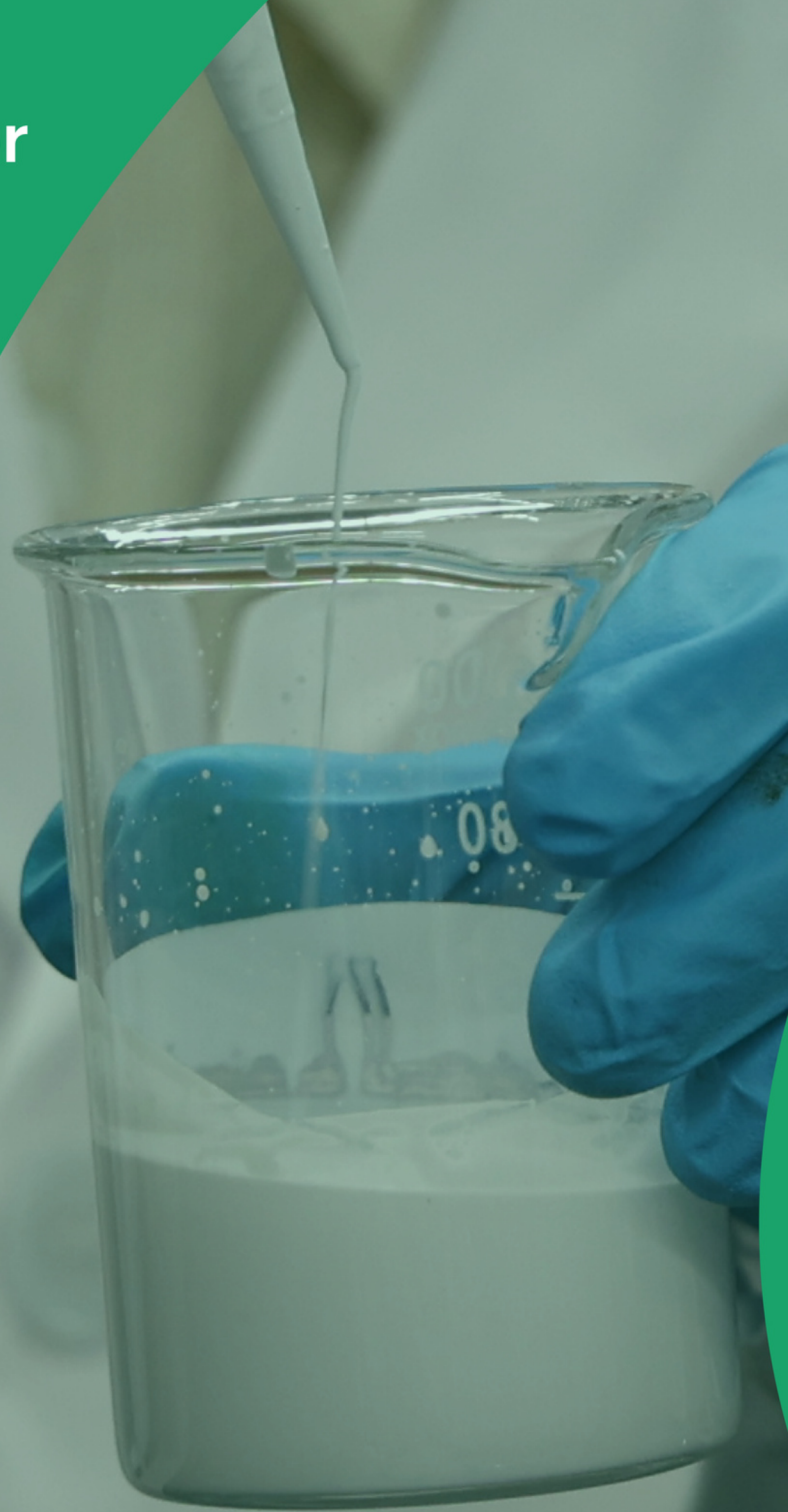


enovate3D

**Your one-stop
Material Solutions for
Additively
Manufactured
Electronics**



www.enovate3d.com

contact@enovate3d.com

© 2025 enovate3D, all rights reserved



Company Introduction



「enovate3D」, the first spin-off venture from Westlake University's School of Engineering, delivers cutting-edge customized solutions in electronic additive manufacturing (AM) through our proprietary micrometer-scale ultra-high-precision 3D printing technology. Our self-developed AM systems achieve 1-10 μm feature resolution, enabling the fabrication of ultraprecise 3D architectures using diverse functional materials such as conductive metals, polymer/ceramic dielectrics, optical and magnetic materials. Designed for industrial scalability, our technology bridges current and next-generation integrated circuit manufacturing needs. Key applications include displays, advanced packaging, and lithium-ion batteries. Trusted by industry leaders, our solutions redefine precision manufacturing for the AI, IoT, and green energy eras.

