



Plastics, adhesives and composite materials

Brief Industrial Profile of the West Palatinate Region



ZukunftsRegion
Westpfalz



Foreword

Dear readers,

The Rhineland Palatinate region, thanks to its excellent position within Europe, can offer your business the best development opportunities. The environment with strong sectors and a high quality of life are a testament and proof of the high appeal for investors and their families. More than 20 universities and research institutes, and the globally-recognised dual apprenticeship guarantees qualified young people to join your industry. Support and the search for straightforward solutions are a top priority for us.



The excellent transport links, whether via road, rail, water or air, connect you to the world. The proximity to France, Belgium and Luxemburg, and the fact that the area is part of the Rhine-Main and Rhine-Neckar business hubs are also great selling points for the dynamic Rhineland Palatinate for your business activities.

The location, right in the heart of Europe, also leads you to expect this mindset and action. Your employees and their families will have an exemplary choice when it comes to childcare and all-day schools. It is a great thing for those who wish to live and work here that our state is one of the most pleasant holiday regions.

Have a look through these pages, and see the variety in the Western Palatinate region!

A handwritten signature in blue ink, appearing to read 'Daniela Schmitt'. The signature is fluid and cursive.

Daniela Schmitt
*Minister for the Economy, Transport, Agriculture and Winemaking
in the Rhineland Palatinate*

The Federal State of Rhineland-Palatinate

Rhineland-Palatinate is situated in Germany's dynamic southwest, in the immediate vicinity of France, Belgium and Luxembourg. It also boasts excellent connections for anyone wanting to develop worldwide business relationships, thanks to the neighbouring Rhine-Main area being the European economic centre that it is.

Position in Europe

Area:

19.854 km²

Inhabitants:

4.1 million

Important industry sectors:

- Chemistry and pharmacy
- Healthcare
- Automotive industry
- Metal processing
- Mechanical engineering
- Nutrition



99,7

percent of all companies in the Rhineland-Palatinate are **medium-sized**. Thanks to their flexibility, they react quickly to global challenges.



7

Every seventh person employed in Rhineland-Palatinate works in a **high-tech** field. Because of this, the federal state is in national top position.

An excellent business location ...

The Rhineland Palatinate has fast transport links to land, water and air. This saves businesses time and money. The proximity to the Frankfurt Airport hub, efficient motorways, Europe's high-speed rail network and the location on the Rhine, the most important waterway in Europe, form the basis of an excellently connected transport system.

The innovative economy, predominantly characterised by medium-sized organisations, cooperates closely with science and is among the best in the world. The combination of global players such as BASF, Daimler, Schott and Boehringer Ingelheim and medium-sized global market leaders is unique.



Petra Dick-Walther
State Secretary in the Ministry for the
Economy, Transport, Agriculture and
Winemaking in the Rhineland Palatinate

“An above-average economic power, and a successful blend of industrial and medium-sized businesses in all branches of the economy are the brand essence of the Rhineland Palatinate. The strong international drive provides opportunities and potential, and reveals the direction we would like to move in as a powerful region.”

The appeal of the state in terms of its education is based on more than 40 research institutes and universities, as well as free university education for your first degree. The tertiary education and the dual apprenticeship with well-trained specialists and master craftspeople are world renowned.

And finally, a brief word about the mindset here: the people in the Rhineland Palatinate are open, warm and uncomplicated. Visitors appreciate the hospitality in the Rhineland Palatinate which, for many people from near and far, remains a popular holiday region with excellent culture and enjoyment.

... and a perfect environment for innovations.

The Rhineland Palatinate offers is world top class when it comes to particularly forward-thinking areas in business and science. This is why the state government is focusing on the areas where we have the greatest competitive advantages, and where our unique selling points are particularly prominent. With a view of the opportunities that present themselves from the global megatrends, as well as the latest leading markets and technological developments.

The areas for potential are offered consistent support, such as:

- Targeted strengthening of and support for the infrastructure and the development of competence in research and development,
- Support for ambitious research and technology projects,
- The creation of the best start-up conditions for innovative company foundations,
- Ensuring access to new research results for all businesses and
- Offering research, innovation and technology support as one unit..



In the **founder satisfaction ranking**, the Rhineland Palatinate is in 2nd place out of all 16 states



percent **export quota** in the Rhineland Palatinate in 2018 (Germany 50.3%)

The West Palatinate

The West Palatinate region is situated in the Southwest of Germany in the federal state of Rhineland-Palatinate. Besides the regional centre of Kaiserslautern, it includes the independent cities of Pirmasens and Zweibrücken, as well as the districts Kaiserslautern, Südwestpfalz, Kusel and Donnersberg. It borders France in the south, Saarland in the west, the Rhine-Main area in the northeast and the Rhine-Neckar metropolitan region to the east. In comparison to its neighbours, the West Palatinate region offers companies particularly attractive locations in terms of price and accessibility, favourable conditions for investors and for employees, employment in future-oriented industries and an environment with a high quality of life.



520.000

Around 520,000 **people** live in the West Palatinate overall. Practically though, it is closer to 570,000, because...



50.000

Americans live in and around Kaiserslautern ("K-Town") as the biggest **American community** outside of the USA.



132

Citizens from 132 **various nations** live and work in West Palatinate.

Traffic and accessibility

Whether on one of the numerous motorways that cross the region or the good local and long-distance rail connections, the West Palatinate can always be quickly and easily reached. Special feature: from Kaiserslautern, the metropolis of Paris is only about 150 minutes away by train. More importantly: the biggest German airport, the international hub Frankfurt/Main may be reached by car in under an hour. More regional airports in the area round out this enticing offer.

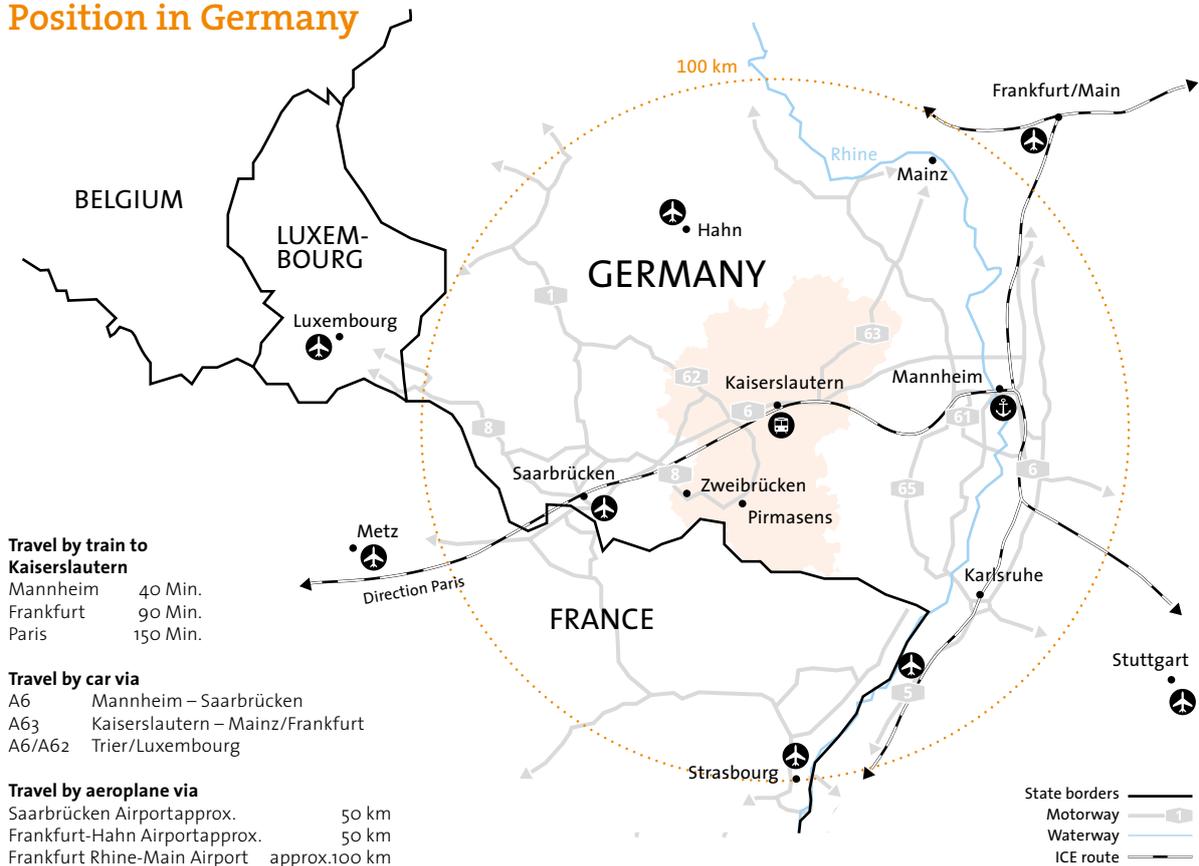
Labour market, population

In recent years, the number of employees subject to social security contributions has increased significantly to around 165,000 in 2018. At the same time, the number of unemployed people has continued to decrease. Due to demographic change, it was forecast that the

Western Palatinate would experience a noticeable population decline in the coming years. In recent decades, however, especially in the centres, things have developed much more favourably than previously feared.

The official population statistics don't even include the some 50,000 Americans, who have been present in the Western Palatinate for 70 years, as well as members of NATO countries and their families. The US-American community is the largest outside the USA, which is reflected in a traditionally high level of English language proficiency among the local population. This presence, the large number of foreign students, foreign companies and their employees and the border with France with its numerous cross-border commuters all make the Western Palatinate an especially international region.

Position in Germany



international **airports**
less than a two-hour drive away.



An estimated 20 million people live within a two-hour drive around the **West Palatinate**.



Economy and Technology

The West Palatinate has traditionally been rooted in industrial production. Machine and apparatus construction, automotive suppliers, footwear and leather goods, chemicals, plastics and last but not least, building materials still characterise the economic structure of the region to this day, which itself is strongly supported by SMEs. The US military is also a significant economic factor.

Based on its industrial roots, the West Palatinate's economy has developed in recent decades into a strongly export-oriented, SME-influenced research and development economy with innovative production and a specialisation in IT.

