

Innovations in Composites between Chinese and European companies

- The example of Fibrecoat ® high performance fibers

Dr. Michael Effing, CEO and Founder of AMAC GmbH

Chairman of Composites Germany

And

Simon Schwellenbach , FibreCoat® Business Development

16 September 2025

China Roadshow with Shanghai Full-CASE

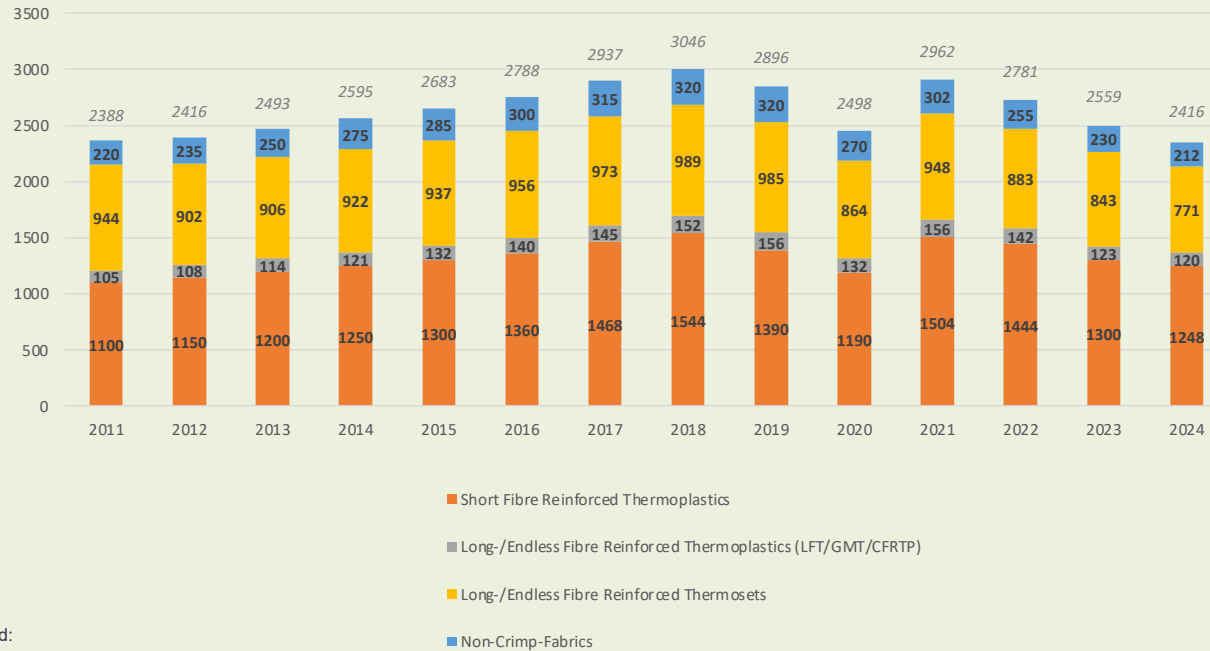
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The Worldwide Composites Market - Facts



- **Worldwide Composites Market 2024: 13,5 million tons**
 - **Increase compared to 2023 (13 million tons) \approx 4 %**
 - **Decrease Europe compared to 2023 \approx -5,6 %**
- **Different regional development: Americas, Asia & Europe**
- **95 % of the Reinforcements are Glass Fibres**
- **Carbon Fibre Reinforced Plastics: Market share of ca. 2 %**
- **Shortfibre Reinforced Thermoplastics are the biggest market segment in Europe**
- **Thermosets are still the biggest group in Europe in the field of long- and endless fibre systems**

The European Composites* Market (2024)



