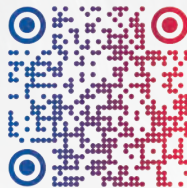




MASTERSCAN ENGINEERING
INSPECTION WITH INTEGRITY



ABOUT THE COMPANY



Established in May 2005, Masterscan Engineering Pte. Ltd. is an independent Testing and Inspection company specializing in Non-Destructive Testing and Asset Integrity services for industrial sectors ranging from Oil & Gas, Petro-Chemical, Construction, Energy and Renewable energy.

Over the years, Masterscan has continuously strived to deliver services to serve its plethora of clientele. It has been providing quality services with integrity, a strong core of technical strength, and cost-effective solutions.

To date, as an independent Testing and Inspection organization accredited by the Singapore Accreditation Council-Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) and an approved inspection entity by DNV, ABS, and Llyod's Register Singapore to carry out NDT inspection of offshore and ships structures in the industry, Masterscan has completed over 600 projects and gained over 230 satisfied customers.

OUR MISSION, VISION & VALUES



Mission

To be an Industry leader in asset integrity by delivering reliable, high quality and advanced Engineering solutions to consistently champion client satisfaction.



Vision

In an industry where quality and safety are of utmost importance, we persevere to deliver with innovation, capacity, and technical know-how of asset integrity.



Values

Mastering
Assurance
Safety
Trust
Excellence
Reliable



Pioneers in the NDT Industry

17+ years in the NDT industry with a proven track record, serving multiple clients across various industries.



Singapore & International Clients

Established Expertise

Our leadership and technical team have a combined of over 100 years of experience in the industry.



**8 NDT Level IIIs
70+ NDT Level IIs**

Constantly Evolving with New Ventures

We aspire to remain relevant in the industry and continue to evolve as the industry progresses, promising our clients state of the art solutions at any given time.



Great Quality Inspection

OUR 5 PILLARS



Conventional
NDT



Digital Twin
Solutions



Advanced
NDT



Research &
Development



UAV
Solutions

CERTIFICATIONS & ACCREDITATIONS



KEY CLIENTS



CONVENTIONAL NDT



**Ultrasonic Testing
(UT)**



**Radiographic Testing
(RT)**



**Magnetic Particle
Testing (MT)**



**Liquid/Dye Penetrant
Testing (PT)**



**Visual Testing
(VT)**



**Positive Material
Identification (PMI)**

CONVENTIONAL NDT



Ultrasonic Thickness Gauging (UTG)



Hardness Testing



Holiday Testing



Ferrite Content Testing



Heat Treatment

ADVANCED NDT

Phased Array Ultrasonic Testing

Phased Array Ultrasonic Testing (PAUT) is a suite of techniques that use multi-element transducers to create and transmit ultrasonic beams to identify and size defects. Enables faster, more efficient, image-recordable and accurate inspection.

- ✔ Compatible with Robotic scanners and manual scanners.
- ✔ Individually tailored development of qualification blocks, configuring rigs for data collection and levels of post-analysis reporting.
- ✔ Inspection for various materials such as carbon steel, stainless steel, glass reinforced plastic, and other composites.
- ✔ Total Focusing Method/Full-Matrix Capture capabilities for accurate defect sizing.
- ✔ Special applications include Weld Inspection, High Temperature PAUT, HICC, HTHA, Corrosion Mapping and Corrosion under pipe supports.

Get in touch with our Phased Array Experts to implement high-quality inspections for your Assets.



Long-Range Ultrasonic Testing Acoustic Emission



Long-range ultrasonic testing (LRUT) is a fast and cost-effective method for inspecting pipelines. Through using a rig of Ultrasonic transducers, detection of corrosion and other discontinuities are enabled.



Acoustic Emission (AE) refers to the generation of transient elastic waves produced by a sudden redistribution of stress in a material. These in tanks and pressure vessels can be caused by defects and discontinuities. Through constant and periodic monitoring using AE sensors, defects can be identified and localised.

ADVANCED NDT - EDDY CURRENT



Pulse Eddy Current

Pulsed Eddy Current (PEC) is an electromagnetic inspection technique used to detect wall loss on ferromagnetic materials as carbon steel and cast iron. Through volumetric measurement converted into an averaged color coded athickness measurement based on the calibration area, corrosion caused thickness loss can be measured.

