FAN-f Series

High thermal conductivity AlN filler

AlN filler is obtained by adding a small amount of the sintering aid Y_2O_3 and the particle size control agent BN to AlN fine powder with high thermal conductivity and sintering it at high temperatures.
The AlN filler obtained by adding a small amount of Y_2O_3, a sintering aid, and BN, a particle size control agent, to AlN fine powder with high thermal conductivity, and sintering at high temperatures. The AlN filler has excellent filling and flowability for various resins such as epoxy resin, silicone resin, BT resin, etc., and realizes high heat dissipation.

■ Feature

- Insulation &
  High Thermal Conductivity
- spherical particle
- high fill factor

■ Application

- Resins for semiconductor encapsulation
- Heat dissipation sheet
- Heat dissipation base

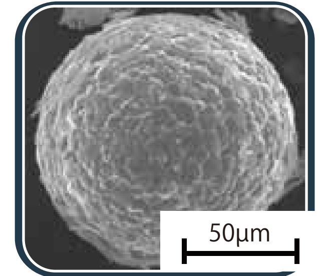


Table1.AlN filler　FAN f Series
Example of particle size distribution

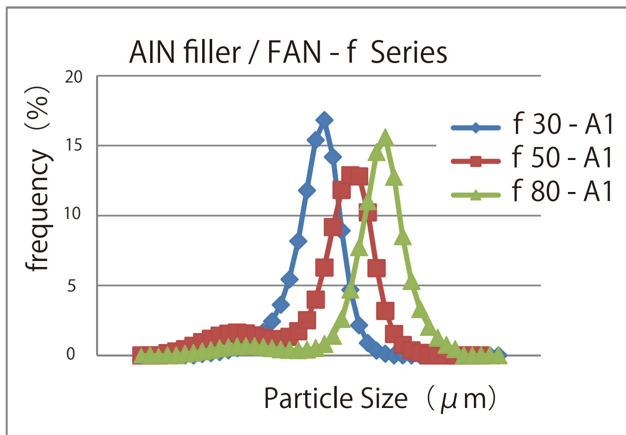
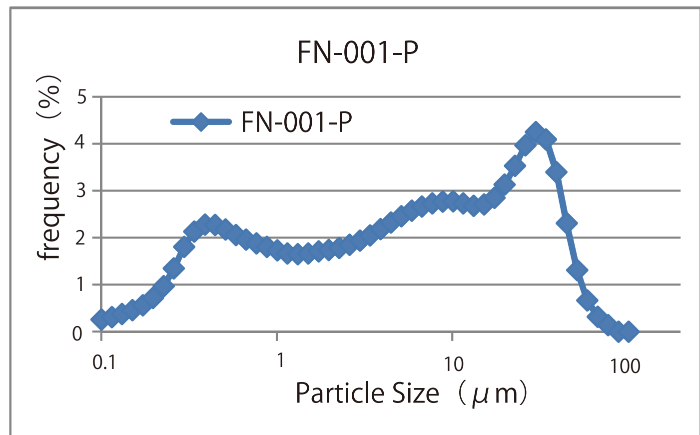


Table2.FN-001-P
Example of particle size distribution



■ Characterization

※Representative value

Grade		FAN- f 05-A1	FAN- f 30-A1	FAN- f 50-A1	FAN- f 80-A1	FN-001-P
Component		AlN (Minor Additives Y_2O_3, BN)				AlNetc.
Particle Shape		Polyhedral Grain	Spherical			
Thermal Conductivity	W/m·K (RT)	170 (Sintered Body)				
Insulation resistance	Ω·cm (RT)	$>10^{13}$ (Sintered Body)				
Density	g/cm^3	3.3 (Sintered Body)				
Average Particle Size	μm	3～10	20～40	35～65	65～90	
	D10	3	15	20	30	
	D90	8	50	95	150	
Remarks		Primary Particle Size	＜200mesh			High Filler

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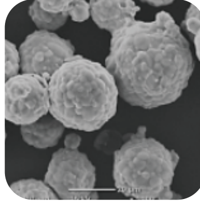
"Blend filler" for insulation/thermal conductive sheets

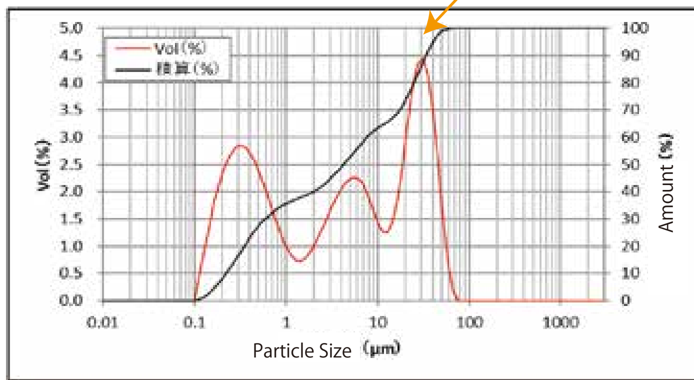
The FN Series blend filler is composed mainly of aluminum nitride ceramic filler, which has high thermal conductivity and large spherical particle size, blended with other ceramic fillers in a unique ratio. It can be blended with silicone and epoxy resins to produce sheets, gels, and adhesives with particularly excellent heat dissipation properties.

