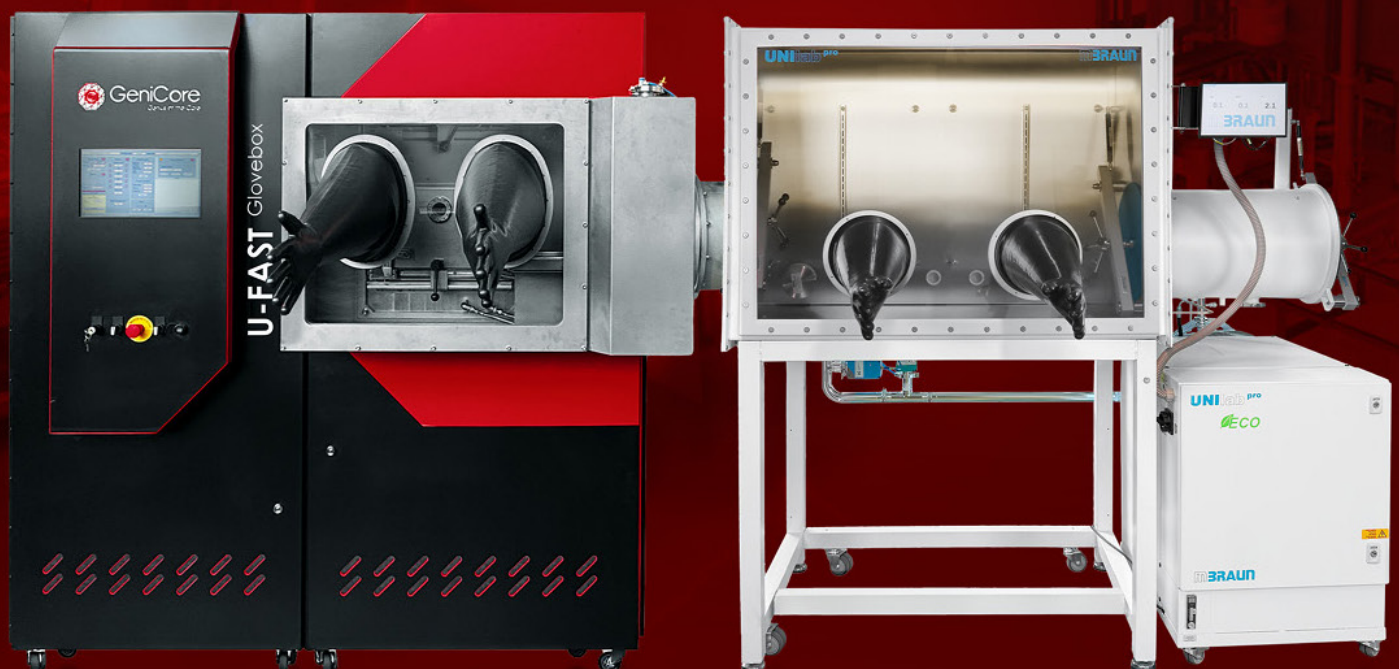
U-FAST

SPS - INNOVATION EXPANDS



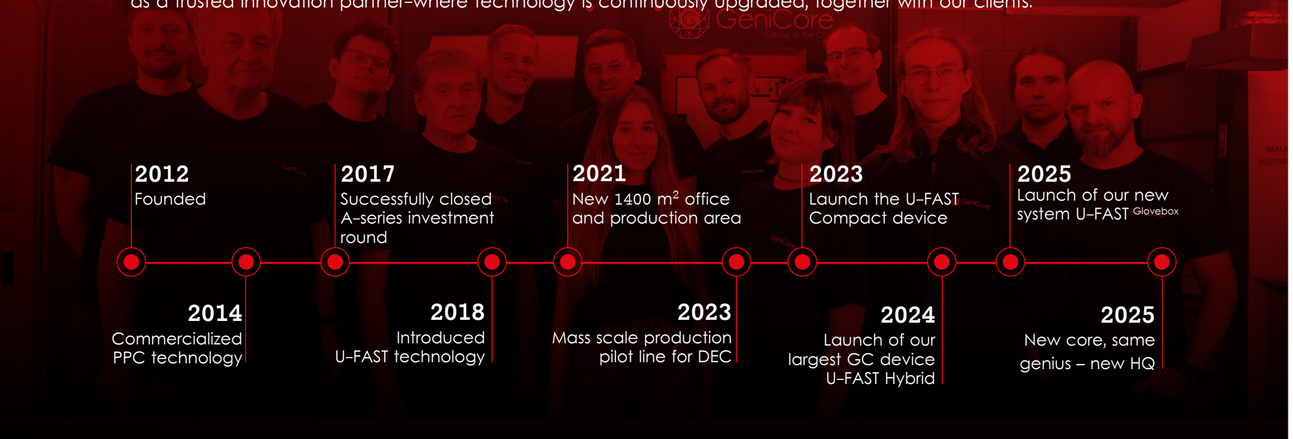
GeniCore
Genius at the Core

WHO WE ARE

GeniCore
Genius at the Core

Since 2012, GeniCore has been at the forefront of technological innovation in Spark Plasma Sintering (SPS). As a company specializing in advanced materials engineering, we design and manufacture state-of-the-art sintering systems, including our flagship U-FAST (Upgraded-Field Assisted Sintering Technology) product line. Our proprietary know-how-spanning technology, equipment, and the materials used in device construction-enables us to deliver tailored, high-performance solutions that meet the evolving needs of industry leaders, research institutions, and universities around the world.

Guided by our motto, "Genius at the Core", we work closely with our clients to co-create next-generation materials and processes. We are dedicated to developing new sintering devices customized to our clients' specific requirements, ensuring our solutions remain aligned with both technological progress and market expectations. GeniCore is recognized as a trusted innovation partner-where technology is continuously upgraded, together with our clients.



GeniCore – Building Tomorrow's Sintering Today.

GeniCore is a trusted partner in the field of sintering technology and the creator of cutting-edge innovations such as **U-FAST (Upgraded-Field Assisted Sintering Technology) and PPC (Pulse Plasma Compaction).** With strong R&D experience, we design devices with a deep focus on material-specific requirements, ensuring optimal performance and adaptability.

REVOLUTION IN TECHNOLOGY: Our U-FAST technology offers a fast, precise, and energy-efficient approach to sintering. It shortens production time, lowers costs, and allows working with a wide range of advanced materials. This makes it a practical tool for both research and industrial use.

