

## Tech Alert

### Liquid Magnets

Liquid magnets also known as Magneto rheological fluid (MRF) or ferrofluid (FF) are strongly magnetized in the presence of a magnetic field. Under normal conditions and the absence of an external magnetic field, it behaves just like an ordinary liquid.

They are colloidal solutions primarily consisting of a carrier liquid and particles. Particle size in MRF is usually between 1 to 10 Micro meter while in FF it is of the order of few nano-meters (Diameter lesser than 10 nano meter). This difference in size changes many properties of the solution; in fact FF needs surfactants to be coated on the particles to prevent them from clumping. Thus MRF and FF have completely different applications.

There are many applications in present day markets already utilizing these properties of **ferro fluids**.

A few key speaker manufacturers are making use of various properties to create audio systems with higher efficiency, less heating and noise reduction due to its magnetic nature. The fluid also works in the industrial Sealants, coolants and lubricant based applications. Due to its liquid nature it reduces the wear and tear, friction and losses/leakages to nothing. Various global researches are underway to be able to utilize FF in various Hard-drives, motor shafts and bearing seals products.

The Automotive industry has been using ferrofluid since early 2000. Both F1 cars and other sports vehicles have been known to use it for applications ranging from suspension, gear box transmissions and engine dampers.

We at Delta / MagDev have setup extensive research partnerships and laboratories and are keen to start manufacture of these fluids in the coming months.

