

# Calibration - a Word about magnetics

This device uses magnets and magnetic sensors to measure the thickness of non-ferrous materials. This technique is very effective because magnetic fields can penetrate these materials with no attenuation or deformation. However, as with most technologies, some tolerance and knowledge is required for achieving the best results.

- Magnetic fields are strong at the magnet surface and deteriorate rapidly in a non-linear manner as distance increases.
- Magnetic fields will vary with changing temperatures.
- Magnetic and most other sensors are unstable and vary their output with changing temperatures.
- Friction may cause the inner magnet to not be centered on the probe tip when moving the probe across the measured object.

Considering the above and following the usage tips will enable you to get the most out of your MAG-ic Probe. MAG-ic Probe is supplied with 2 magnets. The 1/2" ball provides the strongest magnetic field and thus the highest resolution and should always be your first choice. The smaller magnet should only be used when access to the inside of a finished instrument is limited due to small f-holes etc.

MAG-ic Probe starts with a calibration sequence to detect the magnet size and also to try and compensate for small variations in field measurement tolerances. This initial calibration is suitable for most quick measuring jobs, for example where you are making a few measurements, shaping or sanding and then measuring again etc. Note, MAG-ic Probe can be powered by the USB connection without the power switch turned ON, however because computer power supplies may have slightly different outputs, MAG-ic Probe was calibrated with the internal battery connected and power switch in the ON position.

## Advanced Calibration.

When preparing for a more serious prolonged measuring session such as mapping a complete top or plate with many measurements, a two step calibration sequence is advised.

MAG-ic probe is factory calibrated using a precisely machined stepped surface in a temperature controlled environment. The largest effect that may cause a drift in the measurement value, is from variance in probe temperature due to heating by the hand of the user.

After the initial calibration sequence and before attempting a prolonged measuring session, the following sequence is advised. The purpose is to perform a calibration only once the probe has reached a stable temperature.

Hold the probe in your hand in the same way as you would while measuring. Important, do not envelop the entire probe in your hand, simply hold it just as you would while measuring. Your hand will heat the probe. It may take 3-5 minutes for the probe to reach a stable temperature.

Then perform a re-calibration, by pressing the FUNCTION key and choosing the Re-Calibrate option or cycling the power on the unit.



MAG-ic Probe is capable of measuring very small distances to 1/1000th inch. It should make sense then that the probe should be absolutely square to the surface being measured and the opposing magnet. If the probe is slightly tilted, the distance from the center of the probe will be slightly farther from the magnet and introduce false readings. It is a good idea to use the **HOLD** mode to ensure the lowest reading by making small rocking and circling motions at each measuring location.