

RAKU-TOOL® | for the Foundry Industry



Innovative solutions for model, mold, and tool making

RAMPF Group

The RAMPF Group, Germany, stands for **engineering and chemical solutions** and caters to the economic and ecological needs of industry.

Our range of competencies includes:

- > Production and recycling of **materials** for modeling, bonding, and protection
- > **Technical production systems** for positioning and automation, which can be utilized as a stable basis for achieving precision and dynamics
- > **Comprehensive range of solutions and services**, particularly for innovative customer-specific requirements

Using this know-how, RAMPF helps customers achieve profitable and sustainable growth.

Trusting relationships are of utmost importance to RAMPF. They are a vital part of the success story of the family-owned company, which now spans over 35 years.

RAMPF thinks globally and acts locally. The company has production facilities strategically located in the United States, China, and Japan.

RAMPF Tooling Solutions

The company is based in Grafenberg (near Stuttgart), and is the world's biggest 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 expert advice and customer-specific service, ensure the manufacture of our tooling products around the world is cost-effective, environmentally friendly, and of consistent quality.



Machine Systems

System solutions, rump machines, basic machinery, and multi-axis positioning and moving systems based on machine beds made from innovative materials. Precision grinding of mineral casting, steel, hard stone, and ceramics.



Production Systems

Production systems with low-pressure mixing and dispensing systems for the bonding, sealing, foaming, and casting of a wide variety of materials. Wide range of automation skills relating to all aspects of process engineering.



Eco Solutions

Chemical solutions for the production of alternative polyols from PU and PET residues. Conceptual planning and custom-design of PU and PET reprocessing plants and facilities for manufacturing alternative polyols using PET and PA.



Polymer Solutions

Reactive resin systems based on polyurethane, epoxy, and silicone. Liquid and thixotropic sealing systems, electro and engineering casting resins, edge and filter casting resins, and adhesives, as well as comprehensive expertise in application technology.