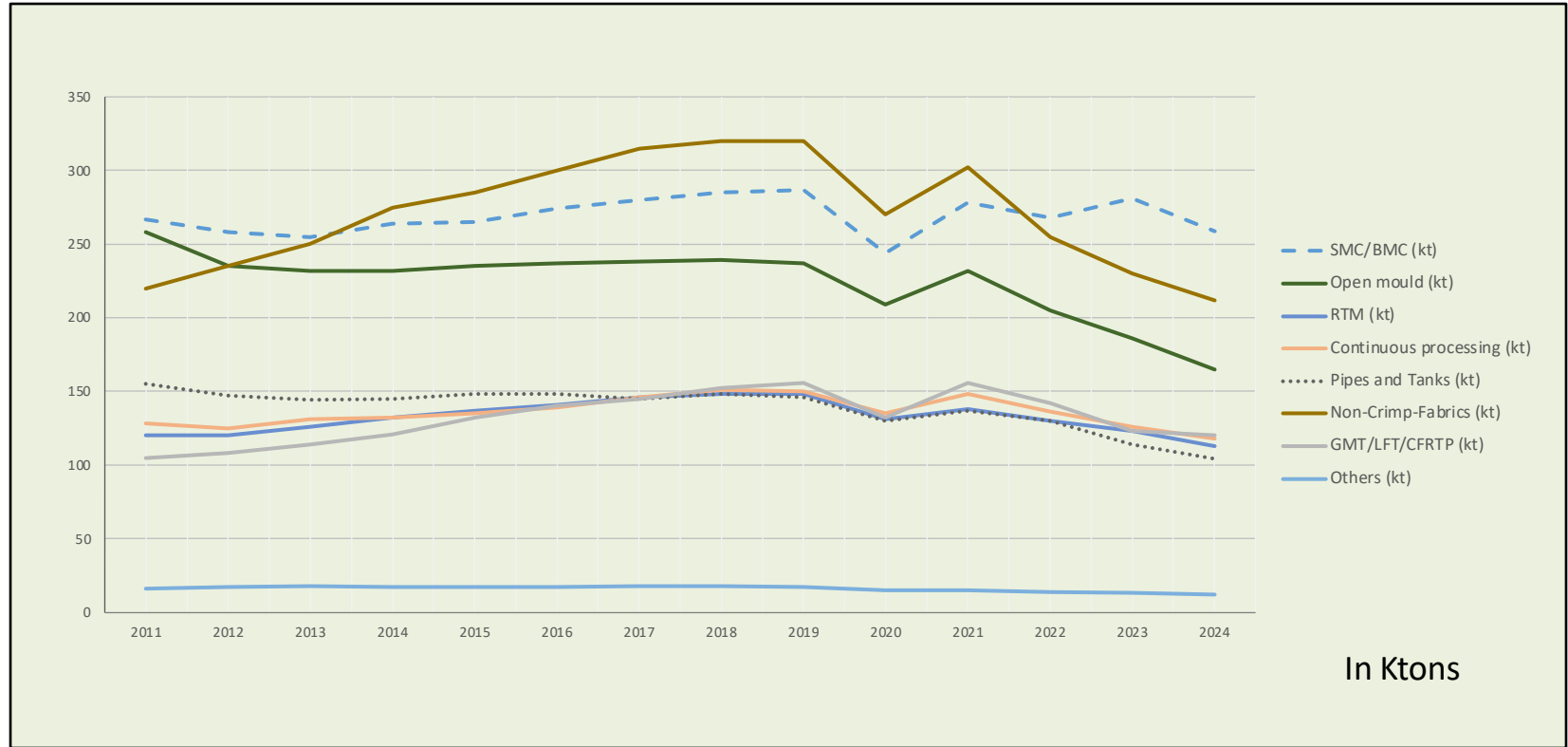
* Not included:

CRP & Natural Fibre Reinforced Plastics

In Ktons

Source: AVK European Market Report 2024

Development of the European Composites Market



Source: AVK European Market Report 2024



Dr. Michael Effing has over 30 years of experience in executive positions in the global composite industry.
复合材料行业30年的经验

Since 20 years business with China
与中国合作20余年

Chairman of the board of the trade associations
Composites Germany and AVK
德国复合材料协会和强化塑料协会主席



Dr. Michael Effing



Mr. Daniel Y. HE, holding MBA, MA and B. Sc degrees, is President of Reach Group and its subsidiary company of Shanghai Full-CASE and has over 25 years of experience in the Chinese composite industry as former VP of Marketing and Sales at Jushi Group.