The conversion of formerly military and industrial areas or areas used by the railway has also played a special part in this transformation. There, with the support of the state, innovative new uses for these areas have emerged. The diversity of the economic structure together with the cooperation of the players in industry-specific networks has left the regional economy unscathed by international turbulence. Agriculture also avails itself of modern production methods, is partnered with modern agricultural machinery manufacturers (John Deere Development Centre), uses state-of-the-art IT technologies and also contributes to the generation of renewable energy in the West Palatinate.



21

The region boasts 21 **scientific institutions** in relation to automotive, electrical and production engineering, electro mobility materials, as well as IT / AI.



4.0

With the Smart Factory and the SME 4.0 Competency Centre, the West Palatinate is one of Germany's leading regions in **Industry 4.0**.



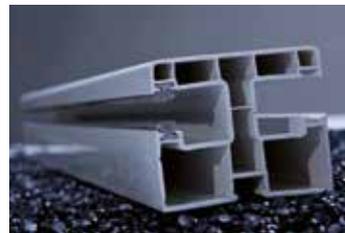
When it comes to complex research projects, people are increasingly turning to networks or so-called “clusters” in which cooperation partners from science and industry pool their different competencies. An example of this is the Science & Innovation Alliance Kaiserslautern (SIAK)



Research foci at the Technical University of Kaiserslautern include innovative vehicle and mobility concepts, intelligent driving and operating comfort systems, as well as energy-efficient vehicles and assistance systems, among others.



A dense network of first-class research facilities ensures that research and development work has practical relevance, providing the transfer points where results are put into practice.



The plastics industry based in the West Palatinate is an impressive example of the ongoing adaptability of our companies to changing conditions.

Education, Research & Innovation

The competitiveness of the region is based on an innovative and flexible economy, but above all on a strong technological orientation in science, research and education. Several renowned research institutes in the field of information and communication technology are represented at the site, including two Fraunhofer Institutes, a Max Planck Institute and the German Research Centre for Artificial Intelligence (DFKI).

The Technical University and the University of Applied Sciences Kaiserslautern with its three locations in the region, as well as numerous vocational schools make the West Palatinate a priority region for training com-

puter scientists, engineers and skilled workers in the Rhineland-Palatinate.

Technology transfer offices, patent information centres, the Science & Innovation Alliance, the Smart Factory, the SME 4.0 Competency Centre, etc. contribute to the integration of research institutions within the regional economy and help to ensure its competitiveness now and in the future.



21.200

In 2018 there were around 14,900 students enrolled in more than 100 degree programs at **TU Kaiserslautern**, among those 2,650 were foreign students. A further 6,300 students were enrolled at the three locations of the **University of Applied Sciences, Kaiserslautern** in some 60 degree programs.



Plastics, adhesives and composite materials

The importance of the sector in the Western Palatinate

Building on extensive experience of handling a broad variety of materials, from metal to textiles to leather goods, the manufacture and processing of plastics and adhesives has developed into the leading industry in the Pirmasens area, and one of the most important areas of competence in the Western Palatinate's economy. The development of bio-based products and highly complex composite materials has already laid the foundation for the industry's further growth.



From raw material to product: businesses in the Western Palatinate are tackling the changed requirements of the plastics sector.

The Western Palatinate's regional competence focus on plastics, adhesives and composite materials is the story of the region's ability to adapt successfully to changed economic situations: its area of competence began in the footwear industry in particular. Up until the end of the 1960s, Pirmasens was the footwear capital of Germany. Around half of the everyday footwear sold in the Federal Republic came from the region. The countless shoe factories and their suppliers were experts in the correct way to handle leather, but also in manufacturing and the correct use of adhesives and plastics and textiles. The leather shortage which followed the war had prompted the use of plastics as an alternative, which paved the way into the new technological area.

When footwear production began to move abroad in the 1970s and the majority of the shoe factories closed, the suppliers were faced with the challenge of establishing new groups of customers. They reflected on their core competences in manufacturing plastics and adhesives, and found that the automotive industry in particular was where an interesting clientele could be found (for example, plastic housings for FWBs). Others were able to assert themselves through their development edge as a supplier in the growing sports footwear market (for example, plastic shoe lasts from frames). A prominent example of the long industrial tradition of the sector is the company Kömmerling, which was founded in 1897. The Pirmasens-based footwear industry suppliers produced two businesses which are highly successful today. Kömmerling Chemische Fabrik is a key specialist organisation when it comes to adhesives and sealants within US-based chemical group H.B. Fuller. The profine Group has reached success with plastic profiles for doors and windows. Another example is TEHALIT, which started off producing plastic shoes and which now specialises in the manufacture of electrical installation channels and charging columns within the Hager Group. Other companies have found a profitable niche in the production of plastic packaging and containers, or complex injection-moulded components.

Over recent years, the line of development from the footwear industry to the adhesives and plastics sector has continued to bio-based high-tech materials. Political and societal catalysts for change have brought about new development opportunities for existing companies. With the support of the available research

competence in the region, the industrial tradition of the Western Palatinate in this area can be transferred to the era of digitisation and bioeconomy.

The plastics sector faces changed requirements regarding their products and the underlying production processes. The drivers for this are the increasing scarcity of resources, which in turn drives up prices, and the pressure towards ecological and environmentally-friendly concepts. The future lies in bio-based, recyclable products which meet the consistently high technical requirements. One of the most important sales markets for plastics is vehicle construction. Due to this market's profound structural transition in the direction of more sustainable mobility solutions, the plastics sector is also under pressure to change. The use of electric engines brings with it new material demands, such as resistance against high electrical voltage. The plastics industry is able to match the increasing use of lightweight construction elements. The modification of plastics and the improved material properties which result from this are opening up more and more fields of application for plastic parts, in construction, for instance.

A few years ago, research into bio-based alternatives to conventional plastics was conducted at the research institutions in the Western Palatinate. For example, microorganisms are to be used to convert organic residues into bio-based raw materials. These can then be used to produce bioplastics. At the same time, in the future, the plastics are to be made in such a manner that as much of them can be recycled as possible, and thus are then to be used again for sophisticated applications. The Technical University of Kaiserslautern and Kaiserslautern University of Applied Sciences are training highly qualified specialists in chemistry, polymer chemistry, material sciences and materials engineering, thus laying the foundation for the supply of skilled experts in the future. At the same time, together with several institutes on the ground, both universities are contributing to the maintenance of high quality standards and the driving forward of product and process innovations. These include the Prüf- und Forschungsinstitut in Pirmasens (PFI) and the Institut für Oberflächen- und Schichtanalytik (IFOS), to name just a few.

Composite materials is a comparatively new regional area of competence with excellent growth prospects. By bonding at least two different materials in a compound material, improved product properties can be achieved with regard to weight, stability, malleability or flame protection, for instance. The regional area of growth was given a decisive push thanks to the foundation of the Institut für Verbundwerkstoffe (IVW) in 1990, building upon existing competences at TU Kaiserslautern in material sciences. Since the start of 2021, the IVW has been part of the renowned Leibniz Association. Through its numerous successful spin-off companies in recent years, the company has contributed to a dynamic development in this area, which also increasingly benefits existing operations. Here, the extensive experience of the local companies dealing with different materials – from metal to textiles to plastics– is really starting to bear fruit. The existing expertise in developing high-performance adhesives is also paying off. When

it comes to natural-fibre composites, the raw material wood, which is rapidly renewable in the region, is being utilised more and more.

The foundations for sustainable growth in plastics, adhesives and composite materials have therefore already been laid. In the years to come, the numerous globally active, medium-sized companies, innovative start-ups and research institutes will also ensure that the area of competence remains one of the significant sectors to support economic development in the Western Palatinate.

Locations

- Featured Businesses
- Other Businesses in the sector
- Vocational Schools, Universities, Institutes, Networks