Tooling Solutions

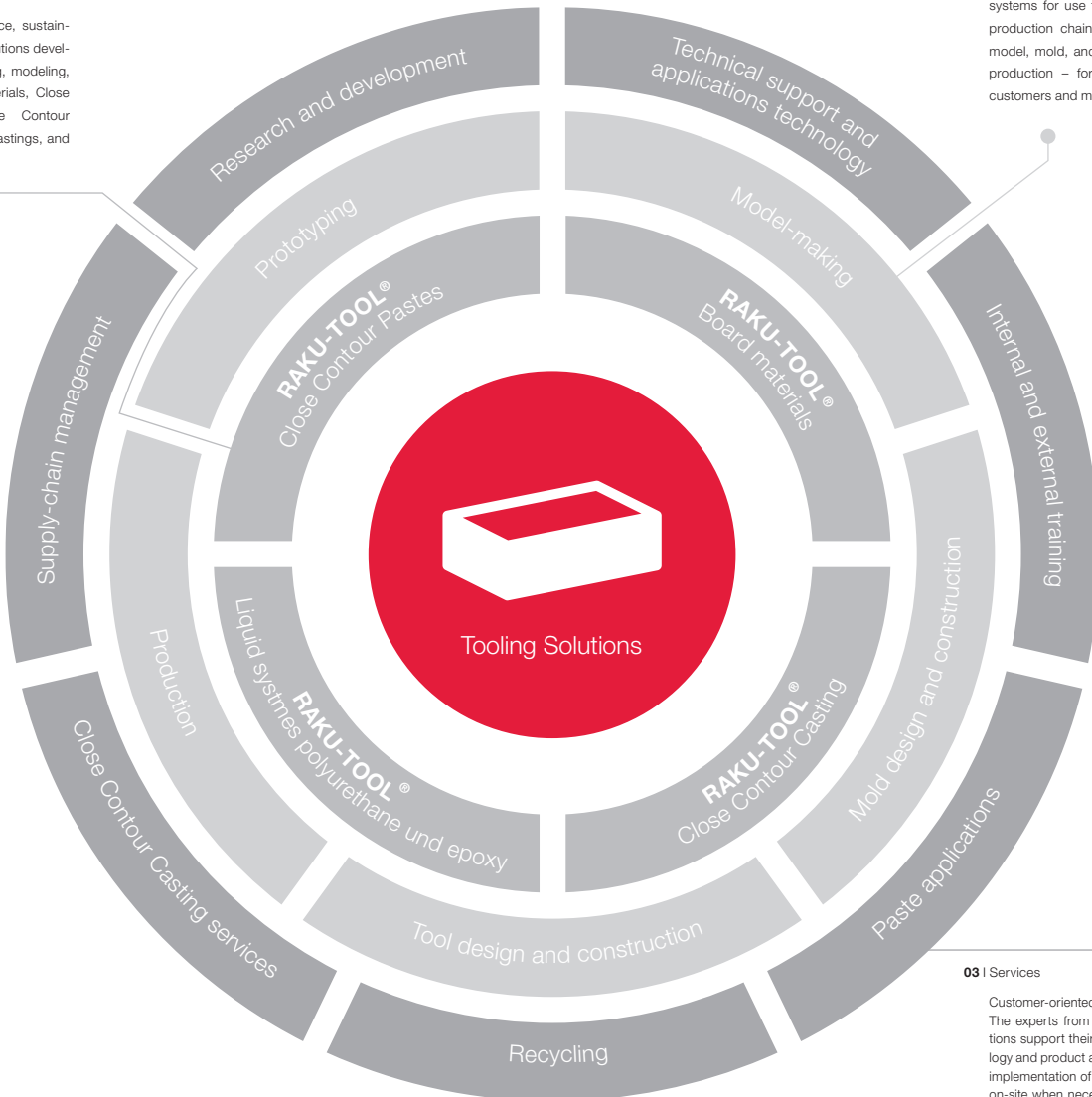
Tooling Solutions service portfolio

01 | Materials

Creative, high-performance, sustainable: RAMPF Tooling Solutions develops and produces styling, modeling, and working board materials, Close Contour Pastes, Close Contour Blocks, Close Contour Castings, and liquid systems.

02 | Production systems

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.