Masterscan uses Eddify's Lyft Machine for Applications including Corrosion Under Insulation (CUI), Scab/Blister Assessment and Flow-Accelerated corrosion.



Near Field Testing

Near Field Testing (NFT) is specifically suited to detecting corrosion, erosion, and pitting inside carbon steel tubing. NFT is perfect for fin-fan tube heat exchangers because eddy currents do not go through the wall of the tube. NFT is also much more sensitive to defects close to structures such as support places and tube-sheers.



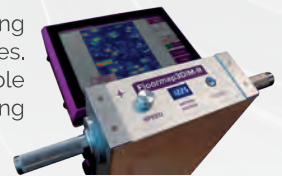
Remote Field Testing

Remote Field Testing (RFT) is being used to successfully inspect ferromagnetic tubing such as carbon steel or ferritic stainless steel. It offers good sensitivity when detecting and measuring volumetric defects resulting from erosion and corrosion.



Magnetic Flux Leakage

Magnetic Flux Leakage (MFL) is commonly used for inspecting tank floors in the petrochemical and Oil & Gas industries. Masterscan uses Eddify's FloorMap 3Di machine to enable faster inspections of tank floors and pipelines, allowing end-users to act faster on maintenance.



Internal Rotary Inspection System

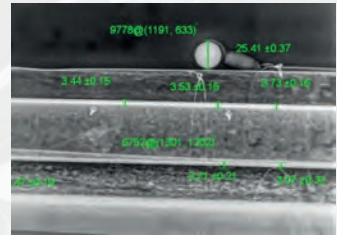
Internal Rotary Inspection System (IRIS) is a technique that can be applied on both ferrous and non-ferrous materials and even on non-conductive materials like plastics. With IRIS the remaining wall thickness of tubes can be accurately measured. IRIS is more accurate than other tube inspection techniques and has the advantage of presenting information about the geometry of defects.

ADVANCED RADIOGRAPHY

Digital Radiography (DR)

Digital Radiography (DR) is an advanced X-ray inspection which produces real time digital radiographic image on a computer. Through usage of X-ray sensitive panels to capture data during inspection, data is transferred to a computer immediately in an image form. As such, it improves testing efficiency by:

- Real time imaging
- Shorter exposure time, increased speed and productivity
- Digital images and data storage
- Improved detectability
- Remaining thickness measurement



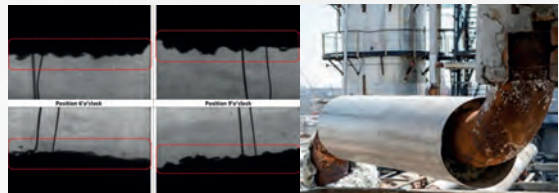
Computerised Radiography (CR)

Computerised Radiography (CR) is the digital replacement of conventional radiography using photo-stimulated luminescence screens to capture X-ray images. Through its reusable and flexible cassettes, it converts the stored images into digitalised images, providing high quality images that can be post-processed for evaluation.

Real Time Radiography (RTR)

- Uses real time digital imaging & locates indications of corrosion or corrosion signs.
- Speeds up the CUI & Saves cost from opening for insulation for CUI.
- Avoids health hazards related to RT and inhalation of Insulation particles.
- Reduced Cost and increased efficiency of Insulation Maintenance. Benefits include but not limited to:

- ✓ High speed screening
- ✓ Easy operator interpretation
- ✓ Reduced missed calls
- ✓ Video and still image recording
- ✓ Simplified report generation



REMOTE INSPECTION



Robotic Crawlers

Mostly used in pipeline, large vessel, or holding tank inspections, Robotic Crawlers are another device in the Remote Visual Inspection (RVI) where long distances or inaccessibility calls for such remote based use. Some enabled methods are RTR, PAUT, VT & UTG.



Steer Rover Scanner for Weld Inspection & Corrosion Mapping

The portable motorized scanner is based on the field-proven MapROVER Scanner but adds steering capabilities so that users can position it from a distance.



