



RAMPF ADVANCED POLYMERS

# RAKU® TOOL

Trend-setting systems for the composites industry



# RAKU® TOOL Board Materials

Optimizing processes and efficiency

Model and mold engineering materials are essential in the composite industry for manufacturing high-quality components. They enable the precise production of molds and models that serve as negative molds or tools, allowing for the manufacture of final composite parts with complex geometries and excellent surface quality.



**Epoxy Boards**

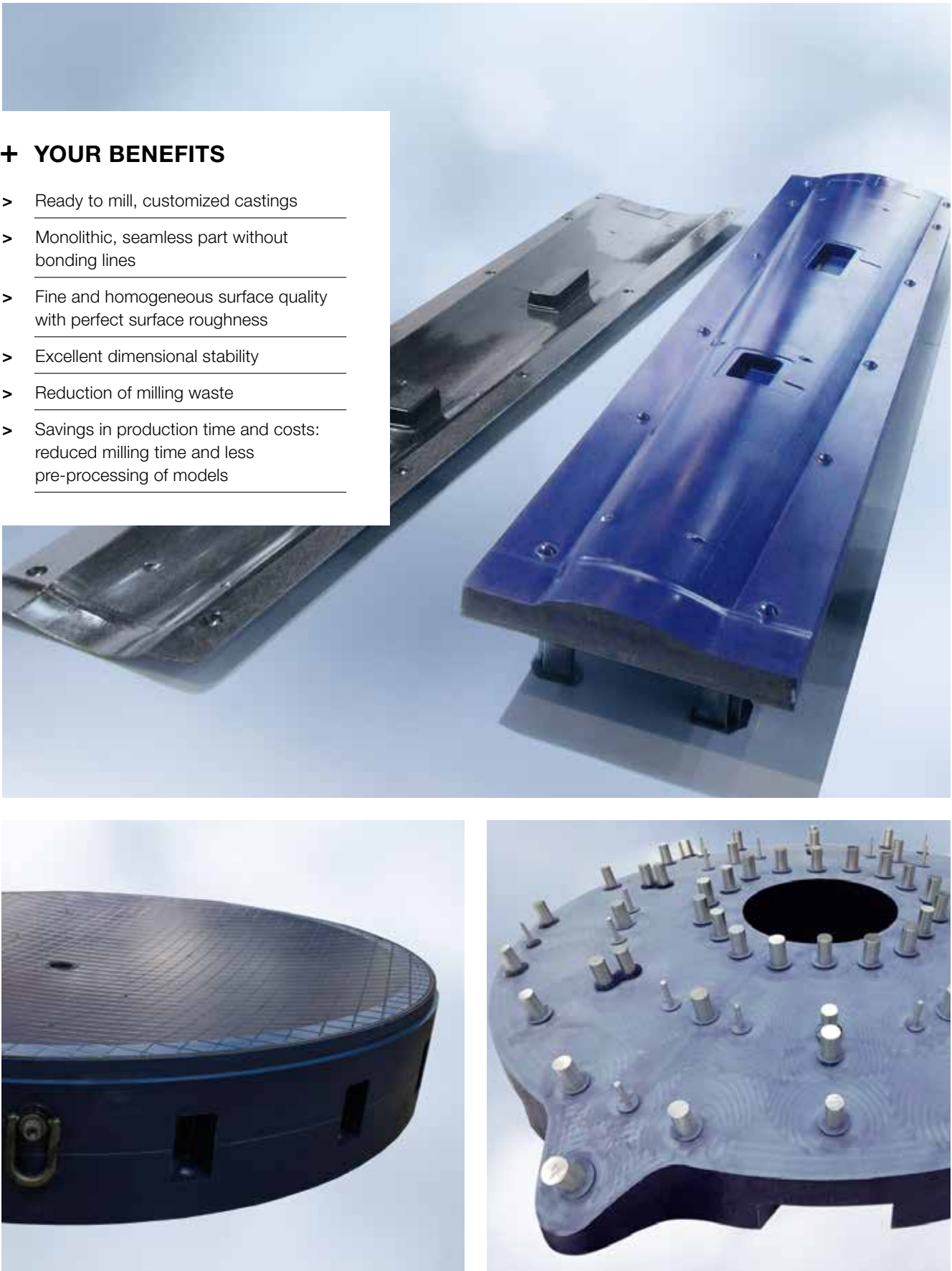
**+ YOUR BENEFITS**

- > Very fine, closed surface, minimized sealer consumption and finishing
- > Dimensionally stable, no distortion
- > Easy to mill
- > Compatible with all standard sealers and release agents
- > Optimal adhesive and repair package: specifically tailored to heat resistance and hardness of the boards
- > Short processing times
- > Customized boards for a wide range of applications