Mr. Daniel Y. HE

AMAC GmbH & Shanghai Full-CASE—The Modern Composites Silk Road

现代复合材料 “丝绸之路”



Thermoplastics and
Thermosets
- Bio-Based
- Materials for Additive
Manufacturing
High-performance Additives

Materials
新材料

M&A
Support
并购支持

Composite
Machine
Technologies
复合材料机器技术

Networks
网络

Tape Placement & Process
- Continuous Lamination Machines
- 3 D Printing
- Advanced Automated Thermoset
Processing

AZL& ITA Partnership
- German Trade associations
- Chinese Research Institutes



Dr. Michael Effing and Daniel He

- ✓ Official Cooperation since April 2020
- ✓ 正式合作始于2020年4月
- ✓ Daniel He and Dr. Michael Effing have a 20-years-long-term business relationship
- ✓ 20年的合作关系
- ✓ Tremendous networks both in China and Europe
- ✓ 中欧合作诸多机会

Strategic Cooperation Shanghai Full-CASE and AMAC (Europe) along the “Composites Silk Road”

Prospect 1: Textechno Testing Solutions

Textechno公司测试解决方案

- Founded in 1949 in Mönchengladbach, Germany
Family business, operating world-wide
- 1949年在德国成立的家族企业，全球运作
- Since the 1960ies market- and technology leader in testing instruments for **man-made fibres and yarns**
- 自1960年代起成为人造纤维和纱线测试设备的市场和技术领先者
- Since 2010 additional focus on testing solutions for **composite materials**
- 自2010年进一步关注复合材料的测试解决方案



Textechno's Headquarter in Germany (德国总部)



Lenzing Instruments in Austria (奥地利子公司)

FIMATEST

Fibre-Matrix Adhesion Testing
纤维基体胶合测试仪



Texttechno
textile testing technology

The **FIMABOND**
embedding station

+

The **FAVIMAT+** single fibre
testing device



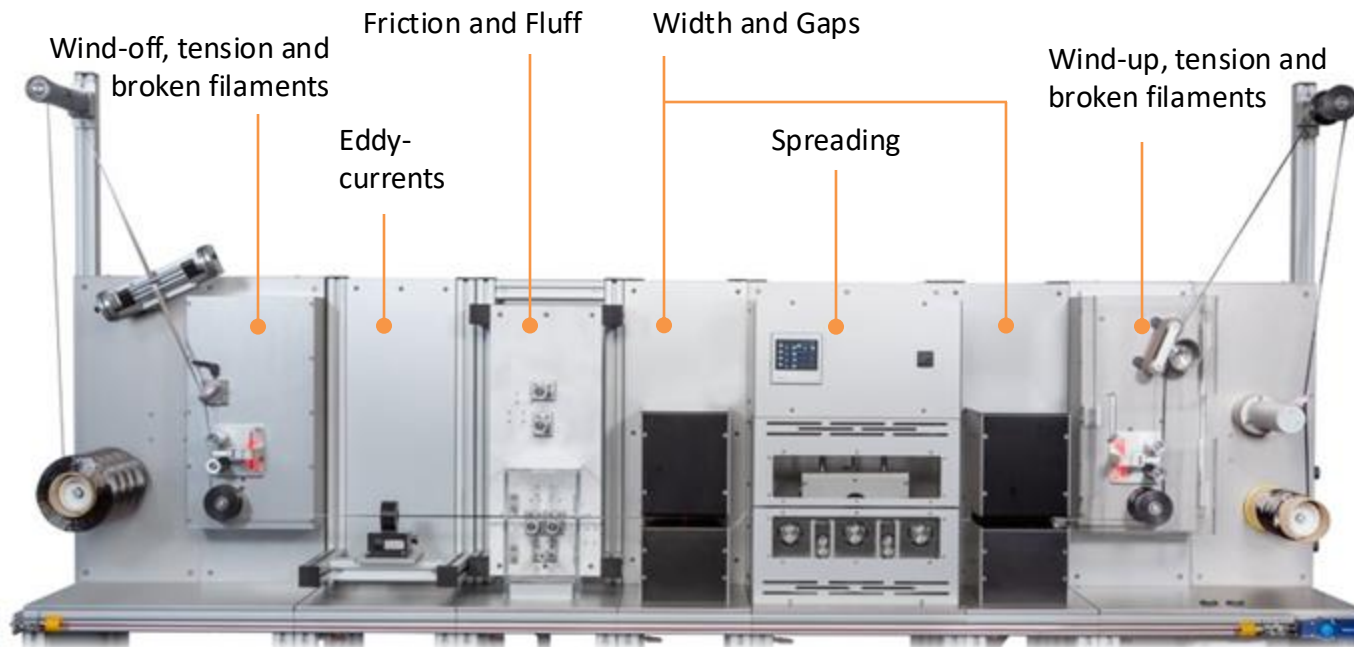
FIMATEST is efficient and precise alternative to ILSS testing
FAVIMAT+ measures all important properties of reinforcement fibres

- fiber-matrix adhesion, interfacial shear strength
- breaking strength, modulus, diameter, friction...