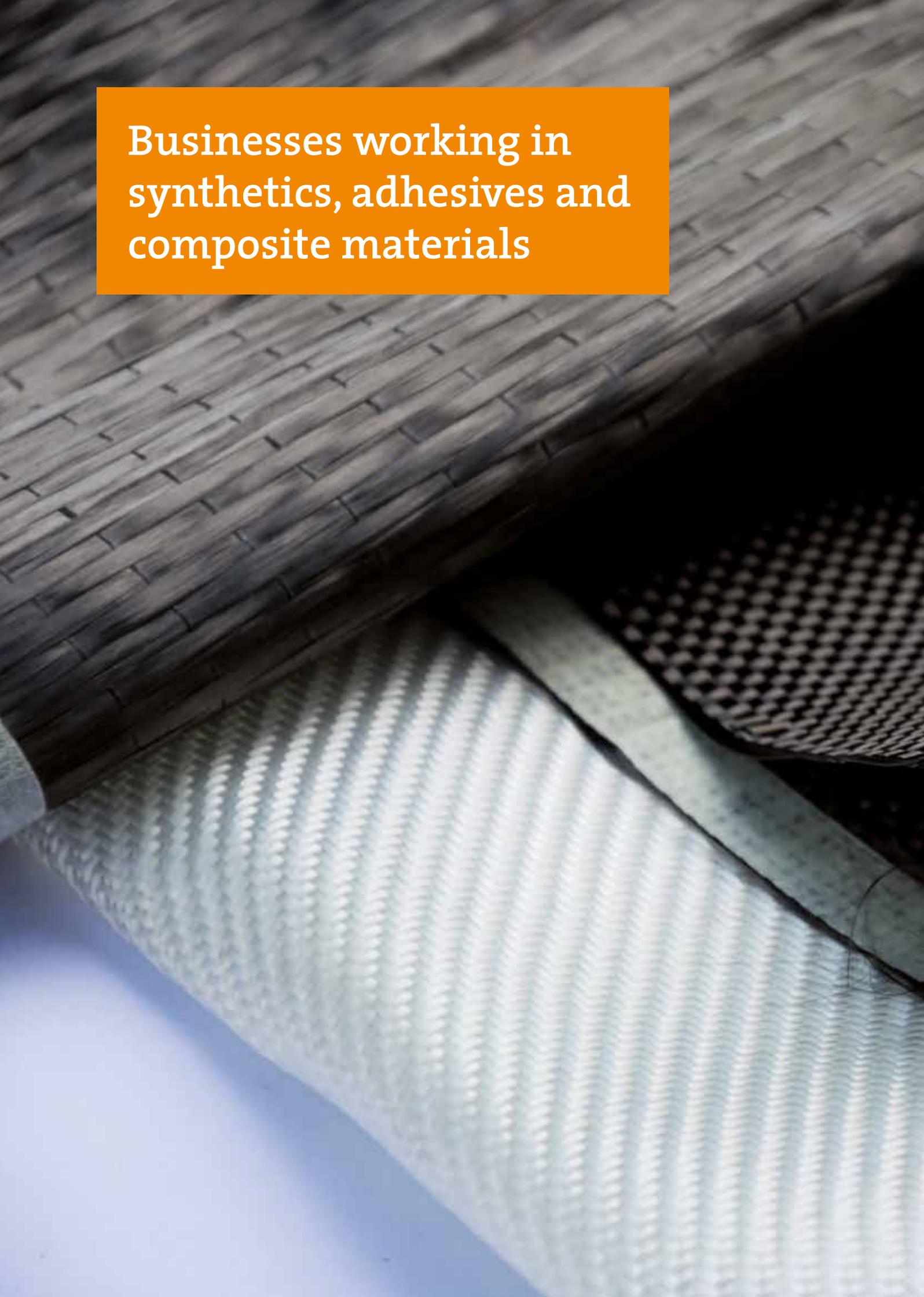


No	Featured businesses	Competences	Information
1	A+ composites GmbH	Composite materials	www.aplus-composites.de
2	ADTRACON Adhesive Technologies GmbH	Adhesive systems	www.adtracon.de
3	ALPLA Werke GmbH & Co. KG	Plastic packaging solutions	www.alpla.de
4	BITO-Lagertechnik Bittmann GmbH	Shelf, container and transport systems	www.bitto.com
5	Brenntag GmbH	Distribution of chemicals and ingredients	www.brenntag.com
6	Easicomp GmbH	Long-fibre-reinforced thermoplastics	www.easicomp.de
7	Framas Kunststoff GmbH	High-performance injection-moulded components	www.framas.com
8	Fuchs Lubritech GmbH	Special lubricants	www.fuchs.com
9	FWB Kunststofftechnik GmbH	Injection-moulded parts	www.fwb-gmbh.com
10	ITW Fastener Products GmbH	Fastening solutions for the automotive industry	www.itw-fasteners.com
11	Karl Peter Kunststoffe GmbH	Plastic profiles	www.kp-kunststoffprofile.de
12	Kömmerling Chemische Fabrik GmbH	Adhesives and sealants	www.koe-chemie.de
13	Moreplast GmbH	Technical plastic profiles	www.moreplast.de
14	Profine GmbH	Plastic profiles for windows and doors	www.profine-group.com
15	RAMPF Eco Solutions GmbH	Chemical recycling	www.rampf-group.com
16	Schliessmeyer GmbH	Injection-moulding	www.schliessmeyer.de
17	SLS Kunststoffverarbeitung GmbH & Co. KG	Solid, hollow-chamber, construction & custom profiles	www.sls-kunststoffprofile.de

No	Other businesses in the sector	Competences	Information
18	BBC CELLPACK	Plastic packaging	www.bbcgroup.com
19	bema Bauchemie GmbH	Construction chemicals	www.bema-bauchemie.de
20	CirComp GmbH	Fibre composite materials	www.circomp.de
21	Dienes Packaging GmbH	Cannisters, bottles, containers	www.dienespackaging.com
22	Hager Tehalit	Solutions for electrical installation	www.hager.de
23	Jakob Keck Chemie GmbH	Footwear finish products	www.keck-chemie.de
24	JOMO thermomolding GmbH & Co. KG	Shoe inserts, foam, textiles	www.jomo-online.com.br/de
25	K.S. Kunststoff Innovation GmbH	Injection-moulding technology	www.ks-kunststoff.de
26	KOB GmbH	Medical bandages and fabric	www.kob.de
27	Kunststoff-Verarbeitung Wilhelm GmbH	Injection-moulding and plastic technology	www.wilhelmgmbh.de
28	Legu Plastics GmbH	Technical plastic components	www.leguplastics.de
29	RIKA Chemie GmbH	Separating agents, colour pastes, varnish	www.rika-chemie.com
30	Röchling Hydroma GmbH	Thermoplasts and duroplasts	www.roechling.com
31	Rodaswiss Kunststofftechnik GmbH	Mould making, injection-moulding	www.roda-swiss.de
32	Seibel Kunststofftechnik GmbH	Injection-moulded components	www.seibel-gmbh.de
33	thinXXS Microtechnology AG	Microfluid single-use systems	www.thinxxs.com
34	uniplast GmbH Bauteile	Plastic windows and doors	www.up-fenster.de
35	Wakol GmbH	Adhesive and sealing systems	www.wakol.com

No	Universities of applied sciences, institutes, networks	Information
36	Kaiserslautern University of Applied Sciences – Institut für Kunststofftechnik Westpfalz (IKW)	www.hs-kl.de
37	Institute for Surface and Layer Analysis GmbH (IFOS)	www.ifos.uni-kl.de
38	Rhineland-Palatinate plastic network	www.kunststoff-netzwerk.de
39	Leibniz-Institute for Composite Materials GmbH (IVW)	www.ivw.uni-kl.de
40	Testing and research institute Pirmasens e.V.	www.pfi-germany.de
41	Technische Universität Kaiserslautern	www.uni-kl.de

No	Vocational schools (BBS)		
42	VS I – Technology, Kaiserslautern	46	VS Rodalben
43	VS Zweibrücken	47	Landgraf Ludwig secondary school plus Pirmasens
44	VS Kusel	48	Secondary school plus Lauterecken-Wolfstein
45	VS Landstuhl	49	Master School Kaiserslautern



Businesses working in
synthetics, adhesives and
composite materials



A+ Composites GmbH

Optimal plastic reinforcement using innovative composite materials and new processes

A+ Composites manufactures unidirectional fibre-reinforced tapes and composite materials in a process they developed themselves.

For the team at A+ Composites, innovation is not just a phrase; it's a fixed part of their everyday working lives. This is reflected in their growing number of patents, as well as in their research work, and also in their awards.

This allows the company to offer its customers high-quality products on one hand, and at the same time, support them with creativity, ingenuity and expertise when it comes to implementing the reinforcement materials.

Since 2015, the relatively new company from south-west Pfalz has produced more than 200 different tapes and built up so much knowledge. They can produce tapes which have the stability and e-modules of aviation tapes, yet remain within the price range of the automotive industry. The UD tapes can be rolled into pipes and tanks, pressed into 3D parts as organic sheet material, inserted into injection moulds or bonded directly onto compatible materials with a layer of adhesive. This gives you an excellent reinforcement effect with very little material.

Competences:

- Fibre-reinforced plastics for injection-moulding, pressing and winding processes
- Reinforcement tapes for adhesive purposes
- Over 200 variants created
- Integration of UD tapes into downstream processes

The quality assurance approach integrated into the process involves determining the key values of each millimetre of tape. Further key values are measured for each spool.

Sustainability is a vital topic for A+ Composites. In the research project 'All-Polymer' in which two universities and three other companies also took part, plastic fibre tapes were used to develop completely recyclable and reinforced plastic parts. A big disadvantage of recycled plastic is its low performance when compared to primary plastics. The All-Polymer approach increases the performance of recycled plastics, making them suitable for recycling.



Contact:

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www.aplus-composites.de



ADTRACON Adhesive Technologies GmbH

Tailored and precise adhesive solutions

ADTRACON supplies medium and large businesses around the world with reactive hotmelts from Pirmasens.

ADTRACON can look back over two decades of research and development. Their “tailor-made products” for optimising quality and economic efficiency in their customers’ production processes developed into an extensive range of sophisticated reactive hotmelts for standard and special applications. Starting out as a newcomer, the business has now become a specialist company in this product area and now serves numerous sectors with the highest quality and technology demands.

ADTRACON has been producing reactive melt adhesives in its own production facility in Pirmasens since 2005.

As well as standard products, their customers are increasingly demanding innovative, specialised products. This is how the business began to offer a sophisticated range of “tailor-made products” for optimising quality and economic efficiency in their customers’ production processes.

The brand adhesives are just as diverse as the many different problems that they solve. AdtraPUR reactive hotmelts are real all-rounders. Almost all properties (e.g. stability before cross-linking, heat resistance, open time etc.) can be adjusted in relation to the other properties. This fine-tuning enables the optimisation



of processes with requirements which go beyond the usual technology standards for the market.

In terms of an optimised occupational hygiene system, ADTRACON offers a series of low-emission PUR hot-melts for various sectors.

Alongside adhesive production and sales, the company also acts as a service provider for raw material manufacturers, adhesive manufacturers and adhesive users. A dedicated team and up-to-date lab and production

technology guarantee that projects are processed quickly, competently and without high costs.

The company also offers support and advice to adhesive users when it comes to optimising processes and saving costs during production.

ADTRACON®
ADHESIVE TECHNOLOGIES

Competences:

- Innovations in melt adhesives
- Intensive research and development
- Sophisticated, tailor-made adhesives
- A vast range of standard products

Contact:

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www.adtracon.de



ALPLA WERKE LEHNER GmbH & Co. KG

Closing the plastic loop

For 43 years now, ALPA has been manufacturing high-quality packaging solutions from plastic in Kaiserslautern. This packaging is used for shower gels, cleaning agents or detergents. The modern factory in the Palatinate is viewed as a pioneer within the group when it comes to utilising recycled materials. The result: a significant reduction in their carbon footprint.

Austrian-based ALPLA Group, with its headquarters in Hard on the shores of Lake Constance, is one of the leading companies in the plastic packaging sector. Globally, around 21,600 workers produce tailor-made packaging systems, bottles, seals and injection-moulded components at 178 facilities across 45 countries. This quality packaging is used in various different sectors: the food and drinks industry, cosmetics and hygiene products, household cleaners, detergents and cleaning agents, medication, motor oils and lubricants.