We provide end-to-end solutions for industrial 3D printing systems, encompassing advanced materials development, precision equipment manufacturing, and process optimization. Our team of 120 engineers, researchers, and technicians combines cross-disciplinary expertise in materials science, automation engineering, and electronics manufacturing to deliver production-ready innovations.

304

Patents applied for domestically and internationally

264

Patents applied for invention

91

Patent granted for invention

100+

R&D personnel

4000+

R&D center (m²)

5000+

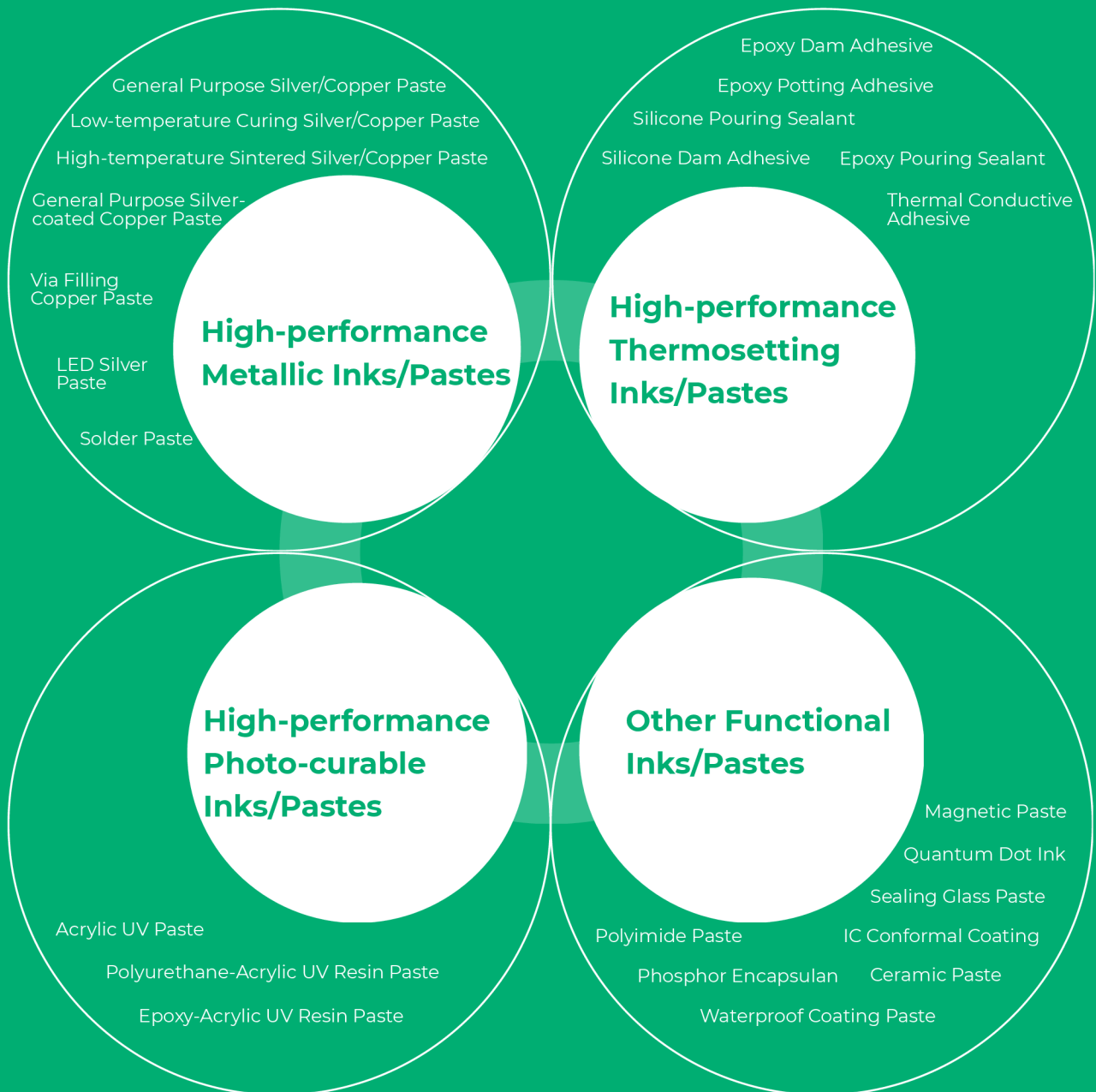
Production base (m²)