ROVINGTEST

Modular Test System for the Performance of Rovings

粗纱测试仪



ROVINGTEST measures all important properties in manufacturing, processing and R&D of **carbon-** and **glass** fibre rovings in a single test system.

Prospect 2: ITA Reinforced!

Institute for Textiles (ITA)s at the RWTH Aachen University in Germany



Become an official partner of ITA at RWTH

About ITA

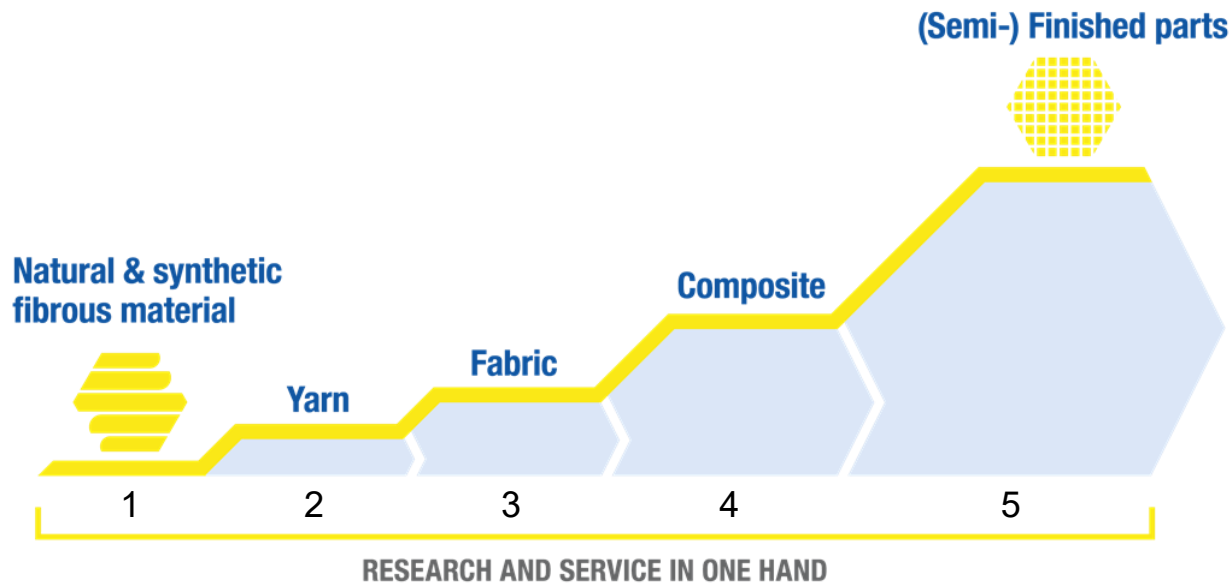
- Leading research and qualification service provider
- Located in the centre of the RWTH Aachen Campus among other institutes
- 450 employees in areas of fibre-based high-performance materials, textile semi-finished products and their manufacturing processes
- Partner of research and development industry focusing on textile engineering
- Oriented towards social megatrends of sustainability and digitalization
- Comprehensive problem solutions along entire textile value chain and transfer support provided



[ITA main facility at Campus Melaten]



[Campus Melaten of RWTH Aachen University]



Presentation by Dr. Christoph Greb at the CCE 2025



Dr.-Ing. Christoph Greb
Scientific Director
Institut für Textiltechnik (ITA)
At the RWTH Aachen University
52074 Aachen/ Germany

Digitalization and intelligent manufacturing in Germany's Composite Materials industry – Chances, trends and innovations

FibreCoat GmbH

Making high-performance Materials affordable

We develop and produce revolutionary fibre-based materials for high-performance composites



FIBRECOAT

— RWTH Aachen University Engineers

In-depth technological and economic training
and distinctive network

— Technology leader in filament coating

Unique patented system for single filament
coating, enabling the production of high-
performance fabrics and composites

