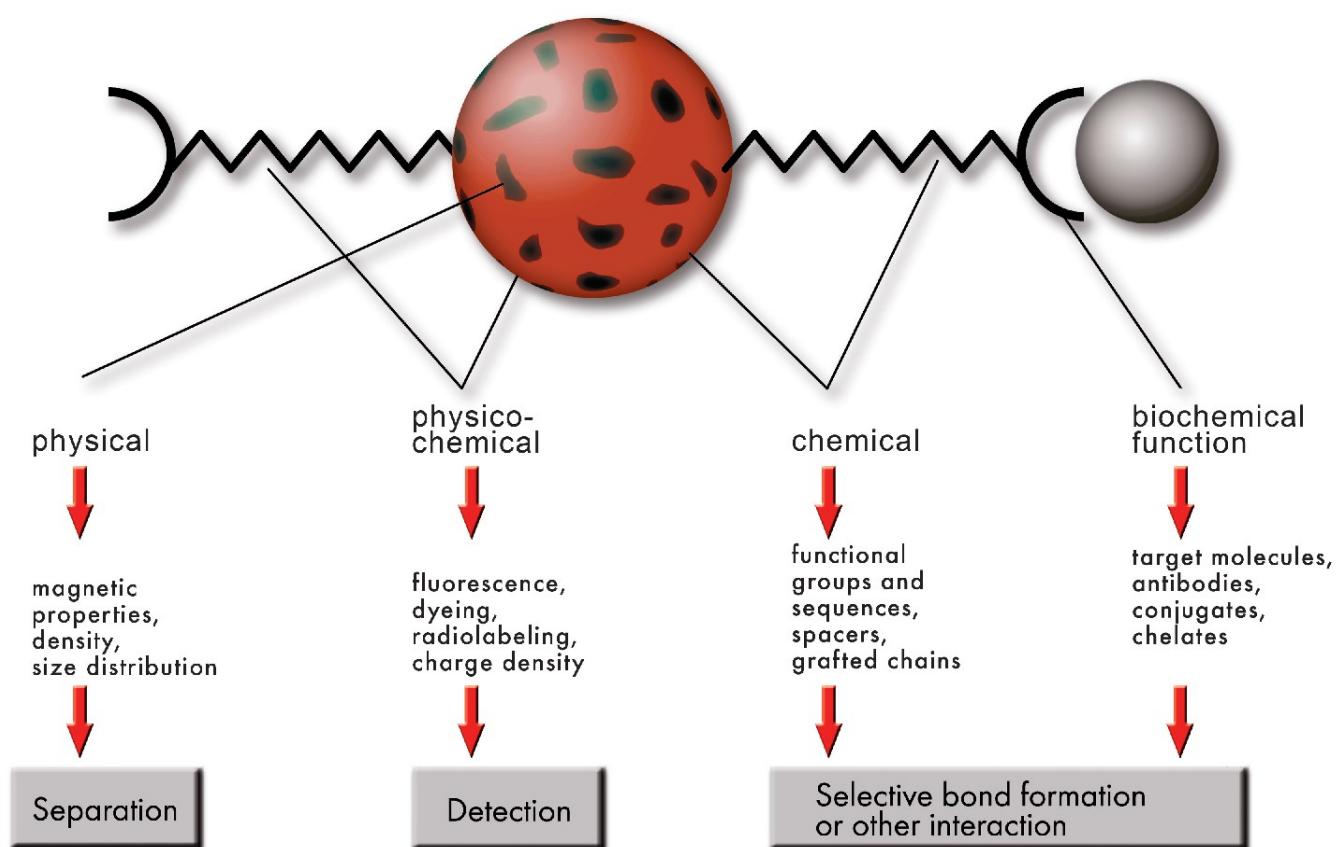




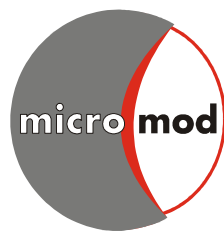
**micromod**  
**Partikeltechnologie GmbH**

Products 2019

# Modular Designed Nano and Micro Particles



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Modern particle applications require high levels of functionality and quality with regard to substrate fixation, separation and detection. Micromod's customers are predominantly producers of diagnostic kits and high-throughput equipment, biotechnology companies, and various research institutions.

Chemical surface-functionalized and/or magnetizable polymer particles for predominantly biochemical applications take center stage in the portfolio and the development activities. The synthetic strategies designed within the company enable particle production from milliliter to bulk scale quantities depending on application. The broad range of micro- and nanoparticle products is reflected in our comprehensive catalog, which contains about 1000 items.

The major line of products are nanomag® (magnetic polysaccharide particles), micromer® (polystyrene copolymer particles) and sicastar® (silica particles). These particle types are complemented with a variety of biodegradable particles and additional highly specialized particles such as magnetic BNF-particles (Bionized NanoFerrite), which are thermally blocked at room temperature or IDA-latex particles, which possess a very high binding capacity for trace elements. Dextran based magnetic particles of the perimag® and synomag® series feature excellent properties in MRI, MPI and hyperthermia applications. For the separation of nucleic acids, nanomag®-particles are available that combine unique surface properties with a high magneto-mobility. Fluorescent sicastar® and micromer® particles are of particular interest for applications in Life Sciences due to their high fluorescence intensity and variable surface chemistry. The offered particle types are available in a broad range of particle diameters and functionalizations. Selected products can be supplied according to the cGMP requirements in coordination with the customer.

Most recent scientific findings in the area of particle technology are constantly embedded into the ongoing operations to develop customized solutions as a partner in cooperative projects with renowned domestic and foreign research institutions.

A modern quality management according to EN ISO 13485:2016 in combination with a sophisticated particle analysis system allows the micromod Partikeltechnologie GmbH to ensure customers a high quality standard in all product categories.



## Product overview

Micromod's particle assortment comprises nanoparticles with diameters as small as 10 nm to microparticles with diameters up to 100  $\mu\text{m}$ .

The diagram below gives a rough overview on the ranges of magnetic, fluorescent, white and coloured particles of the different particle categories, that are explained in the table on the right.

	10 nm	100 nm	1 $\mu\text{m}$	10 $\mu\text{m}$	100 $\mu\text{m}$	Product matrix
Magnetic particles	20 nm – 500 nm					dextran
		80 nm – 100 nm				bionized nanoferrite
			2 – 12 $\mu\text{m}$			polystyrene
				30 $\mu\text{m}$ – 100 $\mu\text{m}$		poly(lactic acid)
		350 nm – 6 $\mu\text{m}$				silica
		150 nm				poly(ethylene imine)
		150 nm				chitosan
	30 – 250 nm					iron oxide
Fluorescent particles	10 nm – 20 $\mu\text{m}$					silica
	25 nm	– 6 $\mu\text{m}$				polystyrene, polymethacrylate
		250 nm	– 100 $\mu\text{m}$			poly(lactic acid)
Fluorescent magnetic particles		250 nm				albumin
		50 nm – 300 nm				dextran
		100 nm				bionized nanoferrite
White particles	10 nm – 20 $\mu\text{m}$					poly(lactic acid)
		25 nm	– 100 $\mu\text{m}$			silica
		250 nm	– 100 $\mu\text{m}$			polystyrene, polymethacrylate
		300 nm				poly(lactic acid)
		250 nm				latex
Colored particles		100 nm	– 100 $\mu\text{m}$			albumin
			1 $\mu\text{m}$ – 12 $\mu\text{m}$			silica
		250 nm	– 100 $\mu\text{m}$			polystyrene
						poly(lactic acid)
	10 nm	100 nm	1 $\mu\text{m}$	10 $\mu\text{m}$	100 $\mu\text{m}$	

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	polystyrene	micromer <sup>®</sup> -blue	<b>66</b>
	poly(lactic acid)	PLA-blue	<b>67</b>

## Special services

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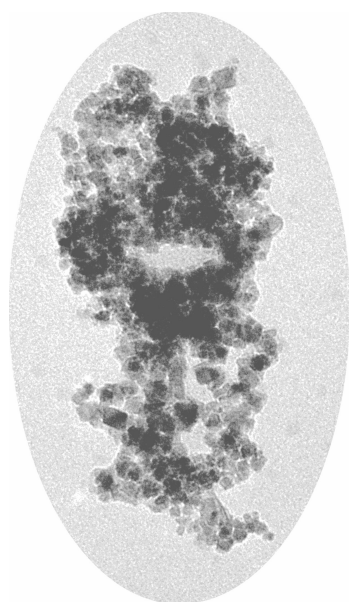
- **Development and production of customized particles types**
- **Customized filling of products**
- **Surface design of custom particles**
- **Particle production under controlled hygienic conditions**
- **Coupling of antibodies, peptides, oligonucleotides and other molecules**
- **Size determination of particles**
- **Zeta potential measurement of particles**
- **Determination of AC susceptibility of magnetic particles**
- **Drying of particles on request**
- **Research samples and prototypes on request**



# Magnetic particles

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nanomag®-D particles are prepared via the core-shell method with a core of magnetite and a dextran shell. The magnetite core consists of aggregates of individual iron oxide crystals with diameters of 5-15 nm. nanomag®-D particles contain 75-80% (w/w) magnetite in a matrix of dextran (MW: 40.000 D) and can easily be separated with a conventional permanent magnet. The nanomag®-D particles are available with particle diameters of 130 nm, 250 nm and 500 nm.

TEM image of nanomag®-D particles, 250 nm (section)

## Magnetic dextran nanoparticles (nanomag®-D)

- are designed with the surface functionalities OH (plain), NH<sub>2</sub> and COOH for the covalent binding of proteins, antibodies or other molecules,
- are available with covalently bound proteins (avidin, streptavidin, protein A, albumin) or other biomolecules (biotin, glutathion),
- can be provided with covalently bound antibodies on request,
- are offered with the nickel(II) chelator nitrilotriacetic acid (NTA) or ready to use with the corresponding nickel complex (Ni-NTA) for the binding of histidine labeled proteins,
- are available with various hydrophilic surfaces (PEG 300, PEG-NH<sub>2</sub> or PEG-COOH),
- are available with negative surface potentials (e.g. COOH, SO<sub>3</sub>H).

## Plain and PEGylated particles

Plain nanomag®-D particles have an unmodified dextran surface. They have a high potential for nucleic acid separation. Especially the 500 nm nanomag®-D particles provide an excellent magnetic mobility in high-throughput nucleic acid separations. The surface modification with PEG 300 or PEG 2000 prevents the unspecific protein binding on the particle surface. nanomag®-D particles are supplied in water without any surfactants.

Product code	Product name	Surface	Diameter	Solid content	Quantity
09-00-132	nanomag®-D	plain	130 nm	25 mg/ml	10 ml
09-00-252	nanomag®-D	plain	250 nm	25 mg/ml	10 ml
09-00-502	nanomag®-D	plain	500 nm	10 mg/ml	10 ml
09-54-132	nanomag®-D	PEG 300	130 nm	10 mg/ml	10 ml
09-54-252	nanomag®-D	PEG 300	250 nm	10 mg/ml	10 ml
09-82-182	nanomag®-D	PEG 2000	180 nm	10 mg/ml	10 ml



## Functionalized particles

nanomag®-D particles with diameters of 130 nm, 250 nm and 500 nm are designed with the surface functionalities NH<sub>2</sub>, COOH or the corresponding more hydrophilic PEG-NH<sub>2</sub> or PEG-COOH groups for the covalent binding of proteins, antibodies or other molecules. Thus several conjugation methods can be applied, e.g.

- carbodiimide activation of COOH groups for conjugation to amino groups,
- glutaraldehyde activation of amino groups for conjugation to amino groups or
- maleimide or SPDP functionalization of the amino groups for conjugation of SH-labeled biomolecules.

Furthermore 130 nm and 250 nm nanomag®-D particles are available with SO<sub>3</sub>H groups to provide a negatively charged surface, and with biotin to allow the specific binding of avidin or streptavidin or their conjugates.

The nanomag®-D particles with glutathione on the surface can be used for affinity purification of glutathione-S-transferase (GST) and GST fusion proteins from cell lysates of various kinds. Upon incubation of a sample with the glutathione particles, GST-tagged proteins bind to the immobilized glutathione ligand, allowing undesired components of the sample to be washing away by magnetic separation. Addition of reduced glutathione or an acid buffer recovers the GST fusion protein in purified form.

All functionalized nanomag®-D particles are supplied in water without any surfactants.

Product code	Product name	Surface	Diameter	Solid content	Quantity
09-01-132	nanomag®-D	NH <sub>2</sub>	130 nm	10 mg/ml	10 ml
09-01-252	nanomag®-D	NH <sub>2</sub>	250 nm	10 mg/ml	10 ml
09-01-502	nanomag®-D	NH <sub>2</sub>	500 nm	10 mg/ml	10 ml
09-02-132	nanomag®-D	COOH	130 nm	10 mg/ml	10 ml
09-02-252	nanomag®-D	COOH	250 nm	10 mg/ml	10 ml
09-02-502	nanomag®-D	COOH	500 nm	10 mg/ml	10 ml
09-09-132	nanomag®-D	SO <sub>3</sub> H	130 nm	10 mg/ml	10 ml
09-09-252	nanomag®-D	SO <sub>3</sub> H	250 nm	10 mg/ml	10 ml
09-26-132	nanomag®-D	biotin	130 nm	10 mg/ml	2 ml
09-26-252	nanomag®-D	biotin	250 nm	10 mg/ml	2 ml
09-26-502	nanomag®-D	biotin	500 nm	10 mg/ml	2 ml
09-55-132	nanomag®-D	PEG-NH <sub>2</sub>	130 nm	10 mg/ml	10 ml
09-55-252	nanomag®-D	PEG-NH <sub>2</sub>	250 nm	10 mg/ml	10 ml
09-55-502	nanomag®-D	PEG-NH <sub>2</sub>	500 nm	10 mg/ml	10 ml
09-56-132	nanomag®-D	PEG-COOH	130 nm	10 mg/ml	10 ml
09-56-252	nanomag®-D	PEG-COOH	250 nm	10 mg/ml	10 ml
09-56-502	nanomag®-D	PEG-COOH	500 nm	10 mg/ml	10 ml
09-61-132	nanomag®-D	glutathione	130 nm	10 mg/ml	10 ml
09-61-252	nanomag®-D	glutathione	250 nm	10 mg/ml	10 ml

## Protein coated particles

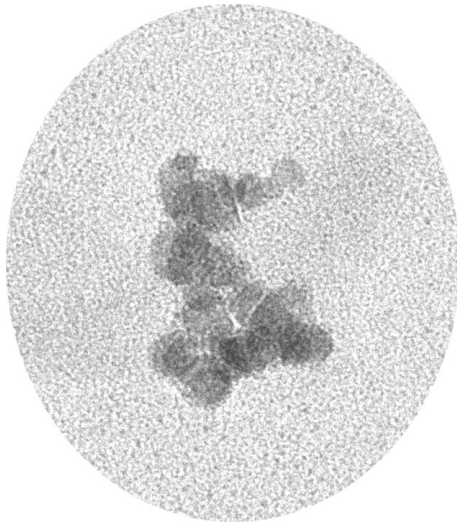
nanomag®-D particles with diameters of 130 nm, 250 nm and 500 nm are provided with covalently bound proteins (avidin, streptavidin, protein A, albumin). The protein coated particles are supplied in PBS buffer (pH=7.4) with 0.02 % sodium azide. Avidin and streptavidin bind biotinylated molecules easily and with a high affinity, while protein A picks up and orients IgGs from a mixture of species. The particles allow an easy magnetic separation of the target molecules with permanent magnets. The nanomag®-D particles can be provided with covalently bound antibodies on request.

Product code	Product name	Surface	Diameter	Solid content	Quantity
09-18-132	nanomag®-D	avidin	130 nm	10 mg/ml	2 ml
09-18-252	nanomag®-D	avidin	250 nm	10 mg/ml	2 ml
09-18-502	nanomag®-D	avidin	500 nm	10 mg/ml	2 ml
09-19-132	nanomag®-D	streptavidin	130 nm	10 mg/ml	1 ml
09-19-252	nanomag®-D	streptavidin	250 nm	10 mg/ml	1 ml
09-19-502	nanomag®-D	streptavidin	500 nm	10 mg/ml	1 ml
09-20-132	nanomag®-D	proteinA	130 nm	10 mg/ml	1 ml
09-20-252	nanomag®-D	proteinA	250 nm	10 mg/ml	1 ml
09-20-502	nanomag®-D	proteinA	500 nm	10 mg/ml	1 ml
09-21-132	nanomag®-D	albumin (BSA)	130 nm	10 mg/ml	10 ml
09-21-252	nanomag®-D	albumin (BSA)	250 nm	10 mg/ml	10 ml
09-21-502	nanomag®-D	albumin (BSA)	500 nm	10 mg/ml	10 ml

## Particles with chelators for metal ions on the surface

nanomag®-D particles with diameters of 130 nm and 250 nm are offered with the nickel(II) chelator nitrilotriacetic acid (NTA) for the binding of histidine labeled proteins. Recombinant proteins containing a 6xhistidine-tag can be purified by Ni-NTA (nickel-nitrilotriacetic acid) chromatography which is based on the interaction between a transition  $Ni^{2+}$  ion immobilized on a matrix and the histidine side chains. Following washing of the matrix by separation with a permanent magnet the 6xhistidine-tag fusion proteins can be eluted by adding free imidazole or EDTA or by reducing the pH.

Product code	Product name	Surface	Diameter	Solid content	Quantity
09-11-132	nanomag®-D	NTA	130 nm	10 mg/ml	10 ml
09-11-252	nanomag®-D	NTA	250 nm	10 mg/ml	10 ml
09-48-132	nanomag®-D	Ni-NTA	130 nm	10 mg/ml	10 ml
09-48-252	nanomag®-D	Ni-NTA	250 nm	10 mg/ml	10 ml



nanomag<sup>®</sup>-D-spio particles are prepared by precipitation of iron oxide in the presence of dextran. They are available with particle diameters of 20 nm, 50 nm and 100 nm.

The functionalized nanomag<sup>®</sup>-D-spio consist of about 55-85% (w/w) iron oxide in a matrix of dextran (MW: 40.000 Da) in dependence on the diameter and surface modification. The nanomag<sup>®</sup>-D-spio particles differ in the size of the iron oxide domains for different diameters. While 20 nm nanomag<sup>®</sup>-D-spio particles contain iron oxide crystals of 7-10 nm, the iron oxide crystallite diameter of the 100 nm nanomag<sup>®</sup>-D-spio particles is 10-13 nm.

TEM image of nanomag<sup>®</sup>-D-spio particles, 100 nm (section)

The nanomag<sup>®</sup>-D-spio particles cannot be separated with a conventional permanent magnet but in a high gradient magnetic field. They are preferably applied for detection purposes in magnetic resonance imaging or in magneto-immuno assays.

100 nm sized nanomag<sup>®</sup>-D-spio particles show good specific power absorption rates for hyperthermia applications.

## Superparamagnetic dextran nanoparticles (nanomag<sup>®</sup>-D-spio)

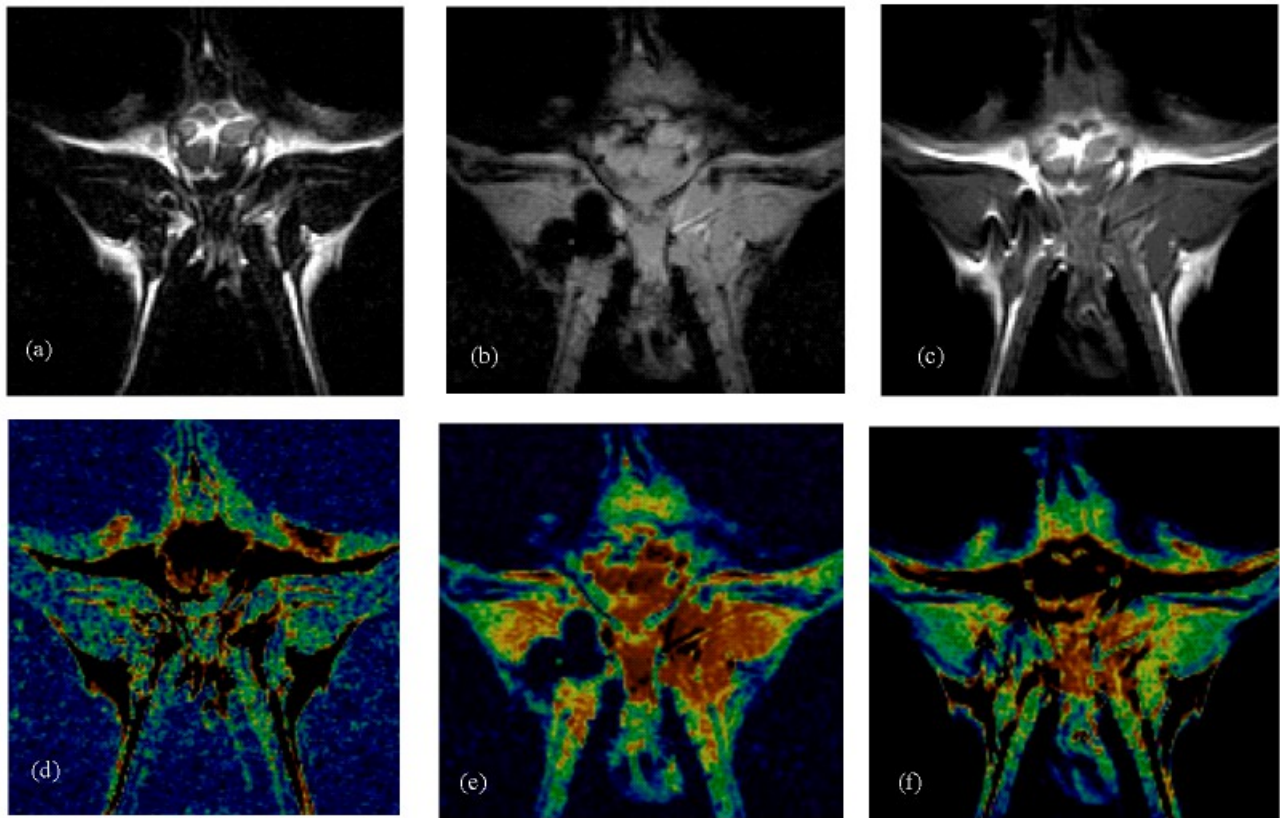
- are designed with the surface functionalities OH (plain), NH<sub>2</sub> and COOH for the covalent binding of proteins, antibodies or other molecules,
- are available with covalently bound proteins (avidin, streptavidin, protein A, albumin) or other biomolecules (e.g. biotin),
- and are available with various hydrophilic surfaces (PEG 300, PEG-NH<sub>2</sub> or PEG-COOH).

