

## **Development of a Differential Magnetic Probe to Evaluate Metal Loss due to Corrosion**

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### ***Abstract***

Corrosion is one of the most common problems associated with steel structures. The occurrence of corrosion may lead to metal loss, at which point might threaten the integrity of a steel structure. Therefore, the employment of magnetic flux leakage (MFL) and eddy current testing (ECT) is beneficial in providing detection of metal loss due to corrosion. Thus, a differential magnetic probe using both methods is developed. The probe consists of two fluxgate sensors and an excitation coil. Then, a line scan measurement is conducted on a 6mm mild steel sample with metal loss defects. From the result of the line scan measurement of the MFL signals, the presence and depth of the defects could be identified. Meanwhile, only the defect presence can be identified from the ECT signals, although only restricted to higher frequencies detection.

*Keywords:* Magnetic flux leakage; MFL; Eddy current testing; ECT; Corrosion.