INVESTMENTS AND PARTNERSHIPS





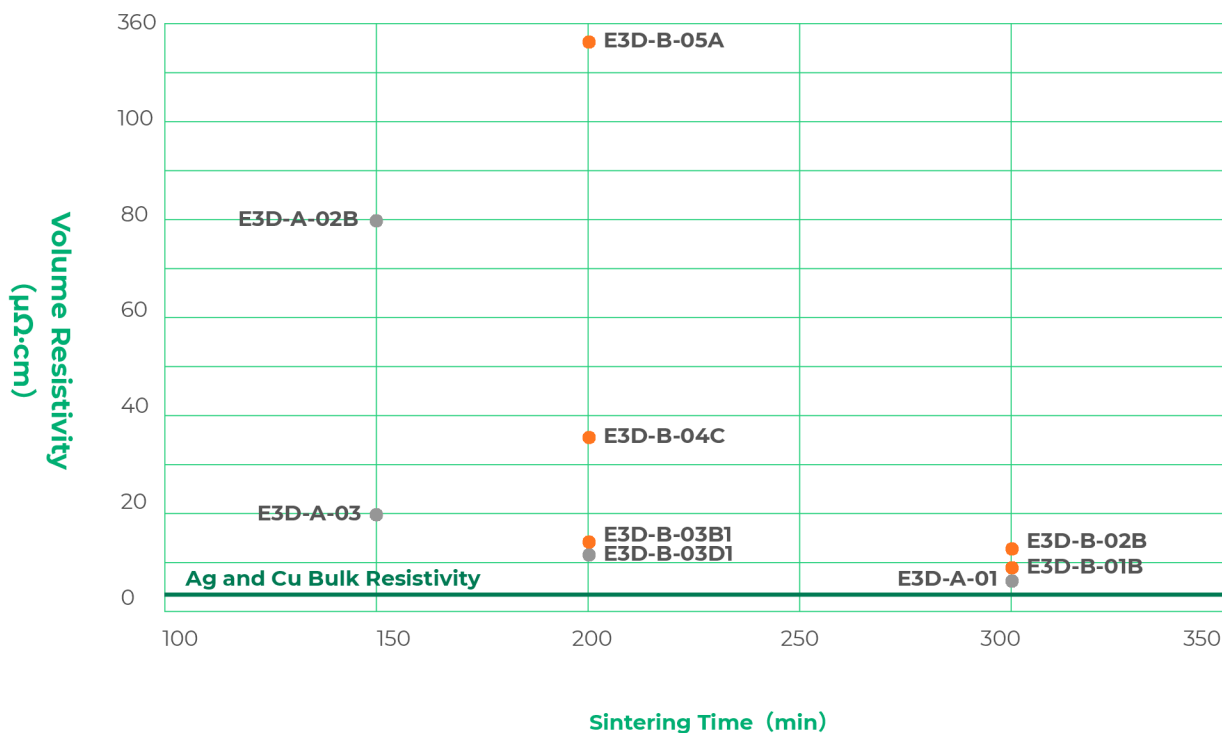
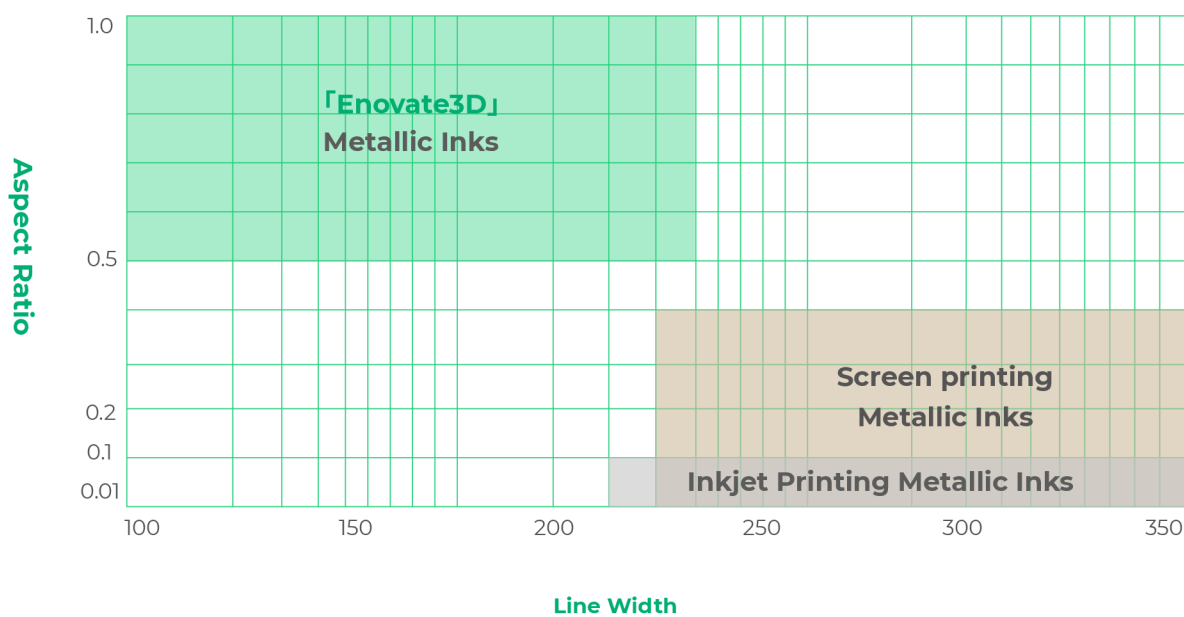
Additive/Printable Electronic Materials





