

## Supplementary Information

### Liquid Bridge-Liquid metal largely enhances thermal conductivity and mechanical properties of thermal interface material

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#### Other Supplementary Materials for this paper include:

Graphical Abstract (supplied as independent files)

Supplementary Movie 1 (supplied as independent files)

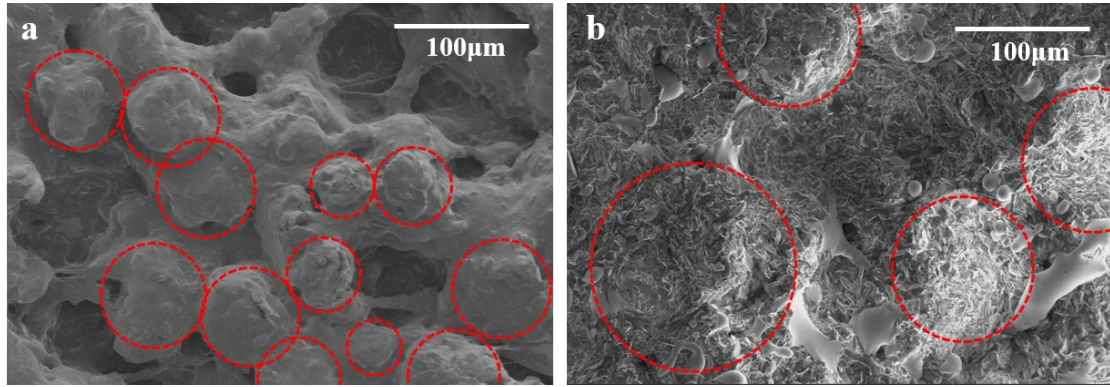


Fig. S1 (a) SEM images of SBN/PDMS TIMs and (b) SEM images of LM/SBN/PDMS TIMs.

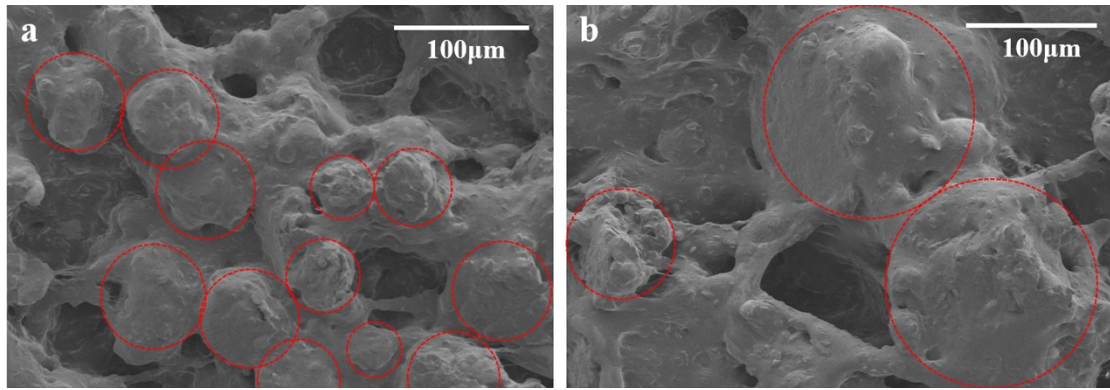


Fig. S2 a) SEM image of SBN-60/PDMS and b) SEM image of SBN-160/PDMS.

