GGS

Contractor-Conscious Non-Destructive Testing

As a full-service NDT provider, we *do not* perform mechanical integrity inspections, so there is no conflict of interest.

We offer a supplemental service to support your complete evaluation by validating fitness, quantifying the state of suspect areas found in an inspection, and revealing concealed weaknesses.

Weaknesses in a system may be hidden under insulation, concealed inside pipe walls, or located in tough to reach spots. For this reason, GGS uses the most nimble and sensitive NDT technologies available today. As a result, we are able to detect even the tiniest abnormalities on bare, insulated, nested and suspended piping.

Our non-destructive testing (NDT) services for ammonia refrigeration piping systems provide quantitative data that helps companies meet compliance requirements, justify project budgets and prioritize maintenance.

If you are a contractor or consultant managing facility testing for your customer, you can count on GGS to follow your lead.

For contractors, GGS will:

1. Work directly with the customer or strictly through you, the contractor
2. Provide an all-inclusive quote to the facility or your company
3. Integrate with existing customer service contracts
4. Test multiple customer/facility systems in a single deployment
5. Test locations in your customer's system as instructed by you (and/or test at common failure points)
6. Help demonstrate the value of NDT and/or our service for your customer
7. Offer timely scheduling

When you need to test, *choose GGS.*

Gamma Graphics Services (GGS)
120 South Lincoln Avenue
Carpentersville, IL 60110

www.inspectpipe.com
847-844-8765 x202
eddie@inspectpipe.com

Technology

More information in less time with with no disruptions.

GGS performs non destructive testing (NDT) on process piping with **Radiometric Profiling (RP)**. This technique identifies specific types of pipe defects and is able to assess the general condition of piping for informed decision making and regulatory compliance.

The versatile design of the Profiler allows for pipe testing readings on areas and environments that other non destructive testing methods are unable to achieve. We scan through any pipe material to locate and measure pipe wall thickness, hidden wet/iced insulation, pipe size, pipe schedule, components and more.

Each job is performed by a 2-man technician team, experts in NDT application on ammonia refrigeration systems. Data is collected at common failure points and/or locations identified as a result of your Mechanical Integrity Inspection.

Large vessels (over 24" in diameter) are tested with Ultrasonic Thickness Testing (UTT) technology. UT allows us to determine the wall thickness and evidence of corrosion on vessels.

0

No Safety Risk

RP is safe. There is zero radiation exposure risk, so facility staff can be present during testing.

0

No Configuration Limitations

All piping at your site – including nested and suspended – can be accessed and tested.

0

No Holes in Insulation

There is no need for insulation removal or pipe cleaning. We test your pipes as we find them.

200

More Information, Faster

We evaluate and collect accurate data on an average of 200 test locations per day.

100%

Real-Time Results

Instant measurements allow for on-the-spot analysis and further investigation of anomalies.

360°

Complete Coverage

Entire circumference of insulated and uninsulated pipe is profiled, wall to wall and top to bottom.

Reporting

Get conclusive testing data you can rely on.

Information collected for each individual testing/scan measurement location (SML) is conclusive, thorough and easy to understand. Results include all findings and maximum detail for each SML.

Upon completion of testing, the non destructive data we collect on the system is analyzed and compiled. Each section of the report is designed to highlight, in different ways, information about the system. Our analysis includes complete detail, suspect areas and related implications. It will reveal the areas that warrant higher priority based on testing results.

The results are delivered in a comprehensive report, both in hard copy and electronic format. It is presented to the customer's team by one of our NDT experts via web conference.

Post report delivery, we remain available to answer any questions and provide related support in the event of an audit.

Advantages

Reach well beyond the minimum standard with a NDT evaluation from GGS. Our testing provides what you need to minimize vulnerability and make clear, thoughtful moves in the areas that matter most.

- Affirm the stability of a system
- Reveal vulnerabilities of piping and vessels
- Improve planning and maintenance decision-making
- Justify budgeting with conclusive data
- Meet OSHA & EPA regulatory requirements
- Gain peace of mind with early detection
- Confirm code compliance and P&ID accuracy

Findings

For **piping**, our testing locates and/or measures pipe wall thickness, corrosion, erosion, wet insulation, pipe size and schedule, welds, components and more

For **pressure vessels**, our testing provides location and/or measurements of corrosion, wall thickness, wet insulation, missing insulation and presence of ID confirmation..

Company

GGS is one of the most trusted non destructive testing companies in the field by facility and safety managers, engineers, technicians, contractors and consultants. Established in 1990, we are a team of experts with 75+ years of NDT experience across our leadership team.

LIXI, Inc., Gamma Graphics Services' parent company, developed the radiometry technology Radiometric Profiling (RP) and the LIXI Profiler. In 2004 we integrated this versatile technology into our pipe testing service to help companies better answer the most important question – **is my system safe?**

This advanced NDT method has helped facilities around the globe eliminate costly steps, streamline maintenance and planning, strengthen PSM & RMP compliance strategies and minizmize risk and disruption during on-site testing.