# RAKU® TOOL Close Contour Casting & Blocks

## + YOUR BENEFITS

- > Ready to mill, customized castings
- > Monolithic, seamless part without bonding lines
- > Fine and homogeneous surface quality with perfect surface roughness
- > Excellent dimensional stability
- > Reduction of milling waste
- > Savings in production time and costs: reduced milling time and less pre-processing of models





# Close Contour Pastes

Dimensionally stable, seamless models and molds



**+ YOUR BENEFITS**

- > Very fine, homogeneous, and seamless surface quality for all component sizes
- > Cost-efficient model construction thanks to low-cost substructure
- > Easy and fast milling with less waste due to close contour shape
- > Good dimensional stability
- > Heat resistant
- > Easy processing, paste application by hand or CNC machine
- > Can be applied without slump on vertical surfaces
- > Low exotherm, machinable after 9-14 hours room temperature cure
- > Suitable for large components

# Infusion and Laminating Systems

Light and strong – High-strength, durable parts



**Epoxy Gelcoat Systems**

**+ YOUR BENEFITS**

- > Sandable and polishable
- > Abrasion and chemical resistant
- > Polishable to a high gloss
- > Suitable for high-temperature applications

**Epoxy Laminating Systems**

**+ YOUR BENEFITS**

- > High mechanical properties with room temperature curing
- > Excellent wetting properties
- > Pot life and curing times adjustable via hardeners
- > Outstanding compatibility with fibers, fabrics, and fillers
- > Good strength
- > Solvent-free

**Epoxy Infusion & RTM Systems**

**+ YOUR BENEFITS**

- > Low viscosity
- > No degassing under vacuum
- > Excellent wetting and flow properties
- > Suitable for high-temperature applications



Selection Criteria

Various production processes.  
First-class products.

The following information is based on our experience with plastic molds and tools.  
The processes / methods / unit volumes can vary in practice.

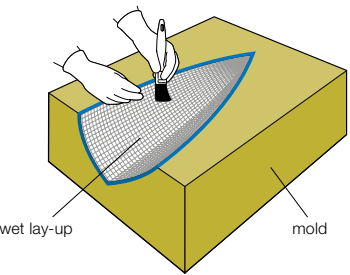
PRODUCTION PROCESSES							
	HAND/ WET LAY-UP	VACUUM BAGGING/ WET LAY-UP	RESIN INFUSION	VACUUM BAGGING/ PREPREG (OUT OF AUTOCLAVE)	AUTOCLAVE PROCESS	WET COMPRESSION MOLDING	RTM
ECONOMIC SELECTION CRITERIA							
Series volume	< 50	< 50	< 50	< 50	< 100	< 100	< 100
Cycle times	long	long	long	moderate	moderate	short	short
Process costs	low	low	low	high	very high	high	very high
QUALITATIVE SELECTION CRITERIA							
Possible geometry	Complex	Complex	Complex large and thick parts	Complex, size limited by autoclave/ circulating air oven	Complex, size limited by autoclave/ circulating air oven	Complex, size limited by molding press	Complex, size limited by fixing equipment
Surface finish	moderate	good	good	good	good	good	good
Design	one-sided	one-sided	one-sided	one-sided	one-sided	double-sided	double-sided
Part quality	semi- moderate	moderate	high	very high	very high	high	high
Part thickness variance	very high	high	low	very low	very low	very low	very low
Typical fiber volume content	approx. 35 % fabricator dependent	approx. 40–45 %	approx. 50–55 %	approx. 55–60 %	approx. 65–70 %	approx. 50–55 %	approx. 50–55 %
Mechanical properties	low	moderate	very high	very high	very high	high	high
Structural changes	easy	easy	easy	easy to moderate	moderate to difficult	moderate to difficult	moderate to difficult
Process reliability and reproducibility	moderate	moderate	good	very good	very good, controlled process parameters	very good, controlled process parameters	very good, controlled process parameters

Production Process

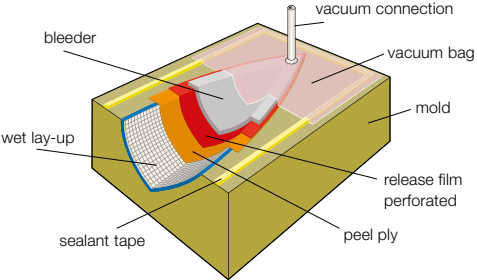
Quality and efficiency in  
perfect harmony

The key production processes for **RAKU® TOOL** materials are:

