KREMPEL

COMPOSITE MATERIALS AND COMPONENTS

- Prepregs & UD Prepregs
- Composite sheets
- Moulded parts
- Filament windings and pultrusion profiles

COMPOSITE MATERIALS
FROM CONCEPT TO COMPONENT

Our composite materials and high-performance components are well-established features of the aerospace industry, the rail industry and the vehicle construction industry, as well as in medical and electrical engineering and sports equipment manufacturing.

Unlike conventional materials, our composite materials have unique properties, such as high strength with low weight, high tensile and bending strength or thermal and electrical insulation.

We support our customers right from the design phase and help them to find appropriate composite-based designs for their components. The components are dimensioned and designed using classic material strength and lamination theories or using FEM analyses. During the production of our prepregs, we used various technologies to impregnate fabrics, non-wovens, rovings and non-crimp fabrics with specially adjusted resin systems. The main reinforcement materials we use are glass, carbon and aramid fibres, however, we also work with natural fibres.

The impregnated surface materials are ideal starting materials for sheets and components that we manufacture from our own prepregs or high-quality thermoplastics. This means that we are able to meet customer-specific requirements with optimal solutions and ensure an incredibly high standard of quality.

Krempel has modern multi-daylight presses, moulded part presses, autoclaves and vacuum tables. Our in-house tool making facility means that we can offer short production times for components – from the initial design to the finished product.

KREMPEL
ENGINEERING CONFIDENCE

Krempel is more than just a supplier of materials. We support our customers with our technical and chemical expertise during the early stages of the development of their composite material solutions. We pride ourselves on our ability to deliver durable, high-performance solutions in the field of composite materials.

APPLICATIONS

Aerospace
Automotive
E-mobility
Railway
Protection technology
Medical
Electrical engineering

PORTFOLIO

Pepregs & UD-Prepregs
CFRK/GFRK laminates
CFRK/GFRK components
Fibre composite tubes
Pultrusion profiles

TECHNOLOGIES

Impregnation
Pressing
Moulding
Filament winding
Pultrusion
Injection moulding

PREPREGS & UD-PREPREGS
CUSTOMISED FIBRE PRODUCTS

Prepregs (PREimPREGnated) and UD Prepregs (UD = unidirectional) are semi-finished fibre products that are impregnated with reactive resins. These materials offer an endless range of processing possibilities and provide the perfect basis for the production of lightweight and high-strength components.

The Krempel prepreg systems are based on reactive resins with a curing system that is latent at room temperature and highly reactive at elevated temperatures. In their initial state, the prepreg resins have medium to high viscosity and are in the reactive B stage. Further processing of these materials is achieved through the supply of energy and simultaneous moulding procedures.

This process causes the low-molecular, meltable resin transitions to the high-molecular, unmeltable C stage. We adapt the resin system to suit the relevant requirements in order to ensure a controlled and tailored process. When combined with glass, carbon and aramid fibres, this enables the production of structural components with outstanding properties. When it comes to the customised development and modification of these surface materials, we are the right partner for you.

HIGH-PERFORMANCE RESIN SYSTEMS

- Fabrics made of carbon or glass fibres (E or S glass)
- Multi-axial non-crimp fabrics made of carbon or glass fibres
- Aramid fabrics
- Non-woven fabrics
- Natural fibres
- Hybrid fabrics

We adapt all resin systems to suit the relevant requirements using reinforcements. We can also offer addition resin systems upon request.

DELIVERY SPECIFICATIONS

FABRIC PREPREGS

Maximum width:	1250 - 1750 mm
Areal weight:	50 - 1.800 g/m²

UD PREPREGS

Maximum width:	600 mm
Narrow rolls:	from 15 mm

MATERIALS

Fibres:	Glass, carbon, aramid, silicone and cotton
Resins:	Epoxy, phenol, polyimide, bismaleimide, etc.

PREGNIT
TAILOR-MADE CFRP AND GFRP SHEETS

A key factor during the production of composite sheets is the ability to retain high material strength while reducing weight and ensuring optimal mechanical properties. For many years, Krempel has produced composite sheets made of carbon fibres (CFRP = carbon fibre-reinforced plastic) and glass fibres (GFRP = glass fibre-reinforced plastic) in line with the highest quality standards. These composite sheets are produced under the name PREGNIT.

Our composite sheets are produced from our own prepregs and laminated in order to achieve their outstanding mechanical properties. The fibres are embedded in an easily mouldable resin matrix and carefully pressed using our modern multi-daylight presses and moulded part presses. After pressing, they have the desired properties, including stiffness, strength, thermal stability. Our PREGNIT composite sheets have proven to be a highly effective solution for the construction of lightweight, yet incredibly durable components and structures across a wide range of applications.

