

# *JunPus International Co., Ltd.*

***Nano Diamond***

***Thermal Compound***



# Product Introduction

## Thermal Compound CPU / GPU



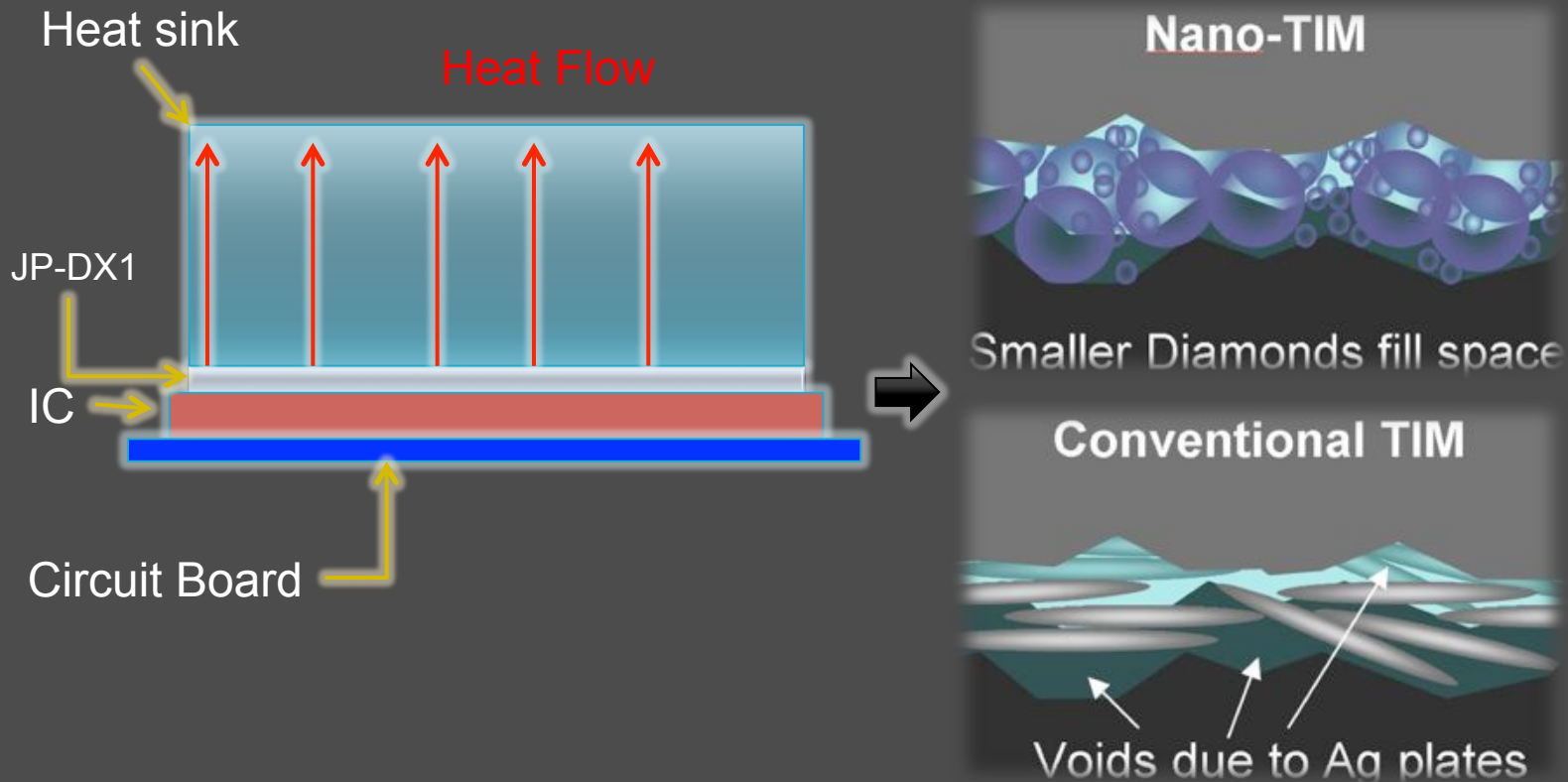
Product name	JP-DX1	JP-D9000	JP-D8000
Color Appearance	Gray	Gray	Gray
Viscosity(mPa. s)	3,000,000	5,500,000	3,000,000
Specific Gravity(g/cm3)	2.7	2.7	2.2
Thermal Conductivity(w/m-K)	16 MAX	8.9	5.5
Thermal Resistance (°C*cm2/w)60Psi	0.05	0.08	0.103
Dielectric Constant	14.5 at 1MHz	14.5 at 1MHz	14.5 at 1MHz
Volatile matter(%)120°C@96hrs	0.18	0.18	0.24
Out Gasing(%),200°C@96hrs	0.01	0.01	0.02
Temperature Stability(°C)	-50 ~ 200	-50 ~ 150	-50 ~ 180
Shelf Life	2 years	2 years	2 years