— Innovating the Composite industry

Material designed to support sustained success in the
market



60+ Employees
Aachen, 80
Employees* Rustavi



Revenue 2024: 8 Mio. USD



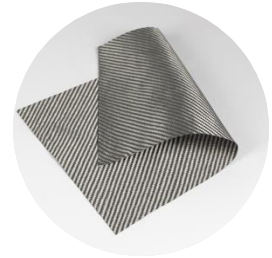
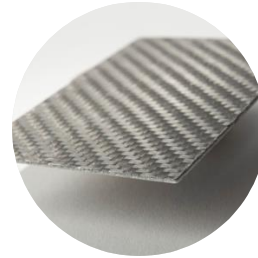
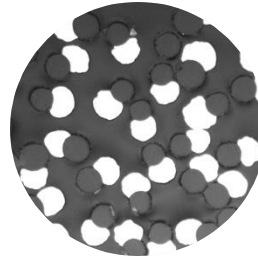
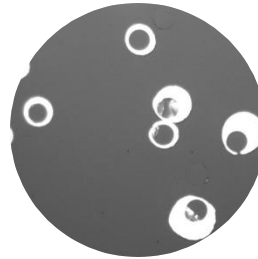
3 Production sites:
Aachen (GER), Rustavi (GE), Gorlice (PL)

AluCoat

Coated filament

New aluminum coated glass or basalt fiber with high stiffness and metal properties

- Multifilament yarn with single coated filaments
- Full or partial but homogeneous sheath
- Tailored fibre volume fraction 50 - 80 %



Our Process

From Basalt/Glass to Fibre

Continuous basalt and glass fibre spinning

Industrial spinning line with spinning speeds of 1,500 m/min.

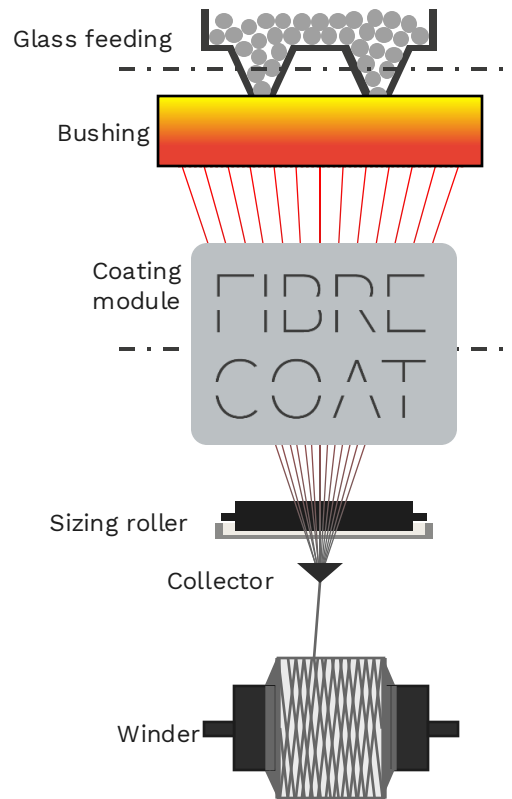
Metal and sizing application

Flexible coating system for different metals and inline sizing application.

Advanced winder technology

Automated system doubling the fibre production speed.

**100% more
effective
Production**



Product Portfolio

FibreCoat offers bi-component multi filament yarns with basalt core and metallic sheath

Current Offerings:



Aluminium coated basalt fibre -

AluCoat

Strong, lightweight fibre with enhanced material properties.



Tin coated basalt fibre

Corrosion-resistant fibre designed for durability.



Zinc coated basalt fibre

Robust fiber ideal for long-lasting industrial applications.



Bismuth coated basalt fibre

Heat-dissipating fiber designed for safe, eco-friendly electronic and thermal solutions.

In the Pipeline:



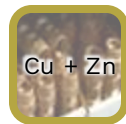
Nickel coated basalt fibre

Corrosion-resistant fibre designed for durability.



Copper coated basalt fibre

Corrosion-resistant fibre designed for durability.



Brass coated basalt fibre

Corrosion-resistant fibre designed for durability.

