

**KARL MAYER**

WE CARE ABOUT YOUR FUTURE

**KARL MAYER**

**TECHNICAL  
TEXTILES**

TECHNICAL TEXTILES

# THE INNOVATIVE MARKET LEADER IN TECHNICAL TEXTILES

Automotive / Building and Construction / Transport and  
Aerospace / Renewable Energy / Sports Equipment /  
Personal Protection / Advertising / Medical Technology /  
Infrastructure / Apparel and Home Textiles / Reinforce-  
ment and Coating Substrates



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# TECHNICAL TEXTILES

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## THE INNOVATIVE MARKET LEADER

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## CREATING ADDED VALUE FOR OUR CUSTOMERS

Technical textiles are opening up new end uses; they are replacing conventional materials and are used as reinforcing materials in composites for a wide range of applications, including the mobility, energy, construction and leisure sectors. In the technical textiles sector, KARL MAYER has consolidated its expertise in machines for producing technical textiles, so that it can cater optimally for the current and future needs of its clients.

With our innovative machine portfolio, we are the go-to partner for the industry. We are the drivers of technology and innovation in composites and lightweight construction technology. New materials, such as fibre-reinforced plastics containing carbon and glass, are a few of the important future technologies for the automotive and aerospace industries. We are also making an important contribution to future challenges like saving energy and resources. There we can benefit from our many years of experience working with our partners, for example in the wind turbine sector and in the increasingly important construction industry.

We also concentrate on efficient production in conventional applications, such as advertising banners and other coating substrates, as well as geotextiles, such as in road building.

By working closely with our customers, our aim is to develop systems that offer the best cost-benefit ratio. We do this by using our sophisticated standard platforms as the basis for developing customised solutions.

In this way, we are supporting our customers by developing unique selling points in their markets and helping them to become the technology leaders. This brochure aims to show what added value KARL MAYER's systems can bring to the various applications of technical textiles.

We would be pleased to help you to achieve your goals and are looking forward to meeting you in person!

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# DRIVING INNOVATIONS FORWARD



## LEADER IN PRODUCTIVITY

With the latest generation of raschel machines with parallel weft-insertion the fabric output has increased up to 30%. For example, the maximum speed to produce plaster grids with the WEFTTRONIC® II G 245" has been increased from 1,200 rpm to 1,600 rpm.

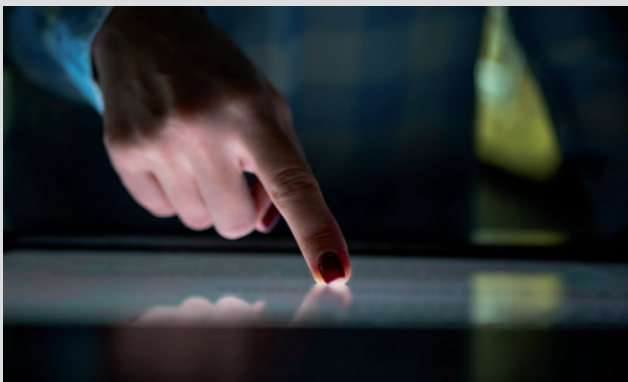
# KM.ON

DIGITAL DRIVEN INNOVATION

## DIGITIZING BUSINESS WITH KM.ON

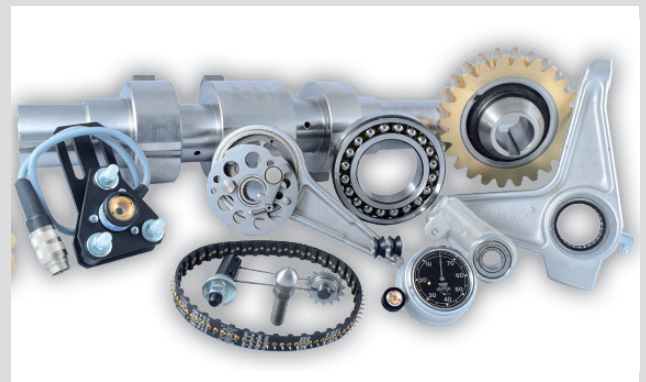
Digitisation is a basic component of our company strategy. With our corporate start-up, KM.ON, we have a software company at our disposal that can act quickly and customer-oriented on the market.

We are developing innovative software products and modern, digital solutions and services for our customers so they can achieve even greater success. We offer eight product categories, which can be used according to the individual customer's needs.



