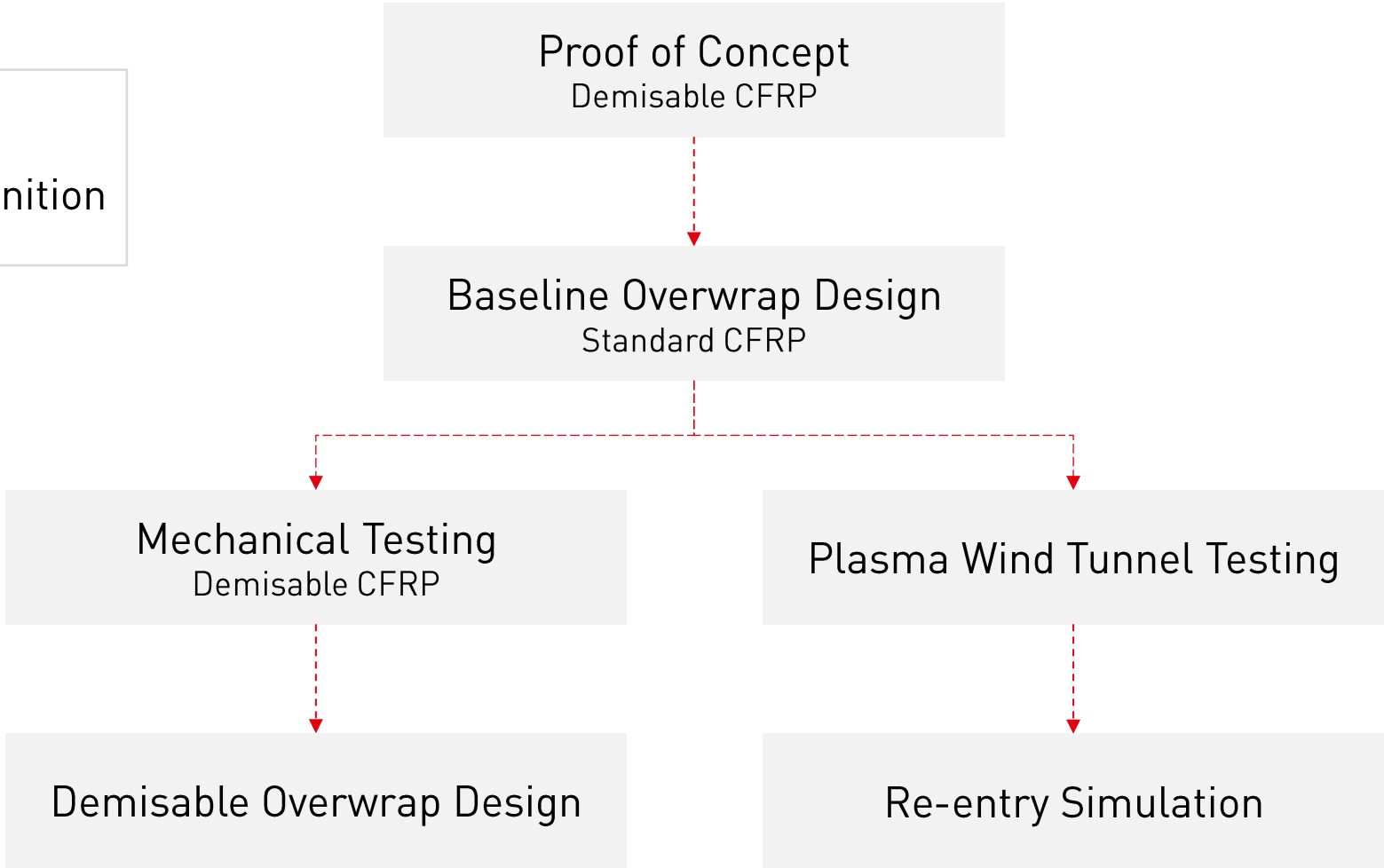
PROJECT OVERVIEW

Title	Demisable Krypton Tank
Objective	Design and test of a fully demisable krypton tank
Program	ESA ARTES 4.0 CORE COMPETITIVENESS GENERIC PROGRAMME LINE Activity Reference 4B.177 Component A: ADVANCED TECHNOLOGY
ESA Contract No.	4000143280/24/NL/GM/lf
ESA Technical Officer	Dénis Neves
Project Start	03/24
Project Closed	05/26

