herone

TAILORED PERFORMANCE

we **develop** & **manufacture** your composite profiles with improved **cost-performance** ratio

by utilizing

herone technology

thermoplastic advantage

your benefit…

tailored functionality

ultra light weight

sustainable solution

cost-effective parts

synergetic partnership

herone

FOUNDED
may 2018

VISION
innovate composites for sustainable living

WHAT
development & manufacture of thermoplastic composite profiles

TEAM
12 employees with >30 year experience in composites

SALES REVENUE
500 K€

product portfolio

complex geometry

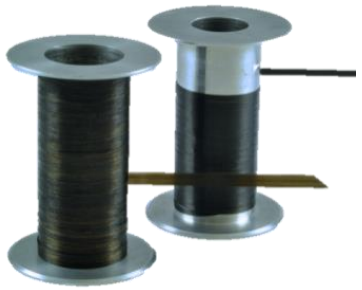
motion & load transfer

fluid transport & storage

advanced function

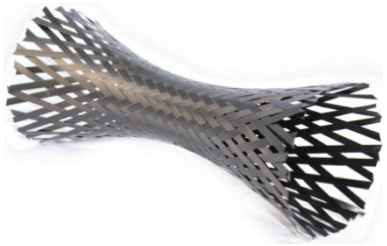
herone technology

thermoplastic tape



textile preforming

organoTube



moulding + functionalization

integral profile

100%
automated

near net shape

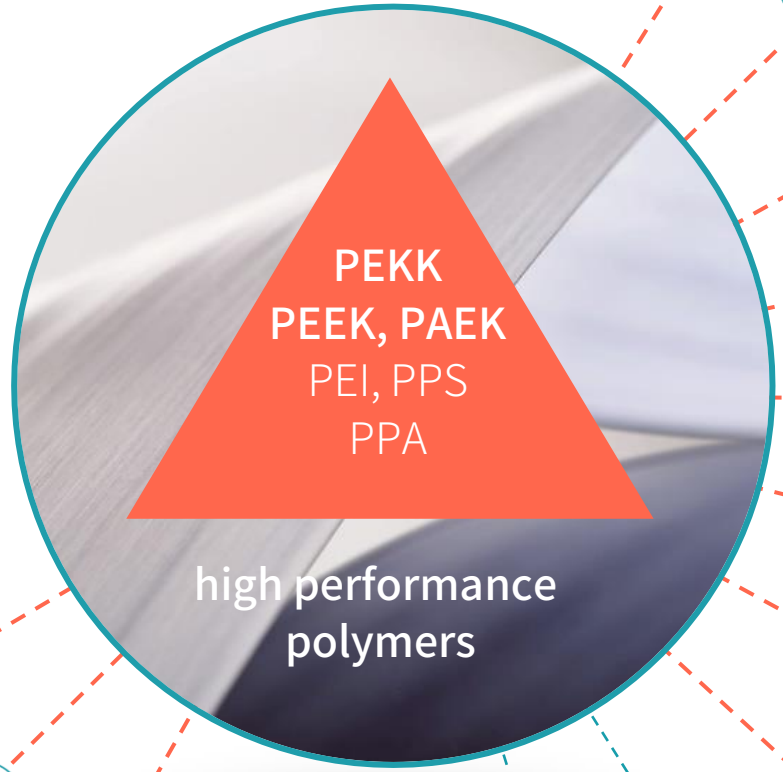
-90%
cycle time

reduced
assembly costs

thermoplastic advantage

exceptional performance in space*

- low material permeation
- Increased durability
- Cryo compatibility
- High chemical & UV resistance
- Increased impact resistance



