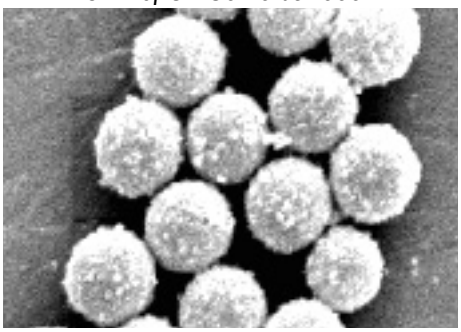
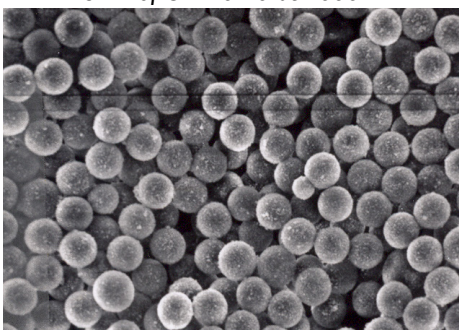
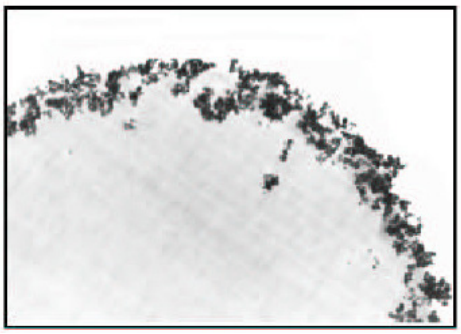
SPHERO™ Paramagnetic Magnetic Particles

SEM of CM-30-10 at 2000x

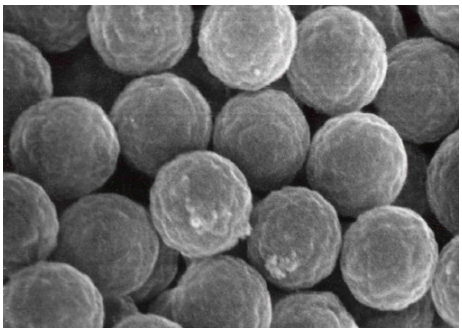


SEM of CM-40-10 at 1000X





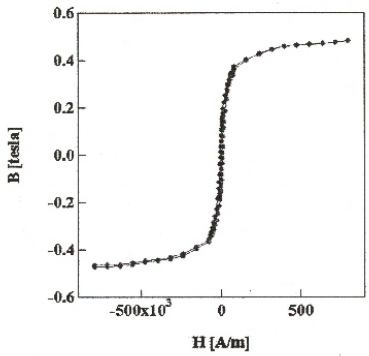
Cross section of SPHERO™ Magnetic Particles showing magnetitelayer on the surface of core particles



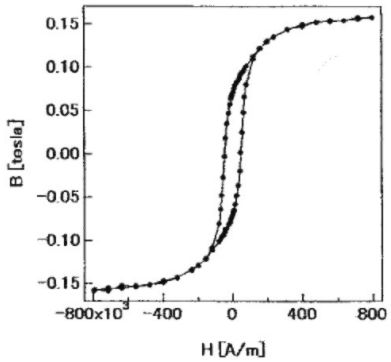
SEM of CMS-40-10 at 5000x

Magnetic Characteristics of SPHERO™ Magnetic Particles and Ferromagnetic Particles

The magnetic characteristics of magnetic particles are determined by measuring the magnetic Hysteresis Loop of magnetic particles with a magnetometer as shown below. The magnetic particles are subjected to an increasing magnetizing field (H in Oersteds) in one direction, while sensing the magnetic field (B in Gauss) in the sample to reach maximum or saturation magnetization (Bm). The magnetizing field is then returned to zero and the field retained is measured as the remnant magnetization (Br). Finally, the field is reversed until magnetization is at zero again. The corresponding field strength (Hc) is the coercivity of the magnetic particles. If the Br and Hc are near zero, the magnetic particles are characterized as superparamagnetic as shown for Cat. No. CM-10-10 . On the other hand, the Ferromagnetic Particles will have Hysteresis Loop similar to Cat. No.CFM-40-10.



