Supporting Information

Microstructures, Grain and Nanowires Growth during Selective Laser Melting of Ag-Cu/Diamond Composites

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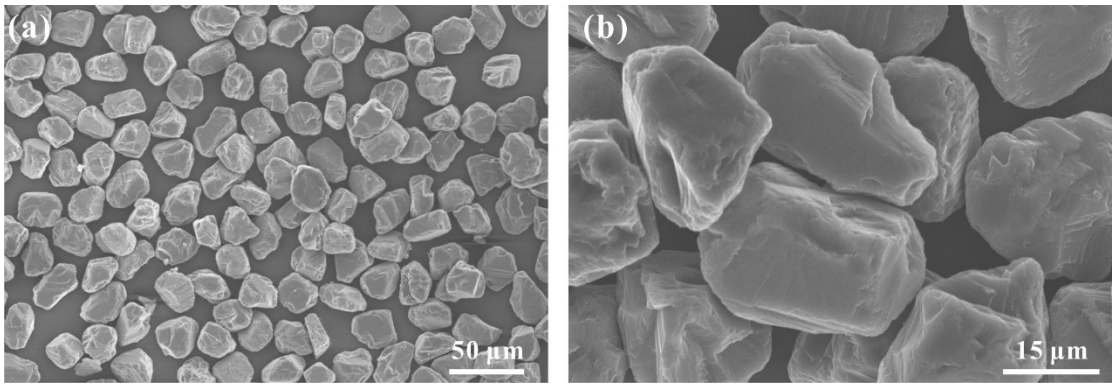

Figure S1. The morphology of diamond particles.

Table S1: The detailed parameters of rectangular contour samples.

Process parameters	Rectangular contour samples
Laser power (W)	40, 50, 60, 70, 80, 90, 100, 110, 120
Scanning speed (mm/s)	400, 600, 800, 1000, 1200, 1400, 1600, 1800, 2000
Layer thickness (μm)	100
Speciment geometry (mm^2)	1×5

The line energy densinty (LED, J/m) is defined as **Eq S1**：

$$LED = \frac{P}{v} \tag{1}$$

where P represents the laser power (W) and v is the scanning speed (mm/s), respectively.

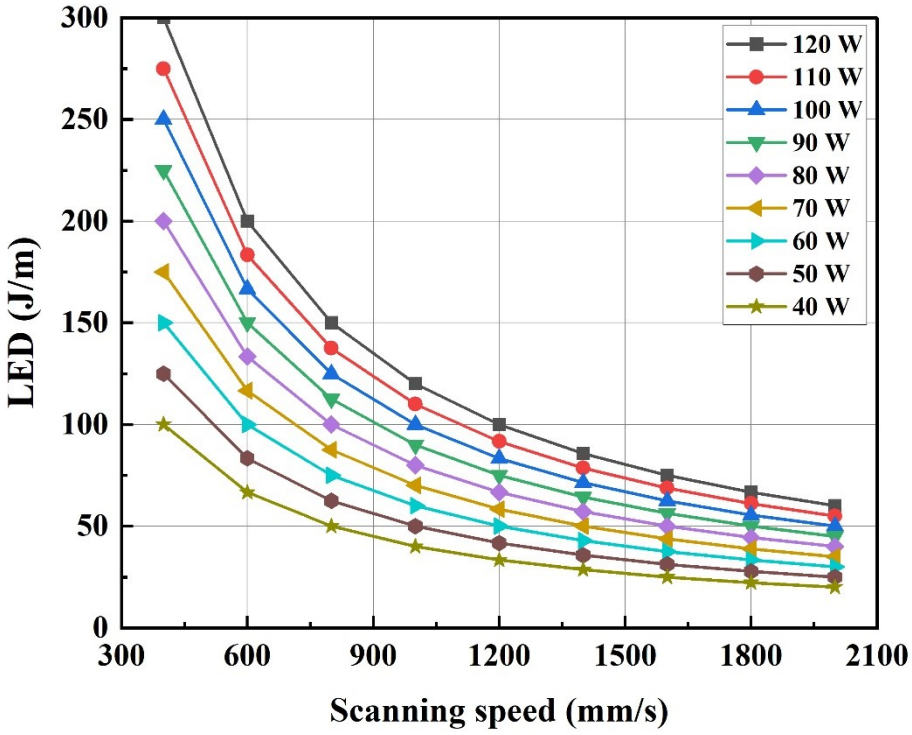

Figure S2: LED at different processing parameters of rectangle contours.

Table S2: The processing parameters used to manufacture cubic samples.