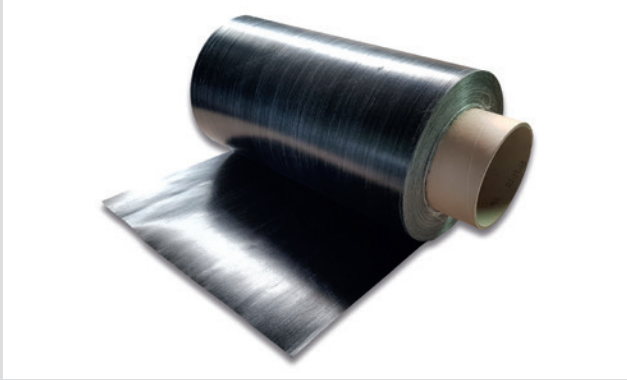
## AUTOMATION, INTUITIVE OPERATION

KAMCOS® 2 (KARL MAYER COMMAND SYSTEM) is our operator interface for configuring, monitoring and adjusting the electronic functions of the machine. Furthermore available is the KARL MAYER CONNECT app for an easy and intuitive user assistance. Third-party software can also be accessed via multiple interfaces.



## EASY ORDER OF ORIGINAL SPARE PARTS

Virtual order, real benefit – easy ordering of selected spare parts with just one mouse click. KARL MAYER'S B2B platform WEBSHOP SPARE PARTS ensures a quick and easy access to wear and tear parts and to standard spare parts. Original spare parts guarantee safe machine operation.



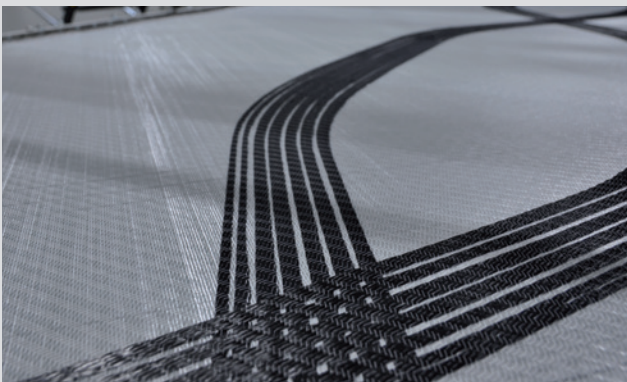
## NEW TECHNOLOGY FOR COST-EFFECTIVE FIBRE PROCESSING

SIM.PLY combines a completely revised spreading module with tailored impregnation technology in a continuous, efficient processing sequence. The seamless interface guarantees a consistently high spreading quality.



## SUSTAINABILITY

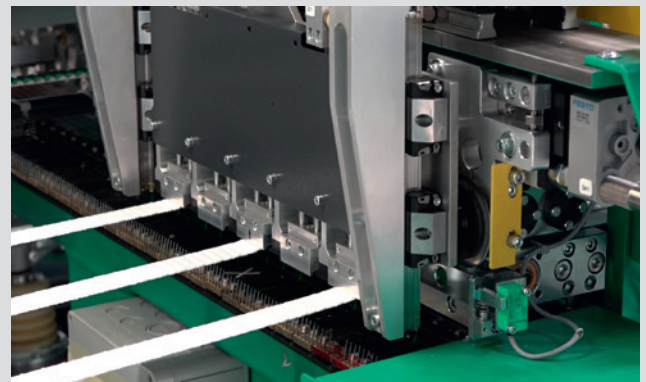
With its machine portfolio, KARL MAYER can provide the global market with sustainable machine solutions. The fabrics that can be produced provide the potential for sustainability. Processing high-performance fibres, such as carbon and glass, and the associated savings that can be made, for example in concrete as a raw material in the construction industry, and in energy in the automotive industry, are just two promising applications.



## NEW APPLICATIONS

In the constantly evolving field of production technologies for manufacturing fibre-reinforced plastics, KARL MAYER is making a significant contribution to the individual processing of high-performance fibres.

By combining different materials in various configurations, complex semi-finished products can be produced, which makes the best use of the performance potential of the fibres.



## OPTIMISING THE PRODUCTION PROCESSES

On the basis of our industry-proven standard components, we at KARL MAYER develop solutions for individual machines in order to guarantee that our customers' ideas and products will be successful. By cooperating closely with them, we can develop new, optimised technologies to guarantee efficient production processes.