High-performance Metallic Inks/Pastes

High-performance Metallic Inks/Pastes exhibits excellent electrical conductivity and adhesion when sintered at temperatures between 150–300°C, enabling printing with a precision of 1–50 μm. It is suitable for applications in displays, photovoltaics, consumer electronics, advanced packaging, and other fields.



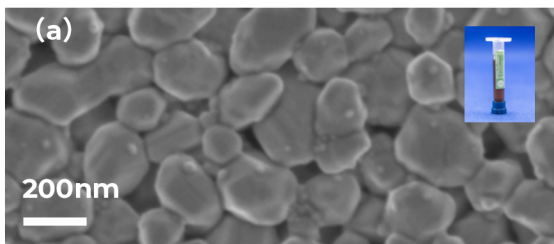
● E3D-A Series Conductive Silver Pastes ● E3D-B Series Conductive Copper Pastes

Silver Inks/Pastes

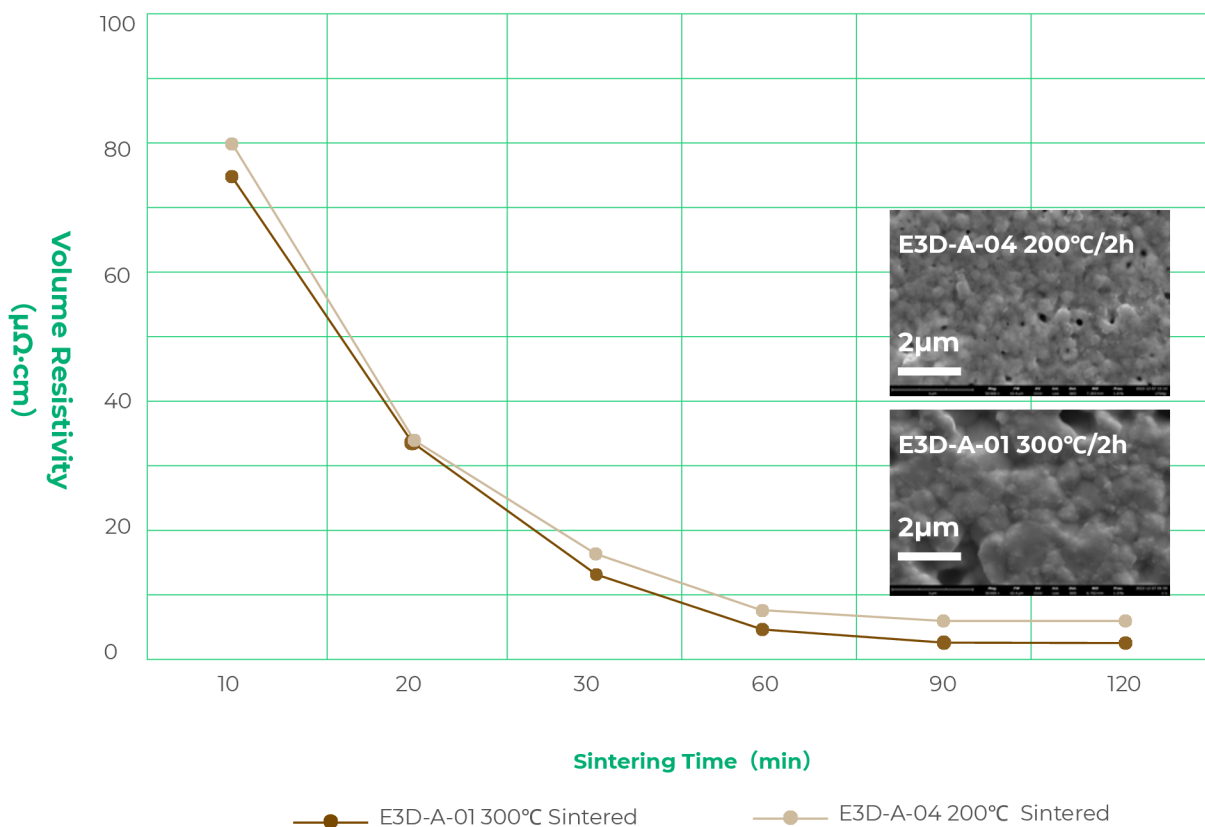
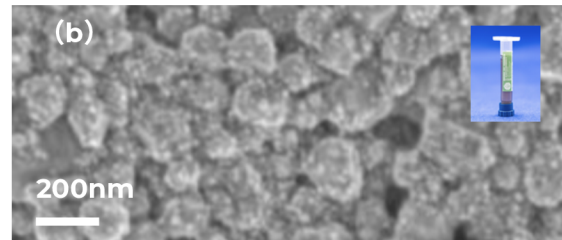
Silver Inks/Pastes exhibits excellent electrical conductivity and adhesion when sintered at temperatures between 150–300°C, enabling printing with a precision of 1–50 μm.

