

Emirates

Industrial Laboratory

Oilfield • Marine • Industrial



Since 1984



ONE-DESTINATION CENTER For Testing and Inspection Excellence

- Shutdown/Turnaround Inspection
- Non-Destructive Testing
- Field Inspection
- Metallurgical Investigation
- Mechanical Testing
- Chemical Testing

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Emirates Industrial Laboratory a.k.a. EILAB stands committed to be #1 Top customer choice in engineering services recognized by Integrity, quality and ethics of our people and our services.





Emirates Industrial Laboratory a.k.a. EILAB works to create and maintain a hub for one-destination. Exceed customer expectations by delivering highest quality and responsive service with highest technology and best committed team

Emirates Industrial Laboratory a.k.a. EILAB adopts a market-based business management philosophy founded on core values of personal and organization integrity, highest technology driven, optimized use of resources, empowered personnel, sustainable environment and thriving community.



Founded in 1984, Emirates Industrial Laboratory is located inside the prestigious Drydocks World-Dubai in Port Rashid.



Offering laboratory testing, inspection and engineering consultancy services for petrochemicals, oil & gas, heavy metals, power, energy & infrastructure construction industries.

Metallurgical test, metallography, corrosion test and failure investigation are overseen by our qualified and industry experienced Metallurgists.



Full-fledged mechanical and physical test facility for qualification of ferrous and non-ferrous materials in base or welded condition.

Chemical test on Oil and Petroleum, water, metal ferrous and non-ferrous, soil and other related samples are carried out by our expert Chemists.



Our chemical lab is equipped with state-of-art analytical equipment like spectrophotometer, OES, ICP-OES etc.

Expert in conventional and advanced NDT with Rope Access. Sizeable number of Technicians qualified to ASNT & PCN Level II in RT, RTFI, UT, MT, PT, VT, MFL etc.



PWHT and Welding Inspection. Our Level III qualified NDE Advisors guide the NDT projects to the complete satisfaction of client.

Qualified and experienced personnel in API Inspection, Welding Inspection, Painting and Coating Inspection, Quality Inspection.



Expert in providing Shutdown Inspection, Asset Integrity Management Services like FFS, RBI, RBI, corrosion monitoring etc.



ONE-DESTINATION CENTER
For Testing and Inspection Excellence



Consultancy services on Engineering, Welding, Metallurgy, Asset Integrity, Inspection, Chemistry and NDT.



EILAB has been serving the General Engineering, Oil and Gas Sector and marine sector for over three decades.

The name has become synonymous with quality service and customers have been placing their trust in EILAB as their quality representative, being assured of top class independent, competent and professional testing services.

The advantages of using EILAB's services are diverse and highlighted below:

The commercial laboratory in Middle East having Technical services, Metallurgy, Mechanical Testing, Chemistry, NDT, Field Inspection, Asset Integrity Services, PWHT and Welding consultancy facilities all under one roof.

EILAB employs more than 100 NDT Technicians qualified to ASNT & PCN Level II in RT, RTFI, UT, MT, PT, VT, MFL etc. EILAB employs Level III qualified NDE Advisors for each major NDT projects.

EILAB is involved in providing the inspection services Corrosion/Erosion Survey NDT/Welding Inspection Services for both Offshore and Onshore clients in Oil & Gas Industry.

EILAB has on its rolls qualified API Inspectors (i.e., API 510, API 570 and API 653) and Metallurgists and PhD's in Chemistry. EILAB has qualified CSWIP/AWS NACE/BGAS qualified Inspection Engineers; qualified Painting / Coating Inspectors.

In addition to conventional NDT services, EILAB provides specialist NDT Services such as PAUT, TOFD, PEC (Pulsed Eddy Current), IRIS, ECT, Thermography, LOTIS, FTIS, INVISTA.

EILAB employs a multitude of Rope Access NDT personnel consisting of IRATA qualified Inspection Supervisors and IRATA qualified NDT Technicians.

The Rope Access NDT teams are continuously engaged in carrying out corrosion monitoring services at offshore Oil & Gas installations.