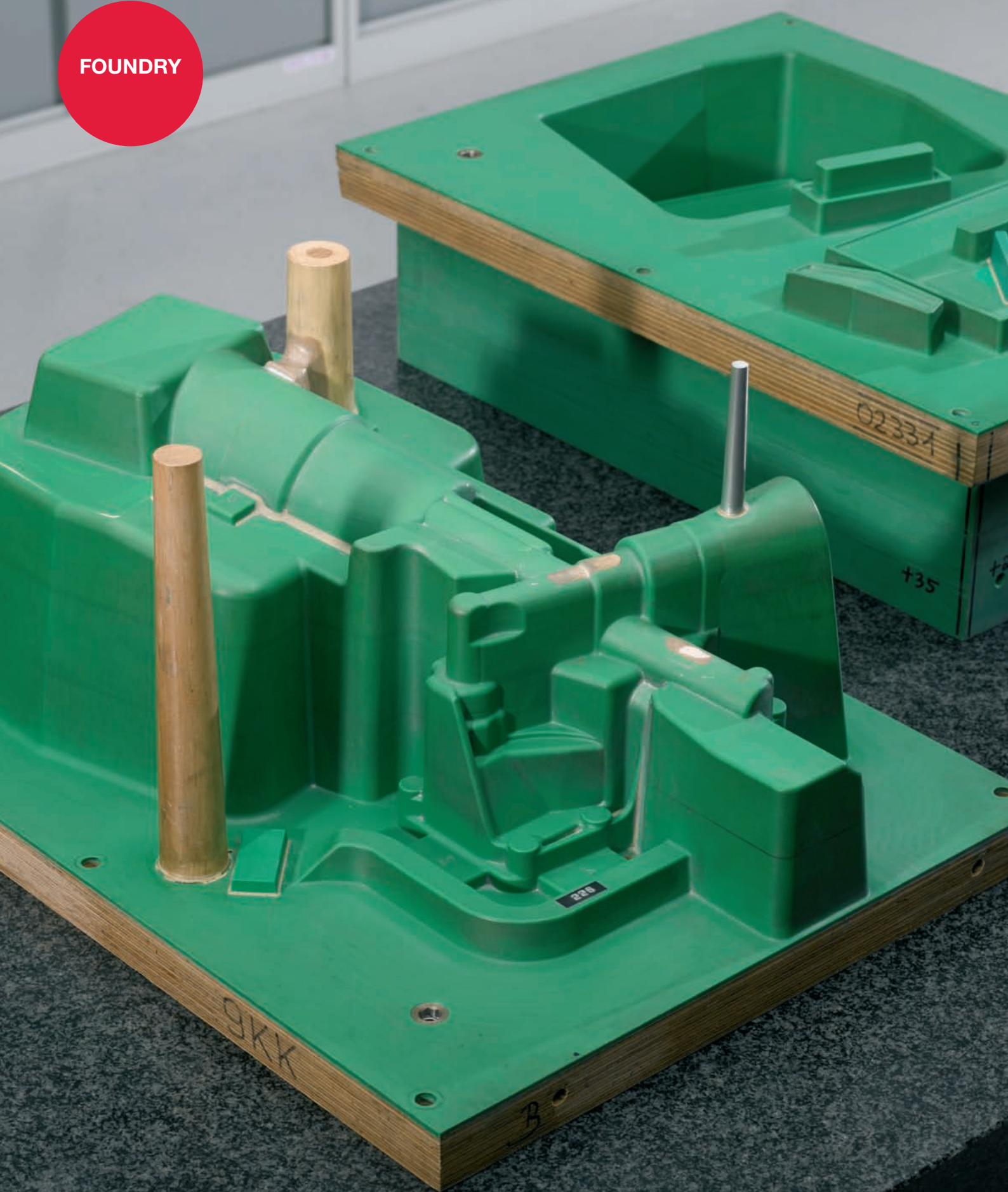
03 | Services

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 – including on-site when necessary. They also offer training courses in which the products and solutions are presented using practical demonstrations.

Foundry

» Since 2006 RAMPF Tooling Solutions has been offering modern polyurethane and epoxy board and liquid materials for molding and core making in the foundry industry. These are continuously developed to meet the latest market and process requirements. Our customers use our materials for first models, small series as well as large series production world-wide. High quality and application know-how are trademarks of RAMPF Tooling Solutions. «

FOUNDRY



RAKU-TOOL® |

Your reliable partner for the Foundry Industry

Epoxy and Polyurethane Systems for the Foundry Industry.

For a quarter of a century RAMPF Tooling Solutions has been developing and producing high quality products for models, molds and tools that are used from the design stage right through to production. Our comprehensive RAKU-TOOL® product range offers a large selection and many solutions for the foundry industry. Take advantage of our experience!

Your applications:

- > Models
- > Single and double-faced pattern plates
- > Reversible pattern plates
- > Cores, Core boxes
- > Core inserts
- > Negatives



Your advantages

- > Excellent abrasion resistance
- > Dimensional stability (no after shrinkage)
- > Good wear resistance
- > Good shape stability and strength
- > Low moisture sensitivity
- > Easy repair and change
- > Quick build-up, reduction in process costs

Product choice for your application:

RAKU-TOOL® Products	Prototyping	Small Series Production	Medium Series Production	Large Series Production
Boards	●	●	●	●
Mass Casting Polyurethane Casting Systems Fast Cast Systems	●	●		
Epoxy Gelcoats Epoxy Casting Systems Multipurpose Resins Laminating Pastes	●	●	●	
Polyurea Gelcoats Polyurea Casting Systems			●	●



