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RAMPF ADVANCED POLYMERS

Sealing systems

Multi-talent based on polyurethane and silicone

RAMPF

#DiscoverTheFuture



Chemical and Engineering Solutions



Advanced Polymers



Composite Solutions



Machine Systems



Production Systems

RAMPF Advanced Polymers is a company of the international RAMPF Group. Find out more on page 28.

RAMPF Advanced Polymers

High-performance. Customized. Eco-friendly.

We have been developing and manufacturing reactive resin systems based on polyurethane, epoxy, silicone, and silane-modified polymers.

Our portfolio includes

- > Sealing systems, electro and engineering casting resins, edge and filter casting resins, and adhesives
- > Board and liquid materials for model and mold engineering
- > Chemical solutions for the manufacture of customized recycled polyols based on polyurethane, PET, and PIR residues

Our products and solutions are used globally and in a wide range of industries – from automotive and electromobility, electrics/

electronics, and white goods to aerospace, foundry, furniture, and mattresses.

We conserve resources and our environment, both in the development of our chemical products and in their manufacture and recycling.

Together with our customers and partners, we are working towards a successful and sustainable future.





Products and services

High-performance, customized, and resource-saving technologies for a sustainable future



INNOVATIVE MATERIALS & BRAND DIVERSITY

Plastic systems for sealing, design, insulating, bonding, protecting, and casting

RAKU® POX Epoxy	RAKU® PUR Polyurethane	RAKU® SEAL Sealants	RAKU® SIL Silicone
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Plastic systems and solutions for state-of-the-art model, mold, and tool engineering

RAKU® TOOL Polyurethane and Epoxy

Customized, high-quality recycling polyols

RECYPOL® Ether and Ester Polyols	PETOL® Ester Polyols	Polyols based on renewable raw materials
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HIGH-PERFORMANCE & SUSTAINABLE

Ambition. Reality. Tradition.

Every day, we strive to make our products and solutions even more eco-friendly, from the selection of raw materials to the manufacturing process and delivery.

As a pioneer in the chemical recycling of polyurethane, we have been setting standards for over three decades. The raw materials obtained with our groundbreaking technologies are used in both our customers' products and our own.

It goes without saying that we procure energy sustainably – and use it intelligently. At our locations in Grafenberg and Pirmasens, we use only green electricity from renewable energy sources. An proactive environmental management system ensures that we never stand still but continuously improve our energy and environmental performance.

SERVICE TODAY & IN THE FUTURE

Customer-oriented. Competent. Committed.

We provide our customers with comprehensive support – from product development to market launch and sales. And we do this around the globe: With production facilities on three continents and a worldwide network of distribution partners, we are always there for our customers, wherever they are.

In all this, people are always at the center. Trusting and successful collaboration with our customers is our top priority. Together, we develop the solutions of tomorrow – and have been doing so for more than forty years.



+ YOUR BENEFITS

- > Perfect seal thanks to automated application of the liquid gasket without any coupling points and bonding

- > Economic benefits thanks to accelerated and simplified production and assembly processes

- > Reliable and long-lasting seal – the gasket is firmly attached to the component and cannot be removed

- > No tooling costs, flexible adjustments to updated components using NC technology

Technology | In-situ gaskets

Innovative liquid sealing systems for the solutions of tomorrow

Formed-in-place sealing systems based on polyurethane (RAKU® PUR) and silicone (RAKU® SIL) from RAMPF Advanced Polymers provide components with reliable and efficient protection against moisture, dust, chemicals, and various environmental influences.

Unlike gaskets that are inserted or stuck on, liquid gaskets

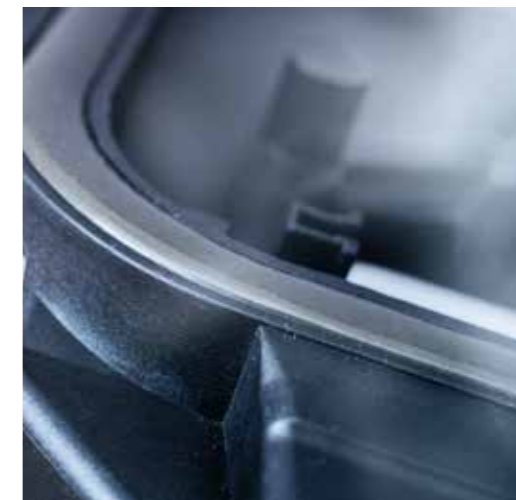
- > **Formed-In Place Gasket (FIPG)**
- > **Formed-In Place Foam Gasket (FIPFG)**

are applied directly onto the component using a dispensing machine. The material adheres to the component very quickly and forms a secure bond.