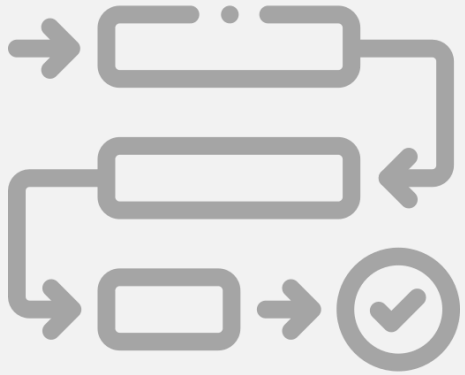
EUROPEAN SPACE AGENCY

PROJECT OVERVIEW

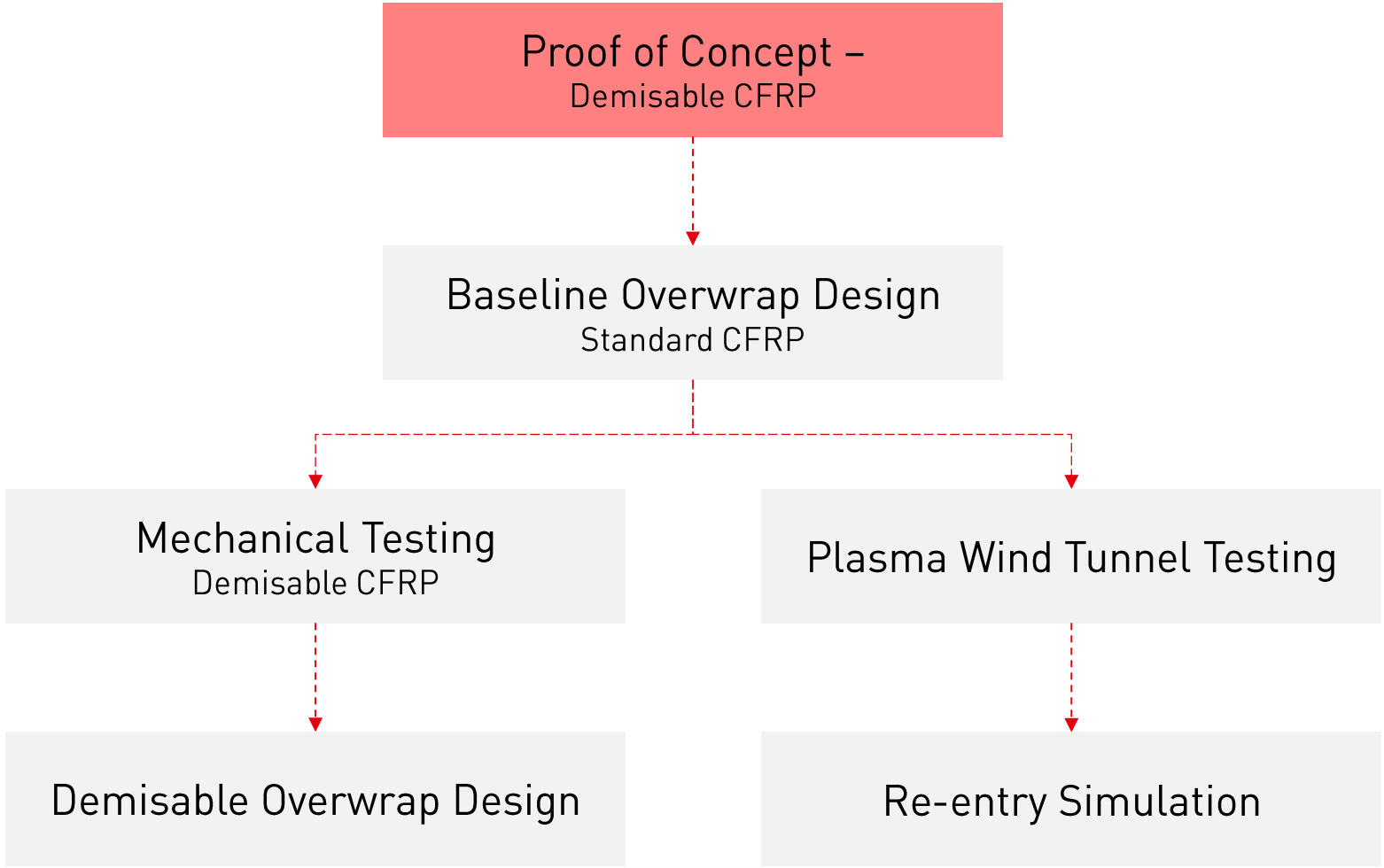
Previous Project:
Material development & definition