... more to come

AluCoat Materials



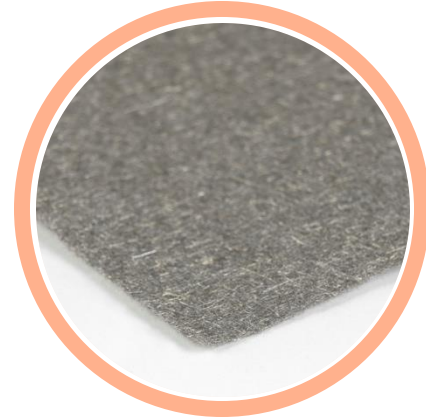
AluCoat Roving



Chopped AluCoat
Strands



AluCoat
Woven Fabric



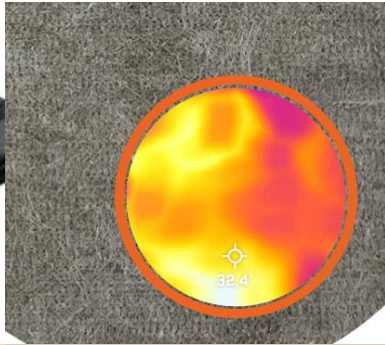
AluCoat
Non-Woven Fabric

Applications



EV Battery and Inverter casing

Shielding of
electrical
components



Electrical heating

Textile electrical
resistance heating
systems



ESD compounds

Electrical discharge
and conductive
compounds



Reinforcement

Glass (AluCoat)
fibre reinforcement
of cast aluminum
parts



Lightning strike protection

Composite as
electrical protection

FIBRECOAT

FibreCoat Solutions for Automotive

Next generation EMI shielding and flame-retardant materials for EV battery and inverter casings