Since 1978, around 150 workers in Kaiserslautern have been producing packaging solutions for notable cus-

tomers from the consumer goods sector, especially for beauty products, detergents and cleaning products. These customers include Ecover and Werner & Merz with the Frosch brand. The company can also count lubricant manufacturer Liqui Molly as one of their clients. The business operates a three-shift operation with 23 production lines in their production facility spanning 3,000 square metres, processing different plastics such as PET, HDPE or PP. The annual output is 948 million units, which is the equivalent of around 7,000 heavy-goods loads. The PET segment makes up around 85 percent of material consumption, HDPE and PP form the remaining 15 percent.



Investments for raising the proportion of recycled material in the manufactured products are playing an increasingly important role. The ALPLA Group operates its own recycling facilities for producing recycled PET (rPET) and recycled HDPE (rHDPE) in Austria, Poland and Spain, as well as in the form of joint ventures in Mexico and Germany. The business is currently working on numerous other international projects. The use of recycled PET contributes to a reduction in greenhouse gases of up to 90%. This means that in 2019, ALPLA Kaiserslautern was able to prevent 17,000 tons of CO₂ emissions.

In the case of PET preforms, smaller units which are blown into complete PET bottles in the customer's filling plant, the proportion of recycled material is already at over 60 percent. This is an important step towards a closed circular economy.



ALPLA

Competences:

- Preforms made from plastic
- Plastic bottles
- Manufacturing technologies: ISBM, EBM, IM

Materials:

- PET (rPET), HDPE (rHDPE), PP

Markets:

- Beauty Care, Home Care, Oil and Lubricants

Contact:

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 Von-Miller-Straße 11
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 Telephone: +49 (0)631 53564-0
 E-Mail: office-kaiserslautern@alpla.com
 www.alpla.com



BITO-Lagertechnik Bittmann GmbH

Sustainable and practical plastic container systems

BITO-Lagertechnik Bittmann GmbH in Meisenheim develops, manufactures and sells shelf, container, picking and transportation systems for all sectors. The company, founded in 1845, is active worldwide and employs 1,000 workers, 780 of whom are based at the main headquarters in Meisenheim and the adjacent production facility in Lauterecken. There are also 14 subsidiaries in almost all European countries as well as Dubai and the USA.

At the Lauterecken site, BITO-Lagertechnik uses an injection-moulding process to manufacture high-quality, sturdy and practical reusable plastic container systems in many varieties and sizes for the most varied of areas and industries – whether for use in large, automated logistics centres, warehouses, in production facilities or in smaller workshops. The storage, pi-

cking and transport containers also undergo a further processing stage depending on the customer specifications, and can be fitted with a range of accessories based on the customer's own wishes and needs. For example, for use in the pharmaceutical industry or online food retail.



As well as offering a production process which is as energy efficient as possible, BITO also values offering ecological alternatives to products made from virgin plastic. For years, the innovative and forward-thinking storage technology specialist has run its own well-organised container recycling plant. Plastic waste, rejected goods or returnable containers are ground up to produce new containers or accessories, in combination with certified “post-consumer plastic”, which refers to recycled plastic from household waste.

BITO also offers a small parts container which is made from a mixture of polypropylene and the fibres from

sunflower seed kernels, which would otherwise only be a waste product from the food industry.

BITO
LAGERTECHNIK



Competences:

Complete provider of shelf, container, picking and transport systems for all sectors

Contact:

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www.bitto.com



Brenntag

Global market leader Brenntag makes use of a site in the Western Palatinate

Brenntag is the global market leader when it comes to the distribution of chemicals and ingredients. Going beyond the mere sale of process chemicals, Brenntag's business is geared towards special products, added-value services and customer-specific solutions. At the site in Ramstein, for instance, tailor-made plastics are produced based on customer requirements.

The Brenntag compounding facility in Ramstein, belonging to the polymers business unit, specialises in the development, production and sale of compounds made from technical plastics and high-performance polymers in order to offer extensive and tailored support to customers in the plastics-processing industry when implementing their individual applications.

“Our core competence is special compounds which we develop in close collaboration with our customers for their specific needs,” explains Peter Koch, Polymers & Rubber Business Manager for Germany, Austria and Switzerland at Brenntag GmbH, and adds: “This allows us to create completely unique materials with a specific profile of characteristics for complex, technical applications, for mobility, E&E or industrial engineering, for instance.” Customers can choose from a vast range of base polymers and additive and filling material combinations. They also benefit from our decades of compounding experience, application expertise and solution competence. This user-oriented approach, the flexible adaptation to suit customer needs and fast response times mean that the company develops and

produces plastics for metal substitution, so-called functionalised compounds (e.g. heat conductive, detectable), for use in contact with foodstuffs or tribologically optimised types on the company's own production lines at the Ramstein site with a capacity of approx. 4,500 tonnes every year. The materials are suitable for injection moulding and extrusion.

The certified quality assurance and environmental management system guarantees the continued improvement of products, processes and productivity. The company's own lab also means that various measurement and testing procedures are available. “We see ourselves as an innovative development partner in a market that is moving more and more in the direction of polymers. Focus topics such as new mobility, automation and circular economy address completely new requirements of plastic in almost all industries and sectors,” according to Peter Koch.



Competences:

- Compound development
- Metal substitution
- Heat-conductive compounds
- Detectable compounds
- Types suitable for use with foodstuffs
- Tribologically optimised compounds
- Compounds suitable for use with drinking water

Contact:

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www.brenntag.de



Easicomp GmbH

Success made „Easi“

First and foremost, Easicomp GmbH is a service provider for “long-fibre-reinforced thermoplastics” (LFRTs). The range of services the company offers includes consulting, development, production and sale of fibre composites.

At Easicomp GmbH, founded in 2011, the team is made up of qualified and experienced experts in LFRTs who had already spent many years working together successfully before Easicomp GmbH was founded.

Easicomp is a specialist in so-called long-fibre-reinforced thermoplastics (LFRTs). These materials are characterised by their excellent mechanical properties and low density. They can be used effectively (e.g. using injection moulding) to produce complex components and are therefore a very interesting group of materials for low-cost lightweight construction. Easicomp supports other companies (e.g. plastics or fibres manufacturers) with incorporating new materials into their product range.

This extensive knowledge also helps customers to develop very effective LFRT products. This can range from the development of a product group to longer-term R&D cooperation. Easicomp also produces LFRTs to meet customer needs, as well as their quality and time requirements. To do this, they work together on a forecast to ensure that the corresponding quantities are always available. Thanks to its extensive experience, the Easicomp team is able to offer excellent support to its business partners when it comes to market introduction and



market growth. This cooperation can ensure market success and accelerate growth.

Current research projects deal with the topics upcycling and antimicrobial material. Easicomp also works with 100% green energy.

EASICOMP

engineered advanced solutions in composites

Competences:

Easicomp is the perfect solution for custom projects involving long-fibre-reinforced thermoplastics

Contact:

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“An ideal interaction between the 4 Ms – Man, Machine, Mould and Material.”

Martin Jachmann (COO)

framas Kunststofftechnik GmbH

Forming the future – Innovative solutions for pioneering products

For more than 70 years, the fram

as Group has been creating trailblazing products and has developed from a small Pirmasens-based family business to a globally active company with more than 2,500 employees. The group is characterised by its advanced technologies and vast product range.

The company specialises in the development and manufacture of high-performance plastic components which meet specific customer requirements for the sports product industry. As well as shoe lasts, heel counters and soles, the portfolio also includes spike systems and damping elements. The fram

as Group products are used in the sports, medical and safety footwear segments, to name a few examples. How-

ever, the company's expertise is in demand even outside of the footwear sector: fram

as products can already be found in the electronics and automobile industries, for example.

The fram

as Group offers its customers a complete solution with everything carried out in-house – from the development phase to the finished product.



The company also places a great deal of value on generating new, innovative ideas, which is why the group has its own innovations department. This allows the company to set new standards in areas such as sustainability. Material combinations developed by the company itself are paving the way for the sustainable development of the plastics industry as a whole. The ten facilities around the world guarantee short communications and supply channels. The company has sites in China, Indonesia, South Korea, Hong Kong and Vietnam, as well as the USA and Germany, of course.

fram as is a business from the region which has established itself in the global market. It upholds the traditional craft of shoe last construction and exemplifies the ideas of innovation with state-of-the-art production facilities for injection-moulded plastic components.

Innovation – Technology – Tradition – This is fram as.

fram as[®]

Competences:

- The production of high-performance injection-moulded components to meet specific customer needs
- Ten global facilities guarantee short communications and supply channels
- Everything in-house, from development to production
- In-house innovation department and internal material research/development

Contact:

fram as Kunststofftechnik GmbH
 Rodalber Straße 180
 66953 Pirmasens
 Telephone: +49 (0)6331 5152-0
 E-Mail: info@fram as.com
 www.fram as.com



Fuchs Lubritech GmbH

High-performance lubricants for special applications

The product range offered by FUCHS LUBRITECH GmbH includes lubricants and separating agents for highly specialised applications. The range of more than 1,000 high-quality and high-performance special products is highly regarded worldwide.

Where the capabilities of standard lubricants end is where you'll find the special lubricants from FUCHS LUBRITECH. The individual application is always the focus of their work, meaning that the company works in close collaboration with its customers to develop a lubricant which is tailored to suit their requirements. Over the last decade, the company has generated a range which is constantly expanding, characterised by the high performance of the products, even in extreme conditions. Special lubricants from FUCHS

LUBRITECH also represent sustainability as well as safety, reliability and affordability.

FUCHS LUBRITECH was founded in 1951 in Weilerbach as REINER Chemie, and can look back on more than 60 years of experience. As a company, it is proud of its Palatinate roots and has made targeted investments in its headquarters in IG Nord in Kaiserslautern over recent years. On a global level, Fuchs Lubritech employs more than 450 workers and is part of the largest



independent lubricant provider, FUCHS PETROLUB SE in Mannheim.