GGS is a source of unbiased support and respects existing professional relationships. We offer corporate-level, annualized and standard programs for individual and multi-site corporations and 3rd parties in the US and abroad.

Safety in GGS operations is not just a corporate goal, it is a requirement.

The Experience Modification Rating (EMR) of the company, which takes into account the number of claims/injuries a company has had in the past, is a Rating of 1.

This is greatly attributed to our technicians performance with safety as the central focus of while deployed at customer facilities. Since 2017 through the current date, our accident and safety metrics, including accidents on-site, citations, OSHA investigations, litigations and the like, hold steady at zero (0) occurrences across the board.

Technicians

GGS deploys two-man teams to perform non destructive testing services at every facility we work for. This approach ensures optimal efficiency, collaborative decision-making, ensures safety, and enhances security.

Our technicians are experts in NDT technology and execution. Many are veterans, and many have decades of history invested in non destructive testing and evaluation methods.

Pending independent certification, Radiometric Profiling is currently categorized under ASNT's Radiography training classification. Additionally, GGS field technician training and certifications include ASNT Level II and Level III in multiple NDT disciplines, API 570 and 653, OSHA 30 hour General Industry Training and Radiation Safety.

Understanding the different elements present in ammonia refrigeration systems is essential. Knowing the many variations of how pipe damage can occur in refrigeration, both instantly and over an extended period of time, allows our experienced technicians to utilize their skills to accurately identify and determine the extent of any damage to the piping system. This provides consistently reliable results leading to a higher level of service for our customers.

Assocations & Advocacy

The organization is committed to ongoing active participation in industry associations and contributions to education.

Refrigerating Engineers & Technicians Association (RETA) Corporate Members, Active Board Member, Conference and Chapter Meeting Speakers

International Institute of Ammonia Refrigeration (IIAR) Regular and Associate Members, ANSI/IIAR 6-2019 Standard Subcommittee, BSR/IIAR CO2 Standard Subcommittee

UW Madison Industrial Refrigeration Consortium (U of WI, Madison, IRC) Instructor for a course in the Principles and Practices of Mechanical Integrity for Industrial Refrigeration Systems

ISNetworld Active Contractor Member

Radiometric Profiling [RP]

Capabilities for Non-Destructive Testing of piping compared to *Ultrasonic Thickness Testing [UTT]*

Examining the Non-Destructive Testing (NDT) options for pipe testing will ensure you and/or your mechanical contractor are able to make the best choice while considering efficiency, effectiveness and scope. The details below compare the capabilities of RP, which is best for testing more insulated and bare piping in less time and results in more data points across the system than with UTT, which is best for testing a limited number of locations in piping where the insulation is compromised and replacement is necessary.

	Radiometric Profiling [RP]	Ultrasonic Thickness Testing [UTT]
Tests insulated piping 'as is'	**Capable.** Jacketing and insulation remain intact, testing does not breach the vapor barrier.	**Not Capable.** Requires holes or removal of jacketing and insulation and surface prep, breaches the vapor barrier.
Zero radiation exposure risk	**Capable.** There is zero radiation exposure risk. Testing can occur during business operations without interruption.	**Capable.** There is zero radiation exposure risk. Testing can occur during business operations without interruption.
All piping can be tested	**With exception.** Can interrogate all piping up to 24" diameter, including elbows, nested and suspended.	**Capable.** Can interrogate all piping including nested and suspended.
Real-time results	**Capable.** Additional locations can be tested based on results to determine extent of damage without impact on job scope.	**Capable.** Additional locations can be tested based on results to determine extent of damage, may impact job scope.
Fast evaluation	**Capable.** Average rate of data collection is 200 test locations per day.	**With exception.** Average rate of data collection is 50 test locations per day on insulated piping and equipment.
Measures entire pipe profile, 360°	**Capable.** Measures the entire circumference of the pipe, top and bottom, wall to wall.	**Not Capable.** Measures only where transducer is in contact with pipe (about a 1" diameter area on a single side).
Water or ice in insulation	**Capable.** Detected and measured in insulated piping in its current state.	**With exception.** Wet insulation is detected with visual only after insulation is removed.
Pipe wall thickness	**Capable.** Measured in bare and insulated piping in its current state.	**With exception.** Based on estimates, prone to erroneous or inconclusive results on pitted or frozen pipe.
Pipe size + schedule	**Capable.** Measured in bare and insulated piping in its current state.	**With exception.** Size is determined with visual after insulation is removed.
Corrosion	**Capable.** Evidence is identified in bare and insulated piping in its current state.	**With exception.** Corrosion is detected with visual after insulation is removed. Corrosion may prevent measurement.