The sealing systems adapt perfectly to the component and lie stress-free in the groove.

The chemical properties are tailored to the relevant requirements.

FIPG and FIPFG sealing systems are an established standard in a number of industries, including automotive, household appliance, electronics, control cabinet, and lighting. Our products can easily be adapted to meet specific requirements and are constantly being developed, making them the number one choice, even when it comes to newly emerging application areas such as e-mobility.





Material types

Polyurethane or silicone?

We have the best solution for your application

RAMPF Advanced Polymers is your expert partner in polyurethane- and silicone-based sealing systems. Choosing the best possible sealing material depends on the requirements profile of the end properties and on the manufacturing process.

	POLYURETHANE (RAKU® PUR)	SILICONE (RAKU® SIL)
Operational scope	<ul style="list-style-type: none"> • Heat resistance: long-term: from -40 to +90°C short-term: +140°C • Chemical resistance against fats and oils, detergents, aqueous solutions, etc. 	<ul style="list-style-type: none"> • Heat resistance: long-term: from -60 to +200°C short-term: +300°C • Exceptional chemical resistance • Weather resistant
Properties	<ul style="list-style-type: none"> • Outstanding physical properties such as compression set, tensile strength, break elongation, etc. • Low water absorption • UV-stabilized systems 	<ul style="list-style-type: none"> • Optimal physical properties remain constant across almost the entire temperature range of the application • Outstanding compression set, even at high temperatures • Extremely water-resistant • Low water absorption up to max. 0,3% • Excellent resistance against UV and microwave radiation
Adhesion	<ul style="list-style-type: none"> • Excellent adhesion on almost any substrate • Perfectly matched pre-treatment systems available 	<ul style="list-style-type: none"> • Outstanding adhesion to a wide variety of substrates • Pre-treatment available if necessary
Construction	<ul style="list-style-type: none"> • Compression rate: 30-60% 	<ul style="list-style-type: none"> • Compression rate: 10-30%
Listings	<ul style="list-style-type: none"> • UL 94 (HF-1, HF-2, HBF) • FMVSS 302 • UL 50, UL 50E, UL 508 • IP, NEMA 	<ul style="list-style-type: none"> • Flame retardancy in line with UL 94 HBF for all silicone foam gaskets • UL 50, UL 50E, UL 508 • IP, NEMA, ATEX



+ YOUR BENEFITS

- > More than 40 years of experience in developing and marketing innovative sealing systems
- > In-depth technical consulting on selecting the appropriate sealant and designing your components to optimize sealing results
- > Joint process development and optimization
- > Material, machine, and process from a single source – the complete expert service from RAMPF

Manufacturing process

The art of foaming

Chemical know-how for perfect sealing processes

Perfect chemistry: Chemists, engineers, and technicians work hand-in-hand at RAMPF. As a result, we can offer you solutions that move you forward economically and in terms of materials and production engineering. We do this using high-quality sealing materials and efficient processes.