FUCHS LUBRITECH fosters a company culture which is characterised by its emphasis on appreciation, trust and respect for one another. As a company offering training opportunities, it allows young people to join the business in a flexible way that suits their needs. The employees are the most important resource. FUCHS LUBRITECH sees the knowledge, experience and dedication of every single employee as the basis for successful business processes, innovative products and satisfied customers.

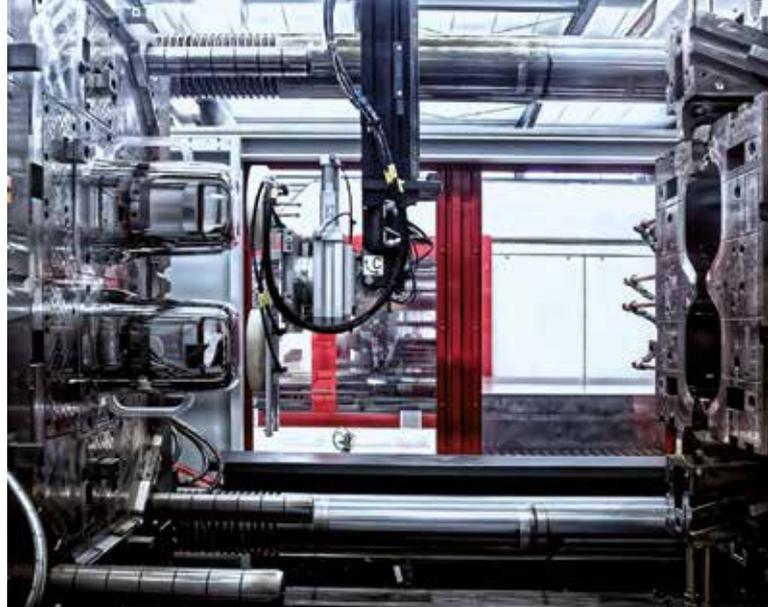


Competences:

- Special lubricants
- Separating agents
- Lubricants suitable for use with foodstuffs
- Automotive lubricants
- Greases
- Industrial lubricants

Contact:

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www.fuchs-lubritech.com



FWB Kunststofftechnik GmbH

Innovative injection-moulded parts made from high-tech plastic

FWB Kunststofftechnik GmbH represents innovative development and technical competence in the field of injection-moulded plastic technology. Its comprehensive support of individual customer requirements – from the idea to the design, right up to the precise production of the injection-moulded shapes – guarantees their claim of the best production quality.

For over 30 years, the company FWB Kunststofftechnik GmbH has fulfilled the individual requirements of notable businesses both within Germany and abroad. Specialising on tasks relating to injection-moulding tools, automation, plastic components and assembly, FWB, with its 170 employees, achieves an annual turnover of approx. 20 million euros.

As a pioneering company, FWB aspires to a top position in the international plastics sector, as well as the associated tool production. To achieve this, the company focuses on innovation in plastics, mastering complicated processes and developing powerful tools. Today, the company is already one of the leading providers of individual solutions in Germany.

FWB has received various awards for its success, and the company sees its highly qualified and dedicated employees as the primary reason behind this. Permanent investments in further training and education highlight the high value that the company places on its staff.

As one of the largest employers in Pirmasens, the company doesn't merely feel connected to the region, it feels a sense of obligation to it as well. The commitment to charitable aid organisations and support for local schools and sports associations are documented proof of this attitude.

In 2020, FWB Kunststofftechnik GmbH became 100% subsidiary company of HELLA GmbH % Co. KGaA. HELLA makes an annual turnover of around 5.8 billion euros with just under 36,000 employees. It is a market leader in light, electronics and aftermarket with over 125 sites in around 35 countries.



Competences:

- Injection-moulded tool construction
- Automation
- Plastic components
- Production process development
- Construction
- Production
- Assembly

Contact:

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www.fwb-gmbh.de



ITW Fastener Products GmbH

Products for the Vehicles of Today and Tomorrow

At home anywhere. Travelling with us on every street worldwide.

ITW is a global partner for the largest car manufacturers and their suppliers.

As part of the internationally successful ITW company group with more than 50,000 employees in 56 countries, ITW has the resources and resilience of a global company. There is hardly a vehicle today that doesn't have some part of the rigorous engineering and mature product quality of ITW Global Fasteners in there somewhere.

Our speciality is the development and production of innovative plastic fasteners for the automotive industry. These include cable mountings and cable fastenings, covers and panel fixings, among other things. Areas of application are e.g. the vehicle interior, brake and fuel systems, the engine and drive area and the body work. Our products contribute to a powerful overall package in vehicle design.

Our decades of experience in plastic design and injection moulding technology has led to the development of trendsetting solutions that offer the user numerous advantages: Design improvements, simplification of assembly processes, optimisation of processes, time savings and, last but not least, cost

reduction for the same quality and product improvement.

We offer a universal and time-monitored concept, starting with the component development, then the provision of prototypes, tool construction, part production, right up to manual or fully automatic assembly.

Our in-depth understanding of automotive assembly operations and our significant engineering expertise enables us to always find the best possible solution for our customers. As a global player, we offer innovative products, individual services and effective support.



Competencies:

Innovative fastening solutions for the automotive industry.

- Component development
- Provision of prototypes
- Tool planning
- Production / fully automatic assembly

Contact:

ITW Fastener Products GmbH
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www.itw-fasteners.com



KP KUNSTSTOFFE GmbH

Plastic profiles for the global market – Made in the Rhineland Palatinate

For more than 50 years, the family company in Münchweiler on the Rodalb has been developing and producing plastic profiles for the most varied of applications in the global market.

Expertise and portfolio

Above all, the success of the company is based on its flexibility to be able to implement complex customer requirements, and to maintain a high level of delivery reliability with close to zero errors. This is the result of a seamless synchronisation of the two main pillars of the company: tool construction and plastic profile extrusion. The experts in tool construction develop and build tools so that they can implement the sometimes highly complex geometric requirements set by their international customers. The tools are calibrated and integrated into the production system, where melted-down plastics are added to a plastic extruder and shaped into the desired geometry by the tools themselves. The result is consistently available, high-quality plastic profiles of industrial quality. Depending on the specifications, seals are fitted to the plastic profiles in a coextrusion process, the plastics are assembled, fitted with holes or cut to precise lengths. The high standards applied and modern monitoring data capture utilised here guarantee process safety, consistent quality and reliability, even if the production quantities are low. Since its foundation, the company has produced just under 3,000 tools and new developments are implemented each day. The lifetime maintenance

guarantee means that many customers have been able to rely on the tools for decades.

Diverse and interesting areas of use

Extruded plastic profiles made from H-PVC, ABS, ASA and many other thermoplastics are essential for operations around the world, thanks to their versatility in use and their shelf life. The possibility of producing plastic profiles which are 100% recycled means that these are far superior to many other materials. The plastic profiles from KP Kunststoffe GmbH can be found as semi-finished products for further processing, mainly in facade and mechanical engineering, in windows and doors and in countless other areas of application, such as bowling alleys, cinemas, aquariums, ski lifts, aircraft, swimming pools, cashier registers at supermarkets, and even as the exterior coating of the Burj Khalifa in Dubai, the tallest skyscraper in the world.

**KP KUNSTSTOFF-
PROFILE**

Competences:

- Production and development of plastic profiles
- Extruded profiles made from H-PVC, ABS and many other thermoplastics
- Custom plastic profiles
- In-house tool construction to order

Contact:

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www.kp-kunststoffprofile.de

Engineering Adhesives



Kömmerring Chemische Fabrik GmbH

Innovative adhesive technologies for the market requirements of tomorrow

KÖMMERLING CHEMISCHE FABRIK GMBH, based in Pirmasens in the south-west Palatinate is a global leader in the manufacture of high-quality adhesives and sealants and has been part of the American adhesive group H.B. Fuller since 2017. H.B. Fuller is the second largest producer of adhesives and sealants in the world.

Since its foundation in 1897, KÖMMERLING has set milestones again and again when it comes to developing new technologies for modern bonding and sealing. Today, thanks to its outstanding product quality and global service, the company is a recognised system supplier for the markets glass, general industries, electronics & energy and BTRS (bus, truck, rail, specialty vehicles), RV (recreational vehicles) and automotive. As a Centre of Excellence at the Pirmasens site and specialist in reactive adhesives, H.B. Fuller | KÖMMERLING provides its customers with pioneering system solutions at the highest level, which replace mechanical connections and make products lighter, sturdier and quieter.

Modern lightweight construction solutions are implemented through the use and combination of new materials. Combining plastics with one another, like bonding plastics with metals, requires special adhesive systems. The reason for this is the extraordinarily

chemical diversity of the plastics and the very different physical and chemical surface properties which result from this.

With its innovative adhesive technologies, H.B. Fuller | KÖMMERLING supplies an important building block for the complete implementation of the space-saving multi-material mix. As a full-service provider, the company has all the chemical technologies available which are necessary to meet the complex market requirements, and fulfil the high demands of its customers.

