



● TesTex Service Locations  
 ● TesTex Affiliates

**TesTex Service Locations:**

Pittsburgh, PA  
 Atlanta, GA  
 Houston, TX  
 South Bend, IN  
 Philadelphia, PA  
 New Orleans, LA  
 Bakersfield, CA  
 Buenos Aires, Argentina  
 Mumbai, India  
 Baroda, India  
 Varanasi, India  
 Hiroshima, Japan  
 North Killingholme, UK  
 Lyon, France  
 Le Havre, France  
 Moncton, Canada  
 Moscow, Russia

**Future Service Locations:**

Colombia  
 United Arab Emirates  
 Indonesia/Malaysia  
 Saudi Arabia  
 Brazil  
 Mexico  
 China

**TesTex Affiliates:**

TesTex Inspection, LLC  
 Pittsburgh, PA  
 Baker Inspection Group, LLC  
 North Canton, Ohio

**Headquarters:**

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INNOVATIVE PRODUCTS & SERVICES FOR NON-DESTRUCTIVE TESTING



**T**esTex, Inc. was established in 1987 with a clear mission to develop innovative products and services for the Non-Destructive Testing industry.

After 22 years of continuous effort, TesTex has a vast array of products and services to offer to both industrial site end users as well as service providing NDT companies. Our unique and proprietary technologies are focused mainly in electromagnetics along with an increasing number of ultrasonic devices.

To date, TesTex has approximately twenty operating locations worldwide. Through our own operations and the operations of those who have acquired our systems, our technologies are being applied on a worldwide basis.

In addition to Non-Destructive Testing, TesTex has followed a natural path to expand into the fields of Inspection and Mechanical Integrity/Process Safety Management through the formation of sister companies such as TesTex Inspection LLC (TIL) and Baker Inspection Group (BIG).

Future plans include the continuing effort of ongoing applied Research and Development as well as the continuous expansion of service operations and technology applications.

We proudly present to you this offering which details our current slate of products and services for your review.

*Very Best Regards,*

*The staff of TesTex, TesTex UK, TesTex India, TesTex SA Argentina, TesTex Japan, TesTex France, TesTex Canada, TesTex Russia, TesTex Inspection LLC, and Baker Inspection Group*



*Headquarters/Research and Development/Manufacturing Facility. Pittsburgh, PA*

**Low Frequency Electromagnetic Technique (LFET)** was developed to inspect flat bottom storage tank floors. Over time, scanners have been contoured to inspect convex or concave ferrous and nonferrous metal tubing/piping surfaces. Various scanners are available for most applications.

### Applications:

- Boiler Waterwalls
- Reheaters/Superheaters
- Storage Tanks
- Pipelines
- Service Water Piping
- Fire Protection Piping
- Coal Mill Piping
- General Piping
- Pressure Vessels
- Heat Exchanger Shells

## Waterwall Inspections

### Inspection Benefits:

- Approx. 2000 linear feet (610m) per shift
- Uniform rust, scale, and coatings are not a problem
- Hot-side surface scan
- Easily detects corrosion cells, hydrogen damage, caustic gouging, pitting, and general wall loss
- Inspects both ferrous and nonferrous tubing



## TS-2000

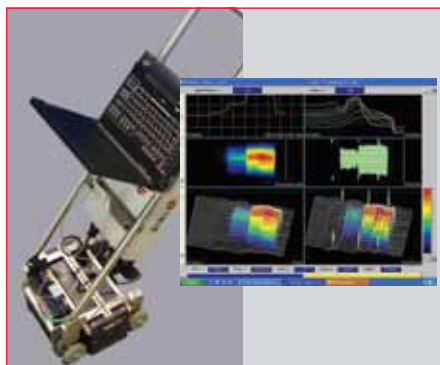
### Equipment Features:

- Inspects up to .500" (12.7mm) thick ferrous material
- No couplant needed
- High resolution color graphics with 3D display
- Variety of contoured scanners to fit any tube diameter
- Up to 32 sensors to achieve maximum coverage in a single scan

## Tank Floor Inspections

### Inspection Benefits:

- Detects both topside and bottomside defects
- Inspects through coatings
- Minimal floor preparation required
- Inspects heat affected zones
- General wall loss and pitting easily detected
- Inspects both ferrous and select nonferrous metals



## Falcon Mark II

### Equipment Features:

- Falcon features 32 channels and a 13" (330mm) wide scan area
- Flaw Threshold LEDs
- Over speed alarm
- High resolution color graphics with 3D display
- Real time display with advanced signal processing
- Optional battery power
- Optional encoder
- Optional mapping software

## O.D. Pipeline Inspection

### Inspection Benefits:

- Inspection speeds of up to 10-15 ft/min (3.05-4.57m/min)
- 360° coverage on pipe diameters ranging from 3"-10" (76.2mm-254mm)
- Multiple scans required on pipes > 10" (254mm) O.D.
- Can scan through uniform scale, rust, or coatings
- Inspects both ferrous and nonferrous piping



## LineCat

### Equipment Features:

- Mechanically driven option
- Operational in Sub-Arctic climates
- System can be adapted to fit many pipe sizes with interchangeable parts and components
- Aluminum construction for weight reduction
- Optional encoder

## General Piping Inspections

### Inspection Benefits:

- Inspects both straight sections and bends
- Inspects through both I.D. and O.D. scale
- Detects MIC attack, FAC, erosion, corrosion, pitting and cracking
- Testing is performed on-line with the product inside having no impact



## PS-2000

### Equipment Features:

- Light weight scanner attachments
- Large frequency range 5Hz to 30KHz
- Real-Time Display
- Operates manually or with motorized crawler
- Scanner cable lengths up to 100 ft (30.5m)
- Discriminates I.D and O.D. defects

**Remote Field Electromagnetic Technique (RFET)** is designed to quickly and accurately inspect ferrous tubing from the I.D. TesTex has pioneered the advancement of this technique for both the inspection of small diameter tubing and large diameter piping. This method is effective in detecting a variety of internal and external defects such as general corrosion, erosion, pitting, etc.