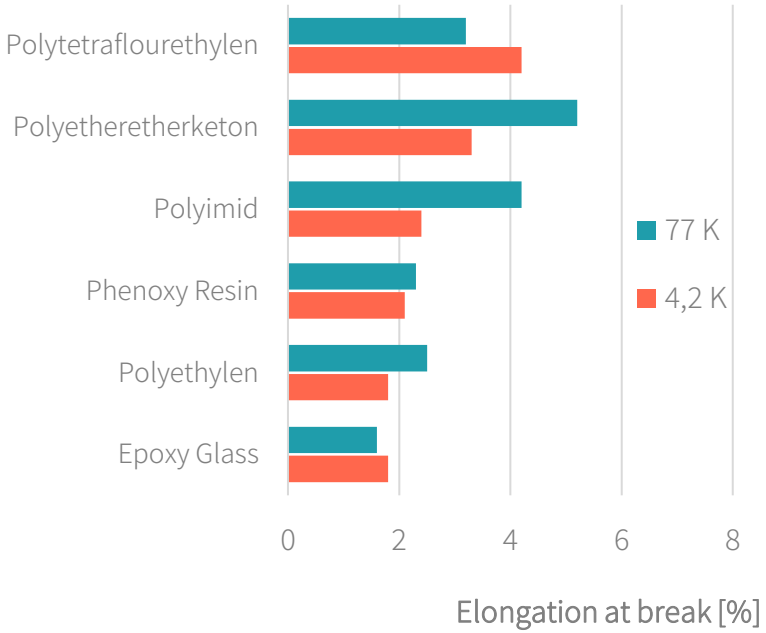
- increased mechanical performance
- +40% damage tolerance
- +60K operating temperature
- increased damping behavior
- 100% recyclable
- quality surface finish
- chemical & UV resistance
- corrosion resistance
- biocompatibility (class VI)
- optimal imaging in X-ray, CT and MRT
- fast processing
- thermoformability
- weldability