## Plain and functionalized particles

Plain nanomag<sup>®</sup>-D-spio particles have an unmodified dextran surface and are available with diameters of 20 nm, 50 nm and 100 nm. nanomag<sup>®</sup>-D-spio particles are designed with the surface functionalities OH (plain), NH<sub>2</sub> and COOH as well as PEG-NH<sub>2</sub> and PEG-COOH for the covalent binding of proteins, antibodies or other molecules. They are supplied in water with an iron concentration of about 2.4 mg/ml without any surfactants. Thus several conjugation methods can be applied, e.g.

- cyanogen bromide activation of plain particles for conjugation to amino groups
- carbodiimide activation of COOH groups for conjugation to amino groups

- glutaraldehyde activation of amino groups for conjugation to amino groups or
- maleimide or SPDP functionalization of the amino groups for conjugation of SH-labeled biomolecules.



MR images of 20 nm plain nanomag®-D-spio particles (spio) in rat lymph node:

- a) T2-weighted image of spio particles in rat lymph node (right paw),
  - b) susceptibility effects of spio particles with T2\* gradient echo image,
  - c) T1-weighted image of spio in rat lymph node,
  - d) T2 map of spio, e) T2\*map of spio and, f) T1 map of spio
- (Firouznia K et al., Pak. J. Biol. Sci. 2008;11(4):607-612)

## nanomag®-D-spio

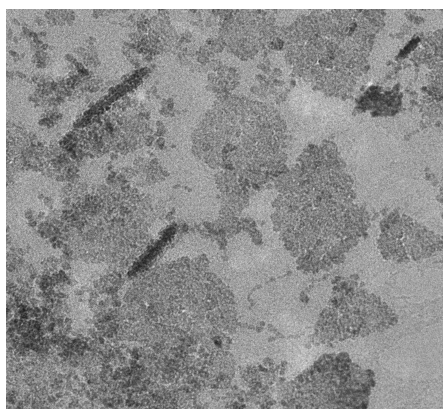
Product code	Product name	Surface	Diameter	Solid content	Quantity
79-00-201	nanomag®-D-spio	plain	20 nm	25 mg/ml	10 ml
79-00-501	nanomag®-D-spio	plain	50 nm	25 mg/ml	10 ml
79-00-102	nanomag®-D-spio	plain	100 nm	25 mg/ml	10 ml
79-01-201	nanomag®-D-spio	NH <sub>2</sub>	20 nm	5 mg/ml	10 ml
79-01-501	nanomag®-D-spio	NH <sub>2</sub>	50 nm	5 mg/ml	10 ml
79-01-102	nanomag®-D-spio	NH <sub>2</sub>	100 nm	5 mg/ml	10 ml
79-02-201	nanomag®-D-spio	COOH	20 nm	5 mg/ml	10 ml
79-02-501	nanomag®-D-spio	COOH	50 nm	5 mg/ml	10 ml
79-02-102	nanomag®-D-spio	COOH	100 nm	5 mg/ml	10 ml
79-26-201	nanomag®-D-spio	biotin	20 nm	5 mg/ml	2 ml
79-26-501	nanomag®-D-spio	biotin	50 nm	5 mg/ml	2 ml
79-26-102	nanomag®-D-spio	biotin	100 nm	5 mg/ml	2 ml
79-55-201	nanomag®-D-spio	PEG-NH <sub>2</sub>	20 nm	5 mg/ml	10 ml
79-55-501	nanomag®-D-spio	PEG-NH <sub>2</sub>	50 nm	5 mg/ml	10 ml
79-55-102	nanomag®-D-spio	PEG-NH <sub>2</sub>	100 nm	5 mg/ml	10 ml
79-56-201	nanomag®-D-spio	PEG-COOH	20 nm	5 mg/ml	10 ml
79-56-501	nanomag®-D-spio	PEG-COOH	50 nm	5 mg/ml	10 ml
79-56-102	nanomag®-D-spio	PEG-COOH	100 nm	5 mg/ml	10 ml

### Protein coated particles

nanomag®-D-spio particles are available with covalently bound proteins (avidin, streptavidin, protein A, albumin) or other biomolecules (e. g. biotin). The protein coated particles are supplied in PBS buffer (pH=7.4) with 0.02 % sodium azide. The iron concentration of the suspensions is about 2.4 mg/ml.

Product code	Product name	Surface	Diameter	Solid content	Quantity
79-18-201	nanomag®-D-spio	avidin	20 nm	5 mg/ml	2 ml
79-18-501	nanomag®-D-spio	avidin	50 nm	5 mg/ml	2 ml
79-18-102	nanomag®-D-spio	avidin	100 nm	5 mg/ml	2 ml
79-19-201	nanomag®-D-spio	streptavidin	20 nm	5 mg/ml	1 ml
79-19-501	nanomag®-D-spio	streptavidin	50 nm	5 mg/ml	1 ml
79-19-102	nanomag®-D-spio	streptavidin	100 nm	5 mg/ml	1 ml
79-20-201	nanomag®-D-spio	proteinA	20 nm	5 mg/ml	1 ml
79-20-501	nanomag®-D-spio	proteinA	50 nm	5 mg/ml	1 ml
79-20-102	nanomag®-D-spio	proteinA	100 nm	5 mg/ml	1 ml
79-21-201	nanomag®-D-spio	albumin (BSA)	20 nm	5 mg/ml	5 ml
79-21-501	nanomag®-D-spio	albumin (BSA)	50 nm	5 mg/ml	5 ml
79-21-102	nanomag®-D-spio	albumin (BSA)	100 nm	5 mg/ml	5 ml





TEM image of perimag® particles, 130 nm (section)

perimag® particles are prepared by precipitation of iron oxide in the presence of dextran. The plain particles consist of about 50% (w/w) iron oxide in a matrix of dextran (MW: 40.000 Da) and can be produced under clean room conditions on request. Functionalized perimag® particles consist of about 70% (w/w) iron oxide in a matrix of cross-linked dextran. perimag® are available with a hydrodynamic diameter of 130 nm.

#### perimag® nanoparticles

- are available with the surface functionalities OH (plain) and NH<sub>2</sub> for the covalent binding of biomolecules, e.g. antibodies, peptides or oligonucleotides,
- are provided with covalently bound streptavidin (Conjugations of other proteins or antibodies are offered on request.)

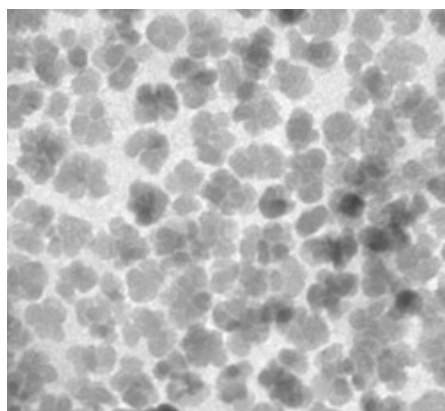
Plain perimag® nanoparticles have an unmodified dextran surface. They show excellent properties as contrast agent in Magnetic Particle Imaging (MPI) and Magnetic Resonance Imaging (MRI) as well as in hyperthermia applications. The plain particles are supplied with an iron concentration of 8.5 mg/ml in water without any surfactants. They can be produced with higher iron concentrations and under clean room conditions on request.

perimag® with amino groups on the surface possess a moderate positive zeta potential in the physiological pH range and are interesting tools for the magnetic labeling of stem cells without use of any transfection agents. This allows the tracking and homing of stem cells in the field of regenerative medicine. The amino functionalized particles are supplied with an iron concentration of 5 mg/ml in water without any surfactants.

perimag® with streptavidin on the surface are suitable for the binding of biotinylated molecules (e.g. antibodies, oligonucleotides, dyes). They are supplied with an iron concentration of 2.5 mg/ml in PBS buffer (pH=7.4) with 0.02% sodium azide. Other conjugations with proteins or antibodies are available on request.

Product code	Product name	Surface	Diameter	Solid content	Quantity
102-00-132	perimag®	plain	130 nm	25 mg/ml	10 ml
102-01-132	perimag®	NH <sub>2</sub>	130 nm	10 mg/ml	10 ml
102-19-132	perimag®	streptavidin	130 nm	5 mg/ml	2 ml





synomag®-D particles are core-shell particles with a “nanoflower”-shaped iron oxide core covered by a dextran shell. They exhibit excellent properties as tracer for Magnetic Particle Imaging (MPI) and are suitable for hyperthermia applications. The plain particles consist of about 55% (w/w) iron oxide (mainly  $\gamma\text{-Fe}_2\text{O}_3$ ) in a matrix of dextran (MW: 40.000 Da). Functionalized synomag®-D particles consist of about 80% (w/w) iron oxide in a matrix of cross-linked dextran. Synomag®-D are available with a hydrodynamic diameter of 50 nm and 70 nm.

TEM image of synomag®-D particles, 50 nm (section)

## synomag®-D nanoparticles

- are available with the surface functionalities OH (plain) and NH<sub>2</sub> for the covalent binding of biomolecules, e.g. antibodies, peptides or oligonucleotides
- are provided with covalently bound streptavidin (Conjugations of other proteins or antibodies are offered on request.)
- cannot be separated with a conventional permanent magnet but in a high gradient magnetic field.

Plain synomag®-D nanoparticles have an unmodified dextran surface and are supplied with an iron concentration of 10 mg/ml in water without any surfactants. They can be produced with higher iron concentrations on request.

synomag®-D with amino groups on the surface are a universal platform for the direct reaction with N-hydroxysuccinimidyl ester functionalized cross-linkers or fluorescent dyes. This allows the introduction of a broad variety of surface functionalities for the desired conjugation reactions. The amino functionalized particles are supplied with an iron concentration of 6 mg/ml in water without any surfactants.

synomag®-D with streptavidin on the surface are suitable for the binding of biotinylated molecules (e.g. antibodies, oligonucleotides, dyes). They are supplied with an iron concentration of 6 mg/ml in PBS buffer (pH=7.4) with 0.02% sodium azide. Other conjugations with proteins or antibodies are available on request.

Product code	Product name	Surface	Diameter	Solid content	Quantity
104-00-501	synomag®-D	plain	50 nm	25 mg/ml	5 ml
104-00-701	synomag®-D	plain	70 nm	25 mg/ml	5 ml
104-01-501	synomag®-D	NH <sub>2</sub>	50 nm	10 mg/ml	5 ml
104-01-701	synomag®-D	NH <sub>2</sub>	70 nm	10 mg/ml	5 ml
104-19-501	synomag®-D	streptavidin	50 nm	10 mg/ml	1 ml
104-19-701	synomag®-D	streptavidin	70 nm	10 mg/ml	1 ml

## nanomag<sup>®</sup>-CLD

nanomag<sup>®</sup>-CLD particles are prepared via the core-shell method with a core of magnetite and a dextran shell with particle diameters of 300 nm and 500 nm. The particles consist of 80-90% (w/w) magnetite in a matrix of cross-linked dextran (MW: 40.000 D) and can easily be separated with a conventional permanent magnet.

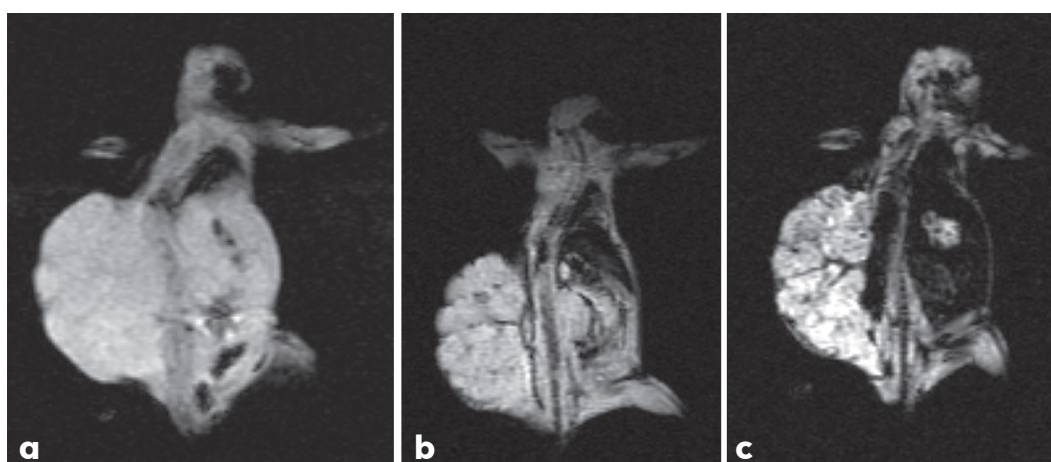
The surface of cross-linked dextran provides a high stability of the particle shell, that is especially important after binding of target molecules. The nanomag<sup>®</sup>-CLD particles are designed with NH<sub>2</sub>, COOH or PEG-COOH groups for the covalent binding of proteins, antibodies or other molecules. All functionalized nanomag<sup>®</sup>-CLD particles are supplied in water. The nanomag<sup>®</sup>-CLD particles are available with covalently bound streptavidin for the binding of biotinylated target molecules. Other protein surfaces are available on request.

Product code	Product name	Surface	Diameter	Solid content	Quantity
05-01-302	nanomag <sup>®</sup> -CLD	NH <sub>2</sub>	300 nm	10 mg/ml	10 ml
05-01-502	nanomag <sup>®</sup> -CLD	NH <sub>2</sub>	500 nm	10 mg/ml	10 ml
05-02-302	nanomag <sup>®</sup> -CLD	COOH	300 nm	10 mg/ml	10 ml
05-02-502	nanomag <sup>®</sup> -CLD	COOH	500 nm	10 mg/ml	10 ml
05-19-302	nanomag <sup>®</sup> -CLD	streptavidin	300 nm	10 mg/ml	1 ml
05-19-502	nanomag <sup>®</sup> -CLD	streptavidin	500 nm	10 mg/ml	1 ml
05-56-302	nanomag <sup>®</sup> -CLD	PEG-COOH	300 nm	10 mg/ml	10 ml
05-56-502	nanomag <sup>®</sup> -CLD	PEG-COOH	500 nm	10 mg/ml	10 ml

## nanomag<sup>®</sup>-CLD-spio

nanomag<sup>®</sup>-CLD-spio particles are prepared by precipitation of iron oxide in the presence of dextran and subsequent cross-linking. They are available with particle diameters of 20 nm, 50 nm and 100 nm and consist of about 70-90% (w/w) iron oxide in a matrix of cross-linked dextran (MW: 40.000 Da). Like the corresponding non-cross-linked particles they differ in the size of the iron oxide domains for different diameters. They cannot be separated with a conventional permanent magnet but in a high gradient magnetic field. The nanomag<sup>®</sup>-CLD-spio particles are preferably applied for detection purposes in targeted magnetic resonance imaging or in magneto immuno assays. A very efficient conjugation of proteins and antibodies is achieved by reaction of maleimide functionalized nanomag<sup>®</sup>-CLD-spio particles with thiolated target molecules. A technote for the introduction of maleimide groups on the surface of aminated nanomag<sup>®</sup>-CLD-spio particles is provided at [www.micromod.de](http://www.micromod.de). The aminated nanomag<sup>®</sup>-CLD-spio particles are supplied in water with an iron concentration of 2.4 mg/ml. nanomag<sup>®</sup>-CLD-spio particles are also available with a hydrophilic PEG 300 surface.

The nanomag<sup>®</sup>-CLD-spio particles can be provided with covalently bound antibodies on request.

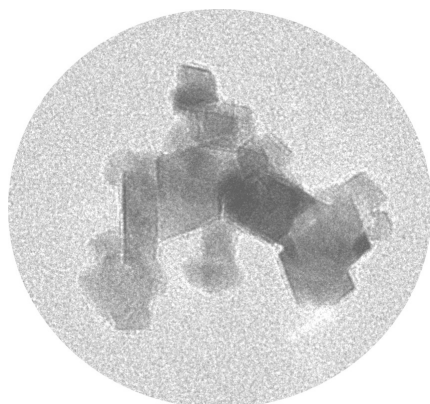


C595-antibody conjugated 20 nm nanomag<sup>®</sup>-CLD-spio as potential MR contract agent for ovarian cancer detection. MR image of mice:

- a) before injection of nanoparticles,
  - b) after injection of 20 nm nanomag<sup>®</sup>-CLD-spio particles and
  - c) after injection of corresponding C595-antibody labeled particles
- (Shabazi-Gahrouei D et al., J. Med. Phys. 2013;38(4):198-204)

Product code	Product name	Surface	Diameter	Solid content	Quantity
77-01-201	nanomag <sup>®</sup> -CLD-spio	NH <sub>2</sub>	20 nm	5 mg/ml	10 ml
77-01-501	nanomag <sup>®</sup> -CLD-spio	NH <sub>2</sub>	50 nm	5 mg/ml	10 ml
77-01-102	nanomag <sup>®</sup> -CLD-spio	NH <sub>2</sub>	100 nm	5 mg/ml	10 ml
77-54-201	nanomag <sup>®</sup> -CLD-spio	PEG 300	20 nm	5 mg/ml	10 ml
77-54-501	nanomag <sup>®</sup> -CLD-spio	PEG 300	50 nm	5 mg/ml	10 ml
77-54-102	nanomag <sup>®</sup> -CLD-spio	PEG 300	100 nm	5 mg/ml	10 ml

## BNF particles



BNF particles (Bionized NanoFerrite) are thermally blocked at room temperature and show specific interaction with alternating magnetic fields. Therefore they are an interesting tool for magnetic energy transfer and magnetic labeling.

The BNF particles are prepared via the core-shell method with a core of 75-80% (w/w) magnetite and a shell of dextran or hydroxyethyl starch. The magnetite crystallite diameter is about 20 nm.

TEM image of BNF starch particles, 100 nm (section)

The BNF-Dextran and BNF-Starch particles are available with particle diameters of 80 nm and 100 nm. The 100 nm BNF particles can be separated with conventional permanent magnets, but the corresponding 80 nm particles have to be separated in high gradient magnetic fields or for several hours with strong permanent magnets.

### Bionized NanoFerrite particles (BNF-Dextran and BNF-Starch)

- are designed with the surface functionalities OH (plain), NH<sub>2</sub>, PEG-NH<sub>2</sub>, COOH and PEG-COOH for the covalent binding of proteins, antibodies or other molecules,
- are available with covalently bound proteins (streptavidin, protein A),
- can be provided with covalently bound antibodies on request,
- can easily be filtered through 0.22  $\mu$ m filters.

### Plain and functionalized particles

The plain BNF particles have a shell of dextran or hydroxyethyl starch. The corresponding functionalized BNF particles consist of a matrix of cross-linked dextran or hydroxyethyl starch, respectively. The BNF-Dextran and BNF-Starch particles are designed with the surface groups NH<sub>2</sub>, COOH, PEG-NH<sub>2</sub> and PEG-COOH for the covalent binding of proteins, antibodies or other molecules. The functionalized BNF particles are supplied in water.

A technote for the introduction of maleimide groups on the surface of aminated BNF particles is provided at [www.micromod.de](http://www.micromod.de).

## BNF particles

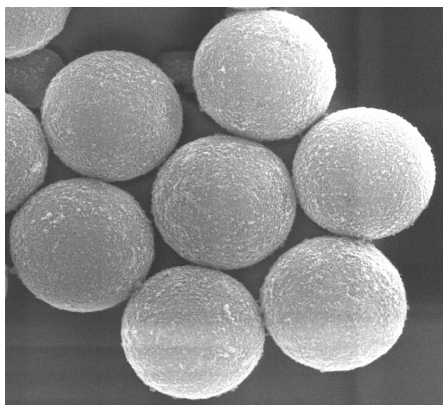
Product code	Product name	Surface	Diameter	Solid content	Quantity
10-00-801	BNF-Starch	plain	80 nm	25 mg/ml	10 ml
10-00-102	BNF-Starch	plain	100 nm	25 mg/ml	10 ml
10-01-801	BNF-Starch	NH <sub>2</sub>	80 nm	10 mg/ml	10 ml
10-01-102	BNF-Starch	NH <sub>2</sub>	100 nm	10 mg/ml	10 ml
10-02-801	BNF-Starch	COOH	80 nm	10 mg/ml	10 ml
10-02-102	BNF-Starch	COOH	100 nm	10 mg/ml	10 ml
10-55-801	BNF-Starch	PEG-NH <sub>2</sub>	80 nm	10 mg/ml	10 ml
10-55-102	BNF-Starch	PEG-NH <sub>2</sub>	100 nm	10 mg/ml	10 ml
10-56-801	BNF-Starch	PEG-COOH	80 nm	10 mg/ml	10 ml
10-56-102	BNF-Starch	PEG-COOH	100 nm	10 mg/ml	10 ml
84-00-801	BNF-Dextran	plain	80 nm	25 mg/ml	10 ml
84-00-102	BNF-Dextran	plain	100 nm	25 mg/ml	10 ml
84-01-801	BNF-Dextran	NH <sub>2</sub>	80 nm	10 mg/ml	10 ml
84-01-102	BNF-Dextran	NH <sub>2</sub>	100 nm	10 mg/ml	10 ml
84-02-801	BNF-Dextran	COOH	80 nm	10 mg/ml	10 ml
84-02-102	BNF-Dextran	COOH	100 nm	10 mg/ml	10 ml
84-55-801	BNF-Dextran	PEG-NH <sub>2</sub>	80 nm	10 mg/ml	10 ml
84-55-102	BNF-Dextran	PEG-NH <sub>2</sub>	100 nm	10 mg/ml	10 ml
84-56-801	BNF-Dextran	PEG-COOH	80 nm	10 mg/ml	10 ml
84-56-102	BNF-Dextran	PEG-COOH	100 nm	10 mg/ml	10 ml

### Protein coated particles

BNF particles are available with covalently bound streptavidin or protein A and can be provided with covalently bound antibodies on request. The protein coated particles are supplied in PBS buffer (pH=7.4) with 0.02 % sodium azide. The biotin binding capacity of the streptavidin coated particles is about > 200 pmol/mg Fe.

