

ABOUT THE TECHNOLOGY

PRESS-AND-SINTER

The backbone of the Pressed Materials industry—proven, efficient, economical and scalable

Press-and-sinter compacts metal powders under high pressure, then sinters them into strong, near-net-shape parts with minimal waste—one of the most cost-effective methods for producing high-volume, high-performance components used in cars, appliances, and more.



How It Works

Metal powder and alloying agents are selected and blended

Powder is poured into a precision die cavity

A mechanical or hydraulic press compacts the powder into a “green” part

The part is ejected and sent through a sintering furnace, bonding particles at high temperatures

Optional secondary operations (e.g., sizing, machining, coating) may follow

Press-and-sinter is the workhorse behind thousands of components we rely on every day.



North Central Pennsylvania
Pressed Materials Consortium

Want to know more? Visit pressedmaterials.org or contact our Regional Innovation Officer, John Williams at jcw5919@psu.edu

Features and Benefits

- Core technology of the industry with decades of innovation and proven success
- Compatible with a wide variety of metal powders and alloys
- Enables mass production of precision parts with minimal post-processing
- Offers a diversity of uses and applications

Example Applications



- Gears, sprockets, and cams for automotive and heavy equipment



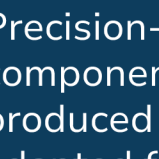
- Clutch plates and brake parts



- Lock components and appliance mechanisms



- Electric motor components



- Structural brackets and bushings

Key Advantages Over Other Processes

PnS Offers...	Compared To...
Low material waste	High scrap in machining processes
Fast, high-volume production	Slow, custom-run methods
Excellent dimensional repeatability	Variability in casting/welding
Low cost per part at scale	High labor/tooling costs
Ability to form complex internal geometries	Not possible in stamping or casting

Real-World Innovation: Multi-Component Pressing to Simplify Supply Chains

Advanced compaction press technology allows multiple pieces to be combined into a single PM component, streamlining supply chains and lowering costs. For example, incorporating a locating pin during compaction eliminates the need for secondary dowel pin assembly—an approach widely applied in automotive transmission and braking components.

Future Potential

Precision-engineered gears, structural components, and specialized alloys produced through press-and-sinter can be adapted for lightweight aircraft parts, high-strength defense hardware, and energy-efficient propulsion systems—**positioning our region as a trusted supplier in emerging global markets.**