# APPLICATIONS



KARL MAYER can offer you added value for every application:

- Maximum productivity
- High, reproducible quality through automatic process control
- High level of flexibility by combining a wide range of different materials
- Customised design of the end product
- High machine availability, through its product-supporting service organisation

## AUTOMOTIVE



The automotive industry is a producer of highly sophisticated products. For some time now, engineers have been focusing on using carbon and other high-performance materials based on textiles. In the future, car chassis and bodies made from high-performance fibres will no longer be a rarity. The increasing use of lightweight components reinforced with textiles in a car is offering huge opportunities. In the automotive industry especially, criteria such as low weight, high stability and customised rigidity are playing a decisive role. KARL MAYER's technology can help you to achieve these ambitious goals.

### YOUR BENEFIT – OUR SOLUTION

- Efficient energy consumption through lightweight constructions
- Passenger protection through the selective use of high-performance fibres (crash safety)
- Corrosion resistance through high-performance fibres with suitable matrix systems

### END USES

- Structural body components
- Exterior
- Interior (including blinds)

## BUILDING AND CONSTRUCTION



The vision for the future of the construction industry is: building lighter, more efficiently and more intelligently, and to think and act in a way that will conserve resources. On the one hand, it is a question of efficiency – using lighter building materials conserves resources. On the other hand, the aesthetics are important for creating concrete structures with finer and more varied shapes and forms for the same strength and rigidity. Repairing and restoring existing buildings and bridges is another area of the construction industry that is gaining importance. In conventional applications, such as textile roofs, the textiles produced on our machines can deliver attractive use and design possibilities.

### YOUR BENEFIT – OUR SOLUTION

- High-performance fibres prevent corrosion and increase the service life
- A thinner concrete covering conserves resources and energy
- More varied design possibilities since the materials are freely formable
- Repair work can be carried out faster for a lower overall cost

### END USES

- Plaster grids
- Roofing materials
- Textile-reinforced concrete
- Pipe repair
- Repair and restoration of buildings and bridges
- Building protection

## TRANSPORT AND AEROSPACE



The aviation industry is the best example of the successful use of carbon fibres. Manufacturers are increasingly using components containing high-performance fibres to replace aluminium components in their latest models. This decreases the weight considerably and reduces the costs of fuel and maintenance. In commercial vehicles especially, high demands are placed on the toughness, loading capacity and durability of the materials used.

### YOUR BENEFIT – OUR SOLUTION

- Efficient energy consumption through lightweight constructions
- Corrosion prevention reduces maintenance costs
- Thermal insulation and fire protection
- Higher tear propagation resistance, tensile strength and higher temperature stability
- Possibility of integrating sensors

### END USES

- Aircraft construction
- Commercial vehicles
- Boat-building and shipbuilding
- Public transport
- Lorry and truck tarpaulins
- Securing loads

## RENEWABLE ENERGY



On the wind turbine market in particular, composite structures are essential for the development of lighter, longer rotor blades with a better performance. This enables coastal regions and areas where there is less wind to be exploited, further reducing costs. The experience gained here can also be transferred to other areas where lightweight construction technology can reduce the weight for the same performance spectrum.

### YOUR BENEFIT – OUR SOLUTION

- Lightweight constructions improve efficiency and simplify transport in inaccessible areas
- Reduced maintenance costs
- Possibility of designing optimised blade geometries

### END USES

- Wind turbines
- Oil rigs

## SPORTS EQUIPMENT



Higher, further, faster. The sports industry needs strong yet lightweight textiles. Customised material compositions using high-tech fibres guarantee high strength for low weight.

### YOUR BENEFIT – OUR SOLUTION

- Lightweight constructions improve the performance spectrum
- Design freedom, increased customisation
- Small- and large-scale production, thanks to flexible machines
- Prestige associated with using carbon

### END USES

- Sports and recreational equipment
- Bicycles
- Helmets
- Motorbikes



## PERSONAL PROTECTION



A wide variety of protective clothing is used in many areas. For example in this sector KARL MAYER offers technologies for producing multilayered, multiaxial textiles from aramid fibres for bulletproof vests, as well as machines for producing biaxial, weft-inserted, warp knitted textiles from high-performance yarns with a large number of filaments.

### YOUR BENEFIT – OUR SOLUTION

- Optimisation of the manufacturing processes through the production of multilayered, warp-knitted textiles
- Increased tear propagation resistance and abrasion resistance through specific textile constructions
- Combination of different materials in one production step
- Improved comfort through the use of flexible, high-performance fibres

### END USES

- Trousers, gloves, etc.
- Ballistic and antistab vests
- Hard ballistics
- Car components

## ADVERTISING



Textiles for use in the advertising sector have been especially developed to be lightweight and transparent, yet strong. They should ensure that the advertising message is as visible as possible and they should be efficient and economical to produce – because their use is frequently temporary and location-specific. This type of warp knitted textile can be used as the print carrier for example for outdoor and indoor advertising, for decorating stands at exhibitions and in the construction industry as privacy screens.