BNF particles with a poly-D-lysine (PDL) or poly-L-Lysine (PLL) coating can be applied for a direct particle loading into cells in PBS buffer (pH=7.4) without any stabilizers. A technote for the PDL or PLL coating of BNF particles is provided at [www.micromod.de](http://www.micromod.de).

Product code	Product name	Surface	Diameter	Solid content	Quantity
10-19-801	BNF-Starch	streptavidin	80 nm	10 mg/ml	1 ml
10-19-102	BNF-Starch	streptavidin	100 nm	10 mg/ml	1 ml
10-20-801	BNF-Starch	proteinA	80 nm	10 mg/ml	1 ml
10-20-102	BNF-Starch	proteinA	100 nm	10 mg/ml	1 ml
84-19-801	BNF-Dextran	streptavidin	80 nm	10 mg/ml	1 ml
84-19-102	BNF-Dextran	streptavidin	100 nm	10 mg/ml	1 ml
84-20-801	BNF-Dextran	proteinA	80 nm	10 mg/ml	1 ml
84-20-102	BNF-Dextran	proteinA	100 nm	10 mg/ml	1 ml



micromer®-M are uniform microspheres consisting of magnetite around an organic matrix of a styrene-maleic acid-copolymer. The final coating with a polymer layer leads to the encapsulation of magnetite and the introduction of chemical functionalities. The micromer®-M particles can easily be separated with conventional permanent magnets. They are provided in the size range of 2 to 10 microns.

REM image of micromer®-M particles, plain, 6 μm

### Magnetic polystyrene particles (micromer®-M)

- are designed with the surface functionalities  $\text{NH}_2$ ,  $\text{PEG-NH}_2$ ,  $\text{COOH}$  and  $\text{PEG-COOH}$  for the covalent binding of proteins, antibodies or other molecules,
- are available with covalently bound proteins (avidin, streptavidin, protein A, albumin) or other polymers (polyethylene imine).

### Functionalized particles

micromer®-M particles are designed with the surface functionalities  $\text{NH}_2$ ,  $\text{PEG-NH}_2$ ,  $\text{COOH}$  and  $\text{PEG-COOH}$  for the covalent binding of proteins, antibodies or other target molecules. The particles are stable in aqueous media and to some extent in DMSO. Thus the whole variety of conjugation methods can be applied, e.g.

- carbodiimide activation of  $\text{COOH}$  groups for conjugation to amino groups,
- glutaraldehyde activation of amino groups for conjugation to amino groups or
- maleimide or SPDP functionalization of the amino groups for conjugation of SH-labeled biomolecules.

micromer®-M particles with a polyethylene imine (PEI) coating are designed for binding of nucleic acids or oligonucleotides.

All functionalized micromer®-M particles are supplied in water.



Product code	Product name	Surface	Diameter	Solid content	Quantity
08-01-203	micromer®-M	NH <sub>2</sub>	2 µm	50 mg/ml	10 ml
08-01-303	micromer®-M	NH <sub>2</sub>	3 µm	50 mg/ml	10 ml
08-01-403	micromer®-M	NH <sub>2</sub>	4 µm	50 mg/ml	10 ml
08-01-503	micromer®-M	NH <sub>2</sub>	5 µm	50 mg/ml	10 ml
08-01-603	micromer®-M	NH <sub>2</sub>	6 µm	50 mg/ml	10 ml
08-01-703	micromer®-M	NH <sub>2</sub>	7 µm	50 mg/ml	10 ml
08-01-803	micromer®-M	NH <sub>2</sub>	8 µm	50 mg/ml	10 ml
08-01-104	micromer®-M	NH <sub>2</sub>	10 µm	50 mg/ml	10 ml
08-02-203	micromer®-M	COOH	2 µm	50 mg/ml	10 ml
08-02-303	micromer®-M	COOH	3 µm	50 mg/ml	10 ml
08-02-403	micromer®-M	COOH	4 µm	50 mg/ml	10 ml
08-02-503	micromer®-M	COOH	5 µm	50 mg/ml	10 ml
08-02-603	micromer®-M	COOH	6 µm	50 mg/ml	10 ml
08-02-703	micromer®-M	COOH	7 µm	50 mg/ml	10 ml
08-02-803	micromer®-M	COOH	8 µm	50 mg/ml	10 ml
08-02-104	micromer®-M	COOH	10 µm	50 mg/ml	10 ml
08-55-203	micromer®-M	PEG-NH <sub>2</sub>	2 µm	50 mg/ml	10 ml
08-55-303	micromer®-M	PEG-NH <sub>2</sub>	3 µm	50 mg/ml	10 ml
08-55-403	micromer®-M	PEG-NH <sub>2</sub>	4 µm	50 mg/ml	10 ml
08-55-503	micromer®-M	PEG-NH <sub>2</sub>	5 µm	50 mg/ml	10 ml
08-55-603	micromer®-M	PEG-NH <sub>2</sub>	6 µm	50 mg/ml	10 ml
08-55-703	micromer®-M	PEG-NH <sub>2</sub>	7 µm	50 mg/ml	10 ml
08-55-803	micromer®-M	PEG-NH <sub>2</sub>	8 µm	50 mg/ml	10 ml
08-55-104	micromer®-M	PEG-NH <sub>2</sub>	10 µm	50 mg/ml	10 ml
08-56-203	micromer®-M	PEG-COOH	2 µm	50 mg/ml	10 ml
08-56-303	micromer®-M	PEG-COOH	3 µm	50 mg/ml	10 ml
08-56-403	micromer®-M	PEG-COOH	4 µm	50 mg/ml	10 ml
08-56-503	micromer®-M	PEG-COOH	5 µm	50 mg/ml	10 ml
08-56-603	micromer®-M	PEG-COOH	6 µm	50 mg/ml	10 ml
08-56-703	micromer®-M	PEG-COOH	7 µm	50 mg/ml	10 ml
08-56-803	micromer®-M	PEG-COOH	8 µm	50 mg/ml	10 ml
08-56-104	micromer®-M	PEG-COOH	10 µm	50 mg/ml	10 ml
08-59-203	micromer®-M	PEI	2 µm	50 mg/ml	10 ml
08-59-303	micromer®-M	PEI	3 µm	50 mg/ml	10 ml
08-59-403	micromer®-M	PEI	4 µm	50 mg/ml	10 ml
08-59-603	micromer®-M	PEI	6 µm	50 mg/ml	10 ml
08-59-803	micromer®-M	PEI	8 µm	50 mg/ml	10 ml
08-59-104	micromer®-M	PEI	10 µm	50 mg/ml	10 ml

## Protein coated particles

micromer®-M particles are available with covalently bound proteins (avidin, streptavidin, protein A, albumin) in the size range of 2 µm to 10 µm. Avidin and streptavidin bind biotinylated molecules easily and with a high affinity, while protein A picks up and orients IgGs from a mixture of species. The albumin (BSA) coating makes the surface of the polystyrene particles more hydrophilic and biocompatible if needed. The protein coated particles are supplied in PBS buffer (pH=7.4) with 0.02 % sodium azide. micromer®-M particles were widely used in the development of biosensors and corresponding immunoassays.

Product code	Product name	Surface	Diameter	Solid content	Quantity
08-18-203	micromer®-M	avidin	2 µm	25 mg/ml	2 ml
08-18-303	micromer®-M	avidin	3 µm	25 mg/ml	2 ml
08-18-403	micromer®-M	avidin	4 µm	25 mg/ml	2 ml
08-18-503	micromer®-M	avidin	5 µm	25 mg/ml	2 ml
08-18-603	micromer®-M	avidin	6 µm	25 mg/ml	2 ml
08-18-703	micromer®-M	avidin	7 µm	25 mg/ml	2 ml
08-18-803	micromer®-M	avidin	8 µm	25 mg/ml	2 ml
08-18-104	micromer®-M	avidin	10 µm	25 mg/ml	2 ml
08-19-203	micromer®-M	streptavidin	2 µm	25 mg/ml	1 ml
08-19-303	micromer®-M	streptavidin	3 µm	25 mg/ml	1 ml
08-19-403	micromer®-M	streptavidin	4 µm	25 mg/ml	1 ml
08-19-503	micromer®-M	streptavidin	5 µm	25 mg/ml	1 ml
08-19-603	micromer®-M	streptavidin	6 µm	25 mg/ml	1 ml
08-19-703	micromer®-M	streptavidin	7 µm	25 mg/ml	1 ml
08-19-803	micromer®-M	streptavidin	8 µm	25 mg/ml	1 ml
08-19-104	micromer®-M	streptavidin	10 µm	25 mg/ml	1 ml
08-20-203	micromer®-M	proteinA	2 µm	25 mg/ml	1 ml
08-20-303	micromer®-M	proteinA	3 µm	25 mg/ml	1 ml
08-20-403	micromer®-M	proteinA	4 µm	25 mg/ml	1 ml
08-20-503	micromer®-M	proteinA	5 µm	25 mg/ml	1 ml
08-20-603	micromer®-M	proteinA	6 µm	25 mg/ml	1 ml
08-20-703	micromer®-M	proteinA	7 µm	25 mg/ml	1 ml
08-20-803	micromer®-M	proteinA	8 µm	25 mg/ml	1 ml
08-20-104	micromer®-M	proteinA	10 µm	25 mg/ml	1 ml
08-21-203	micromer®-M	albumin (BSA)	2 µm	25 mg/ml	10 ml
08-21-303	micromer®-M	albumin (BSA)	3 µm	25 mg/ml	10 ml
08-21-403	micromer®-M	albumin (BSA)	4 µm	25 mg/ml	10 ml
08-21-503	micromer®-M	albumin (BSA)	5 µm	25 mg/ml	10 ml
08-21-603	micromer®-M	albumin (BSA)	6 µm	25 mg/ml	10 ml
08-21-703	micromer®-M	albumin (BSA)	7 µm	25 mg/ml	10 ml
08-21-803	micromer®-M	albumin (BSA)	8 µm	25 mg/ml	10 ml
08-21-104	micromer®-M	albumin (BSA)	10 µm	25 mg/ml	10 ml

sicastar<sup>®</sup>-M particles are produced by hydrolysis of orthosilicates in the presence of magnetite. sicastar<sup>®</sup>-M particles are available with a diameter of 350 nm or 1.5  $\mu$ m, respectively. These particles are not ideally spherical, but have monomodal size distributions. They can easily be separated with conventional permanent magnets and are extremely stable in organic solvents and at high temperatures.

## Magnetic silica particles (sicastar<sup>®</sup>-M)

- have a hydrophilic surface with terminal Si-OH-bonds (plain)
- are designed with the surface functionalities OH (plain), NH<sub>2</sub>, COOH, N-hydroxy-succinimide (NHS) and epoxy for the covalent binding of proteins, antibodies or other molecules,
- are available with covalently bound proteins (avidin, streptavidin, protein A, albumin) and biotin,
- can be offered with the nickel(II) chelator nitrilotriacetic acid (NTA) or ready to use with the corresponding nickel complex (Ni-NTA) for the binding of histidine labeled proteins,
- are available with a hydrophobic octadecyl (C18) surface,
- are deliverable with an organic polymer shell (core-shell method) on request.

## Plain particles and functionalized particles

The 350 nm plain sicastar<sup>®</sup>-M particles have an extremely dense coating around the iron oxide core. Thus these particles are inert in many biological assays and do not influence any background signals.

The plain 1.5  $\mu$ m sicastar<sup>®</sup>-M particles can be used to isolate plasmid-DNA. 5-10  $\mu$ g plasmid DNA per mg particles can be isolated from 1-1.5 ml overnight bacteria culture with OD (260 nm) / OD (280 nm) > 1.9.

sicastar<sup>®</sup>-M particles with a diameter of 1.5  $\mu$ m are available with the surface functionalities NH<sub>2</sub>, COOH, N-hydroxysuccinimide (NHS) and epoxy for the covalent binding of proteins, antibodies or other molecules. The particles are stable in aqueous media and also in organic solvents. This allows the conjugation of water-soluble target molecules, as well as compounds that are only soluble in organic solvents. Biotinylated sicastar<sup>®</sup>-M particles are also available for the selective binding of avidin- or streptavidin-conjugated target molecules. NHS- and epoxy-functionalized particles are provided as powder to preserve their reactivity. All other functionalized particles are supplied in water.

sicastar®-M particles with a diameter of 1.5 µm are offered with the nickel(II) chelator nitrilotriacetic acid (NTA) or ready to use with the corresponding nickel complex (Ni-NTA) for the binding of histidine labeled proteins. Recombinant proteins containing a 6xhistidine-tag can be purified by Ni-NTA (nickel-nitrilotriacetic acid) chromatography which is based on the interaction between a transition Ni<sup>2+</sup> ion immobilized on a matrix and the histidine side chains. Following washing of the matrix 6xhistidine-tag fusion proteins can be eluted by adding free imidazole or EDTA or by reducing the pH.

sicastar®-M particles with a diameter of 1.5 µm are available with a hydrophobic octadecyl (C18) surface as powder to allow a direct use in aqueous or organic solvents. This hydrophobic surface provides a high selectivity for polar, neutral and moderately nonpolar pharmaceuticals, natural products, food additives, organic chemicals and biologicals.

Product code	Product name	Surface	Diameter	Solid content	Quantity
39-00-352	sicastar®-M	plain	350 nm	25 mg/ml	10 ml
39-00-153	sicastar®-M	plain	1,5 µm	50 mg/ml	10 ml
39-01-153	sicastar®-M	NH <sub>2</sub>	1,5 µm	50 mg/ml	10 ml
39-02-153	sicastar®-M	COOH	1,5 µm	50 mg/ml	10 ml
39-08-153	sicastar®-M	epoxy	1,5 µm	-	0,5 g
39-11-153	sicastar®-M	NTA	1,5 µm	50 mg/ml	10 ml
39-15-153	sicastar®-M	NHS	1,5 µm	-	0,5 g
39-26-153	sicastar®-M	biotin	1,5 µm	25 mg/ml	5 ml
39-48-153	sicastar®-M	Ni-NTA	1,5 µm	25 mg/ml	10 ml
39-51-153	sicastar®-M	C18	1,5 µm	-	0,5 g

### Protein coated particles

sicastar®-M particles with a diameter of 1.5 µm are provided with covalently bound proteins (avidin, streptavidin, protein A, albumin). Avidin and streptavidin bind biotinylated molecules easily and with a high affinity, while protein A picks up and orients IgGs from a mixture of species. The albumin (BSA) coating makes the surface of the silica particles more biocompatible if needed. The protein coated particles are supplied in PBS buffer (pH=7.4) with 0.02 % sodium azide.

Product code	Product name	Surface	Diameter	Solid content	Quantity
39-18-153	sicastar®-M	avidin	1,5 µm	10 mg/ml	2 ml
39-19-153	sicastar®-M	streptavidin	1,5 µm	10 mg/ml	2 ml
39-20-153	sicastar®-M	proteinA	1,5 µm	10 mg/ml	2 ml
39-21-153	sicastar®-M	albumin (BSA)	1,5 µm	10 mg/ml	5 ml

sicastar®-M-CT particles are produced by hydrolysis of orthosilicates in the presence of magnetite. They consist of cluster-typed aggregates in a broad size range with a mean diameter of 6 microns. The sicastar®-M-CT particles show a homogeneous distribution of magnetite in the silica matrix by the special preparation method and have a hydrophilic surface with terminal Si-OH moieties. They can easily be separated even in highly viscous media with conventional permanent magnets and are extremely stable in organic solvents and at high temperatures.

Cluster-typed magnetic silica particles (sicastar®-M-CT):

- are designed with the surface functionalities OH (plain), NH<sub>2</sub>, COOH and epoxy for the covalent binding of proteins, antibodies or other molecules,
- are available with covalently bound proteins (avidin, streptavidin, protein A, albumin),
- can be offered with the nickel(II) chelator nitrilotriacetic acid (NTA) or ready to use with the corresponding nickel complex (Ni-NTA) for the binding of histidine labeled proteins,
- are available with a hydrophobic octadecyl (C18) surface.

## Plain and functionalized particles

The plain sicastar®-M-CT particles can be used to isolate plasmide-DNA also from highly viscous media.

sicastar®-M-CT particles are available with the surface functionalities NH<sub>2</sub>, COOH and epoxy for the covalent binding of proteins, antibodies or other molecules. The particles are stable in aqueous media and also in organic solvents. Beside the conjugation of water soluble molecules the conjugation of target molecules, that are only soluble in organic solvents is also possible. The NH<sub>2</sub>- and COOH functionalized particles are supplied in water, while the epoxy-modified particles are provided as powder to preserve the reactivity.

sicastar®-M-CT particles can be offered with the nickel(II) chelator nitrilotriacetic acid (NTA) or ready to use with the corresponding nickel complex (Ni-NTA) for the binding of histidine labeled proteins. All functionalized sicastar®-M-CT particles are supplied in water.

Product code	Product name	Surface	Diameter	Solid content	Quantity
59-00-603	sicastar®-M-CT	plain	6 µm	50 mg/ml	10 ml
59-01-603	sicastar®-M-CT	NH <sub>2</sub>	6 µm	50 mg/ml	10 ml
59-02-603	sicastar®-M-CT	COOH	6 µm	50 mg/ml	10 ml
59-08-603	sicastar®-M-CT	epoxy	6 µm	-	0,5 g
59-11-603	sicastar®-M-CT	NTA	6 µm	50 mg/ml	10 ml
59-48-603	sicastar®-M-CT	Ni-NTA	6 µm	50 mg/ml	10 ml
59-51-603	sicastar®-M-CT	C18	6 µm	-	0,5 g

A hydrophobic octadecyl (C18) surface of sicastar®-M-CT particles provides a high selectivity for polar, neutral and moderately nonpolar pharmaceuticals, natural products, food additives, organic chemicals and biologicals. These hydrophobic particles are supplied as powder for the direct use in aqueous or organic media.

## Protein coated particles

sicastar®-M-CT particles are provided with covalently bound proteins (avidin, streptavidin, protein A, albumin). Avidin and streptavidin bind biotinylated molecules easily and with a high affinity, while protein A picks up and orients IgGs from a mixture of species. The albumin (BSA) coating makes the surface of the silica particles more biocompatible if needed. The protein coated particles are supplied in PBS buffer (pH=7.4) with 0.02 % sodium azide.

Product code	Product name	Surface	Diameter	Solid content	Quantity
59-18-603	sicastar®-M-CT	avidin	6 µm	10 mg/ml	2 ml
59-19-603	sicastar®-M-CT	streptavidin	6 µm	10 mg/ml	2 ml
59-20-603	sicastar®-M-CT	proteinA	6 µm	10 mg/ml	2 ml
59-21-603	sicastar®-M-CT	albumin (BSA)	6 µm	10 mg/ml	5 ml



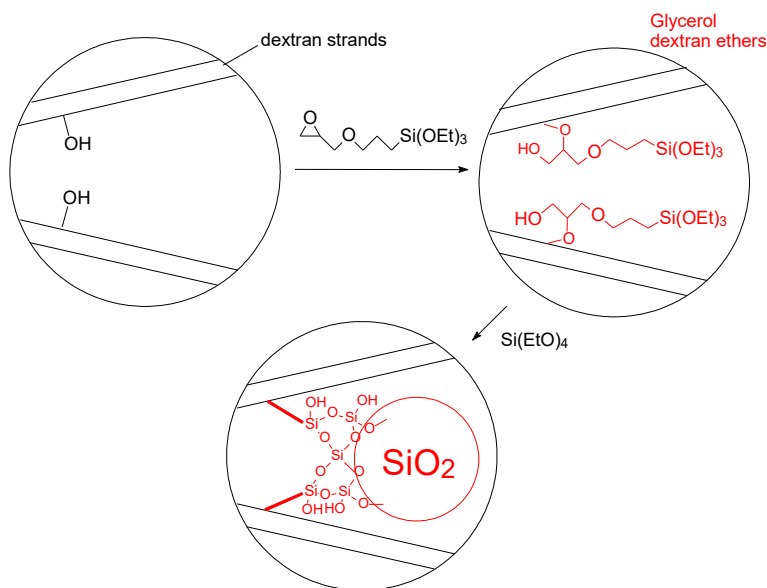
## nanomag<sup>®</sup>-silica

nanomag<sup>®</sup>-silica particles are prepared via the core-shell method with a core of magnetite and a dextran shell with a simultaneous cross-linking of the dextran strands by silica nanostructures. They possess a diameter of 250 nm and a magnetite content of 75-80%.

nanomag<sup>®</sup>-silica particles can easily be separated with a conventional permanent magnet.

The surface functionalities NH<sub>2</sub> and COOH are designed for the covalent binding of proteins, antibodies or other molecules. The nanomag<sup>®</sup>-silica particles with a plain or the hydrophobic octadecyl (C18) surface are especially interesting for high-throughput nucleic acid separation. All nanomag<sup>®</sup>-silica particles are supplied in water.