Silver Inks	Curing Conditions	Volume Resistivity (μΩ·cm)	Key Characteristics	Applications
E3D-A-01	300°C/60min	≤ 5	Extremely low resistance, High shape fidelity	Precision Interconnects, Passive Flexible Circuits, etc.
E3D-A-02B	150°C/30min	≤ 80	Low temperature curing, Strong adhesion, Excellent solderability	Precision Interconnects, Passive Flexible Circuits, etc.
E3D-A-03	150°C/30min	≤ 20	Excellent conductivity, Strong adhesion, Low temperature curing	Heat Dissipation Components, HIT Photovoltaic Grid Lines, Electromagnetic Shielding, Via-filling, etc.
E3D-A-04	200°C/60min	≤ 12	Excellent conductivity, Strong adhesion, Low temperature curing	Printed Circuits, Microelectrodes, Antennas, MiniLED, etc.

SEM images of (a) E3D-A-01A



(b) E3D-A-04

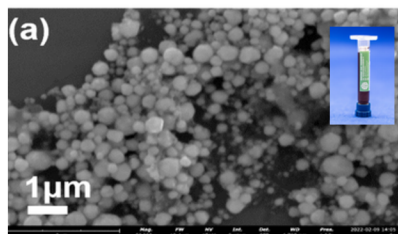


Copper Inks/Pastes

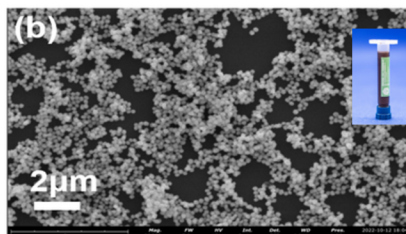
Copper Inks/Pastes exhibits excellent electrical conductivity and adhesion when sintered at temperatures between 200–300°C, enabling printing with a precision of 10–50 μm.

Copper Inks	Curing Conditions	Volume Resistivity (μΩ·cm)	Key Characteristics	Applications
E3D-B-01B	300°C/30min	≤ 8.6	Extremely low resistance, Strong adhesion, Excellent solderability.	Precision Interconnects, Passive Components, Microwave Devices, Flexible Circuits, Photovoltaic Grid Lines, etc.
E3D-B-02B	200°C/60min	≤ 86.5	Excellent electrical conductivity, Excellent conformability, Low-temperature curing.	Printed Circuits, Die Attachment, Antennas, etc.
E3D-B-02C	200°C/30min	≤ 340	Excellent conductivity, Low amount of volatile substances, Low-temperature curing.	Printed Circuits, Thermal Management Components, Die Attachment, etc.
E3D-B-02D	300°C/60min	≤ 12	Extremely low resistance, Strong adhesion, Excellent solderability.	Precision Interconnects, Photovoltaic Grid Lines, Microwave Communications, etc.
E3D-B-03B	300°C/60min	≤ 18	Extremely low resistance, Strong adhesion.	Printed Circuits, Via-filling, etc.
E3D-B-03C	200°C/60min	≤ 340	Strong adhesion, Excellent conformability, Low-temperature curing	Chip Heat Dissipation, Die Attachment, Complex 3D Structures, etc.