By selecting suitable fibre materials and resin systems, we are able to specifically adapt the properties of the sheets to meet the specific requirements of projects in industries such as aerospace and automotive manufacturing and in the area of ballistic protection.

After the pressing process, the composite sheets can be further processed in a range of different ways: they can be drilled, milled and sawn.

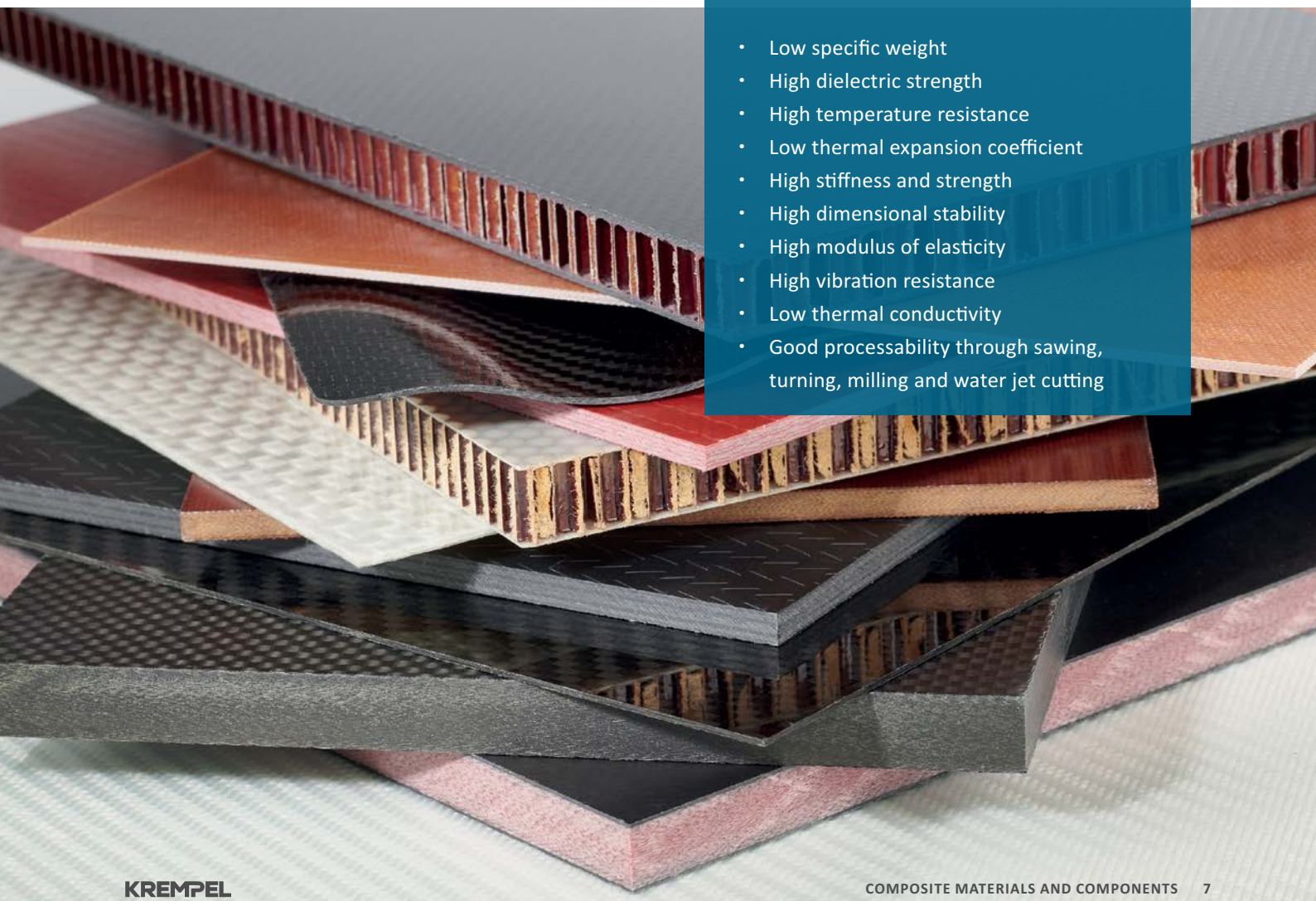
MANUFACTURING CAPABILITIES

- 6-daylight hot presses
- Moulded part presses
- Autoclave production
- Film stacking
- Surface qualities: smooth, with peel ply or sanded

