

EPUDUR | Ultra-high performance concrete for machine beds



Innovative solutions for highly dynamic production technology

RAMPF Group

The international RAMPF Group 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, lightweight construction, bonding, and protection
- > **Technical production systems** for precise, dynamic positioning and automation, as well as technologies for complex composite parts production
- > **Comprehensive range of solutions and services**, particularly for innovative customer-specific requirements

This know-how helps our 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 Germany, in the United States, Canada, China, and Japan.

RAMPF Machine Systems

Based in Wangen (near Göppingen), Germany, the company is the market-leading development partner and system supplier of complete machine bed solutions and machine systems.

Its service portfolio includes system solutions, trunk machines, basic machinery, and multi-axis positioning and moving systems based on machine beds and machine bed components made from alternative materials such as mineral casting, hard stone, ultra-high performance concrete, aluminum foam, and fiber composites.

High-precision machine systems are created using innovative replication, grinding, and lapping processes in temperature-controlled production environments.

This makes RAMPF Machine Systems the full-service partner for developing and manufacturing future-oriented machinery and production technology for a wide range of industries.



Machine Systems



Production Systems



Composite Solutions



Eco Solutions

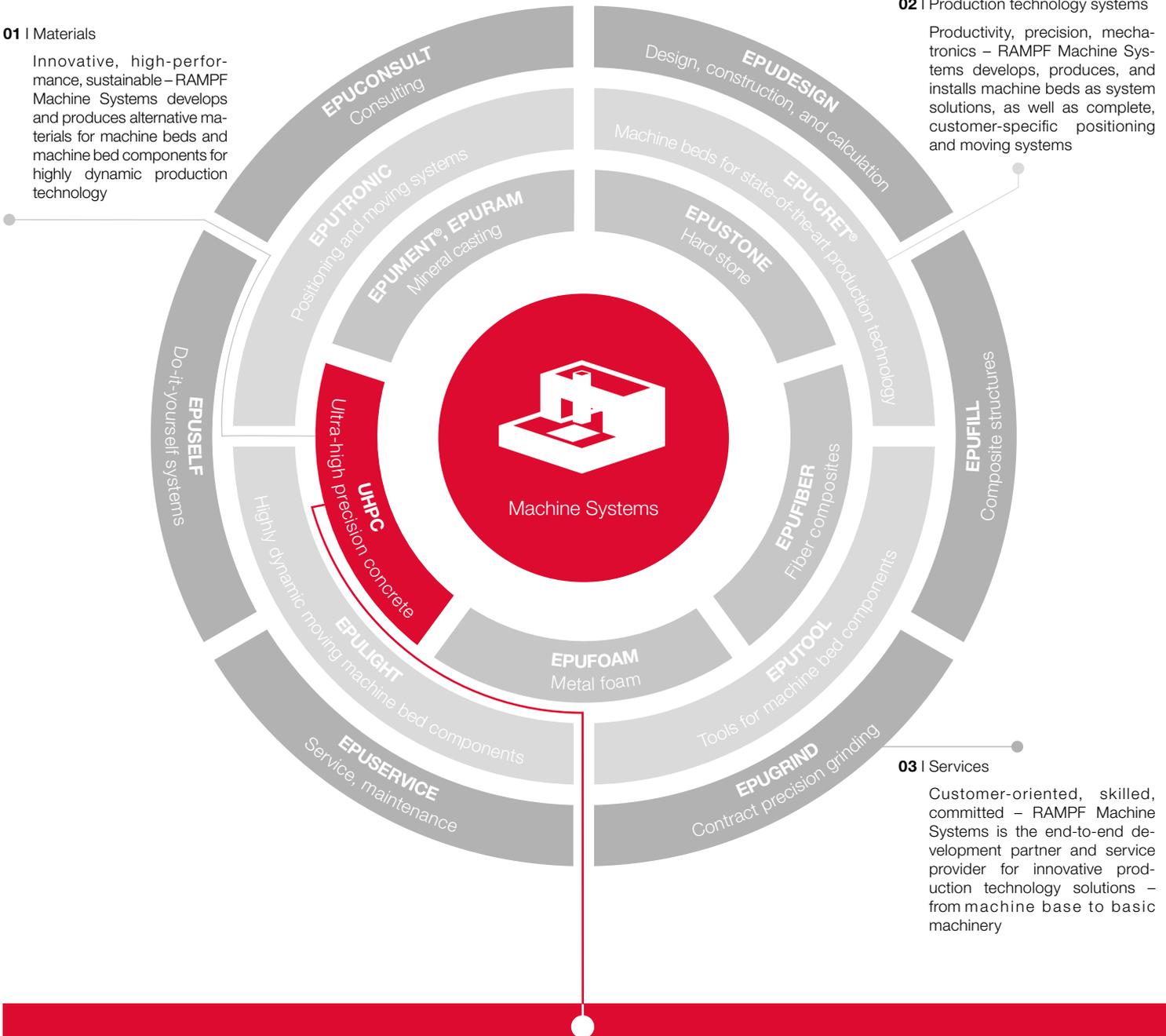


Polymer Solutions

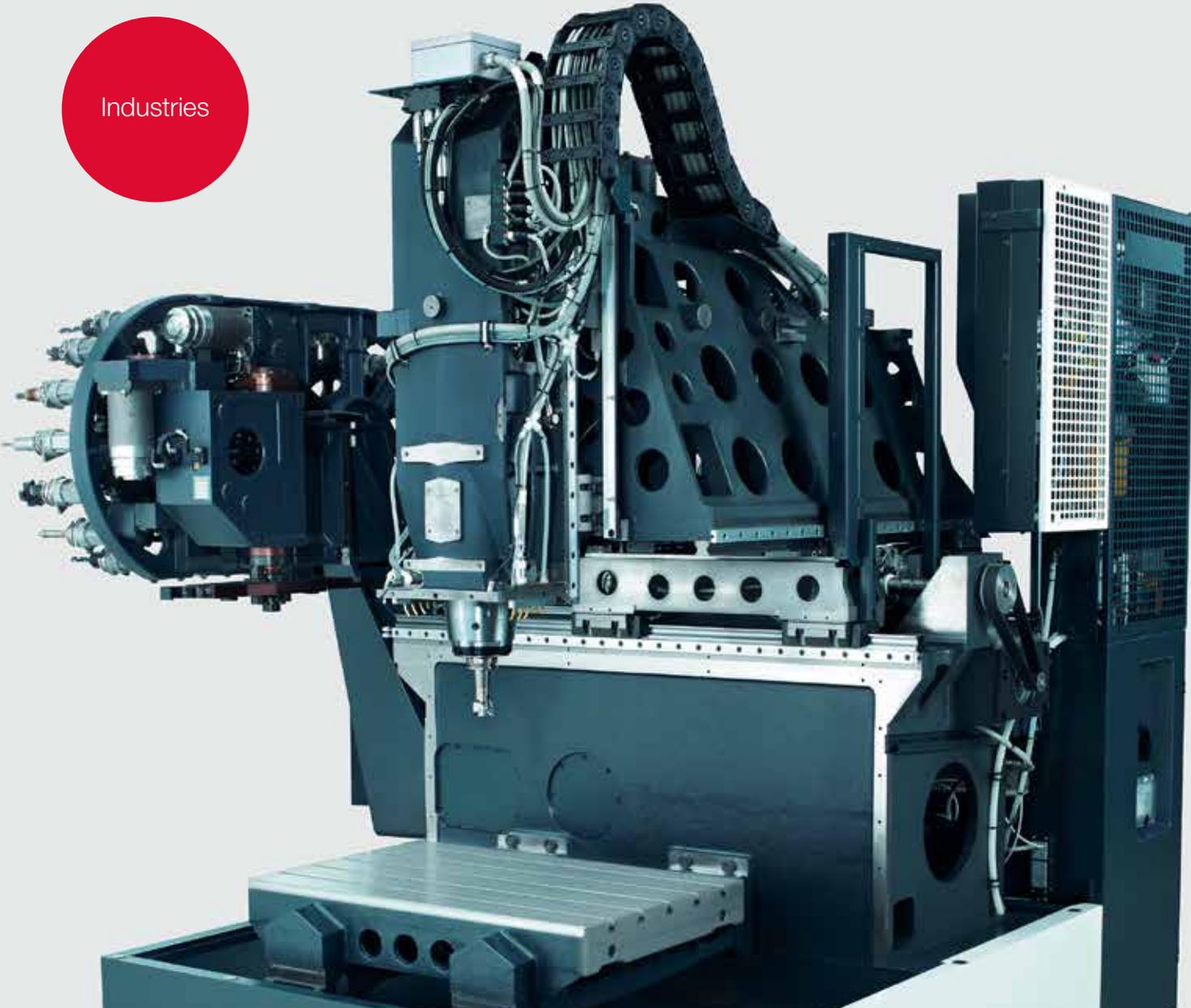


Tooling Solutions

Range of products and services



» Ultra-high performance concrete (UHPC) is an innovative material for machine beds and machine bed components in highly dynamic mechanical engineering. The latest developments based on nanotechnology make EPUDUR ultra-high performance concrete an interesting alternative for load-bearing machine bed components in cutting-edge production technology. RAMPF Machine Systems performs objective and in-depth needs analyses to advise customers on the optimum bed material for each machine. «



Industries



Machine Tools

EPUDUR ultra-high performance concrete (UHPC) for machine beds and machine bed components for highly dynamic machine tools used in applications such as milling, turning, grinding, and eroding.



Energy

EPUDUR ultra-high performance concrete (UHPC) for bases for power machines subject to high dynamic loads, such as motors, generators, turbines, and centrifuges.



Production