Product code	Product name	Surface	Diameter	Solid content	Quantity
13-00-252	nanomag <sup>®</sup> -silica	plain	250 nm	10 mg/ml	10 ml
13-01-252	nanomag <sup>®</sup> -silica	NH <sub>2</sub>	250 nm	10 mg/ml	10 ml
13-02-252	nanomag <sup>®</sup> -silica	COOH	250 nm	10 mg/ml	10 ml
13-51-252	nanomag <sup>®</sup> -silica	C18	250 nm	10 mg/ml	10 ml



Intercalation of nano-scaled silica for cross-linking of the dextran strands on the surface of nanomag<sup>®</sup>-silica particles

(Grüttner C, Teller J, J. Magn. Magn. Mat. 1999;194(4):8-15)

## nanomag<sup>®</sup>-C

nanomag<sup>®</sup>-C particles are prepared via the core-shell method with a core of magnetite and a chitosan shell. The particles have a diameter of 150 nm and a magnetite content of 75-80%. They can easily be separated with a conventional permanent magnet. nanomag<sup>®</sup>-C particles have already amino functionalities resulting from the chitosan structure without any further surface modifications (surface: plain)

Product code	Product name	Surface	Diameter	Solid content	Quantity
04-00-152	nanomag <sup>®</sup> -C	plain	150 nm	25 mg/ml	10 ml

## PLA-M particles

PLA-M particles consist of magnetite (40% w/w) in a matrix of poly(D,L-lactic acid) with a molecular weight of 17.000 D. They are available with mean diameters of 30  $\mu\text{m}$  and 100  $\mu\text{m}$ . Magnetic poly(lactic acid) particles are established in the field of magnetic drug targeting in connection with a controlled drug release (The half-life time of the beads under in-vivo conditions mainly depends on the molecular weight of the polymers and increases with the molecular weight of the polymer.). PLA-M particles can also be offered with carboxylic acid or amino groups on the surface.

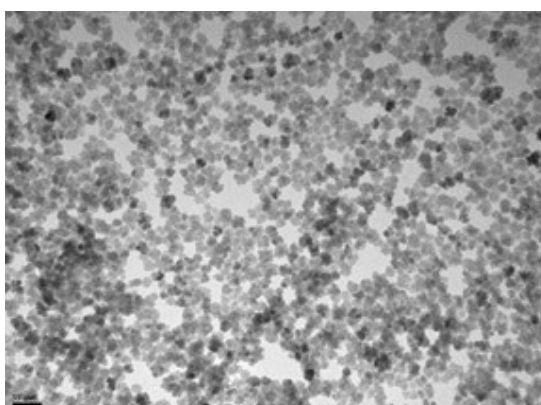
Product code	Product name	Surface	Diameter	Solid content	Quantity
12-00-304	PLA-M	plain	30 $\mu\text{m}$	10 mg/ml	10 ml
12-00-105	PLA-M	plain	100 $\mu\text{m}$	10 mg/ml	10 ml
12-01-304	PLA-M	NH <sub>2</sub>	30 $\mu\text{m}$	10 mg/ml	10 ml
12-01-105	PLA-M	NH <sub>2</sub>	100 $\mu\text{m}$	10 mg/ml	10 ml
12-02-304	PLA-M	COOH	30 $\mu\text{m}$	10 mg/ml	10 ml
12-02-105	PLA-M	COOH	100 $\mu\text{m}$	10 mg/ml	10 ml

## PEI-M particles

Magnetic poly(ethylene imine) (PEI) particles are prepared via the core-shell method with a core of magnetite and a poly(ethylene imine) shell. They have a diameter of 150 nm and a magnetite content of 75-80%. The magnetic PEI particles can easily be separated with a conventional permanent magnet and are interesting tools for magnetic driven transfection of cells.

	Product name	Surface	Diameter	Solid content	Quantity
17-00-152	PEI-M	plain	150 nm	25 mg/ml	10 ml

synomag®-particles with a „nanoflower“- shaped multi- core consisting of maghemite crystals are available with hydrodynamic particle diameters of 30 and 50 nm. The particles exhibit excellent properties as tracer for Magnetic Particle Imaging (MPI) and are suitable for hyperthermia applications. They cannot be separated with conventional permanent magnets, but in a high gradient magnetic field. Synomag® particles with COOH groups on the surface are designed for an improved cell uptake, those with PEG-OMe (25 kDa) on the surface for prolonged circulation time in blood.



TEM image of synomag®, 30 nm.

Synomag® particles are delivered in water without any surfactants.

Product code	Product name	Surface	Diameter	Solid content	Quantity
103-02-301	synomag®	COOH	30 nm	10 mg/ml	5 ml
103-02-501	synomag®	COOH	50 nm	10 mg/ml	5 ml
103-124-301	synomag®	PEG 25.000-OMe	30 nm	10 mg/ml	5 ml
103-124-501	synomag®	PEG 25.000-OMe	50 nm	10 mg/ml	5 ml

## Iron oxide particles

Iron oxide particles are available with hydrodynamic diameters of 50 nm and 250 nm, respectively. The surface of the 50 nm particles is colloidal stabilized with carboxylic acid groups. The 250 nm iron oxide particles consist of monodisperse magnetite aggregates and can easily be separated with permanent magnets. They possess a low tendency of sedimentation and are also available with gold labeling. In addition, iron oxide particles are functionalized with a phospholipid surface for cell interaction studies in a hydrodynamic diameter of 70 nm. The particles possess nearly no sedimentation tendency and cannot be separated with conventional permanent magnets. For magnetic separation a high gradient magnetic system is recommended.

Product code	Product name	Surface	Diameter	Solid content	Quantity
45-02-501	Iron oxide particles	COOH	50 nm	10 mg/ml	10 ml
45-00-252	Iron oxide particles	plain	250 nm	25 mg/ml	10 ml
45-42-252	Iron oxide particles	Au-labeled	250 nm	25 mg/ml	10 ml
45-111-701	Iron oxide particles	phospholipid	70 nm	10 mg/ml	10 ml



# Fluorescent particles

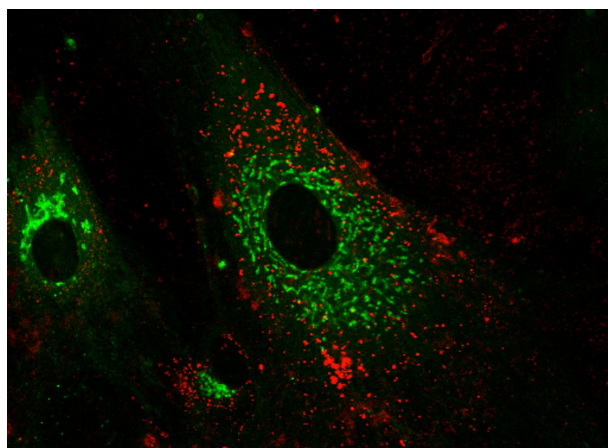
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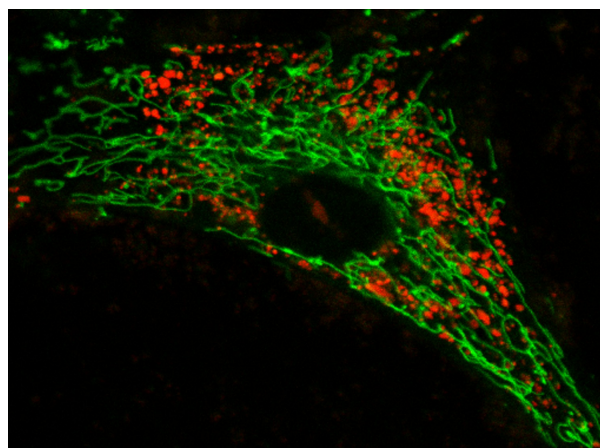
sicastar®-F particles are produced by hydrolysis of orthosilicates and related compounds. They contain a high amount of covalently bound fluorescence dye in the silica matrix and are extremely stable in organic solvents and buffers. No toxic effects come from the covalently bound fluorescence dyes. They are monodisperse and nonporous in the size range of 10 nm to 1.5  $\mu\text{m}$  with a density of 2.0 g/cm<sup>3</sup> and a polydispersity index < 0.2. The larger porous sicastar®-F particles have broader size distributions in the area of the porous silica particles with adjusted diameters between 3 and 20  $\mu\text{m}$  and a density of 1.8 g/cm<sup>3</sup>.

## Fluorescent silica particles (sicastar®-F)

- are available with red fluorescence (sicastar®-redF, excitation: 569 nm, emission: 585 nm), green fluorescence (sicastar®-greenF, excitation: 485 nm, emission: 510 nm) and blue fluorescence (sicastar®-blueF, excitation: 354 nm, emission: 450 nm),
- have a hydrophilic surface with terminal Si-OH-bonds (plain),
- are designed with the surface functionalities NH<sub>2</sub> and COOH for the covalent binding of proteins, antibodies, oligonucleotides, enzymes or other molecules,
- are provided with covalently bound streptavidin and ref fluorescence with diameters of 100 nm, 300 nm, 500 nm, 3  $\mu\text{m}$  and 5  $\mu\text{m}$ ,
- are available with red fluorescence and a strong hydrophobic trimethylsilyl (TMS) surface in the size range of 50 nm to 20  $\mu\text{m}$
- are often applied for detection purposes (flow cytometry, membrane checks, flow investigations).



Uptake of 100 nm plain sicastar®-redF particles in human mesenchymal stem cells (Golgi apparatus green coloured)



Uptake of 50 nm carboxylated sicastar®-redF particles in human mesenchymal stem cells (Mitochondria green coloured)

Silica particles  $\geq 200$  nm can easily be separated by simple sedimentation or centrifugation. sicastar® particles < 200 nm can be washed by SEC (size exclusion chromatography) or ultrafiltration/dialysis or can be separated by ultracentrifugation.

Silica particles with special fluorescent properties are available on request. The particles are delivered in aqueous suspension without any surfactants.

## **sicastar®-greenF**

sicastar®-greenF particles are available in the size range of 30 nm to 20 µm with green fluorescence with an excitation at 485 nm and an emission at 510 nm.

Product code	Product name	Surface	Diameter	Solid content	Quantity
42-00-301	sicastar®-greenF	plain	30 nm	25 mg/ml	10 ml
42-00-501	sicastar®-greenF	plain	50 nm	25 mg/ml	10 ml
42-00-701	sicastar®-greenF	plain	70 nm	25 mg/ml	10 ml
42-00-102	sicastar®-greenF	plain	100 nm	50 mg/ml	10 ml
42-00-202	sicastar®-greenF	plain	200 nm	50 mg/ml	10 ml
42-00-302	sicastar®-greenF	plain	300 nm	50 mg/ml	10 ml
42-00-502	sicastar®-greenF	plain	500 nm	50 mg/ml	10 ml
42-00-103	sicastar®-greenF	plain	1 µm	50 mg/ml	10 ml
42-00-153	sicastar®-greenF	plain	1,5 µm	50 mg/ml	10 ml
42-00-303	sicastar®-greenF	plain	3 µm	50 mg/ml	10 ml
42-00-503	sicastar®-greenF	plain	5 µm	50 mg/ml	10 ml
42-00-104	sicastar®-greenF	plain	10 µm	50 mg/ml	10 ml
42-00-154	sicastar®-greenF	plain	15 µm	50 mg/ml	10 ml
42-00-204	sicastar®-greenF	plain	20 µm	50 mg/ml	10 ml
42-01-301	sicastar®-greenF	NH <sub>2</sub>	30 nm	25 mg/ml	10 ml
42-01-501	sicastar®-greenF	NH <sub>2</sub>	50 nm	25 mg/ml	10 ml
42-01-701	sicastar®-greenF	NH <sub>2</sub>	70 nm	25 mg/ml	10 ml
42-01-102	sicastar®-greenF	NH <sub>2</sub>	100 nm	25 mg/ml	10 ml
42-01-202	sicastar®-greenF	NH <sub>2</sub>	200 nm	25 mg/ml	10 ml
42-01-302	sicastar®-greenF	NH <sub>2</sub>	300 nm	50 mg/ml	10 ml
42-01-502	sicastar®-greenF	NH <sub>2</sub>	500 nm	50 mg/ml	10 ml
42-01-103	sicastar®-greenF	NH <sub>2</sub>	1 µm	50 mg/ml	10 ml
42-01-153	sicastar®-greenF	NH <sub>2</sub>	1,5 µm	50 mg/ml	10 ml
42-01-303	sicastar®-greenF	NH <sub>2</sub>	3 µm	50 mg/ml	10 ml
42-01-503	sicastar®-greenF	NH <sub>2</sub>	5 µm	50 mg/ml	10 ml
42-01-104	sicastar®-greenF	NH <sub>2</sub>	10 µm	50 mg/ml	10 ml
42-01-154	sicastar®-greenF	NH <sub>2</sub>	15 µm	50 mg/ml	10 ml
42-01-204	sicastar®-greenF	NH <sub>2</sub>	20 µm	50 mg/ml	10 ml
42-02-301	sicastar®-greenF	COOH	30 nm	25 mg/ml	10 ml
42-02-501	sicastar®-greenF	COOH	50 nm	25 mg/ml	10 ml
42-02-701	sicastar®-greenF	COOH	70 nm	25 mg/ml	10 ml
42-02-102	sicastar®-greenF	COOH	100 nm	25 mg/ml	10 ml
42-02-202	sicastar®-greenF	COOH	200 nm	25 mg/ml	10 ml
42-02-302	sicastar®-greenF	COOH	300 nm	50 mg/ml	10 ml
42-02-502	sicastar®-greenF	COOH	500 nm	50 mg/ml	10 ml
42-02-103	sicastar®-greenF	COOH	1 µm	50 mg/ml	10 ml
42-02-153	sicastar®-greenF	COOH	1,5 µm	50 mg/ml	10 ml
42-02-303	sicastar®-greenF	COOH	3 µm	50 mg/ml	10 ml
42-02-503	sicastar®-greenF	COOH	5 µm	50 mg/ml	10 ml
42-02-104	sicastar®-greenF	COOH	10 µm	50 mg/ml	10 ml
42-02-154	sicastar®-greenF	COOH	15 µm	50 mg/ml	10 ml
42-02-204	sicastar®-greenF	COOH	20 µm	50 mg/ml	10 ml

**sicastar®-redF**

sicastar®-redF particles are available in the size range from 10 nm to 20 µm with red fluorescence with an excitation at 569 nm and an emission at 585 nm.

Product code	Product name	Surface	Diameter	Solid content	Quantity
40-00-101	sicastar®-redF	plain	10 nm	25 mg/ml	10 ml
40-00-301	sicastar®-redF	plain	30 nm	25 mg/ml	10 ml
40-00-501	sicastar®-redF	plain	50 nm	25 mg/ml	10 ml
40-00-701	sicastar®-redF	plain	70 nm	25 mg/ml	10 ml
40-00-102	sicastar®-redF	plain	100 nm	50 mg/ml	10 ml
40-00-202	sicastar®-redF	plain	200 nm	50 mg/ml	10 ml
40-00-302	sicastar®-redF	plain	300 nm	50 mg/ml	10 ml
40-00-502	sicastar®-redF	plain	500 nm	50 mg/ml	10 ml
40-00-103	sicastar®-redF	plain	1 µm	50 mg/ml	10 ml
40-00-153	sicastar®-redF	plain	1,5 µm	50 mg/ml	10 ml
40-00-303	sicastar®-redF	plain	3 µm	50 mg/ml	10 ml
40-00-503	sicastar®-redF	plain	5 µm	50 mg/ml	10 ml
40-00-104	sicastar®-redF	plain	10 µm	50 mg/ml	10 ml
40-00-154	sicastar®-redF	plain	15 µm	50 mg/ml	10 ml
40-00-204	sicastar®-redF	plain	20 µm	50 mg/ml	10 ml
40-01-301	sicastar®-redF	NH <sub>2</sub>	30 nm	25 mg/ml	10 ml
40-01-501	sicastar®-redF	NH <sub>2</sub>	50 nm	25 mg/ml	10 ml
40-01-701	sicastar®-redF	NH <sub>2</sub>	70 nm	25 mg/ml	10 ml
40-01-102	sicastar®-redF	NH <sub>2</sub>	100 nm	25 mg/ml	10 ml
40-01-202	sicastar®-redF	NH <sub>2</sub>	200 nm	25 mg/ml	10 ml
40-01-302	sicastar®-redF	NH <sub>2</sub>	300 nm	50 mg/ml	10 ml
40-01-502	sicastar®-redF	NH <sub>2</sub>	500 nm	50 mg/ml	10 ml
40-01-103	sicastar®-redF	NH <sub>2</sub>	1 µm	50 mg/ml	10 ml
40-01-153	sicastar®-redF	NH <sub>2</sub>	1,5 µm	50 mg/ml	10 ml
40-01-303	sicastar®-redF	NH <sub>2</sub>	3 µm	50 mg/ml	10 ml
40-01-503	sicastar®-redF	NH <sub>2</sub>	5 µm	50 mg/ml	10 ml
40-01-104	sicastar®-redF	NH <sub>2</sub>	10 µm	50 mg/ml	10 ml
40-01-154	sicastar®-redF	NH <sub>2</sub>	15 µm	50 mg/ml	10 ml
40-01-204	sicastar®-redF	NH <sub>2</sub>	20 µm	50 mg/ml	10 ml
40-02-301	sicastar®-redF	COOH	30 nm	25 mg/ml	10 ml
40-02-501	sicastar®-redF	COOH	50 nm	25 mg/ml	10 ml
40-02-701	sicastar®-redF	COOH	70 nm	25 mg/ml	10 ml
40-02-102	sicastar®-redF	COOH	100 nm	25 mg/ml	10 ml
40-02-202	sicastar®-redF	COOH	200 nm	25 mg/ml	10 ml
40-02-302	sicastar®-redF	COOH	300 nm	50 mg/ml	10 ml
40-02-502	sicastar®-redF	COOH	500 nm	50 mg/ml	10 ml
40-02-103	sicastar®-redF	COOH	1 µm	50 mg/ml	10 ml
40-02-153	sicastar®-redF	COOH	1,5 µm	50 mg/ml	10 ml
40-02-303	sicastar®-redF	COOH	3 µm	50 mg/ml	10 ml
40-02-503	sicastar®-redF	COOH	5 µm	50 mg/ml	10 ml
40-02-104	sicastar®-redF	COOH	10 µm	50 mg/ml	10 ml
40-02-154	sicastar®-redF	COOH	15 µm	50 mg/ml	10 ml
40-02-204	sicastar®-redF	COOH	20 µm	50 mg/ml	10 ml

sicastar®-redF particles are also available with a strong hydrophobic trimethylsilyl (TMS) surface in the size range of 50 nm to 20 µm. These hydrophobic particles are provided as powders that allow a direct suspension of the particles in organic solvents.

Product code	Product name	Surface	Diameter	Solid content	Quantity
40-17-501	sicastar®-redF	TMS	50 nm	25 mg/ml	10 ml
40-17-102	sicastar®-redF	TMS	100 nm	25 mg/ml	10 ml
40-17-202	sicastar®-redF	TMS	200 nm	50 mg/ml	10 ml
40-17-302	sicastar®-redF	TMS	300 nm	50 mg/ml	10 ml
40-17-502	sicastar®-redF	TMS	500 nm	50 mg/ml	10 ml
40-17-103	sicastar®-redF	TMS	1 µm	50 mg/ml	10 ml
40-17-153	sicastar®-redF	TMS	1,5 µm	50 mg/ml	10 ml
40-17-303	sicastar®-redF	TMS	3 µm	50 mg/ml	10 ml
40-17-503	sicastar®-redF	TMS	5 µm	50 mg/ml	10 ml
40-17-104	sicastar®-redF	TMS	10 µm	50 mg/ml	10 ml
40-17-204	sicastar®-redF	TMS	20 µm	50 mg/ml	10 ml

sicastar®-redF particles are available with covalently bound streptavidin on the surface and diameters of 100 nm, 300 nm, 500 nm, 3 µm and 5 µm. Streptavidin coated particles bind biotinylated molecules easily and with a high affinity.

The protein coated particles are supplied in PBS buffer (pH=7.4) with 0.02 % sodium azide.

Product code	Product name	Surface	Diameter	Solid content	Quantity
40-19-102	sicastar®-redF	streptavidin	100 nm	10 mg/ml	1 ml
40-19-302	sicastar®-redF	streptavidin	300 nm	10 mg/ml	1 ml
40-19-502	sicastar®-redF	streptavidin	500 nm	10 mg/ml	1 ml
40-19-303	sicastar®-redF	streptavidin	3 µm	25 mg/ml	1 ml
40-19-503	sicastar®-redF	streptavidin	5 µm	25 mg/ml	1 ml

## sicastar®-blueF

sicastar®-blueF particles are available in the size range from 70 nm to 20 µm with blue fluorescence with an excitation at 354 nm and an emission at 450 nm.

Product code	Product name	Surface	Diameter	Solid content	Quantity
41-00-701	sicastar®-blueF	plain	70 nm	25 mg/ml	10 ml
41-00-202	sicastar®-blueF	plain	200 nm	50 mg/ml	10 ml
41-00-302	sicastar®-blueF	plain	300 nm	50 mg/ml	10 ml
41-00-502	sicastar®-blueF	plain	500 nm	50 mg/ml	10 ml
41-00-103	sicastar®-blueF	plain	1 µm	50 mg/ml	10 ml
41-01-202	sicastar®-blueF	NH <sub>2</sub>	200 nm	25 mg/ml	10 ml
41-01-302	sicastar®-blueF	NH <sub>2</sub>	300 nm	50 mg/ml	10 ml
41-01-502	sicastar®-blueF	NH <sub>2</sub>	500 nm	50 mg/ml	10 ml
41-01-103	sicastar®-blueF	NH <sub>2</sub>	1 µm	50 mg/ml	10 ml
41-01-303	sicastar®-blueF	NH <sub>2</sub>	3 µm	50 mg/ml	10 ml
41-01-503	sicastar®-blueF	NH <sub>2</sub>	5 µm	50 mg/ml	10 ml
41-01-104	sicastar®-blueF	NH <sub>2</sub>	10 µm	50 mg/ml	10 ml
41-01-154	sicastar®-blueF	NH <sub>2</sub>	15 µm	50 mg/ml	10 ml
41-01-204	sicastar®-blueF	NH <sub>2</sub>	20 µm	50 mg/ml	10 ml
41-02-202	sicastar®-blueF	COOH	200 nm	25 mg/ml	10 ml
41-02-302	sicastar®-blueF	COOH	300 nm	50 mg/ml	10 ml
41-02-502	sicastar®-blueF	COOH	500 nm	50 mg/ml	10 ml
41-02-103	sicastar®-blueF	COOH	1 µm	50 mg/ml	10 ml
41-02-303	sicastar®-blueF	COOH	3 µm	50 mg/ml	10 ml
41-02-503	sicastar®-blueF	COOH	5 µm	50 mg/ml	10 ml
41-02-104	sicastar®-blueF	COOH	10 µm	50 mg/ml	10 ml
41-02-154	sicastar®-blueF	COOH	15 µm	50 mg/ml	10 ml
41-02-204	sicastar®-blueF	COOH	20 µm	50 mg/ml	10 ml

micromer®-F are monodisperse particles from polystyrene, substituted polystyrenes, polystyrene-co-polymers or polymethacrylates. While the 25 nm particles consist of polymethacrylate, the larger particles have a polystyrene matrix. Plain fluorescent polystyrene / polymethacrylate particles (micromer®-F) have no additional coatings or special functional groups on the surface.