FOUNDRY
Pattern Plates

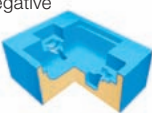
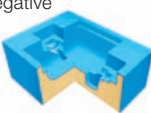
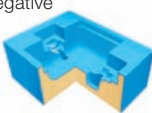
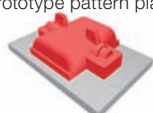
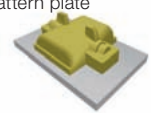
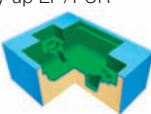
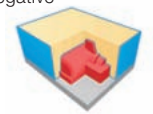
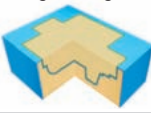
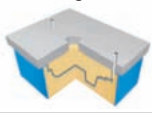
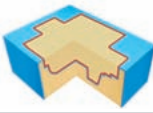
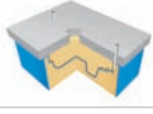


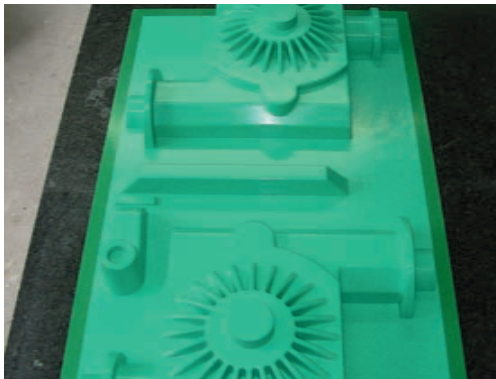
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Build-up methods for pattern plates

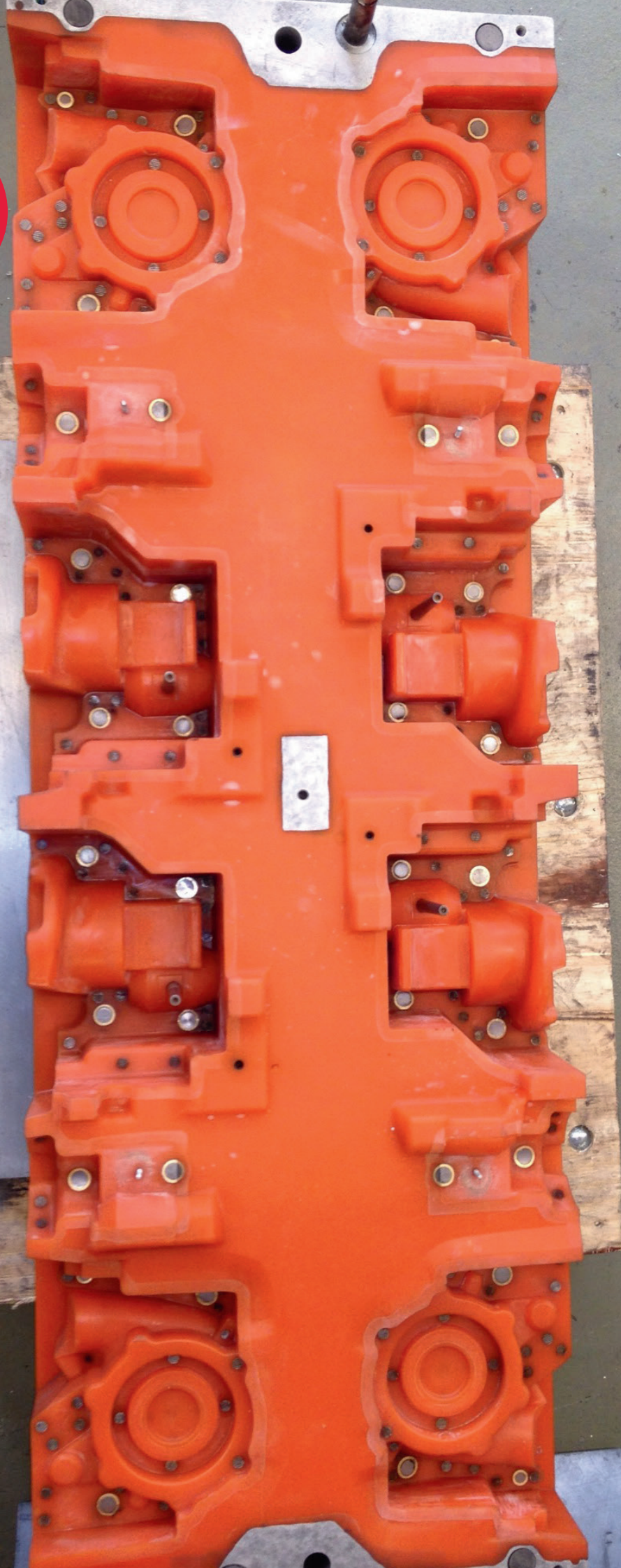
When producing foundry patterns and pattern plates various build-up methods can be chosen based on operational conditions, customer requirements and number of parts to be produced. With its comprehensive product range RAMPF Tooling Solutions offers the ideal solution for all build-up methods of plastic pattern equipment.