CM-10-10 showing paramagnetic characteristics



CFM-40-10 showing ferromagnetic characteristics

SPHERO™ Magnetic Polystyrene Particles

- Consists of paramagnetic particles prepared by coating a layer of iron oxide and polystyrene onto polystyrene core particles
- Uniform in size and spherical in shape
- Separated using a magnet and resuspended when removed from the magnetic field
- Used for cell separation, affinity purification, DNA probe assays, magnetic particle EIA, etc.

Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
Magnetic Polystyrene	2.0-2.9	2.5	PM-20-10	10 mL
Magnetic Polystyrene	3.0-3.9	2.5	PM-30-10	10 mL
Magnetic Polystyrene	4.0-4.5	2.5	PM-40-10	10 mL
Magnetic Polystyrene	5.0-5.9	2.5	PM-50-10	10 mL

SPHERO™ Carboxyl Magnetic Particles

- Used during the isolation and affinity purification of biomolecules in a wide range of assays and applications
- Contains carboxylic acid groups which can be used for carbodiimide activation (e.g. EDC) for covalent coupling
- Couples to the primary amino groups of nucleic acids, peptides, proteins or other target molecules.

Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
Carboxyl Magnetic	0.1-0.39	2.5	CM-025-10	10 mL
Carboxyl Magnetic	0.4-0.69	2.5	CM-05-10	10 mL
Carboxyl Magnetic	0.7-0.9	2.5	CM-08-10	10 mL
Carboxyl Magnetic	1.0-1.4	2.5	CM-10-10	10 mL
Carboxyl Magnetic	1.0-1.4	2.5	CM-10-100	100 mL
Carboxyl Magnetic	1.5-1.9	2.5	CM-15-10	10 mL
Carboxyl Magnetic	1.5-1.9	2.5	CM-15-100	100 mL
Carboxyl Magnetic	2.0-2.9	2.5	CM-20-10	10 mL
Carboxyl Magnetic	2.0-2.9	2.5	CM-20-100	100 mL
Carboxyl Magnetic	3.0-3.9	2.5	CM-30-10	10 mL
Carboxyl Magnetic	4.0-4.5	2.5	CM-40-10	10 mL
Carboxyl Magnetic	4.0-4.5	2.5	CM-40-100	100 mL
Carboxyl Magnetic	5.0-5.9	2.5	CM-50-10	10 mL
Carboxyl Magnetic	6.0-8.0	2.5	CM-60-10	10 mL
Carboxyl Magnetic	6.0-8.0	2.5	CM-60-100	100 mL
Carboxyl Magnetic	8.0-9.9	2.5	CM-80-10	10 mL
Carboxyl Magnetic	10.0-13.9	1.0	CM-100-10	10 mL
Carboxyl Magnetic	14.0-17.9	1.0	CM-150-10	10 mL
Carboxyl Magnetic	18.0-22.9	1.0	CM-200-10	10 mL
Carboxyl Magnetic	27.0-37.0	1.0	CM-300-10	10 mL
Carboxyl Magnetic	90.0-120.0	1.0	CM-1000-10	10 mL

SPHERO™ Jeffamine® Magnetic Particles

Contains a PEG-based spacer arm that is terminated with amine groups for coupling carboxyl-containing molecules.

Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
Jeffamine® Magnetic	0.1-0.39	1.0	JAM-025-10	10 mL

JEFFAMINE® is a registered trademark of Huntsman Corporation

SPHERO™ Carboxyl PMMA Magnetic Particles

Provides carboxyl magnetic beads with less autofluorescence than magnetic polystyrene beads

Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
Carboxyl PMMA Magnetic	3.0-3.9	1.0	CPMA-30-10	10 mL

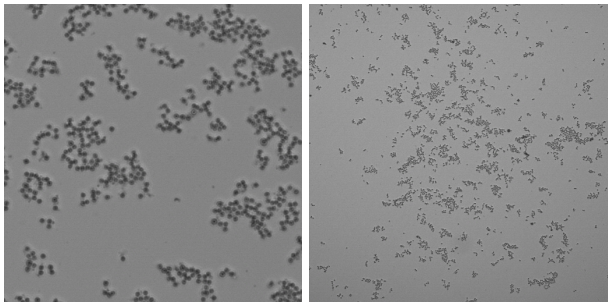
SPHERO™ Epoxy Magnetic Particles

Covalently binds to primary amino and sulfhydryl groups in proteins and peptides

Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
Epoxy Magnetic	0.4-0.6	2.5	EM-05-10	10 mL
Epoxy Magnetic	2.0-2.9	2.5	EM-20-10	10 mL
Epoxy Magnetic	2.0-2.9	2.5	EM-20-100	100 mL

SPHERO™ Amino Magnetic Particles

- Supplied as an aqueous suspension magnetic particles to provide primary amino groups
- Used to covalently couple proteins using bifunctional crosslinking agents
- Rapidly separates bound from unbound molecules using a magnetic separator.