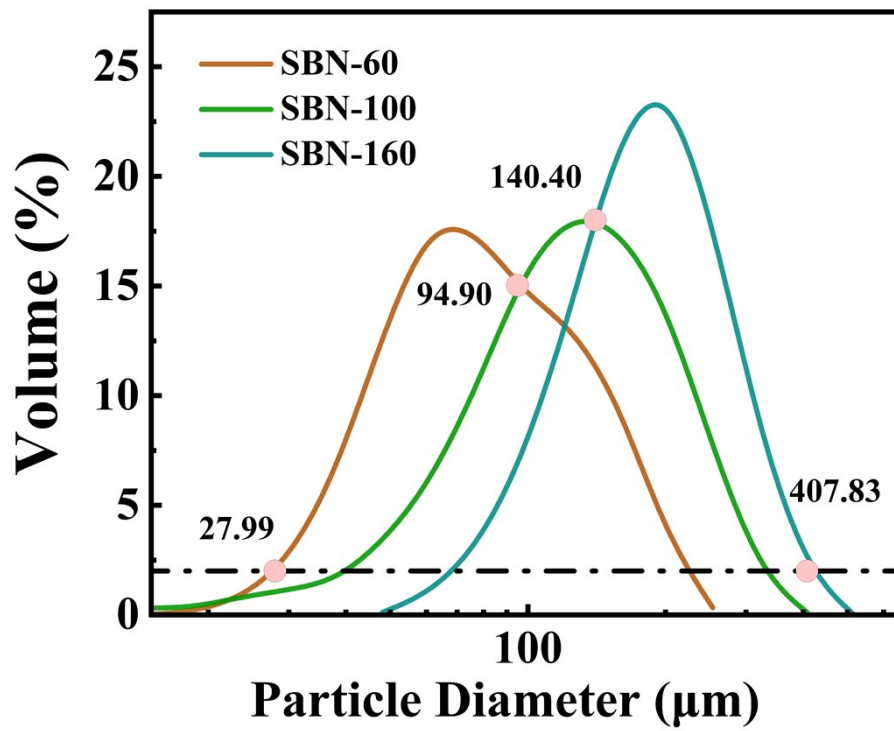


Fig. S3. Particle Diameter of SBN-60, SBN-100 and SBN-160

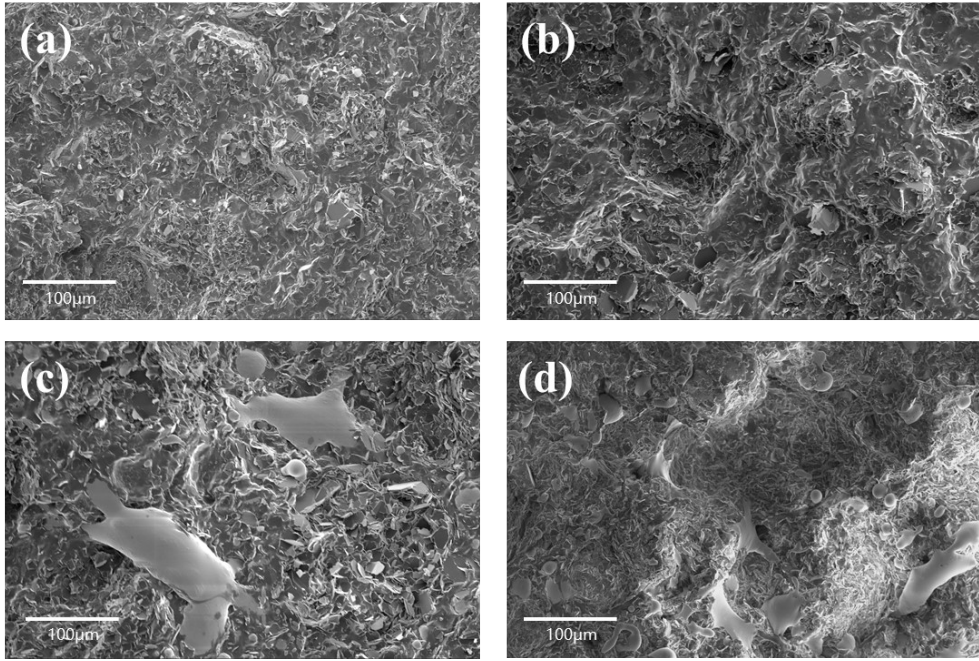


Fig. S4. SEM images of (a) SBN/PDMS TIMs. (b) LM/SBN/PDMS TIMs.  
(c) LM/SBN/PDMS TIMs. (d) LM/SBN/PDMS TIMs.

Table S1. The Total Energy Change of the System Before and After the Formation of  
The Liquid Metal Bridge

$\gamma_F^d$	$\gamma_F^p$	$\gamma_P^d$	$\gamma_P^p$	$\gamma_M^d$	$\gamma_M^p$	$W_{FM}$	$W_{PF}$	$W_{PM}$	$\Delta W$
45.88	5.42	23.45	4.63	0.42	0.06	9.92	75.62	7.34	-73.04

Table S2. Different Filler Compound Systems

Number	Volume Fraction/%		
	SBN-60	SBN-100	SBN-160
1	33.82	14.64	51.54
2	39.10	60.90	—
3	33.82	—	66.18
4	—	28.41	71.59

Table S3. Energy Loss

Cycle	Sample	
	SBN/PDMS	2:1 LM/SBN/PDMS
1	49.44	59.30
2	24.45	28.43
3	22.37	23.95
4	23.55	24.50
5	22.34	23.86
6	21.33	23.64
7	20.97	24.63
8	22.71	23.56
9	23.38	22.72
10	20.51	20.12