

Application Note, Nickel Sphere Calibration Sample, Model 730908

This nickel sphere is provided for use in the calibration of magnetometers. The moment value at 298 K in an applied field of 398 kA/m (5000 Oe) is given by the following value:

$$m = 6.92 \text{ mA}\cdot\text{m}^2 \quad (\text{SI})$$

$$m = 6.92 \text{ emu} \quad (\text{cgs emu})$$

The uncertainty in this value is estimated at $\pm 1.5\%$.

Measurement Background

A random sampling from a lot of 3 mm diameter, >99% Ni spheres were compared directly against a National Institute of Standards and Technology (NIST) SRM 772a Magnetic Moment Standard using a vibrating sample magnetometer. The moment for the spheres was also determined from the sphere volume, the known density 8.907 g/cm^3 , and the mass magnetization for nickel, $\sigma = 54.94 \text{ A}\cdot\text{m}^2/\text{kg}$ (54.94 emu/g), stated in the certification for the NIST SRM 772a. These two determinations were found to agree to 0.3% for the sampling.

Handling

The moment value for this sample should remain valid as long as the sample is not mishandled. Handle only with non-metallic, non-magnetic tweezers and avoid contamination or deformation of any kind.

Certification

This sample is provided as a working calibration sample suitable for use on a day-to-day basis. If a certified standard or traceability to national standards is required, the purchase of a NIST SRM 772a should be considered (available from Lake Shore, Model 730907).