**Applications:**

- Boiler Gen Banks
- Feedwater Heaters
- Service water piping
- General piping
- Heat Exchangers

**Feedwater Heater Inspections**

**Inspection Benefits:**

- U-bend Inspections possible
- Tests 300-500 tubes/shift (RFET)
- Tolerates low fill factors
- I.D./O.D. flaw detection
- Requires no couplant
- Requires little tube cleaning



**Eagle-2000 Plus**

**Equipment Features:**

- Up to 8 channels/32 sensors
- Lightweight and compact
- Windows/PC based
- Modular
- Up to 100' (30.5m) probes without amplification
- High resolution color graphics with 3D display

**Heat Exchangers/Boiler Inspections**

**Inspection Benefits:**

- Inspects through scale
- Tests 300-500 tubes/shift (RFET)
- Tolerates low fill factors
- I.D./O.D. flaw detection
- Probes down to .250" (6.35mm) in diameter
- Inspects bends
- Inspects from either drum in boilers



**Small Diameter Pipeline Inspection**

**Inspection Benefits:**

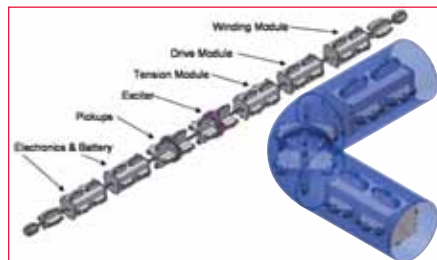
- I.D. based inspection
- Tethered
- Inspects up to 12" (305mm) diameter pipes
- Up to 32 channels



**Intermediate Diameter Pipeline Inspection**

**Inspection Benefits:**

- I.D. based inspection
- Tethered
- Inspects 12"-30" (305-762mm) diameter pipelines
- Up to 160 channels
- Linear and angular position embedded in scan data
- Negotiates most bends



**Equipment Features:**

- Internal RAID for data storage
- Water/shock resistant
- 10' (3.05m) per minute inspection rate
- PC based storage/analysis
- Distance encoder
- Unmanned self-contained probe (no umbilical)
- Tethered for horizontal or vertical runs

**Larger Diameter Pipeline Inspection**

**Inspection Benefits:**

- I.D. based inspection
- 72 channels
- Linear and angular position embedded in scan data
- Up to 500' (152m) runs
- Inspects up to 42" (1.07m) diameter pipes
- Negotiates limited bends



**Equipment Features:**

- Three pass inspection; 130° coverage arc with overlap
- Environmentally sealed
- 10' (3.05m) per minute inspection rate
- All components fit through a 24" (610mm) manway
- Distance encoder
- Manned vehicle

**Eddy Current Technique (ECT)** was developed to test nonferrous metals. TesTex expanded upon this technique with the help of automated software and high speed probe driving and pulling mechanisms. TesTex has also added the ability to inspect ferrous metals with the introduction of the Mag-Wave technique

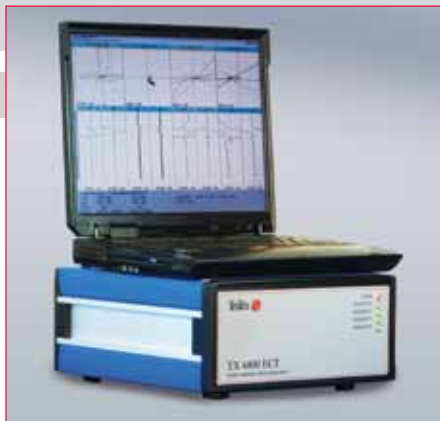
### Applications:

- Condensers
- Feedwater Heaters
- Coolers
- Evaporators
- Chillers

### ECT Tubular Inspection

#### Inspection Benefits:

- Four frequencies for better flaw sizing and detection
- Automated and Manual analysis done on-site
- Unwanted signals such as support plates can be suppressed
- Compatible with TS-MAP and AR-Wizard so final report is delivered on-site



### TX-4400

#### Equipment Features:

- Eight standard channels with a multiple of mixing channels
- 1KHz to 1.2MHz frequency range
- Real-time mixing
- Compatible with bobbin, surface, and magnetic saturation probes
- Wide variety of special data filters
- Fully digital

### High Speed Inspection

#### Inspection Benefits:

- Inspection speeds of up to 5 ft/sec (1.52m/sec)
- Inspects up to 8 tubes per minute
- 2k-3k tubes inspected per team per 12 hour shift
- Can be used on ferrous and nonferrous materials