*in comparison with epoxy

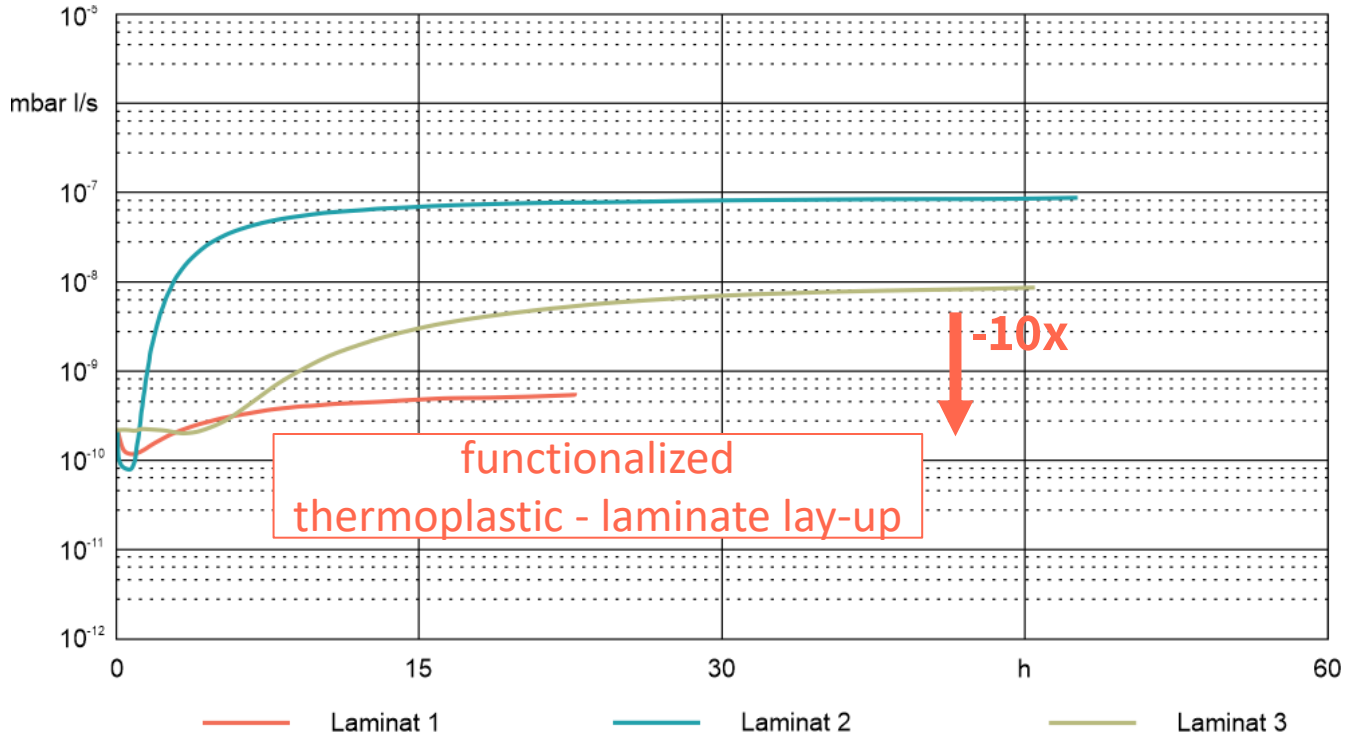
fluid transfer & storage

thermoplastics at cryogenic temperatures

potential mechanical performance & permeability



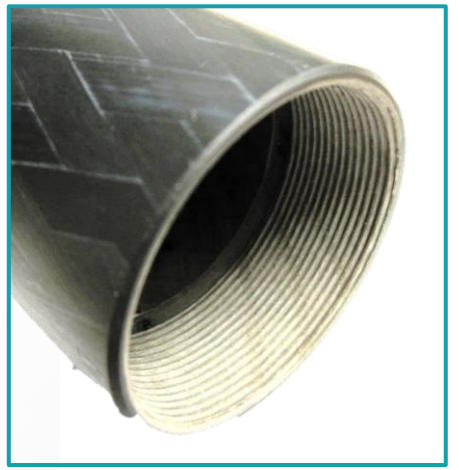
equivalent behavior for strength

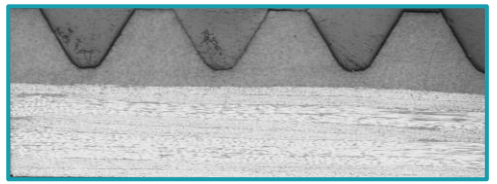


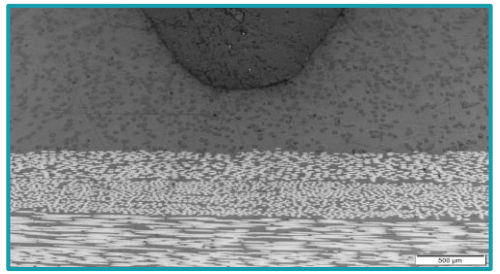
integral design

with tailored performance

we design for simplified parts with enhanced functionality and tailored performance







strut load introduction with co-consolidated thread (e.g. GF-PEKK)

structural

strut*

up to 270 kN / crash optimization / 250 °C

- 10 % weight

-40 % costs

performance ↑

- >60% fiber content
- true 0°
- highest laminate quality
- PEEK-Matrix

costs ↓

herone technology

- automated preforming
- out of autoclave consolidation

all thermoplastic design

- high modularity
- reduced part count

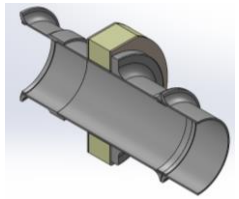
*comparison to epoxy-based strut

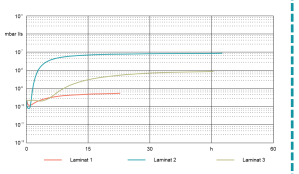
fluid transfer & storage

pipes & pressure vessels

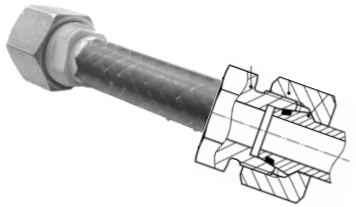
e.g. hydraulic, hydrogen, LH2, LOX

space – LOX/LH2 fuel pipes





aviation – hydraulic/fuel pipes



automotiv - modular H2 vessels

aviation – high resistance pipe

performance ↑

- >60% fiber content
- fluid tight laminates, e.g. against liquid hydrogen (cryogenic)
- chemical resistance of thermoplastics

costs ↓

herone technology

- automated preforming
- out of autoclave consolidation
- post-processing by bending

