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# **RAMPF** Tooling Solutions

Solutions for state-of-the-art Model, Mold, and Tool Engineering

# RAMPF

## #DiscoverTheFuture



### Engineering and Chemical Solutions



Machine Systems



Production Systems



Composite Solutions



Eco Solutions



Polymer Solutions



Tooling Solutions

**RAMPF** Tooling Solutions is a company of the international **RAMPF** Group.  
Find out more on page 28.

# RAMPF Tooling Solutions

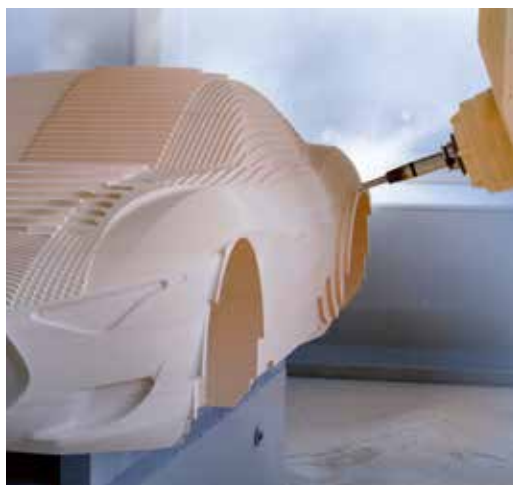
## Innovative solutions for model, mold, and tool engineering

**The company based in Grafenberg (near Stuttgart), Germany, is the world's largest producer of high-performance, high-quality styling, modeling, and working board materials.**

Services and products such as Close Contour pastes, Close Contour casting, including large-volume casting, 1 : 1 casting, and Close Contour blocks ensure the manufacture of outstanding Close Contour models and molds.

The company develops pioneering systems for the composites industry that cover a wide variety of production processes and a broad range of temperatures.

The very latest production processes and facilities, combined with comprehensive R & D activities, ensure that our products are manufactured cost effectively and environmentally friendly, and conform to the highest quality standard – worldwide.



Discover more on  
[youtube.com/rampfgroup](https://youtube.com/rampfgroup)

# **Your industry** | Your application

Quality, progress, and  
performance for all key industry  
applications







## AEROSPACE

- Cutting jigs
- Drilling fixtures & jigs
- Galvanobath models
- Interior fittings
- Lay-up tools
- Stretch forming tools/shaping dies



## AUTOMOTIVE CONSTRUCTION AND MANUFACTURING

- Cutting jigs
- Data control models
- Fixtures & jigs
- Functional cubing
- Galvanobath models
- Hammer forms
- Lay-up tools
- Metal forming tools
- Pilot production
- Prototypes (parts)
- Show Cars
- Styling & design models



## CERAMICS

- General mold engineering and negatives
- Membranes (pressing)
- Models for pressure casting molds (microporous acrylic resin molds)
- Models for plaster working molds



## ELECTRICAL INDUSTRY

- Components
- Fixtures & jigs



## FOUNDRY

- Cores
- Core boxes
- Master models
- Models, pattern plates
- Negatives



## FURNITURE & BOOTH CONSTRUCTION

- Decorative panels
- Interior fittings
- Paneling / wall cladding



## MARINE INDUSTRY

- Interior fittings
- Lay-up tools
- Master models
- Molds for laminating parts



## MECHANICAL ENGINEERING

- Assembly jigs
- Fixtures & jigs
- Molds
- Machine parts
- Models
- Support casting



## MEDICAL TECHNOLOGY

- Cutting jigs
- Fixtures & jigs
- Molds
- Models



## PLASTICS PROCESSING

- Cutting jigs
- Fixtures & jigs
- Foam molding tools
- Prototypes (parts)
- UP forming tools
- Vacuum forming molds



## SPORT AND LEISURE

- Cutting jigs
- Fixtures & jigs
- Lay-up tools for small-series
- Models
- Theme parks



## WIND ENERGY

- Lay-up tools (RTM / resin infusion)
- Master models
- Models for laminating parts



## **Products and services**

Together with you we develop creative and customized solutions that are tailored to meet your specific needs and requirements.



## MATERIALS

<b>RAKU® TOOL</b> Board materials	<b>RAKU® TOOL</b> Close Contour products	<b>RAKU® TOOL</b> Liquid systems
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### **Creative, high-performance, sustainable:**

RAMPF Tooling Solutions develops and produces styling, modeling, and working board materials, Close Contour pastes, Close Contour castings / blocks, and liquid systems.

## PRODUCTION SYSTEMS

Mold design and construction	Model-making	Production	Prototyping	Tool design and construction
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### **Customized, high-tech, professional:**

RAMPF Tooling Solutions develops systems for use throughout the entire production chain – from prototyping, model, mold, and tool construction to production – for existing and future customers and market requirements.

## SERVICES

Technical support and applications technology	Close Contour casting services	Research and development	Internal und external training
Paste applications	Recycling	Supply-chain management	

### **Customer-oriented, skilled, committed:**

The experts from RAMPF Tooling Solutions support their customers in technology and product applications, and in the implementation of their ideas – also on-site. They also offer training courses in which the products and solutions are presented using practical demonstrations.