Radiometric Profiling [RP]

Capabilities for Non-Destructive Testing of piping compared to *Radiography [RT]*

Examining the Non-Destructive Testing (NDT) options for pipe testing will ensure you and/or your mechanical contractor are able to make the best choice while considering efficiency, effectiveness and scope. The details below compare the capabilities of RP, which is best for testing more insulated and bare piping in less time and results in more data points across the system than with RT, which can be used to test a limited number of locations in piping during times when radiation exposure is not an issue.

	Radiometric Profiling [RP]	Conventional Radiography [RT]
Tests insulated piping 'as is'	**Capable.** Jacketing and insulation remain intact, testing does not breach the vapor barrier.	**Capable.** Jacketing and insulation remains intact, testing does not breach the vapor barrier.
Zero radiation exposure risk	**Capable.** There is zero radiation exposure risk. Testing can occur during business operations without interruption.	**Not Capable.** Higher risk of radiation exposure, test area barricades and operations interruption may be required.
All piping can be tested	**With exception.** Can interrogate all piping up to 24" diameter, including nested and suspended.	**Not Capable.** Piping larger than 8" diameter, nested piping, suspended piping and elbows cannot be tested.
Real-time results	**Capable.** Additional locations can be tested based on results to determine extent of damage without impact on job scope.	**Not Capable.** Results are not available in the field, image is processed and analyzed post-evaluation
Fast evaluation	**Capable.** Average rate of data collection is 200 test locations per day.	**Not Capable.** Average rate of data collection is 20 test locations per day.
Measures entire pipe profile, 360°	**Capable.** Measures the entire circumference of the pipe, top and bottom, wall to wall.	**Not Capable.** Captures image of 1 or 2 walls, source accuracy is dependent/sensitive to orientation of film and radiation source.
Water or ice in insulation	**Capable.** Detected and measured in insulated piping in its current state.	**With exception.** Evidence of wet insulation can be detected (not measured) in some piping.
Pipe wall thickness	**Capable.** Measured in bare and insulated piping in its current state.	**With exception.** Measured in bare and insulated piping in its current state, accuracy sensitive to orientation.
Pipe size + schedule	**Capable.** Measured in bare and insulated piping in its current state.	**With exception.** Measured in bare and insulated piping in its current state, accuracy sensitive to orientation.
Corrosion	**Capable.** Evidence is identified in bare and insulated piping in its current state.	**With exception.** Measured in bare and insulated piping in its current state, accuracy sensitive to orientation.

Radiometric Profiling [RP]

Capabilities for Non-Destructive Testing of piping compared to *Pulsed Eddy Current [PEC]*

Examining the Non-Destructive Testing (NDT) options for pipe testing will ensure you and/or your mechanical contractor are able to make the best choice while considering efficiency, effectiveness and scope. The details below compare the capabilities of RP, which is best for testing more insulated and bare piping in less time and results in more data points across the system than with PEC, which is best for testing larger, flatter surfaces such as vessels.

	Radiometric Profiling [RP]	Pulsed Eddy Current [PEC]
Tests insulated piping 'as is'	**Capable.** Jacketing and insulation remain intact, testing does not breach the vapor barrier.	**With exception.** Removal of insulation above 8" thick is required. Suitable for magnetic steels only.
Zero radiation exposure risk	**Capable.** There is zero radiation exposure risk. Testing can occur during business operations without interruption.	**Capable.** There is zero radiation exposure risk. Testing can occur during business operations without interruption.
All piping can be tested	**With exception.** Can interrogate all piping up to 24" diameter, including nested and suspended.	**Not Capable.** Inappropriate for small diameter piping, results are affected by nearby pipe, flanges, valves, and other ferrous steel.
Real-time results	**Capable.** Additional locations can be tested based on results to determine extent without impact on job scope.	**Capable.** Additional locations can be tested based on results to determine extent, may impact job scope.
Fast evaluation	**Capable.** Average rate of data collection is 200 test locations per day.	**With exception.** Average rate of data collection is 100 test locations per day on large diameter piping.
Measures entire pipe profile, 360°	**Capable.** Measures the entire circumference of the pipe, top and bottom, wall to wall.	**Not Capable.** Measures average single wall.
Water or ice in insulation	**Capable.** Detected and measured in insulated piping in its current state.	**Not Capable.** Cannot measure water or ice in insulation.
Pipe wall thickness	**Capable.** Measured in bare and insulated piping in its current state.	**With exception.** Accurately measured in bare and insulated piping above 6" without isolated pitting.
Pipe size + schedule	**Capable.** Measured in bare and insulated piping in its current state.	**With exception.** Accurately measured in bare and insulated piping above 6" without isolated pitting.
Corrosion	**Capable.** Evidence is identified in bare and insulated piping in its current state.	**With exception.** Accurately measured in bare and insulated piping above 6" having general corrosion only.