

SPS-P²C

One Step Powder to Part Compaction

THE ONLY AMERICAN SUPPLIER OF SPARK PLASMA SINTERING SYSTEMS/ PULSED DIRECT CURRENT SINTERING WITH DUAL RAM TECHNOLOGY ALONG WITH THREE DECADES OF OPERATIONAL EXPERIENCE.

The time proven, award winning SPS-P²C Plasma Sintering Equipments, with their superior process profiling technology, and large part capacity, can deliver next-in-class materials allowing the realization of your most challenging and dynamic materials engineering and research ideas.

SPS-P²C
100



SPS-P²C
200



SPS-P²C
300



Model	Press Capacity Tons (kN)	Max. Current A (@V)	Max Temp. (°C)	Sample Size	Chamber Size
SPS-P ² C 100	Up to 50 (498)	15,000 (0-12)	3000	4"x4"x0.25"	15" x 20"
SPS-P ² C 200	200 (1,992)	15,000-50,000 (0-30)	3000	6" x 6" x0.50"	20" x 40"
SPS-P ² C 300	250/500 (2491/4982)	50,000-100,000 (0-30)	3000	10"x10"x1.0"	30"x30"x36"

SPS-P²C-powder compaction technology is specifically designed to unlocking the high-performance promises suggested by submicron and nano-scale science and materials engineering.

- SPS-P²C can compact nano, submicron and micron particulate blends with powders of all shapes
- P²C equipment and processing offers significant economic and physical performance improvements over traditional hot pressed and sintered.

SAFETY 1st—Auto-Shutoff over-temp protection systems monitor key components

VERSATILITY and ACCESSIBILITY – Ease of sample loading/removal

VACUUM CHAMBER—Stainless Steel, Water cooled, Multiple gases can be used for sintering

SYSTEM START UP & TRAINING—Installation and training will be provided onsite.



Materials Modification, Inc. | 2809-K Merrilee Dr. | Fairfax, Virginia | 703-560-1371 | www.matmod.com

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Proudly Made

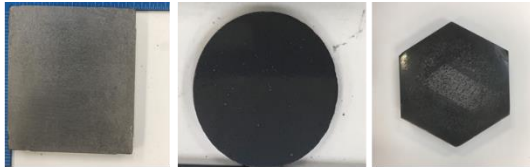


In the USA

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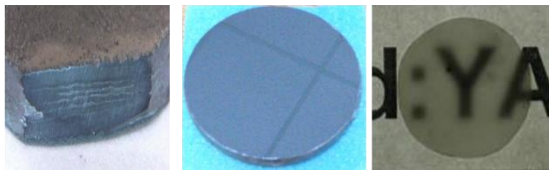
Shapes
& Sizes



Armor
& Tools



Composites
Mirrors &
Opticals



- **Metals**—Fe, Ni, Cu, Al, Co, Re, W, Mo, Ta, Ti, Mg, NiAl, TiAl
- **Ceramics**—SiC, B₄C, ZrO₂, TiB₂, HfB₂, ZrB₂, Y₃Fe₅O₁₂, TiC, WC, Y₃Al₅O₁₂, MgB₂, CaF₂, MgF₂, MoS₂, LaB₆ & many electroceramics
- **Composites**—TiB₂-Al₂O₃, TiB₂-ZrO₂, TiB₂-B₄C, SiC-B₄C, WC-Co, Mo-Cu, W-Cu, C-Cu, HfC-TaC, ZrC-B₄C
- **Multilayered Materials**—Up to 5 layers of differing functional properties
- **Unconventional Structures**—Nano-Carbon and Layered Composites | Porous Materials | Joining

The Innovative Solution— SPS-P²C Leaps Beyond Conventional Hot Pressing and Sintering

- Predictable Uniformity—Ability to start consolidation with nano-scale materials and end with nano crystalline grain structures
- Greater final material purity—No binders, No cementation/alloying agents, Low/No unprocessed reactants, No Canning Required, Unrestricted geometries possible.
- One-Step in-situ compaction, plus rapid uniform plasma heating for maximum densification and control over grain structure
- Maximum theoretical densities, exclusive preprocess cleaning and out gassing of particulate surface contaminants for excellent inter-particle fusion
- Low-temp/high thermal energy sintering yields fast-cycle consolidation—minutes vs. hours.

Answering Challenges of High Purity, Wear, Heat and Corrosion in Typical Commercial Applications

- Unrestricted R&D engineering with submicron/nano-scale metallic, ceramic and hybrid materials, new classes of bi-metal, ceramic/metal laminations, multi-material matrix/composites
- Custom Nano and Sub-Micron Sputtering Targets | Super Performance Seals and Bearings | Oil and Gas Well Drilling Components | Tube/Wire Drawing and Extrusion Die Inserts | Hot and Cold Forming Punches | Carbides for Wire EDM | Large Cutting Inserts | Brake Materials | Wire and Mandrel Tube Preforms | Water Jet Nozzles | Abrasion Resistant Parts | Mirrors and Optical Components (Lasers) | Thin Film Deposition

Broad Government and Commercial Market Segments

Metals, ceramics or hybrids designed for applications in land, sea, air and space defense, medical and industrial markets where low/no downtime are crucial considerations.

High Temperature Mirrors | IR Windows | Lightweight Body Armor Inserts | Exterior and Interior Vehicular Armor | Fixed and Rotary Wing Aircraft Cockpit Armor | General R&D and Engineering Development of Ceramic, Metallic, and Functionally Gradient Materials | Refractory Metal Substrates

US Patents: 5,989,487 | 6,001,304 | 6,183,690 B1 | 6,187,087 B1 | 6,309,591 B1 | International Patents: AU: 752326 | IN: 197635



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