steps up to production

Full Casting	Lay-up	Face Casting	Prototype Pattern Plate/ Face Casting	Milling
model 	model 	model 	model 	model 
negative 	negative 	negative 	prototype pattern plate 	pattern plate 
full casting 	lay-up EP/PUR 	production of core 	negative 	
pattern plate 	backing casting 	face casting EP/PUR 	production of core 	
	pattern plate 	pattern plate 	face casting PUR 	
			pattern plate 	



FOUNDRY
Core Boxes

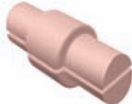
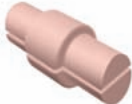
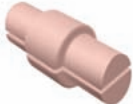
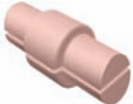
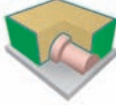
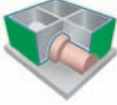
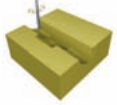
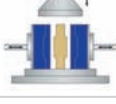
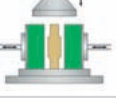
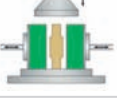
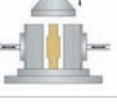
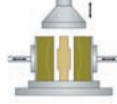


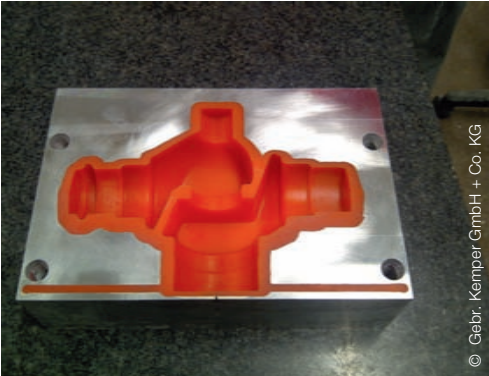
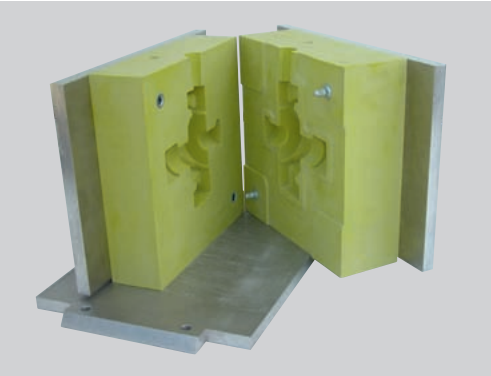
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Build-up methods for core boxes