03
DEVELOPMENT PROGRESS

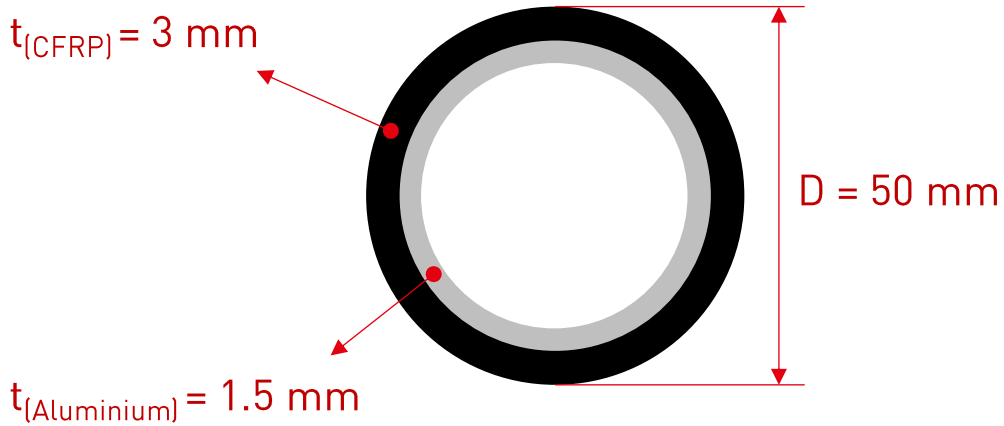


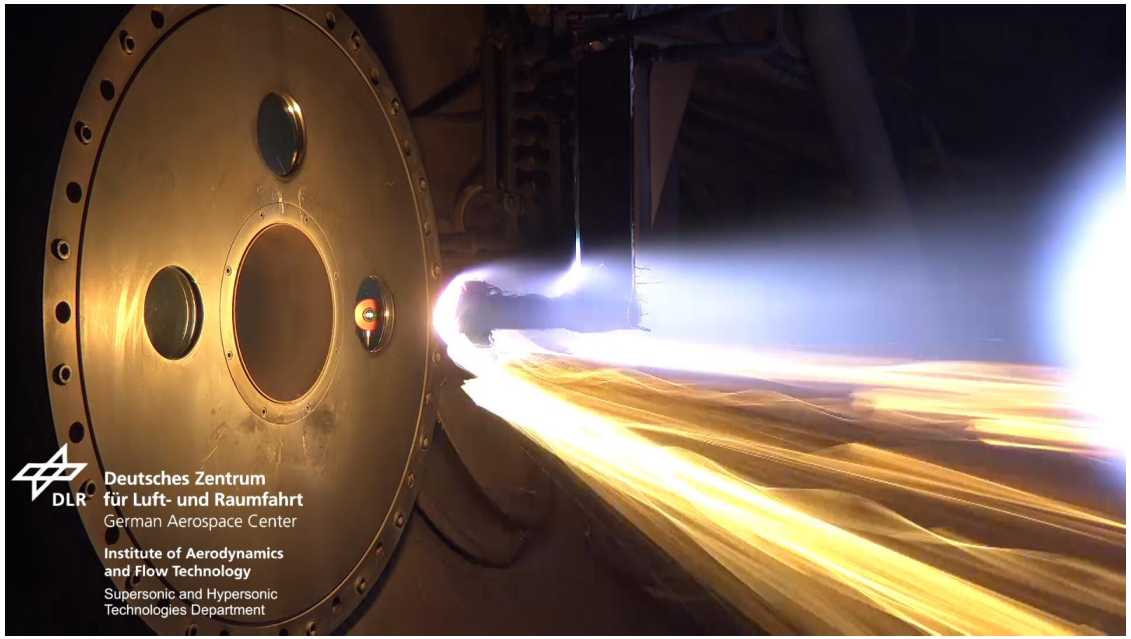
PROJECT LOGIC

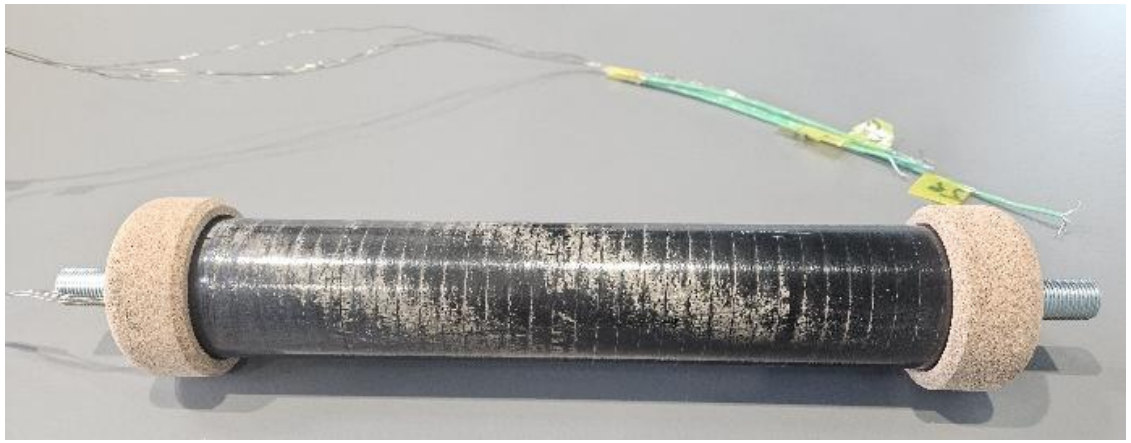


PROOF OF CONCEPT