EPUDUR ultra-high performance concrete (UHPC) for load-bearing machine bed components in high-performance production technology in the print, graphics, timber, textile, electronics, optics, and packaging sectors.

Your industry | Your application

We develop, produce, precision-machine, and finish machine beds and machine bed components made of EPUDUR ultra-high performance concrete (UHPC) for all kinds of mechanical engineering applications – and do so cost-effectively, quickly, and to high-quality standards for a lasting effect.

 Machine tools

 Laser applications

 Solar module production

 Microproduction

 Measuring, testing, and inspection technology

 Packaging machines

 Woodworking machines

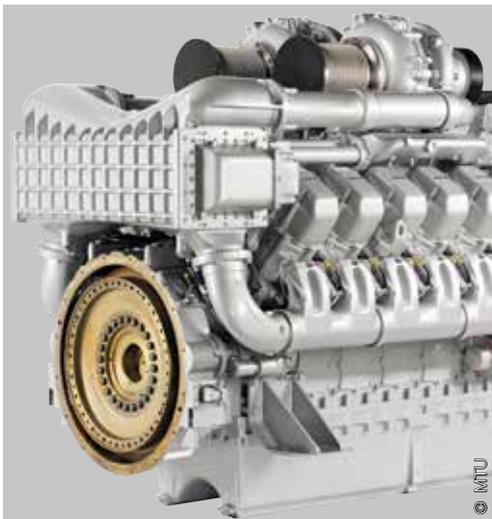
 Textile machinery

 Energy generation machinery

 Optics production

 Graphics machines

 Pick & place applications



Properties



EPUDUR | Properties and parameters

of a high-performance concrete material for highly dynamic mechanical engineering

EPUDUR is an ultra-high performance concrete (UHPC) based on the latest generation of premium cements. It has been further developed from Mikrodur technology using nano-structured synthetic silica. Other elements include grit, sand, and stone dust. A little water is also needed to produce the requisite chemical reaction.