CUSTOMER EVOLUTION: Every project is different. That's why we design our systems to be flexible and scalable. The U-FAST product line can be customized to meet the unique requirements of each client – from **nanocrystalline materials, advanced composites or thermoelectric materials** to many other specialized applications.

COLLABORATIVE INNOVATION AT THE EUROPEAN LEVEL: We actively participate in EU and national-level projects, collaborating with leading institutions such as **Fraunhofer IKTS, LNEG (Laboratório Nacional de Energia e Geologia, I.P.), SINTEF**, and **ICMPE CNRS**. These partnerships **reflect the trust and recognition** GeniCore has earned across the scientific and industrial communities. Together, we are shaping the future of SPS technology.

CHOOSE GENICORE-WHERE INNOVATION MEETS PRECISION, AND TECHNOLOGY EVOLVES WITH YOU.

U–FAST
SPS R|EVOLUTION

U–FAST SPS is an example of spark plasma sintering that sets new standards in the sintering process. Our innovation is based on advanced technology that generates current pulses with a duration shorter than 1 ms, enabling sintering of materials with minimal or zero grain growth.

As leaders in **Spark Plasma Sintering (SPS) technology**, GeniCore offers more than just advanced equipment – we work closely with our customers, providing support at every step. Our U–FAST technology is known for its adaptability, **acting as a flexible platform for growth** that can be tailored to fit the unique needs of each project and evolve as those needs change.

With years of experience in research and development, we understand the challenges of working with advanced materials. We see every project as different, so our systems are designed to be adaptable and ready for whatever challenges come next. It's not just about technology – it's about making sure it works well for you now and in the future.