Rope Access

Masterscan Engineering is a proud approved organization of IRATA to perform rope access works. Some of the services we provide with rope access include UTG, PAUT, ECT, PEC, DRT and RTR. Our Rope Access Team on site consists of IRATA Level IIIs, Level IIs and Level Is. We maintain utmost safety for our rope access team with a rigorous safety management system.



UNMANNED AERIAL VEHICLES (UAV)

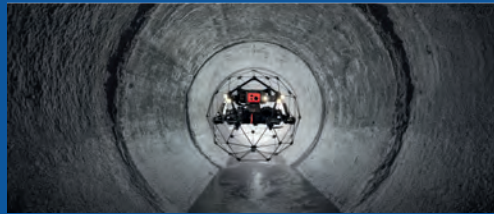
In partnership with



Masterscan has invested into HoverSurv Technologies, a UAV Solutions and engineering entity to combine Asset Integrity and UAV expertise to provide extensive and innovate Drone-enabled inspection services.

EXTERNAL

With commercial grade, custom made and DJI drones, Visual Inspection is an effective way of inspecting at height assets.



CONFINED SPACE

Using Flyability's Elios 2 and 3, Visual Inspection in GPS-denied environments have never been safer, more accurate and effective.

DRONE UTG

Custom built UTG drones enabled by motorised couplant dispenser allows readings to be taken at height and wirelessly transmitted for up to 500m.



Why UAV?

- ✓ Increased Accessibility
- ✓ Safer
- ✓ Faster
- ✓ 4K Resolution footage
- ✓ Measurement capabilities

Applications

- ✓ Pipe racks
- ✓ Tanks interior and exterior
- ✓ Flare stack
- ✓ Marine & Offshore structures and vessels
- ✓ Reactors

Approved by



DIGITAL TWIN SOLUTIONS

A smart digital replica of Physical Assets

With Industry 4.0, the need for having a more digitalized and more intelligent platforms to work on is of utmost importance. By using UAVs and Terrestrial scanners, Masterscan implements Digital Twin capability for clients in the Oil & Gas and Marine Industries.

Phase by Phase Implementation

| | |
|---|---|
|  | <h4>Reality Model</h4> <ul style="list-style-type: none"> 3D Mesh 360 Pano Images Point Cloud Data |
| <h4>Static Information from Reality Model</h4> <ul style="list-style-type: none"> Visual Data Geo-Spatial Information Measurements |  |
|  | <h4>Static/Dynamic Information into Reality Model</h4> <ul style="list-style-type: none"> Asset-Tagging Predictive Maintenance Heat-Map Layered Reality Model |
| <h4>Dynamic/Static Reality Model into As-Built Reality Model</h4> <ul style="list-style-type: none"> Overlay of CAD Model Overlay of Real-Time Mechanisms |  |

What clients achieve

- Updated P&ID drawings through 3D modelling
- 360 degree Asset view – virtual site walks
- Predictive maintenance
- Visualised health of assets

- ✔ Digital tagging of Assets
- ✔ Implementation of AI based solutions
- ✔ Repository of Information
- ✔ Smarter inspections

RESEARCH & DEVELOPMENT

With the goal of solving unique and relevant problems, Masterscan works with industrial clients to develop techniques, experiment and implement solutions. In the year 2022, Masterscan has worked on developing a robotic crawler, MasterLexx.



MasterLexx Capabilities

- ✔ 360 degree visual inspection
- ✔ Self-balancing mechanism
- ✔ Allows accessibility to Congested pipelines
- ✔ Post-processing using Photogrammetry
- ✔ Fits Pipes from 6 to 24 inches
- ✔ Wireless

Other Notable Works

- ✔ PAUT for Flanges using Pitch catch technique
- ✔ DRT for 3D printed parts and composites
- ✔ Enhancing Drone flights in GPS Denied Environments
- ✔ Implementation of 3D modelling through UAVs and Terrestrial scanners



OTHER SERVICES



PRIMOS CWQ Welders Qualification

Level III Services

Heat Treatment Services

Training & Certification

Technical Manpower

Quality Assurance / Quality Control


Professional Engineering


API Services

Welding Inspection

Electrical Services and Installation



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