

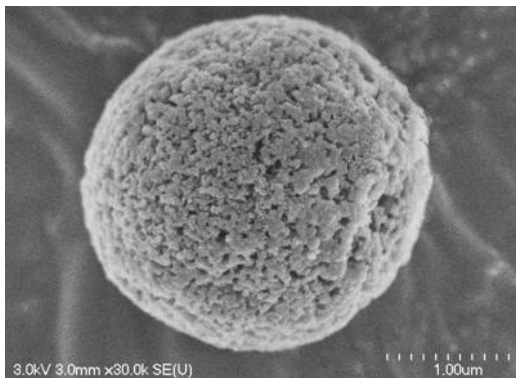
SOLUTIONS FOR WATER TREATMENT : MAT250 SERIES

HOLLOW SILICA MICROSPHERES

DESCRIPTION

Water treatment

Silica microspheres can be used for biological treatment of domestic, municipal or industrial waste water. More specifically, our hollow silica microsphere offer a media support for microorganism growth which can be used as bacterial carriers for both aerobic and anaerobic conditions for waste water treatment.



PROPERTIES

- Available in different particle sizes from 1 to 70 μm . Our two typical products have a size (D50) around 10 and 30 μm
- Surface area of 100 m^2/g ($2 \times 10^7 \text{ m}^2/\text{m}^3$) and more
- Particles covered with polar and non-polar chemical groups
Can be functionalized with other organic or inorganic species for specific applications
- Can be dispersed in water, alcohols and other organic solvents.
- Possibility to encapsulate different active agents such as nutrients for bacteria, fertilizers, etc

TYPICAL PROPERTIES

Chemical Name	Silicon dioxide
Structure	Amorphous
Surface Groups	Organic polar and non-polar groups
Powder density	0.3±0.03 g/mL
Purity (powder)	> 99 %
Surface Area	> 100 m^2/g
Pore size	15 - 30 nm

SPECIFICATIONS

Morphology	hollow silica particles
Size	Different sizes from 10 to 30 microns

Forms supplied

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

Custom Synthesis

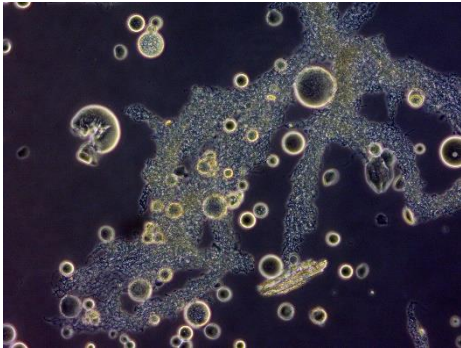
- Special sizes
- Custom surface modifications (functionalization with organic, inorganic, metallic or biological species)

**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.*

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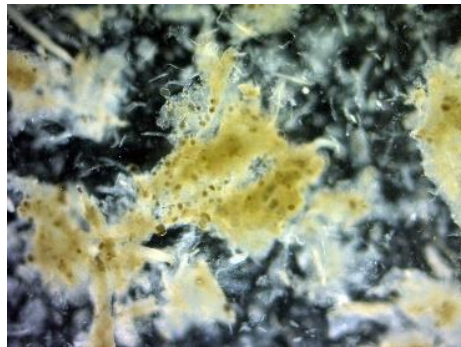
BENEFITS AS CARRIER OF MICROORGANISMS

GENERAL BENEFITS



- Reduced incubation time (e.g. 24 h vs 168h for commercial plastic carriers)
- Reduce microorganism loss by increasing their agglomeration
- Increase resistance of bacteria to physico-chemical changes and toxic contaminants
- Can be used in aerobic or anaerobic conditions.
- Possibility to increase the growth during the start-up by loading nutrients for bacteria inside the microcapsules

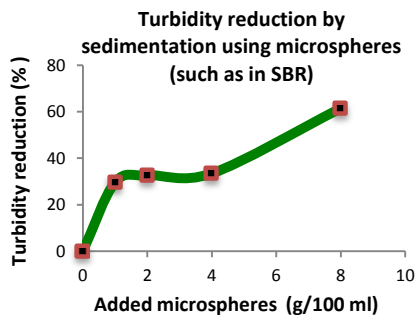
SPECIFIC BENEFITS



- In anaerobic conditions, reduction of volatile solid and increase of biogas production by 30% compared to a reference medium (without bacterial carriers)
- In aerobic conditions for nitrification, 60% more ammonia were converted after 94 days than the reference condition
- Reduce sedimentation time in SBR (sequential batch reactor)

RANGE OF APPLICATION

- Can be used for different applications such as sequencing batch, membrane bioreactor, moving bed bioreactor, anaerobic or aerobic digester and activated sludge system as well
- Different contaminants can be degraded with microorganism using our bacterial carriers (e.g. aromatics, hydrocarbons, halogenated organic compounds, ammonia, nitrates, etc)



CAUTIONARY INFORMATION

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