### PD-6K

#### Equipment Features:

- Light weight, only 13.2 lbs (6kg)
- High speed probe insertion
- Connects directly to TX-4400 and utilizes the same software
- Adapts to different air fittings
- Needs only plant air
- Can be used with RFET probes and the Eagle-2000 plus electronics

### Ultra High Speed Inspection

#### Inspection Benefits:

- Inspection speeds up to 10 ft/sec (3.05m/sec)
- Probe insertion speeds of up to 22 ft/sec (6.71m/sec)
- Can inspect up to 12 tubes per minute
- 4k-5k tubes inspected per team per 12 hour shift



### PDP-22

#### Equipment Features:

- Probe inspection speeds are held constant
- Connects directly to TX-4400 and utilizes the same software
- Fits in 16" (406mm) manway
- Durable and reliable
- Over designed for long life
- Modular components for easy maintenance/repair

### Ferrous ECT Inspection

#### Inspection Benefits:

- Small pitting can be detected and quantified
- Large volume flaws can be detected and quantified
- Saturation can be adjusted to eliminate signal noise due to finned tubes
- Differentiates between I.D. and O.D. flaws



### Mag-Wave ET (MWET)

#### Equipment Features:

- 1KHz to 500KHz frequency range
- Computer automated analysis available
- Wide variety of MWET probe sizes
- Probes can be inserted automatically with the above Probe Driver (PD-6k)
- Uses TesTex 4400 Eddy Current unit plus an external amplifier/power supply

**Ultrasonic inspections** have been enhanced at TesTex for many different applications. A line of crawlers were created to accommodate various inspection challenges. In addition, tubular inspection needs were addressed with the addition of I.R.I.S. technology.

**Applications:**

- Tank Shells
- Columns
- UT Prove Up
- Pipes
- Finned Tubes
- Stacks/Chimneys
- Waterwalls
- Pressure Vessels

**UT Tank Shell Inspection**

**Inspection Benefits:**

- No scaffolding required
- Instant thickness readings
- Able to inspect 100' (30.5m) from one location
- Able to scan horizontal or vertical



**Viper**

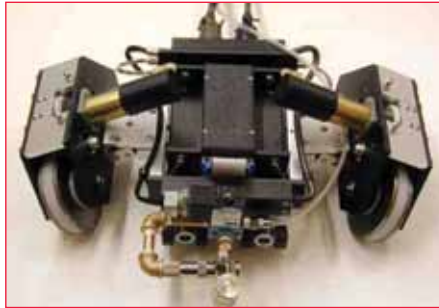
**Equipment Features:**

- Controlled with a handheld joystick
- Strong permanent magnet wheels
- Holds through several layers of paint
- Available in several designs for the inspection of tanks, stacks, pipes, etc.
- Optional encoder available

**UT/LFET Tank Shell Inspection**

**Inspection Benefits:**

- 4" (102mm) wide inspection swath
- No scaffolding required
- Able to scan horizontal or vertical
- Able to inspect 100' (30.5m) from one location



**LFET Viper**

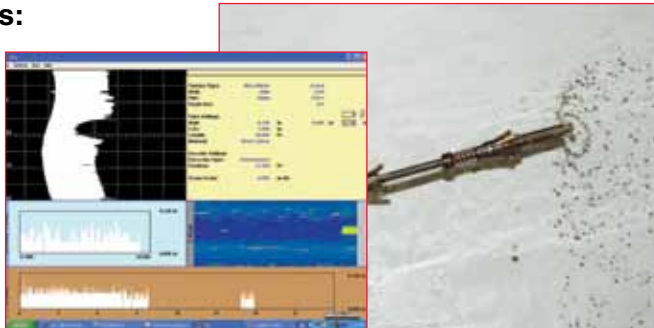
**Equipment Features:**

- Carries a 4" (102mm) wide LFET scanner
- Controlled with a handheld joystick
- Strong permanent magnet wheels
- Holds through several layers of paint
- Optional UT prove up
- Contours for curved surface inspection
- High resolution color graphics with 3D display
- Real time display with advanced signal processing

**I.R.I.S. Tubular Inspection**

**Inspection Benefits:**

- Inspects tube lengths up to 100' (30.5m)
- Inspects tube sizes from .340" (8.6mm) to 3.5" (88.9mm)
- Actual wall thickness readings recorded
- 100% of tube is covered through a helical path



**Helix-XT**

**Equipment Features:**

- User friendly setup panel and UT board control interface
- Full color acquisition and data viewer software with A, B, and C scans
- 4 different turbines and 5 different centering devices
- Compact and rugged design
- High speed 100MHz A/D
- Up to 20k PRF (Pulse Repetition Frequency)

**UT Inspection**

**Inspection Benefits:**

- Instant material thickness readings
- Inspects ferrous and nonferrous materials
- Can inspect high temperature surfaces with special couplant
- Easy to use



**TA-2000**

**Equipment Features:**

- Data logging capability
- Dual-element transducer
- A-scan display
- Menu driven
- Protective vinyl case with shoulder strap
- Attached four step steel calibration block
- Light weight and handheld

**Balance Field Electromagnetic Technique (BFET)** was developed by TesTex as an alternative to traditional surface eddy current. It is used to detect surface and sub-surface cracking in metals. With scanning speeds from a few inches/second to 1 ft/sec, the Hawkeye 2000 is much faster than conventional NDT techniques such as Dye Penetrant and Magnetic Particle testing. This technique can virtually be used anywhere cracking is an issue.