Formats Plastic Sheets	Prototype press:	500 x 500 mm
	Multi-daylight presses:	1500 x 1000 mm 2500 x 1250 mm 3000 x 1500 mm
	Sheet thickness:	0.2 – 100 mm
Technische Daten Autoklav	Ø 600 x 1400 mm	20 bar, 400° C
	Ø 1600 x 3600 mm	20 bar, 200° C
Precision machined parts	Multi-axis vertical lathes Automatic CNC drilling with conveyor belt feed Automatic lathes Automatic precision sawing	
Water jet cutting 4 cutting heads	Machining dimensions:	x = 3100 mm y = 3100 mm z = 250 mm

OUTSTANDING PROPERTIES

- Low specific weight
- High dielectric strength
- High temperature resistance
- Low thermal expansion coefficient
- High stiffness and strength
- High dimensional stability
- High modulus of elasticity
- High vibration resistance
- Low thermal conductivity
- Good processability through sawing, turning, milling and water jet cutting



MOULDED PARTS
CUSTOMISED PRECISION PARTS

Krempel produces composite components for a range of renowned clients as part of build-to-print projects. We guarantee precise and efficient production in accordance with drawings and specifications with a focus on process reliability and tolerance adherence.

We also provide comprehensive support during the development and design of new components with build-to-spec manufacturing. This includes the careful selection of adequate materials and construction methods to achieve the desired properties and functionalities. Our customers benefit from our comprehensive expertise in the production of high-performance prepreg systems. Tooling is another one of the many services we offer.

We produce components with incredibly tight tolerances and turn, drill and saw these components with state-of-the-art CNC machines or water jet cutting machines. Our production facilities feature the latest technology. This allows us to carry out series production of components made of composite materials in small or large batches. We also manufacture prototypes and samples in our design shop.

Ensuring the highest quality is our top priority and that is why we comply with all relevant production standards. The manufacturing of components is certified in accordance with ISO 9001, ISO 9100 and IATF 16949.

Additionally, our part manufacturing area is certified according to DIN6701, DIN2304 and TLA-0023, which qualifies us to carry out adhesive bonding with the corresponding safety and quality requirements in rail vehicle construction as well as in the field of defence technology.

COMPETENCE IN COMPONENT MANUFACTURING

- Construction
- Component manufacturing
- Tool making
- Component assembly and finishing
- Expertise in autoclave manufacturing and out-of-autoclave manufacturing
- Modern CNC machinery
- High-performance water jet cutters
- Measurement technology

FILAMENT WINDING

Krempel manufactures fibre-reinforced filament windings using the filament winding process in a wide range of material combinations. They include epoxy, vinyl ester and polyester-impregnated glass, aramid and carbon fibre rovings. Our production is always focused on the specific application requirements of our customers.

We produce these components on state-of-the-art filament winding machines. During the design of rotationally symmetric hollow bodies, we make precise decisions with regard to the fibre selection, the type of resin, the winding angle and the cross-section.

The insulation classes F to H and heat resistance up to 240° C are guaranteed. We also have solutions for higher thermal requirements.

FIBRE COMPOSITE TUBES

Using modern precision machinery, Krempel produces high-precision, mandrel-wound fibre composite tubes in accordance with customer specifications. Our selection of materials ranges includes standard matrix systems such as phenol, epoxy, melamine and silicone resins with glass, aramid, polyester, carbon and cotton fibre reinforcement. For the high-voltage applications, mica-based matrix systems are available.

Our expertise also extends to moulded tubes, including square tubes, rectangular tubes and hybrid constructions. Krempel is one of the largest European manufacturers of fibre composite tubes for use in industry and of phenolic resin ball bearing cages for use in precision spindle bearings.

MATERIAL PERFORMANCE

The joining of the letters „M“ and „P“ in our logo stands for „Material Performance“ and reflects our aspiration to implement work processes with the highest quality materials. It highlights our role as a technological partner for our customers, who we provide with comprehensive support during the development of their products.