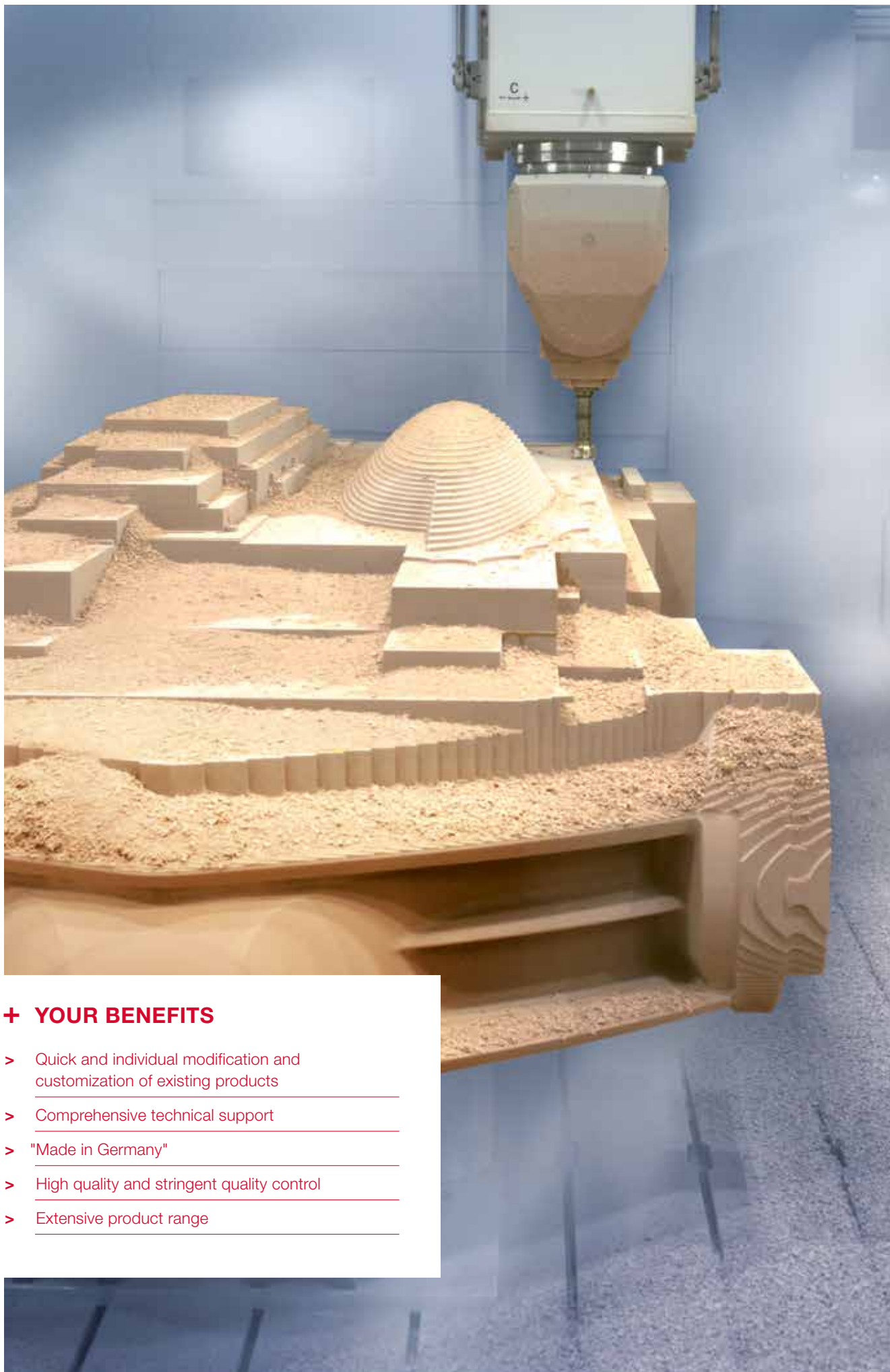






#### **BOARD MATERIALS**

Mill it. Finished.  
We are the world's largest  
producer of styling, modeling,  
and working boards.



## + YOUR BENEFITS

- > Quick and individual modification and customization of existing products
- > Comprehensive technical support
- > "Made in Germany"
- > High quality and stringent quality control
- > Extensive product range

# RAKU® TOOL Board materials

## We have the solutions for your applications

Over the last 40 years, RAMPF Tooling Solutions has been producing board materials. We are the market leader with the world's largest production of styling, modeling, and working boards.

### RAKU® TOOL Board materials at a glance

AREA	KEY APPLICATIONS	KEY PROPERTIES	DENSITY G / CM <sup>3</sup>		
			0,08–0,47	0,5–1,0	1,1–1,7
<b>Styling Design</b>	<ul style="list-style-type: none"> <li>• Program proving</li> <li>• Supporting structures</li> <li>• Design studies</li> <li>• Negative molds</li> </ul>	<ul style="list-style-type: none"> <li>• Fine surface</li> <li>• Easy to process</li> <li>• Dimensionally stable</li> </ul>	•		
<b>Modelling</b>	<ul style="list-style-type: none"> <li>• Cubing</li> <li>• Show cars</li> <li>• Data control models</li> <li>• Functional cubing</li> <li>• Lay-up tools</li> <li>• Jigs &amp; fixtures</li> </ul>	<ul style="list-style-type: none"> <li>• Very fine surface</li> <li>• Easy to machine</li> <li>• Dimensionally stable</li> </ul>		•	
<b>Prototyping / Small series</b>	<ul style="list-style-type: none"> <li>• Hammer forms</li> <li>• Lay-up tool</li> <li>• Rapid Prototyping casting molds</li> <li>• Flanging tools</li> <li>• Welding fixtures</li> </ul>	<ul style="list-style-type: none"> <li>• Good mechanical properties</li> <li>• Easy to machine</li> <li>• Impact and edge strength</li> </ul>			•
<b>Foundry</b>	<ul style="list-style-type: none"> <li>• Pattern plates</li> <li>• Core boxes</li> <li>• Models</li> <li>• Negatives</li> <li>• Auxiliary tools</li> </ul>	<ul style="list-style-type: none"> <li>• Excellent abrasion resistance</li> <li>• Good temperature resistance</li> <li>• Low thermal expansion</li> <li>• Eco-friendly and sustainable</li> </ul>		•	•
<b>Ceramics</b>	<ul style="list-style-type: none"> <li>• Models</li> <li>• Appliance and working models</li> <li>• Negatives</li> <li>• Auxiliary tools</li> </ul>	<ul style="list-style-type: none"> <li>• Excellent surface</li> <li>• Good styrene resistance</li> </ul>		•	•
<b>Composites</b>	<ul style="list-style-type: none"> <li>• Models</li> <li>• Lay-up molds</li> <li>• Prepreg lay-up tools</li> </ul>	<ul style="list-style-type: none"> <li>• Good impact strength</li> <li>• Chemical resistant</li> <li>• Can be polished to a high gloss</li> </ul>	•	•	•