Choosing GeniCore means joining the U–FAST SPS R|Evolution – a practical, evolving approach to sintering that grows with you and helps turn your ideas into reality.

GeniCore | Your FUTURE our technology today.

MINIMIZED GRAIN GROWTH:
Resulting in materials with exceptional structure and mechanical properties.

DECREASED WATER CONSUMPTION THROUGH CLOSED LOOP:
U–FAST SPS utilizes a closed–loop system, minimizing water consumption and addressing the challenges of sustainable development.

REDUCED ELECTRICITY CONSUMPTION / HIGHER EFFICIENCY:
Lead to operational cost savings around 30% compared to HP technologies.

TECHNOLOGICAL ACHIEVEMENTS:
current pulses <1 ms, vacuum pump $5x10^{-5}$ mbar in a small Compact device, technical vacuum under a minute in the MASS device, 200 mm sinter diameter in the Hybrid systems.

U–FAST COMPACT

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REVOLUTION IN COMPACT SPS DESIGN.

Introducing a major step forward in compact design U–FAST Compact, the ideal SPS solution for small research labs. This small, powerful, and precise system supports innovation without compromise. Designed for cost–effective performance, it delivers high–quality results with a precision pressing system and is fully compatible with air–cooled chillers for simplified lab integration.

PARAMETERS	
Max. pulse current [A]	5 000
Max. output voltage [V]	14
Pulse duration [ms]	0.8 – 999
Vacuum [mbar]	$5x10^{-5}$
Pressing force [kN]	2 – 100
Pulse Pause [ms]	0 – 500
Number of pulses	1 – 500
Pulse control	fully programable

U–FAST COMPACT

U–FAST^{COMPACT} 10

Max Sintered Diameter
Ø 10 mm

Press Punch Diameter (Max)
60 mm

Max Current
1 100 A

SPS pulses

Pressing force
35 kN

Oil rotary pump
$9x10^{-2}$ mbar

U–FAST^{COMPACT} 20

Max Sintered Diameter
Ø 20 mm

Press Punch Diameter (Max)
60 mm

Max Current
2 200 A

SPS pulses

Pressing force
55 kN

Oil rotary pump
$9x10^{-2}$ mbar

U–FAST^{COMPACT} 30

Max Sintered Diameter
Ø 30 mm

Press Punch Diameter (Max)
60 mm

Max Current
3 300 A

SPS pulses

Pressing force
75 kN

Oil rotary pump
$9x10^{-2}$ mbar

U–FAST^{COMPACT} 40 PRO

Max Sintered Diameter
Ø 40 mm

Press Punch Diameter (Max)
60 mm

Max Current
5 000 A

SPS pulses

Pressing force
100 kN

Oil rotary pump + Turbo pump
$5x10^{-5}$ mbar

U-FAST GC

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VERSATILE EVOLUTION FOR R&D AND LOW-VOLUME PRODUCTION.

Designed for both research and small-scale manufacturing, this system leverages advanced SPS technology to efficiently consolidate materials with precision and speed. It's an ideal solution for tech companies and manufacturers with in-house R&D, offering a perfect balance between innovation, scalability, and performance

	PARAMETERS
10 000	Max. pulse current [A]
14	Max. output voltage [V]
0.8 – 999	Pulse duration [ms]
$5x10^{-5}$	Vacuum [mbar]
7 – 350	Pressing force [kN]
0 – 500	Pulse Pause [ms]
1 – 500	Number of pulses
fully programable	Pulse control

U-FAST GC

U-FAST GC 35	U-FAST GC 55	U-FAST GC 85	U-FAST GC 85 PRO
Max Sintered Diameter **Ø 35 mm**	Max Sintered Diameter **Ø 55 mm**	Max Sintered Diameter **Ø 85 mm**	Max Sintered Diameter **Ø 85 mm**
Max Current **3 300 A**	Max Current **6 600 A**	Max Current **10 000 A**	Max Current **10 000 A**
SPS pulses	**SPS pulses**	**SPS pulses**	**SPS pulses**
Pressing force **125 kN**	Pressing force **196 kN**	Pressing force **298 kN**	Pressing force **350 kN**
Oil rotary pump **$9x10^{-2}$ mbar**	Oil rotary pump **$9x10^{-2}$ mbar**	Oil rotary pump **$9x10^{-2}$ mbar**	Oil rotary pump + Turbo pump **$5x10^{-5}$ mbar**

R&D

U–FAST Glovebox

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INERT ATMOSPHERE FOR FULLY CONTROLLED SPS PROCESSING.