Discover more on youtube.com/rampfgroup

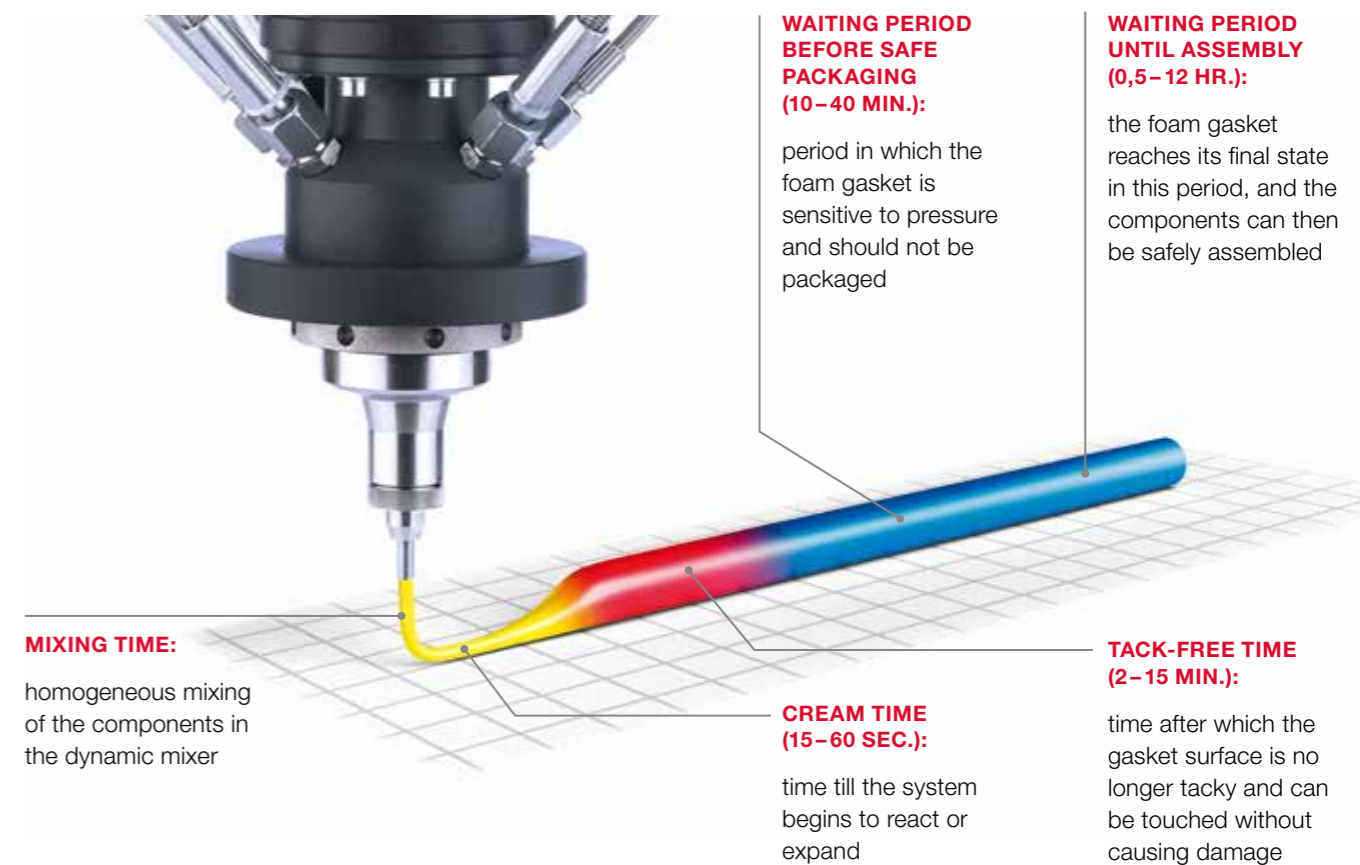
COMPONENTS

- > Foam gaskets consist of a liquid to paste-like component A (polyol) and a component B (isocyanate)

REACTION

- > Exothermic reaction
- > reacts evenly and reliably at room temperature

Foaming process:





Sealing systems

What is your foam type?

Versatility and flexibility set our sealing systems apart

Standard product range: RAMPF Advanced Polymers' wide-ranging product portfolio includes sealing materials with outstanding chemical, physical, and mechanical properties for almost any application.

Custom sealing systems: Thanks to our developers' expert knowledge and years of experience, we can adapt existing materials or develop new ones to suit your exact product and process conditions.



LIQUID SEALING FOAMS

are applied in grooves and forms and are self-levelling. Both tolerances of < 0.3 mm and sealants with a cross-section $> = 2.5$ mm can be achieved.

APPLICATIONS:

Liquid sealants are frequently used in the LED and lighting industry. RAMPF offers a variety of liquid systems with different properties, including antibacterial, UV-stable, and flame retardant.



THIXOTROPIC SEALING FOAMS

are applied to flat surface or three dimensional parts with a height-to-width ratio of 1:2 to 1:1.