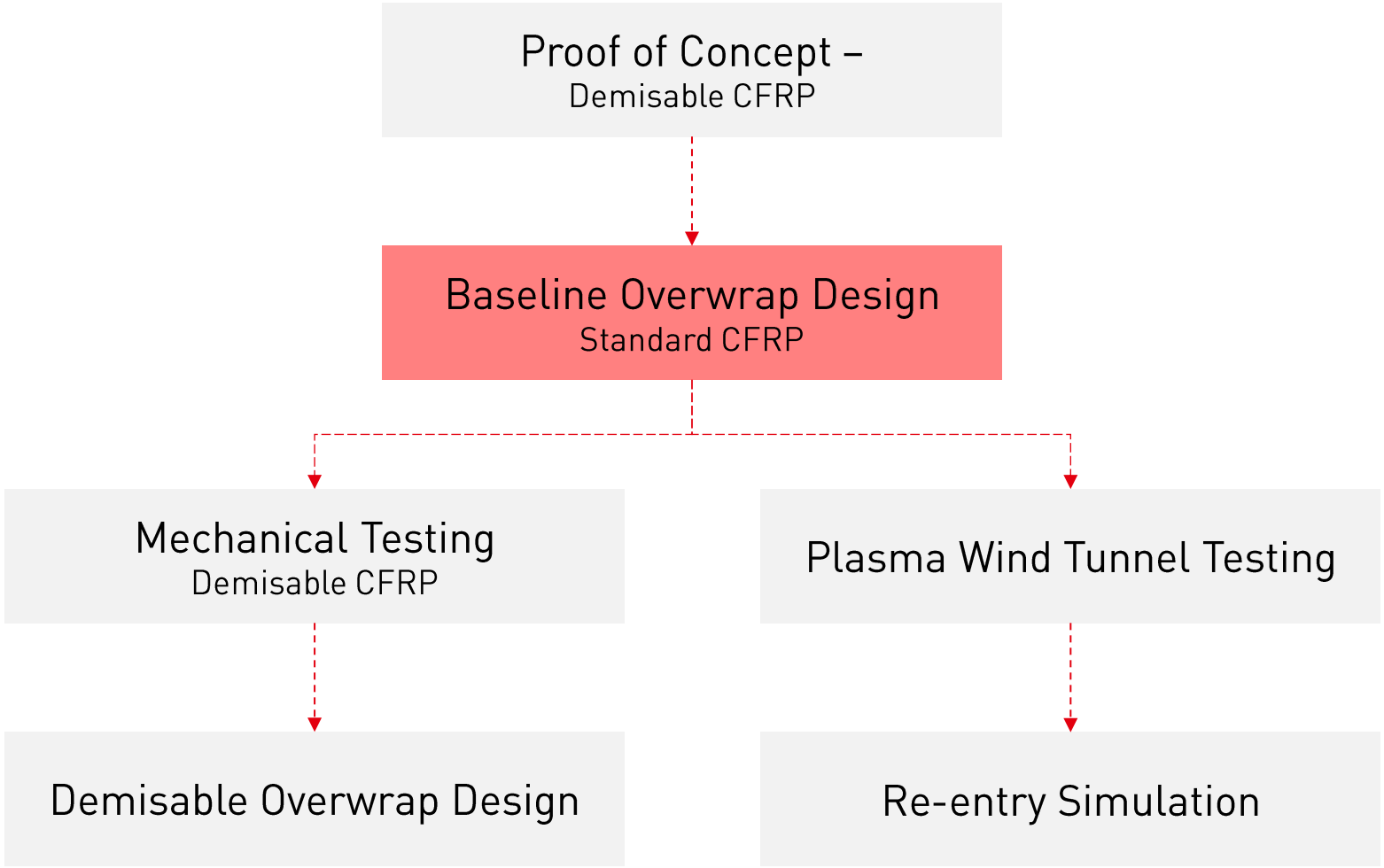
- Plasma Wind Tunnel test campaign
- Samples → Tubes
- Results
  - CFRP layer fully demised after ~ 2 min
  - Proof of concept successful