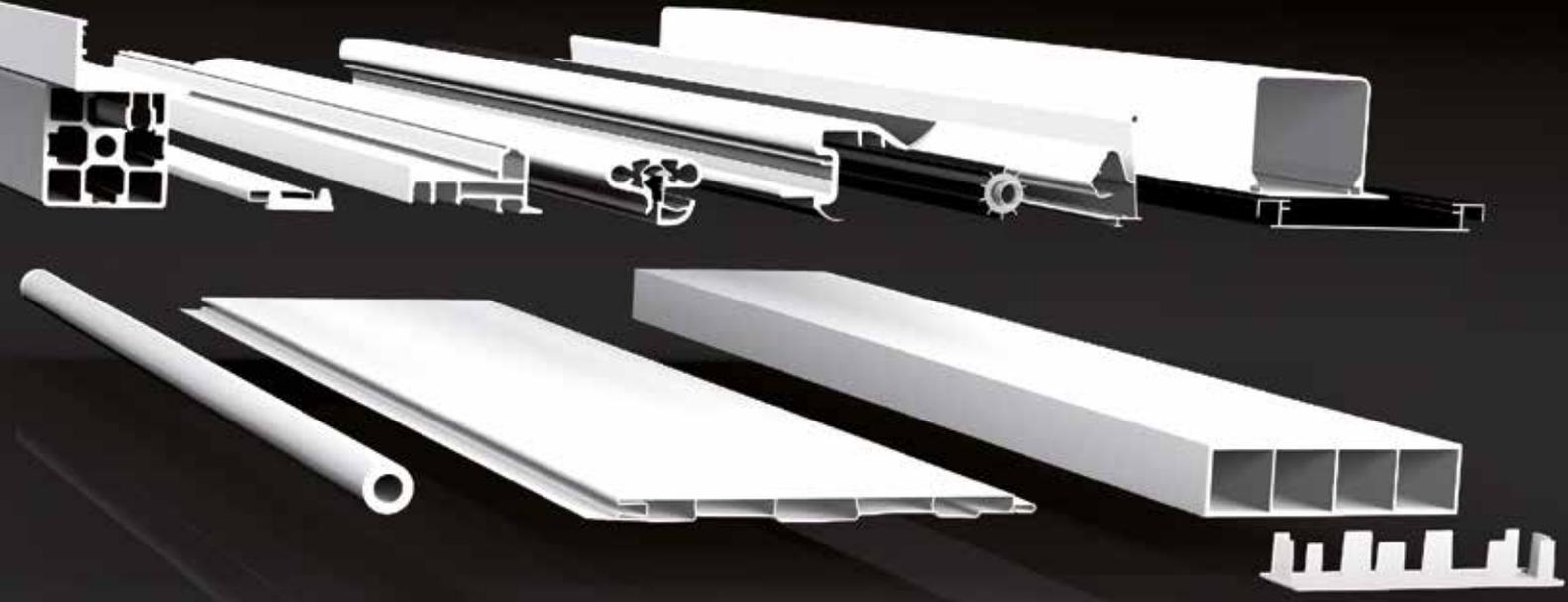


Competences:

- Total solutions provider – all technologies from one source
- Innovative adhesives and sealants for the greatest energy efficiency
- Modern lightweight solutions for implementing the multi-material mix
- Global service

Contact:

Kömmerring Chemische Fabrik GmbH
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E-Mail: info.koe@hbfuller.com
www.koe-chemie.de



moreplast GmbH

Innovative technical plastic profiles

moreplast GmbH produces the most varied of plastic profiles for notable brands and businesses in an extrusion process. The company also sells many of their own innovative plastic products for roofs, houses and gardens via their online shop: www.moreplast-shop.de.

For more than 50 years, moreplast GmbH has been developing custom plastic profiles for industry and commerce, special granulates for the plastic-processing industries. The main area of business is developing and manufacturing custom profiles and tool construction for custom profiles, as well manufacturing special granulates for extrusion.

Over the decades, the company has consistently tackled new challenges, researched, developed, designed, constructed, learned and thus accumulated a great deal of expertise. This competence is a crucial competitive advantage.

Most innovations come about through novel combinations of function, idea and material. moreplast can support you with your material innovation: more lightweight, better aesthetics, better functionality, more affordable. The properties of a plastic can be determined on an individual basis by the materials used in its manufacture, the manufacturing process itself, and a wealth of admix-

tures. Plastic can be moulded in almost limitless ways, it can be very sturdy, hard or soft. It can also be extruded as a transparent, coloured, glossy or matt product. If you require a profile or granulate with very specific properties, moreplast GmbH can produce this just for you.

The combination of development, manufacture and production opens up all options for optimisation. There is often no material which combines all the desired properties. In these cases, moreplast is happy to develop the right basic substance for you, and adapt the manufacturing process to suit.



moreplast
innovation kunststoff

Competences:

- Development + manufacture of custom technical profiles
- Manufacture of special granulates + mixtures
- Manufacture + sale of lightweight roof systems, assembly kits for balcony railings and fence systems – all made in Germany

Contact:

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www.moreplast.de
www.moreplast-Shop.de (Privat Kunden)



RAMPF Eco Solutions GmbH & Co. KG

Sustainability pioneer

Producing high-quality raw materials from plastic waste –
RAMPF Eco Solutions has specialised in this area for over three decades.

Worn-out car seats, motorbike seats, mattresses, fitness and leisure products and residual materials from industry: some people see these as waste, but for RAMPF Eco Solutions, these are valuable sources of raw materials, because the Pirmasens-based company specialises in the chemical recycling of polyurethane waste materials. To do this, the versatile plastic is broken down into its basic chemical elements and treated so that the products, so-called polyols, can be used again in the chemical industry as a secondary resource. The recycled polyols recovered in this way are at least comparable with raw materials obtained from fossil sources in terms of both quality and technical properties. This means that these chemical solutions from RAMPF Eco Solutions create a cycle, which has both economic and ecological advantages.

RAMPF Eco Solutions develops and constructs highly technical recycling plants for businesses which have a high volume of polyurethane waste, which allows them to produce recycled polyols on site. These can be fed back into production directly. When planning and producing the multi-functional plants to produce polyols from PET, phthalic anhydride and polyisocyanurate as well, RAMPF Eco Solutions works together with leading businesses in industrial plant construction.

RAMPF Eco Solutions has also developed chemical solutions to allow PET, polyester and renewable or bio-based



raw materials such as plant-based oils to be used as the raw material source to produce recycled polyols.



Competences:

- Chemical recycling
- The development and production of recycled polyols
- The design and construction of recycling plants

Contact:

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www.rampf-group.com



profine GmbH

Window profiles from Pirmasens for the global market

profine is a global leader in the manufacture of plastic profiles for windows and doors, and a notable provider of privacy solutions and PVC sheets. With the strong brands KBE, KÖMMERLING and TROCAL, profine has the right profile for every purpose and represents the top level of product and service quality.

As an owner-run company group, profine aspires to a sustainable and growth-oriented development. profine employs 3,800 workers at 29 sites in 23 countries. At the Pirmasens site, the company has more than 1,200 workers.

profine production takes place at sites in Germany, France, Italy, the UK, India, Spain, Russia, the Ukraine, the USA and China. The close-knit network of sales and logistics sites allows profine to offer optimal

support to its partners on the ground.

KÖMMERLING is the traditional brand of the profine Group and looks back over a long success story: the company, founded in Pirmasens by Karl Kömmerling in 1897, is a strong profine brand today, and its products are delivered to over 100 countries around the world. The Palatinate site is the largest and most important site in the group. KÖMMERLING is one of the world's leading brands when it comes to PVC sheets.



With the KÖMMERLING Better World foundation, the company is engaged in work for different concerns in society.

profine-brand window systems are the result of decades of research and development. profine produces brand-specific and country-specific profile systems from plastic with several thousand individual profiles. The advanced system technology allows the highest quality and safety standards to be met. A vast range of colour and design options gives the customer excellent freedom when it comes to the design. profine is characterised by the idea of

quality, innovation, efficient processes and sense of responsibility, profine thinks ahead when it comes to plastic windows, and utilises its strong market position for the success of its customers. The close partnership between them is the basis of the company success.



Competences:

- Leading manufacturer of plastic profiles for windows and doors
- Notable provider of privacy solutions and PVC sheets
- Owner-run company group
- 3,800 employees at 29 sites in 23 countries
- The Pirmasens site has more than 1,200 employees
- Traditional brand: KÖMMERLING

Contact:

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SCHLISSMEYER – Innovationen in Kunststoff

Customer-oriented. Driven by Innovation. Value-based.

For over 50 years, SCHLISSMEYER GmbH has been successfully supplying renowned customers from the automotive, aviation, mechanical engineering, appliances, construction and agricultural machinery, medical technology and packaging industries.

As a full-service provider, we assume all stages of the value-creation chain from planning to finished product: concept development, industrial design and product development, over plant and control mechanism construction, tool and special purpose machine construction, packaging development, right up to series production.

With first-class technologies, impressive innovations and targeted investments, we guarantee our customers a distinct competitive edge. International tool procurement in combination with in-house toolmaking means we achieve top quality at competitive prices.

In the 2K injection moulding process, highly complex construction parts made with hard-soft combinations are manufactured. From simple completions to complex assemblies, we manufacture assembly work of any kind from a single source. For larger numbers of pieces, we rely on industrial robots for the precise insertion of adhesive and foam strips, as well as masking and protective films or metal parts in injection moulds.

We apply layers in a variety of decors and colours with hot embossing and in-mould decoration.

Our machine park can cover injection weights from 1g to 3,645g, the maximum clamping force is currently 1,000 tons. In order to guarantee efficient and fully-automated production, the machines are equipped with robot handling systems.

All business and production processes are subject to strict quality management in accordance with DIN ISO 9001, as well as the VDA's automobile directive 6.1. Our environmental management is certified according to DIN ISO 14001.

SCHLISSMEYER is a flexible, reliable and engaged partner to our customers.

SCHLISSMEYER 
Kunststoff – Gut in Form

Competencies:

- Full-service provider
- Product development to series production
- Injection moulding up to 1,000 tons
- 2K injection moulding
- Toolmaking
- Surface decoration
- Assembly work

Contact:

SCHLISSMEYER GmbH
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66482 Zweibrücken
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E-Mail: carrera@schliessmeyer.de
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SLS Kunststoffverarbeitungs GmbH & Co.KG

The profile maker

SLS Kunststoffverarbeitungs GmbH & Co. KG is headquartered in Dahn. The medium-sized family company was founded in 1985 by Manfred Streck, Hans Schmidt and Thomas Leibrock.

Representing the second generation of owners, Marco Streck and Jürgen Schmidt took on their fathers' director roles in April 2015, and in January 2020, Jan-Steven Leibrock followed suit.

The range of services offered by SLS covers a vast offering of extruded solid, hollow-chamber, construction and custom profiles – also produced in multi-component coextrusion and post-coextrusion processes. The company takes care of consulting, development, tool construction, production, assembly and quality assurance. SLS processes the plastics PVC, PP, PS, PE, POM, SB, ASA and ABS as well as PVC foam and various blends. The company produces both small series and large series with part weights from 20 to 4000 grams per meter. Each year, the company processes several thousand tons of granulate and dry blends.

