

# Magnetics Industry Overview *by* Walt Benecki

**What's new? How about sensors, inductors, pumps, motors, roller coaster brakes, rocket launchers, fridge magnets and sneakers!**

Although producers of magnetic materials have been under heavy competitive pressures from China, users of magnetic materials continue to develop new, and often novel, applications for both soft and permanent magnet materials. This article will review just a handful of new and interesting applications that have been introduced during 2005.

Earlier this year MTS Systems Corporation ([www.mtssensors.com](http://www.mtssensors.com)) announced the introduction of a linear-position sensor which incorporates the latest in magnetostrictive sensor technology. The result, according to MTS, is the world's smallest magnetostrictive position sensor. The sensor electronics fit completely inside a 36 mm (1.4 in) by 23 mm (0.91 in) cylindrical package. The sensor can be powered with a standard 5-volt power supply. Its modular architecture permits the sensor to operate using 12- or 24-volt power and also adds additional protection circuitry for EMI immunity. MTS feels this new position sensor will be utilized in sprayers, dispensing machines, fastener magazines, x-y positioning machines, small robots, filling machines and marking equipment.

In January, 2005, Pulse Engineering ([www.pulseeng.com](http://www.pulseeng.com)) announced the availability of industry's first integrated ferrite-bead inductor. Pulse's Power Bead® inductor contains two independent inductors integrated into a single core structure and part number with no magnetic coupling between the two inductors. Replacing two surface mount powdered iron inductors with one integrated ferrite inductor produces the following benefits: a 20% savings of board space, a 47% lower direct current resistance, an 80% lower core loss and a cost reduction of 25%. This new inductor is expected to find application in any multi-phase circuit application. Although typically used for double data rate (DDR) memory, multi-phase CPU power, and other desktop, portable and server computing applications, it can also be used in 2 and 4 phase telecommunications power systems.

Micropump, Inc. ([www.micropump.com](http://www.micropump.com)) is promoting an electro-magnetically driven pump that offers small package size without sacrificing power or capacity. A 40-70 W brushless DC motor drives the pump electromagnetically, eliminating physical contact with the motor. The result means no moving parts in the drive unit which leads to superior service life. The package includes over-molded NdFeB magnets, surface mount technology and enhanced heat sink capability. This new pump will serve applications requiring a flow rate up to 3.2 liters per minute with a maximum differential pressure up to 7 bar.

ABB Inc. ([www.abb.com](http://www.abb.com)) has recently announced a new line of low-base-speed permanent synchronous magnet motors that have no rotor slip and offer better accuracy than conventional asynchronous motors. The complete system, when controlled by a low-voltage AC drive, can be connected directly to a motor/load, without a gearbox or pulse encoder. Powers range from 22-670 HP and include base speeds from 220-600 RPM. This system can be utilized in several industries, including pulp and paper, marine propulsion, ski lifts, elevators, rotary kilns, and film and foil converting machines.

Magnetar Technologies ([www.magnetarcorp.com](http://www.magnetarcorp.com)) is marketing a magnetic braking system that has found initial application in the roller coaster industry. This patented technology uses magnetic force to stop any moving object, at any weight and speed, without friction, electrical power or the use of mechanical or moving parts. The brakes are static, self regulating and require no control devices or maintenance. Magnetar hopes to expand the application of this braking technology into material handling systems, elevators and escalators.

Sandia National Laboratories ([www.sandia.com](http://www.sandia.com)) announced earlier this year that they are developing a new method to launch missiles using magnetic forces, rather than conventional fuel, through a powerful electromagnetic booster system. The booster creates a repelling force similar to the one created when two magnets with the same polarity are pushed together, using it to push rockets into the air. A Sandia scientist indicated that the new system has been recently demonstrated in a test system and could become standard on new navy ships and might one day be used to launch rockets into orbit. One advantage of the electromagnetic booster system is that it leaves no heat signature behind that can be tracked by enemy ships.

There are also new applications for magnetic products in the retail sector. Serefex Corporation ([www.serefex.com](http://www.serefex.com)) has announced a new product named Fridge Tape ®. Serefex feels that Fridge Tape is the answer to everyone's desire for a way to neatly organize the outside of your refrigerator. Fridge Tape is a two-sided product consisting of one magnetic side and one adhesive side. The tape can be attached to the back of photographs, artwork, greeting cards, menus and other lightweight items. Once properly attached, the item then sticks directly to the refrigerator surface, eliminating the traditional refrigerator magnet.

And finally, we now have magnetic control systems in sneakers! Adidas ([www.adidas.com](http://www.adidas.com)) has announced a running shoe that provides variable cushioning by automatically and continuously adjusting itself using a sensor and a magnet. A microprocessor is located in the arch of the shoe and drives a tiny screw and cable system that adjusts the heel cushion depending on the signals sent back by an electric sensor coupled to a magnet. It is powered by a small battery that conserves power by adjusting the shoe while it is in the air during a runner's stride. This new shoe is now available in select stores and retails for about \$300.

Much of the above information was extracted directly from company press releases or product literature, so before you strap on those magnetically controlled sneakers and hop into that roller coaster, please make sure that the above products are thoroughly tested in your particular application! My apologies to those who have recently announced new magnetic applications that were not included in this article.

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