PROJECT LOGIC

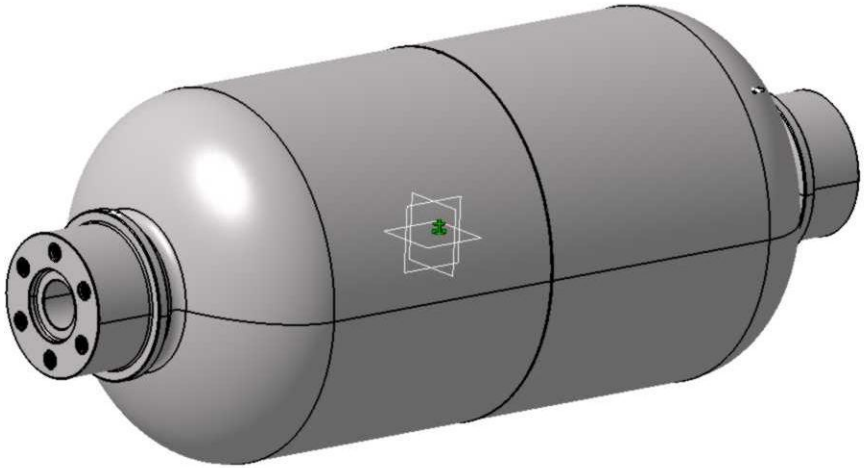


BASELINE OVERWRAP DESIGN

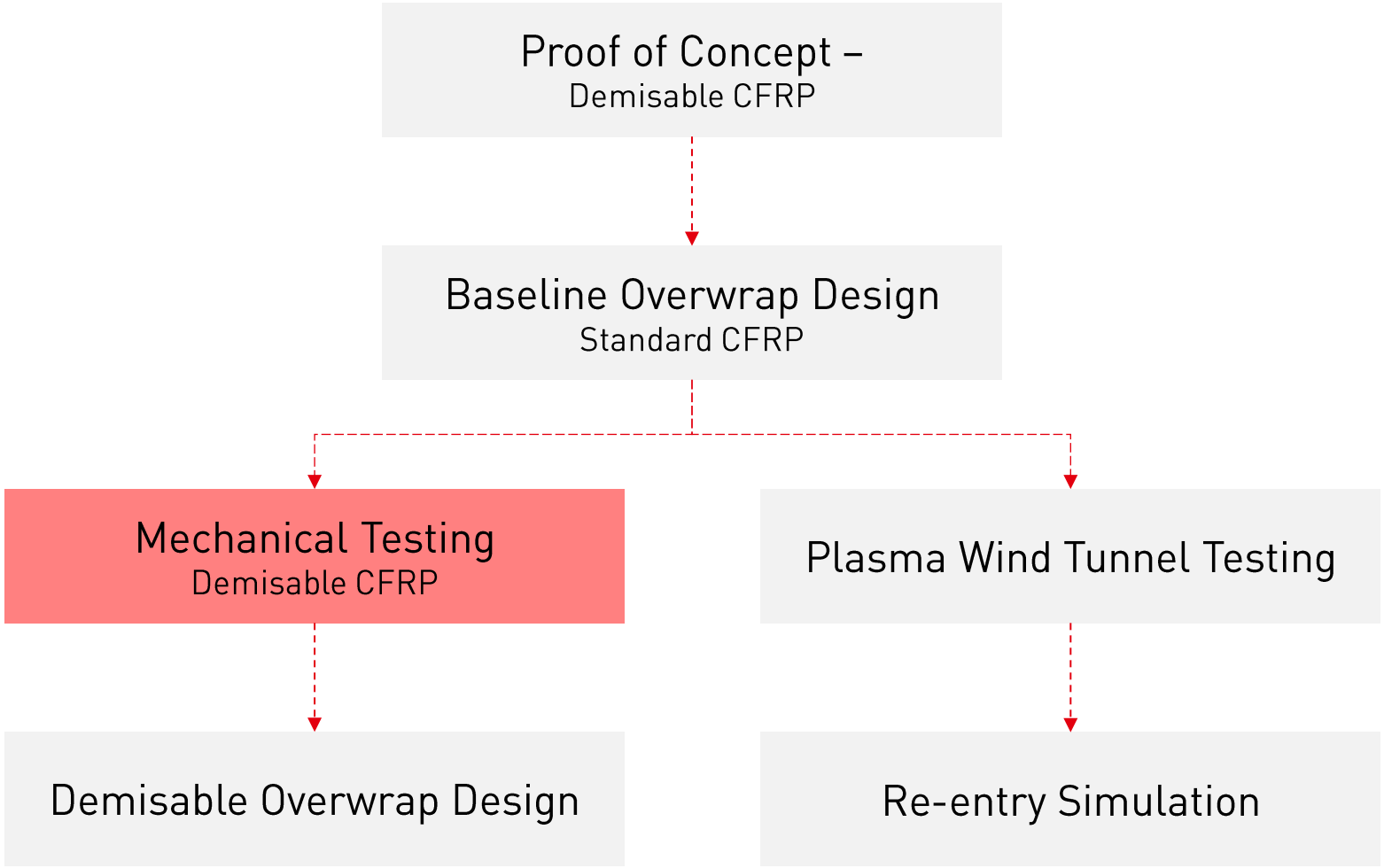
- FEM analysis standard CFRP → not demisable
- Requirements
  - MEOP (Maximum Expected Operating Pressure): 310 bar
  - Pressure safety factors: Proof 1.25xMEOP, Burst 1.5xMEOP
- Results
  - Standard CFRP layup
  - CFRP thickness: 1.88 mm