### YOUR BENEFIT – OUR SOLUTION

- Maximum productivity through high fabric output, thanks to the wide working width
- Broad spectrum of uses through high machine flexibility
- Choice of different working widths, adapted to suit the subsequent processing stages

### END USES

- Billboards
- Frontlit
- Backlit
- Blockout
- Mesh

## MEDICAL TECHNOLOGY



The medical sector has high demands on the quality of the textile materials used in its field.

Innovative materials with specific stress/strain characteristics are used here, as well as hollow fibres for blood filtration. Carbon offers particular advantages here. For example, a prosthesis is very flexible and adapts easily to the body's movements. It is also stable and can cope with high demands and high levels of stress.

### YOUR BENEFIT – OUR SOLUTION

- Precise handling of delicate fibres
- Small-scale production, thanks to flexible machines
- Design freedom for individual customisation
- Efficient use of machines through special customer solutions (cut-to-length weft-insertion)

### END USES

- Prostheses
- Blood filtration
- Instrument engineering
- Mobility

## INFRASTRUCTURE



Requirements such as separation, filtration, drainage, reinforcement, tension equalisation and protection are becoming increasingly important in the construction industry. Warp knitted geogrids or geocomposites can be used here. The requirements for the physical characteristics of the textile substrates demand top-quality production methods in order to optimally exploit the properties of the high-performance fibres.

### YOUR BENEFIT – OUR SOLUTION

- Conservation of resources through increased service life of the end product
- Processing of high-performance fibres and exploiting their maximum strength levels
- Optimum processability, even in adverse conditions of use
- Combination of several requirements by joining different textiles to grid structures

### END USES

- Mining
- Bank and slope reinforcement
- Road and railway building
- Landfill and tunnel construction
- Reclamation of opencast mines
- Drainage

## APPAREL AND HOME TEXTILES



We can supply machines for producing for example knitted interlinings for the clothing industry. Depending on the area of application, these can be used to permanently retain the shape of the garment, prevent creasing and improve function. Home textiles are characterised by their individuality, wide variety of designs, their colours and the types of materials used. Our machine concepts enable us to offer you the best solution for your particular requirements.

### YOUR BENEFIT – OUR SOLUTION

- Maximum productivity through high fabric output, thanks to the wide working width
- Production of the finest, warp knitted textile constructions from delicate fibre materials
- Wide variety of patterns, thanks to the flexibility of the machine technology

### END USES

- Interlinings
- Protective clothing
- Bedding
- Upholstery fabrics
- Blinds and privacy screens
- Outerwear

## REINFORCEMENT AND COATING SUBSTRATES



All sorts of warp knitted coating substrates, which are usually made from high-strength polyester yarns, feature two straight yarn layers in the 0° and 90° directions. They are fixed with the knitting yarn to produce a textile substrate with a particularly high tear propagation resistance and exceptional tensile strength values for low weights per unit area.

### YOUR BENEFIT – OUR SOLUTION

- Maximum productivity through high fabric output, thanks to the wide working width
- Broad range of applications through modular machine technology
- Wide variety of fabric constructions, due to the production of product-specific openings

### END USES

- Swimming pools
- Sun screens
- Trade fairs
- Adhesive tapes
- Tarpaulins

# KARL MAYER AS A DRIVER OF CUST

## HUESKER GROUP

The HUESKER Group based in Gescher, develops and manufactures geosynthetics and technical textiles, which are used in tailor-made solutions for the construction, agricultural and industrial sectors. The enterprise was set up in 1861, it operates internationally, and has roughly 540 employees. HUESKER's key to success is linked to the company's first-class engineering performance and production technologies, many years of experience in the fabric production, coating and making-up of technical textiles, as well as its innovative strength.



"We have been working together with KARL MAYER for more than 30 years, our cooperation being characterized by mutual trust and successful outcomes. Our geotextiles and technical textiles for agriculture and industry have always met the highest demands in terms of quality, reliability and safety, on which our customers can rely 100%. There are no limits for our ideas. It is important to have the right partner for every situation."

