



Pharmaceutical company uses level sensors to obtain accurate and reliable measurements

CARY, NC (June 2003) - MTS' MR M-series level sensor increases reliability and accuracy in the measurement of water solutions and buffers in a California-based pharmaceutical company's portable tanks.

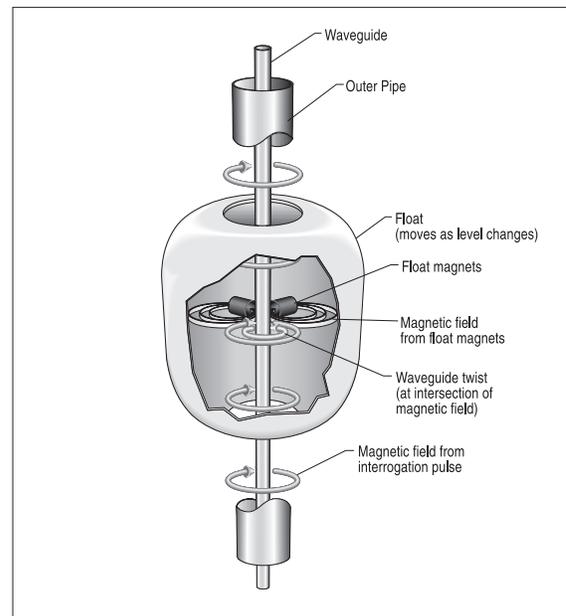
The Problem

A pharmaceutical company based in California uses level sensors to measure water solutions and buffers in its portable tanks. The company needed to obtain accurate and reliable measurement results for data improvements and overall product quality, as well as measure in high salinity solutions.

The high foaming solutions used in the company's process required an accurate, reliable level sensor. Engineers tested several other level sensing technologies to obtain accurate data, but experienced unstable results each time. Load cells could have solved the problem, but the cost requirement of this technology was unacceptable and cannot be used with portable tanks. Radar was also ruled out due to foam contained in the process, which renders radar technology ineffective. Additionally, the company tried ultrasonic level sensing but it gave variable readings.

The Solution

By utilizing a MTS Sensors' MR M-Series level sensor, the company's engineers were able to receive good mass balances and accurate solutions for its application. The M-Series Analog sanitary level sensor is intrinsically safe and utilizes a two-wire 4-20mA analog output with HART communications. Housed within an electropolished 316L stainless steel enclosure, the level sensor uses magnetostrictive technology. Magnetostriction provides a high degree of accuracy and is unaffected by variable process temperatures, pressures or media electrical properties that limit other level measurement technologies. The M-Series gauge is designed to tough NEMA 4X standards to withstand high temperature, pressure and caustic solutions used in the sanitation process. Also, the customer does not have to remove the sensor from the vessel for cleaning.



Basic Components of a Magnetostrictive Level Sensor

Pharmaceutical company uses level sensors to obtain accurate and reliable measurements

Overall Improvements

The pharmaceutical company found that the product performed reliably throughout the testing. Installed last winter, the sensor gives the company improved data and product quality. Magnetostrictive level sensors measure the distance between a float (product and/or interface) magnet and the electronics head end of the sensing rod. The float/s magnet has ample clearance from the sensing rod, and therefore there are no parts to wear out. As shown in Figure 1, a magnetostrictive position sensor comprises five basic components: the float magnet, waveguide, pickup, damp and electronics module. There is also a protective tube over the waveguide.

The sensing rod is mounted along the vertical axis of the tank, and the float magnet is allowed to freely move along the sensing rod. The head includes an electronics module, which reports the float/s position information to a controller (or other receiving device) in the appropriate analog or digital format. Magnetostrictive liquid level sensors include a float with a magnet mounted inside, a waveguide and an outer pipe.

Magnetostriction is a property of certain materials in which application of a magnetic field causes strain, resulting in a size or shape change of the material. This is due to the alignment of the magnetic domains within the material with the applied magnetic field. Magnetic domains can be envisioned as many tiny permanent magnets which are randomly arranged before the application of the magnetic field¹. When the magnetic field is applied, the poles of the magnetic domains align themselves along the gradient of the flux lines of this field.

References:

¹ D.S. Nyce, *Magnetostriction-Based Linear Position Sensors*, *SENSORS*, vol. 11, No. 4, 1994.

The Contact

MTS Systems Corporation
Sensors Division
Tel: 919-677-0100, Fax: 919-677-0200
david.edeal@mts.com
www.mtsensors.com