APPLICATIONS:

Thixotropic sealing foams are used for example, in the automotive industry. RAMPF's PU gasket RAKU® PUR Speed is used for sealing door modules and tail lights. Due to its extremely short curing time, the processing of components can be continued shortly after application.



COMPACT SEALS

based on polyurethane and silicone are produced by polymerization without volume changes and can be adjusted from liquid to pasty. Characteristics include a wide hardness range, very high mechanical strength, and high elasticity of up to 500 percent (e.g. RAKU® SIL 37-1001). In addition, the gaskets score with very good vibration and sound absorption (NHV) as well as high pressure resistance.

APPLICATIONS:

Compact seals are used amongst others, in the automotive industry (e.g. temperature control systems, battery housings).



MOULDED FOAMED GASKETS

are inserted into the given mould or groove via a 2-component mixing and dispensing system. After the foam has been applied, the component is placed. The foam expands, rises upwards, and bonds with the component. After a very short time, the foam is able to be demoulded and the component can be removed. All geometries are possible, regardless of height-width ratio.

APPLICATIONS:

Moulded foamed gaskets are used, in the automotive industry in both the engine compartment and interior (e.g. air conditioning system, partition walls).

Your industry | Your application

Market-driven solutions based on polyurethane and silicone

The broad spectrum of properties of our RAKU® PUR and RAKU® SIL systems combined with the experience and expertise of our staff guarantee the optimal solution for your requirements.

Our wide range of high-performance sealing systems can be adapted to individual customer requirements for special components, processes, and applications.

Sealing systems from RAMPF Advanced Polymers meet the highest quality requirements and are used by leading manufacturers in, for example, the automotive and electronics industries. Renowned institutes test and confirm the high quality of our products.

Our many years of experience in product development and processing technologies enable us to provide you with comprehensive advice on materials and process engineering issues.



AUTOMOTIVE



**ELECTRICAL /
ELECTRONICS**



E-MOBILITY



ENERGY TECHNOLOGY



**HOUSEHOLD
APPLIANCES**



PACKAGING





+ YOUR BENEFITS

- > Approvals for interior and exterior by leading automobile manufacturers

- > IATF 16949

- > Low-emission systems to VDA 278 / VDA 270

- > Listed at Daimler, VW, BMW, Porsche, Chrysler, FCA, Ford, GM, Tesla, Toyota, Kia/Hyundai, Volvo, and many more

- > Reduction in noise and vibrations (NVH – noise, vibration, harshness)

- > Meets fire protection requirements to UL 94



Automotive
Fast and powerful

High-performance, long-lasting seals for automobile and vehicle construction

Products of the RAKU® PUR and RAKU® SIL brands meet the most challenging requirements of the automotive industry, including providing long lasting protection against moisture, dust, and chemical influences as well as compliance with strict emission regulations and the highest NVH standards (noise, vibration, harshness). This means our sealing systems make an essential contribution to your personal driving experience.

However, automobile manufacturers do not only measure speed in miles per hour. To survive in this competitive market, ultrafast process chains in production are indispensable. This is why RAMPF Advanced Polymers has developed fast curing sealing systems based on RAMPF Speed technology. After application, the gasket is available for further component handling within a very short time.

Example applications:



BRAKE LIGHTS AND HEADLIGHTS



ELECTRICAL ENCLOSURES



VENTILATION GRILLS



LOUDSPEAKERS



DOOR AND DOOR-LOCK MODULES



OTHER COMPONENTS



+ YOUR BENEFITS

- > UV-resistance available
- > Listings: UL 50 and UL 50E (tightness), UL 94 (flame retardancy), DIBt (German Institute for Construction Technology)
- > IP codes (degree of protection of housing from touch, foreign objects, and water) such as IP 65, IP 66, and IP 67 can be met
- > Anti-bacterial to VDI 6022 guideline possible
- > Temperature range from -60 to +250°C



Electrical / electronics

Reliable protection

Sealing systems ensure the long-term functionality of your application

Sealing systems certified to UL50 and UL50E are available from RAMPF Advanced Polymers. This test specification for control cabinets and other electronics housings has now spread from the United States, Canada, and Mexico to become a global standard for the highest quality foam gaskets.