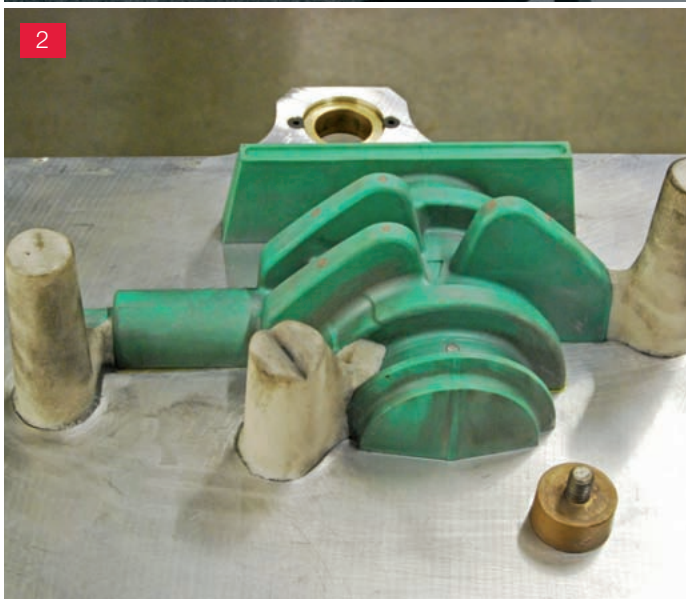
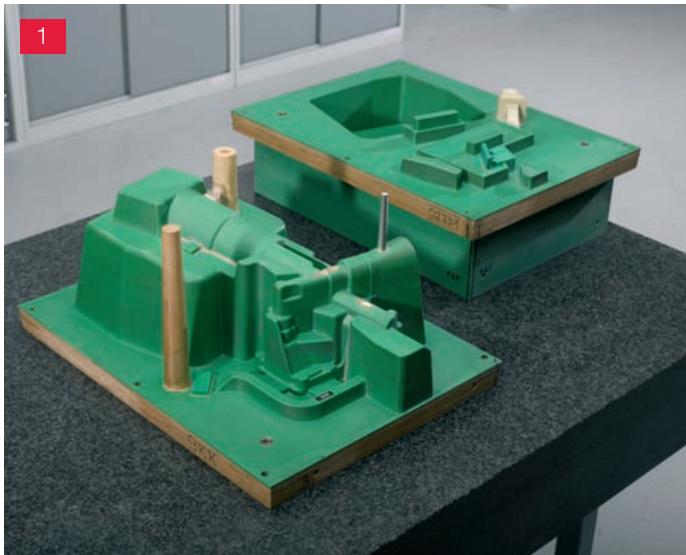
The numerous build-up methods for cores in the foundry industry, whether for small or large series, set high requirements for core boxes. Amongst these are good dimensional stability at temperatures of up to 60 °C, high abrasion and good chemical resistance. With a large product range RAMPF Tooling Solutions offers comprehensive solutions for the various build-up methods for core boxes.

steps up to production

Full Casting	Lay-up	Backing Structure	Backing Structure/ Face Casting	Milling
model 	model 	model 	model 	special board 
full casing EP/PUR 	lay-up EP/PUR 	backing structure EP/PUR 	aluminium backing structure with face casting 	core box-milling (HSC) 
core box 	core box 	core box 	core box 	milled core box half 
production 	production 	production 	production 	core box 
				production 



FOUNDRY Applications



Further Information

Image 1: **Production of pattern plate made from RAKU-TOOL® WB-1222 used for the manufacture of a housing.**

approx. > 20,000 parts

- > Working board RAKU-TOOL® WB-1222 is bonded straight onto the pattern plate using adhesive RAKU-TOOL® PP-3311/PH-3905. The oversized model is bonded in layers of 50 mm thickness.
- > Milling of oversized model with a CNC 3-axis milling machine
- > Process is repeated until the desired model thickness has been achieved
- > Finishing of pattern plate
- > Placing of casting and gating systems

Image 2: **Production of pattern plate with model made from RAKU-TOOL® WB-1250. The pattern plate was used for the manufacture of a flange plug valve.**