SLS is certified according to DIN EN ISO 9001:2015. The company also has an approval from CSTB for the French market, as well as approvals for other European markets and sectors.

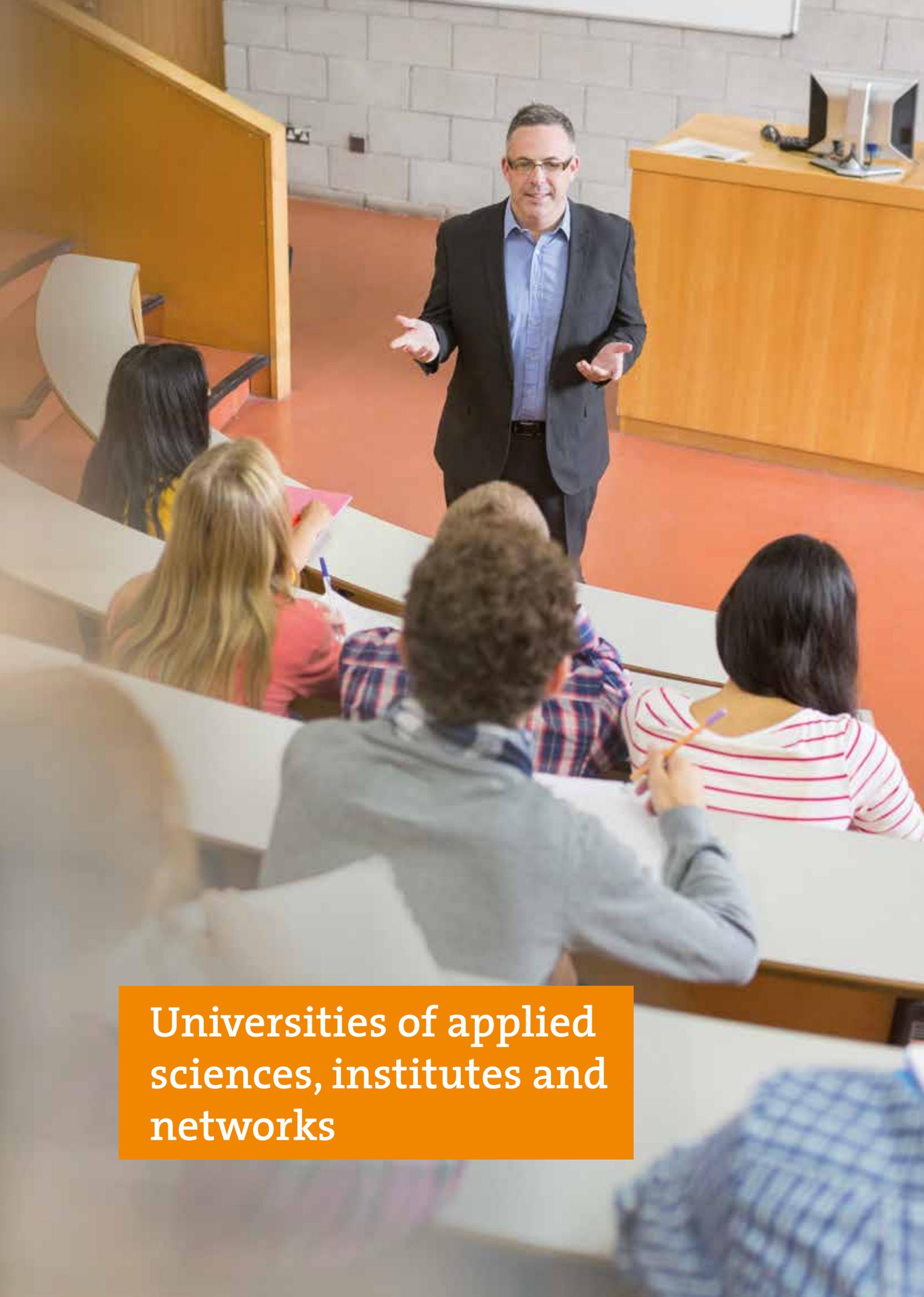


Competences:

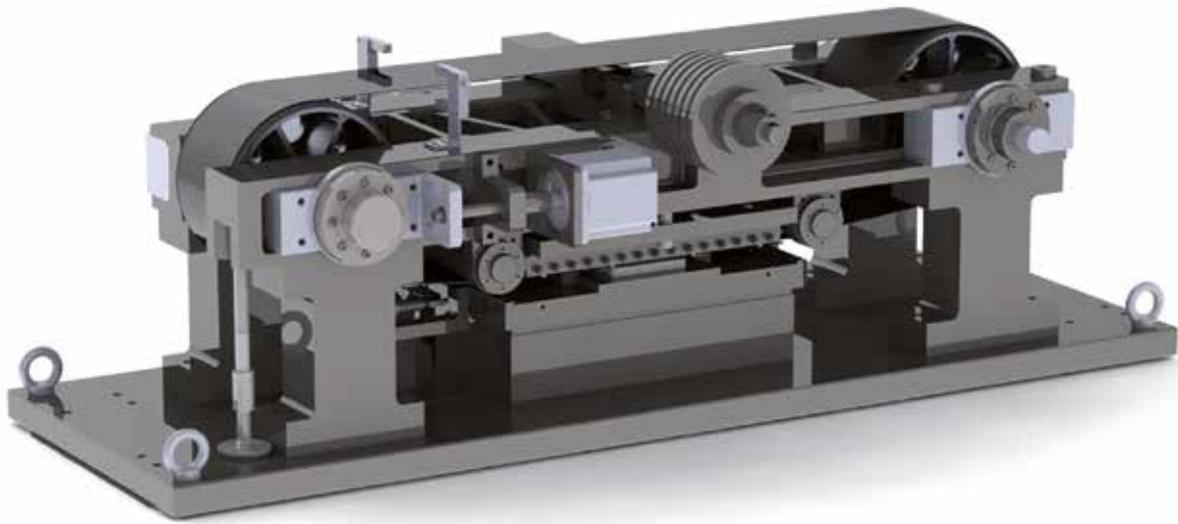
- The development of new profiles/solutions
- The construction of extrusion tools
- Tool construction for the greatest degree of flexibility
- The production of plastic profiles
- Assembly, right up to packaging units which are ready for sale

Contact:

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www.sls-kunststoffprofile.de



Universities of applied sciences, institutes and networks



Institut für Kunststofftechnik Westpfalz

There's so much more to plastics than just plastic

The Institut für Kunststofftechnik Westpfalz (IKW) carries out applied research and development on reinforced and unreinforced plastics.

The Institut für Kunststofftechnik Westpfalz (IKW) was founded in 2010 and, as one of the institutes of the University of Applied Sciences in Kaiserslautern, is a scientific institution from the faculty of Logistics and Polymer Sciences. It is a research and testing institute in the Pirmasens university town, covering reinforced and unreinforced plastics, and a partner for carrying out publicly-funded and industrially-funded projects along the value chain of plastic components, starting with the construction and material selection or its development, to the processing and testing phases, and then on to its recycling.

A great deal of attention is paid to the intrinsic and extrinsic refinement of plastic and composite components. In all, the IKW is set up in a very versatile and diverse way, and primarily engages in research niches. It has a unique selling point as a research institution in Germany in almost all of its areas of competence. On an international level, the IKW cooperates with the Center for Composite Materials (CCM) in Newark, DE in the USA, and the Center for Advanced Composite Materials in Auckland, New Zealand.



Forschungsschwerpunkte und Competences:

- Ultrasonic testing of fibre composite components according to EN 4179
- Measurement of thermal conductivity
- 3D weaving
- 3D printing under high environmental pressure
- Tribology with ice as the friction partner
- Aroma migration in seals for wine bottling
- Rotational moulding

Contact:

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*Ankle orthosis brace r
enforced with carbon fibre*

Reinforced plastics are the goal

Polymer composites combine the positive characteristics of several materials into a new material. This can then be used in more diverse ways than pure plastic.

The Leibniz-Institut für Verbundwerkstoffe (IVW) is a non-profit research institution in the Rhineland Palatinate and associated with the Technical University of Kaiserslautern. It is the home of research into the foundations of future applications for composite materials which are of great importance for future mobility, energy, climate and environment, production technology and healthcare, for instance. New materials, construction methods and production processes are investigated and, once there is a fundamental understanding, these are adapted to suit the respective requirements.

As well as classic plastic reinforcement with particles or fibres, the institute also focuses on the development of particularly ecologically efficient and multi-functional composites. The specifications are very diverse, for example, they may be highly resilient and stable with excellent tolerance of damage, flame resistance, electrical conductivity, thermal/noise/corrosion protection, a barrier effect, low wear, "integrated" lubrication effect and recyclability.

With the adapted composites, we develop, produce and test prototypes of components which may be used in the future in transportation, mechanical engineering, the energy sector and in medicine.

The Leibniz-Institut für Verbundwerkstoffe is making innovations!



Image on the right: finite element model of the basic design; to show realistic load on the orthosis brace, a "shoe" was modelled which transfers the movement of the leg onto the orthosis brace



Competences:

- Tailored & smart composites
- Tailored thermosets & biomaterials
- Tribology
- Material cycles
- Construction methods
- Process simulation
- Mechanical characterisation & modelling
- Fatigue & service life analysis
- Pressing & joining technologies
- Roving & tape processing
- Impregnation & preforming technologies

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Institut für Oberflächen- und Schichtanalytik (IFOS) GmbH

Surface and layer analysis

Analytical competence for product development and quality assurance for plastics, adhesives and composites.

When developing and producing innovative products where specific surface characteristics are highly important for the application and function, flexible access to modern surface and layer analysis processes is a competitive advantage that should not be underestimated. In this way, as well as the visual characteristics, gliding characteristics, wear behaviour, adhesion and corrosion properties, joinability and much more are determined by the composition and structure of the surfaces and interior interfaces.