#### Products and services:

#### HIGH-PERFORMANCE RANGE OF STANDARD PRODUCTS

which can be rapidly adapted to meet changing market needs.

#### COMPLETE PACKAGE SOLUTION

comprising boards, matching adhesives, and repair pastes.

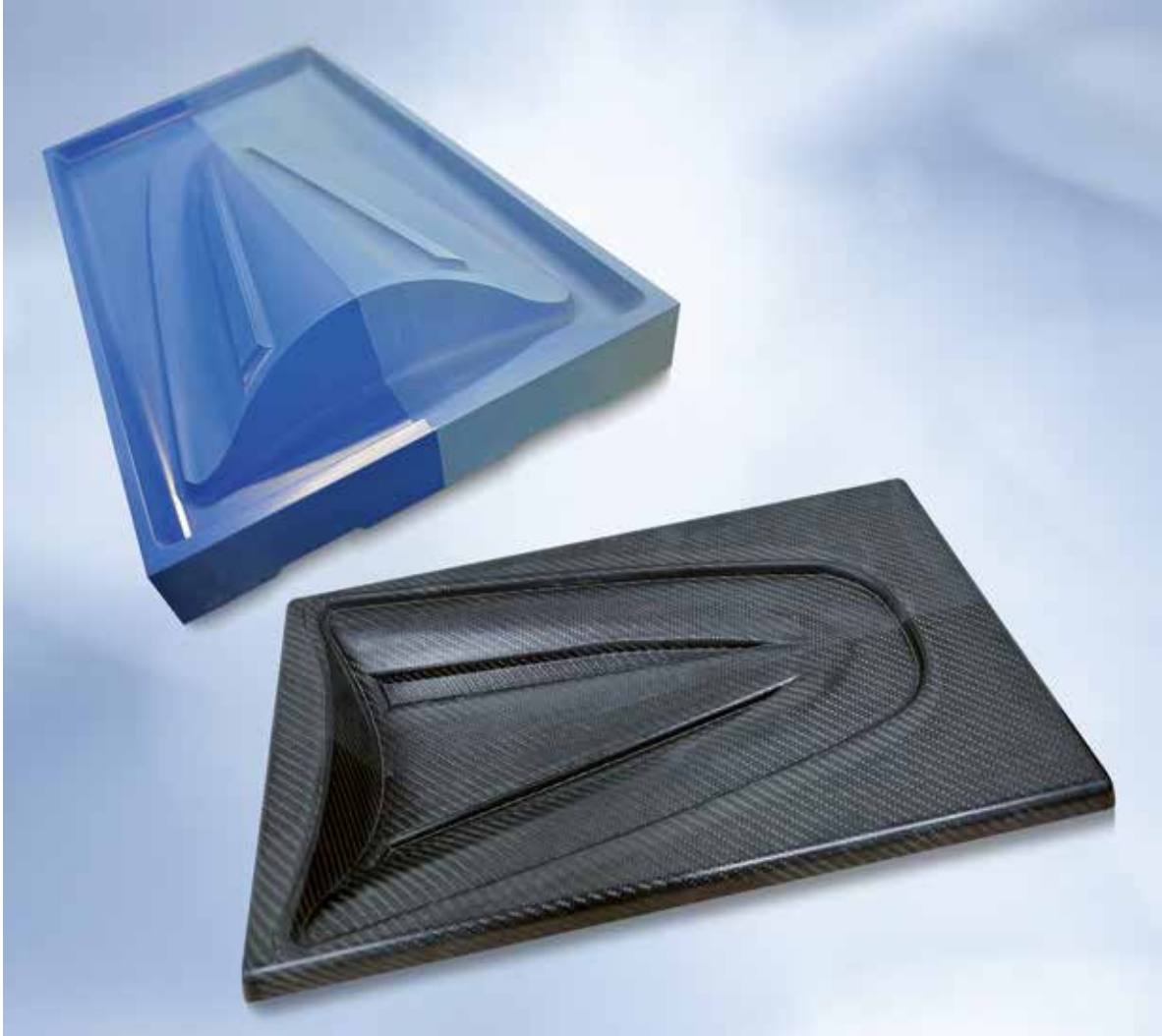
#### CUSTOMIZED PRODUCTS

Your partner for customized developments tailored to your specific requests.