*Heinz-Georg Richels, Vice President Manufacturing HUESKER Group*

KARL MAYER delivers warp knitting machines with course-oriented weft-insertion for the production of geo-grids to HUESKER. By means of these models it is possible to efficiently produce grids with different mesh openings made from various technical yarns. A special technical equipment for HUESKER enables the manufacture of especially stable, heavy grid variants.

## RELX

Reliance Composite Solutions, RelX, is the composite brand of the influential conglomerate Reliance Industries Ltd. with its head office in Mumbai. This global player was founded in 1966, and today it is the largest and most profitable private enterprise in India. Besides, it belongs to the world's biggest companies of the „Fortune Global 500“ list.

RelX supplies composites with a great variety of designs and excellent quality. The highly innovative composite solutions enable applications in the most diverse areas, among other things in renewable energy.

"The machines are utilized for competently producing Glass Fibre Fabrics which are a vital part of Technical Textiles which suffice the requirement of FRP/CFRP composites products. We have been dealing with KARL MAYER since long and we are glad to use their machines and each part of machinery which enabled us to perform in each of business and management aspects."

*Rajesh Patel, Plant Manager – Technical Fabrics, Reliance Composites Solutions*



For producing its technical textiles, RelX uses KARL MAYER's multiaxial and biaxial warp knitting machines. These machines impress with the high quality of their products and their flexibility.

# OMER BENEFITS

## YOUSUNG INDUSTRIAL FABRICS

YOUSUNG Industrial Fabrics produces high-quality technical textiles, which are mainly used for making coating substrates. The enterprise was founded in 1960. The warp knitting division for the field of technical textiles was set up in 1999, with machines supplied by KARL MAYER. Their output amounts to up to 2.4 million running meters of weft-insertion warp knitted fabrics per month. For ensuring the company's success, YOUSUNG Industrial Fabrics relies on a close partnership with its customers. With its know-how and technical possibilities, the manufacturer develops solutions offering highest customer benefit.

"KARL MAYER produces incomparable machines. By means of the offered technical possibilities, we are in a position to provide our customers with solutions which enable them to be always one step ahead of the competition. Moreover, KARL MAYER is a reliable partner whom we can fully trust."

*Mr. Oh, President of YOUSUNG Industrial Fabrics*



## OUR KNOW-HOW IS YOUR STRENGTH

- Realisation of end-use-oriented technical solutions supported by the expertise of recognised experts in processing technology
- Tailor-made, customer-specific, complete solutions based on industry-proven standard modules and components guarantee
  - the service life of your machines through stable machine technology
  - cost-efficient solutions
- Customised modification of existing processes enables you to refine your production operations
- Pre- and after-sales concepts support your processing technology in the long term
- Our global service network provides you with rapid, targeted technical support
- Our global orientation always puts us close to our markets and to our customers and their needs

KARL MAYER's warp knitting machines with course-oriented weft-insertion mainly offer YOUSUNG Industrial Fabrics efficiency and diversity. The manufacturer's product portfolio includes warp knitted articles for a wide range of applications, such as roofings and tarpaulin materials.

## ENGTEX

Engtex AB was founded in 1939, and right from the start the company relied on a fast adaptability to changing circumstances. In this way, the enterprise offers products that perfectly satisfy the needs of the market. Moreover, the clients are supported by a highly competent, efficient and flexible service in terms of research, design and development. For this purpose, Engtex makes use of its own experience and know-how, but also of an extensive network. The company's diverse lines of business include Medical, Automotive, Security and Reinforcement. Engtex is especially well known for its cut protection solutions AVERTIC intended for protective work clothing and building security.

Engtex uses the latest technologies for its communication and production.

The company's innovative textile solutions are made on KARL MAYER Raschel machines with and without course-oriented weft-insertion. Some models are equipped with substrate fabric feeding systems. Besides, Engtex also uses tricot machines. The cooperation between Engtex and KARL MAYER already started in the 1950s.



"KARL MAYER's excellent knowledge and professionalism helps us to be in forefront of technical textiles."

*Patrik Johansson, CEO of Engtex AB*

# INNOVATIVE PORTFOLIO AND AN EXPERT DEVELOPMENT PARTNER

## INNOVATIVE MACHINE PORTFOLIO



### WEFT-INSERTION WARP KNITTING MACHINES

Our weft-insertion warp knitting machines can produce dense fabrics as well as meshes with product-specific openings. And, of course, this is all done in the best quality and at optimum productivity levels.

The textiles are usually made up of three yarn systems. The weft and filler yarns give the products their unique appearance. The knitting yarns from another guide bar fix the textile according to the construction.