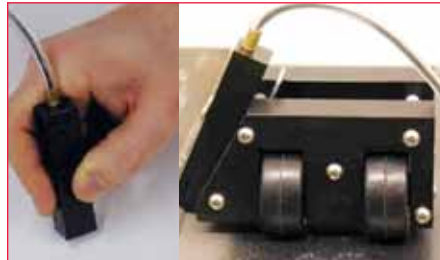
**Applications:**

- Pressure vessels
- Tube to header welds
- Dissimilar metal welds
- Windmill towers
- General vessels
- Storage tank floor/shell welds
- Bridges
- Columns
- DA tanks

**Weld Inspection**

**Inspection Benefits:**

- Detects surface and sub-surface cracking with or without coatings
- Test speeds from a few inches/second to 1 ft/second (0.30m/sec)
- Minimal surface preparation
- Detects cracks within .375" (9.5mm) of the surface
- Inspects ferrous and nonferrous metals



**Hawkeye-2000**

**Equipment Features:**

- Real time data processing
- Data displayed in horizontal, vertical, and impedance planes
- Noise and liftoff signals can be rotated away from flaw signals
- Up to 8 channels
- Frequency range 5Hz-30KHz

**Butt Weld and Surface Inspection**

**Inspection Benefits:**

- No couplant needed
- Minimal surface preparations
- Can inspect both sides of weld with one pass
- 4" (102mm) of coverage per pass



**Raster Hawkeye**

**Equipment Features:**

- 4 channels
- Precision height adjustment
- Bearing wheels
- Scanner body rotates up to 60° for cracking in various directions
- Traversing sensor array
- Rugged construction

**Surface Inspection**

**Inspection Benefits:**

- Detects surface and sub-surface cracking with or without coatings
- Test speeds from a few inches/second to 1ft/sec (0.30m/sec)
- Minimal surface preparation
- Inspects ferrous and nonferrous metals



**Single/Multi Channel Hawkeye Scanner**

**Equipment Features:**

- Up to 16 channels
- Detects surface and subsurface cracking to .125" (3.2mm)
- Lightweight ergonomic design
- Scans circumferentially around object

**Vessel Inspection**

**Inspection Benefits:**

- No couplant needed
- Minimal surface preparation
- Detects cracks, undercuts, porosity, slag, etc.
- Test speeds from a few inches/second to 1ft/sec (0.30m/sec)



**Deep Penetrating Pencil Hawkeye Probe**

**Equipment Features:**

- Detects defects up to .375" (9.5mm) from the surface in carbon steel
- Scans .500" (12.7mm) wide path
- Compact design
- Easy to use

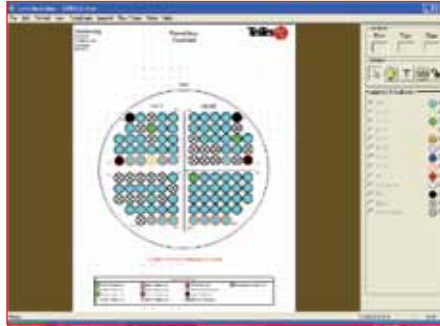
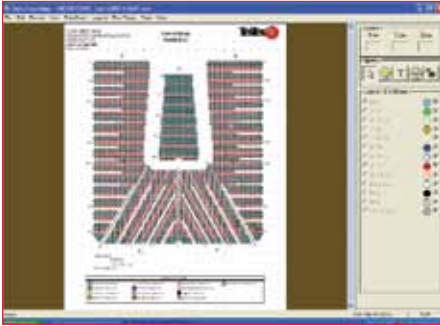


*Specialized software* has been developed by TesTex for a variety of inspection applications. These applications include, but are not limited to, tube sheets, tank floors, report writing, and automated analysis.

**Compatibilities:**

- TS-MAP: TesTex RFET and ECT software
- AR-Wizard: TesTex Tube Sheet Mapping software
- TF-Map: TesTex WinTank software
- TX-Solution: TesTex ECT software

**Tube Sheet Mapping**

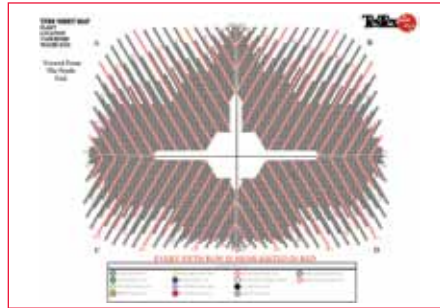
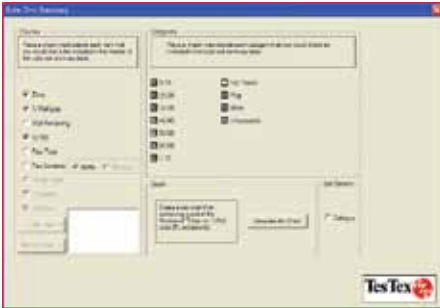


**TS-MAP**

**Software Features:**

- Extensive help menu
- Any tube layout can be made
- Tube dimensions can be in either inches or millimeters
- Maps can be inverted so units can be viewed from both ends
- Five standard legends to choose from
- Extremely user friendly