# Applications Board materials

## PREPREG LAY-UP TOOL

**RAKU® TOOL** WB-0890 Board material



### + ADDED VALUE

- |   |  |
|---|--|
| > Finest surface structure  | > Dimensionally stable   |
| > Less finishing time   | > Excellent edge strength  |
| > Significantly less sealer needed  | > Compatible with all paints, release agents, and epoxy prepregs in line with industry standards |
| > Surface quality finish of master model is transferred onto prepreg mold <ul style="list-style-type: none"><li>· no re-sanding of mold necessary</li><li>· prolonged service life of prepreg molds</li></ul> | > Easy and quick to machine  |
| > HDT 100–110 °C  | > Very good chip formation, no sticking  |



## PATTERN PLATE FOR THE MANUFACTURE OF A FAN HOUSING

**RAKU® TOOL** WB-1258 Board material

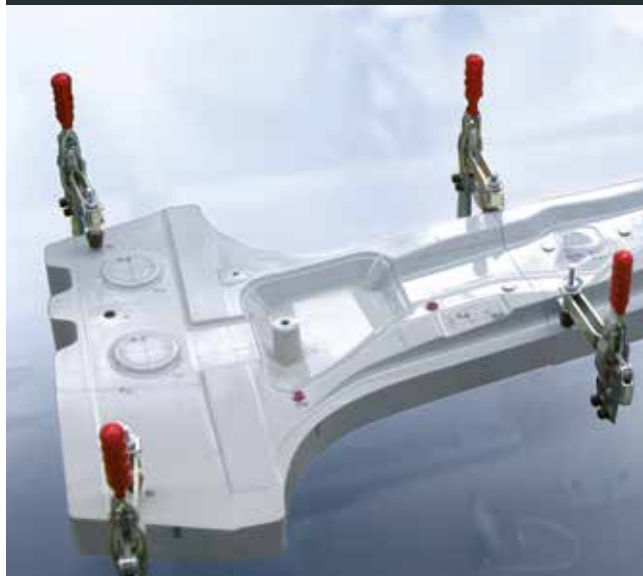
### + ADDED VALUE

- > Very high abrasion resistance with high dimensional stability and accuracy
- > For large series production:  
> 100,000 replications under corresponding operating conditions
- > Minimal sand adhesion
- > Fast and high-precision production of models through direct milling from CAD data
- > Limited handling of liquid systems (adhesive)
- > Quick and easy changes
- > Cost savings in comparison to metal or face cast pattern plates
- > Color matched adhesive
- > Excellent impact resistance and edge strength
- > Excellent resistance to chemicals, no swelling
- > Save the planet! This board is produced using eco-friendly recycling polyol



## FIXTURE

**RAKU® TOOL** WB-1000 Board material



### + ADDED VALUE

- > Approximately 60 % reduction in weight compared to metal, i. e. jigs and fixtures are easier to handle
- > More cost-effective than metal
- > Easy processing and post-processing
- > Any required dimension can quickly be joined together by bonding the board material. No welding or drilling required. Thanks to adhesives specifically matched to the board material, the final properties remain the same







### **CLOSE CONTOUR PRODUCTS**

Seamless modeling pastes.  
Ready to mill castings.





# RAKU® TOOL

## Close Contour products

Every job is different.  
So are our solutions.



### + YOUR BENEFITS

- > Close Contour shape
- > Rapid milling
- > Little waste
- > Seamless, fine surface

Close Contour pastes, Close Contour blocks, and Close Contour castings are high-performance products and the result of targeted development work and years of practical experience. We tailor our Close Contour products to your specific requirements quickly and effectively.

## CLOSE CONTOUR CASTINGS

### **Extensive advice and consulting**

Our experienced team supports you during project planning and implementation.

### **Ordering, easy and quick.**

Simply provide us with the CAD data of the part / mold in igs file or stp file format including machining allowance.

### **Mold construction, casting, and post-cure – no work for you!**

We produce the casting mold based on your CAD data. The ensuing casting process involves specific heat treatment and quality control. The high mechanical properties of the final product are achieved through the post-cure process.

### **Delivery**

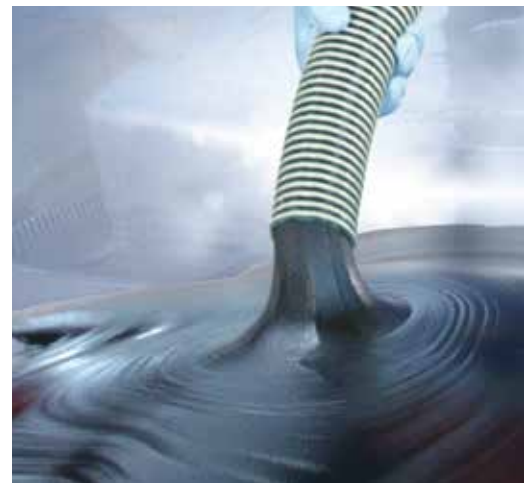
We supply you with a ready to mill casting and you can concentrate on your key strength – milling.

## CLOSE CONTOUR PASTES

The paste is applied to a close contour shape supporting structure, cured, and then machined according to CAD data. RAMPF Tooling Solutions also offers a Close Contour Paste application service.

## CLOSE CONTOUR BLOCKS

Special blocks are produced in renown board quality according to customer specifications (L x W x H) and supplied as customized, rectangular, unmachined blocks.

