



GNPGraystar

Specialty Materials

AN ISO 9001 CERTIFIED COMPANY

Aluminum Nitride (AlN) Fillers

TECHNICAL DATA SHEET

DESCRIPTION:

GNPGraystar's Aluminum Nitride is a high purity AlN that exhibits high thermal conductivity, high electrical insulation properties, near spherical particles, high solid loading, low thermal expansion coefficient and sharp particle size distribution.

APPLICATIONS:

GNPGraystar's High Purity Aluminum Nitride (AlN) Fillers are used in the production of IGBT driver boards, semiconductor manufacturing parts such as etching mask, electrostatic chuck, and heater, in LED heat dissipation boards, in crucibles, and many other applications.

STANDARD FILLERS:

(no surface coating, not water resistant)

TYPICAL DATA:	M-G	F-10	F-30	F-50	F-80
Mean Particle Size (μm)	1.2 - 1.5	5 - 10	20 - 40	40 - 60	70 - 90
Particle Shape	Near spherical	Near spherical	Spherical	Spherical	Spherical
Real Density (g/cm^3)	3.26	3.26	> 3.30	> 3.30	> 3.30
Thermal Conductivity ($\text{W}/\text{m}\cdot\text{K}$)	> 170	> 170	> 170	> 170	> 170
Apparent Density (g/cm^3)	0.3 - 0.5	1.3 - 1.5	1.4 - 1.6	1.6 - 1.8	1.6 - 1.8
Tap Density (g/cm^3)	0.7 - 0.9	1.6 - 1.8	1.8 - 2.0	1.8 - 2.0	1.8 - 2.0

RF SERIES STANDARD FILLERS:

(Sintered Agglomerated; No Surface Coating, Basic Water Resistance)

TYPICAL DATA:	300RF	550RF	800RF
Mean Particle Size (μm)	30	55	80
Particle Shape	Spherical	Spherical	Spherical
Real Density (g/cm^3)	3.26	3.26	3.26
Specific Surface Area (m^2/g)			
Water Resistance Rating	< 8 hours	< 8 hours	< 8 hours

North Branch

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South Branch

9 Simmonsville Rd., Bluffton, SC 29910
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RFE SERIES FILLERS FOR EPOXY RESIN SYSTEMS:

(Sintered Agglomerated; Surface Coated with Basic Water Resistance)

TYPICAL DATA:	300RFE	550RFE	800RFE
Mean Particle Size (µm)	30	55	80
Particle Shape	Spherical	Spherical	Spherical
Real Density (g/cm ³)	3.26	3.26	3.26
Specific Surface Area (m ² /g)			
Water Resistance Rating	24-72 hours	24-72 hours	24-72 hours

RFS SERIES FILLERS FOR SILICONE POLYMER SYSTEMS:

(Sintered Agglomerated; Surface Coated with Basic Water Resistance)

TYPICAL DATA:	300RFS	550RFS	800RFS
Mean Particle Size (µm)	30	55	80
Particle Shape	Spherical	Spherical	Spherical
Real Density (g/cm ³)	3.26	3.26	3.26
Specific Surface Area (m ² /g)			
Water Resistance Rating	24-72 hours	24-72 hours	24-72 hours

RW SERIES STANDARD FILLERS:

(Sintered Agglomerated; no Surface Coating; State-of-the-Art Water Resistant Treatment)

TYPICAL DATA:	300RW	550RW	800RW
Mean Particle Size (µm)	30	55	80
Particle Shape	Spherical	Spherical	Spherical
Real Density (g/cm ³)	3.26	3.26	3.26
Specific Surface Area (m ² /g)	< 0.13	< 0.067	< 0.05
Water Resistance Rating	Up to 500 hours	Up to 500 hours	Up to 500 hours

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RWE SERIES FILLERS FOR EPOXY RESIN SYSTEMS:

(Sintered Agglomerated; Surface Coated; State-of-the-Art Water Resistant Treatment)