**Automated Reporting**

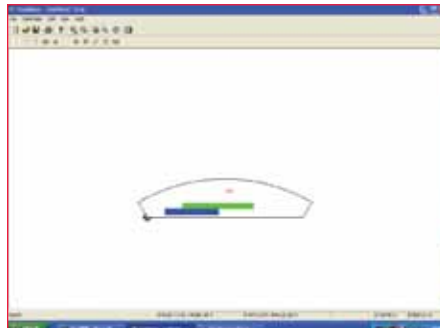
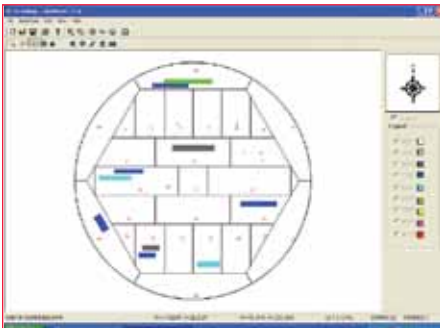


**AR-Wizard**

**Software Features:**

- All data can be imported from the analysis program with a simple click of the mouse
- On screen, step by step instructions for generating a preliminary or final report
- Either report can be generated within minutes of completing the inspection

**Tank Floor Mapping**

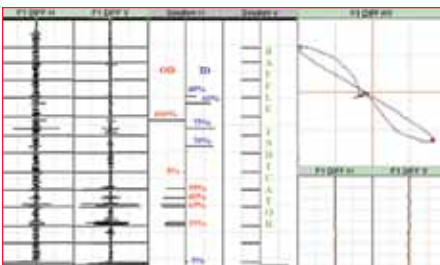


**TF-MAP**

**Software Features:**

- Plates can be numbered
- Each plate can be sized individually
- Resize by row
- Annular rings can be created
- Unlimited plate entry
- Can add patch plates
- Import sweep data
- Generate reports that include individual plates

**Automated Analysis**



**TX-Solution**

**Software Features:**

- Controls are all set from just one panel
- A full length tube can be analyzed in less than one second
- A 1,000 tube unit can be analyzed in less than 20 minutes
- Can be set to compare all 4 frequencies to rule out false positives
- Sorts indications and moves waveforms into 10% wall loss folders

## FEATURED PRODUCTS

### Prodigy 8C



The Prodigy 8C is the most innovative O.D. scanning system and method for the testing of tubing and piping to date. The Prodigy 8C is a one man, multichannel NDT system for scanning most any boiler tube/ pipe from the O.D. It detects and quantifies both I.D. and O.D. defects in ferrous metals. The system uses a dry non-contact method based on the principles of Electromagnetics (LFET). This system has its own built-in computer which is conveniently attached to the operator's body. The system can be adapted to many different applications such as testing ligaments, bends, space constricted areas, and small diameter tubing. The system is fast, accurate, cost effective, and field proven.

### Equipment Features

- 8 channels (8 phase, 8 amplitude)
- Frequency selection from 5 to 80 Hz
- PC Based
- LFET method (Low Frequency Electromagnetic Technique)
- USB interface
- Powered from a computer USB port
- Microsoft Windows XP Professional
- 1 GHz Processor
- 1 GB ram
- 16 GB compact flash
- 5.6" LCD display with VGA controller and industrial 3 button mouse
- Environmentally sealed connections
- AC or DC operated
- Standard 6' (1.83m) or optional 25' (7.62m) scanner cable
- Total weight under 12 lbs (5.45kg)
- 5 hours of battery life
- Compatible with any TesTex LFET based scanner with up to 8 channels

### Falcon Wingspan



The world's most advanced and compact inspection tool for above ground storage tanks has many new features to enhance inspection capabilities. These improvements are based upon TesTex's field experience in testing thousands of storage tanks, as well as input from dozens of NDT inspectors from both domestic and international industries. The Falcon Wingspan System is based on the principles of Low Frequency Electromagnetic Technique (LFET). This system has several advantages over other conventional methods such as magnetic flux leakage (MFL) and ultrasonic testing (UT).

- 24" (610mm) scanning width
- 12 sensor pods (96 Sensors) with individual suspension for lift off compensation

### Equipment Features

- Uses a maximum voltage of 12V DC
- Chemically resistant wheels provide easy maneuverability and independent height adjustment
- 12V batteries provide 10 hours of operation
- PC based/modular electronics using Field Programmable Gate Array (FPGA) technology
- Encoder tracks distance and speed information for locating and mapping flaws
- No couplant or magnets required
- Minimal floor preparation
- Tests through coatings
- Scanning speeds of 15-20 ft (4.6-6.1m) per minute
- Real time data display with advanced signal processing
- High Resolution color graphics with 3D display
- Full coverage over scanned area with no "dead space"
- Topside and bottomside defects evaluated in a single scan

**TesTex is a Solution Provider.** We directly solicit feedback from industrial companies and trade groups in order to determine emerging needs in the field of NDT. Once a set of needs are established, TesTex conducts applied R&D to develop an inspection solution. Once a solution is developed, TesTex can then offer a deliverable solution in the form of an inspection service.

Since its founding in 1987, TesTex has been focused on the Research & Development of high-end NDT methods primarily in Electromagnetics. The first application development project was for Bettis Atomic Labs (for the United States Nuclear Navy). The task was to develop an inspection technology for Magnetic Heat Exchanger Tubes that could detect and quantify wall thinning as well as pitting without using a secondary inspection method.