Fluorescent polystyrene / polymethacrylate particles

- are designed with carboxylic acid groups (COOH) and amino groups (NH<sub>2</sub>) on the particle surface for the covalent binding of proteins, antibodies or other molecules,
- micromer®-redF particles are available with covalently bound streptavidin on the surface and diameters of 100 nm, 250 nm, 3 µm and 5 µm,
- are available with red (micromer®-redF, excitation: 552 nm, emission: 580 nm) and green (micromer®-greenF, excitation: 475 nm, emission: 510 nm) fluorescence.

The labeling with other fluorescence dyes is possible on request. micromer®-F particles are supplied in aqueous suspension without any surfactants.

## micromer®-greenF

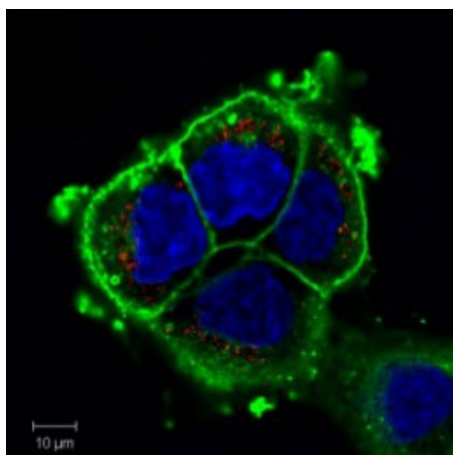
micromer®-greenF particles are available with an encapsulated fluorescein derivative in aqueous suspension without any surfactants. The particles are provided with diameters of 25 nm, 50 nm, 100 nm and 250 nm with an excitation at 475 nm and an emission at 510 nm.

Product code	Product name	Surface	Diameter	Solid content	Quantity
29-00-251	micromer®-greenF	plain	25 nm	10 mg/ml	10 ml
29-00-501	micromer®-greenF	plain	50 nm	10 mg/ml	10 ml
29-00-102	micromer®-greenF	plain	100 nm	10 mg/ml	10 ml
29-00-252	micromer®-greenF	plain	250 nm	25 mg/ml	10 ml
29-01-251	micromer®-greenF	NH <sub>2</sub>	25 nm	10 mg/ml	5 ml
29-01-102	micromer®-greenF	NH <sub>2</sub>	100 nm	10 mg/ml	5 ml
29-01-252	micromer®-greenF	NH <sub>2</sub>	250 nm	25 mg/ml	5 ml
29-02-251	micromer®-greenF	COOH	25 nm	10 mg/ml	5 ml
29-02-501	micromer®-greenF	COOH	50 nm	10 mg/ml	5 ml
29-02-102	micromer®-greenF	COOH	100 nm	10 mg/ml	5 ml
29-02-252	micromer®-greenF	COOH	250 nm	25 mg/ml	5 ml



## micromer®-redF

micromer®-redF particles are available with an encapsulated rhodamine derivative in aqueous suspension without any surfactants. The particles are provided in the nanoscale with diameters of 25 nm, 50 nm, 100 nm, 250 nm and in the micron-scale with 3 µm, 4 µm, 5 µm and 6 µm with an excitation at 552 nm and an emission at 580 nm.



Immunofluorescence staining of A431 cells after treatment with EG2-conjugated 25 nm micromer®-redF particles (EGFR-green, E2-conjugated particles-red, cell nucleus-blue)  
(Witecy S, PhD thesis, Helmholtz-Zentrum Dresden-Rossendorf, 2012)

Product code	Product name	Surface	Diameter	Solid content	Quantity
30-00-251	micromer®-redF	plain	25 nm	10 mg/ml	10 ml
30-00-501	micromer®-redF	plain	50 nm	10 mg/ml	10 ml
30-00-102	micromer®-redF	plain	100 nm	10 mg/ml	10 ml
30-00-252	micromer®-redF	plain	250 nm	25 mg/ml	10 ml
30-01-251	micromer®-redF	NH <sub>2</sub>	25 nm	10 mg/ml	5 ml
30-01-102	micromer®-redF	NH <sub>2</sub>	100 nm	10 mg/ml	5 ml
30-01-252	micromer®-redF	NH <sub>2</sub>	250 nm	25 mg/ml	5 ml
30-02-251	micromer®-redF	COOH	25 nm	10 mg/ml	5 ml
30-02-501	micromer®-redF	COOH	50 nm	10 mg/ml	5 ml
30-02-102	micromer®-redF	COOH	100 nm	10 mg/ml	5 ml
30-02-252	micromer®-redF	COOH	250 nm	25 mg/ml	5 ml
30-02-303	micromer®-redF	COOH	3 µm	25 mg/ml	10 ml
30-02-403	micromer®-redF	COOH	4 µm	25 mg/ml	10 ml
30-02-503	micromer®-redF	COOH	5 µm	25 mg/ml	10 ml
30-02-603	micromer®-redF	COOH	6 µm	25 mg/ml	10 ml

micromer®-redF particles are available with covalently bound streptavidin on the surface and diameters of 100 nm, 250 nm, 3 µm and 5 µm. Streptavidin coated particles bind biotinylated molecules easily and with a high affinity.

The protein coated particles are supplied in PBS buffer (pH=7.4) with 0.02 % sodium azide.

Product code	Product name	Surface	Diameter	Solid content	Quantity
30-19-102	micromer®-redF	streptavidin	100 nm	10 mg/ml	1 ml
30-19-252	micromer®-redF	streptavidin	250 nm	10 mg/ml	1 ml
30-19-303	micromer®-redF	streptavidin	3 µm	25 mg/ml	1 ml
30-19-503	micromer®-redF	streptavidin	5 µm	25 mg/ml	1 ml

## PLA-F particles

The fluorescent poly(lactic acid) particles consist of poly(D,L-lactic acid) with a molecular weight of 17.000 Da. They are available with diameters of 250 nm and 500 nm in small size distributions and with mean diameters of 2  $\mu\text{m}$ , 30  $\mu\text{m}$  and 100  $\mu\text{m}$  in broader size distributions. Plain fluorescent poly(lactic acid) particles do not have any functional groups on the surface.

Fluorescent poly(lactic acid) particles

- are designed with carboxylic acid groups (COOH) and amino groups (NH<sub>2</sub>) on the particle surface for the covalent binding of proteins, antibodies or other molecules,
- are available with red (PLA-redF, excitation: 552 nm, emission: 580 nm) and green (PLA-greenF, excitation: 502 nm, emission: 527 nm) fluorescence.

The fluorescent poly(lactic acid) particles are supplied in water and can be loaded with drugs on request.

Product code	Product name	Surface	Diameter	Solid content	Quantity
51-00-252	PLA-greenF	plain	250 nm	10 mg/ml	5 ml
51-00-502	PLA-greenF	plain	500 nm	10 mg/ml	5 ml
51-00-203	PLA-greenF	plain	2 $\mu\text{m}$	10 mg/ml	5 ml
51-00-304	PLA-greenF	plain	30 $\mu\text{m}$	10 mg/ml	5 ml
51-00-105	PLA-greenF	plain	100 $\mu\text{m}$	10 mg/ml	5 ml
51-01-252	PLA-greenF	NH <sub>2</sub>	250 nm	10 mg/ml	5 ml
51-01-502	PLA-greenF	NH <sub>2</sub>	500 nm	10 mg/ml	5 ml
51-01-203	PLA-greenF	NH <sub>2</sub>	2 $\mu\text{m}$	10 mg/ml	5 ml
51-01-304	PLA-greenF	NH <sub>2</sub>	30 $\mu\text{m}$	10 mg/ml	5 ml
51-01-105	PLA-greenF	NH <sub>2</sub>	100 $\mu\text{m}$	10 mg/ml	5 ml
51-02-252	PLA-greenF	COOH	250 nm	10 mg/ml	5 ml
51-02-502	PLA-greenF	COOH	500 nm	10 mg/ml	5 ml
51-02-203	PLA-greenF	COOH	2 $\mu\text{m}$	10 mg/ml	5 ml
51-02-304	PLA-greenF	COOH	30 $\mu\text{m}$	10 mg/ml	5 ml
51-02-105	PLA-greenF	COOH	100 $\mu\text{m}$	10 mg/ml	5 ml
52-00-252	PLA-redF	plain	250 nm	10 mg/ml	5 ml
52-00-502	PLA-redF	plain	500 nm	10 mg/ml	5 ml
52-00-203	PLA-redF	plain	2 $\mu\text{m}$	10 mg/ml	5 ml
52-00-304	PLA-redF	plain	30 $\mu\text{m}$	10 mg/ml	5 ml
52-00-105	PLA-redF	plain	100 $\mu\text{m}$	10 mg/ml	5 ml
52-01-252	PLA-redF	NH <sub>2</sub>	250 nm	10 mg/ml	5 ml
52-01-502	PLA-redF	NH <sub>2</sub>	500 nm	10 mg/ml	5 ml
52-01-203	PLA-redF	NH <sub>2</sub>	2 $\mu\text{m}$	10 mg/ml	5 ml
52-01-304	PLA-redF	NH <sub>2</sub>	30 $\mu\text{m}$	10 mg/ml	5 ml
52-01-105	PLA-redF	NH <sub>2</sub>	100 $\mu\text{m}$	10 mg/ml	5 ml
52-02-252	PLA-redF	COOH	250 nm	10 mg/ml	5 ml
52-02-502	PLA-redF	COOH	500 nm	10 mg/ml	5 ml
52-02-203	PLA-redF	COOH	2 $\mu\text{m}$	10 mg/ml	5 ml
52-02-304	PLA-redF	COOH	30 $\mu\text{m}$	10 mg/ml	5 ml
52-02-105	PLA-redF	COOH	100 $\mu\text{m}$	10 mg/ml	5 ml

## Albumin-F particles

Fluorescent albumin particles consist of cross-linked bovine serum albumin (BSA) or human serum albumin (HSA), resp., on request. They are prepared with a mean diameter of 250 nm and show a green fluorescence with an excitation at 485 nm and an emission at 510 nm. The fluorescent albumin particles are supplied in water.

Product code	Product name	Surface	Diameter	Solid content	Quantity
36-00-252	Albumin-greenF	plain	250 nm	10 mg/ml	5 ml

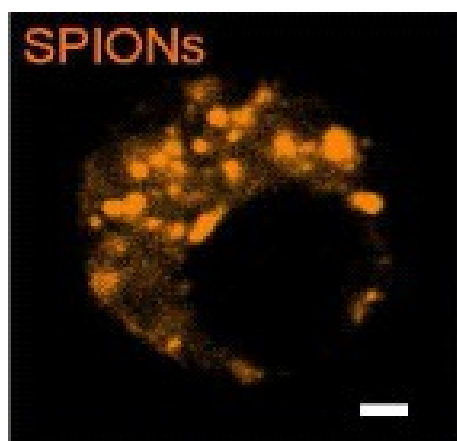
# Fluorescent magnetic particles

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Fluorescent magnetic particles allow the application of magnetic properties together with the ability of optical visualization. nanomag<sup>®</sup>-CLD-redF particles combine separation and detection purposes. They show a red fluorescence with an excitation at 552 nm and an emission at 580 nm. The 100 nm nanomag<sup>®</sup>-CLD-redF particles are prepared by precipitation of iron oxide in the presence of dextran. The particles consist of about 80-90% (w/w) iron oxide in a particle matrix of cross-linked dextran (MW: 40.000 Da). They can not be separated with a conventional permanent magnet, but in a high gradient magnetic field. The 100 nm nanomag<sup>®</sup>-CLD-redF are supplied in water without any surfactants with an iron concentration of 2.4 mg/ml.

The 300 nm nanomag<sup>®</sup>-CLD-redF particles also have a red fluorescence with an excitation at 552 nm and an emission at 580 nm. They are prepared by the core-shell method and consist of an iron oxide core in a matrix of cross-linked dextran. They can easily be separated with a conventional permanent magnet.



Confocal imaging of the location of LAMP1 conjugated nanomag<sup>®</sup>-CLD-redF in INS-1 cells (scale bar: 2  $\mu$ m) (Zhang E et al., ACS Nano, 2014;8(4):3192–3201)

The 100 nm nanomag<sup>®</sup>-CLD-redF particles are available with a plain surface or with amino groups on the surface for the covalent binding of proteins, antibodies or other molecules.

Product code	Product name	Surface	Diameter	Solid content	Quantity
23-00-102	nanomag <sup>®</sup> -CLD-redF	plain	100 nm	5 mg/ml	5 ml
23-00-302	nanomag <sup>®</sup> -CLD-redF	plain	300 nm	5 mg/ml	5 ml
23-01-102	nanomag <sup>®</sup> -CLD-redF	NH <sub>2</sub>	100 nm	5 mg/ml	5 ml

## synomag®-CLD-F

Fluorescent magnetic nanoparticles with „Nanoflower“ structure combine sophisticated magnetic properties and detection purposes. They are available as synomag®-CLD-F with red (excitation: 552 nm, emission: 580 nm) and as synomag®-CLD-far redF with far-red fluorescence (excitation: 732 nm, emission: 758 nm) with hydrodynamic particle diameters of 50 nm and 70 nm. Due to their magnetic properties synomag®-CLD-F particles are excellent tracers for MPI. The matrix of the maghemite particles consist of crosslinked dextran (40.000 Da) and can be provided with a plain surface or with amino groups on the surface for the covalent binding of proteins, antibodies or other molecules.

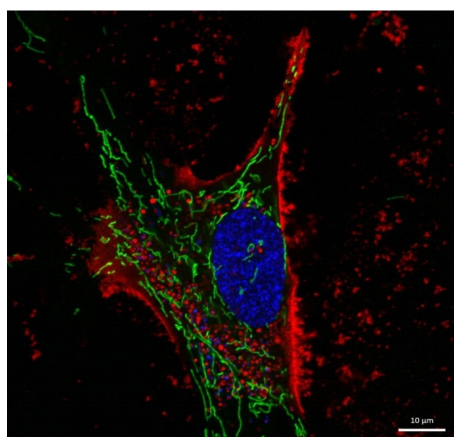
Synomag®-CLD-F particles cannot be separated with a conventional permanent magnet but in a high gradient magnetic field. All particle types are supplied in PBS buffer (pH= 7.4) without any surfactants.

Product code	Product name	Surface	Diameter	Solid content	Quantity
125-00-501	synomag®-CLD-redF	plain	50 nm	10 mg/ml	5 ml
125-00-701	synomag®-CLD-redF	plain	70 nm	10 mg/ml	5 ml
125-01-501	synomag®-CLD-redF	NH <sub>2</sub>	50 nm	10 mg/ml	5 ml
125-01-701	synomag®-CLD-redF	NH <sub>2</sub>	70 nm	10 mg/ml	5 ml

Product code	Product name	Surface	Diameter	Solid content	Quantity
126-00-501	synomag®-CLD-far redF	plain	50 nm	10 mg/ml	5 ml
126-00-701	synomag®-CLD-far redF	plain	70 nm	10 mg/ml	5 ml
126-01-501	synomag®-CLD-far redF	NH <sub>2</sub>	50 nm	10 mg/ml	5 ml
126-01-701	synomag®-CLD-far redF	NH <sub>2</sub>	70 nm	10 mg/ml	5 ml

## BNF-F particles

BNF-F particles are thermally blocked at room temperature and show specific interaction with alternating magnetic fields. They are prepared via the core-shell method with a core of 75-80% (w/w) magnetite with crystallite diameters of about 20 nm and a shell of cross-linked dextran (BNF-Dextran-redF) or cross-linked hydroxyethyl starch (BNF-Starch-redF). Fluorescent and magnetic BNF-F particles combine separation and detection purposes. They are available with red (excitation: 552 nm, emission: 580 nm) and far-red fluorescence (excitation: 732 nm, emission: 758 nm).



Labeling of mesenchymal stem cells with poly-D-lysine modified BNF-Starch-redF (blue: nucleus, green: mitochondria)

The 100 nm BNF-F particles can be separated with strong conventional permanent magnets and easily be filtered through 0.22  $\mu\text{m}$  filters.

BNF-redF and BNF-far redF particles are available with a plain surface or with amino groups on the surface for the covalent binding of proteins, antibodies or other molecules. Streptavidin coated BNF-redF particles are provided for the binding of biotinylated antibodies, dyes, oligonucleotides or other molecules. All BNF-F particles are supplied in PBS buffer (pH = 7.4) without any surfactants. The streptavidin coated BNF-F particles are stabilized with 0.02 % sodium azide.

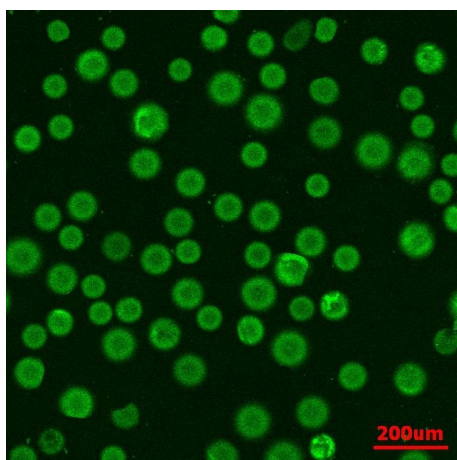
Product code	Product name	Surface	Diameter	Solid content	Quantity
64-00-102	BNF-Starch-redF	plain	100 nm	10 mg/ml	5 ml
64-01-102	BNF-Starch-redF	NH <sub>2</sub>	100 nm	10 mg/ml	5 ml
64-19-102	BNF-Starch-redF	streptavidin	100 nm	5 mg/ml	1 ml
94-00-102	BNF-Dextran-redF	plain	100 nm	10 mg/ml	5 ml
94-01-102	BNF-Dextran-redF	NH <sub>2</sub>	100 nm	10 mg/ml	5 ml
94-19-102	BNF-Dextran-redF	streptavidin	100 nm	5 mg/ml	1 ml

Product code	Product name	Surface	Diameter	Solid content	Quantity
164-00-102	BNF-Starch-far redF	plain	100 nm	10 mg/ml	5 ml
164-01-102	BNF-Starch-far redF	NH <sub>2</sub>	100 nm	10 mg/ml	5 ml
164-19-102	BNF-Starch-far redF	streptavidin	100 nm	5 mg/ml	1 ml
194-00-102	BNF-Dextran-far redF	plain	100 nm	10 mg/ml	5 ml
194-01-102	BNF-Dextran-far redF	NH <sub>2</sub>	100 nm	10 mg/ml	1 ml
194-19-102	BNF-Dextran-far redF	streptavidin	100 nm	5 mg/ml	1 ml



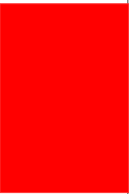
## PLA-M-F particles

Fluorescent and magnetic poly(lactic acid) particles combine the biocompatibility of the particles with separation and detection purposes. They consist of magnetite (40% w/w) in a matrix of poly(D,L-lactic acid) with a molecular weight of 17.000 Da. The particles are available with mean diameters of 30  $\mu\text{m}$  and 100  $\mu\text{m}$  (broader size distributions) and can be loaded with drugs on request. We provide these magnetic particles with green or red fluorescence. The PLA-M-greenF particles have an excitation at 502 nm and an emission at 527 nm. The PLA-M-redF particles have an excitation at 552 nm and an emission at 580 nm.



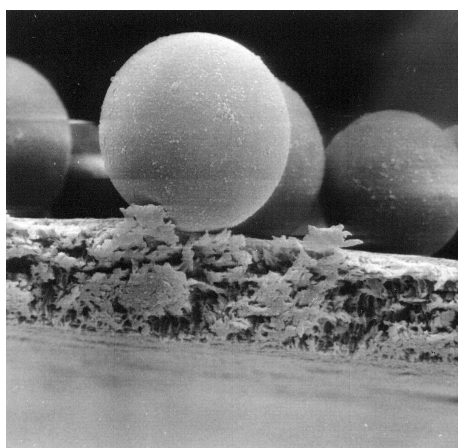
Fluorescence microscopy image of 100  $\mu\text{m}$  PLA-M-greenF

Product code	Product name	Surface	Diameter	Solid content	Quantity
70-00-304	PLA-M-greenF	plain	30 $\mu\text{m}$	10 mg/ml	10 ml
70-00-105	PLA-M-greenF	plain	100 $\mu\text{m}$	10 mg/ml	10 ml
71-00-304	PLA-M-redF	plain	30 $\mu\text{m}$	10 mg/ml	10 ml
71-00-105	PLA-M-redF	plain	100 $\mu\text{m}$	10 mg/ml	10 ml



# White particles

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sicastar® are produced by hydrolysis of orthosilicates and related compounds. The amorphous silica matrix provides a hydrophilic surface with terminal Si-OH-bonds. The sicastar® particles are monodisperse and nonporous in the size range of 10 nm to 1,5 μm with a density of 2.0 g/cm<sup>3</sup>. They possess broader size distributions in case of porous silica particles with adjusted diameters between 3 and 20 microns and a density of 1.8 g/cm<sup>3</sup>. sicastar® particles are extremely stable in organic solvents and aqueous buffers.