Optimum protection against dirt, moisture, and chemical influences is absolutely essential for components used in the control cabinet, lighting, and electronics industries. In addition, there are high requirements for the compensation of tolerances. RAMPF Advanced Polymers has the perfect sealing system for every conceivable indoor and outdoor application. Impressive features include high-quality sealing (confirmed by IP tests), excellent resistance to aging, low assembly forces, and optimum adherence to a variety of substrates, including stainless steel, aluminum, powder coatings, and plastic.

RAKU® PUR and RAKU® SIL sealing systems can be applied two- and three-dimensionally, and also meet the increasingly stringent requirements for flame-retardant materials to UL 94. The flame-retardant sealing systems are used wherever there are partial ignition sources.

Example applications:



ELECTRICAL ENCLOSURES



INDUSTRIAL LIGHTING



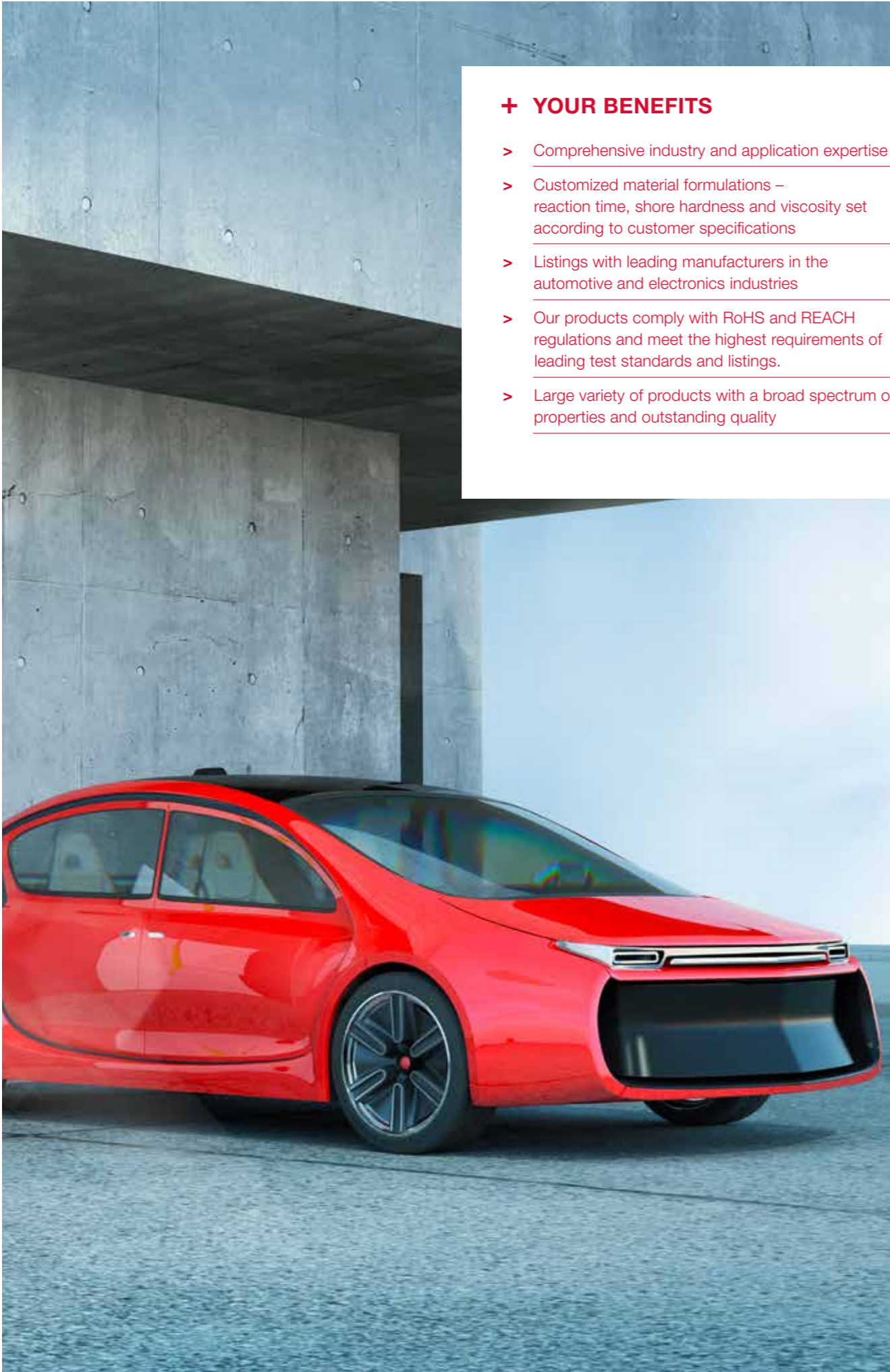
CONTROL CABINETS

OPERATING EQUIPMENT

HOUSING COVERS

LED MODULES

SOLAR INVERTERS, AND MUCH MORE



+ YOUR BENEFITS

- > Comprehensive industry and application expertise
- > Customized material formulations – reaction time, shore hardness and viscosity set according to customer specifications
- > Listings with leading manufacturers in the automotive and electronics industries
- > Our products comply with RoHS and REACH regulations and meet the highest requirements of leading test standards and listings.
- > Large variety of products with a broad spectrum of properties and outstanding quality



E-Mobility

Innovative. High-tech.

Keeping the wheels turning

The energy concept of the future would be unthinkable without electro mobility. From e-cars and e-buses to e-bikes and e-scooters – this sector is experiencing enormous growth all over the world, and everything seems to be heading toward e-mobility.

Against this backdrop, RAMPF Advanced Polymers is an expert partner for reactive resin systems with its polyurethane- and silicone-based sealing systems. Sealing individual e-mobility components ensures protection against dust, dirt, moisture, other chemical substances, and environmental influences.

The power supply to the drive is absolutely crucial for this technology. RAMPF already offers innovative solutions for lithium-ion technology with its RAKU® PUR and RAKU® SIL product ranges. When it comes to other alternative energy sources, such as fuel cells, our experts are already developing sealing solutions for the future that, thanks to their impressive versatility, meet the most complex requirements.

