

06/11/2021 (Rev 1)

Topic: Grease Ferrous Debris

Using a FerroQ for An Improved Ferrous Debris Measurement

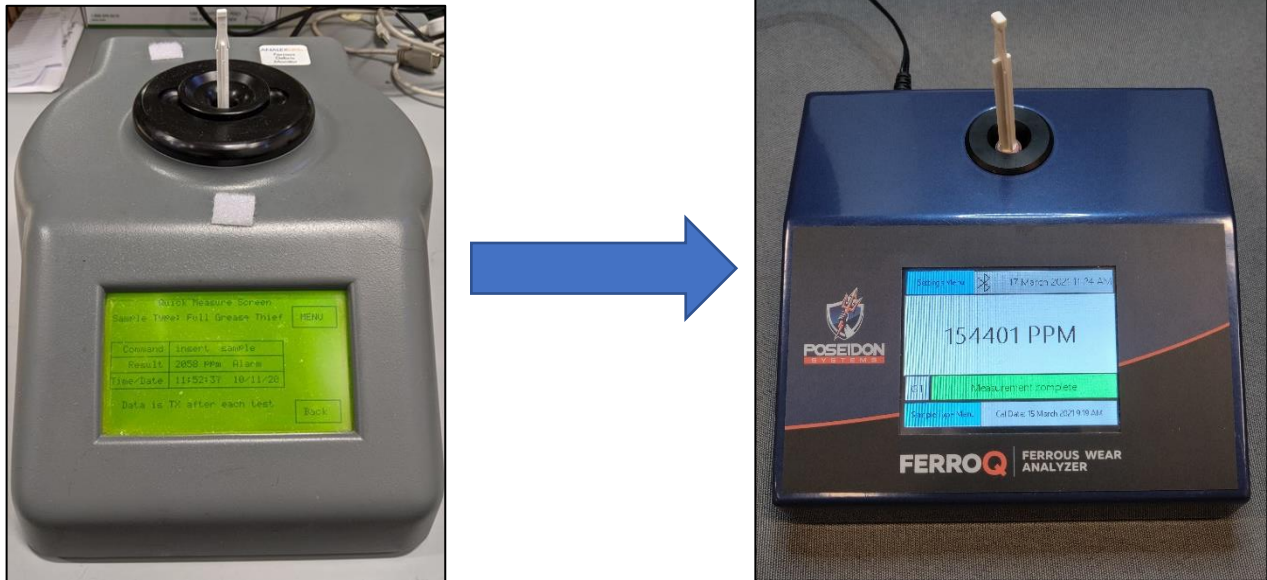


Figure 1 Analex Ferrous Debris Monitor (fdM+) on the left and the FerroQ Ferrous Wear Analyzer on the right.

Introduction:

This technical bulletin describes the new instrument for detecting Ferrous Debris at MRG Labs.

Background:

Ferrous Debris Analysis has been developed to determine the concentration of ferrous wear in a given lubrication sample to evaluate the health of the equipment and lubricant. These instruments use ferromagnetic coils to quantify an amount of ferrous wear in a sample in parts per million (ppm). MRG has historically used the Analex fdM+ for ferrous debris measurement; however, MRG Laboratories will be switching its ferrous debris testing from the fdM+ to the FerroQ Ferrous Wear Analyzer.

The Analex fdM+ used a ferromagnetic coil to determine the ferrous debris concentration in a sample. The sample would be dropped into the fdM+ and bounce off the bottom until settling inside the instrument. The fdM+ used the bounce of the sample to determine the amount of ferrous material in the sample. The FerroQ also uses A proximity sensor is triggered when the device is inserted. starting the 6-second test

The Concern:

Since the FDM+ is no longer manufactured, MRG labs will be switching to the FerroQ for ferrous debris analysis. Studies were conducted comparing the effectiveness of the fdM+ and the FerroQ, and results showed an increase in overall ferrous measurement accuracy and repeatability with the FerroQ. Testing was performed on both instruments using small metal balls at various heights. It was found that the fdM+ has a strong ferrous measurement when the ball was at the bottom of the sample. The results began to deviate as the ball moved further away from the bottom of the instrument. The FerroQ, however,

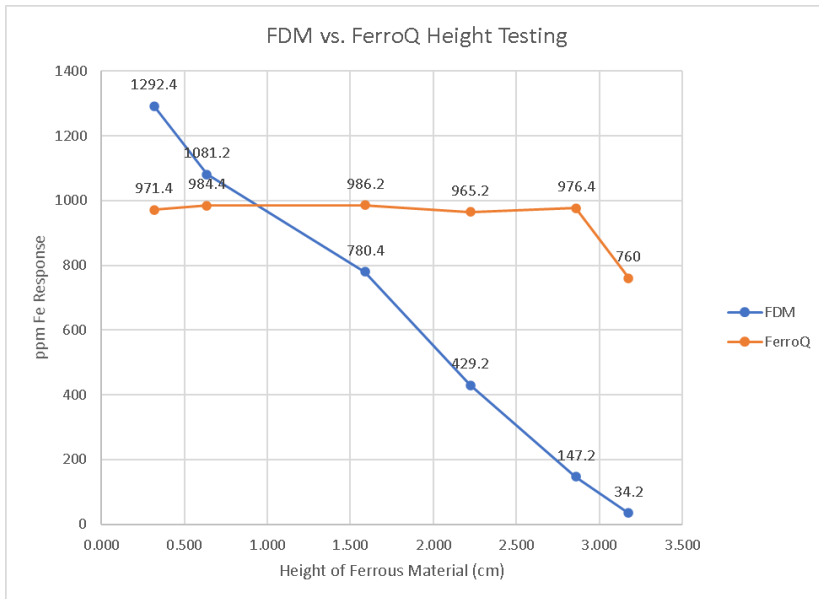


Figure 2 Graph comparing ferrous measurements with a metal ball at various heights. The fdM+ response is shown in blue and the FerroQ response is shown in orange.

continued to keep a similar ferrous response throughout the different heights of the metal ball. Figure 2 shows a graph of this study with the height of the metal ball on the X-axis and the ferrous response on the Y-axis. This is important for lubricant sampling because a sample may not be homogenous in its ferrous concentration distribution. If samples ferrous debris is concentrated at the top of the sampling device, the fdM+ may produce a decreased ferrous response due to the ferromagnetic coil ability. The FerroQ is able to record accurate ferrous measurements regardless of the height or uniformity of the ferrous debris in a sample.

The FerroQ was designed to provide a repeatable ferrous debris measurement regardless of the level of homogeneity in the sample.

The FerroQ also has a higher range of detection than the fdM+. Where before the fdM+ could reach a maximum of 30,000 ppm, the FerroQ can reach a maximum of 200,000 ppm. MRG Laboratories believes this change from fdM+ to FerroQ will result in more accurate and repeatable ferrous measurements with a range nearly 10x that of the fdM+.

What this Means to You:

As of June 14, 2021, MRG Laboratories will no longer perform ferrous debris testing using the Analox fdM+ and will switch over to the FerroQ Ferrous Debris Analyzer in the interest of providing more consistent and trendable data. Using FerroQ may lead to different ferrous debris values, as a result, you may see a spike in ferrous debris values.

Recommendations:

New acceptable limits should be determined for the equipment as previous ferrous data using fdM+ will show differences to the newly implemented FerroQ results. MRG Laboratories can assist customers as they create new limits, as necessary.

Questions or requests for more information may be directed to:

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Keywords

Grease Ferrous Debris
FDM+
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