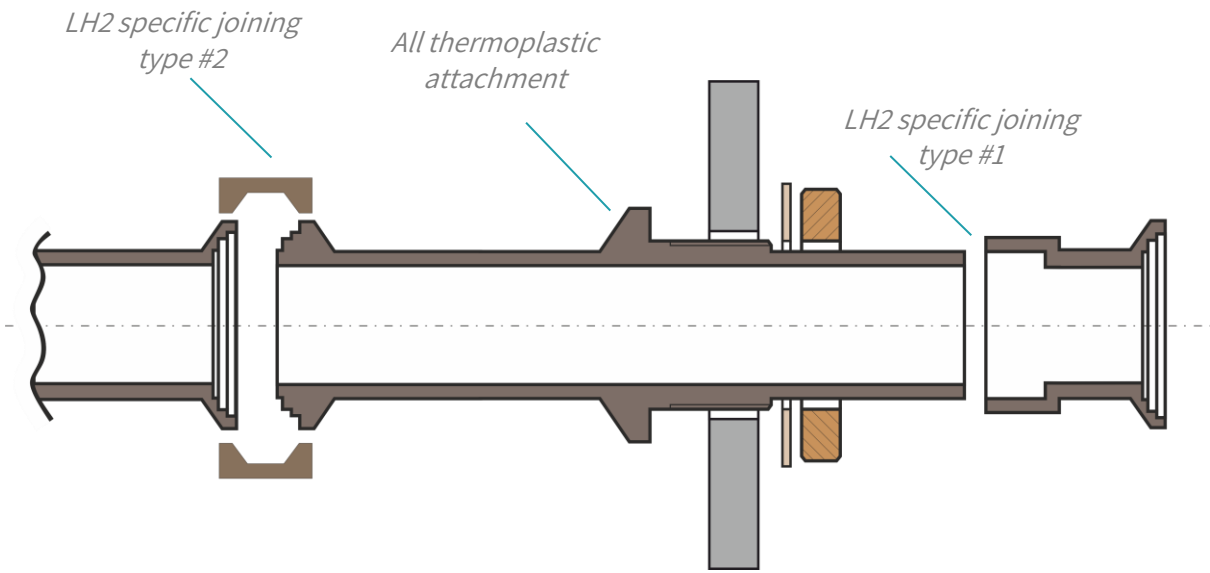
all thermoplastic design

- integral fitting with load introduction & sealing functionality
- reduced part count
- modular design

liquid hydrogen in space apllications

design advantage of thermoplastic composites

Integral design to minimize leakage of fuel pipes & utilization of thermoplastics with LOX compatibility



fluid transfer & storage

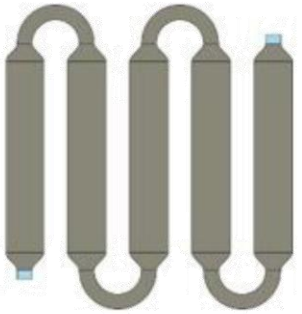
modular vessel system

functionalization as a solution

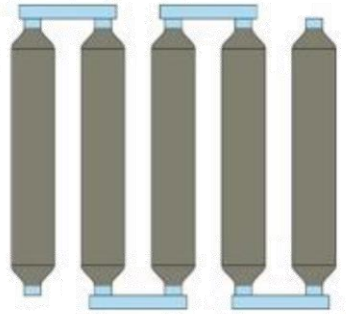
design approach

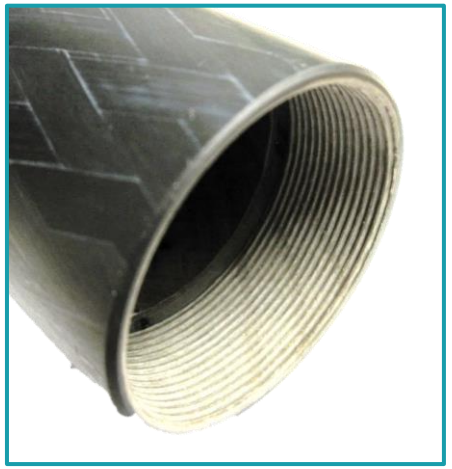
- cost-efficient manufacturing of semi-finished parts
- local integral functionalisation to integrate composite/metallic dome
- integral or differential design

