

Western Instruments

Established 1965

Using Magnetometers (W-FI Field Indicators)



The picture to the left shows a W-FI-10 measuring a strong Magnetic Field at the end of a pipe from about 4" away from the end. We know it is strong field as we know magnetic fields drop logarithmically as a function of distance.

The inspector holding this W-FI-10 is holding it correctly. If the Magnetic Field were less strong, he could place the White Arrow on the bevel of the pipe, and get a more true reading as to the strength of the Magnetic Field. For most applications, an end that measures +/-3 Gauss is considered Demagnetized.

Magnetic Field Indicators can be grouped into two general categories, the Pocket Magnetometer which has a mechanical movement and is often referred to a Gauss Meter (Western's W-FI-10, 20, or 50). The second type illustrated below is Electronic and usually has a Digital Display. These instruments use a Hall Effect which is a Semi Conductor that gives an electronic output of the strength of a Magnetic Field. This signal is processed into a number on the Digital Display, which is illustrated below.

These Electronic Magnetometers are often called Hall Effect Meters by the unknowing, and should be called Digital Magnetometers. Unless an operator has studied the use of a Digital Magnetometer and understands the basic physics of Magnetism. The supervisor must recognize the KISS Principle (Keep it Simple Stupid) so a Pocket Magnetometer is recommended. Firstly, the surface someone is measuring must have a physical characteristic to permit the magnetism to leak to the surface (Flux Leakage). When performing a magnetic test (MPI or MFE), a crack will permit the measurement of the specific area around a crack with a Digital Magnetometer. However one would not use a Pocket Magnetometer for this as, the area it measures the Flux Leakage from is far larger. A Level III Inspector may measure the leakage when developing a detailed procedure. However, if a crack is detected by a floor or field inspector, he should not care as he has found the crack. When performing a detailed surface magnetism survey, the Engineer must know the direction of the field his instrument is taking and have enough mechanical aptitude on how to hold the *Hall Effect* probe. Furthermore, is the Digital Magnetometer a single, Double, Triple, or 4 Axis Instrument.



The area a Hall Effect measures is very small, while a Pocket Magnetometer is much larger. When it comes to Demagnetization we want the larger picture, as it's affect on MWD Instrumentation, and prior to Welding is far more appropriate.

Using a Pocket Magnetometer