#### Special features of the technology and advantages of the machines:

- No waviness, since the yarn layers lie straight at angles of 0° and 90°
- Insertion and fixing of the weft yarns only at product-relevant locations
- Flexible product design, thanks to the Multispeed system and weft repeat functionality
- High productivity through working widths of up to 6,800 mm and maximum machine speeds of 2,000 rpm
- Machine gauges of up to E 40, depending on the application
- Wide range of applications because of the high variety of yarns that can be processed

### COMPOSITE MACHINES

#### *Textile machines for non-crimp fabrics*

Our machines are synonymous with maximum productivity and quality when producing multiaxial constructions. They have been developed specifically for processing glass, carbon, aramid and other technical high-performance fibres.

#### Special features of the technology and advantages of the machines:

- Production of multilayered non-crimp fabrics (NCFs)
- Possibility of processing continuous filament yarns or fibre tapes
- Laying angles from +20° to -20° are possible
- Fixing of the layers with a knitting yarn system
- Combination of weft layers with other semi-finished products

#### *Fibre-spreading assembly units for unidirectional fibre tapes*

Machines for producing dry, unidirectional fibre tapes with low weights per unit area from continuous filament yarns.

#### Special features of the technology and advantages of the machines:

- Production of low weights per unit area
- High productivity
- Production of tapes with widths of up to 800 mm
- Modular machine concepts allow additional fixing means to be introduced, such as adhesive meshes, powders and films



#### *Machines for thermoplastic tapes*

Our solution for efficient production of continuous fibre-reinforced thermoplastic tapes. The technology of the SIM.PLY enables a continuous process control and uninterrupted production at high production speeds. Tapes with a width of up to 800 mm can be produced. Thanks to the modular machine concept, the system can be individually configured according to customers' requirements.

#### **Special features of the technology and advantages of the machines:**

- Modular machine design for spreading of fibres and impregnation with thermoplastic matrix systems
- High productivity of up to 10 m/min
- 400–800 mm working width
- Process temperature of up to 260 °C
- Area weight 180–230 g/m<sup>2</sup>

## **STRENGTHS OF THE TECHNOLOGY MADE BY KARL MAYER TECHNICAL TEXTILES:**

- Highly productive processing of high-performance fibres like polyester, glass, carbon, basalt and aramid
- Maximum performance of the end products for optimum use of the fibre properties, thanks to
  - homogeneous preparation
  - gentle handling of the fibres
  - defined laying and fixing
- High flexibility of the layered structure through
  - simultaneous processing of different fibre materials
  - different laying angles
- Combining several processing stages by processing different types of materials (yarns, substrates, powders, meshes)
- Increased freedom when designing the end products by specifically manipulating the draping characteristics
- Quality assurance of the end products, thanks to reproducible production processes and the use of suitable monitoring systems
- Solid machine technology and cost efficiency by combining industrially proven standard components with customised solutions
- The possibility of integrating KARL MAYER's solutions helps our customers to optimise their entire production process

# OUR MACHINE PORTFOLIO

## THE PERFECT SOLUTION FOR ALL YO

	AUTOMOTIVE	BUILDING AND CONSTRUCTION	TRANSPORTATION AND AEROSPACE
<b>WEFT-INSERTION MACHINES</b>			
WEFTTRONIC® II HKS			
TM WEFT			
WEFTTRONIC® II RSP			
WEFTTRONIC® II RS			
WEFTTRONIC® II G			
RS MSUS – HG			
RS MSUS – V			
<hr/>			
<b>COMPOSITE MACHINES</b>			
BIAXTRONIC® CO			
COP BIAx 2			
COP MAX 4			
MAXTRONIC®			
COP MAX 5			
UD 700/UD 500			
SIM.PLY			



# UR REQUIREMENTS

RENEWABLE ENERGY	SPORTS EQUIPMENT	PERSONAL PROTECTION	ADVERTISING	MEDICAL TECHNOLOGY	INFRASTRUCTURE	APPAREL AND HOME TEXTILES	REINFORCEMENT AND COATING SUBSTRATES
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# KARL MAYER Worldwide



## Europe

**Germany** Obertshausen, Chemnitz, Selbitz, Frankfurt am Main, Reutlingen, Waldmünchen  
**Italy** Mezzolombardo, Carpi **Switzerland** Oberbüren **UK** Nottingham

## Asia

**Bangladesh** Dhaka **China** Changzhou, Hong Kong **India** Ahmedabad, Delhi **Japan** Fukui

## North America

**USA** Greensboro

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