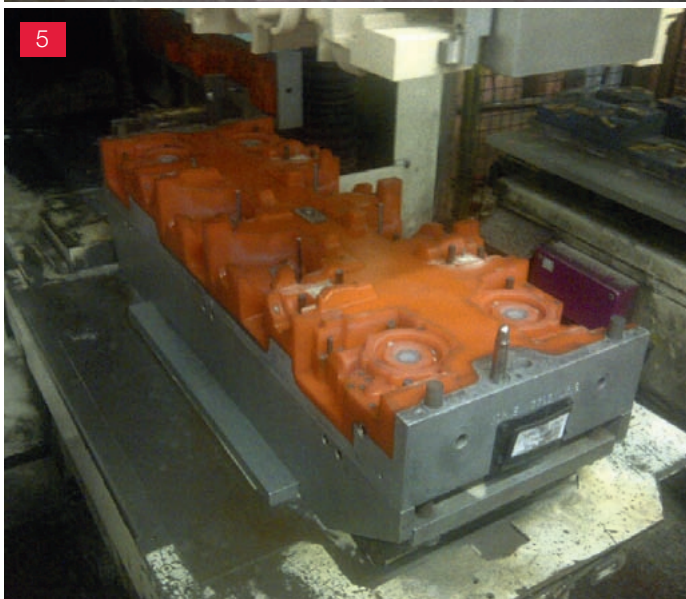
approx. > 20,000 parts (on an FDC molding facility)

- > Model is made from RAKU-TOOL® WB-1250 working board, 100 mm
- > Milling of model on CNC milling machine
- > Finishing of model
- > Screwing down or inserting model on/into base plate

Image 3: **Production of a core box from RAKU-TOOL® WB-1210 via direct CNC milling from data to produce a flange plug valve**

approx. > 50,000 parts

- > Cold Box process
- > Laempe L10 equipment
- > Core box made from RAKU-TOOL® WB-1210 working board, 100 mm
- > All three core box parts are machined on an HSC milling machine
- > Finishing of core box
- > Trial



Further Information

Image 4: **Two-part core box, produced via face casting with RAKU-TOOL® casting system PC-3451/PH-3952. Core box was used for the manufacture of a valve housing.**

approx. > 50,000 parts

Since 2008 in the market.

The undersized cores can be re-coated after abrasive wear of the surface.

> Master model (later represents the sand core) is milled from board material RAKU-TOOL® MB-0670. This then represents the core box cavity which is face cast.

> Core box backing structure is made from RAKU-TOOL® WB-1450, bonded with adhesive RAKU-TOOL® PP-3310/PH-3905, then milled. The board material is recessed by 5 mm in excess of the model.

> Paste release agent RAKU-TOOL® AC-9102 is applied to the model and then assembled and fixed to milled WB-1450 for face casting.

> Face casting with casting resin RAKU-TOOL® PC-3451/PH-3952, layer thickness 5 mm.

> Demolding and finishing of core box (e.g. insertion of air jets etc.).

> (Trial)

Image 5: **Production of a core box for the manufacture of an exhaust manifold with integrated turbo-charger with RAKU-TOOL® casting system PC-3458/PH-3958**

Core boxes approx. 63,000 parts

Cold Box process

Laempe L25, shooting pressure 3–4 bar

Pattern plate approx. 160,000 parts

> Face casting with RAKU-TOOL® PC-3458/PH-3958 in a layer thickness of 4–7 mm using a Dekumed mix and meter machine with integrated heating.

> RAKU-TOOL® PC-3458/PH-3958 has to be heated up to 40 °C for processing and cure.