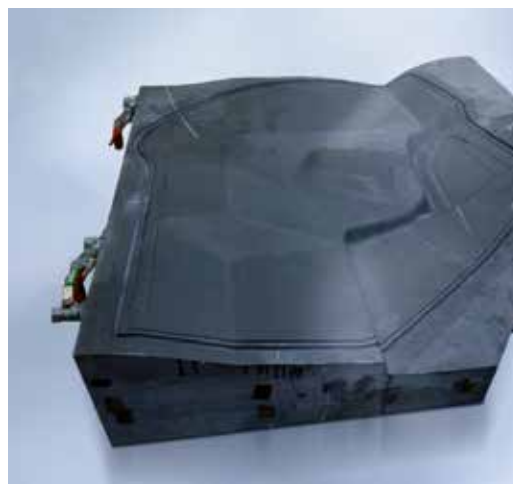
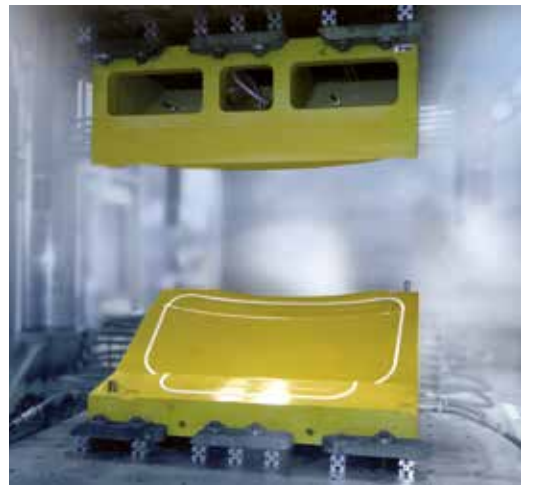


## RAKU® TOOL Close Contour products at a glance

	CLOSE CONTOUR PASTES	CLOSE CONTOUR BLOCKS	CLOSE CONTOUR CASTINGS
<b>KEY APPLICATIONS</b>			
Design and styling	•		
Master models, cubing models	•	•	•
Molds	•	•	•
Jigs and fixtures	•	•	•
Tools	•	•	•
Foundry patterns		•	•
<b>QUALITATIVE SELECTION CRITERIA</b>			
Size of the models / tools	Medium to very large*	Small to medium	Medium to large*
Mechanical properties / depending on product	See data sheet	See data sheet	See data sheet
<b>ECONOMIC SELECTION CRITERIA</b>			
Little waste	•	•	•
Quick machining due to close contour shape	•	•	•
Light, cost-effective supporting structures	•		
No handling of liquid products		•	•
Delivery time	Immediate	Approx. 5 days	Approx. 10 days
Equipment costs	•	None	None
Work hygiene / exposure	Marginal	None	None
Special features	Seamless surface	Seamless surface	Seamless surface

