



fibacore

strength from the core

History

❖ Joint Venture between

- ❖ Composite Metal Technology (CMT) & C&J Antich & Sons (Antich)

❖ CMT

- ❖ Pioneered ALPF
- ❖ Public company in 2003
- ❖ MMC development & improvement
- ❖ No known competition

❖ Antich

- ❖ Advanced Weavers
- ❖ 2D & 3D
- ❖ UK Based

❖ 3M

❖ Bühler

CMT

3M

C&J
ANTICH
& SONS LIMITED

BUHLER

Fibacore

- ❁ Advanced Materials Company
- ❁ Centre of Excellence for MMCs
- ❁ Material of choice for low-weight & high performance
- ❁ Maximise ability through continuous R&D
- ❁ Low volume & prototype manufacturer



Aluminium Fibacore

✿ CFR-AMC

- ✿ Nextel 610 alumina (aluminium oxide) fibre - Unidirectional, 2D or 3D preform
- ✿ Aluminium-based matrix (99.99 Al, LM25, L99, 6061)

✿ Tailorable properties

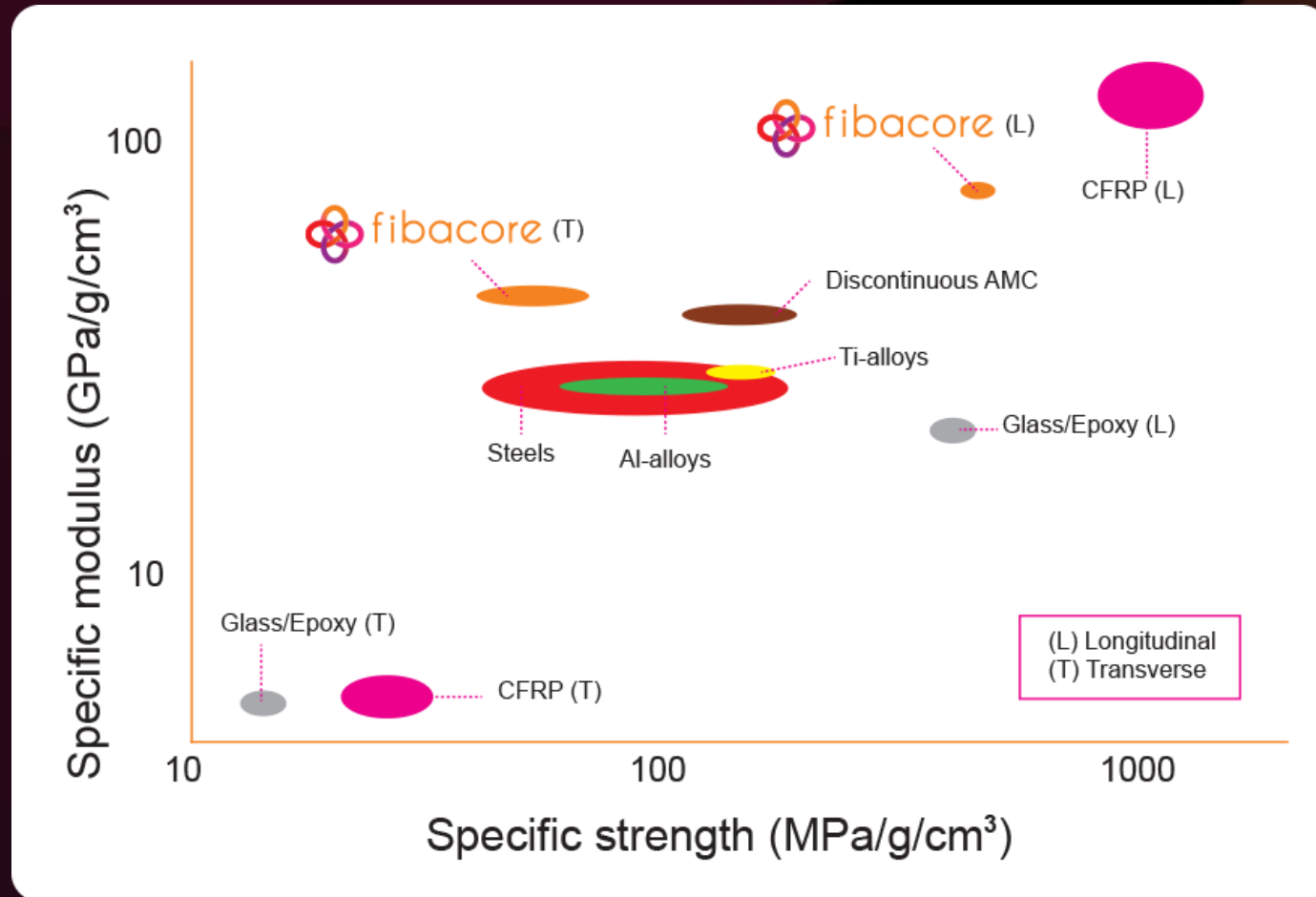
✿ Cycle time of under 90 seconds

✿ Greater than 95% recyclability

Mechanical Property	Value	Mechanical Property	Value
Longitudinal modulus	240 GPa	Transverse strength	230 MPa
Transverse Modulus	130 GPa	Shear strength	70 MPa
Shear Modulus	48-57GPa	Density	3.4 g/cc
Longitudinal Tensile Strength	1600 MPa	Longitudinal compressive strength	2500 MPa
Longitudinal Coefficient Thermal Expansion	7 ppm/°C	Transverse coefficient of thermal expansion	16ppm/°C

Maximum Properties for Unidirectional Aluminium Fibacore.

Fibacore Properties



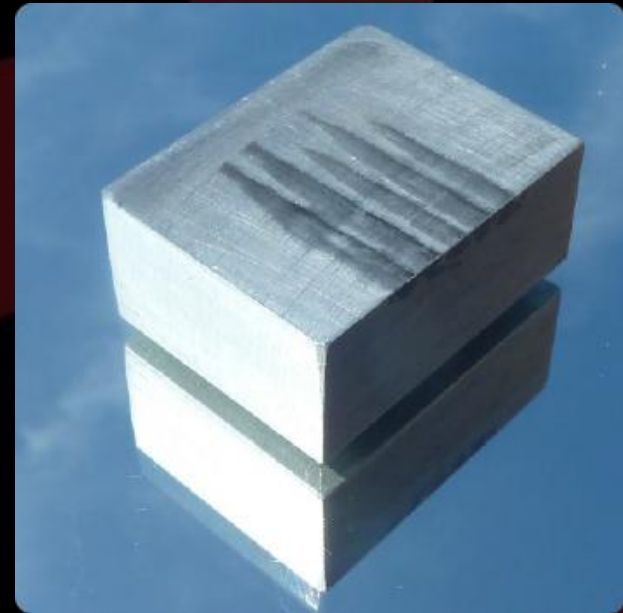
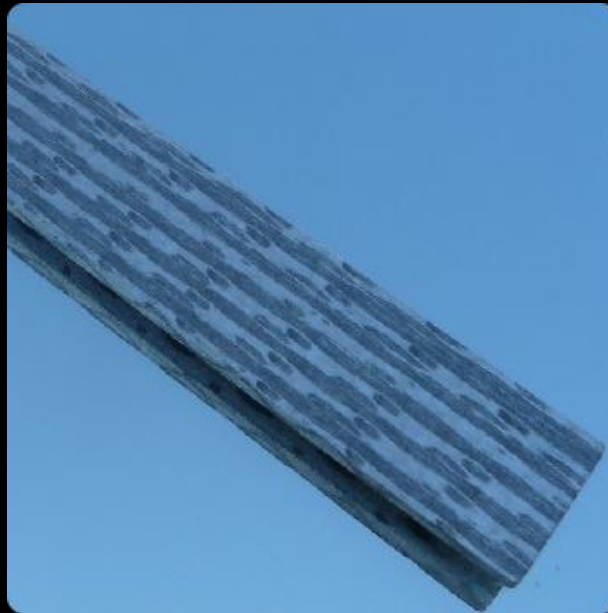
3D Weave