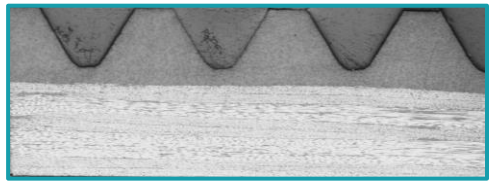
Integral design

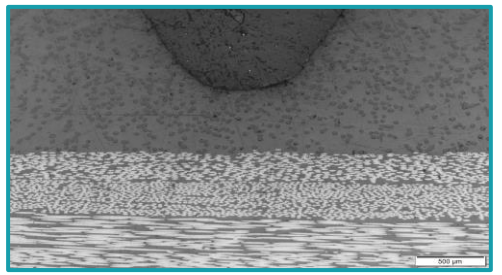


differential design





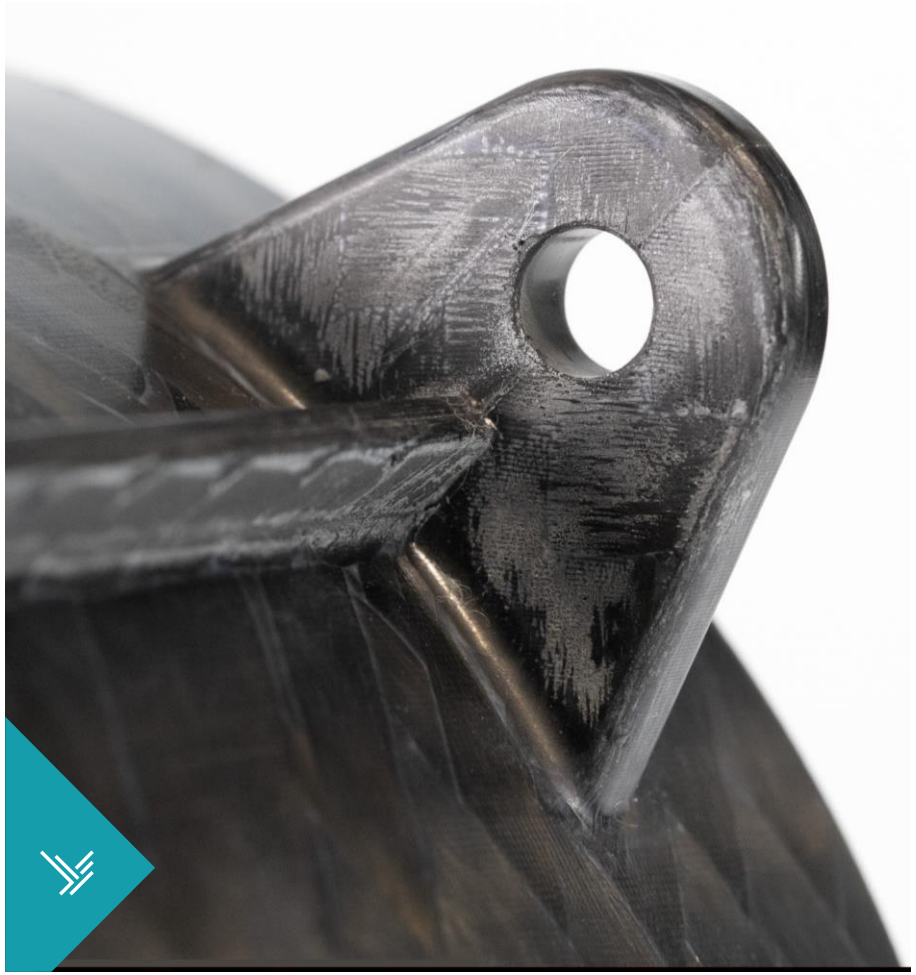


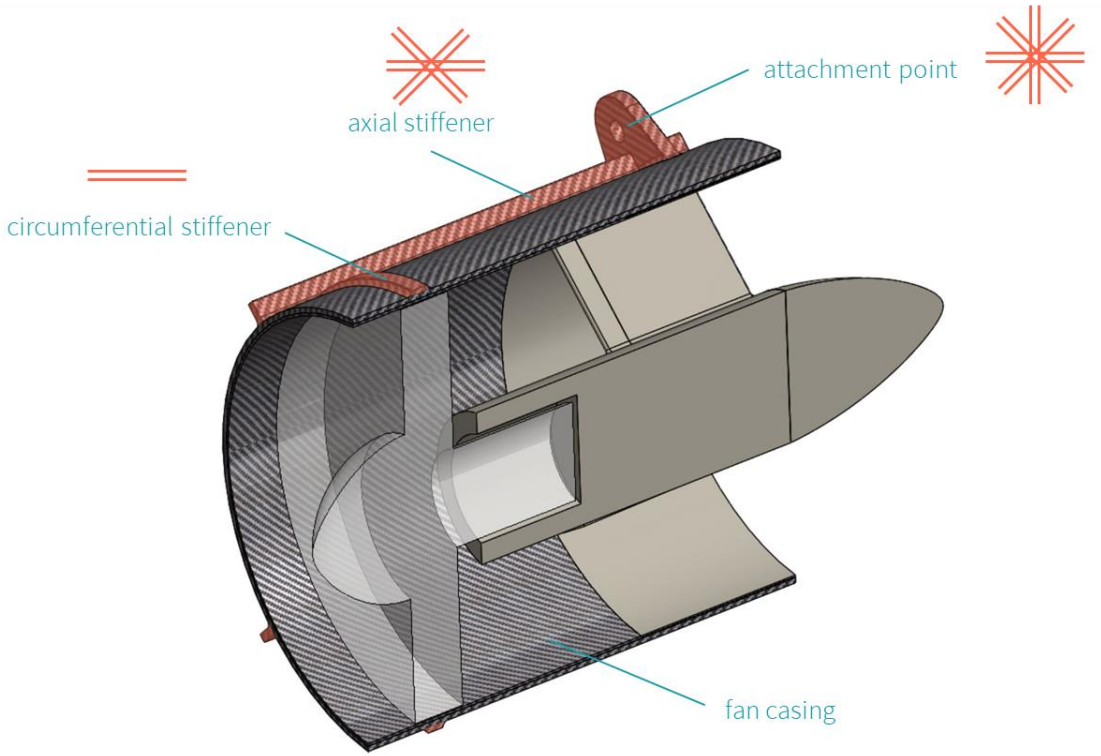


high load carrying integral composite thread

advanced funtionc

eVTOL fan casing





- all thermoplastic design with integrated functional elements
- demonstration of out of autoclave process route with <20 min cycle time
- high quality part with CF/GF-PAEK hybrid laminate lay-up

production capability

producible part specification

- part length : 3.400 mm
- part diameter: 10 – 200 mm
- wall thickness: up to 8 mm
- braiding angle: ±15° - 70°
- 0°-layers: true 0° process integrated layers
- lay-ups: hybrid - braided / 0°-plies
- cross-section: variable shapes
- curvature: > 30 mm (along profile achses)