Whether through internal feedback from our Field Service Group, or direct input from industrial clients or trade groups, TesTex continues to conduct consistent Research & Development. We have a full time staff spanning areas of expertise in Digital Design, Mechanical Innovation, Software Programming, System Integration, and Sensor Development.

### Underground Service Water Piping Inspection

In response to a request by the Electric Power Research Institute (EPRI), TesTex (in partnership with Nova Technology Inc.) has developed a prototype system to inspect 42" (1.07m) diameter buried piping. TesTex created a custom Remote Field Electromagnetic Technique instrumentation package which, when integrat-



ed with a specialized pipe crawler built by Nova Technology, provides an inspection capability not previously available to any industry with buried large diameter piping systems.

With 72 sensors, the instrumentation has the sensitivity to detect a .500" (12.7mm) diameter pit of 50% wall loss in a 42" (1.07m) carbon steel pipe with



.500" (12.7mm) wall. The 72 sensors have a circumferential coverage of a 130° arc, allowing the entire pipe surface to be scanned in three passes with coverage overlap. In addition, the sensors are designed for up to 1" (25.4mm) liftoff from the inner pipe surface to allow for sediment build-up on the surface.

The inspection system (crawler and instrumentation) has been designed for quick assembly and disassembly. Each of the disassembled components can be inserted into the buried pipe through a standard 24" (610mm) manway. System assembly within the pipe is performed by a two-man team. Assembly, inspection, and disassembly can all be performed in a wet environment of up to 5" (127mm) of standing water.

### Intermediate Diameter Piping Inspection

In response to a request by the Electric Power Research Institute (EPRI), TesTex (in partnership with Nova Technology Inc.) is currently developing a prototype system to inspect piping of the intermediate diameter range of 12" to 30" (305 to 762mm). Based on instrumentation previously designed for EPRI, TesTex is creating a custom small-footprint Remote Field Electromagnetic Technique payload package which, when integrated into a specialized delivery vehicle built by Nova Technology, provides an unmanned inspection capability for horizontal and/or vertical intermediate diameter piping systems.

With 64 to 160 sensors (pipe diameter dependent), the electronic package has the sensitivity to detect a .500" (12.7mm) diameter pit of 50% wall loss in .500"

(12.7mm) pipe wall. Regardless of pipe diameter, the sensors provide complete 360° circumferential coverage with a single scanning pass. In addition, the sensors are designed for up to 1" (25.4mm) liftoff from the inner pipe surface to allow for sediment build-up on the I.D. surface.

Prior to deploying the probe down the pipe, the electronics configuration and system functionality are validated through a maintenance monitor port. Once configured, the electronics are fully functional without the need of user interaction. Sensor, positional, and system status data are simultaneously collected and easily off-loaded on completion of the scanning pass.

TesTex is developing a full suite of analysis and mapping application software in support of this project.

### Windmill Tower Cracking

A provider of windmills purchased steel that contained a number of surface cracks that needed to be investigated before the erection of 27 windmills. The tower portion of these windmills were 250' (76.2m) in height and are built from



4 sections. The bottom diameter is 13' (4m) and narrows at the top to a diameter of 9' (2.74m). The towers have a wall thickness between .875" (22.2mm) and 1.125" (28.6mm).

These tower sections were coated with an epoxy paint. As such, visual inspection for cracks was not possible. Because the problem was surface cracking, the tower sections had to be inspected from the outside as well as the inside of each section.

The initial teams were inspecting the sections with surface eddy current using a .250" (6.35mm) transducer. Inspection time was one tower length every 7 to 11 days using (4) teams.

TesTex was contacted to investigate alternatives that would provide accuracy while improving productivity.

TesTex applied its Balanced Field Electromagnetic Technique (BFET) which, enables penetration up to .125"

(3.2mm). The probes were arranged in an array that enabled a scan width of 4" (102mm) to 8" (203mm). By arranging the probes in an array, scanning speeds were enhanced exponentially. The inspection productivity increased to 1 tower per day scanning both the inside and outside with no increase in the number of teams.



## Pipelines

An oil company, in Prudhoe Bay, Alaska, with a transit pipeline, experienced two leaks within a year from internal pitting corrosion caused by MIC Attack. The oil company inspection department needed a screening technique to be able to detect a 30% deep, .250" (6.35mm) diameter pit.

The pipe-line was 34" (864mm) in diameter, .375" (9.53mm) thick carbon steel. There were two 5 mile (8km)



sections of transit piping with one pipe-line having a thin polyken tape wrap approximately .008" (0.203mm) thick. The inspection method needed to cover from the 4 o'clock to the 8 o'clock position.

Using the principles of Low Frequency Electromagnetic Technique (LFET), Tes- Tex developed the "LineCat" that combined 16 – 2" (50.8mm) wide pods into a rig for a coverage area of 32" (813mm) in width. This inspection rig was moved



along the pipe through the use of a remote controlled magnetic wheel crawler.



This inspection system scanned the pipe at 4" (102mm) per second and was able to detect a .250" (6.35mm) diameter pit with 30% wall loss. The use of the LineCat allowed up to a 1000 feet (305m) of pipe to be inspected per shift.

## Inspection of Economizers, Reheaters, and Superheaters

Tubes are spaced tightly together in Economizers, Re- heaters, and Super- heaters. The inspec- tion of these tubes is a major challenge for utilities. These tubes experience small diameter I.D. pitting caused by oxidation. The tubes may also experience O.D. erosion from fly ash, flue gas, or soot blowers.