Types	Input volume energy density (J/mm^3)	Processing parameter P (W), v (mm/s), h (mm), t (mm)
Over melting	562.5	$P = 90$, $v = 800$, $h = 0.01$, $t = 0.02$
	625	$P = 100$, $v = 800$, $h = 0.01$, $t = 0.02$
	500	$P = 100$, $v = 1000$, $h = 0.01$, $t = 0.02$
	600	$P = 120$, $v = 1000$, $h = 0.01$, $t = 0.02$
Good melting	300	$P = 60$, $v = 1000$, $h = 0.01$, $t = 0.02$
	450	$P = 90$, $v = 1000$, $h = 0.01$, $t = 0.02$
	357.1	$P = 100$, $v = 1400$, $h = 0.01$, $t = 0.02$
	428.6	$P = 120$, $v = 1400$, $h = 0.01$, $t = 0.02$
Weak melting	200	$P = 40$, $v = 1000$, $h = 0.01$, $t = 0.02$
	166.7	$P = 40$, $v = 1200$, $h = 0.01$, $t = 0.02$
	250	$P = 60$, $v = 1200$, $h = 0.01$, $t = 0.02$
	214.3	$P = 60$, $v = 1400$, $h = 0.01$, $t = 0.02$

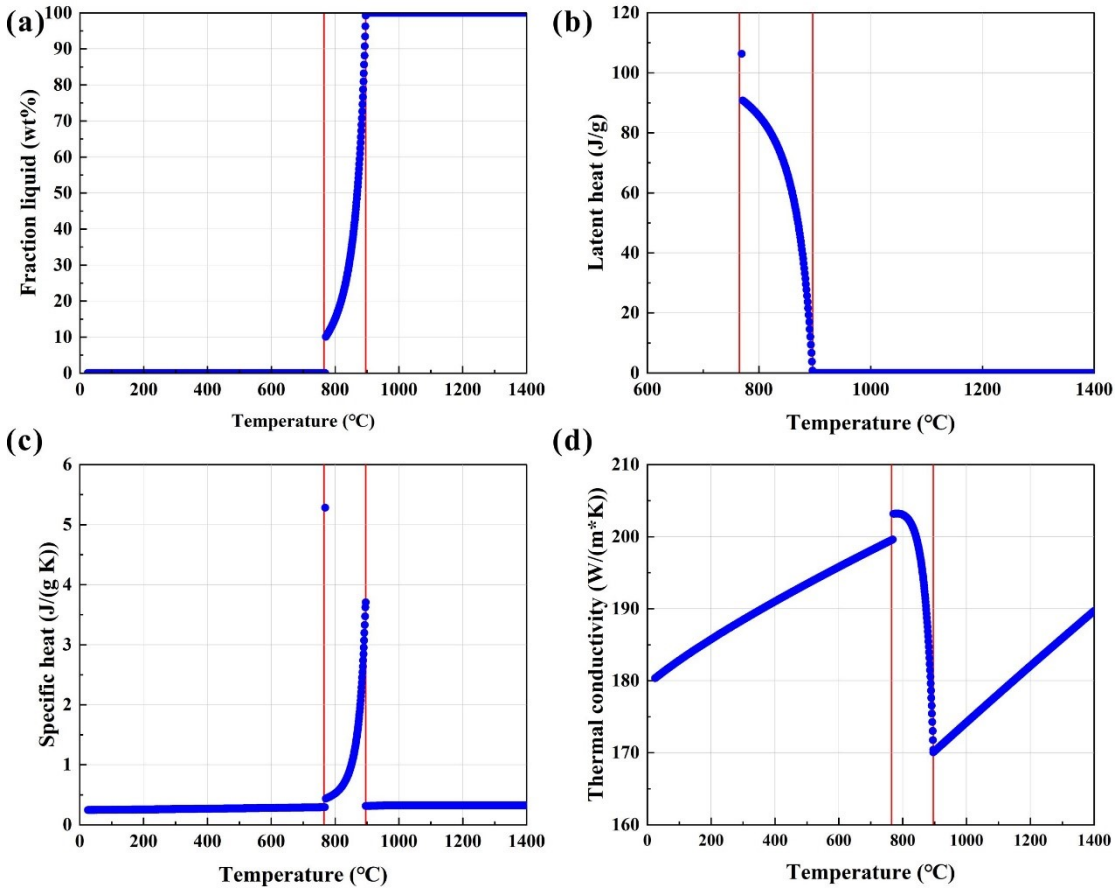

Figure S3: Thermophysical properties of Ag-Cu powders. (a) solidification curve; (b) latent heat curve; (c) specific heat curve; and (d) thermal conductivity curve.