Designed for seamless integration with U–FAST sintering systems, enabling powder handling and sintering in a moisture – and oxygen–free environment. Ideal for research centers and institutions working with highly reactive or air– sensitive materials. Developed in collaboration with MBRAUN to support advanced material synthesis from start to finish – without atmospheric exposure.

U–FAST Glovebox

U–FAST UNILab	U–FAST LabMaster	U–FAST Self–acting
Pressing Stamp Diameter **Ø 60 mm**	Pressing Stamp Diameter **Ø 90 mm**	Pressing Stamp Diameter **Ø 90 mm**
Pressing force **125 kN**	Pressing force **200 kN**	Pressing force **350 kN**
Max Current **6 600 A**	Max Current **10 000 A**	Max Current **10 000 A**
Oil rotary pump **$9x10^{-2}$ mbar**	Oil rotary pump **$5x10^{-3}$ mbar**	Oil rotary pump **$5x10^{-3}$ mbar**
Glovebox system **UNIlab mbraun**	Glovebox system **LabMaster mbraun**	Glovebox system **Lab Master mbraun + automatic gates**

R&D

W 700 × L 1140 × H 2000 mm (net)*

approx. 750 kg (net)*

W 1930 × L 1120 × H 2000 mm (net)*

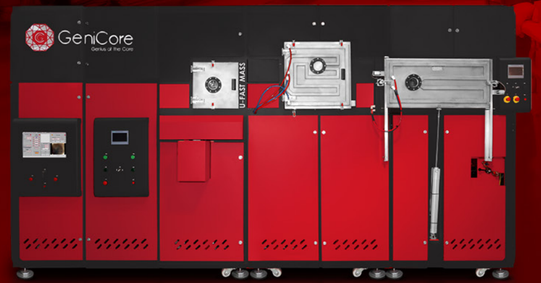
approx. 1950 kg (net)*

W 4230 × L 2010 × H 2000 mm (net)*

approx. 2500 kg (net)*

*All dimensions are approximate and may vary. Custom sizes available on request.

PRODUCTION



W 6000 × L 2500 × H 3500 mm (net)*

approx. 12000 kg (net)*

W 8500 × L 10040 × H 6600 mm (net)*

approx. 30000 kg (net)*

*All dimensions are approximate and may vary. Custom sizes available on request.

U–FAST MASS

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REVOLUTION IN AUTOMATED SPS FOR LARGE–SCALE PRODUCTION.

This next–generation system marks a breakthrough in automated Spark Plasma Sintering, purpose–built for continuous, high–volume manufacturing. Engineered with modular, energy–efficient hardware, it delivers exceptional performance while significantly reducing operational costs.

Designed for industrial scalability, the system can be equipped with up to six independent graphite sets, enabling flexible, high–throughput production without compromising precision.

PARAMETERS
Max. pulse current [A]	30 000
Max. output voltage [V]	14
Pulse duration [ms]	0.8 – 999
Vacuum [mbar]	$5x10^{-5}$
Max. pressing force [kN]	300 – 400
Pulse Pause [ms]	0 – 500
Number of pulses	1 – 500
Pulse control	fully programable

GEOMETRY	APLICATION	YIELD
Ø 12.7 x 5 mm	Ceramic whiskers tools material	450 000 pcs
20 x 20 x 2.5 mm	High thermal conductive sustrate	1 000 000 pcs

U–FAST MASS

U–FAST MASS	U–FAST MASS PRO
Heating power **200 kW**	Heating power **300 kW**
Process SPS **standard pulses length**	Process SPS **shorter pulses**
working mode **Fully automated**	working mode **Fully automated**
Load **300 kN**	Load **400 kN**
Oil rotary pump **$9x10^{-2}$ mbar**	Dry pre–pumping system + Turbomolecular pump **$5x10^{-5}$ mbar**

U–FAST HYBRID

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REVOLUTION IN BIG DIAMETERS SPS SINTERING.