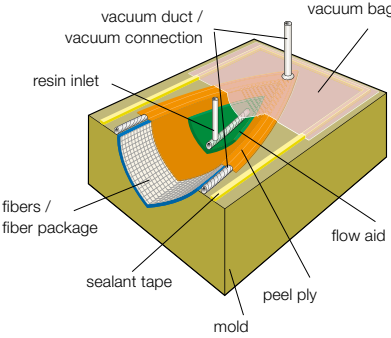
HAND /  
WET LAY-UP



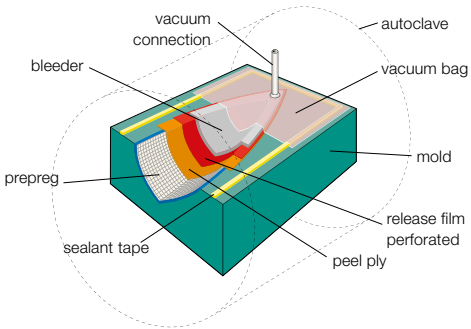
VACUUM BAGGING  
WET LAY-UP



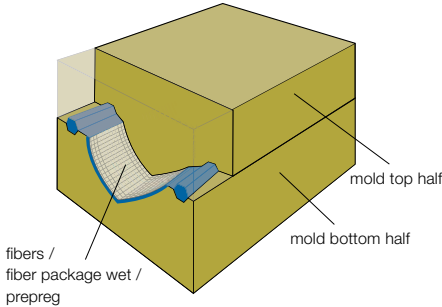
RESIN INFUSION



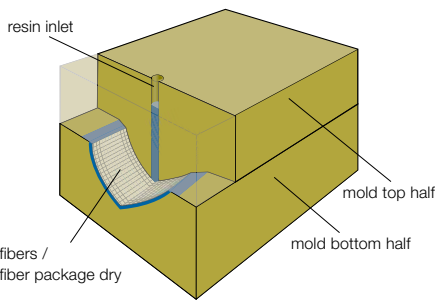
AUTOCLAVE PROCESS



WET COMPRESSION MOLDING



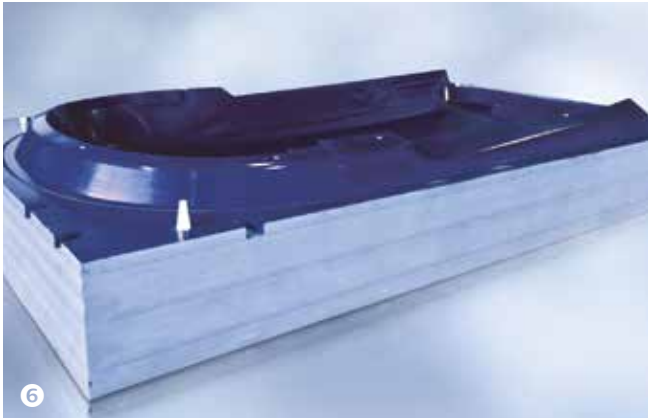
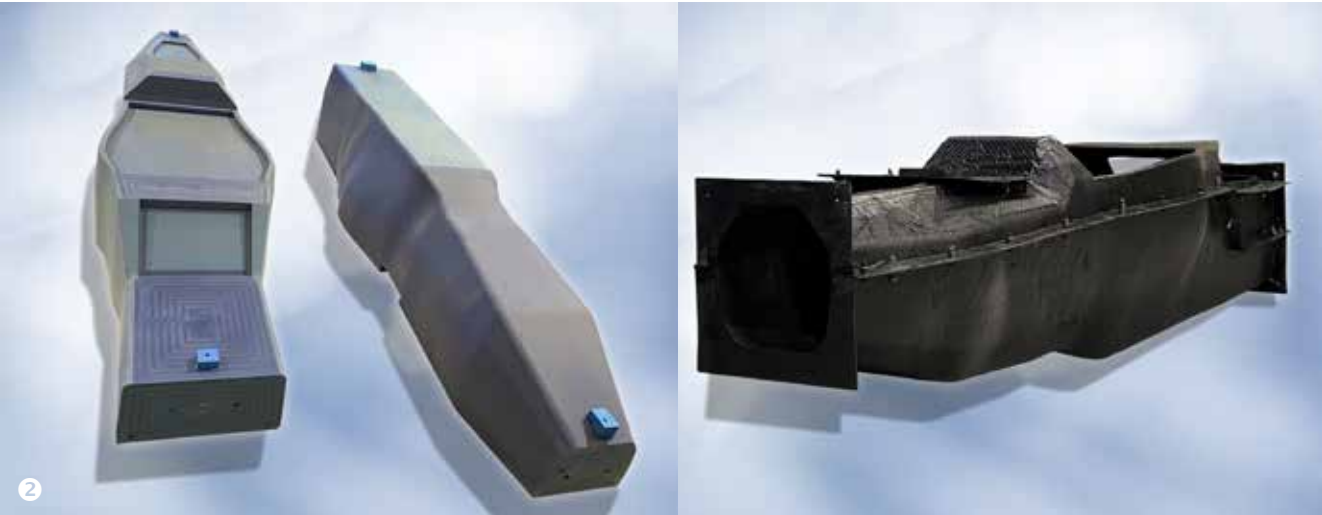
RTM  
(RESIN TRANSFER MOLDING)





# RAKU® TOOL in action

Product and solution examples from the marine, wind energy, automotive, and motorsport industries.