- Rate up to 25.000 parts per year per shift

design, engineering and testing services

Design & Engineering

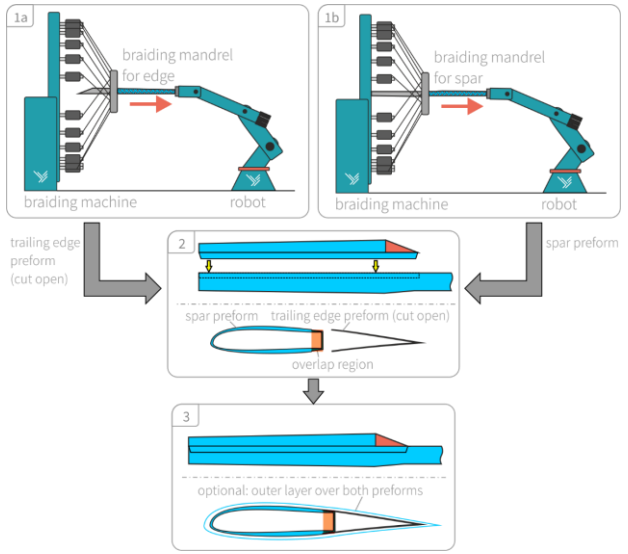
- Conceptional and detailed component design (2D-concept drawing, CAD, FEM, etc.) incl. load introduction and additional function integration
- Conceptional and detailed process design
- Cost-rate analysis for Business Case evaluation

Material characterization Quality inspection*

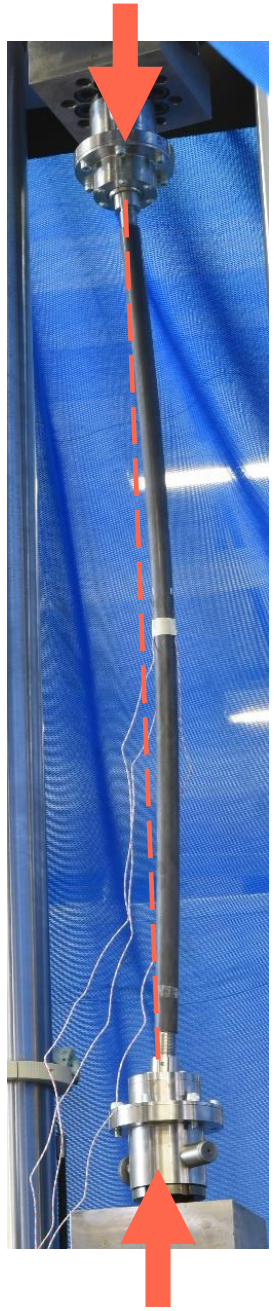
- Static, dynamic & cyclic tension, compression, torsion & bending testing of flat & tubular specimen (unnotched, open hole, VNRS) from -55°C to 180°C & environmental conditioning
- Impact testing e.g. BVID or CAI
- Physical testing like DSC, TGA, DMA
- CT-, ultrasonic-, FVC, FAW, porosity (foto micrograph) measurement
- 3D visual surface scanning (ATOS), 3D coordinate measuring

