PULSED EDDY CURRENT (PEC)
Who we are

Conventional and Advanced NDT and Inspection Services

Oil and Gas, Refinery, Petrochemical, Heavy Industry, Mining

Over 400 personnel including more than 300 inspectors

Thailand headquarters with International expertise since 1979
Thickness readings through coatings and insulation

Electromagnetic technique for measuring the thickness of steel objects such as pipe and vessels

Eddy Current sensor is placed on top of the thermal insulation

Magnetic field generated in the material

By measuring the duration for eddy current to “decay” a reference to the thickness of the material can be made.
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Principle

Insulated steel pipe
PEC instrument
Probe

Pulse Generator
Analogue to Digital Converter (ADC)
Computer
Steel Thickness

Current Pulse
Current
Time

Transmission coil
Receiver coil
Magnetic field
Insulation cover
Insulation material
Steel
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- Magnetic pulse sent out
- Eddy Currents generated in the (permeable) material
- Eddy currents generate a magnetic field of their own, affecting the receiver coil
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• While penetrating the material the eddy currents get weaker and decay.

• When the eddy currents hit the back wall a sudden drop in Eddy current strength takes place.

• The time of between the first pulse and when this sudden drop off takes place is a measure for the thickness of the material.

**PEC signal**

![Diagram showing PEC signal with points 1, 2, and 3, indicating thinner and thicker wall scenarios.](image)
Applications:

• CUI
  • Insulated Piping
  • Insulated Vessels
  • Insulated Tanks

• High temp applications

• Surfaces covered by marine growth
  • Offshore risers
  • Caissons
  • Port structures, steel sheet piling
  • Ship hulls

• Composite wrap repaired areas

• Behind concrete fire proofing
  • Sphere legs
  • Vessel skirts
  • Boilers

• Concrete coated pipes

• Power plant piping (Flow Accelerated Corrosion, FAC)
Application example: Sphere legs
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Application example: CUI

• Piping
• Tanks
• Vessels
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Application example: Offshore Risers/ Caissons
Application example: Subsea applications
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Capabilities

• High temperature no concern (-100 to 550 Degrees C)
• 3-35 mm thickness
• Pipe diameter 3” to flat
• Lift off range 0-200 mm (up to 200 mm insulation)
• Accuracy +/- 10%
• Measure through Aluminum and SS sheeting
• Results highly repeatable, suitable for corrosion monitoring
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Disadvantages

- Can only be used on ferro-magnetic materials
- Measures variations in wall thickness within an object, not absolute thickness
- Can’t measure through galvanized sheeted insulation
- Small isolated corrosion pits can be missed.
- Measures the average wall thickness over the footprint of the probe
  - Depends on size of probe and amount of lift off
Reporting
### Summary of Gas Chillers E-1502 (Section-A)

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#### Reporting Summary

**Graphs showing distribution of readings and remaining weight.**
How Can We Help?

Contact

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