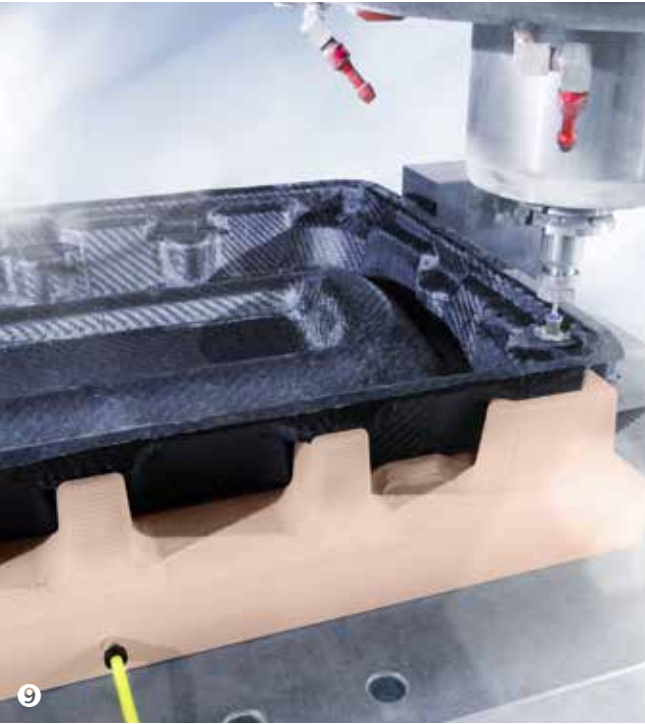
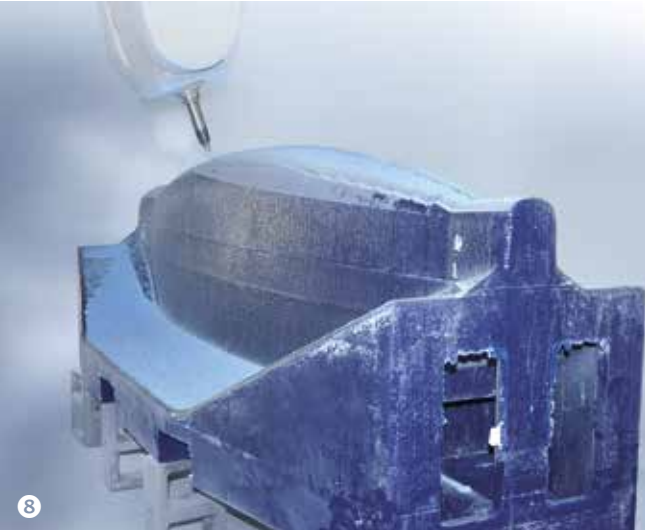
- ❶ Wind blade master model made from RAKU® TOOL CP-6060 to produce a lay-up tool for wind blade manufacture
- ❷ Master model made from RAKU® TOOL CC-6503 Close Contour Casting for student formula racing car – carbon fiber part for monocoque
- ❸ Master model made from RAKU® TOOL CC-6503 Close Contour Casting to produce a lay-up tool with low-temperature tooling prepregs
- ❹ Master model made from RAKU® TOOL CC-6503 Close Contour Casting to produce a prepreg lay-up tool for the manufacture of an airplane silencer
- ❺ Production mold made from RAKU® TOOL WB-1404 board and fiber reinforced light weight part made from RAKU® TOOL EI-2500 / EH-2970-1 epoxy resin infusion
- ❻ Mold made from RAKU® TOOL CC-6503 Close Contour Casting for the production of carbon fiber parts via RTM

# RAKU® TOOL in action

Product and solution examples from the marine, wind energy, automotive, and motorsport industries.



7 Production mold for boat hull produced via resin infusion (gelcoat RAKU® TOOL EG-2104 / EH-2950-1 resin infusion EI-2500 / EH-2973)  
 8 Milling of master model from RAKU® TOOL CC-6503 Close Contour Casting  
 9 Vacuum clamping fixture made from RAKU® TOOL MB-0600 board



# RAMPF #DiscoverTheFuture

We have been developing and manufacturing reactive resin systems based on polyurethane, epoxy, silicone, and silane-modified polymers – for more than four decades.

- 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 protect 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.

## Chemical and Engineering Solutions

Advanced Polymers	Composite Solutions	Machine Systems	Production Systems

RAMPF Advanced Polymers is a company of the international RAMPF Group.

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