

# Magnetic Particles QC

## OVERVIEW



## Equipment

- Magnetic Susceptibility system MS3

## Applications

- Assess the magnetic properties of magnetic particles and magnetic powders

Magnetic particles are nowadays used in a wide array of application from biomedical to industrial applications. However, it is essential, irrespective of the application, to ensure that their behavior is as expected, their magnetic properties must be consistent across the batches.

There are different ways to qualify their properties, but most tend to be time consuming and/or destructive.

There is therefore a requirement for a rapid assessment of properties especially if this is for quality control.

Magnetic susceptibility on the other hand can provide information about particles' magnetic properties against a reference batch in an inexpensive, non-destructive and quick way.

## **Magnetic Susceptibility for Quality Control of Magnetic Particles**

Magnetic particles ranging in size from nm to um and mm are used in a number of applications. In biomedical application, the particles can be coated with specific protein that will lead the particles to 'stick' to tumors for example. Magnetic sensors can then be used to locate the aggregate of magnetic particles. Other applications include their use as tracers for MRI use.

In industrial applications, magnetic particles can for example be added to inks for security purpose. Particles can also be used in geosciences as tracers.

In any case the MS2/MS3 is ideally suited to measure the susceptibility with a precision down to 1e-6SI (volume). There are several sensors available, though for particles quality control, the most suited are the MS2G which accepts volume up to 1cc, or the MS2B with volume up to 12cc.

Quality control will rely on comparing the magnetic susceptibility of the batch being manufactured with a reference batch.

The measurements are typically done with a first reference blank where the value of the air susceptibility (and empty sample pot) is taken. The sample(s) readings are then recorded. Depending on the time elapsed to the first blank, a second blank measurement is taken, with the software correcting any drift that may have taken place in the time interval.

More details about the magnetic susceptibility equipment can be found at <https://gmw.com/product/magnetic-susceptibility/>

Any questions about this note or the equipment, please contact sales@gmw.com.