



**Finally.  
Reliable NDE Inspection of  
Non-Metallic Materials.**

# **Spectrum Evisive Scan**

**Polyethylene Butt Fusion Welds**

**HDPE Electrofusion Coupling**

**HDPE and FRP Pipe and Joints**

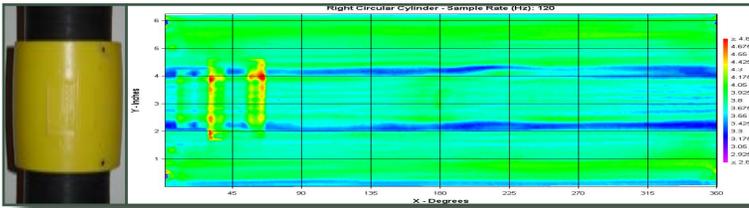
**FRP Tanks or Vessels**

**Rubber Expansion Joints**

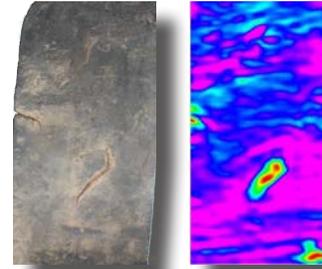
**Truck Tires**



# Spectrum Evisive Provides Accurate Assessment of Previously Uninspectable Components



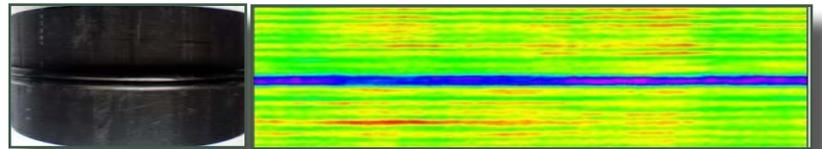
✓ Polyethylene Butt and Electrofusion Welds



✓ Truck Tires



✓ FRP and HDPE Pipe



✓ HDPE Pipe Joints

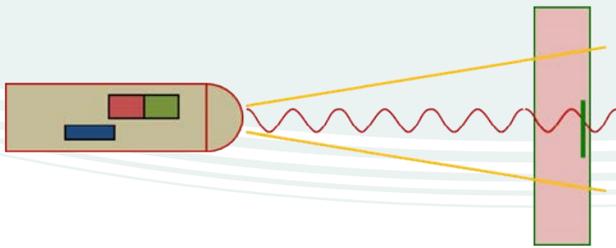
## Materials That Can Now Be Inspected

- Thermoplastics
- Reinforced and Unreinforced Rubber
- Fibre Reinforced Plastic
- Honeycomb Structured Composites
- Spoolable Composite Pipe
- Coated, Lined or Insulated Steel
- Complex Composite or Hybrid Structures
- Ceramics
- Polyethylene and Other Plastics
- Wood
- Kevlar
- Foam and Ceramic Insulation
- Epoxy and Polyurea Linings and Coatings
- Masonry
- Refractories

## Defects That Can Now Be Detected

- Cold Fusion in HDPE Welds
- Misalignment
- Corrosion on steel pipe I.D. through a liner
- Corrosion on steel pipe O.D. through insulation
- Delaminations
- Disbonds
- Cracks
- Foreign Material Inclusions
- Voids
- Adhesive Misapplication
- Air Bubbles
- Changes in thickness
- Moisture or other liquid contamination
- Mechanical damage
- Physical changes due to chemical attack

# How Does It Work?



The system bathes the subject part in microwave energy.

Reflected energy is measured with the transmitted signal to create a detector voltage.

The probe (transmitter and receiver antenna) is moved over the specimen surface.

The detector voltage is sampled across the specimen and an image is created.

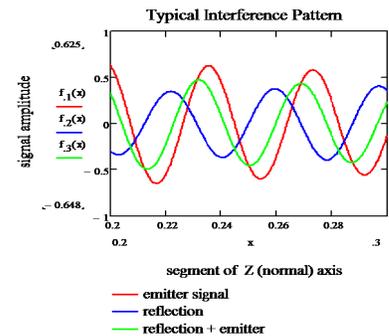
The difference between the emitter signal and reflection is a standing wave pattern.

The Z distance to reflection within a wave length defines phase relationship of the reflected signal to the emitted signal and the amplitude of the difference signal.

The difference is a variable DC voltage.

This DC signal creates the image value for a given point over the part surface.

This point cloud is the Spectrum NDT Evisive scan data and yields the images directly.



## Advantages of Spectrum Evisive Compared to Other NDE Technologies

Unlike ultrasonic, microwave (MW) energy is not absorbed or dispersed in non-metallic material.

MW energy is able to pass through multiple layers of materials, making detection of even deep defects simple.



The Spectrum Evisive system is adept at identifying delaminations, the most common flaw leading to failure of composite (FRP) materials, which are undetectable by radiography.

The signal will not be lost or masked due to multiple reflectors, such as fibre reinforcements.

For polyethylene welded joints, this technology is particularly strong at detecting cold fusion where no ultrasonic reflections exist.

It can also measure and image “bulk” properties, such as porosity, density, moisture ingress, and changes in chemical composition.

No direct contact, couplant, or immersion is required to inspect a component.

Inspection can be performed with access from a single side only.

# About Spectrum

Demand for pipeline integrity and related services is increasing rapidly, and Spectrum is expanding to meet that demand. Spectrum brings decades of experience and the most advanced nondestructive examination techniques and technology. We offer pipeline integrity services to protect your investment and your bottom line, nondestructive analysis techniques to assess material, component and system properties without damage, and reliable inspection capabilities for non metallic components.

Spectrum specializes in applying very advanced non-destructive evaluation techniques to solve our customers' inspection and quality control challenges. For more than a decade we have specialized in using CIT Phased Array technology. And with the introduction of microwave inspection technologies, Spectrum has become the leader in both non-metallic and metallic NDT applications.

## Support for the Industry

Spectrum's customers benefit from the technical support offered by Spectrum across all areas of NDT. This enables our clients to:

- ✓ Reduce cost & increase profitability
- ✓ Comply with government regulations
- ✓ Improve safety, quality and availability
- ✓ Establish & increase competitive advantage
- ✓ Extend useful service life

### We offer services to:

Pipelines

Manufacturers

Oil and Gas Companies

Petroleum Plants

Fabricators

And more



### Contact Spectrum

Bay 40, 3170 114 Avenue SE  
Calgary, Alberta T2Z 3V6

Phone: (403) 262-9958

Fax: (403) 262-0049

[www.spectrumndt.com](http://www.spectrumndt.com)