Component testing*

- Component specific tension, compression and torsion testing
- Crash, Impact & bird strike testing
- Rotational testing e.g. turbine or fan blades



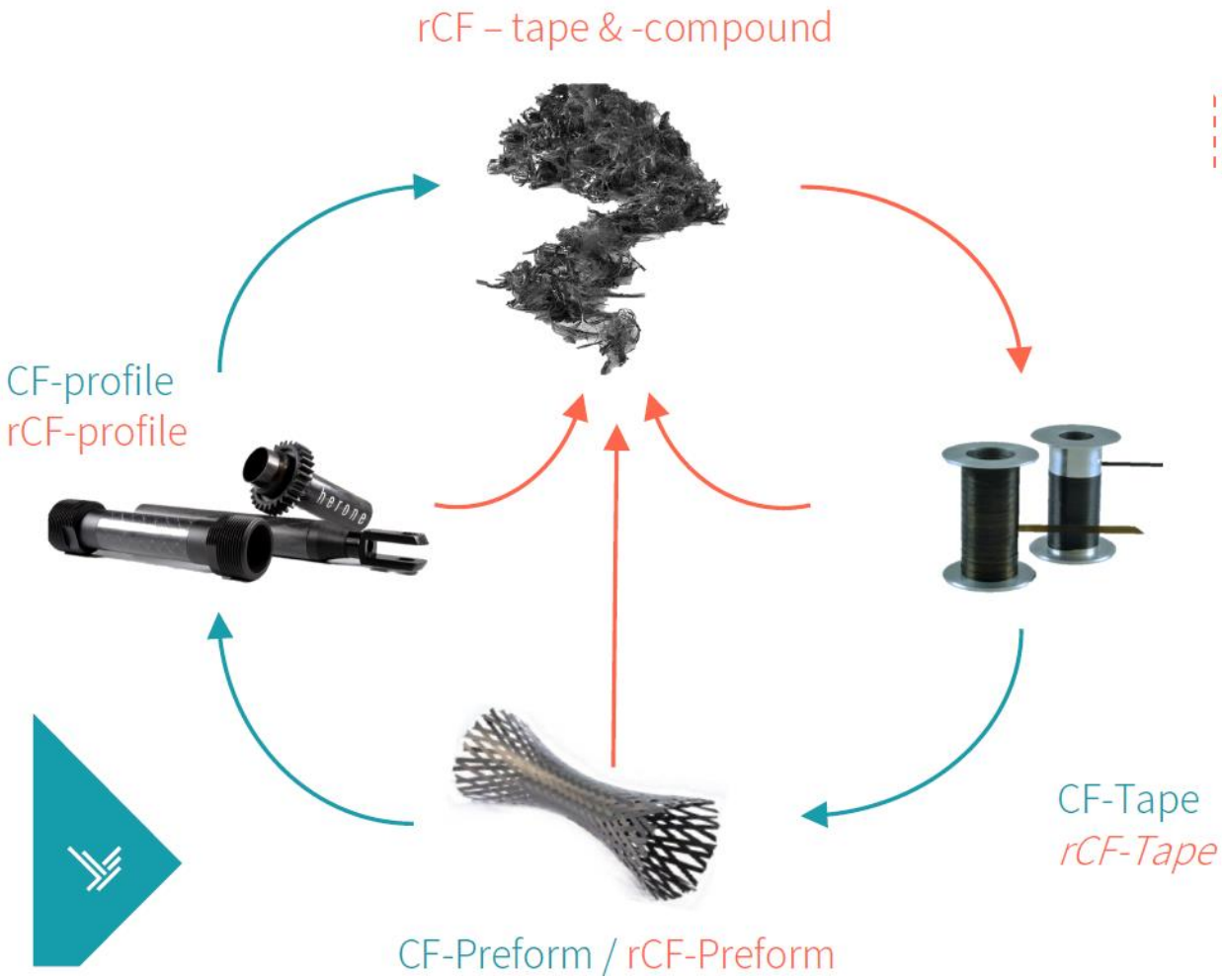
e.g. part & process design

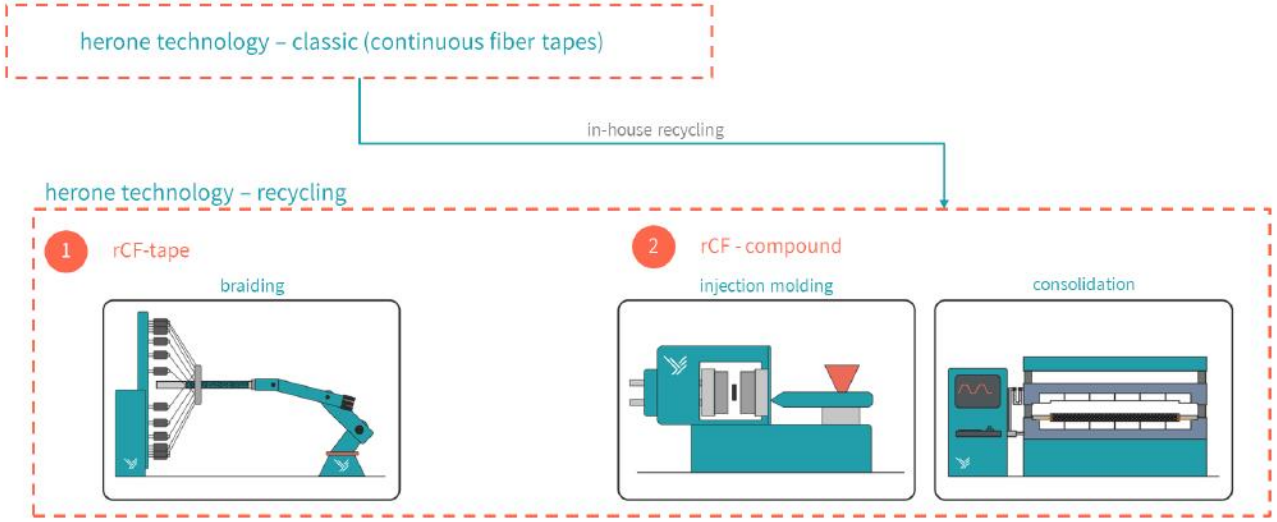


e.g. Component testing

*testing is done in cooperation with TU Dresden

herone recycling strategy

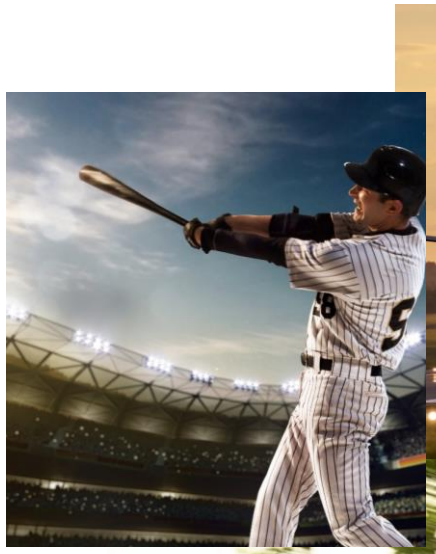


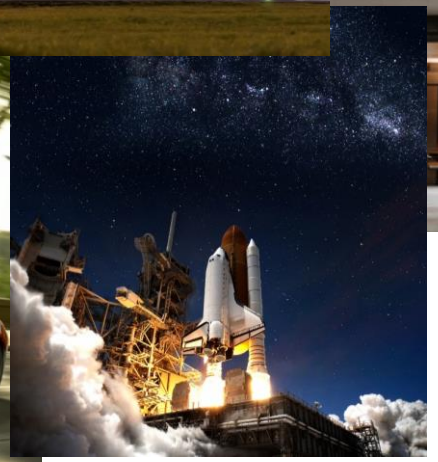


advantages of rCF products

1. technological – higher degree of deformation (thick walled & 90° bandages)
2. economical – more cost-efficient
   - expanded field of application (secondary structures)
   - substitution of other materials
   - saving of disposal costs

customers & partners





tailored for performance
made in series

herone

herone
TAILORED PERFORMANCE

Sales USA & North America:

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