LINER

- Material: aluminium
- Volume: 1 L
- Outer diameter: 90 mm



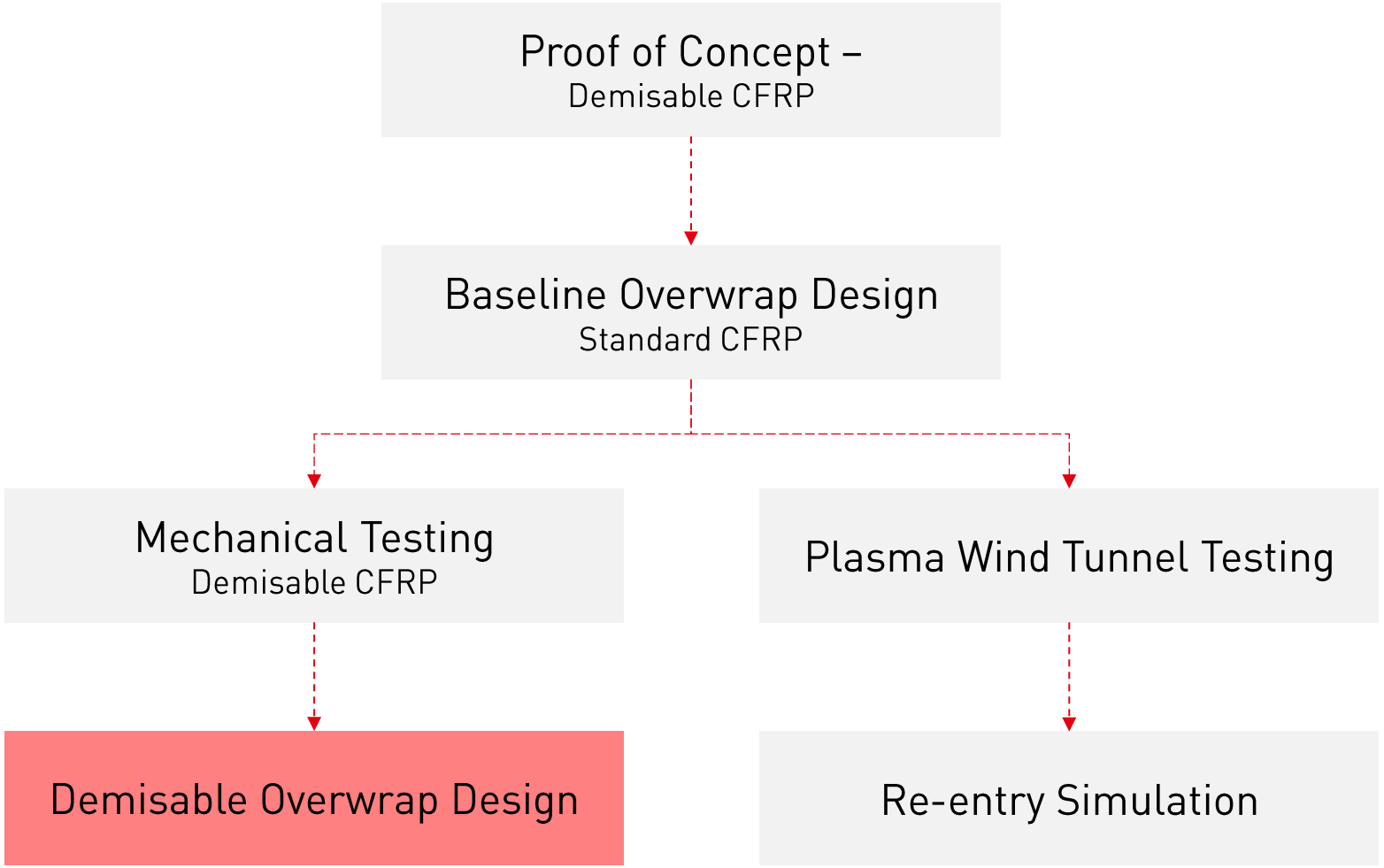
PROJECT LOGIC



MECHANICAL TESTING DEMISABLE CFRP

- Input for demisable overwrap design
- Tailored test method
  - Longitudinal tensile properties
- Results
  - Demisable CFRP strain at break ~14 % lower
  - Knock-down factor for tensile strength derived