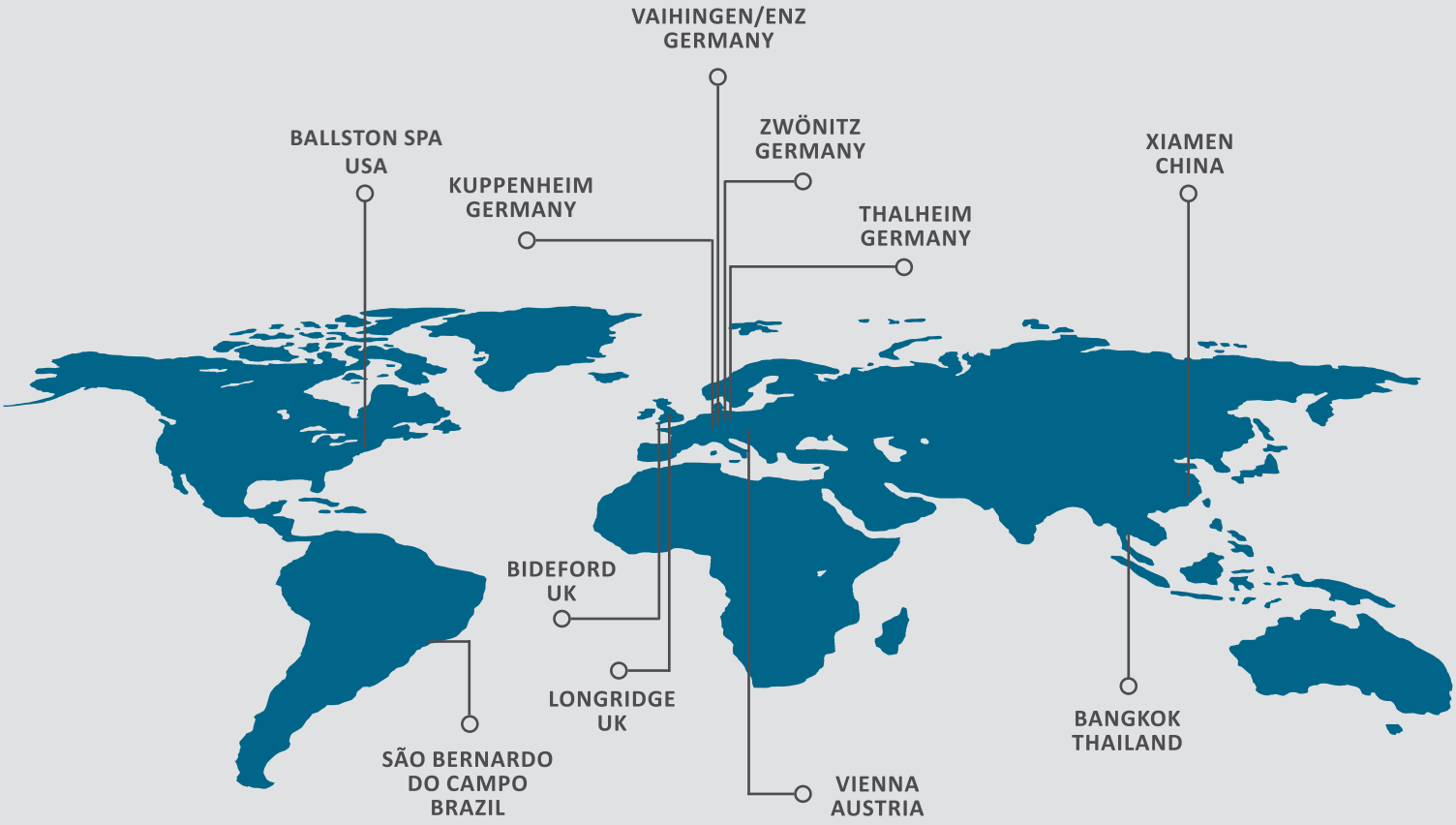
Krempel maintains long-standing partnerships with renowned raw material suppliers, and for more than 150 years, Krempel has been a constant and trustworthy partner in the field of composite materials and components.

WACOSIT® – FIBRE-REINFORCED PLASTIC PROFILES

We use the pultrusion process to manufacture fibre-reinforced plastic profiles made of synthetic resin-impregnated rovings and/or fabric tapes. Over 5000 standard geometries are available, including resin-impregnated rovings made of glass, plastic and aramid fibres. Our outstanding expertise lies in the production of complex, moulded custom profiles according to the specific requirements of our customers.

INJECTION MOULDED PARTS

Krempel has high-performance injection moulding machines for the production of plastic parts with complex geometries. Our technical polymers include high-performance thermoplastics, such as polyether ether ketone (PEEK), polyphenylene sulfide (PPS) and polyphthalamide (PPA). We serve multiple industries, including the automotive, medical technology and packaging industries. For the welding equipment industry, for example, we manufacture nozzle insulators, torch bodies, thread protectors, swirl baffles/rings, heat shields, plungers, switch and impeder casings. We supply pre-assembled components for a constantly increasing number of customers.



As a leading manufacturer of electrical insulation materials, composites and electronic materials, Krempel is a system partner to customers in the energy, mobility and industry sectors. Our technical materials and components help to ensure that lives and technology are protected effectively, reliably and responsibly.

The Krempel Group has 11 locations on four continents and employs more than 1,100 people worldwide.

Krempel GmbH
Papierfabrikstrasse 4
71665 Vaihingen/Enz
Germany
T +49 7042 915-0
info@krempel.com

Krempel.com