\* With large models / molds build-up in segments possible

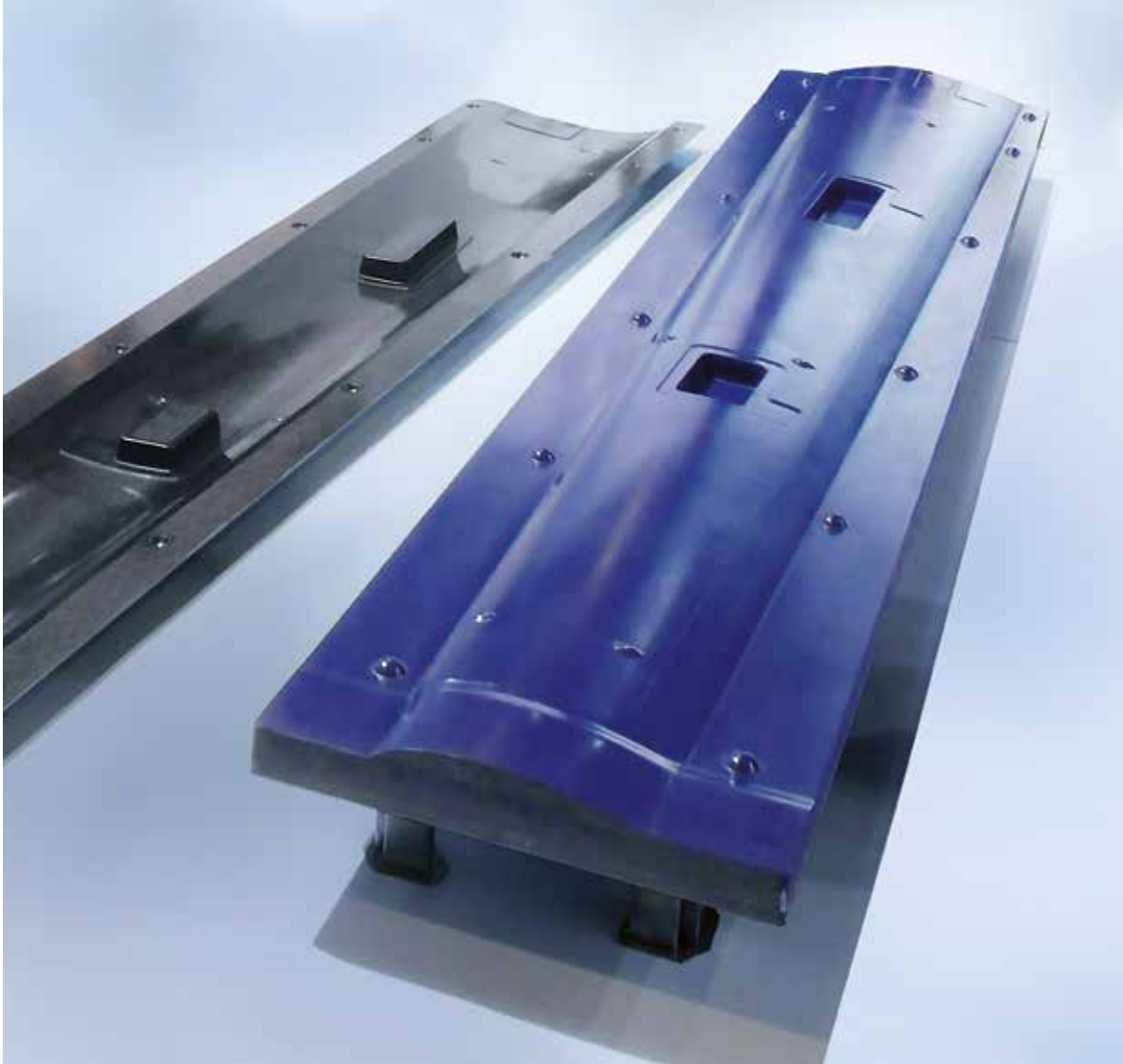




# Applications Close Contour

## PRODUCTION OF A PREPREG LAY-UP TOOL FOR MANUFACTURING AN AIRCRAFT WING

**RAKU®TOOL** CC-6503 Close Contour casting



### + ADDED VALUE

- > Excellent surface of LTM prepreg mold, no bonding lines
- > No bonding or cutting of board material – overdimensional casting supplied ready for machining
- > Shorter machining time thanks to close contour shape
- > Temperature resistant up to 80 °C
- > Good dimensional stability

## MANUFACTURE OF A MOLD FOR PRODUCING WIND TURBINE BLADES USING THE COMPOSITE CONSTRUCTION METHOD

**RAKU® TOOL** CP-6060 Close Contour paste



### + ADDED VALUE

- > Close contour shape
- > Faster machining, less waste
- > Economical production of large models and molds
- > High temperature resistance up to 70 °C
- > Very fine, homogeneous surface
- > Good dimensional stability
- > Can be processed after approx. 9 hours curing at RT

## PRODUCTION OF FUNCTIONAL PROTOTYPES (PASSENGER CABINS)

**RAKU® TOOL** CC-6506 Close Contour casting

### + ADDED VALUE

- > Very dense, homogeneous, and fine surface, polishable
- > Excellent surface of RIF tool, no bonding lines
- > Reduction of milling time through close contour shape
- > High temperature resistance up to 110 °C
- > Good dimensional stability, good compressive strength
- > Compatible with all paints in line with industry standards
- > Eco-friendly due to less waste (close contour shape)









**POLYURETHANE AND  
EPOXY LIQUID SYSTEMS**

Results guaranteed!





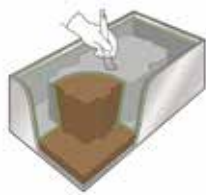
# RAKU® TOOL

## Liquid materials

### Gelcoats, Laminating, Casting, and Multipurpose Systems.

RAKU® TOOL liquid products offer a large selection of innovative and efficient gelcoat, laminating, casting, and multipurpose systems for various manufacturing techniques, build-up methods, and applications.