The result is a material whose pore volume is ten times lower than that of standard construction concrete, thus equipping it with the strength, modulus of elasticity, and chemical resistance which is an interesting proposition for machine bed applications in the mechanical engineering industry.

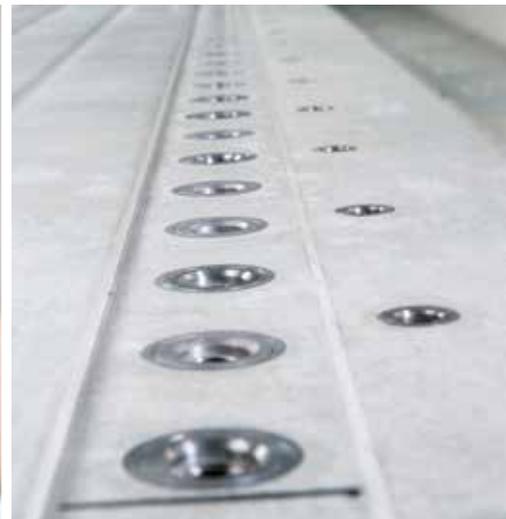


Your benefits

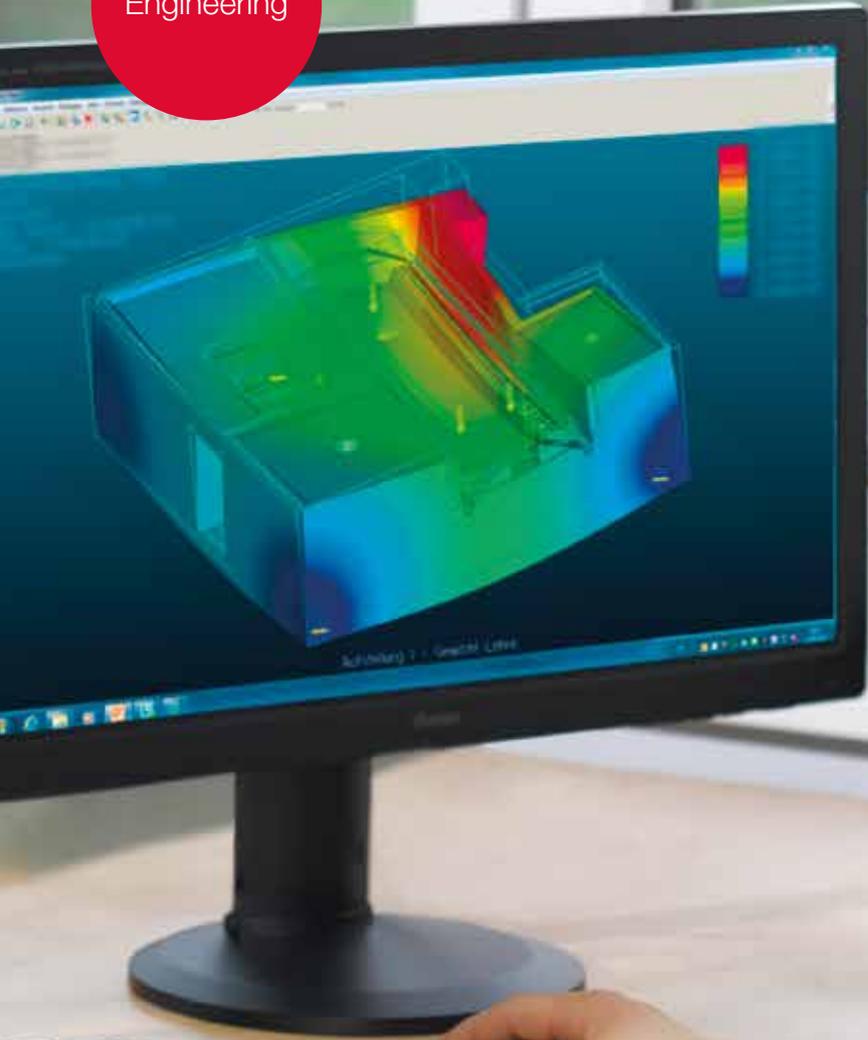
- > Machine beds made of UHPC exhibit strength, modulus of elasticity, damping, and thermal behavior similar to that of mineral casting and hard stone.
- > Components made of high-performance concrete are non-flammable and age-resistant at low and high temperatures.
- > UHPC components can be recycled in the form of building materials.