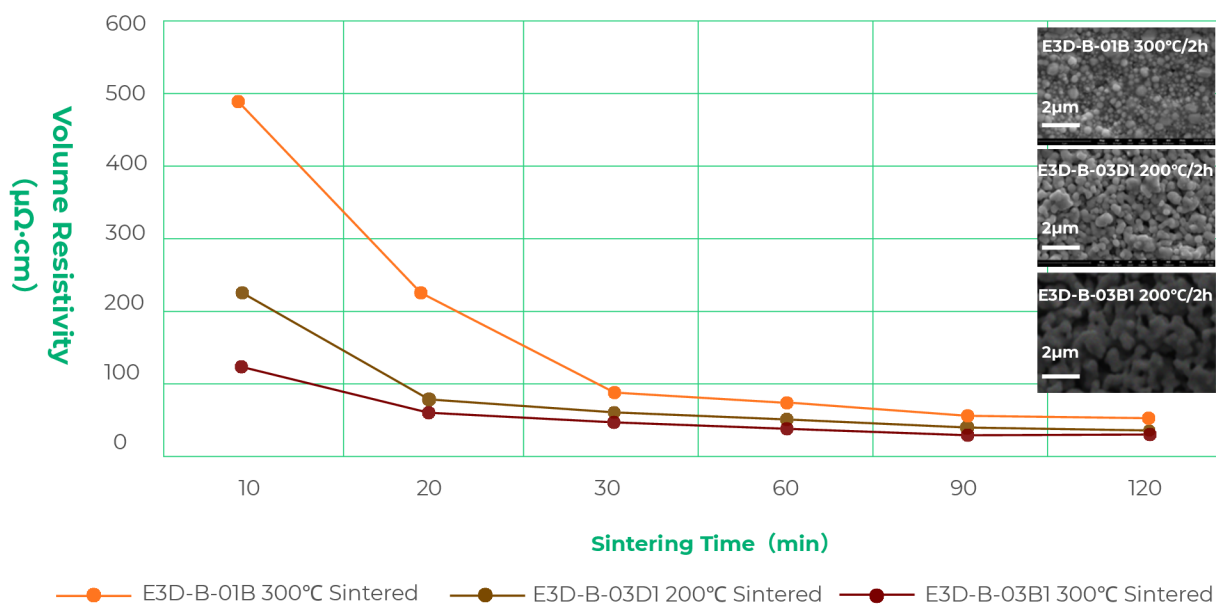
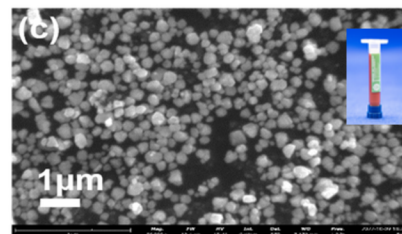
SEM images of (a) E3D-B-01B



(b) E3D-B-02C



(c) E3D-B-02D





High-performance Thermosetting Inks/Pastes(Epoxy)

High-Performance Thermosetting Pastes (Epoxy) are thermosetting epoxy encapsulants characterized by high adhesion strength, high heat deformation temperature, high hardness, and low shrinkage rate. They exhibit excellent adhesion to most substrates such as PET films, ceramics, glass, PI, and PCBs.

Product Advantages



High adhesion strength



High hardness, High Tg



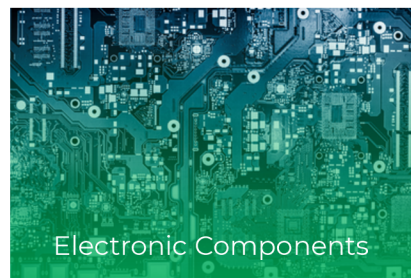
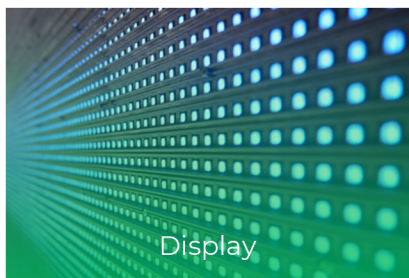
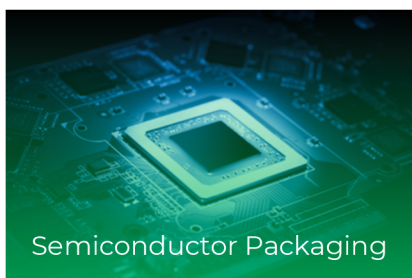
Low shrinkage rate



Excellent weather resistance

Application Fields

Suitable for Mini/Micro LED encapsulation; encapsulation protection of sensors and automotive electronics with high-temperature requirements; fixation and encapsulation protection of bare chips (e.g., FCBGA); bonding of materials such as PC, glass, and plastics. Research, development, and customization can be performed according to diverse scenario-specific, processing, and application demands.