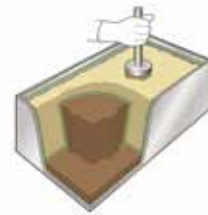
#### LAY-UP



Gelcoats



Backing / Full casting



Backing / Tamping



Laminating with fibers



Laminating with pastes

#### CASTING



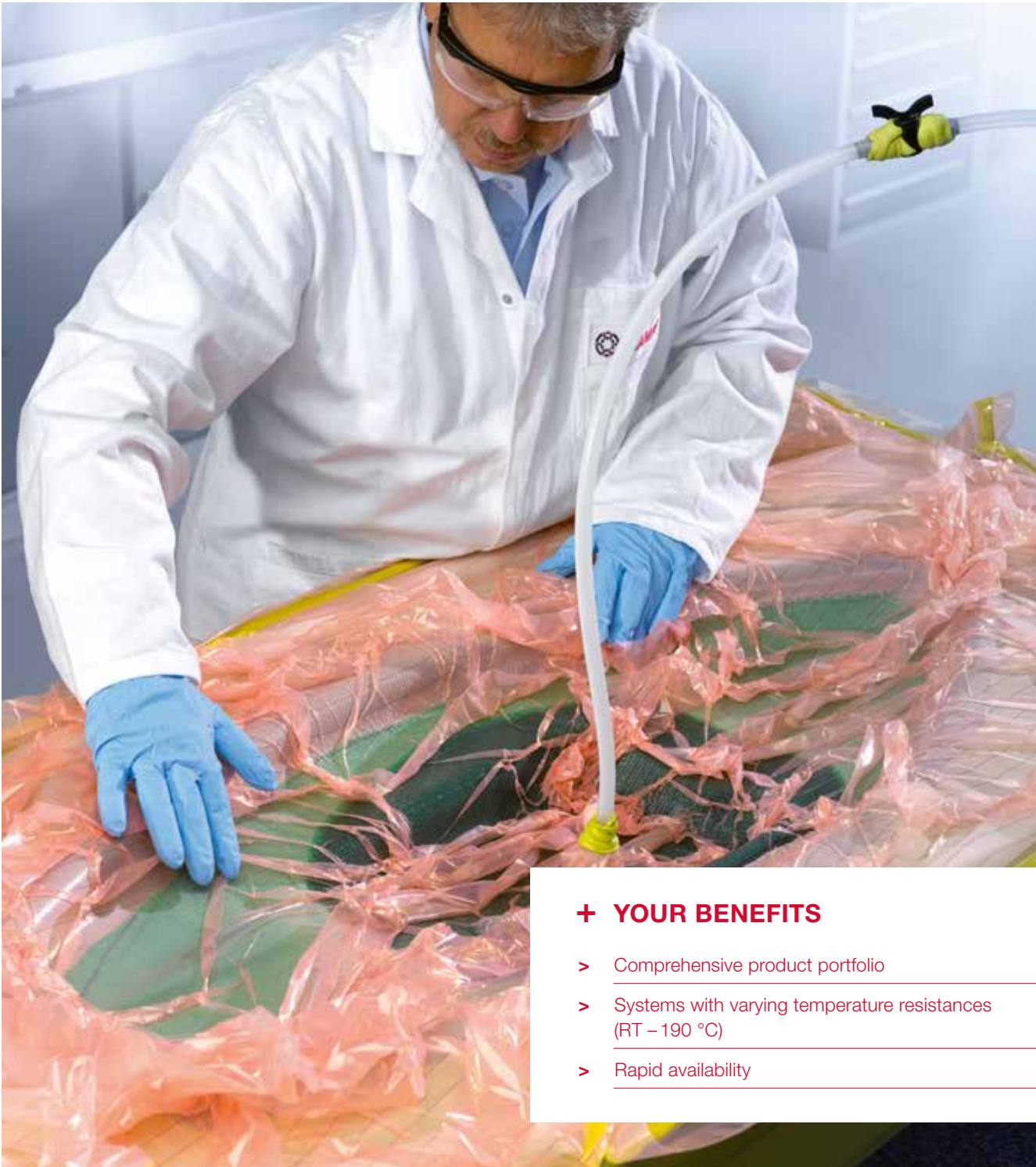
Full casing



Face casting

# At a glance

<b>GELCOATS</b> Epoxy, Polyurea	<b>RAPID PROTOTYPING SYSTEMS</b> Polyurethane
<b>LAMINATING AND MULTIPURPOSE SYSTEMS</b> Epoxy	<b>FAST CAST</b> Polyurethane
<b>LAMINATING PASTES</b> Epoxy	<b>REPAIR PASTES</b> Epoxy
<b>INFUSION SYSTEMS</b> Epoxy	<b>ADHESIVES</b> Epoxy, Polyurethane
<b>CASTING SYSTEMS</b> Epoxy, Polyurethane, Polyurea	<b>AUXILIARIES</b> Release agents, Fillers



## + YOUR BENEFITS

- > Comprehensive product portfolio
- > Systems with varying temperature resistances (RT – 190 °C)
- > Rapid availability

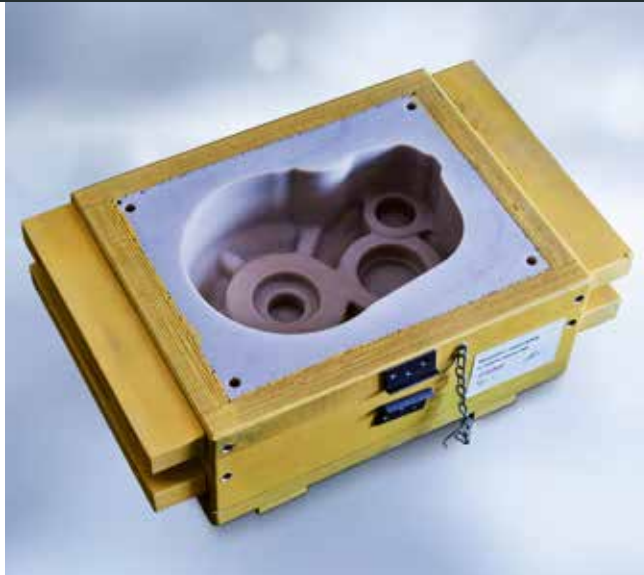
# Applications Liquid materials

## CORE BOX FOR THE PRODUCTION OF A GEAR BOX

**RAKU®TOOL** PC-3403 / PH-3903 / AC-9004 Mass casting

### + ADDED VALUE

- > Production of several identical core boxes with one core possible
- > Highly detailed and dimensionally accurate
- > Through the full casting process it is possible to represent geometries that cannot be obtained through milling (e.g. corner without radius)
- > Sufficient abrasion resistance for approx. 250–500 moldings
- > Can be cast in thick layers and large volumes, up to 350 mm with max. filler ratio using the full casting process
- > Excellent mechanical properties (filled and unfilled)
- > Minimal shrinkage
- > Casting viscosity can be adjusted via the addition of filler
- > Easy to repair and modify



## CARBON BOAT

**RAKU®TOOL** EI-2500 / EH-2970-1 Resin Infusion with CFRP



### + ADDED VALUE

- > Good flow and wetting properties
- > Temperature resistant up to 115 °C
- > RT curing
- > Unfilled, low viscosity
- > Suitable for resin infusion and RTM

## PAINT AND ASSEMBLY PROTECTION FOR PRODUCTION IN THE AUTOMOTIVE INDUSTRY

**RAKU® TOOL** PR-3650 / PH-3904 Rapid prototyping

### + ADDED VALUE

- > Contrary to thermoplastics, the rapid prototyping system can already be used to produce a small number of parts. There are no large investments for tools.
- > Simulates PE / PP
- > No heated molds are necessary e.i. no brittle phase after demolding
- > Fast demold time, after approx. 15 min.
- > The material can be processed at room temperature
- > High impact strength
- > Compatible with filler and paint



## THREE-PART CORE BOX FOR SERIES PRODUCTION

**RAKU® TOOL** PC-3458 / PH-3958 Casting system



### + ADDED VALUE

- > The original: "Orange" and highly abrasion resistant
- > Can be put into operation the next day
- > Proven, more than 170,000 parts produced under corresponding operating conditions
- > Very high dimensional stability and accuracy of foundry core box (metal support)
- > When wear limit has been reached, the front casting layer can be refaced (cost reduction for maintenance / reconditioning)
- > Excellent resistance to chemicals, no swelling
- > No / minimal sand adhesion



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

## **RAMPF – a global market-leading specialist in custom chemical and engineering solutions**

We are experts for reactive resins, machine systems, and lightweight composite construction solutions.

