



# Eddy Current Testing

## Introduction

MISTRAS Group's Services Division offers a complete range of inspection, training and QA/QC services. We integrate innovative technologies with conventional testing methods to ensure the integrity of industrial materials and components as cost effectively as possible.

## Current Condition

Eddy Current testing is based on measuring the impedance of a coil (Figure 1) or inducing electrical currents (Eddy Currents) in a conductive material. Any changes in the coils impedance due to geometry, material changes, or discontinuities- such as pitting, erosion, corrosion, baffle fretting, cracking, and/or other anomalies will disrupt the flow of Eddy Current and produce a representative signal on the ET instrument.

Eddy Current testing is commonly used to inspect non-magnetic (nonferrous) and slightly magnetic alloys that are conductive such as: stainless, 90/10 Cu. Ni., brass, titanium, hastalloy, Inconnel, copper, monel, etc. Eddy Current testing is very sensitive to small defects such as stress corrosion cracking (Figure 2); however it is critical to use proper Eddy Current techniques and procedures. Interpretation of Eddy Current data is very complex and requires years of experience to correctly characterize signal formations (See Figure 3).

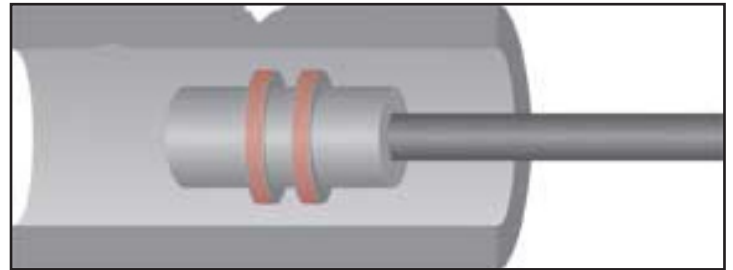


Figure 1

## Application Solutions

MISTRAS Services provides highly qualified Eddy Current technicians for on-site and in house data analysis, utilizing the most advance state of the art software for ET testing (Multi-Scan MS 5800 / Figure 4). The equipment allows the technician to accurately and confidently inspect any tubing in Real-time, by allowing full length recording capabilities. This allows Data Analysis to be performed offline in order to assess damage with the customer.

### ET Applications:

- Heat Exchangers
- Condensers
- Feedwater Heaters
- AC Chillers (Air Conditioners)

### Applications Advantages:

- Inspection of nonferromagnetic tubing (such as Stainless, 90/10 Cu.Ni, Brass, Monel, Titanium, and etc).
- High rate of inspection (80 to 100 tubes per/hr).
- Can distinguish between I.D. and O.D. defect orientation.
- Sensitivity to gradual wall loss, corrosion, pitting, erosion, baffle fretting, cracking and etc.

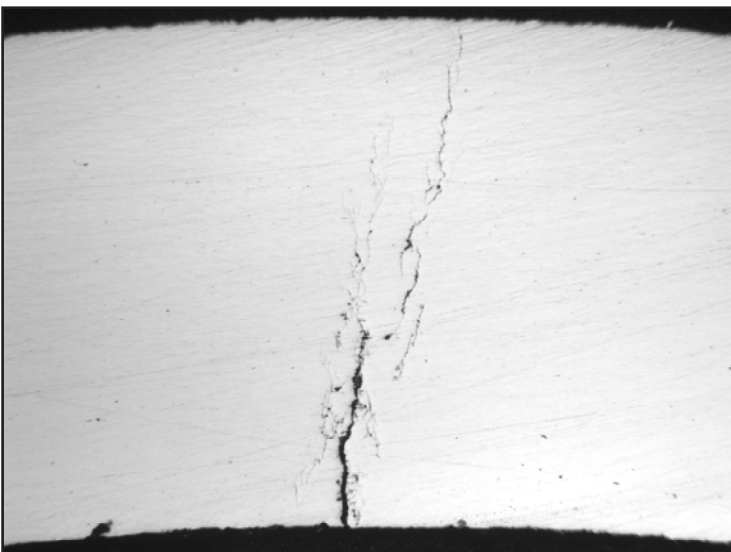


Figure 2

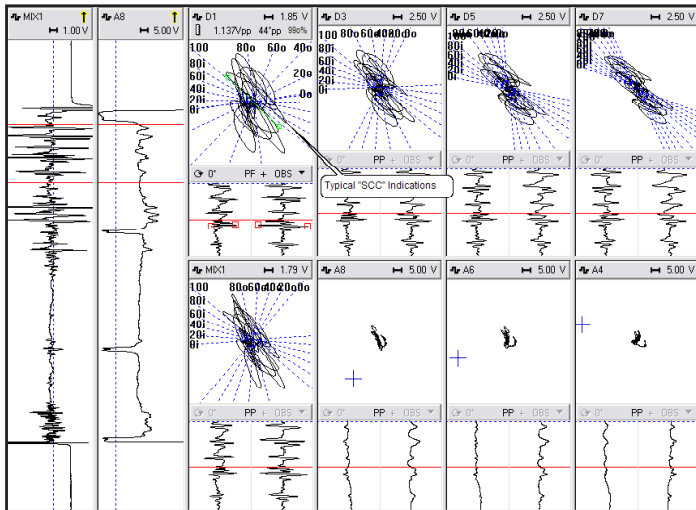


Figure 3

### Requirements and Site Preparation:

- Tubes must be cleared of all I.D. loose scale and deposits.
- Hydro-blast (10,000 to 25,000psi / depending on material type) is common practice.
- 110 AC power supply.
- Customer safety requirements in plant or unit.
- Tube information is critical (U-1 Spec. Sheet) to assure proper equipment is used for the project.

### Reporting:

- Formal report contains cover sheet, table of contents, introduction, executive summary, tube sheet layouts, data summary sheets, detail data sheets, printouts of graphics, etc.

MISTRAS Group, Inc. is a team of skilled researchers, engineers, technicians and manufacturing personnel dedicated to the development of practical and cost saving solutions to meet your challenging inspection needs.

For assistance or additional information, please contact our main headquarters at 609-716-4150 or via email at [sales.services@mistrasgroup.com](mailto:sales.services@mistrasgroup.com).



Figure 4

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