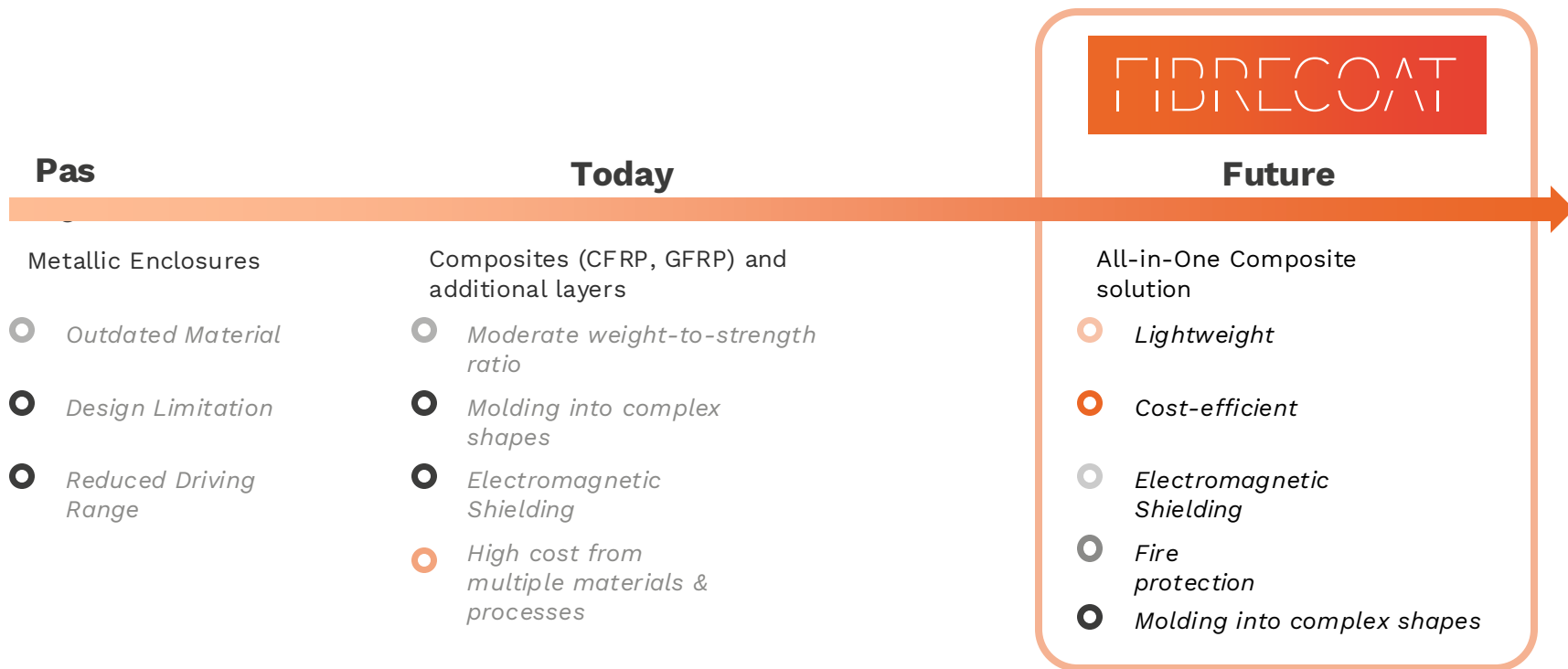
Material Challenges

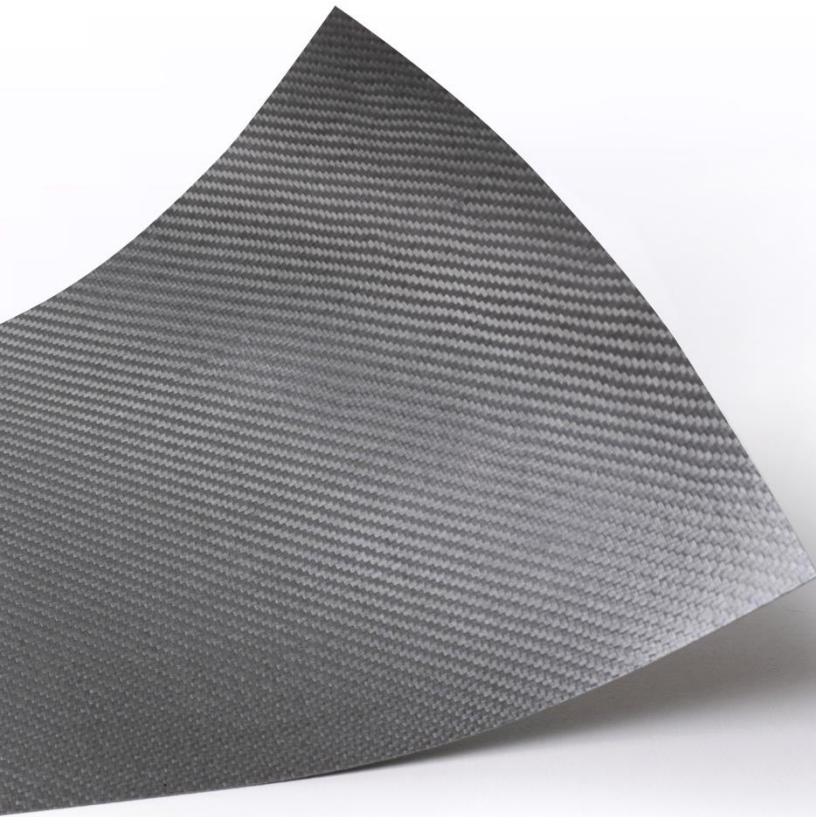
Today's EV materials can't keep up with tomorrow's demands

- **Performance:** Limited range
- **Economic:** High costs from multiple materials & processes
- **Environmental:** Carbon-heavy metals
- **Customer:** Consumer push for greener, more affordable EVs
- **Regulatory:** Stricter EMC, fire safety, sustainability requirements

Materials in EV Battery/Inverter Enclosures

FibreCoat's advanced materials are driving the essential changes needed to enhance modern EVs