Specification Parameters

Model		E3D-C-01		E3D-C-04	E3D-C-05	E3D-C-06	E3D-C-07	E3D-C-08
Pre-curing Properties	Appearance	Black (A)	Colorless (B)	Black	Yellow transparent	White, whiteness \geq 60	White	White
	Viscosity(dPa·s)	1500 \pm 300	1 \pm 0.1	8900 \pm 200	650 \pm 20	1.5 \pm 0.3, Customizable	14000 \pm 500	Paste form
	Density(g/cm ³)	1.76	1.16	1.76	1.06	1.09	1.81	2.13
Post-curing Properties	Glass transition temperature Tg(°C)	190		152	172	—	>140	>150
	Hardness	85D		85D	70D	62D	>90D	>80D
	Coefficient of expansion(ppm/K, <Tg)	28		22	—	—	14	56
	Dielectric Strength(V/mil)	2.9		3.0	3.0	—	—	—
	Reflectivity(%)	—		—	—	\geq 90	—	\geq 92
Curing Conditions		120°C/1h+150°C/1h		160°C/1h	150°C/1h	150°C/1h	UVA 1000mW/cm ² 30s+110°C/2h	120°C/0.5h
Working Time(r.t.)		12h		24h	30days	30days	24h (Light-Sensitive)	48h



High-performance Thermosetting Inks/Pastes(Silicone)

High-Performance Thermosetting Pastes (Silicone) are high-performance single-component silicone pastes characterized by high thixotropy, high fracture elongation, and excellent adhesion strength to most substrates such as PET films, ceramics, glass, PI, and PCBs.

Product Advantages



Single-component



High adhesion strength



High fracture elongation



High thixotropy



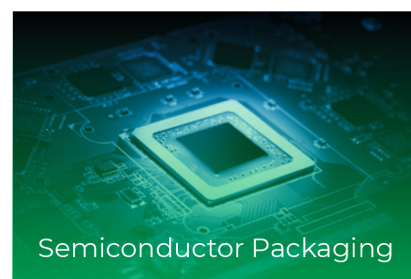
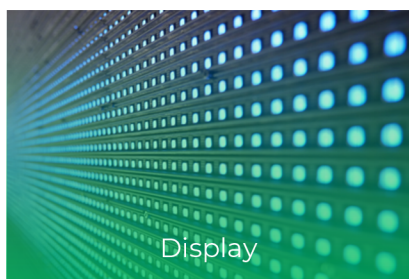
Excellent weather resistance



Excellent insulation properties

Application Fields

Suitable for potting, bonding, and 3D structure construction in display modules, LED lighting, electronic components, modules, and circuit boards. Research, development, and customization can be performed according to diverse scenario-specific, processing, and application demands.



Specification Parameters

Model		E3D-D-03	E3D-D-04B	E3D-D-05	E3D-D-06	E3D-D-07	E3D-D-08
Pre-curing Properties	Appearance	Semi-Transparent	White	Transparent	Transparent	Black	Transparent
	Viscosity(dPa·s)	4000±500	5400±500	24±2	12±1	Paste form	8.7±0.5
	Density(g/cm ³)	1.13	1.26	1.17	1.16	1.13	1.15
Post-curing Properties	Hardness	48A	40A	43D	50D	60A	61D
	Tensile Strength(MPa)	6.8	5.7	6.7	2.2	7	—
	Volume Resistivity(ohm*cm)	5.0×10 ¹⁴	5.0×10 ¹⁴	2.9×10 ¹⁴	1.0×10 ¹⁶	>4.0×10 ¹⁴	—
	Dielectric Strength(V/mil)	550	480	500	650	570	—
Optical Properties		—	Reflectivity >90%	Transmittance ≥99%	Transmittance ≥95%	OD Value ≥2	Transmittance ≥99%
Curing Conditions		150°C/0.5h	150°C/0.5h	150°C/1h	110°C/1h 150°C/3h	150°C/0.5h	80°C/0.5h 150°C/0.5h
Working Time(r.t.)		30days	30days	30days	48h	12h	48h

Note: All above products can be adjusted in color and optical properties according to actual requirements.

High-performance Photo-curable Inks/Pastes

High-Performance UV-Curable inks/pastes are single-component UV-curing adhesives characterized by rapid curing, low shrinkage, and high transparency. They can meet requirements for different refractive index scenarios and exhibit excellent adhesion to most substrates such as glass, PCBs, PC, and stainless steel.

