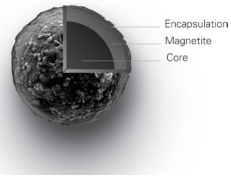
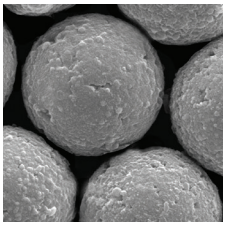
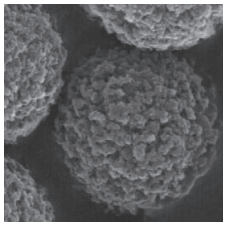
Magnetic Particle Selection Guide

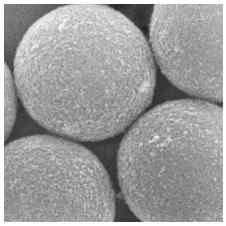
TIPS FOR CHOOSING THE RIGHT PARTICLE

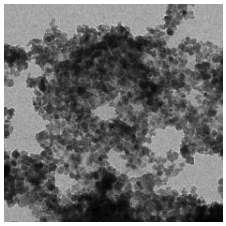


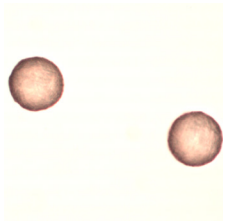
Magnefy™


ProMag® HP (High Performance)


ProMag®


COMPEL™

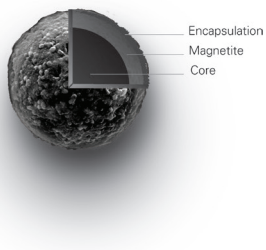

BioMag®


Magzilla™

Superparamagnetic particles have been used extensively in diagnostic and other research applications for the isolation of nucleic acids, proteins, glycans, and cells. The benefits include ease of separation and suitability for high-throughput automation. Magnetic particle-based diagnostic assays demand the highest performance in terms of physical handling, ligand binding characteristics, and signal-to-noise ratios. Bead composition directly impacts settling and magnetic separation profiles, which have implications for assay parameters such as incubation times for binding and elution steps, buffer changes, etc. Most importantly, the composition impacts nonspecific binding characteristics, and background signal arising from the particle itself. These factors have a direct impact on the sensitivity and dynamic range of the assay.

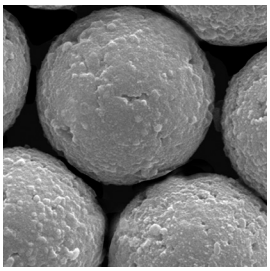
Our comprehensive magnetic particle offerings allow us to address the unique requirements of specific assay and separation systems. Our magnetic beads offer a continuum of options:

Small diameters for assay applications	⟷	**Large diameters** for single-cell applications
Irregular morphology for rapid separation	⟷	**Spherical shape** for uniform bead response
Bumpy surfaces for increased binding capacity	⟷	**Smooth surfaces** for spacing of surface ligands
Fast separation profile for increasing throughput	⟷	**Slow separation profile** for maximizing analyte binding



Magnefy™, Magnefy™ Mach I, and **Magnefy™ Mach I Silica**
Diameter: 1 µm **Matrix:** Polymer **Versions:** COOH, Streptavidin (SA), Click Chemistry (Azide, Alkyne, DBCO), Concanavalin A (Con A), Nickel Chelate, Oligo(dT) **Shape:** Spheroid

Magnefy™, Magnefy™ Mach I, and Magnefy Mach I Silica are ~1 µm high-performance superparamagnetic microspheres with a high surface area/high surface titer. Magnefy™ offer a performance-driven solid phase for magnetic particle-based applications, including SPRI-based total DNA isolation (COOH), molecular applications, and immunoassays. Magnefy™ Mach I have similar surface characteristics but have inner modifications that increase the speed of their separation to increase the turnaround time for automated applications. Magnefy™ Mach I Silica have the increased speed and a surface that is compatible with chaotropic salt DNA/RNA isolations. *(See PDS 756 and PDS 759)*