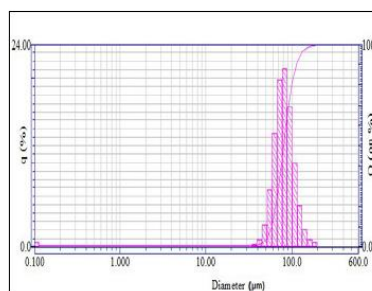
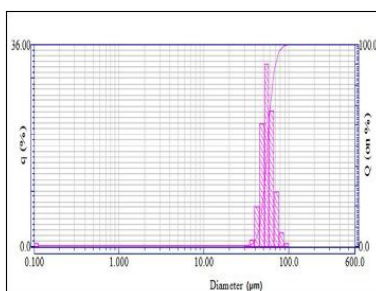
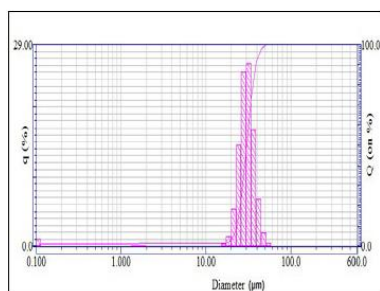
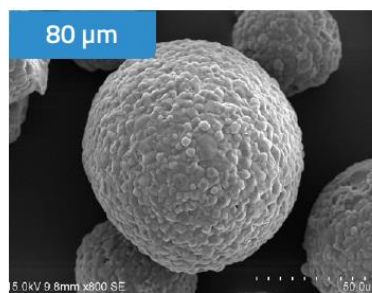
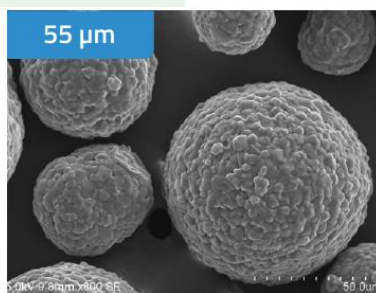
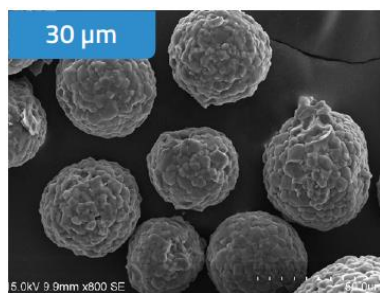
TYPICAL DATA:	300RWE	550RWE	800RWE
Mean Particle Size (μm)	30	55	80
Particle Shape	Spherical	Spherical	Spherical
Real Density (g/cm ³)	3.26	3.26	3.26
Specific Surface Area (m ² /g)	< 0.13	< 0.067	< 0.05
Water Resistance Rating	Up to 500 hours	Up to 500 hours	Up to 500 hours

RWS SERIES FILLERS FOR SILICONE POLYMER SYSTEMS:

(Sintered Agglomerated; Surface Coated; State-of-the-Art Water Resistant Treatment)

TYPICAL DATA:	300RWS	550RWS	800RWS
Mean Particle Size (μm)	30	55	80
Particle Shape	Spherical	Spherical	Spherical
Real Density (g/cm ³)	3.26	3.26	3.26
Specific Surface Area (m ² /g)	< 0.13	< 0.067	< 0.05
Water Resistance Rating	Up to 500 hours	Up to 500 hours	Up to 500 hours

SEM PHOTO AND PARTICLE SIZE DISTRIBUTION (RF, RFE, RFS, RW, RWE, RWS SERIES)



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NON-SPHERICAL ALUMINUM NITRIDE FILLERS:

The NW, NEW, & NWS Series have reduced impurities and very low Oxygen content, as well as a special surface treatment to offer outstanding water resistance. These particles are irregularly shaped with smoother and rounded edges. A significantly improved specific surface area (SSA) allows for a much higher filling rate and lower viscosity.