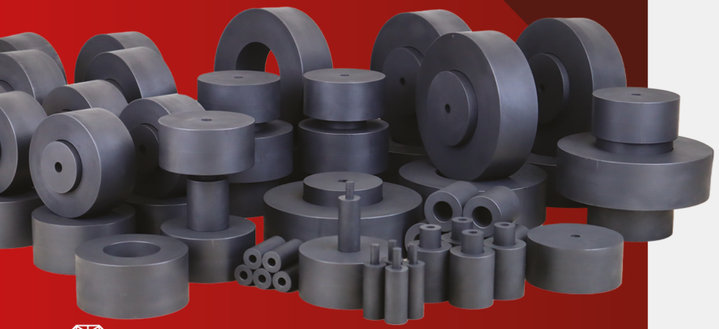
The U–FAST Hybrid sintering technology rapidly heats a wide range of materials, maintaining uniform temperature distribution in samples up to 200 mm. It features two independently controlled heating sources, ensuring precise, efficient heating and improved sample quality.

PARAMETERS
Max Pressing Force	2000 – 3.500 kN
Vacuum Chambers	1 – 2
Max Sintered Diameter	200 mm
Max Pulses Current	60 000 A
Max Heating Power Induction	350 kW
Pre–Pumping System + Turbomolecular Pump	> $5x10^{-5}$ mbar
Max Heating Power U–FAST	> 600 – 1,000 kW

U–FAST HYBRID

U–FAST HYBRID 200	U–FAST HYBRID CSP 350	U–FAST HYBRID CSP 350 PRO
Max Pressing Force **2 000 kN**	Max Pressing Force **3 500 kN**	Max Pressing Force **3 500 kN**
Vacuum chambers **1**	Vacuum chambers **2**	Vacuum chambers **2**
Max Sintered Diameter **200**	Max Sintered Diameter **200**	Max Sintered Diameter **200**
Max Heating Power Induction **350 kW**	Max Heating Power Induction **350 kW**	Max Heating Power Induction **350 kW**
Oil rotary pump **$9x10^{-2}$ mbar**	Oil rotary pump **$9x10^{-2}$ mbar**	Pre–pumping system + Turbomolecular pump **$5x10^{-5}$ mbar**
Max Heating Power U–FAST **600 – 1 000 kW**	Max Heating Power U–FAST **600 – 1 000 kW**	Max Heating Power U–FAST **600 – 1 000 kW**

GRAPHITE TOOLS



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WHETHER YOU'RE WORKING WITH ADVANCED CERAMICS, METALLIC ALLOYS, OR NANOMATERIALS, GENICORE GRAPHITE TOOLING ENSURES REPEATABLE, HIGH-QUALITY RESULTS IN SPS PROCESSING.

GeniCore 3D Sintering

GeniCore, we specialize in the design and machining of high-performance graphite components tailored for Spark Plasma Sintering (SPS) applications. Our graphite molds, punches, spacers, and tooling elements are engineered to meet the stringent requirements of SPS technology, ensuring dimensional accuracy, thermal stability, and contamination-free processing.

Each graphite part is manufactured using dry machining technique without coolants or lubricants to eliminate the risk of chemical contamination. This guarantees compatibility with high-purity sintering environments, including glovebox-integrated systems.

Our graphite expertise is not limited to part production. We transfer the knowledge gained through years of U-FAST (Upgraded Field Assisted Sintering Technology) development directly to our clients, empowering them with best practices in tooling design, sintering parameters, and material compatibility.

Why choose GeniCore graphite tooling?

DESIGNED SPECIFICALLY FOR SPS TECHNOLOGY:
tolerances, geometry, and thermal profiles optimized for pulsed sintering.