REM image of sicastar® microspheres, plain, 15 μm on a filter membrane

#### Silica particles (sicastar®)

- are designed with the surface functionalities OH (plain), NH<sub>2</sub>, COOH, N-hydroxy-succinimide (NHS) or epoxy for the covalent binding of proteins, antibodies or other molecules,
- are available with covalently bound proteins (avidin, streptavidin, protein A, albumin),
- can be provided with covalently bound antibodies on request,
- can be offered with the nickel(II) chelator nitrilotriacetic acid (NTA) or ready to use with the corresponding nickel complex (Ni-NTA) for the binding of histidine labeled proteins,
- are also suitable for the complexation of metal ions with covalently bound chelators on the particle surface (EDTA),
- are provided with gold labeling (other metal labelings (e.g. with Pt, Pd, Ag) are available on request),
- can be modified with other inorganic structures (co-titania or co-alumina),
- are available with various hydrophobic/ organic surfaces (trimethylsilyl (TMS), octadecyl (C18), acrylate).

sicastar® particles > 300 nm can be provided in organic solvents or as powder on request. We do not recommend to dry the smaller plain sicastar® particles (10 nm – 200 nm). In case these nanoparticles are needed in powder form we suggest a previous trimethylsilyl coating in order to generate hydrophobic surface properties. For other applications requesting an organic surface modification, acrylate coated silica particles were designed, which are available as suspension in ethanol.

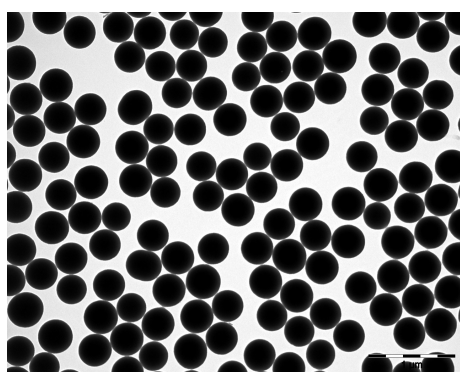
Silica particles ≥ 200 nm can easily be separated by simple sedimentation or centrifugation. Additionally, sicastar® particles < 200 nm can be separated by ultracentrifugation or washed by SEC (size exclusion chromatography) or dialysis.

## Plain particles

Plain sicastar® particles have a hydrophilic surface with terminal Si-OH-groups without any additional functional groups on the surface. The plain particles are available in the size range of 10 nm to 20 µm and are supplied in water or as powder on request.

The nonporous sicastar® particles have small monomodal size distributions with polydispersity indices < 0.2. The larger porous sicastar® particles have broader size distributions with mean diameters of  $3 \pm 0.5 \mu\text{m}$ ,  $4 \pm 0.5 \mu\text{m}$ ,  $5 \pm 0.8 \mu\text{m}$ ,  $10 \pm 2.5 \mu\text{m}$ ,  $15 \pm 4 \mu\text{m}$  and  $20 \pm 11.5 \mu\text{m}$ .

The particles are supplied in water without any surfactants.



TEM image of sicastar® particles, plain, 500 nm

Product code	Product name	Surface	Diameter	Solid content	Quantity
43-00-101	sicastar®	plain	10 nm	25 mg/ml	10 ml
43-00-301	sicastar®	plain	30 nm	25 mg/ml	10 ml
43-00-501	sicastar®	plain	50 nm	25 mg/ml	10 ml
43-00-701	sicastar®	plain	70 nm	25 mg/ml	10 ml
43-00-102	sicastar®	plain	100 nm	50 mg/ml	10 ml
43-00-202	sicastar®	plain	200 nm	50 mg/ml	10 ml
43-00-302	sicastar®	plain	300 nm	50 mg/ml	10 ml
43-00-402	sicastar®	plain	400 nm	50 mg/ml	10 ml
43-00-502	sicastar®	plain	500 nm	50 mg/ml	10 ml
43-00-602	sicastar®	plain	600 nm	50 mg/ml	10 ml
43-00-802	sicastar®	plain	800 nm	50 mg/ml	10 ml
43-00-103	sicastar®	plain	1 µm	50 mg/ml	10 ml
43-00-153	sicastar®	plain	1,5 µm	50 mg/ml	10 ml
43-00-303	sicastar®	plain	3 µm	50 mg/ml	10 ml
43-00-503	sicastar®	plain	5 µm	50 mg/ml	10 ml
43-00-104	sicastar®	plain	10 µm	50 mg/ml	10 ml
43-00-154	sicastar®	plain	15 µm	50 mg/ml	10 ml
43-00-204	sicastar®	plain	20 µm	50 mg/ml	10 ml

## Functionalized particles

sicastar® particles are available with the basic surface functionalities NH<sub>2</sub> and COOH in the size range from 30 nm to 20 µm.

For conjugation of amino groups of target molecules the COOH groups on the particles can be activated with carbodiimide or the amino groups with glutaraldehyde. For conjugation of thiolated molecules the amino groups can be further functionalized for example with SPDP or maleimide groups.

Product code	Product name	Surface	Diameter	Solid content	Quantity
43-01-301	sicastar®	NH <sub>2</sub>	30 nm	25 mg/ml	10 ml
43-01-501	sicastar®	NH <sub>2</sub>	50 nm	25 mg/ml	10 ml
43-01-701	sicastar®	NH <sub>2</sub>	70 nm	25 mg/ml	10 ml
43-01-102	sicastar®	NH <sub>2</sub>	100 nm	25 mg/ml	10 ml
43-01-202	sicastar®	NH <sub>2</sub>	200 nm	50 mg/ml	10 ml
43-01-302	sicastar®	NH <sub>2</sub>	300 nm	50 mg/ml	10 ml
43-01-502	sicastar®	NH <sub>2</sub>	500 nm	50 mg/ml	10 ml
43-01-103	sicastar®	NH <sub>2</sub>	1 µm	50 mg/ml	10 ml
43-01-153	sicastar®	NH <sub>2</sub>	1,5 µm	50 mg/ml	10 ml
43-01-303	sicastar®	NH <sub>2</sub>	3 µm	50 mg/ml	10 ml
43-01-503	sicastar®	NH <sub>2</sub>	5 µm	50 mg/ml	10 ml
43-01-104	sicastar®	NH <sub>2</sub>	10 µm	50 mg/ml	10 ml
43-01-154	sicastar®	NH <sub>2</sub>	15 µm	50 mg/ml	10 ml
43-01-204	sicastar®	NH <sub>2</sub>	20 µm	50 mg/ml	10 ml
43-02-301	sicastar®	COOH	30 nm	25 mg/ml	10 ml
43-02-501	sicastar®	COOH	50 nm	25 mg/ml	10 ml
43-02-701	sicastar®	COOH	70 nm	25 mg/ml	10 ml
43-02-102	sicastar®	COOH	100 nm	25 mg/ml	10 ml
43-02-202	sicastar®	COOH	200 nm	50 mg/ml	10 ml
43-02-302	sicastar®	COOH	300 nm	50 mg/ml	10 ml
43-02-502	sicastar®	COOH	500 nm	50 mg/ml	10 ml
43-02-103	sicastar®	COOH	1 µm	50 mg/ml	10 ml
43-02-153	sicastar®	COOH	1,5 µm	50 mg/ml	10 ml
43-02-303	sicastar®	COOH	3 µm	50 mg/ml	10 ml
43-02-503	sicastar®	COOH	5 µm	50 mg/ml	10 ml
43-02-104	sicastar®	COOH	10 µm	50 mg/ml	10 ml
43-02-154	sicastar®	COOH	15 µm	50 mg/ml	10 ml
43-02-204	sicastar®	COOH	20 µm	50 mg/ml	10 ml

sicastar® particles with diameters of 300 nm to 20 µm are also provided with N-hydroxysuccinimide (NHS) or epoxy groups for the covalent binding of proteins, antibodies or other molecules. NR<sub>3</sub><sup>+</sup> modification shifts the zeta potential into positive direction. All functionalized particles are supplied in water without any surfactants. Only the NHS- and epoxy-modified silica particles are provided as powder to preserve their reactivity with hydroxyl, amino or thiol groups.

Product code	Product name	Surface	Diameter	Solid content	Quantity
43-05-202	sicastar®	NR <sub>3</sub> <sup>+</sup>	200 nm	50 mg/ml	10 ml
43-05-302	sicastar®	NR <sub>3</sub> <sup>+</sup>	300 nm	50 mg/ml	10 ml
43-05-502	sicastar®	NR <sub>3</sub> <sup>+</sup>	500 nm	50 mg/ml	10 ml
43-05-103	sicastar®	NR <sub>3</sub> <sup>+</sup>	1 µm	50 mg/ml	10 ml
43-05-153	sicastar®	NR <sub>3</sub> <sup>+</sup>	1,5 µm	50 mg/ml	10 ml
43-08-302	sicastar®	epoxy	300 nm	-	0,1 g
43-08-502	sicastar®	epoxy	500 nm	-	0,1 g
43-08-103	sicastar®	epoxy	1 µm	-	0,1 g
43-08-153	sicastar®	epoxy	1,5 µm	-	0,1 g
43-08-303	sicastar®	epoxy	3 µm	-	0,1 g
43-08-503	sicastar®	epoxy	5 µm	-	0,1 g
43-08-104	sicastar®	epoxy	10 µm	-	0,1 g
43-08-154	sicastar®	epoxy	15 µm	-	0,1 g
43-08-204	sicastar®	epoxy	20 µm	-	0,1 g
43-15-302	sicastar®	NHS	300 nm	-	0,5 g
43-15-502	sicastar®	NHS	500 nm	-	0,5 g
43-15-103	sicastar®	NHS	1 µm	-	0,5 g
43-15-153	sicastar®	NHS	1,5 µm	-	0,5 g
43-15-303	sicastar®	NHS	3 µm	-	0,5 g
43-15-503	sicastar®	NHS	5 µm	-	0,5 g
43-15-104	sicastar®	NHS	10 µm	-	0,5 g
43-15-154	sicastar®	NHS	15 µm	-	0,5 g
43-15-204	sicastar®	NHS	20 µm	-	0,5 g

### Protein coated particles

sicastar® particles are available with covalently bound streptavidin in the size range of 100 nm to 20 µm. sicastar® particles with an avidin, protein A or albumin (BSA) coating are available in the size range from 300 nm to 20 µm. Avidin and streptavidin bind biotinylated molecules easily and with a high affinity, while protein A picks up and orients IgGs from a mixture of species. The albumin (BSA) coating makes the surface of the silica particles more biocompatible if needed. A coating with HSA is available on request. The protein coated particles are supplied in PBS buffer (pH=7.4) with 0.02 % sodium azide.



Product code	Product name	Surface	Diameter	Solid content	Quantity
43-18-302	sicastar®	avidin	300 nm	25 mg/ml	2 ml
43-18-502	sicastar®	avidin	500 nm	25 mg/ml	2 ml
43-18-103	sicastar®	avidin	1 µm	25 mg/ml	2 ml
43-18-153	sicastar®	avidin	1,5 µm	25 mg/ml	2 ml
43-18-303	sicastar®	avidin	3 µm	25 mg/ml	2 ml
43-18-503	sicastar®	avidin	5 µm	25 mg/ml	2 ml
43-18-104	sicastar®	avidin	10 µm	25 mg/ml	2 ml
43-18-154	sicastar®	avidin	15 µm	25 mg/ml	2 ml
43-18-204	sicastar®	avidin	20 µm	25 mg/ml	2 ml
43-19-102	sicastar®	streptavidin	100 nm	25 mg/ml	1 ml
43-19-202	sicastar®	streptavidin	200 nm	25 mg/ml	1 ml
43-19-302	sicastar®	streptavidin	300 nm	25 mg/ml	1 ml
43-19-502	sicastar®	streptavidin	500 nm	25 mg/ml	1 ml
43-19-103	sicastar®	streptavidin	1 µm	25 mg/ml	1 ml
43-19-153	sicastar®	streptavidin	1,5 µm	25 mg/ml	1 ml
43-19-303	sicastar®	streptavidin	3 µm	25 mg/ml	1 ml
43-19-503	sicastar®	streptavidin	5 µm	25 mg/ml	1 ml
43-19-104	sicastar®	streptavidin	10 µm	25 mg/ml	1 ml
43-19-154	sicastar®	streptavidin	15 µm	25 mg/ml	1 ml
43-19-204	sicastar®	streptavidin	20 µm	25 mg/ml	1 ml
43-20-302	sicastar®	proteinA	300 nm	25 mg/ml	1 ml
43-20-502	sicastar®	proteinA	500 nm	25 mg/ml	1 ml
43-20-802	sicastar®	proteinA	800 nm	25 mg/ml	1 ml
43-20-103	sicastar®	proteinA	1 µm	25 mg/ml	1 ml
43-20-153	sicastar®	proteinA	1,5 µm	25 mg/ml	1 ml
43-20-303	sicastar®	proteinA	3 µm	25 mg/ml	1 ml
43-20-503	sicastar®	proteinA	5 µm	25 mg/ml	1 ml
43-20-104	sicastar®	proteinA	10 µm	25 mg/ml	1 ml
43-20-124	sicastar®	proteinA	12 µm	25 mg/ml	1 ml
43-20-154	sicastar®	proteinA	15 µm	25 mg/ml	1 ml
43-20-204	sicastar®	proteinA	20 µm	25 mg/ml	1 ml
43-21-302	sicastar®	albumin (BSA)	300 nm	25 mg/ml	10 ml
43-21-502	sicastar®	albumin (BSA)	500 nm	25 mg/ml	10 ml
43-21-103	sicastar®	albumin (BSA)	1 µm	25 mg/ml	10 ml
43-21-153	sicastar®	albumin (BSA)	1,5 µm	25 mg/ml	10 ml
43-21-303	sicastar®	albumin (BSA)	3 µm	25 mg/ml	10 ml
43-21-503	sicastar®	albumin (BSA)	5 µm	25 mg/ml	10 ml
43-21-104	sicastar®	albumin (BSA)	10 µm	25 mg/ml	10 ml
43-21-154	sicastar®	albumin (BSA)	15 µm	25 mg/ml	10 ml
43-21-204	sicastar®	albumin (BSA)	20 µm	25 mg/ml	10 ml

### Particles with gold labeling

sicastar® particles are provided with gold labeling in the size range of 3 µm to 20 µm and are supplied in water. The gold labeling allows the binding of thiolated biomolecules. Other metal labels (e.g. Pt, Pd, Ag) are available on request.

Product code	Product name	Surface	Diameter	Solid content	Quantity
43-42-303	sicastar®	Au -	3 µm	25 mg/ml	10 ml
43-42-503	sicastar®	Au -	5 µm	25 mg/ml	10 ml
43-42-104	sicastar®	Au -	10 µm	25 mg/ml	10 ml
43-42-154	sicastar®	Au -	15 µm	25 mg/ml	10 ml
43-42-204	sicastar®	Au -	20 µm	25 mg/ml	10 ml

### Particles with NTA- or Ni-NTA groups on the surface

sicastar® particles are offered with the nickel(II) chelator nitrilotriacetic acid (NTA) or ready to use with the corresponding nickel complex (Ni-NTA) for the binding of histidine labeled proteins in the size range of 300 nm to 20 µm. They are supplied in water.

Recombinant proteins containing a 6xhistidine-tag can be purified by Ni-NTA (nickel-nitrilotriacetic acid) chromatography which is based on the interaction between a transition  $Ni^{2+}$  ion immobilized on a matrix and the histidine side chains. Following washing of the matrix 6xhistidine-tag fusion proteins can be eluted by adding free imidazole or EDTA or by reducing the pH.

Product code	Product name	Surface	Diameter	Solid content	Quantity
43-11-302	sicastar®	NTA	300 nm	50 mg/ml	10 ml
43-11-502	sicastar®	NTA	500 nm	50 mg/ml	10 ml
43-11-103	sicastar®	NTA	1 µm	50 mg/ml	10 ml
43-11-153	sicastar®	NTA	1,5 µm	50 mg/ml	10 ml
43-11-303	sicastar®	NTA	3 µm	50 mg/ml	10 ml
43-11-503	sicastar®	NTA	5 µm	50 mg/ml	10 ml
43-11-104	sicastar®	NTA	10 µm	50 mg/ml	10 ml
43-11-154	sicastar®	NTA	15 µm	50 mg/ml	10 ml
43-11-204	sicastar®	NTA	20 µm	50 mg/ml	10 ml
43-48-302	sicastar®	Ni-NTA	300 nm	50 mg/ml	10 ml
43-48-502	sicastar®	Ni-NTA	500 nm	50 mg/ml	10 ml
43-48-103	sicastar®	Ni-NTA	1 µm	50 mg/ml	10 ml
43-48-153	sicastar®	Ni-NTA	1,5 µm	50 mg/ml	10 ml
43-48-303	sicastar®	Ni-NTA	3 µm	50 mg/ml	10 ml
43-48-503	sicastar®	Ni-NTA	5 µm	50 mg/ml	10 ml
43-48-104	sicastar®	Ni-NTA	10 µm	50 mg/ml	10 ml
43-48-154	sicastar®	Ni-NTA	15 µm	50 mg/ml	10 ml
43-48-204	sicastar®	Ni-NTA	20 µm	50 mg/ml	10 ml

### Particles with other chelators on the surface

sicastar® particles are also offered for the complexation of metal ions with covalently bound chelators on the particle surface. sicastar® particles with EDTA surface functionalities are available in the size range of 300 nm to 20 µm for the complexation of e.g. Cu<sup>2+</sup>, Ni<sup>2+</sup>, Fe<sup>3+</sup> and Co<sup>3+</sup>. Thus silica particles with EDTA surface can also be used for the complexation of radioactive metal ions. These particles are supplied in water.

Product code	Product name	Surface	Diameter	Solid content	Quantity
43-12-302	sicastar®	EDTA	300 nm	50 mg/ml	10 ml
43-12-502	sicastar®	EDTA	500 nm	50 mg/ml	10 ml
43-12-103	sicastar®	EDTA	1 µm	50 mg/ml	10 ml
43-12-153	sicastar®	EDTA	1,5 µm	50 mg/ml	10 ml
43-12-303	sicastar®	EDTA	3 µm	50 mg/ml	10 ml
43-12-503	sicastar®	EDTA	5 µm	50 mg/ml	10 ml
43-12-104	sicastar®	EDTA	10 µm	50 mg/ml	10 ml
43-12-154	sicastar®	EDTA	15 µm	50 mg/ml	10 ml
43-12-204	sicastar®	EDTA	20 µm	50 mg/ml	10 ml

### Particles with hydrophobic surfaces

Some applications require a gentle hydrophobic organic coating of silica particles, especially if an organic polymer coating is necessary for the application. sicastar® particles possessing an acrylate surface with terminal carbon-carbon double bonds are available in the size range of 30 nm to 1 µm as suspension in ethanol.

sicastar® particles are also available with a strong hydrophobic trimethylsilyl (TMS) surface in the size range of 50 nm to 20 µm and with an octadecyl (C18) surface in the size range of 300 nm to 20 µm. The TMS modified particles with diameters of 50 and 100 nm are supplied as suspension in ethanol. The other hydrophobic particles are provided as powders, that allow a direct suspension of the particles in organic solvents and provide a high selectivity for polar, neutral and moderately non polar pharmaceuticals, natural products, food additives, organic chemicals and biologicals.

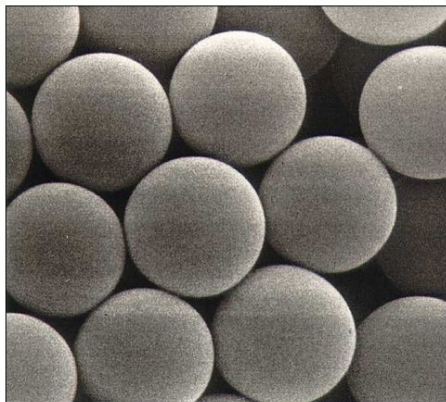
Product code	Product name	Surface	Diameter	Solid content	Quantity
43-06-301	sicastar®	acrylate	30 nm	25 mg/ml	10 ml
43-06-501	sicastar®	acrylate	50 nm	25 mg/ml	10 ml
43-06-701	sicastar®	acrylate	70 nm	25 mg/ml	10 ml
43-06-102	sicastar®	acrylate	100 nm	25 mg/ml	10 ml
43-06-202	sicastar®	acrylate	200 nm	50 mg/ml	10 ml
43-06-302	sicastar®	acrylate	300 nm	50 mg/ml	10 ml
43-06-502	sicastar®	acrylate	500 nm	50 mg/ml	10 ml
43-06-103	sicastar®	acrylate	1 µm	50 mg/ml	10 ml

Product code	Product name	Surface	Diameter	Solid content	Quantity
43-17-501	sicastar®	TMS	50 nm	-	0,25 g
43-17-102	sicastar®	TMS	100 nm	-	0,25 g
43-17-202	sicastar®	TMS	200 nm	-	0,5 g
43-17-302	sicastar®	TMS	300 nm	-	0,5 g
43-17-502	sicastar®	TMS	500 nm	-	0,5 g
43-17-103	sicastar®	TMS	1 µm	-	0,5 g
43-17-153	sicastar®	TMS	1,5 µm	-	0,5 g
43-17-303	sicastar®	TMS	3 µm	-	0,5 g
43-17-503	sicastar®	TMS	5 µm	-	0,5 g
43-17-104	sicastar®	TMS	10 µm	-	0,5 g
43-17-154	sicastar®	TMS	15 µm	-	0,5 g
43-17-204	sicastar®	TMS	20 µm	-	0,5 g
43-51-302	sicastar®	C18	300 nm	-	0,5 g
43-51-502	sicastar®	C18	500 nm	-	0,5 g
43-51-103	sicastar®	C18	1 µm	-	0,5 g
43-51-153	sicastar®	C18	1,5 µm	-	0,5 g
43-51-303	sicastar®	C18	3 µm	-	0,5 g
43-51-503	sicastar®	C18	5 µm	-	0,5 g
43-51-104	sicastar®	C18	10 µm	-	0,5 g
43-51-154	sicastar®	C18	15 µm	-	0,5 g
43-51-204	sicastar®	C18	20 µm	-	0,5 g

### Particles with TiO<sub>2</sub>- or Al<sub>2</sub>O<sub>3</sub>-coating

sicastar® particles are provided with other inorganic structures on the surface. Silica-co-titania particles are available in the size range of 300 nm to 20 µm, and silica-co-alumina particles in the size range of 300 nm to 1 µm. Both particle types are supplied in water.