■ Characteristics
(product grade and particle size distribution)

Blend filler：
FN-001-P grade

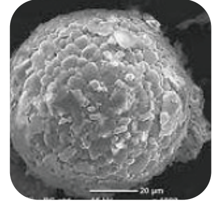
AlN filler：
30μm

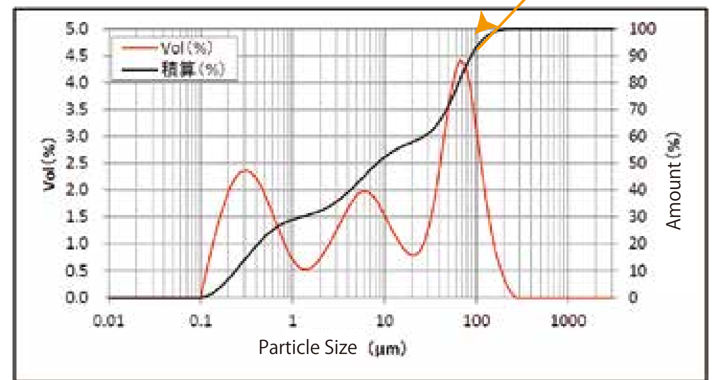




Blend filler：
FN-005-Pgrade

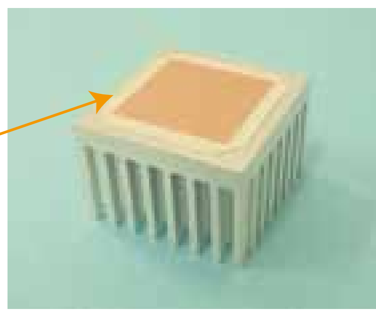
AlN filler：
80μm

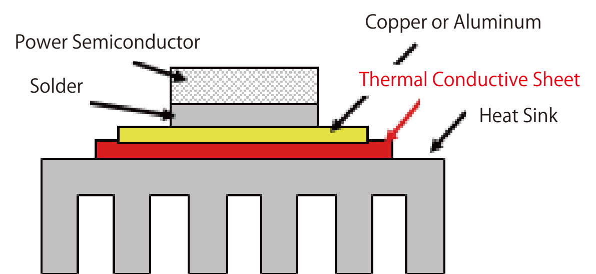




■ Application example

For cooling power semiconductor, High luminance white LED etc.





■ Example of characteristic value

Filler to use		FN-005-P
Filler content	wt%	90
Thickness	mm	0.5
Thermal Conductivity	W/m・K	5

※Resin used: Silicone-based
※The values in the table do not guarantee performance.

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AIN Slice Substrate

AIN substrates based on our unique sintering and processing technologies

■ Specifications

・Shape (max.) □200(mm)
・Thickness dimension 0.25 to 1 (mm)
・Surface roughness Ra≦ 0.8 (μm)
・Laser processing: Available on request

■ Features

・High thermal conductivity and thermal emissivity, and high heat dissipation
・Thermal expansion coefficient matching that of Si
・High thermal shock resistance, withstands rapid heating and cooling.
・Various types of metallization are possible.
・High electrical insulation

■ Special Characteristic

Special Characteristic＼Grade		FAN-170	FAN-200	FAN-230
Thermal Conductivity	W/m･K (RT)	170	200	230
Thermal Emissivity	(100℃)	0.93		
Thermal Expantion Coefficient	10^{-6}/℃ (RT～400℃)	4.5		
Insulation Resistance	Ω･cm (RT)	>10^{13}		
Dielectric Strength	kV/mm (RT)	15		
Dielectric Constant	(1MHz)	8.8		
Dieletric Loss	10^{-4} (1MHz)	5		
Bending Strength	MPa	350		
Density	g/cm^3	3.3		
Y ttrium	%	3.4		

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AlN components for Semiconductor Manufacturing Equipment

Semiconductor manufacturing equipment (front-end process) is required to respond to the trend toward finer design rules and larger diameter wafers (φ300 mm or larger).To achieve that, the selection of materials for the components of the Semiconductor Manufacturing Equipment is extremely important. Aluminum nitride (AlN) is a well-balanced material with excellent thermal conductivity, thermal radiation (heat dissipation), thermal shock resistance, electrical insulation, and thermal expansion matching that of Si wafers.

■ Characteristic

- Large thermal conductivity and thermal emissivity, high thermal uniformity
- Resistant to thermal shock, rapid cooling and rapid heating
- Low temperature expansion matched to Si prevents deformation of wafers due to temperature changes. It also reduces particle generation by deposition film.
- Excellent fluorine gas corrosion resistance

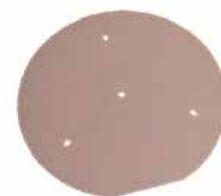
Clamping

■ Application

- Semiconductor Manufacturing Equipment. (CVD, Etching etc.)
- Each Susceptor, Electrostatic chuck, Vacuum chuck Heater burning plate & Heater
- Dummy Wafer
- Target
- Components for manufacturing equipment for compound semiconductors

■ Specifications

Shape (max.) □550(mm)
Thickness dimension
0.25 to 0.30 (mm)



Electrostatic chuck parts

■ Special Characteristic

※Representative value

Special Characteristic＼Grade		FAN-090	FAN-170	FAN-200	FAN-230
Thermal Conductivity	W/m・K（RT）	90	170	200	230
Thermal Emissivity	(100℃)	0.93			
Thermal Expansion Coefficient	10^{-6}/ ℃（RT～400℃）	4.5			
Thermal Shock Resistance	⊿T(Drop)	400（Document value）			
Insulation Resistance	Ω・cm（RT）	$>10^{13}$			
Dielectric Strength	kV/mm（RT）	15			
Dielectric Constant	(1MHz)	8.8			
Dielectric Loss	10^{-4}（1MHz）	5			
Bending Strength	MPa	250～300	300～400		
Density	g/cm^3	3.2	3.3		
Yttrium	%	0.0	3.4		
O（oxygen）	%	0.6	1.7		
Special Characteristic		High Purity	General Purpose	High Thermal Conductivity	

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