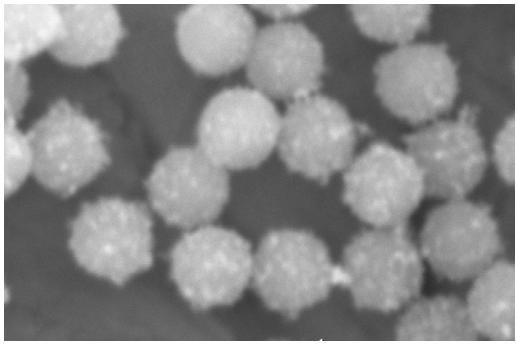


Differential interference contrast images of AM-10-10

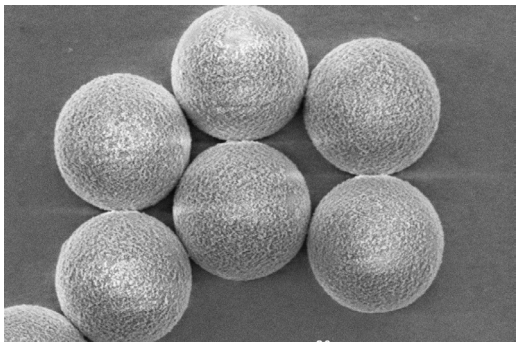
Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
Amino Magnetic	1.0-1.4	2.5	AM-10-10	10 mL
Amino Magnetic	1.0-1.4	2.5	AM-10-100	100 mL
Amino Magnetic	1.5-1.9	2.5	AM-15-10	10 mL
Amino Magnetic	1.5-1.9	2.5	AM-15-100	100 mL
Amino Magnetic	2.0-2.9	2.5	AM-20-10	10 mL
Amino Magnetic	2.0-2.9	2.5	AM-20-100	100 mL
Amino Magnetic	3.0-3.9	2.5	AM-30-10	10 mL
Amino Magnetic	3.0-3.9	2.5	AM-30-100	100 mL
Amino Magnetic	4.0-4.9	2.5	AM-40-10	10 mL
Amino Magnetic	4.0-4.9	2.5	AM-40-100	100 mL
Amino Magnetic	6.0-6.9	1.0	AM-60-10	10 mL
Amino Magnetic	6.0-6.9	1.0	AM-60-100	100 mL
Amino Magnetic	8.0-9.9	1.0	AM-80-10	10 mL

SPHERO™ Magnetic Cross-linked Particles

- Resistant to common organic solvents such as acetone, acetonitrile, DMF and chloroform
- Used in a wide variety of molecular biology, nucleic acid isolation, research protocols and clinical immunoassay reagent applications.



SEM of CMX-10-10



SEM of CMX-300-10

Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
Magnetic, Cross-linked, granules, non-uniform	3.0-6.0	2.5	PMX-40-10	10 mL
Amino Magnetic, Cross-linked	1.0-2.0	2.5	AMX-10-10	10 mL
Amino Magnetic, Cross-linked	3.0-3.9	2.5	AMX-30-10	10 mL
Amino Magnetic, Cross-linked	13.0-17.99	1.0	AMX-150-5	5 mL
Carboxyl Magnetic, Cross-linked	1.0-2.0	2.5	CMX-10-10	10 mL
Carboxyl Magnetic, Cross-linked	1.0-2.0	2.5	CMX-10-100	100 mL
Carboxyl Magnetic, Cross-linked	3.0-6.0	2.5	CMX-40-10	10 mL
Carboxyl Magnetic, Cross-linked	18-22.9	1.0	CMX-200-10	10 mL
Carboxyl Magnetic, Cross-linked	25-37	1.0	CMX-300-10	10 mL
Carboxyl Magnetic, Cross-linked	25-37	1.0	CMX-300-100	100 mL
Carboxyl Magnetic, Cross-linked	90-120	1.0	CMX-1000-10	10 mL

SPHERO™ Aldehyde Magnetic Particles

Large magnetic beads used for the covalently conjugation of primary amine-containing ligands.

Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
GLM-300-10	25-37	1.0	GLM-300-10	10 mL

SPHERO™ Magnetic Polystyrene Particles, Smooth Surface

- Consists of a thick layer of polymer coating on the surface to encapsulate the iron oxide coating
- Does not contain exposed iron oxide on the surface
- Used in applications where exposed iron oxide causes undesirable interferences.

Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
Magnetic Polystyrene , Smooth Surface	2.0-2.9	2.5	PMS-20-10	10 mL
Magnetic Polystyrene , Smooth Surface	3.0-3.9	2.5	PMS-30-10	10 mL
Magnetic Polystyrene , Smooth Surface	4.0-5.0	2.5	PMS-40-10	10 mL

SPHERO™ Amino Magnetic Particles, Smooth Surface

- Aids in the separation in whole blood
- Monodispersed surface for optimal performance.

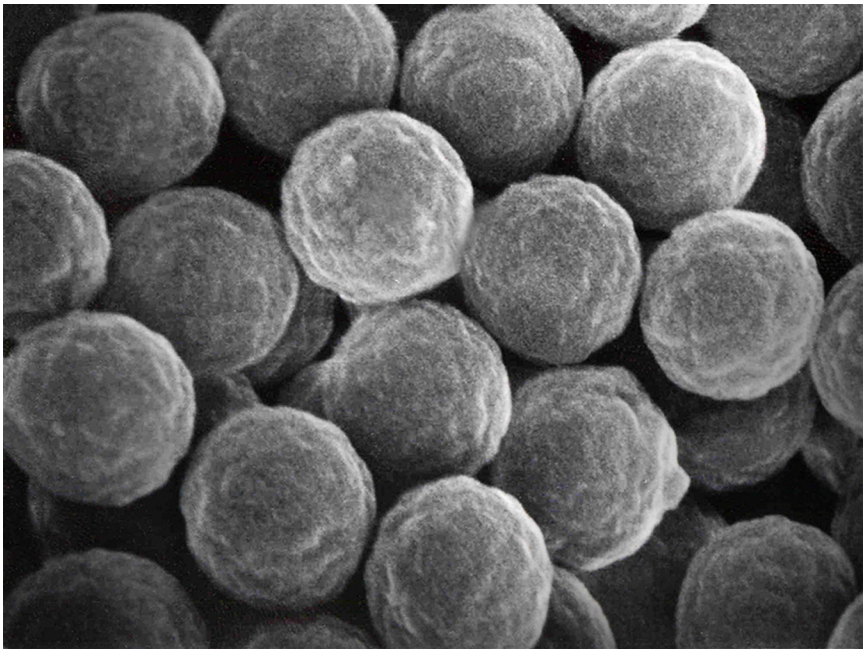
Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
Amino Magnetic, Smooth Surface	4.0-5.0	2.5	AMS-40-10	10 mL
Amino Magnetic, Smooth Surface, High Iron	4.0-5.0	2.5	AMS-40-10H	10 mL

SPHERO™ Carboxyl Magnetic Particles, Smooth Surface

- Activated for covalent coupling to amine-containing molecules using a variety of mechanisms
- Used with one or two-step coupling using EDC to form amide bonds with proteins or other molecules
- Used for coupling to amino modified oligonucleotide probes with MES buffer and EDC.

**See page 88 for a Differential interference contrast images of CMS-40-10*

Particle Type and Surface	Size, µm	% w/v	Catalog No.	Unit
Carboxyl Magnetic, Smooth Surface	3.0-3.9	2.5	CMS-30-10	10 mL
Carboxyl Magnetic, Smooth Surface	3.0-3.9	2.5	CMS-30-100	100 mL
Carboxyl Magnetic, Smooth Surface	4.0-5.0	2.5	CMS-40-10	10 mL
Carboxyl Magnetic, Smooth Surface	4.0-5.0	2.5	CMS-40-100	100 mL
Carboxyl Magnetic, Smooth Surface, High Iron	4.0-5.0	2.5	CMS-40-10H	10 mL
Carboxyl Magnetic, Smooth Surface	8.0-9.9	1.0	CMS-80-10	10 mL
Carboxyl Magnetic, Smooth Surface	18.0-22.9	1.0	CMS-200-10	10 mL



SEM of CMS-30-10