DRY MACHINING PROCESS:
no coolants, no contamination ideal for sensitive materials and cleanroom environments.

PROVEN PERFORMANCE:
GeniCore graphite parts are used in cutting- edge research and industrial applications worldwide.

CUSTOM MOLD DESIGN:
we engineer graphite forms based on your sintering goals, including complex geometries and multi-material interfaces.

KNOWLEDGE SHARING:
our clients benefit from the full spectrum of U-FAST experience, from tooling selection to process optimization.

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U–FAST TECHNOLOGY SUMMARY

GeniCore U–FAST (Upgraded Field–Assisted Sintering Technology) is an advanced sintering solution that leverages a unique pulse–based heating system to achieve superior results compared to conventional FAST devices. Its innovative design enables precise control over the sintering process, minimizing grain growth and enhancing material properties.

Extensive testing has demonstrated U–FAST's effectiveness in applications where traditional methods fall short–particularly in the tooling industry, piezoelectric ceramics, and thermoelectric materials. As research continues, the range of potential applications is expected to expand significantly.

A FASTER AND CHEAPER WAY TO SINTER METALIC AND CERAMIC POWDERS

The U–FAST device has a rated power of 100 kW, a press with a pressure of 3 to 350 kN and a vacuum system ensuring sintering processes at a pressure of up to 5×10^{-5} mbar. Thanks to the use of electrodes in the construction of a material with very high electrical conductivity, it is very energy efficient. Its effectiveness is also influenced by the process being carried out in a vacuum with the use of materials with a very low thermal conductivity coefficient – at the level of 0.44 W/mK. This significantly reduces costs in the production process. The total energy consumption necessary to produce a cobalt–free carbide sinter weighing 1.5 kg and a diameter of Ø 60 mm is 18.5 kWh. The economic advantages also include the time of the sintering process, which is 50 minutes.

Choose GeniCore – where innovation meets precision, and technology evolves with you.

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SUSTAINABILITY

In our activities we follow a policy of sustainable development, which impact area of development of our devices. The operation of Genicore's device has less negative influence to the environment compared to conventional production technologies.

- **Reduction of pollution and water** consumption by using closed-loop cooling systems.
- **Reduction of energy** consumption by heat release within the material subjected to the sintering process.
- **Reduction of energy** consumption in the production process.
- **Reduction of material** consumption per product unit due to the possibility of sintering elements in a shape similar to the final application.

Our client's success is a source of satisfaction and inspiration for further action and development!
Choose GeniCore – where innovation meets precision, and technology evolves with you.

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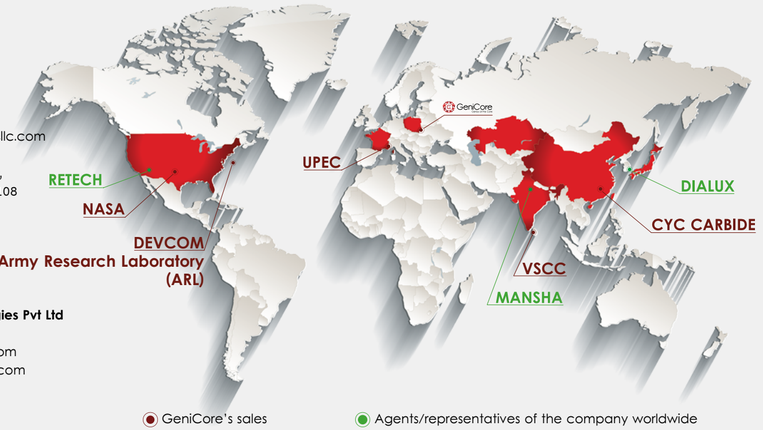
To ensure the best service for our clients, GeniCore operates through a network of trusted distributors worldwide. These distributors provide top-notch sales and service solutions on our behalf.



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GENICORE'S SALES:
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If you have any questions or concerns, please don't hesitate to contact our customer service team at +48 789 221 553 or via email at genicore@genicore.pl. We are ready to address all your needs and provide comprehensive support both before and after purchase.

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