- ❁ True 3D weave
- ❁ 3D-UD, beams, socks
- ❁ Tailorable in X,Y and Z
- ❁ Casting process simplified
- ❁ Fibre content lowered from 65% to 40%











Inserts

- ❖ Selective reinforcement where stiffness & strength is required
- ❖ Aluminium Fibacore within aluminium



Components

Plates & Cylinders

-  Suspension components
-  Engine block
-  Engine components
-  Brake components
-  Gearbox housing & shift actuation
-  Differential housing
-  Wheels
-  Body castings

Rotating or reciprocating parts are particularly suitable

Brake Caliper

- ❖ Aluminium Fibacore plate inserts in bridge section
 - ❖ 2.4mm Aluminium Fibacore, 10mm aluminium sandwich
- ❖ Mass saving 64% vs cast iron
- ❖ Mass reduction 42%, Volume reduction 43% vs aluminium



Suspension Upright

- ❖ Aluminium Fibacore plate inserts in swan neck
 - ❖ 2.4mm Aluminium Fibacore
- ❖ Mass saving 30%
- ❖ Volume saving 30%
- ❖ Stiffness increase 20%



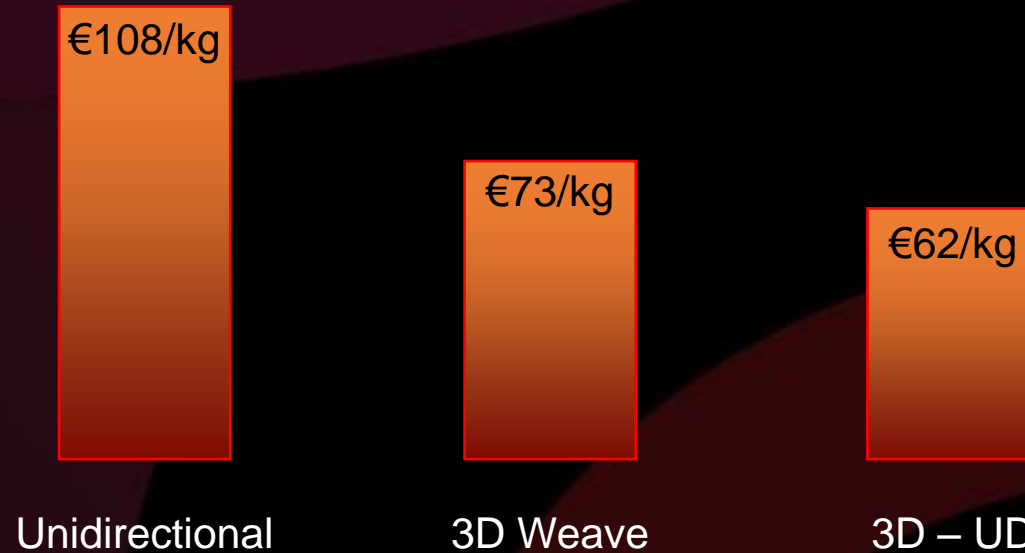
Crush Tube

- ❖ Aluminium Fibacore woven sock in bolt location
- ❖ Compressive strength:
 - ❖ Aluminium (LM25) – 250 MPa
 - ❖ Aluminium Fibacore – 1000 MPa

Bolt configuration simplified




Cost



3D-UD with insert technology is achieving automotive OEMs £/kg weight saving initiatives

What We Offer


Design & Analysis

-  In-house D&A team who can design, model and estimate benefits & cost of using Aluminium Fibacore in your components.

Prototyping

-  Manufacture test pieces and prototypes

Manufacturing

-  With a cycle time of under 90 seconds our two Buhler machines can support the manufacture of < 1,000,000 components per year

Government Funded Projects

- ❖ **AluMatCom 1 & 2 – £5.6m, partnered with Jaguar Land Rover**
 - ❖ To investigate the use of Fibacore in weight saving JLR automotive components
- ❖ **AMSCI – £7.7m**
 - ❖ To aid CMT and Antich to procure machinery enabling low-volume manufacturing



Thank You



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