PROJECT LOGIC

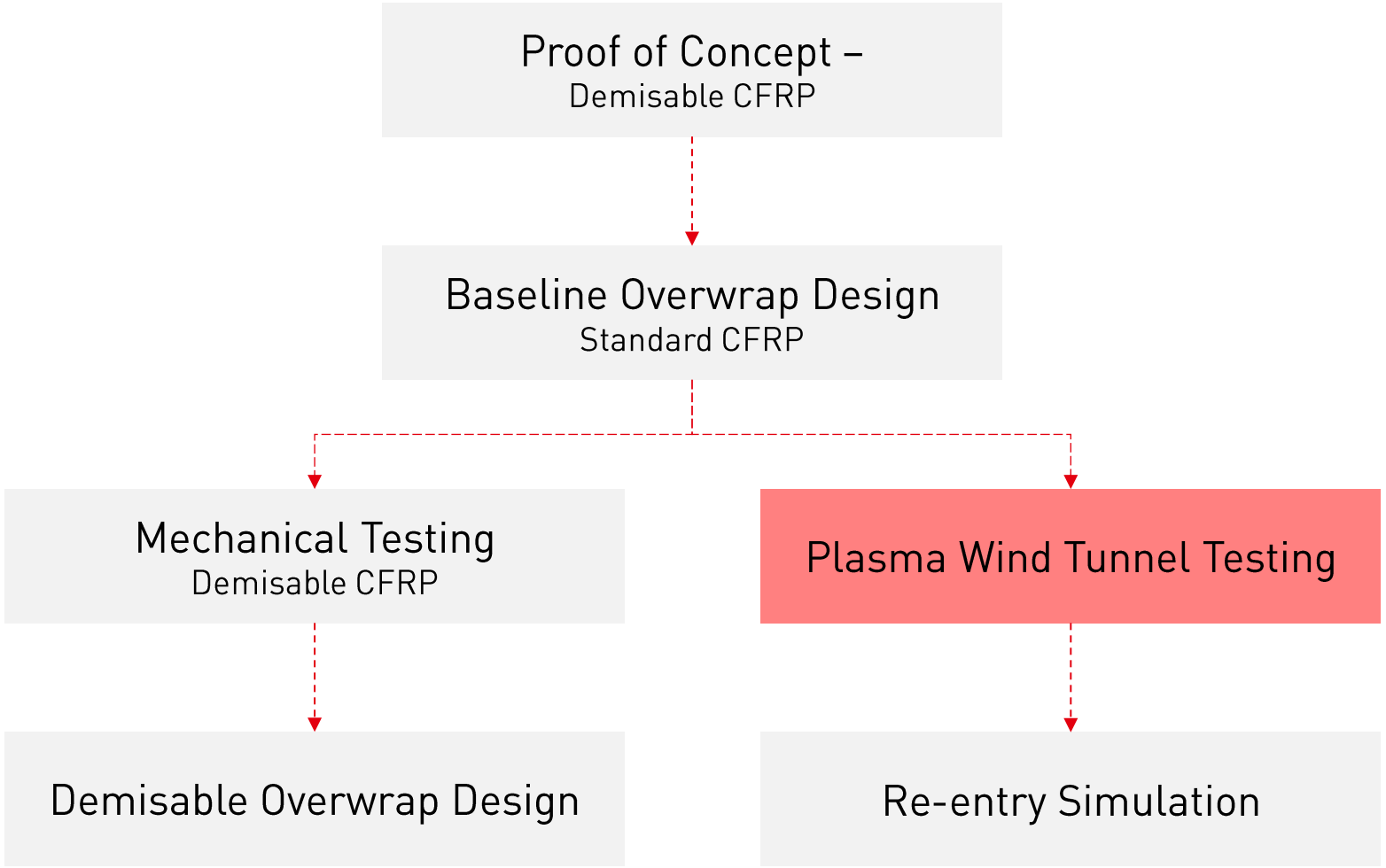


DEMISABLE OVERWRAP DESIGN

- Re-design of baseline
- Requirements equivalent
- Demisable CFRP based on mechanical testing
- Results:

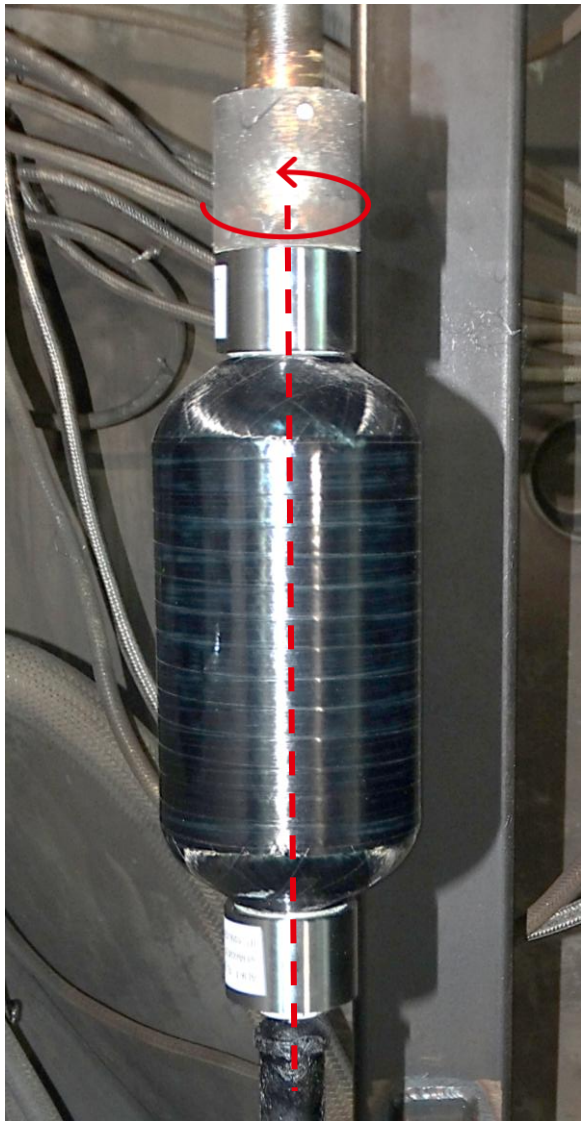
	OVERWRAP THICKNESS [mm]
Baseline overwrap design	1.88
Demisable overwrap design	2.82 (+50 %)