Product code	Product name	Surface	Diameter	Solid content	Quantity
43-16-302	sicastar®	TiO <sub>2</sub>	300 nm	25 mg/ml	10 ml
43-16-502	sicastar®	TiO <sub>2</sub>	500 nm	25 mg/ml	10 ml
43-16-103	sicastar®	TiO <sub>2</sub>	1 µm	25 mg/ml	10 ml
43-16-153	sicastar®	TiO <sub>2</sub>	1,5 µm	25 mg/ml	10 ml
43-16-303	sicastar®	TiO <sub>2</sub>	3 µm	25 mg/ml	10 ml
43-16-503	sicastar®	TiO <sub>2</sub>	5 µm	25 mg/ml	10 ml
43-16-104	sicastar®	TiO <sub>2</sub>	10 µm	25 mg/ml	10 ml
43-16-154	sicastar®	TiO <sub>2</sub>	15 µm	25 mg/ml	10 ml
43-16-204	sicastar®	TiO <sub>2</sub>	20 µm	25 mg/ml	10 ml
43-49-701	sicastar®	Al <sub>2</sub> O <sub>3</sub>	70 nm	25 mg/ml	10 ml
43-49-302	sicastar®	Al <sub>2</sub> O <sub>3</sub>	300 nm	25 mg/ml	10 ml
43-49-502	sicastar®	Al <sub>2</sub> O <sub>3</sub>	500 nm	25 mg/ml	10 ml
43-49-103	sicastar®	Al <sub>2</sub> O <sub>3</sub>	1 µm	25 mg/ml	10 ml



micromer® particles are monodisperse particles from polystyrene, substituted polystyrenes, polystyrene-co-polymers, polymethacrylate derivatives or cross-linked polymers. The smallest micromer® particles are provided with a diameter of 25 nm with a polymethacrylate matrix. The larger particles in the size range of 50 nm to 100 microns consist of a polystyrene matrix. micromer® particles are available as standard products with a large variety of surface modifications for specific applications.

SEM image of micromer® particles, plain, 3  $\mu\text{m}$

#### Polystyrene / polymethacrylate particles (micromer®)

- are designed with the surface functionalities  $\text{NH}_2$ , epoxy and  $\text{COOH}$  for the covalent binding of proteins, antibodies or other molecules,
- are available with covalently bound proteins (avidin, streptavidin, protein A, albumin) or other biomolecules (chitosan, collagen),
- can be offered with the nickel(II) chelator nitrilotriacetic acid (NTA) or ready to use with the corresponding nickel complex (Ni-NTA) for the binding of histidine labeled proteins,
- are available with various hydrophilic surfaces (PEG 300, alkyl-OH) and hydrophobic surfaces (octyl (C8), octadecyl (C18) or acrylate).

#### Plain particles

Plain micromer® particles have no additional coatings or special functional groups on the surface. They are made by radicalic polymerization and contain traces of negatively charged sulfate groups on the surface. They are used "as is" for many applications. After protein coating they are applied in latex agglutination tests and in a large variety of immunoassays. They can serve as size scale for microscopic images of bacteria or other objects of your interest. The plain particles are available in the size range of 25 nm to 10  $\mu\text{m}$ .

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-00-251	micromer®	plain	25 nm	10 mg/ml	10 ml
01-00-501	micromer®	plain	50 nm	10 mg/ml	10 ml
01-00-102	micromer®	plain	100 nm	25 mg/ml	10 ml
01-00-202	micromer®	plain	200 nm	25 mg/ml	10 ml
01-00-502	micromer®	plain	500 nm	50 mg/ml	10 ml
01-00-103	micromer®	plain	1 µm	50 mg/ml	10 ml
01-00-203	micromer®	plain	2 µm	50 mg/ml	10 ml
01-00-303	micromer®	plain	3 µm	50 mg/ml	10 ml
01-00-403	micromer®	plain	4 µm	50 mg/ml	10 ml
01-00-503	micromer®	plain	5 µm	50 mg/ml	10 ml
01-00-603	micromer®	plain	6 µm	50 mg/ml	10 ml
01-00-703	micromer®	plain	7 µm	50 mg/ml	10 ml
01-00-803	micromer®	plain	8 µm	50 mg/ml	10 ml
01-00-104	micromer®	plain	10 µm	50 mg/ml	10 ml

### Functionalized particles

micromer® particles are designed with the surface functionalities COOH and NH<sub>2</sub> in the whole size range of 25 nm to 100 µm and with epoxy groups in the size range of 1 µm to 10 µm. The particles are stable in aqueous media and to some extent in DMSO. The particles are supplied in water without any surfactants. Thus the whole variety of conjugation methods for the covalent binding of proteins, antibodies or other target molecules can be applied, e.g.

- carbodiimide activation of COOH groups for conjugation to amino groups,
- glutaraldehyde activation of amino groups for conjugation to amino compounds,
- maleimide or SPDP functionalization of the amino groups for conjugation of SH-labeled biomolecules,
- simple reaction of epoxy-functionalized particles in a conjugation buffer at pH=9 for conjugation with amino groups or at pH=7 for reaction with SH groups of your target molecules.

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-08-103	micromer®	epoxy	1 µm	50 mg/ml	10 ml
01-08-203	micromer®	epoxy	2 µm	50 mg/ml	10 ml
01-08-303	micromer®	epoxy	3 µm	50 mg/ml	10 ml
01-08-403	micromer®	epoxy	4 µm	50 mg/ml	10 ml
01-08-503	micromer®	epoxy	5 µm	50 mg/ml	10 ml
01-08-603	micromer®	epoxy	6 µm	50 mg/ml	10 ml
01-08-703	micromer®	epoxy	7 µm	50 mg/ml	10 ml
01-08-803	micromer®	epoxy	8 µm	50 mg/ml	10 ml
01-08-104	micromer®	epoxy	10 µm	50 mg/ml	10 ml

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-01-251	micromer®	NH <sub>2</sub>	25 nm	10 mg/ml	10 ml
01-01-102	micromer®	NH <sub>2</sub>	100 nm	25 mg/ml	10 ml
01-01-202	micromer®	NH <sub>2</sub>	200 nm	25 mg/ml	10 ml
01-01-502	micromer®	NH <sub>2</sub>	500 nm	50 mg/ml	10 ml
01-01-103	micromer®	NH <sub>2</sub>	1 µm	50 mg/ml	10 ml
01-01-203	micromer®	NH <sub>2</sub>	2 µm	50 mg/ml	10 ml
01-01-303	micromer®	NH <sub>2</sub>	3 µm	50 mg/ml	10 ml
01-01-403	micromer®	NH <sub>2</sub>	4 µm	50 mg/ml	10 ml
01-01-503	micromer®	NH <sub>2</sub>	5 µm	50 mg/ml	10 ml
01-01-603	micromer®	NH <sub>2</sub>	6 µm	50 mg/ml	10 ml
01-01-703	micromer®	NH <sub>2</sub>	7 µm	50 mg/ml	10 ml
01-01-803	micromer®	NH <sub>2</sub>	8 µm	50 mg/ml	10 ml
01-01-104	micromer®	NH <sub>2</sub>	10 µm	50 mg/ml	10 ml
01-01-154	micromer®	NH <sub>2</sub>	15 µm	25 mg/ml	10 ml
01-01-204	micromer®	NH <sub>2</sub>	20 µm	25 mg/ml	10 ml
01-01-254	micromer®	NH <sub>2</sub>	25 µm	25 mg/ml	10 ml
01-01-304	micromer®	NH <sub>2</sub>	30 µm	25 mg/ml	10 ml
01-01-404	micromer®	NH <sub>2</sub>	40 µm	25 mg/ml	10 ml
01-01-504	micromer®	NH <sub>2</sub>	50 µm	25 mg/ml	10 ml
01-01-105	micromer®	NH <sub>2</sub>	100 µm	25 mg/ml	10 ml
01-02-251	micromer®	COOH	25 nm	10 mg/ml	10 ml
01-02-501	micromer®	COOH	50 nm	10 mg/ml	10 ml
01-02-102	micromer®	COOH	100 nm	25 mg/ml	10 ml
01-02-202	micromer®	COOH	200 nm	25 mg/ml	10 ml
01-02-502	micromer®	COOH	500 nm	50 mg/ml	10 ml
01-02-103	micromer®	COOH	1 µm	50 mg/ml	10 ml
01-02-203	micromer®	COOH	2 µm	50 mg/ml	10 ml
01-02-303	micromer®	COOH	3 µm	50 mg/ml	10 ml
01-02-403	micromer®	COOH	4 µm	50 mg/ml	10 ml
01-02-503	micromer®	COOH	5 µm	50 mg/ml	10 ml
01-02-603	micromer®	COOH	6 µm	50 mg/ml	10 ml
01-02-703	micromer®	COOH	7 µm	50 mg/ml	10 ml
01-02-803	micromer®	COOH	8 µm	50 mg/ml	10 ml
01-02-104	micromer®	COOH	10 µm	50 mg/ml	10 ml
01-02-154	micromer®	COOH	15 µm	25 mg/ml	10 ml
01-02-204	micromer®	COOH	20 µm	25 mg/ml	10 ml
01-02-254	micromer®	COOH	25 µm	25 mg/ml	10 ml
01-02-304	micromer®	COOH	30 µm	25 mg/ml	10 ml
01-02-404	micromer®	COOH	40 µm	25 mg/ml	10 ml
01-02-504	micromer®	COOH	50 µm	25 mg/ml	10 ml
01-02-105	micromer®	COOH	100 µm	25 mg/ml	10 ml



## Protein coated particles

micromer® particles are available with covalently bound avidin, streptavidin or protein A on the surface in the size range of 100 nm to 100 µm. Avidin and streptavidin bind biotinylated molecules easily and with a high affinity, while protein A picks up and orients IgGs from a mixture of species. micromer® particles with covalently bound albumin (BSA) on the surface are provided in the size range of 1 µm to 10 µm. The albumin (BSA) coating makes the surface of the polystyrene particles biocompatible if needed. A coating of micromer® particles with HSA is available on request. The protein coated particles are supplied in PBS buffer (pH=7.4) with 0.02 % sodium azide.

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-18-102	micromer®	avidin	100 nm	10 mg/ml	2 ml
01-18-202	micromer®	avidin	200 nm	10 mg/ml	2 ml
01-18-103	micromer®	avidin	1 µm	25 mg/ml	2 ml
01-18-203	micromer®	avidin	2 µm	25 mg/ml	2 ml
01-18-303	micromer®	avidin	3 µm	25 mg/ml	2 ml
01-18-403	micromer®	avidin	4 µm	25 mg/ml	2 ml
01-18-503	micromer®	avidin	5 µm	25 mg/ml	2 ml
01-18-603	micromer®	avidin	6 µm	25 mg/ml	2 ml
01-18-703	micromer®	avidin	7 µm	25 mg/ml	2 ml
01-18-803	micromer®	avidin	8 µm	25 mg/ml	2 ml
01-18-104	micromer®	avidin	10 µm	25 mg/ml	2 ml
01-18-204	micromer®	avidin	20 µm	25 mg/ml	1 ml
01-18-254	micromer®	avidin	25 µm	25 mg/ml	1 ml
01-18-304	micromer®	avidin	30 µm	25 mg/ml	1 ml
01-18-404	micromer®	avidin	40 µm	25 mg/ml	1 ml
01-18-504	micromer®	avidin	50 µm	25 mg/ml	1 ml
01-18-105	micromer®	avidin	100 µm	25 mg/ml	1 ml
01-19-102	micromer®	streptavidin	100 nm	10 mg/ml	1 ml
01-19-202	micromer®	streptavidin	200 nm	10 mg/ml	1 ml
01-19-103	micromer®	streptavidin	1 µm	25 mg/ml	1 ml
01-19-203	micromer®	streptavidin	2 µm	25 mg/ml	1 ml
01-19-303	micromer®	streptavidin	3 µm	25 mg/ml	1 ml
01-19-403	micromer®	streptavidin	4 µm	25 mg/ml	1 ml
01-19-503	micromer®	streptavidin	5 µm	25 mg/ml	1 ml
01-19-603	micromer®	streptavidin	6 µm	25 mg/ml	1 ml
01-19-703	micromer®	streptavidin	7 µm	25 mg/ml	1 ml
01-19-803	micromer®	streptavidin	8 µm	25 mg/ml	1 ml
01-19-104	micromer®	streptavidin	10 µm	25 mg/ml	1 ml
01-19-204	micromer®	streptavidin	20 µm	25 mg/ml	1 ml
01-19-254	micromer®	streptavidin	25 µm	25 mg/ml	1 ml
01-19-304	micromer®	streptavidin	30 µm	25 mg/ml	1 ml
01-19-404	micromer®	streptavidin	40 µm	25 mg/ml	1 ml
01-19-504	micromer®	streptavidin	50 µm	25 mg/ml	1 ml
01-19-105	micromer®	streptavidin	100 µm	25 mg/ml	1 ml

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-20-102	micromer®	proteinA	100 nm	10 mg/ml	1 ml
01-20-202	micromer®	proteinA	200 nm	10 mg/ml	1 ml
01-20-103	micromer®	proteinA	1 µm	25 mg/ml	1 ml
01-20-203	micromer®	proteinA	2 µm	25 mg/ml	1 ml
01-20-303	micromer®	proteinA	3 µm	25 mg/ml	1 ml
01-20-403	micromer®	proteinA	4 µm	25 mg/ml	1 ml
01-20-503	micromer®	proteinA	5 µm	25 mg/ml	1 ml
01-20-603	micromer®	proteinA	6 µm	25 mg/ml	1 ml
01-20-703	micromer®	proteinA	7 µm	25 mg/ml	1 ml
01-20-803	micromer®	proteinA	8 µm	25 mg/ml	1 ml
01-20-104	micromer®	proteinA	10 µm	25 mg/ml	1 ml
01-20-204	micromer®	proteinA	20 µm	25 mg/ml	1 ml
01-20-254	micromer®	proteinA	25 µm	25 mg/ml	1 ml
01-20-304	micromer®	proteinA	30 µm	25 mg/ml	1 ml
01-20-404	micromer®	proteinA	40 µm	25 mg/ml	1 ml
01-20-504	micromer®	proteinA	50 µm	25 mg/ml	1 ml
01-20-105	micromer®	proteinA	100 µm	25 mg/ml	1 ml
01-21-103	micromer®	albumin (BSA)	1 µm	25 mg/ml	10 ml
01-21-203	micromer®	albumin (BSA)	2 µm	25 mg/ml	10 ml
01-21-303	micromer®	albumin (BSA)	3 µm	25 mg/ml	10 ml
01-21-403	micromer®	albumin (BSA)	4 µm	25 mg/ml	10 ml
01-21-503	micromer®	albumin (BSA)	5 µm	25 mg/ml	10 ml
01-21-603	micromer®	albumin (BSA)	6 µm	25 mg/ml	10 ml
01-21-703	micromer®	albumin (BSA)	7 µm	25 mg/ml	10 ml
01-21-803	micromer®	albumin (BSA)	8 µm	25 mg/ml	10 ml
01-21-104	micromer®	albumin (BSA)	10 µm	25 mg/ml	10 ml

### Collagen and chitosan coated particles

micromer® particles are available with covalently bound collagen and chitosan in the size range of 1 µm to 10 µm.

Collagen is a group of naturally occurring proteins found in animals, especially in the flesh and connective tissues of mammals. It is mostly found in fibrous tissues such as tendon, ligament and skin, and is also abundant in cornea, cartilage, bone, blood vessels, the gut, and intervertebral disc. The collagen around our polystyrene particles increases the affinity to selected target tissues.

Chitosan is a linear polysaccharide composed of randomly distributed β-(1-4)-linked D-glucosamine (deacetylated unit) and N-acetyl-D-glucosamine (acetylated unit). Therefore the chitosan coated polystyrene particles already contain natural amino groups and show special affinities to target surfaces.

The particles are supplied in water without any surfactants.

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-25-103	micromer®	collagen	1 µm	25 mg/ml	5 ml
01-25-203	micromer®	collagen	2 µm	25 mg/ml	5 ml
01-25-303	micromer®	collagen	3 µm	25 mg/ml	5 ml
01-25-403	micromer®	collagen	4 µm	25 mg/ml	5 ml
01-25-503	micromer®	collagen	5 µm	25 mg/ml	5 ml
01-25-603	micromer®	collagen	6 µm	25 mg/ml	5 ml
01-25-703	micromer®	collagen	7 µm	25 mg/ml	5 ml
01-25-803	micromer®	collagen	8 µm	25 mg/ml	5 ml
01-25-104	micromer®	collagen	10 µm	25 mg/ml	5 ml
01-27-103	micromer®	chitosan	1 µm	25 mg/ml	10 ml
01-27-203	micromer®	chitosan	2 µm	25 mg/ml	10 ml
01-27-303	micromer®	chitosan	3 µm	25 mg/ml	10 ml
01-27-403	micromer®	chitosan	4 µm	25 mg/ml	10 ml
01-27-503	micromer®	chitosan	5 µm	25 mg/ml	10 ml
01-27-603	micromer®	chitosan	6 µm	25 mg/ml	10 ml
01-27-703	micromer®	chitosan	7 µm	25 mg/ml	10 ml
01-27-803	micromer®	chitosan	8 µm	25 mg/ml	10 ml
01-27-104	micromer®	chitosan	10 µm	25 mg/ml	10 ml

### Particles with positive or negative surface charges

micromer® particles are available with trialkylammonium groups ( $\text{NR}_3^+$ ) on the surface, that lead to a positive zeta potential. Corresponding sulfonated polystyrene particles ( $\text{SO}_3\text{H}$ ) are provided with negative zeta potentials. Both particle types are available in the size range of 100 nm to 10 µm and are supplied in water without any surfactants.

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-05-102	micromer®	$\text{NR}_3^+$	100 nm	25 mg/ml	10 ml
01-05-103	micromer®	$\text{NR}_3^+$	1 µm	50 mg/ml	10 ml
01-05-203	micromer®	$\text{NR}_3^+$	2 µm	50 mg/ml	10 ml
01-05-303	micromer®	$\text{NR}_3^+$	3 µm	50 mg/ml	10 ml
01-05-403	micromer®	$\text{NR}_3^+$	4 µm	50 mg/ml	10 ml
01-05-503	micromer®	$\text{NR}_3^+$	5 µm	50 mg/ml	10 ml
01-05-603	micromer®	$\text{NR}_3^+$	6 µm	50 mg/ml	10 ml
01-05-703	micromer®	$\text{NR}_3^+$	7 µm	50 mg/ml	10 ml
01-05-803	micromer®	$\text{NR}_3^+$	8 µm	50 mg/ml	10 ml
01-05-104	micromer®	$\text{NR}_3^+$	10 µm	50 mg/ml	10 ml

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-09-102	micromer®	SO <sub>3</sub> H	100 nm	25 mg/ml	10 ml
01-09-103	micromer®	SO <sub>3</sub> H	1 µm	50 mg/ml	10 ml
01-09-203	micromer®	SO <sub>3</sub> H	2 µm	50 mg/ml	10 ml
01-09-303	micromer®	SO <sub>3</sub> H	3 µm	50 mg/ml	10 ml
01-09-403	micromer®	SO <sub>3</sub> H	4 µm	50 mg/ml	10 ml
01-09-503	micromer®	SO <sub>3</sub> H	5 µm	50 mg/ml	10 ml
01-09-603	micromer®	SO <sub>3</sub> H	6 µm	50 mg/ml	10 ml
01-09-703	micromer®	SO <sub>3</sub> H	7 µm	50 mg/ml	10 ml
01-09-803	micromer®	SO <sub>3</sub> H	8 µm	50 mg/ml	10 ml
01-09-104	micromer®	SO <sub>3</sub> H	10 µm	50 mg/ml	10 ml

### Particles with NTA- or Ni-NTA groups on the surface

micromer® particles can be offered with the nickel(II) chelator nitrilotriacetic acid (NTA) or ready to use with the corresponding nickel complex (Ni-NTA) for the binding of histidine labeled proteins in the size range of 1 µm to 10 µm. Recombinant proteins containing a 6xhistidine-tag can be purified by Ni-NTA (nickel-nitrilotriacetic acid) chromatography which is based on the interaction between a transition Ni<sup>2+</sup> ion immobilized on the particle matrix and the histidine side chains. Following washing of the matrix 6xhistidine-tag fusion proteins can be eluted by adding free imidazole or EDTA or by reducing the pH.

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-11-103	micromer®	NTA	1 µm	50 mg/ml	10 ml
01-11-203	micromer®	NTA	2 µm	50 mg/ml	10 ml
01-11-303	micromer®	NTA	3 µm	50 mg/ml	10 ml
01-11-403	micromer®	NTA	4 µm	50 mg/ml	10 ml
01-11-503	micromer®	NTA	5 µm	50 mg/ml	10 ml
01-11-603	micromer®	NTA	6 µm	50 mg/ml	10 ml
01-11-703	micromer®	NTA	7 µm	50 mg/ml	10 ml
01-11-803	micromer®	NTA	8 µm	50 mg/ml	10 ml
01-11-104	micromer®	NTA	10 µm	50 mg/ml	10 ml
01-48-103	micromer®	Ni-NTA	1 µm	50 mg/ml	10 ml
01-48-203	micromer®	Ni-NTA	2 µm	50 mg/ml	10 ml
01-48-303	micromer®	Ni-NTA	3 µm	50 mg/ml	10 ml
01-48-403	micromer®	Ni-NTA	4 µm	50 mg/ml	10 ml
01-48-503	micromer®	Ni-NTA	5 µm	50 mg/ml	10 ml
01-48-603	micromer®	Ni-NTA	6 µm	50 mg/ml	10 ml
01-48-703	micromer®	Ni-NTA	7 µm	50 mg/ml	10 ml
01-48-803	micromer®	Ni-NTA	8 µm	50 mg/ml	10 ml
01-48-104	micromer®	Ni-NTA	10 µm	50 mg/ml	10 ml

### Particles with DBCO-functionalized surface

micromer® particles with a DBCO-(Dibenzocyclooctyne)-functionalized surface are available with diameters of 10 and 20  $\mu\text{m}$  and are well-suited for the copper-free or strain promoted alkyne-azide cycloaddition (SPAAC) under physiological conditions. Thus, azido-modified biomolecules can be efficiently bound and separated under mild centrifugation parameters. The particles are supplied in water without any surfactants.

