Binder Jetting Metal/Ceramic Printers

3DPTEK independently masters multiple key technologies related to the equipment, materials, and processes of binder jetting molding. It has completed the development of the R series for research and development and the P series for production, among other series of equipment. It has also developed systematic material processes for iron-based materials, non-ferrous metals, high-temperature alloys, refractory metals, ceramic materials, inorganic salts, polymers, food materials, and other material systems. 3DPTEK has mature technologies and experience in the placement of fine-particle powders, increasing the density of powder beds, developing high-resolution inkjet systems, rapidly designing and developing binder formulations, and debinding and sintering processes.

Processes

BJ 3D Printing

Green Part

Sintering Debinding

Sintered Parts

Secondary Treatment

Finished Product

3DPTEK

Binder Jetting Metal/Ceramic Printer 3DPTEK-J400P

Production equipment for industries such as MIM (Metal Injection Molding), molds, and cutting tools.

Equipment Parameters

Dimensions (L×W×H)		2470×1730×2400 mm		/High-Temperature Alloy /Tungsten Alloy,etc.
Build Tank Dimensions (L×W×H)		400×400×310 mm	Control Program	AFSWin3DP-L V1.0
Max. Build Vol. (L×W×H)		380×380×300 mm	Data Format	STL
Nozzle Res.	Metallic material	400dpi/800dpi/1200dpi	Eqpt. Weight	≈2.5t
	Carborundum	400dpi	Floor Load Capacity	⩾1.5t/m^2
Max. Forming Speed	Metallic material	3.6L/h	Factory Building Height	⩾3.5m
	Carborundum	5.3L/h	Amb. Temp.	22-28°C
Layer Thk.	Metallic material	0.03-0.2mm	Amb. Hum.	30%-50%
	Carborundum	0.1-0.3mm	Operating System	Windows
Post-Treatment	Metal, silicon carbide materials	Curing-Deatasing-Sintering	Power Supply	380VAC/50HZ/8KW , Three-phase Five-wire
Noz. Count		3/6	Gas Supply	Gas Pressure 0.6~0.8MPa, Flow Rate ⩾1.0 m^3/min， Clean and Dry Gas Supply
Form. Mat.		304/316L/SiC/Copper Alloy		

Application Cases

As a low-cost, high-efficiency additive manufacturing (AM) technology for mass production, Binder Jetting (BJ) for metal and ceramic molding is expected to achieve large-scale industrial applications across sectors including automotive, hardware, electronics, tooling, molds, cutting tools, medical devices, sporting equipment, high-end equipment manufacturing, and the energy industry. With vast market potential, the future market scale is projected to exceed 100 billion RMB.

3C Industry

Used for manufacturing components such as smartphone hinge covers, middle frames, bezels, and smartwatch cases. This process offers superior surface quality, high dimensional accuracy, high yield rates, and ease of post-processing. It provides a low-cost, high-efficiency solution for high-volume production with high integration, significantly reducing assembly requirements.

AI Chip Thermal Management

Through material formulation optimization, 3D structural design, and precision post-processing, high-quality molding of diverse materials and composites (such as Copper-Diamond and Copper-Silicon Carbide) is achieved. The resulting product performance exceeds international MIM (Metal Injection Molding) standards.

MIM Industry

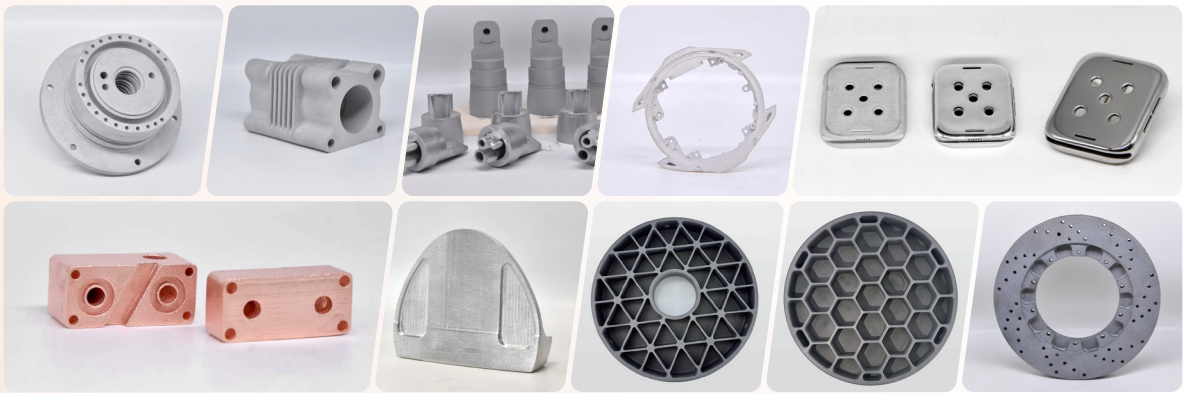
Enables mold-free rapid manufacturing, empowering MIM factories with rapid prototyping capabilities. It effectively addresses the limitations of small-to-medium batch production while enhancing the capacity to manufacture complex-structured and large-scale components.

Mold & Die Industry

Produces mold inserts with embedded conformal cooling channels to achieve precise and rapid cooling at a lower cost. This accelerates production cycles, minimizes part deformation, and improves overall product quality in applications such as injection and die-casting molds.

Tooling Industry

Manufactures high-performance tool bodies and holders with internal complex cooling channels. Suitable for various powder high-speed steels and cemented carbide tools, the solid-state sintering process is utilized to reduce alloy segregation and achieve optimal material mechanical properties.



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