ProMag®HP *(nominal values)*
Diameter: 3 µm **Matrix:** Polymer **Versions:** COOH, SA, Click Chemistry (Azide, Alkyne, DBCO)
Density: (g/cm^3): 1.4 **Shape:** Spherical

ProMag®HP (High Performance) magnetic particles that have been meticulously engineered for use in chemiluminescence assay development. ProMag®HP bring together the superior handling and fast separation rates of ProMag® with a highly optimized composition to ensure the lowest autosignal, particularly with respect to chemiluminescence and exposed iron. *(See PDS 743)*

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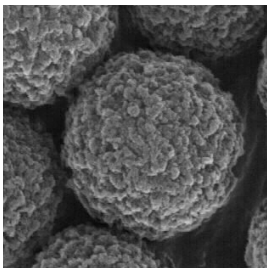
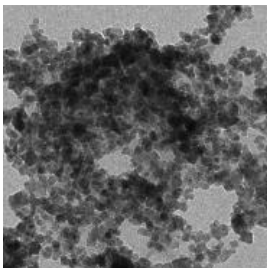


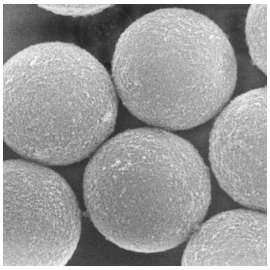
ProMag® *(nominal values)*
Diameter: 1 & 3 µm **Matrix:** Polymer **Versions:** COOH, SA, NH_2, Protein G (3 µm) **Density:** (g/cm^3): 1.6 or 1.8 (diameter dependent) **Shape:** Spherical

ProMag® support diagnostic applications that require highly uniform, high-binding beads and fast separation times. They have a proprietary surface to reduce nonspecific binding in protein-based systems, and for superior handling without the use of surfactant. *(See PDS 715)*



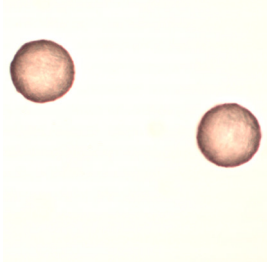
BioMag® *(nominal values)*
Diameter: ~1.5 µm **Matrix:** Silanized iron oxide **Versions:** COOH, NH_2, Affinity Binding Proteins, Secondary Antibodies, Anti-CD Antibodies, Con A, Wheat Germ Agglutinin (WGA) **Density:** (g/cm^3): 2.5
Shape: Irregular, cluster

BioMag® and BioMag®Plus are ~1.5 µm high-performance superparamagnetic microparticles used for the efficient separation of cells and purification of biomolecules. The irregular morphology of these silanized iron oxide clusters provides a much greater surface area than similarly sized spherical particles, resulting in high binding capacities and efficient capture of target with conservative use of particles. The high iron oxide content (>90%) allows for rapid and efficient magnetic separations, even from difficult, e.g. highly viscous, samples.



COMPEL™ *(nominal values)*
Diameter: 3, 6, & 8 µm **Matrix:** Polymer **Versions:** COOH, SA, Fluorescent **Density:** (g/cm^3): 1.1 – 1.2 *(diameter dependent)* **Shape:** Spherical

As highly uniform microspheres in diameters of 3, 6, and 8 µm, COMPEL™ are ideal for applications in flow cytometry. These beads contain a highly optimized amount of magnetite to minimize settling during incubation steps, while ensuring rapid separation times. COMPEL™ beads are ideal for applications that demand uniform bead response, such as miniaturized bioassays and separations. The polymer matrix is conducive to dyeing, and standard blue, green, and red fluorescent versions are available. In fact, we like to dye them so well that we used them to develop QuantumPlex™M, our magnetic bead platform for suspension arrays. *(See PDS 705)*



Magzilla™ *(nominal values)*
Diameter: 30 µm **Matrix:** Polymer **Versions:** COOH **Density:** (g/cm^3): 1.1 – 1.2 (diameter dependent)
Shape: Spherical

Magzilla™ is a large polymer microsphere with internal magnetic layers. The surface contains COOH groups for the covalent attachment of a ligand or nucleic acid of your choosing for a variety of applications including single bead / single well assays for sequencing. *(See PDS 758)*

LET'S CONNECT —

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