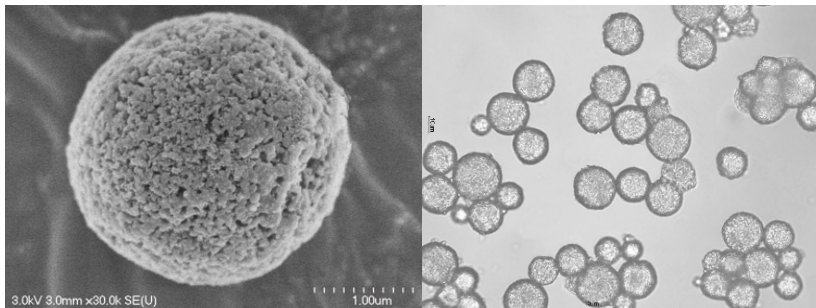


SOLUTIONS FOR ADDITIVE APPLICATIONS: MAT300 SERIES

HOLLOW SILICA MICROSPHERES

MULTI-PURPOSE ADDITIVES FOR PLASTICS, COMPOSITES AND OTHER INORGANIC MATERIALS

MAT300 Advanced Material series are amorphous, functionalized and micro-sized hollow spherical silica particles developed for a wide range of applications. Due to their multi-functionalization, they can be incorporated both in polar polymers as in non-polar matrices.



APPLICATIONS

- Weight-reducing fillers for polymers
- Mechanical fillers for polymers
- Low CTE (coefficient of thermal expansion) fillers
- Fillers for electrical and thermal insulation
- Fire retardant fillers (synergetic effects in association with ATH or MH)
- Anti-blocking, anti-fogging and anti-static additives for polymers
- Nucleating agent for crystalline or semi-crystalline polymers

TYPICAL PROPERTIES*

Chemical Name	Silicon dioxide
Structure	Amorphous
Surface Groups	Organic polar and non-polar groups
Powder Density	0.1 - 0.3 g/ml
Purity (powder)	> 95 %
Surface Area	> 100 m ² /g
Pore Size	15 - 30 nm
Morphology	Hollow silica particles
Size	Different sizes from 5 to 40 microns

SPECIFICATIONS

Forms Supplied

- White powder (free-flowing powder)
- Dispersion in solution (water, alcohols, DMF, acetone, etc.)

Custom Synthesis

- Special sizes
- Custom surface modifications (functionalization with organic, inorganic or metallic species)

**Values stated in this technical data sheet represent typical values as not all tests are run on each lot of material produced. For formalized product specifications, please contact us.*

CAUTIONARY INFORMATION

Before using this product, refer to the Material Safety Data Sheet (MSDS) label for use and handling instructions.

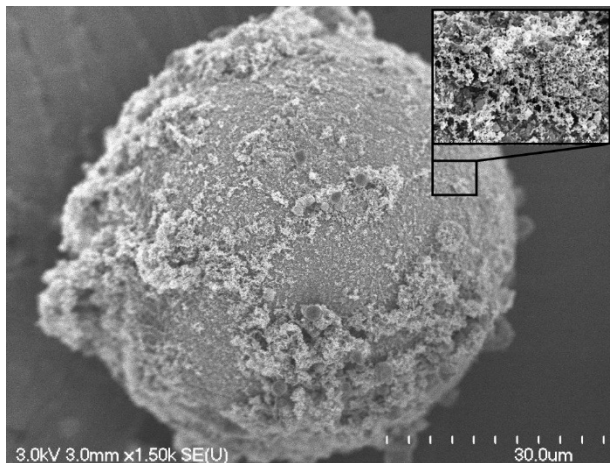
SOLUTIONS FOR ADDITIVE APPLICATIONS: MAT300 SERIES

SILICA-GRAPHENE COMPOSITE MATERIALS

MAT300G SERIES

MAT300G Advanced Material series consist of micro-sized hollow spherical silica particles covered with graphene layers. This results in a low density material having remarkable specific area and thermal and/or electrical conductivity due to the presence of graphene.

Trade Name	Powder Tapped Density	Composition (wt. % of graphene)	Particle Size (D50) of silica particles
MAT300G	0.13 ± 0.03 g/ml	21	20 µm



APPLICATIONS

- Thermally conductive composites (e.g. thermal interface materials, susceptors for rapid thermal processing, etc.)
- Weight-reducing fillers
- Electrically conductive fillers
- Low CTE fillers
- Energy storage
- Semiconductors
- Materials for Microelectronics
- Materials for aerospace applications
- Multi-purpose filler for 3D printing

TYPICAL PROPERTIES*

Name	Silica-graphene composite
Surface Groups	Can be oxidized or not – Possibility of various functionalizations
Powder Density	0.08-0.3 g/ml
Purity (powder)	> 98 %
Surface Area	> 200 m ² /g
Morphology	Graphene-coated hollow silica particles
Size	Different sizes from 5 to 40 microns

SPECIFICATIONS

Forms Supplied

- Black Powder (free-flowing powder)
- Dispersion in solution (water, alcohols, DMF, acetone, etc.)

Custom Synthesis

- Special sizes
- Custom surface modifications (functionalization with different organic and inorganic groups)

ELECTRICAL CONDUCTIVITY*

1000-2000 S/m for 4% wt. loading in epoxy resin.

CAUTIONARY INFORMATION

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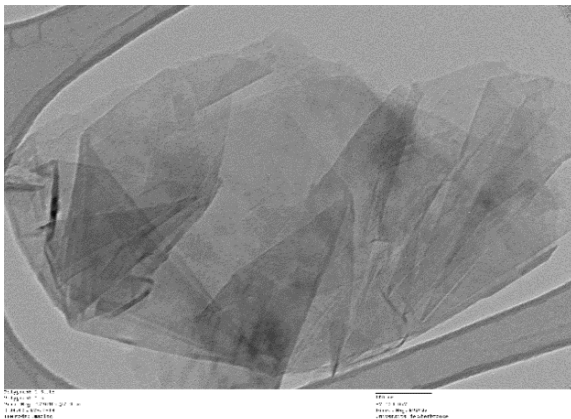
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SOLUTIONS FOR ADDITIVE APPLICATIONS: MAT300 SERIES

GRAPHENE FLAKES

MAT300GF SERIES

MAT300GF Advanced Material series consist of nanoflakes of graphene or graphene oxide available in solution or in the form of powder. The size of these flakes ranges from 1-20 µm with a thickness of several nanometers (few layers of graphene or graphene oxide).



APPLICATIONS

- Thermally conductive composites (e.g. thermal interface materials, susceptors for rapid thermal processing, etc.)
- Electrically conductive fillers
- Low CTE fillers
- Energy storage
- Semiconductors
- Materials for Microelectronics
- Materials for aerospace applications
- Multi-purpose filler for 3D printing

TYPICAL PROPERTIES*

Name	Graphene / Graphene Oxide
Surface Groups	Possibility of various functionalization
Purity (powder)	> 98 %
Surface Area	> 500 m ² /g
Morphology	Flakes
Flake Size	1-20µm
Flake Thickness	5-7 nm

SPECIFICATIONS

Forms supplied

- Black Powder (free-flowing powder)
- Dispersion in solution (water, alcohols, DMF, acetone, etc.)

Custom Synthesis

- Special sizes
- Custom surface modifications (functionalization with different organic and inorganic groups)

THERMAL CONDUCTIVITY*

- Graphene Oxide: Up to 160% increase for 1% wt. loading in PP
- Graphene: Up to 60% increase for 1% wt. loading in PP

CAUTIONARY INFORMATION

Before using this product, refer to the Material Safety Data Sheet (MSDS) label for use and handling instructions

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