



2018 PRODUCT CATALOG

# FERROUS TUBING PROBES



# Ferrous Tubing Probe Selector Matrix

| Tube Material     | Tube Type            | ECT | ECA | IRIS | RFT | NFT | MFL |
|-------------------|----------------------|-----|-----|------|-----|-----|-----|
| Non-ferromagnetic | Tube                 | ✓   | ✓   | ✓    | —   | —   | —   |
|                   | Integral finned tube | ✓   | ✓   | ✓    | —   | —   | —   |
| Low Ferromagnetic | Tube                 | ○   | ○   | ✓    | ✓   | ✓   |     |
|                   | Integral finned tube | ○   | ○   | ✓    | ✓   | ✓   | ✓   |
| Ferromagnetic     | Tube                 | —   | —   | ✓    | ✓   | ✓   | ✓   |
|                   | Integral finned tube | —   | —   | ○    | ✓   | ✓   | ✓   |
|                   | Aluminum finned tube | —   | —   | ✓    | —   | ✓   | ✓   |

## Selection of NDT test method based on detection sensitivity

| Discontinuity Sought  | Sensitivity Criteria     | ECT | ECA | IRIS | RFT | NFT | MFL |
|-----------------------|--------------------------|-----|-----|------|-----|-----|-----|
| ID Pitting            | Probability of Detection | ✓   | ✓   | ✓    | ○   | ○   | ✓   |
|                       | Sizing Capability        | ○   | ✓   | ✓    | ○   | —   | —   |
| OD Pitting            | Probability of Detection | ✓   | ✓   | ✓    | ○   | —   | ○   |
|                       | Sizing Capability        | ✓   | ✓   | ✓    | ○   | —   | —   |
| Axial Cracking        | Probability of Detection | ✓   | ✓   | —    | ○   | ○   | —   |
|                       | Sizing Capability        | ✓   | ✓   | —    | —   | —   | —   |
| Circumferential Crack | Probability of Detection | ○   | ✓   | —    | —   | —   | ○   |
|                       | Sizing Capability        | —   | ✓   | —    | —   | —   | —   |
| ID Corrosion          | Probability of Detection | ✓   | ✓   | ✓    | ✓   | ✓   | ✓   |
|                       | Sizing Capability        | ○   | ✓   | ✓    | ✓   | —   | —   |
| OD Corrosion          | Probability of Detection | ✓   | ✓   | ✓    | ✓   | —   | ○   |
|                       | Sizing Capability        | ✓   | ✓   | ✓    | ✓   | —   | —   |
| At Tubesheet          | Probability of Detection | ○   | ✓   | ✓    | ○   | —   | ○   |
|                       | Sizing Capability        | ○   | ○   | ✓    | —   | —   | —   |

- ✓ The test method has proven results for the specific application
- The test results obtained from the test method can be interpreted reasonably
- Test method is either not suitable for the sought application or non-reliable in terms of repeatability

## Remote Field Testing (RFT) Probes

The Remote Field Testing (RFT) technique is a variation of the eddy current send/receive probe technique. The exciter coils are separated from the receiver coils by a distance equivalent to two or three times the tube OD. The receiver coils sense the flux lines that cross the tube wall twice. Remote field has an equal sensitivity to ID and OD indications, while the phase shift is directly proportional to wall loss. The remote field testing technique is used for the inspection of ferromagnetic tubing; such as carbon steel and ferritic stainless, as well as for the detection and sizing of wall thinning resulting from corrosion, erosion, wear, pitting, and baffle cuts.

### Absolute and Differential Coil Detection

When using Zetec's RFT probes with the MIZ-200 or MIZ-28, RFT probes can inspect in absolute or differential coil mode. Absolute mode provides better detection of long gradual types of flaws. Differential mode is better for detection shorter or more abrupt flaws.



### Frequency Selection for all RFT Probes

20 Hz to 200 Hz used for carbon steel thicker than 6mm

100 Hz to 1000 Hz used for carbon steel applications like SA214 or SA179 (most popular)

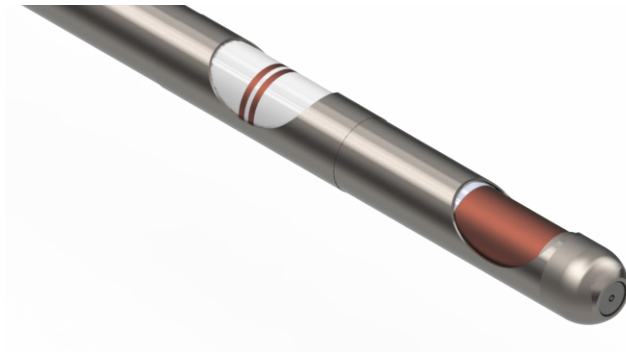
1 kHz to 10 kHz used for thin or lower permeability carbon steel like A-556