TesTex developed an "Inspection Arm" that places a scanner on a tube



deep in the bank to inspect the tubes for wall loss. The inspection arm reduces the amount of time needed to spread tubes for accessibility and provides thickness readings on tubes in hard to reach areas. This project was partially funded by the Electric Power Research Institute (EPRI). The scanner is able to fit in a 2" (50.8mm) horizontal space and a .625" (15.9mm) vertical space. The LFET scanner can size small diameter pits and O.D. erosion.

## Sizing of Thermal Fatigue Cracks and Quench Cracks

Circumferential cracking is a leading cause of lost availability in super critical boilers. The cracks are easily detected if the tubes are cleaned, but this sand- blasting is costly. Even when the cracks are visible, it is difficult to evaluate the

depths of these cracks. Quench crack- ing of boiler tubes is also an issue for plants that use water cannons to remove deposits of Powder River Basin fuels.

TesTex is working on a project, partially funded by EPRI, to develop a method to ac- curately size the cracks. Working with our Hawkeye System, it may be possible to size the cracking. The system works off the principles of Balance Field Elec- tromagnetic Technique (BFET). These cracks occur in a very dense pattern. TesTex is currently try- ing to increase spatial resolution and improve display features to focus on individual crack sizing.



## Detection of Magnetite Due to Exfoliation of Stainless Steel Superheater Tubes

New super critical boilers are designed with austenitic stainless steel super- heater tubes that operate above 1005°F (541°C). These elevated temperatures cause the stainless steel tubes to produce magnetite on the inside surface of the tube. When taken off line, the tubes cool caus- ing the internal magnetite scale to exfoliate and ac- cumulate in the lower tube bends. Large amounts of loose scale in the bends can block steam flow and lead to a tube rupture.



LFET is able to detect and quantify the amount of magnetite in a stainless steel tube through the use of calibration tubes. The LFET scanner can pinpoint the location of the magnetite. This allows the plant to pinpoint which tubes to cut and clear of magnetite.

*TesTex manufactures a wide variety of probes, scanners and accessories to complement our systems. These items range from High Frequency Eddy Current probes to Low Frequency pipeline scanners.*

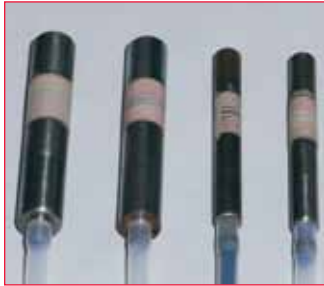
*All probes, scanners and accessories manufactured at TesTex are of the highest quality. TesTex is committed to supplying NDT equipment of the highest possible performance and it is with that commitment, TesTex is able to provide equipment with both excellent response signals and very low noise levels.*

*TesTex manufactures a variety of I.D. probes for various applications. In support of these applications, TesTex also manufactures a wide variety of calibration tubes.*

**Eddy Current Probes**



**MWET Probes**



**Steam Generator Probes**



**RFET Single and Multichannel Probes**



**RFET Submersible Flex Probes**



**Generator Bank Boiler Probes**



**I.D. LFET Probes**



**RFET Multichannel Flexible Pipe Probes**



**RFET Multichannel Flexible Pipeline Probes**



**Eddy Current Calibration Tubes**

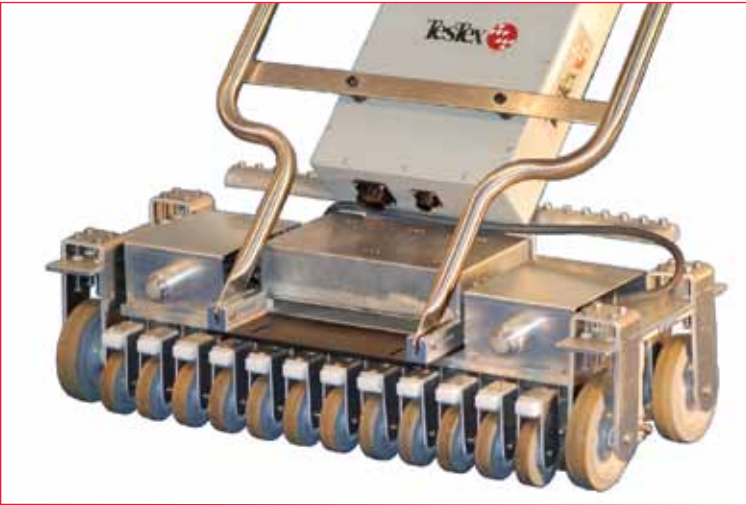


**Remote Field Calibration Tubes**

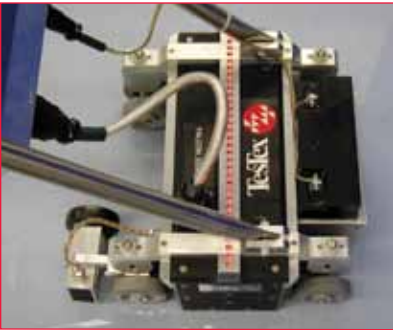


## Tank Floor Scanners

### Falcon Wingspan



### Falcon Mark II



### Falcon JR.



*TesTex manufactures a variety of scanners to support various applications such as waterwalls, tank floors, and superheater bends. In support of these applications, TesTex also manufactures a variety of calibration plates/tubes.*