# Product Introduction

## Thermal Compound LED / IC



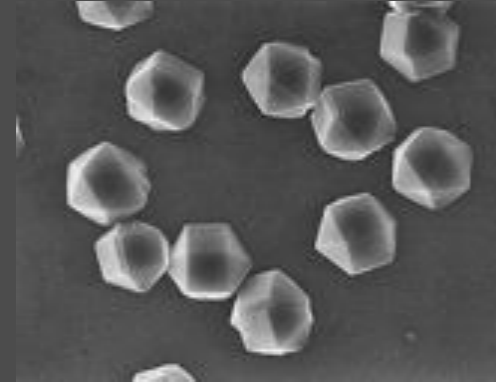
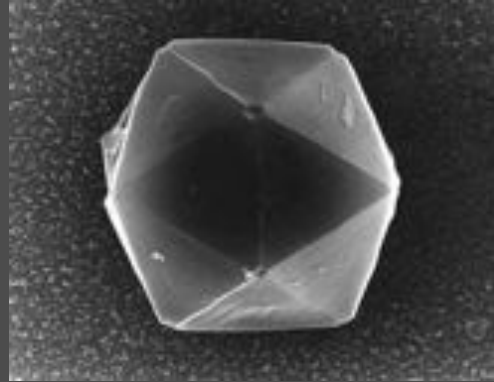
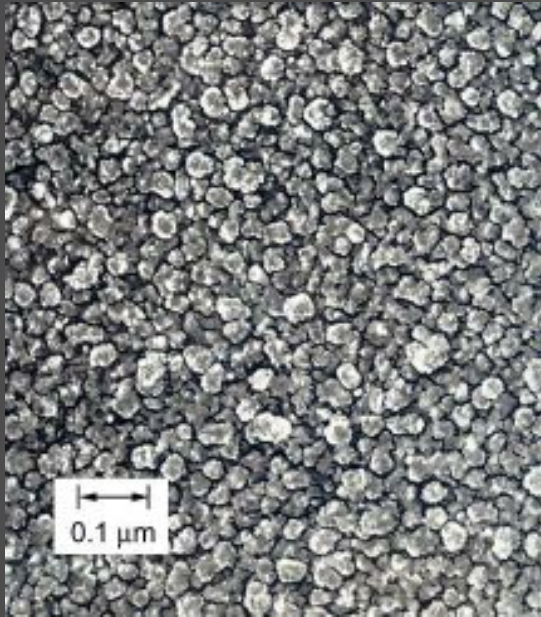
Product name	JP-DL800B	JP-DL700	JP-DL600
Color Appearance	Black	Gray	Gray
Viscosity(mPa. s)	4,200,700	700,000	600,000
Specific Gravity(g/cm <sup>3</sup> )	2.2	1.9	1.8
Thermal Conductivity(w/m-K)	5	4.5	3
Thermal Resistance (°C*cm <sup>2</sup> /w)60Psi	0.109	0.147	0.151
Dielectric Constant	14.5 at 1MHz	14.5 at 1MHz	14.5 at 1MHz
Volatile matter(%)120°C@96hrs	0.24	0.21	0.22
Out Gasing(%),200°C@96hrs	0.02	0.01	0.02
Temperature Stability(°C)	-50 ~ 250	-50 ~ 250	-50 ~ 250
Shelf Life	2 years	2 years	2 years



**JP-D-Series** is a top-quality heat sink compound product developed most recently by Russian nano technology. Made with high purity thermal conducting materials, **JP-D-Series** exhibits excellent thermal conduction thanks to its finer molecular structure produced by nanoscale treatment.