5 kHz to 30 kHz used for ferromagnetic stainless steel like SS439 (A-268) or SEA-Cure

### RFT Probe Diameter Selection

| Tube OD<br>(Outer Diameter) | Recommended Rigid Probe Clearance.<br>Tube ID – Probe OD | Recommended Flexible Probe Clearance<br>Tube ID – Probe OD |
|-----------------------------|--|--|
| 0.5" (12.7mm)               | 0.06" (1.5mm)  | 0.1875" (4.75mm)   |
| 0.625" (15.9mm)             | 0.06" (1.5mm)  | 0.1875" (4.75mm)   |
| 0.75" (19.05mm)             | 0.075" (2mm)   | 0.1875" (4.75mm)   |
| 1" (25.4mm)                 | 0.075" (2mm)   | 0.2" (5mm)   |
| 1.25" (31.75mm)             | 0.1" (2.5mm)   | 0.2" (5mm)   |
| 1.5" (38.1mm)               | 0.125" (3mm)   | 0.2" (5mm)   |
| 1.75" (44.45mm)             | 0.15" (4mm)  | 0.25" (6.35mm)   |
| 2" (50.8mm)                 | 0.15" (4mm)  | 0.3" (7.6mm)   |
| 2.5" (63.5mm)               | 0.15" (4mm)  | 0.3" (7.6mm)   |
| 3" (76.2mm)                 | 0.175" (4.4mm)   | 0.325" (8.26mm)  |
| 3.5" (88.9mm)               | 0.175" (4.4mm)   | 0.325" (8.26mm)  |
| 4" (101.6mm)                | 0.175" (4.4mm)   | 0.325" (8.26mm)  |

# RFTLS Remote Field Testing Low Voltage Single Exciter



## Standard Features

- ▶ Absolute and differential signal
- ▶ Wear resistant design

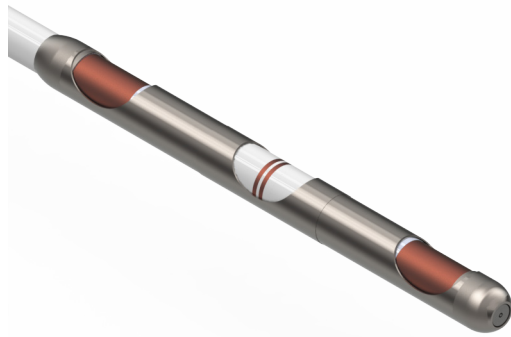
| Probe Diameter<br>1mm Increments                  | Poly<br>Length         | Push Poly<br>Black Polypropylene<br>Poly size Probe Diameter                      |   | Frequencies                                  | Connector       |
|---|------------------------|---|---|--|-----------------|
| 0.320" to 3.000"<br>(8mm to 76mm)                 | 65' (20m)<br>98' (30m) | Poly Diameter<br>5/16" (7.9mm)<br>21/64" (8.3mm)<br>3/8" (9.5mm)<br>1/2" (12.7mm) | Probe Diameter<br>8-10mm<br>11-12mm<br>13-25mm<br>26-76mm | 20-200HZ<br>100-1000HZ<br>1-10KHZ<br>5-30KHZ | 19 Pin Amphenol |
| <i>Custom options are available for all items</i> |                        |   |   |  |                 |

## Supporting Instruments and Software

MIZ-200 with EddyNet or Velocity

MIZ-28 with adaptor 043A800-00 ZEC-ADP-MIZ-28-LV-RFT (allows for exciter coils to be individually excited)

# RFTLD Remote Field Testing Low Voltage Dual Exciter



## Standard Features

- ▶ Absolute and differential signal
- ▶ Wear resistant design

| Probe Diameter<br>1mm Increments                  | Poly<br>Length         | Push Poly<br>Black Polypropylene<br>Poly size Probe Diameter                      |   | Frequencies                                  | Connector       |
|---|------------------------|---|---|--|-----------------|
| 0.320" to 3.000"<br>(8mm to 76mm)                 | 65' (20m)<br>98' (30m) | Poly Diameter<br>5/16" (7.9mm)<br>21/64" (8.3mm)<br>3/8" (9.5mm)<br>1/2" (12.7mm) | Probe Diameter<br>8-10mm<br>11-12mm<br>13-25mm<br>26-76mm | 20-200HZ<br>100-1000HZ<br>1-10KHZ<br>5-30KHZ | 19 Pin Amphenol |
| <i>Custom options are available for all items</i> |                        |   |   |  |                 |

## Supporting Instruments and Software

MIZ-200 with EddyNet or Velocity

MIZ-28 with adaptor 043A800-00 ZEC-ADP-MIZ-28-LV-RFT (allows for exciter coils to be individually excited)



Zetec holds ISO 9001  
and ISO/IEC 17025  
certifications



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