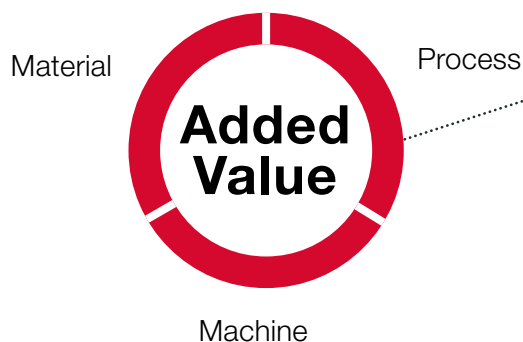
Our mission – discover the future.

In partnership with our customers, we develop tomorrow's products and tailored solutions today – for the decisive competitive edge.

Over the last 40 years, we have grown from an inventive one-man business into an international medium-sized group of companies, with operations at twelve locations on three continents.

Now run by the next generation of our family, the business still maintains the same fundamental values – being a trustworthy and reliable partner for our customers and our employees. This is the only way to build lasting, successful partnerships.

At RAMPF, innovation and tradition go hand in hand. We are one big family, focusing on the future with a sustainable, value-adding approach, and are very much aware of the social and environmental responsibilities associated with our business activities. That is why we are committed to promoting a respectful and appreciative way of dealing with one another.



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

Founded as a  
One-man Business

**1980**

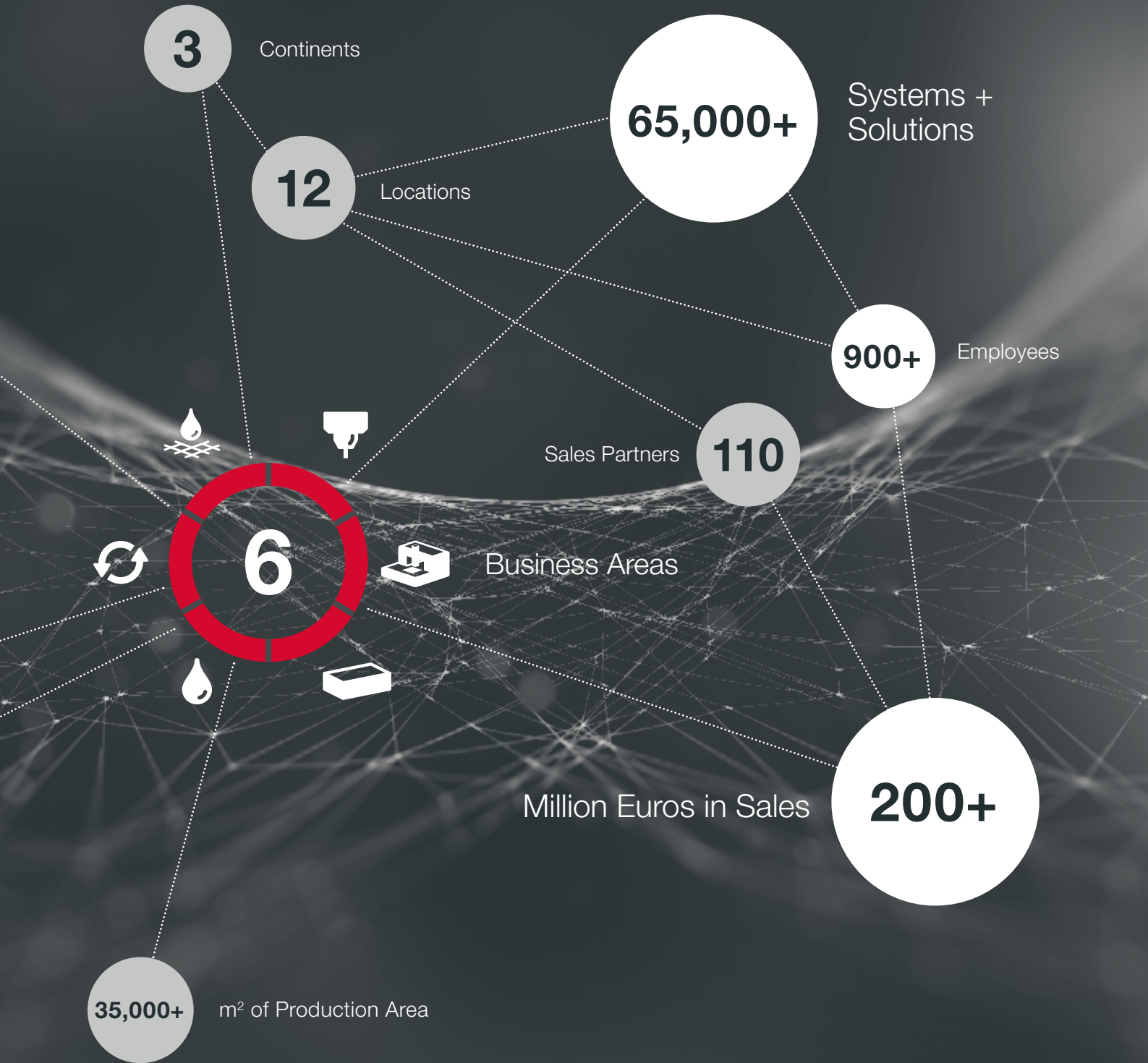
Second-generation  
Family Company

**2**

m<sup>2</sup> of Laboratories

**3,000+**







**RAMPF –**

discover the future

Developing the Solutions  
of Tomorrow – Today.

**+49.7123.9342-1600**

**[tooling.solutions@rampf-group.com](mailto:tooling.solutions@rampf-group.com)**

**Mass production?**  
Not at RAMPF.

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