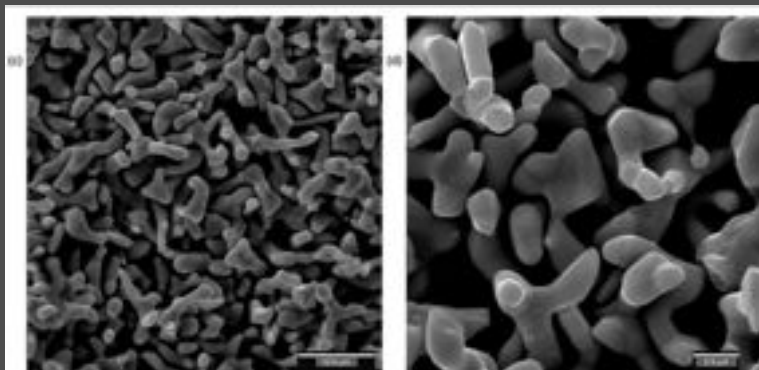
**JP-D-Series** has the following superior properties such as high chemical stability, being non-corrosive, Antioxidation, non-toxicity, non-volatility, non-flammability, and causing no irritation to human skin. It can withstand long-term storage, does not easily solidify, and can be readily implemented to the printing and coating process .  
Main ingredients: Nanodiamond, silicon

## SEM micrograph of nano-diamond particle



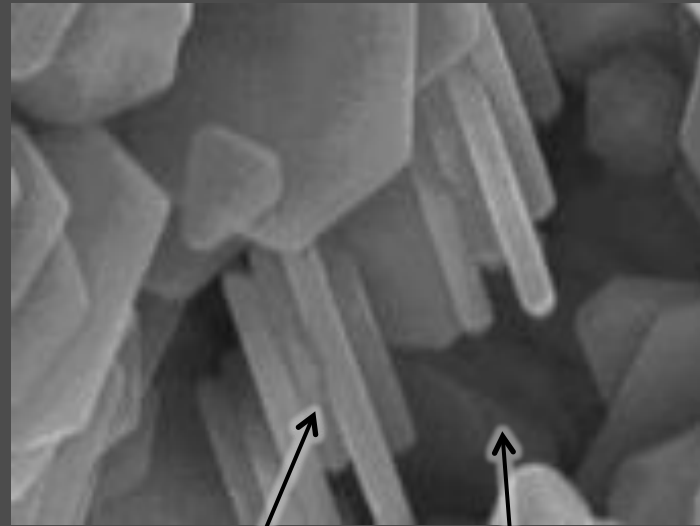
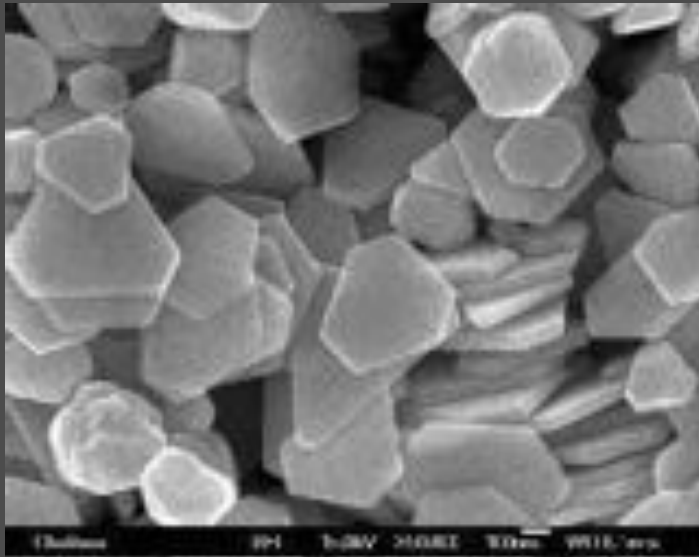
Quasi-spherical shape  
Good mobility & void free filling

## SEM micrograph of AlN particle



Coralloid shape  
worse mobility and voids forming

# SEM micrograph of Silver particle



Aggregation

Void

# Summary of Diamond Characters

Diamond(C)	Silver(Ag)	Alumina Nitride(AlN)
Insulator	Electrical conductive material → Short circuit issue	Semiconductor → Break-down after electric static discharge
Extremely good chemical and physical stability → resistant to ambient & long term reliability	Catalyst material → reliability issue	<ul style="list-style-type: none"> <li>• Slowly dissolve in mineral acids and strong alkalies</li> <li>• Slowly hydrolyze in water and oxidize in atmosphere</li> </ul> → reliability issue
Quasi-spherical shape <ul style="list-style-type: none"> <li>• smooth mobility</li> <li>• surface texture filling ability</li> </ul> → less contact resistance	large flat geometry <ul style="list-style-type: none"> <li>• voids bridging</li> <li>• strong aggregation after stirring</li> </ul>	3-dim irregular shape <ul style="list-style-type: none"> <li>• Strong voids</li> </ul> → Worse contact resistance