Example applications:



**SEALING BATTERY HOUSINGS
(E-CARS, E-BUSES, E-SCOOTERS,
E-BIKES, ...)**



**CHARGING STATIONS AND
CHARGING CONNECTORS**



**SEALING CHARGING CONNECTOR
HOUSINGS ON CARS**



ADDITIONAL E-MOBILITY COMPONENTS



+ YOUR BENEFITS

- > [FDA \(21 CFR 177.1210\) EU Regulation Nr. 10/2011](#)
- > [Wide temperature range](#)
- > [Best chemical resistance](#)
- > [Highest elasticity and tear resistance](#)
- > [Extremely easy processing](#)



Packaging industry

Reliable protection for valuables

Secure and long-lasting sealing for packaging

The requirements placed on packaging and the sealing systems used are becoming increasingly stringent. Whether they're intended for the food industry or for technical or chemical materials – foam gaskets from RAMPF Advanced Polymers deliver the best possible results.

RAKU® PUR and RAKU® SIL sealing systems offer optimum protection against contamination and ensure safe transportation and storage of goods, chemicals, and foodstuffs.

In addition, the strictest hygienic requirements and EU directives for food packaging are met. These sealing solutions are used in containers such as steel and plastic lidded drums, steel cans, and IBCs.

Our products RAKU® PUR and RAKU® SIL exhibit excellent adhesive properties on metals and plastics.

Example applications:



PACKAGING LIDS



PACKAGING LIDS



LIDS FOR STEEL DRUMS



METAL AND PLASTIC LIDS



Household appliances

Functionality and safety

High-quality materials for ultra-fast process times

The household appliance industry (white goods) is a global business, where an ever-increasing demand for high-quality products makes for fierce competition.

Industry demands large quantities, fully automated production processes, ultra fast cycle times, and top quality.

Our high-performance, end-to-end sealing solutions ensure your products always have the edge. Sealing systems from RAMPF Advanced Polymers play a crucial role in the functionality and reliability of these appliances – and therefore also in the satisfaction of the end customer.

Products of the RAKU® PUR and RAKU® SIL brands meet the highest requirements and reliably and efficiently protect household appliances from moisture, dust, bacteria, and chemicals.