PROJECT LOGIC



PLASMA WIND TUNNEL TEST CAMPAIGN

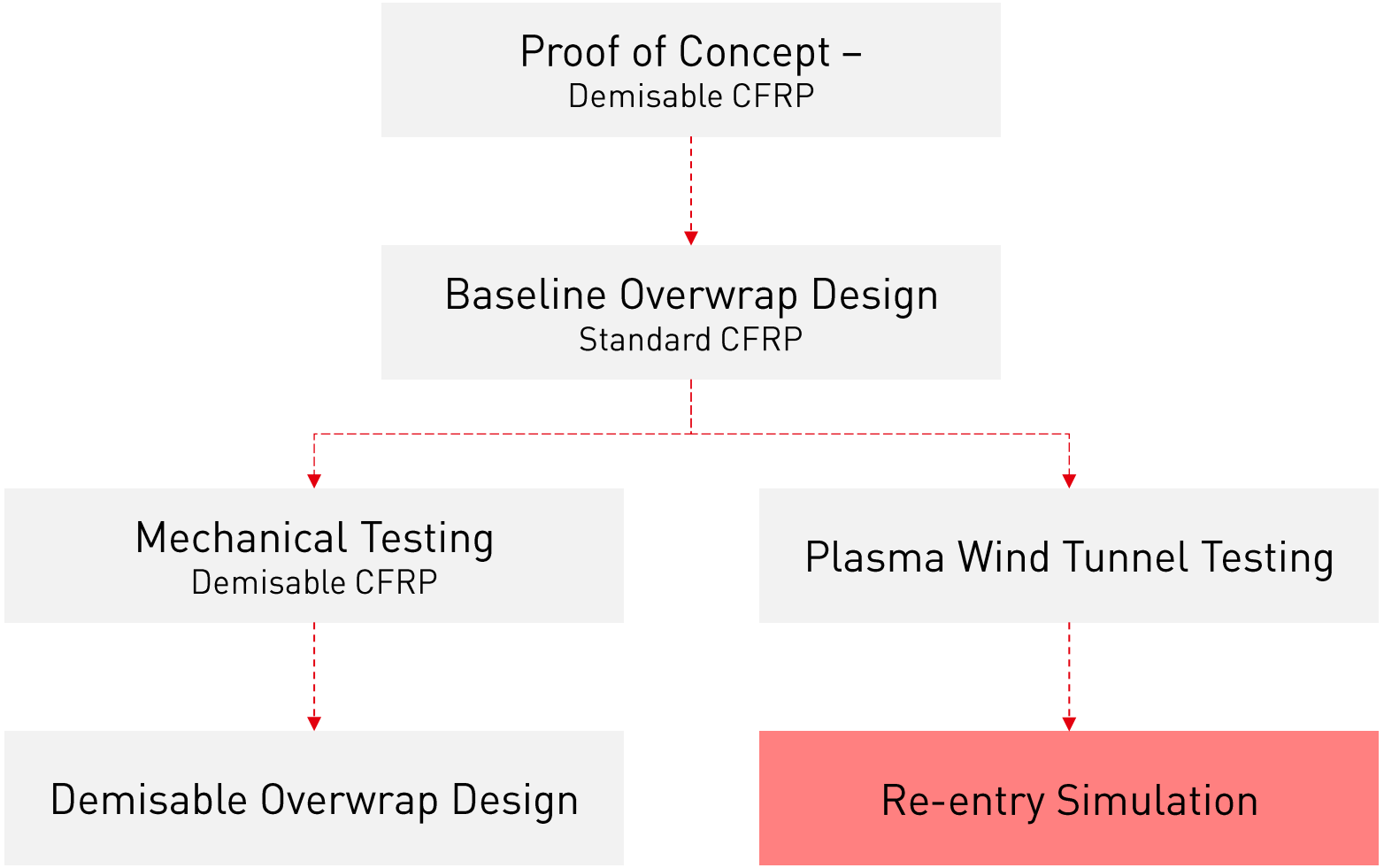
- Test on component level
- Sample
  - 1 L COPV
  - CFRP thickness: 1.5 mm
  - Demisable vs standard CFRP
- Rotation to simulate tumbling
- Heat flux on sample: 300 kW/m²
- Extensive test matrix



PLASMA WIND TUNNEL TEST CAMPAIGN

- Demisable CFRP
  - 85 s until full demise
  - Short time for full demise (low heat flux!)
  - For higher heat flux even <60 s
- Standard CFRP
  - Test stopped after 180 s
  - No degradation

PROJECT LOGIC



RE-ENTRY SIMULATION

- Re-entry simulation 1 L COPV
  - CFRP thickness 3 mm
  - Re-entry tool SAMj by Belstead
- Results:

CASE	DEMISABLE CFRP	STANDARD CFRP
Full demise	For release altitude >84 km considering median of all cases	No full demise

- Conclusion:
  - COPV can demise during re-entry if it is released at a sufficiently high altitude

04
SUMMARY AND OUTLOOK

SUMMARY

- Demisable 1 L COPV!
- Extensive comparison demisable vs standard COPV
- Project DEMISABLE KRYPTON TANK successfully closed

OUTLOOK

FOLLOW UP PROJECT ZERO DEBRIS PLATFORM

- Planned start summer 2026
- Development of demisable COPV → TRL 6
- COPV volume ~10 L

DRACO PROJECT

- Project ongoing
- Experimental mission → Real re-entry
- Demisable & standard COPV

PEAK TECHNOLOGY

Technologieparkstr. 6
4615 Holzhausen
Austria, Europe

www.peaktechnology.at

SIMONE HARTL
Material & Process Engineer

simone.hartl@peaktechnology.at
+43 664 88847186