NW SERIES STANDARD FILLERS:

(Polycrystalline Particles, no Surface Coating; State-of-the-Art Water Resistant Treatment)

TYPICAL DATA:	020NW	050NW	130NW	200NW	500NW	800NW
Mean Particle Size (µm)	2	5	13	20	50	80
Particle Shape	Roundish	Roundish	Roundish	Roundish	Roundish	Roundish
Real Density (g/cm ³)	3.26	3.26	3.26	3.26	3.26	3.26
Specific Surface Area (m ² /g)	< 2.5	< 0.8	< 0.35	< 0.2	< 0.2	< 0.2
Water Resistance Rating	No hydrolysis after 1000+ hours of being directly submerged in water (under 85°C / 85% conditions)					

NWE SERIES FILLERS FOR EPOXY RESIN SYSYEMS:

(Polycrystalline Particles, Surface Coated; State-of-the-Art Water Resistant Treatment)

TYPICAL DATA:	020NWE	050NWE	130NWE	200NWE	500NWE	800NWE
Mean Particle Size (µm)	2	5	13	20	50	80
Particle Shape	Roundish	Roundish	Roundish	Roundish	Roundish	Roundish
Real Density (g/cm ³)	3.26	3.26	3.26	3.26	3.26	3.26
Specific Surface Area (m ² /g)	< 2.5	< 0.8	< 0.35	< 0.2	< 0.2	< 0.2
Water Resistance Rating	No hydrolysis after 1000+ hours of being directly submerged in water (under 85°C / 85% conditions)					

NWS SERIES FILLERS FOR SILICONE POLYMER SYSYEMS:

(Polycrystalline Particles, Surface Coated; State-of-the-Art Water Resistant Treatment)

TYPICAL DATA:	020NWS	050NWS	130NWS	200NWS	500NWS	800NWS
Mean Particle Size (µm)	2	5	13	20	50	80
Particle Shape	Roundish	Roundish	Roundish	Roundish	Roundish	Roundish
Real Density (g/cm ³)	3.26	3.26	3.26	3.26	3.26	3.26
Specific Surface Area (m ² /g)	< 2.5	< 0.8	< 0.35	< 0.2	< 0.2	< 0.2
Water Resistance Rating	No hydrolysis after 1000+ hours of being directly submerged in water (under 85°C / 85% conditions)					

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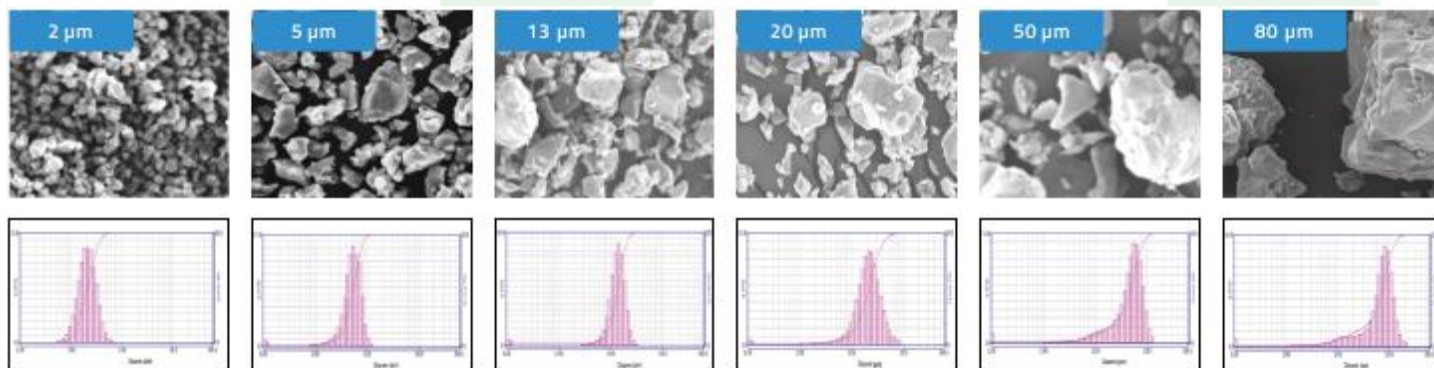
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SEM PHOTO AND PARTICLE SIZE DISTRIBUTION (NW, NWE, NWS SERIES)



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