	GG25 CAST IRON	EPUMENT® MINERAL CASTING	EPUDUR UHPC CONCRETE	EPUSTONE HARD STONE
Density kg/dm ³	7.15	2.40	2.50	2.90
Compressive strength N/mm ²	840	130	125	250
Flexural strength N/mm ²	240	30	14	20
Modulus of elasticity kN/mm ²	120	40	45	65
Thermal expansion 10 ⁻⁶ K ⁻¹	9	15	10	6.5
Damping (log. decrement)	0.0045	0.0340	0.0265	0.0150

Comparison of material properties



Engineering



EPUDUR | Engineering, design, modeling

Services for material-specific design of UHPC machine bed components

As with all other materials, machine bed components made of EPUDUR (ultra-high performance concrete – UHPC) must be laid out to suit the materials in question, designed appropriately, and integrated into the machine to withstand all the necessary stresses and strains and meet all requirements. Supported by CAD and FEM, design measures compensate for weak points (e.g. low tensile strength), and strengths (e.g. high modulus of elasticity) can be utilized accordingly.

Molded-in parts (screw stays, load elements, pipes, tubes, etc.) can be integrated. Exceptional technical and cost-efficient options for the shell construction, casting, precision processing, and assembly process play a key role in this phase, too.



Additional information

Image 1: UHPC base of a vertical milling center (2860 kg; painted in two colors; assembly surfaces with blank precision)

Image 2: UHPC machine bed of a hard turning and grinding center (2870 kg; precision-ground surfaces)

Image 3: UHPC machine bed of a traveling-column milling machine (9140 kg; precision-ground surfaces)



Precision



EPUDUR | Production, accuracy, precision assembly

Complete service offering with ready-to-use UHPC machine bed as a system solution

RAMPF Machine Systems is the system supplier for complete machine beds and machine bed components made of ultra-high performance concrete (UHPC).

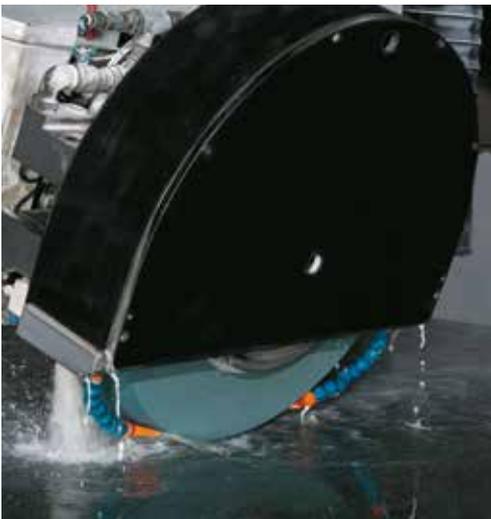
State-of-the-art production equipment, climate-controlled replication halls, and an in-house precision grinding center underline the outstanding position of the world market leader.

Based on the latest technologies and a reliable quality assurance system to ISO 9001:2008, the company supplies complex structures and assemblies made of ultra-high performance concrete (UHPC) with excellent dimensional accuracy, top quality, and the best possible price/performance ratio.



Your benefits

- > Optimal price/performance ratio achieved through material-specific design, functional integration, and reduced effort during assembly.
- > Greatest accuracy achieved through highly-precise flat grinding and hand lapping of EPUDUR machine beds in our internal grinding center.
- > RAMPF Machine Systems takes care of assembly and final completion as a part of the system solution and/or base machine.



RAMPF Group | Locations