Image 6: **Pattern plate made from RAKU-TOOL® WB-1222**

approx. 20,000 parts

> Heinrich Wagner Sinto molding facility

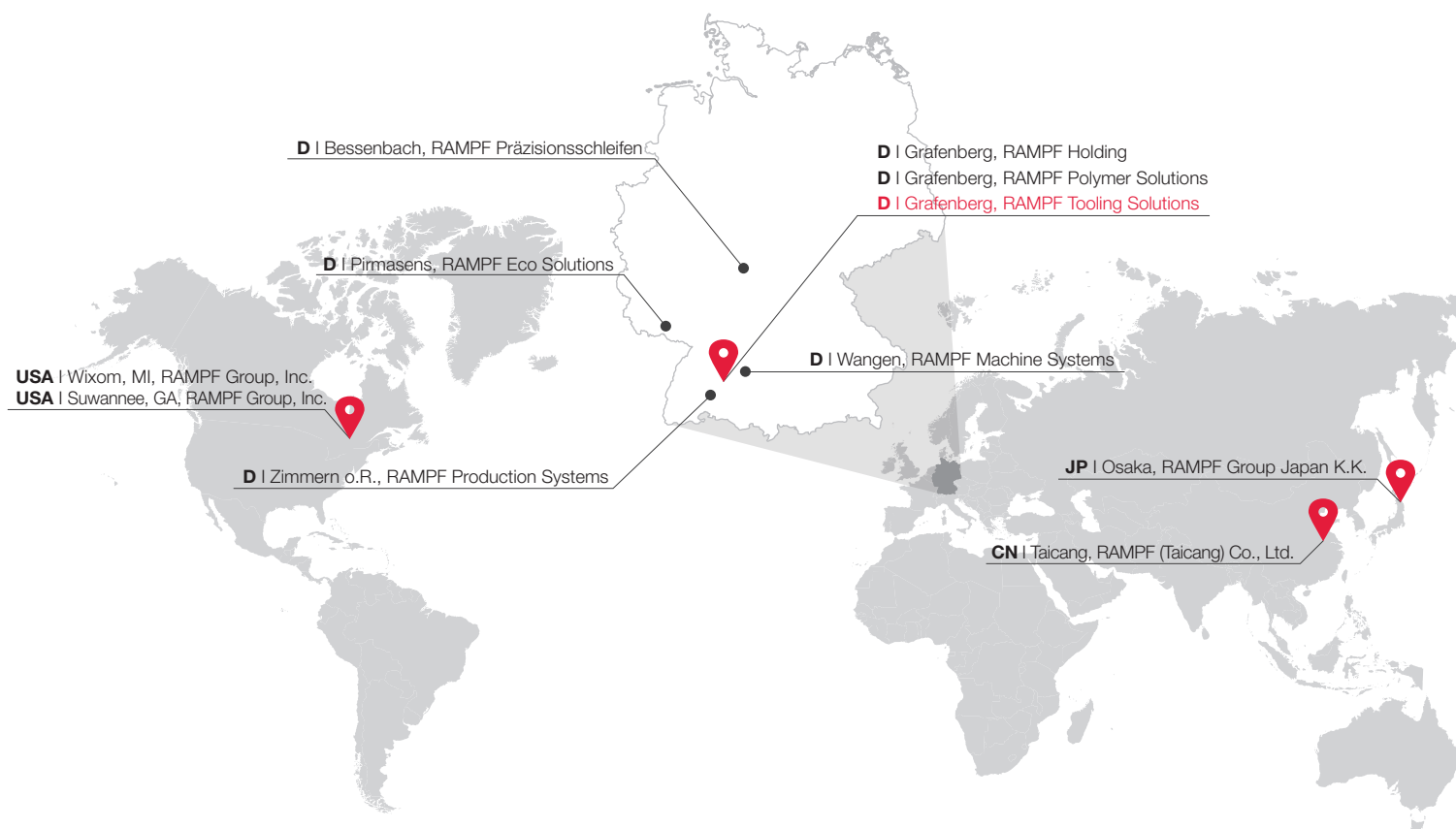
> Model made from RAKU-TOOL® WB-1222 board material, 100 mm

> Machining of model with CNC machine

> Finishing of model

> Pattern plate for production

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