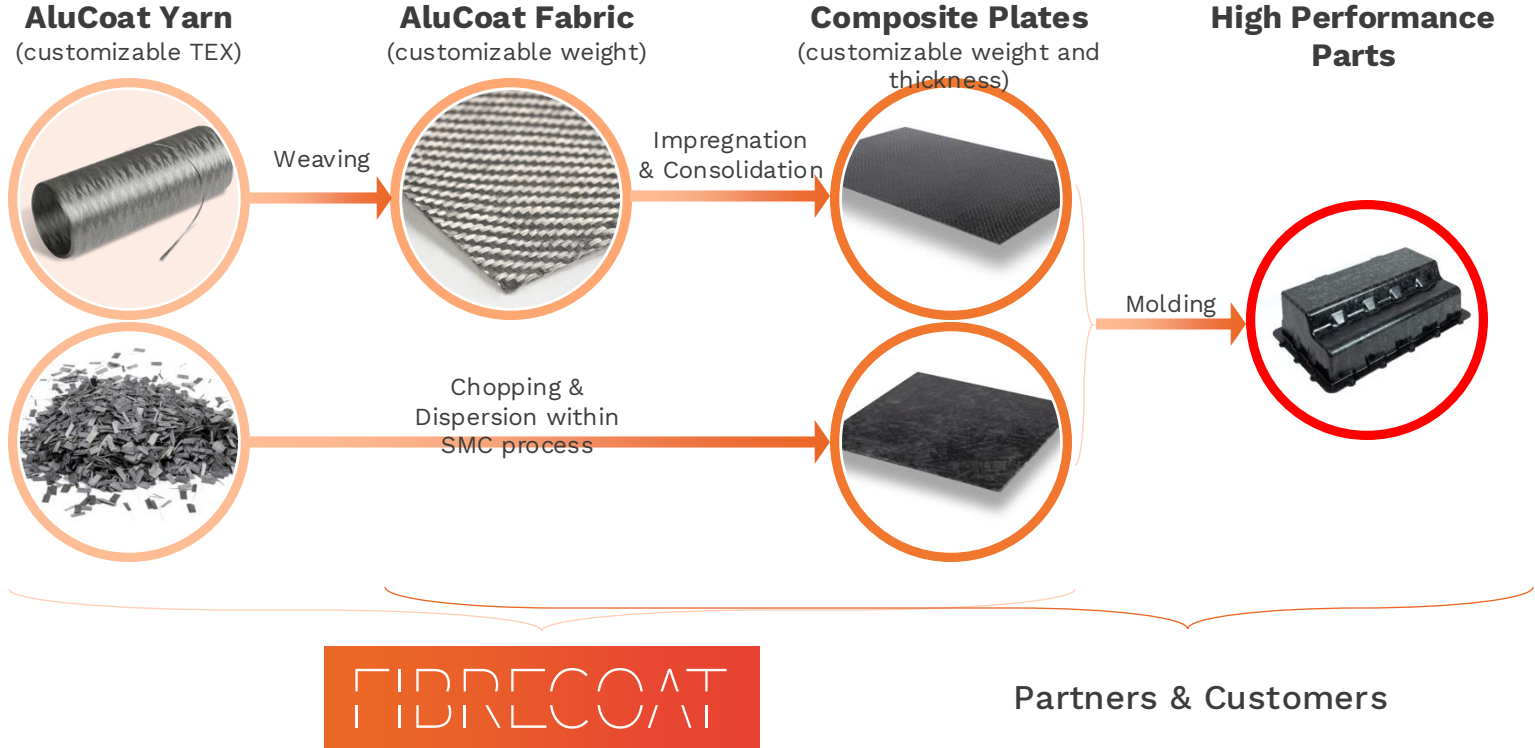


The FibreCoat Benefit

FibreCoat provides a comprehensive, high-performance material designed to support sustained success in the market

- Lightweight Functional Composite
- Electromagnetic Shielding
- Improved Flame Retardancy & Thermal Stability
- Freedom in Design
- Easy Integration into existing Industrial Production

FibreCoat's Automotive Offering



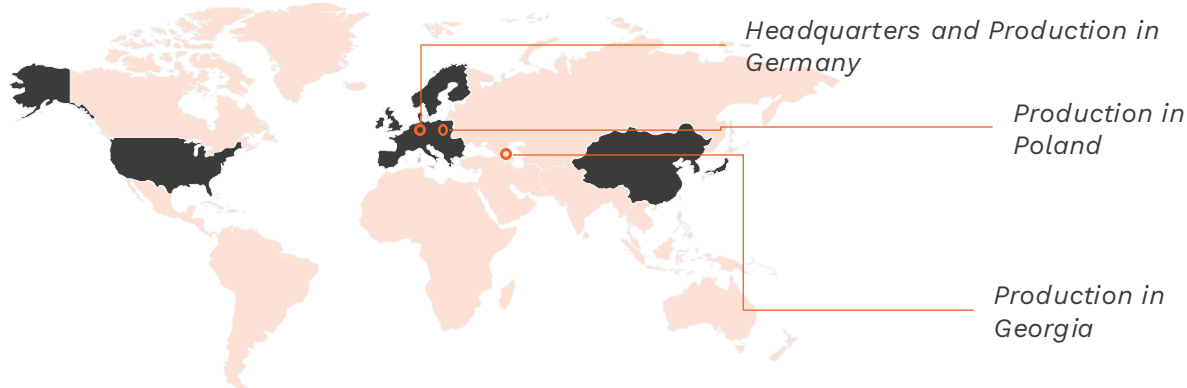
Let us build the next Generation of EVs

FibreCoat Today

- Pre-serial development with leading OEMs and Tier-1
- High EMI shielding effectiveness across wide frequencies and higher fire resistance than glass fibre composites
- Prototype-ready and scalable with existing supply chains
- Partner network in Europe, USA, Asia

Invitation to Partnership

- Looking for OEM & Tier 1 partnerships
- Ready to scale from prototypes to full production
- Invitation to collaborate on lightweight, sustainable EV solutions





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Thanks a lot for your attention

- Let's stay in contact -

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