Product Advantages



Single-component



High adhesion strength



Long operational life



High transparency



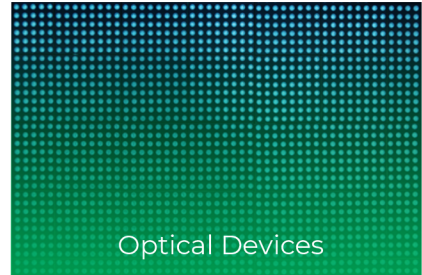
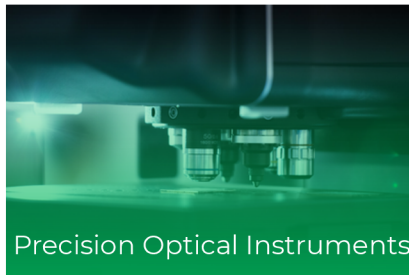
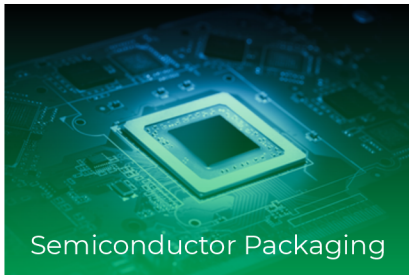
Excellent weather resistance



Low shrinkage rate

Application Fields

Suitable for encapsulation protection in electronic components; optical fields such as optical devices, precision optical instruments, and lens bonding; component positioning, bonding, and sealing. Research, development, and customization can be performed according to diverse scenario-specific, processing, and application demands.



Specification Parameters

Model		E3D-D-03	E3D-D-04B	E3D-D-05	E3D-E-05	E3D-E-06	E3D-E-07
Pre-curing Properties	Appearance	Transparent	Milky White	Transparent	Transparent	Transparent	Transparent
	Viscosity(dPa·s)	85±2	130±5	37±2	45.5±2	18±1	23±2
	Density(g/cm ³)	1.1	1.13	1.2	1.06	1.05	1.5
Post-curing Properties	Glass transition temperature Tg(°C)	45	65	58	73	67	30
	Hardness	62D	65D	66D	88D	86D	80A
	Fracture Elongation(%)	161	220	120	47	50	—
	Volume Resistivity (ohm*cm)	>1.0×10 ¹⁴	—	>1.5×10 ¹³	—	—	—
	Dielectric Strength(V/mil)	300	—	50	—	—	—
	Refractive Index(25°C)	—	—	—	1.5836	1.5830	1.3990
Curing Conditions		30s (100mW/cm ²)	4s (200mW/cm ²)	20s (110mW/cm ²)	5-10s (110mW/cm ²)	10-15s (110mW/cm ²)	15-20s (110mW/cm ²)

Other Functional Inks/Pastes

Other functional Inks/Pastes include quantum dot ink, magnetic materials, ceramic paste, battery paste, etc.

Product Advantages



Single-component



Excellent adhesion



High optical uniformity



Low shrinkage rate



Easy leveling



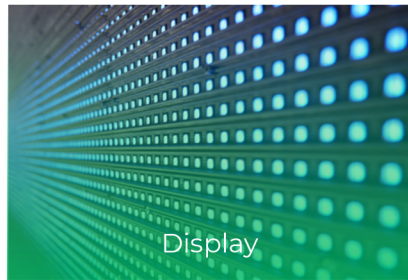
Excellent weather resistance

Application Fields

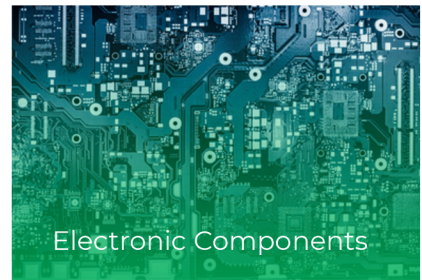
Suitable for lithium-ion batteries, displays, electronic components, and other fields. Research, development, and customization can be performed according to diverse scenario-specific, processing, and application demands.



Lithium-ion Batteries



Display



Electronic Components

All products described in this document comply with the EU RoHS Directive and China's GB38507-2020 VOC regulations. The information contained herein includes general descriptions and/or performance characteristics that may be subject to change due to technological developments or advancements. The values provided are representative and not specification values; specific performance characteristics and/or functions are legally binding only when agreed upon in a formal agreement. 「enovate3D」 reserves the right to modify product specifications without prior notice. For updated or additional product information, please contact us.



Scan the QR code to learn about our equipment.
Business Email: sales@enovate3d.com