Example applications:



SEALING SINKS AND HOBS



POWER UNITS FOR DISHWASHERS



SEALING; DAMPING; AND INSULATION APPLICATIONS IN WASHING MACHINES



COMPONENTS FOR DRYERS, AND MUCH MORE

+ YOUR BENEFITS

- > Meets high sealing requirements to IP standard
- > Meets fire protection requirements to UL 94
- > UV-stable sealing systems
- > Can be used at temperatures from – 60 to + 250°C
- > Excellent noise and vibration damping

Comprehensive support

From concept to finished product

Materials, processing, consulting – your end-to-end partner

RAMPF offers its customers complete support – from product development to market launch:

LABORATORY AND APPLICATION TECHNOLOGY

- Initial consultation on selecting the most suitable material and processing procedure
- Customized development of your material or adaptation of a product from our comprehensive portfolio
- Application engineering consultations for component design and manufacture of sample parts in near-series conditions
- Manufacture of prototypes

PROCESSING EXPERTISE

- Support and consulting for applications as well as process development and optimization
- All-encompassing machinery pool for conducting near-series customer trials
- Low-pressure mixing and dispensing systems from RAMPF Production Systems for processing one, two, and multi-component materials

AFTER-SALES SERVICE AND TRAINING

- Our customer service does not end with the start of series production: Technical field representatives, application technicians, and product developers are all at your service
- The RAMPF Academy offers product and application training courses that emphasize on sharing experiences

Think global | Act local

With production on three continents and sales partners worldwide, we are always there for our customers – wherever they are

RAMPF thinks globally and acts locally. In addition to our state-of-the-art production facility in Grafenberg, our products are also manufactured at key strategic sites in the United States and China.

No matter where they are produced, the same applies – when it says RAMPF, it is RAMPF. The highest standards of quality apply to our production in both the United States and China, which has helped our facilities become very successful. Our foreign subsidiaries RAMPF Group, Inc. (USA), and RAMPF (Nantong) Co., Ltd. (China) are experiencing rapid growth, and ever more customers are placing their trust in RAMPF quality.

Of course, there is more to it than just production standards. The high quality of RAMPF products is also based on first-class advice and a comprehensive array of services.

This strategy is also supported by our global network of sales partners and experts at our sales offices in the United States, China, and Japan. They ensure our customers receive rapid and expert advice – no matter where they are and which industry they represent.



We are inventors. Team players. And a strong partner.

RAMPF stands for pioneering chemical solutions and visionary engineering. Worldwide.

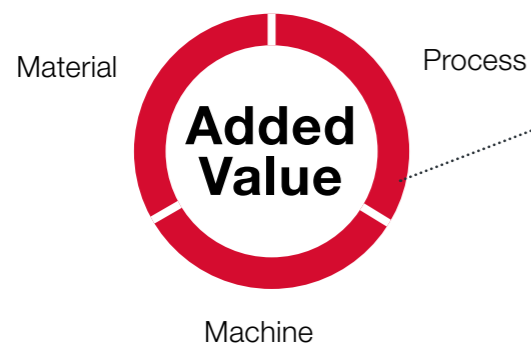
From a one-man operation to an international group with twelve sites spread across three continents – with our products and solutions centered around reactive resins, machine systems, and lightweight construction with composites, we rank among the market leaders in a whole host of industries.

Discover the future – this is both our corporate slogan and the foundation of our long-standing success story. In close cooperation with our customers and partners, we develop tomorrow's products and solutions today – for the decisive competitive advantage.