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-115-104	micromer®	DBCO	10 $\mu\text{m}$	25 mg/ml	5 ml
01-115-204	micromer®	DBCO	20 $\mu\text{m}$	25 mg/ml	5 ml

### Particles with hydrophilic surfaces

micromer® particles are available with various hydrophilic surfaces (PEG 300, other PEG lengths on request, alkyl-OH) in the size range of 1  $\mu\text{m}$  to 10  $\mu\text{m}$ . These hydrophilic coatings reduce the unspecific binding of proteins significantly. The particles are supplied in water without any surfactants.

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-03-103	micromer®	alkyl-OH	1 $\mu\text{m}$	50 mg/ml	10 ml
01-03-203	micromer®	alkyl-OH	2 $\mu\text{m}$	50 mg/ml	10 ml
01-03-303	micromer®	alkyl-OH	3 $\mu\text{m}$	50 mg/ml	10 ml
01-03-403	micromer®	alkyl-OH	4 $\mu\text{m}$	50 mg/ml	10 ml
01-03-503	micromer®	alkyl-OH	5 $\mu\text{m}$	50 mg/ml	10 ml
01-03-603	micromer®	alkyl-OH	6 $\mu\text{m}$	50 mg/ml	10 ml
01-03-703	micromer®	alkyl-OH	7 $\mu\text{m}$	50 mg/ml	10 ml
01-03-803	micromer®	alkyl-OH	8 $\mu\text{m}$	50 mg/ml	10 ml
01-03-104	micromer®	alkyl-OH	10 $\mu\text{m}$	50 mg/ml	10 ml
01-54-103	micromer®	PEG 300	1 $\mu\text{m}$	50 mg/ml	10 ml
01-54-203	micromer®	PEG 300	2 $\mu\text{m}$	50 mg/ml	10 ml
01-54-303	micromer®	PEG 300	3 $\mu\text{m}$	50 mg/ml	10 ml
01-54-403	micromer®	PEG 300	4 $\mu\text{m}$	50 mg/ml	10 ml
01-54-503	micromer®	PEG 300	5 $\mu\text{m}$	50 mg/ml	10 ml
01-54-603	micromer®	PEG 300	6 $\mu\text{m}$	50 mg/ml	10 ml
01-54-703	micromer®	PEG 300	7 $\mu\text{m}$	50 mg/ml	10 ml
01-54-803	micromer®	PEG 300	8 $\mu\text{m}$	50 mg/ml	10 ml
01-54-104	micromer®	PEG 300	10 $\mu\text{m}$	50 mg/ml	10 ml

## Particles with hydrophobic surfaces

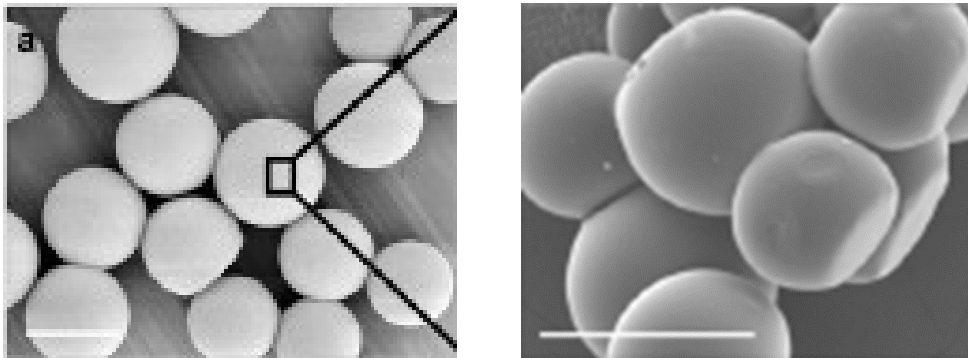
micromer® particles are available with hydrophobic surfaces octyl (C8), octadecyl (C18) or acrylate (with terminal C=C double bonds) in the size range of 1 µm to 10 µm. These hydrophobic surfaces provide a high selectivity for polar, neutral and moderately nonpolar pharmaceuticals, natural products, food additives, organic chemicals and biologicals. The particles are supplied in water without any surfactants.

Product code	Product name	Surface	Diameter	Solid content	Quantity
01-06-103	micromer®	acrylate	1 µm	50 mg/ml	10 ml
01-06-203	micromer®	acrylate	2 µm	50 mg/ml	10 ml
01-06-303	micromer®	acrylate	3 µm	50 mg/ml	10 ml
01-06-403	micromer®	acrylate	4 µm	50 mg/ml	10 ml
01-06-503	micromer®	acrylate	5 µm	50 mg/ml	10 ml
01-06-603	micromer®	acrylate	6 µm	50 mg/ml	10 ml
01-06-703	micromer®	acrylate	7 µm	50 mg/ml	10 ml
01-06-803	micromer®	acrylate	8 µm	50 mg/ml	10 ml
01-06-104	micromer®	acrylate	10 µm	50 mg/ml	10 ml
01-50-103	micromer®	C8	1 µm	50 mg/ml	10 ml
01-50-203	micromer®	C8	2 µm	50 mg/ml	10 ml
01-50-303	micromer®	C8	3 µm	50 mg/ml	10 ml
01-50-403	micromer®	C8	4 µm	50 mg/ml	10 ml
01-50-503	micromer®	C8	5 µm	50 mg/ml	10 ml
01-50-603	micromer®	C8	6 µm	50 mg/ml	10 ml
01-50-703	micromer®	C8	7 µm	50 mg/ml	10 ml
01-50-803	micromer®	C8	8 µm	50 mg/ml	10 ml
01-50-104	micromer®	C8	10 µm	50 mg/ml	10 ml
01-51-103	micromer®	C18	1 µm	50 mg/ml	10 ml
01-51-203	micromer®	C18	2 µm	50 mg/ml	10 ml
01-51-303	micromer®	C18	3 µm	50 mg/ml	10 ml
01-51-403	micromer®	C18	4 µm	50 mg/ml	10 ml
01-51-503	micromer®	C18	5 µm	50 mg/ml	10 ml
01-51-603	micromer®	C18	6 µm	50 mg/ml	10 ml
01-51-703	micromer®	C18	7 µm	50 mg/ml	10 ml
01-51-803	micromer®	C18	8 µm	50 mg/ml	10 ml
01-51-104	micromer®	C18	10 µm	50 mg/ml	10 ml

## PLA particles

Poly(lactic acid) (PLA) particles consist of poly(D,L-lactic acid) with a molecular weight of 17.000 Da. They are available with diameters of 250 nm and 500 nm in small size distributions and with mean diameters of 2  $\mu\text{m}$ , 30  $\mu\text{m}$  and 100  $\mu\text{m}$  in broader size distributions.

The PLA particles are established in the field of drug encapsulation in connection with a controlled drug release. The half-life time of the beads under *in vivo* conditions mainly depends on the molecular weight of the polymers and increases with the molecular weight of the polymer. The PLA particles are available without any functional groups (plain), with COOH or NH<sub>2</sub> groups in the whole size range from 250 nm to 100  $\mu\text{m}$  or with collagen on the surface for 30  $\mu\text{m}$  and 100  $\mu\text{m}$  PLA particles. The PLA particles are supplied in water and can be loaded with drugs on request.



SEM image of 100  $\mu\text{m}$  PLA particles with low and high magnification (scale bar: 100  $\mu\text{m}$ ) (Mima Y et al., Plos ONE, 2012;7(4),e35199)

Product code	Product name	Surface	Diameter	Solid content	Quantity
11-00-252	PLA particles	plain	250 nm	10 mg/ml	10 ml
11-00-502	PLA particles	plain	500 nm	10 mg/ml	10 ml
11-00-203	PLA particles	plain	2 $\mu\text{m}$	10 mg/ml	10 ml
11-00-304	PLA particles	plain	30 $\mu\text{m}$	10 mg/ml	10 ml
11-00-105	PLA particles	plain	100 $\mu\text{m}$	10 mg/ml	10 ml
11-01-252	PLA particles	NH <sub>2</sub>	250 nm	10 mg/ml	10 ml
11-01-502	PLA particles	NH <sub>2</sub>	500 nm	10 mg/ml	10 ml
11-01-203	PLA particles	NH <sub>2</sub>	2 $\mu\text{m}$	10 mg/ml	10 ml
11-01-304	PLA particles	NH <sub>2</sub>	30 $\mu\text{m}$	10 mg/ml	10 ml
11-01-105	PLA particles	NH <sub>2</sub>	100 $\mu\text{m}$	10 mg/ml	10 ml
11-02-252	PLA particles	COOH	250 nm	10 mg/ml	10 ml
11-02-502	PLA particles	COOH	500 nm	10 mg/ml	10 ml
11-02-203	PLA particles	COOH	2 $\mu\text{m}$	10 mg/ml	10 ml
11-02-304	PLA particles	COOH	30 $\mu\text{m}$	10 mg/ml	10 ml
11-02-105	PLA particles	COOH	100 $\mu\text{m}$	10 mg/ml	10 ml
11-25-304	PLA particles	collagen	30 $\mu\text{m}$	10 mg/ml	5 ml
11-25-105	PLA particles	collagen	100 $\mu\text{m}$	10 mg/ml	5 ml

## IDA-latex particles, Albumin particles

Iminodiacetic acid (IDA) particles were specially designed for the enrichment of metal ions from large volumes of sea water. The direct introduction of seawater to an Inductively Coupled Plasma Mass Spectrometer (ICP-MS) can cause a number of serious problems. The high dissolved solids content of seawater can suppress analyte signal, cause interelement interferences and clog the interface sampler and skimmer cones. An alternative is a sample preparation method that can selectively preconcentrate trace metals of interest while having much less affinity for major matrix components such as Na, Ca, and Mg. IDA-Latex particles can be used for pre-concentration / matrix elimination of seawater.

These monodisperse polymer particles with a mean particle diameter of about 300 nm have a very high density of iminodiacetic acid (IDA)-groups on the surface and show an excellent binding capacity for trace metals (e.g. Mn, Co, Ni, Cu, Zn, Cd, Pb, U) in neutral to basic pH-range. The binding capacity for Nickel(II)-ions is about 200  $\mu\text{mol}$  per g of IDA-latex. The IDA-latex particles are supplied in water. For further individual surface modifications the IDA-latex particles are also provided with a high density of amino groups.

Product code	Product name	Surface	Diameter	Solid content	Quantity
87-01-302	IDA-Latex	NH <sub>2</sub>	300 nm	50 mg/ml	10 ml
87-78-302	IDA-Latex	IDA	300 nm	50 mg/ml	10 ml

white particles

Albumin particles consist of cross-linked bovine serum albumin (BSA). They can also be made from human serum albumin (HSA) on request. The albumin particles have a mean diameter of 250 nm and are supplied in water. They serve as model particles in ecological systems, e.g. for the determination of grazing rates of microorganisms and for studies on essential food compartments in ecology. The albumin particles can be unspecifically labeled with radionuclides for applications in nuclear medicine.

Product code	Product name	Surface	Diameter	Solid content	Quantity
37-00-252	Albumin particles	plain	250 nm	10 mg/ml	5 ml



# Colored particles

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Coloured silica particles are produced by hydrolysis of orthosilicates and related compounds. They are available with black, red or blue colour.

Coloured silica particles

- have a hydrophilic surface with terminal Si-OH-bonds,
- are available with a plain surface (Si-OH) or with NH<sub>2</sub> groups on the particle surface for the covalent binding of proteins, antibodies, oligonucleotides, enzymes or other molecules.
- are provided in the size range of 100 nm to 1 µm as monodisperse and nonporous particles with a density of 2.0 g/cm<sup>3</sup>,
- have broader size distributions in the area of the porous silica particles with adjusted diameters between 3 and 20 microns and a density of 1.8 g/cm<sup>3</sup>,
- are applied for membrane checks, flow investigations or the quality of antibody coupling procedures on surfaces.

## sicastar®-black

Black silica particles (sicastar®-black) have a coating of black ink, that is stable in aqueous media, but not in organic solvents. They are available in the size range of 1 µm to 100 µm as powder.

Product code	Product name	Surface	Diameter	Solid content	Quantity
75-00-103	sicastar®-black	plain	1 µm	-	0,5 g
75-00-303	sicastar®-black	plain	3 µm	-	0,5 g
75-00-503	sicastar®-black	plain	5 µm	-	0,5 g
75-00-104	sicastar®-black	plain	10 µm	-	0,5 g
75-00-204	sicastar®-black	plain	20 µm	-	0,5 g
75-00-105	sicastar®-black	plain	100 µm	-	0,5 g

## sicastar®-blue and sicastar®-red

sicastar®-red particles and sicastar®-blue particles contain a high amount of covalently bound dye in the silica matrix.

Plain red and blue silica particles (sicastar®-red and sicastar®-blue) have a hydrophilic surface with terminal Si-OH-bonds. They are monodisperse and nonporous in the size range of 100 nm to 1 µm.



sicastar®-red and sicastar®-blue,  
suspension in water, particle size 1 µm, plain

Red and blue silica particles (sicastar®-red and -blue) are available with amino groups (NH<sub>2</sub>) on the surface for the covalent binding of proteins, antibodies, oligonucleotides, enzymes or other biomolecules. The particles have broader size distributions with adjusted diameters between 3 and 20 microns. They are porous and have a density of 1.8 g/cm<sup>3</sup>.

The particles are supplied in water without any surfactants. sicastar®-blue and sicastar®-red particles are extremely stable in organic solvents and buffers.

Product code	Product name	Surface	Diameter	Solid content	Quantity
73-00-102	sicastar®-blue	plain	100 nm	25 mg/ml	10 ml
73-00-103	sicastar®-blue	plain	1 µm	50 mg/ml	10 ml
73-01-303	sicastar®-blue	NH <sub>2</sub>	3 µm	50 mg/ml	10 ml
73-01-503	sicastar®-blue	NH <sub>2</sub>	5 µm	50 mg/ml	10 ml
73-01-104	sicastar®-blue	NH <sub>2</sub>	10 µm	50 mg/ml	10 ml
73-01-154	sicastar®-blue	NH <sub>2</sub>	15 µm	50 mg/ml	10 ml
73-01-204	sicastar®-blue	NH <sub>2</sub>	20 µm	50 mg/ml	10 ml
74-00-102	sicastar®-red	plain	100 nm	25 mg/ml	10 ml
74-00-103	sicastar®-red	plain	1 µm	50 mg/ml	10 ml
74-01-303	sicastar®-red	NH <sub>2</sub>	3 µm	50 mg/ml	10 ml
74-01-503	sicastar®-red	NH <sub>2</sub>	5 µm	50 mg/ml	10 ml
74-01-104	sicastar®-red	NH <sub>2</sub>	10 µm	50 mg/ml	10 ml
74-01-154	sicastar®-red	NH <sub>2</sub>	15 µm	50 mg/ml	10 ml
74-01-204	sicastar®-red	NH <sub>2</sub>	20 µm	50 mg/ml	10 ml

micromer®-blue particles are monodisperse particles from polystyrene-co-polymers with carboxylic acid groups on the particle surface. They are available in the size range of 1 to 12 microns with blue colour. The particles are stable in aqueous suspensions, but not in the presence of any organic solvents.

Product code	Product name	Surface	Diameter	Solid content	Quantity
60-02-103	micromer®-blue	COOH	1 µm	25 mg/ml	10 ml
60-02-203	micromer®-blue	COOH	2 µm	25 mg/ml	10 ml
60-02-303	micromer®-blue	COOH	3 µm	25 mg/ml	10 ml
60-02-403	micromer®-blue	COOH	4 µm	25 mg/ml	10 ml
60-02-503	micromer®-blue	COOH	5 µm	25 mg/ml	10 ml
60-02-603	micromer®-blue	COOH	6 µm	25 mg/ml	10 ml
60-02-703	micromer®-blue	COOH	7 µm	25 mg/ml	10 ml
60-02-803	micromer®-blue	COOH	8 µm	25 mg/ml	10 ml
60-02-104	micromer®-blue	COOH	10 µm	25 mg/ml	10 ml
60-02-124	micromer®-blue	COOH	12 µm	25 mg/ml	10 ml

## PLA-color particles

Blue poly(lactic acid) particles consist of poly(D,L-lactic acid) with a molecular weight of 17.000 Da. The blue dye is encapsulated in the particles matrix of the biocompatible and biodegradable particles, that are supplied in water. They are available with diameters of 250 nm and 500 nm in small size distributions and with mean diameters of 2  $\mu\text{m}$ , 30  $\mu\text{m}$  and 100  $\mu\text{m}$  in broader size distributions. PLA-blue particles are provided with a plain surface or with  $\text{NH}_2$  or  $\text{COOH}$  for conjugation of biomolecules. Blue poly(lactic acid) particles can be loaded with drugs on request.

Product code	Product name	Surface	Diameter	Solid content	Quantity
54-00-252	PLA-blue	plain	250 nm	10 mg/ml	10 ml
54-00-502	PLA-blue	plain	500 nm	10 mg/ml	10 ml
54-00-203	PLA-blue	plain	2 $\mu\text{m}$	10 mg/ml	10 ml
54-00-304	PLA-blue	plain	30 $\mu\text{m}$	10 mg/ml	10 ml
54-00-105	PLA-blue	plain	100 $\mu\text{m}$	10 mg/ml	10 ml
54-01-252	PLA-blue	$\text{NH}_2$	250 nm	10 mg/ml	10 ml
54-01-502	PLA-blue	$\text{NH}_2$	500 nm	10 mg/ml	10 ml
54-01-203	PLA-blue	$\text{NH}_2$	2 $\mu\text{m}$	10 mg/ml	10 ml
54-01-304	PLA-blue	$\text{NH}_2$	30 $\mu\text{m}$	10 mg/ml	10 ml
54-01-105	PLA-blue	$\text{NH}_2$	100 $\mu\text{m}$	10 mg/ml	10 ml
54-02-252	PLA-blue	$\text{COOH}$	250 nm	10 mg/ml	10 ml
54-02-502	PLA-blue	$\text{COOH}$	500 nm	10 mg/ml	10 ml
54-02-203	PLA-blue	$\text{COOH}$	2 $\mu\text{m}$	10 mg/ml	10 ml
54-02-304	PLA-blue	$\text{COOH}$	30 $\mu\text{m}$	10 mg/ml	10 ml
54-02-105	PLA-blue	$\text{COOH}$	100 $\mu\text{m}$	10 mg/ml	10 ml

# Order conditions

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## Shipping Charges

All prices listed in catalogue are FCA (Free Carrier) due to INCOTERMS 2010, these are applicable for customers using an own courier account for delivery. We normally employ courier services like UPS and +DHL for worldwide shipments under DAP conditions (Delivered At Place). Some countries impose Entry customs clearance / Entry Taxation fees for import, these are not included.

We will add a shipment flat rate to invoice:

Germany: free ; Europe: 30 € ; USA: 60 \$ ; All others: 70 €.

## Purchase Orders

Any offers of the micromod GmbH are exclusively directed to merchants, governmental entities or special governmental estates within the meaning of Sec. 310 para.1 BGB (German Civil Code). Orders from customers are regarded as invitations to bid. Orders can be made via e-mail (Internet) or fax. The binding contract is only concluded upon receipt of the order confirmation by micromod GmbH. All offers of the micromod GmbH are non-binding and subject to confirmation (so-called invitatio ad offerendum) unless they are expressly marked as binding or they include a particular term of acceptance. The legal relations between the micromod GmbH and the customer are solely governed by the written order confirmation, including these order terms and conditions. This represents all consideration between the parties with regard to the subject matter of the contract. We recommend to review the order confirmation and inform micromod GmbH immediately about any discrepancies.

## Payments

Invoices can be paid per bank remittance (Commerzbank Germany, account number 1322262, BIC: COBADEFFXXX, IBAN: DE 08 1304 0000 0132 2262 00) or by crossed cheque. For payments with credit card (we accept VISA and MASTERCARD), please convey us the credit card number as well as the expiry date by fax at: (+49) 381 543 456 20.

## Storage

We recommend storage of products according to TDS (Technical Data Sheet) and Delivery Note. Please do not freeze the products! Use slow circular shake movements to re-disperse particles. Avoid any processes that result in a foam-formation! Any liability for damages arising from an inappropriate storage is hereby disclaimed.

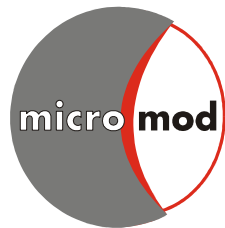
## Disclaimer of Warranty and Liability

The goods delivered by micromod GmbH comply with the specifications provided in the technical data sheets. They are only intended to be used for research and development in-vitro, unless agreed upon otherwise in writing. In particular, they are not intended to be used for application as or with comestibles (foodstuffs), pharmaceuticals (drugs), cosmetics or for household or agricultural uses, respectively. The micromod GmbH assumes no liability or guarantee that the acquired products are capable for the purposes or applications assumed by the customer or for the infringement of any third party rights, in particular patent rights or any other intellectual property rights, by the use of the products, respectively.

The liability of micromod GmbH is restricted to compensation, irrespective of the legal basis, with regard to the product specifications, as they have become integral part of the contract. In particular, it does not extend to any other uses except for those agreed upon as the integral part of the contract and in particular it does not comprise any damages as a result of an inappropriate or improper storage and/or non-stipulated uses, such as the use in connection with the human body as or for comestibles (foodstuffs), medical devices, pharmaceuticals (drugs) or for household or agricultural uses, respectively.

## Applicable law/Jurisdiction

The relations between the micromod GmbH and the customers are subject to the law of the Federal Republic of Germany. The United Nations Convention on Contracts for the international sale of goods of 11 April 1980 (CISG) is not applicable. Exclusive place of jurisdiction for any potential conflict arising out of the relationship between micromod GmbH and the customers or for complaints against the micromod GmbH is Rostock. Any potential compulsory statutory rules regarding exclusive places of jurisdiction are not affected by this clause.



**Editor:**  
**micromod Partikeltechnologie GmbH**

**Registergericht: Amtsgericht Rostock HRB 5837**  
**Steuernummer: 4079/114/03352**  
**Ust-Id Nr. (Vat No.): DE167349493**

**Compilation date – January the 15<sup>th</sup>, 2019**  
**micromod Partikeltechnologie GmbH**





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