Measuring and optimising the quality of surfaces, and identifying errors in order to avoid them in the future, are the central tasks of the Institut für Oberflächen- und Schichtanalytik IFOS in Kaiserslautern, an institute which was founded in 1989 as a non-profit research institute of the Rhineland Palatinate, associated with the Technical University of Kaiserslautern as a link between academic and market-oriented economy.

IFOS has a modern and almost comprehensive collection of instruments and equipment to analyse material surfaces and thin layers. Depending on the specific task, these are used in a targeted manner, i.e. depending on the required test confidence, spatial and/or depth resolution, the suitable process or combination of processes is selected.

The cross-discipline IFOS team is made up of scientists and skilled persons in the natural sciences and technology from physics, chemistry, material and engineering science backgrounds. The team has extensive experience in the customer-oriented processing of analytical issues from industrial practice.

The institute can assist businesses as an analysis service provider, and supports its customers in developing materials, products and processes which are specially related to the company, in analysing errors and damage, in quality assurance and in other areas of application.

You can find presentations of practical application examples at <https://www.ifos.uni-kl.de/auftragsforschung/anwendungsbeispiele>



Competences:

- Instrumental surface analytics
- Commissioned research for industry
- Cooperation partner for project research
- Error and damage analytics
- Surface and thin layer technology

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Kunststoffnetzwerk Rheinland-Pfalz

Almost everything is possible with plastic.

Plastics are all-rounders. Lightweight, sturdy, resistant to acids – with a vast range of excellent material properties. New plastics are always being created. Some of them come from Kunststoffnetzwerk Rheinland-Pfalz.

Well-organised networks offer the businesses involved and their customers many benefits: they organise the very important technical and scientific exchange, they develop joint acquisition and sales activities, and can offer customers complete solutions thanks to their service portfolios which complement each other. To make use of such benefits, businesses in the sector joined forces to set up KUNSTSTOFF-NETZWERK Rheinland-Pfalz in 2000.

The network unites businesses involved in technical consulting and the development of plastic products, the manufacture of semi-finished plastic products and/or the manufacture of finished plastic products, in the broadest sense.

The basis for the contract-regulated cooperation in the KUNSTSTOFF-NETZWERK is fair relationship between all members, resulting in flawless cooperation to benefit the customer. During the project phases, selected members of the network who fit the requirements of the project work in a way which resembles a specific department of a single business.

It is frequently the case that when a project begins, companies are still unaware about how their idea will

be developed and implemented. Meaningful alternatives for design and implementation are often not identified, and are not considered any more after a certain point in time.

The economic independence of the partners in the competence network allows them to examine their task freely. They are free to implement their project in their own way, and to select the related partners. This ensures that the project runs smoothly with as much flexibility as is needed.

With modern machinery, qualified workers and a great deal of competence, the KUNSTSTOFF-NETZWERK represents all-round service innovation, including and especially for complex specifications.



Competences

- Integral development and material-specific production of plastic and fibre-plastic composite components
- Consulting and feasibility testing
- Design and planning
- Implementation

Contact

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Prüf- und Forschungsinstitut Pirmasens e.V.

From biological waste to bio-based performance plastic

Applied biopolymer research in the Western Palatinate

Industry-related research and development in the sustainable use of biogenic waste has been one of the core competences of the PFI in Pirmasens for 20 years. The development, production and optimisation of bio-based and biodegradable plastics are gaining more and more importance here. Working in close cooperation with the plastics-processing industry, universities and research institutions, the PFI develops innovative processes for producing bio-based chemicals and materials. The PFI has a state-of-the-art fermentation centre for the fermentative recovery of platform chemicals from biogenic waste, the building blocks of innovative and sustainable biopolymers. In this fermentation centre, a cross-discipline team of scientists and engineers develop novel bioreactors and fermentation processes.

The technical centre of the PFI has a highly modern lab compounding plant for the application-specific modification of polymers and the optimisation of material properties. The modifications here range from conventional fillers right up to additives based on renewable raw materials, and cover the common options for treating plastics. The individual development stages are

supported by material science analysis and, if desired, the process can culminate in a generatively produced component from the institute's own 3D printing filament.

The PFI in Pirmasens is a globally active and competent R&D partner for businesses working in bioprocess engineering and bio-based polymers, and develops scientific and sustainable processes for producing and using bioplastics in industrial applications and consumer goods.

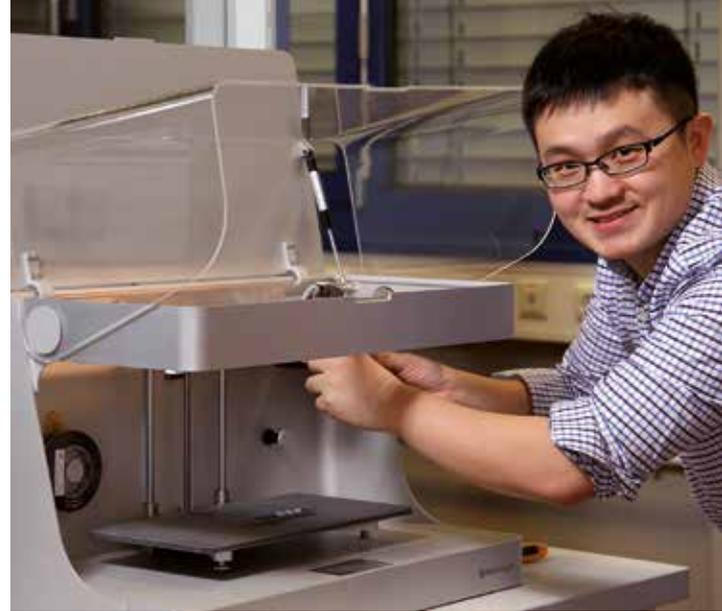
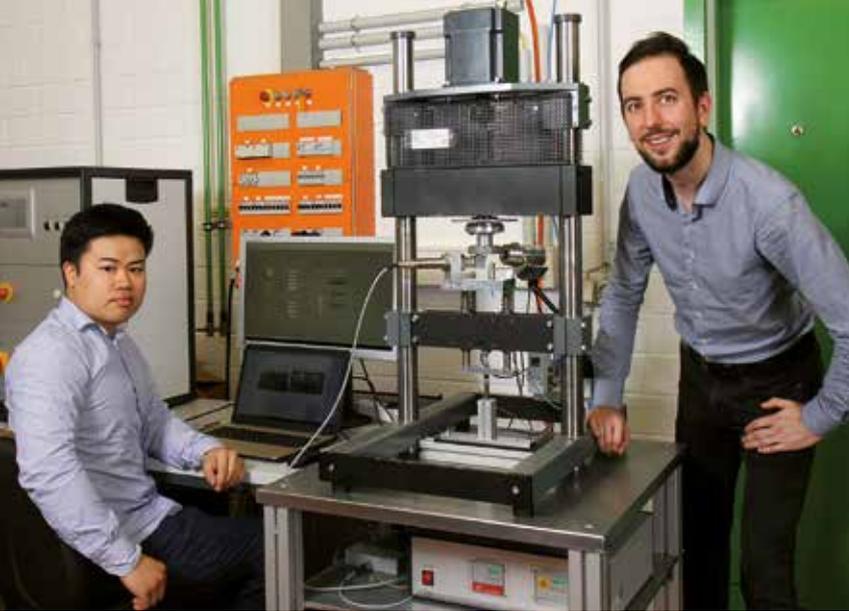


Competences:

- Bioprocess engineering
- Bioreactors and fermentation
- Bio-based base chemicals
- Biopolymers and plastic technology
- 3D printing
- Material testing

Contact:

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The Technical University of Kaiserslautern – Chair of Composite Engineering

Researchers develop more efficient and longer-lasting plastics

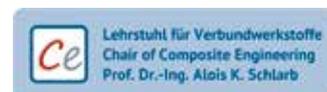
At the Chair of Composite Engineering of the Technical University of Kaiserslautern, the team led by Professor Dr. Alois K. Schlarb works with novel plastics, methods for the efficient characterisation of the performance properties of these plastics, and processing technologies for using these plastics to produce components.

Modified 3D printers are used, for example, to optimise the printing result for plastics. Here, the researchers are examining what conditions need to be met during the printing process. The composition of the material also plays a role here. To reinforce the plastics, they use fibres which are incorporated into the plastic in a certain alignment, like a cord. This is interesting for the lightweight construction of vehicles, for example.

The Kaiserslautern engineers also work with tribological testing. They would like to use this to improve the friction behaviour of material combinations, such as plastic-metal systems.

First, they developed an intelligent system which automatically detects the wear phases, and analyses this data directly. With their technology, they are able to analyse much more data in a shorter time, and also characterise the material properties more precisely.

Another focus of the institute is the investigation of stress cracks in plastics. These form during mechanical load and, at the same time, the influence of a liquid. This can pose a problem for medical products made from plastic, for instance, and represents a risk to patient health. The researchers are developing a new hybrid material made from a plastic matrix with embedded nanoparticles and practical, efficient methods for characterising the susceptibility of medical products to stress cracks.



Research focus:

- Process-structure-property relationships
- Hybrid materials and processes
- Tribology

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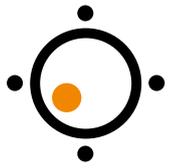


ZukunftsRegion Westpfalz

ZukunftsRegion Westpfalz is a regional initiative committed to the goal of bundling the forces of the West Palatinate to carry out joint projects and, in this way, strengthen the future viability of the region. Supported by the Palatinate Chamber of Industry and Commerce (IHK) and the state government, in just a few years, the association has grown to more than 350 members from business, science, government, and civic organizations.

www.zukunftsregion-westpfalz.de





**ZukunftsRegion
Westpfalz**

Technology leaders with outstanding products, a highly qualified workforce, and a long tradition of support for the metalworking industries are factors contributing to the economic strength of the West Palatinate in this field today.

The traditionally industrial region has developed into an important high-tech location in recent decades and offers ideal conditions for further growth. An innovative cluster in the field of plastics, adhesives and composite materials has emerged in the vicinity of universities and research institutes.

This brochure presents the regional network of high performance companies and innovative research institutes, whose expertise is tightly intertwined. On these pages, entrepreneurs and investors seeking a suitable environment for their investments will find the ideal business contacts.



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