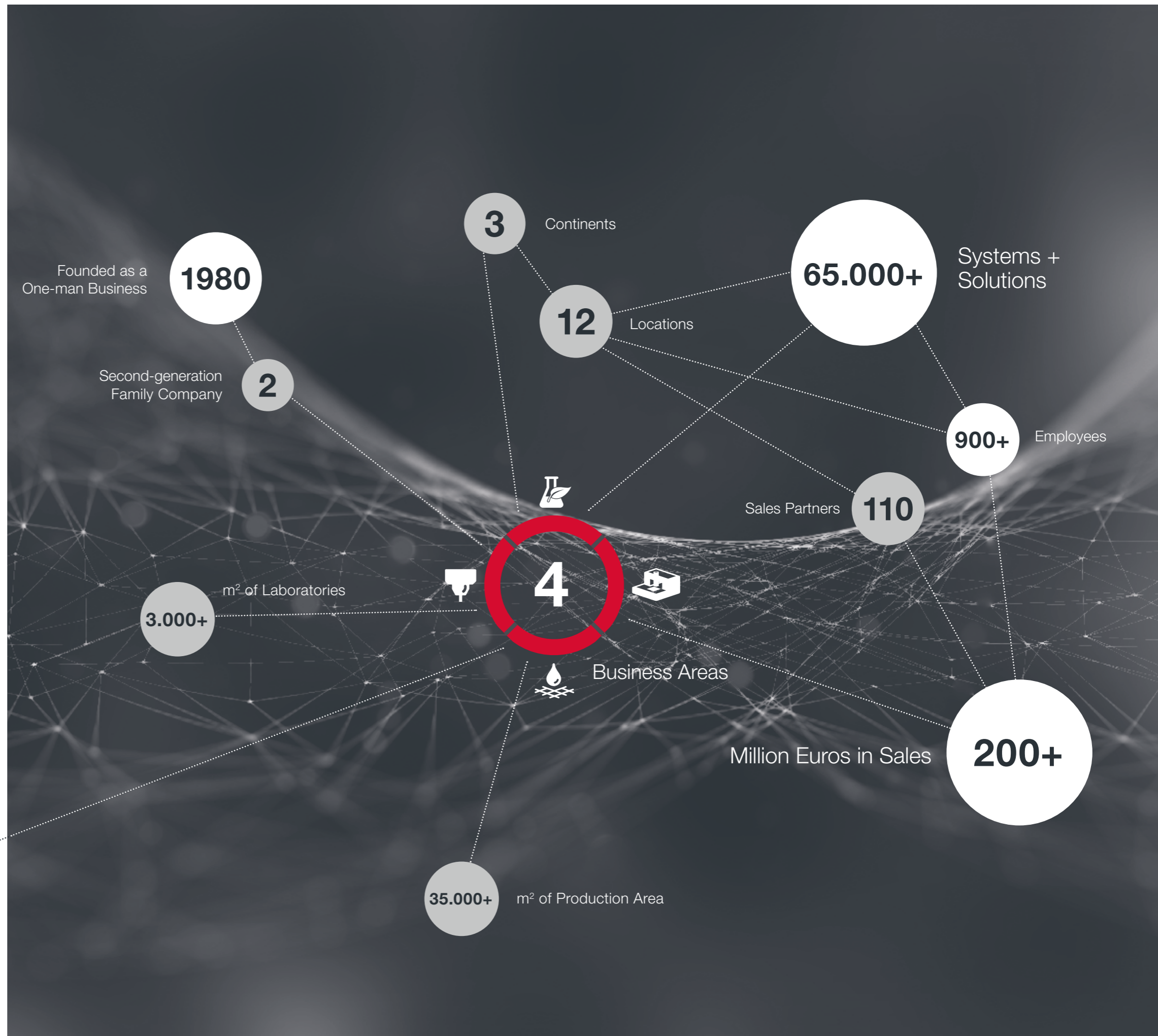
Sustainability has been a priority right from the outset. This is no mere buzzword but an integral part of our day-to-day activities. As pioneers of chemical recycling, we have been contributing to an effective circular economy for decades. The raw materials that we recycle are used both by our customers and within our Group.

We are also a sustainable employer. RAMPF grows with its employees – we invest in our staff and are keen for them to work with us in the long term. We achieve this by openly showing appreciation and offering extensive training and development opportunities.

A forward-looking, sustainable, and value-creating family-run business – as a partner to industry and as an employer, we attach the greatest of importance to trust and reliability. These qualities are an absolute must when it comes to establishing long-term, successful partnerships.



RAMPF – Chemical and Engineering Solutions.
Utilize our wide-ranging innovative potential for Added.Value.





RAMPF –

discover the future

Developing the Solutions
of Tomorrow – Today.

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Mass production?
Not at RAMPF.

**We engineer
made-to-order solutions.**