## Vessel Scanners

### 13 Inch Hand Scanner



### 8 Inch Hand Scanner

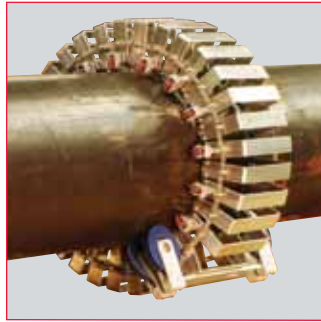


### 4 Inch Hand Scanner



## O.D. Pipe scanners

### Pipeline Scanners



### Large Diameter Pipeline Scanners



### Pipe Scanners



## O.D. Tube Scanners

### Tube Scanners



## Small Diameter Tube Scanners



## Limited Space Scanners



## Sidewall Bend Scanners



## Adjustable Bend Scanners



## Intrados Bend Scanners



TesTex manufactures a variety of scanners to support various applications such as waterwalls, tank floors, and superheater bends. In support of these applications, TesTex also manufactures a variety of calibration plates/tubes.

**O.D. Tube scanners**

**Extrados Bend Scanners**



**Ligament Scanners**



**Near Weld Tube Scanners**



**Viper Crawlers**

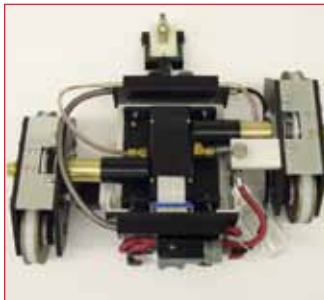
**Adjustable Viper Tractor**



**Waterwall Viper**



**UT/LFET Viper**



**Crack Detection Scanners**

**Hawkeye Lap Weld Scanner**



**Multi-Hawkeye Lap Weld Scanner**



**Multichannel Hawkeye Tube Scanner**



**Lap Weld Scanners**



**Hawkeye T-Weld Scanner**



**Multichannel Deep Penetrating Hawkeye Array**



**Generator Rotor Scanner**



**Raster Hawkeye Butt Weld/Surface Scanner**



**Near Drum Boiler Hawkeye Probes**



**Multichannel Deep Penetrating Hawkeye Array**



## TesTex Inspection, LLC

*TesTex Inspection, LLC is dedicated to providing highly qualified API, AWS, and NACE certified inspectors to the pipeline, petroleum, chemical, nuclear, and power generation industries. Additionally, TesTex Inspection has a complete staff of highly trained and experienced CAD operators, draftsmen, and SNT-TC-1A NDE technicians at your immediate disposal.*

*TesTex Inspection is distinctly qualified to offer you a wide range of state-of-the-art products and services for run and maintain projects, vendor shop surveillance or turn-arounds in the following NDT disciplines:*

- API 653 Certified Tank Inspectors, Including Settlement Surveys
- API 570 Certified Piping Inspectors
- API 510 Certified Vessel Inspectors
- AWS Certified Welding Inspectors
- NACE Certified Inspectors for: Coatings, Linings, Cathodic Protection, Corrosion Prevention Systems
- Instrumentation and Electrical Inspectors
- SNT-TC-1A Technicians:
  - Liquid Penetrant Testing
  - Magnetic Particle Testing
  - Radiographic Film Interpretation
  - Ultrasonic Thickness Determination
- QA/QC Managers, Mechanical Inspectors, Instrument/Electrical Inspectors
- Inspection Supervision, Project Management, Corporate Level III Services
- Pipeline Inspection



## Baker Inspection Group, LLC

*Baker Inspection Group specializes in identifying the problems that can lead to catastrophic events as well as the ones that can lead to costly downtime. We provide professional services to support Process Safety Management specializing in Mechanical Integrity. Baker Inspection Group is a full service NDT supplier and can provide API, AWS, and SNT-TC-1A certified Inspectors to support MI programs and all of your inspection needs.*

- Mechanical Integrity Consulting, Non-Destructive Testing and inspection service provider

### Mechanical Integrity

- Program design/evaluation; site reviews, gap analysis, compliance reviews
- Written procedures; MI applications, procedures, training, testing & inspection, deficiency correction, quality assurance
- Testing & inspection; NDT, API 510/570/653, AWS-CWI
- Quality assurance, vendor surveillance, component and document inspection, specification review
- Engineering evaluation of fixed and dynamic equipment



### Non-Destructive Testing

- Volumetric testing; radiography and ultrasonic
- Surface testing; liquid penetrate and magnetic particle
- Precision measurements and mapping; ultrasonic thickness, coating & cladding thickness, hardness, component dimensioning, CAD, Digital Photography
- NDT solutions for unique design applications
- Level III services; procedures, testing, certification
- Extensive NDT and inspection equipment inventory including radiographic and ultrasonic equipment
- In-house RT vault for product testing
- Ohio & USNRC Radioactive Material

## A Call for Entrepreneurs

TesTex Inc. invites inquiries from prospective candidates possessing an entrepreneurial spirit to participate in and operate one of our future NDT service centers. TesTex will provide training & technology

transfer, sales & marketing support, NDT systems & equipment, as well as other necessary assistance to ensure a successful operation of a TesTex subsidiary.

Interested parties should send an email to: [info@testex-ndt.com](mailto:info@testex-ndt.com) for further information.