In addition, EILAB embarks on a continuing training program to train technicians with ASNT Level II qualification in NDT to acquire IRATA Level I/ Level II qualification in Rope Access.



1

NDT Services

Fully equipped to carry out X-Ray & Gamma Radiography, Ultrasonic Flaw Detection, PAUT, Eddy Current Testing, Fluorescent and Regular Magnetic Particle, Liquid Penetrant Testing, Visual and Baroscopic Inspection.



2

Field Inspection Services

AWS and CSWIP certified welding and quality inspection teams undertake Third Party Inspection for Welded Structures. Shutdown Inspection at petroleum and petrochemicals industries are undertaken by API qualified inspectors.



3

Asset Integrity Management Services

Inline and shutdown inspection services for assets in petroleum and petrochemicals industries, Remaining Life Assessment, Fitness for Service and Risk Based Inspection by industry experienced and certified API inspectors.



4

Post-Weld Heat Treatment (PWHT) Services

Maintains large number of PWHT equipment for reheating the welded material to reduce/relieve residual stress to control hardness and achieve desired material strength.



5

Mechanical Testing

Equipped with testing facilities for Ferrous and Non-Ferrous Materials for Tensile, Compression, Bend, Fracture, Nick Break, Hardness, Impact Test. And qualification tests for Weld Coupons.



6

Metallurgical Investigation

Failure Analysis on component from oil and gas, marine, power, construction, heavy steel industries. Metallography, In-situ Replica Metallography, Grain Size, Corrosion Tests and many more.



Analytical Chemical Laboratory

Equipped to conduct analysis on Metal, Oil, Gas, Drilling Fluids, Chemicals, Mud, Effluents, Water, Scales and Sludges. In-situ identification of material grade by PMI Machine.



DEFECTS SHALL NOT PASS

We at EILAB take pride in boasting our core NDT services by conventional and advanced methods.

With ASNT & PCN qualified technicians proficient in multiple discipline of NDT, we serve and execute the demand of NDT works in U.A.E. and other gulf countries.

Fully equipped to carry out Visual Inspection, Baroscopic Examination, X-Ray Radiography, Gamma Radiography, Ultrasonic Flaw Detection, Eddy Current Testing, Fluorescent and Regular Magnetic Particle Testing, and Liquid Penetrant Testing.

We execute NDT works to the satisfaction of client requirement, so we perform NDT tests at project sites, onshore or offshore.

Our performance in executing NDT woks has given us recognition among all major oil & gas companies in UAE and GCC by getting awarded with project approvals and their prestigious projects.



Addition to ultrasonic flaw detection, we excel ultrasonic gauging works as well, with competency approvals from the international shipping inspection and surveillance agencies for Ultrasonic Thickness Gauging.

Key Takeaways:

- Reputed NDT service provider
- Approvals from major End-users, power, oil & gas companies



- Visual Inspection
- **Borescopic Examination**
- X-Ray Radiography
- Gamma-Ray Radiography
- Small Controlled Area Radiography
- Ultrasonic Flaw Detection
- **Ultrasonic Thickness Gauging**
- **Eddy Current Testing**
- Magnetic Particle Inspection
- N Liquid Penetrant Testing
- Vacuum Box Testing
- Magnetic Flux Leakage

- N IRIS/ECT/RFET/PSEC For Heat Exchanger Tubes
- **D** In-Service Robotic Inspection for Storage Tanks
- T Alternating Current Field Measurement (ACFM)
- LRUT for Inaccessible or Underground Pipelines
- **FTIS For Furnace Tubes**
- **AUT For Pipelines**
- Crawler Radiography for Pipelines
- Corrosion Mapping for Vessels, Pipelines
- Corrosion Under Pipe Support (Pipelines)
- **Phased Array**
- Time of Flight Diffraction (TOFD)

Pulsed Eddy Current

Leak Testing

Acoustic Emission Testing





All NDT technicians possess ASNT & PCN Level II qualification in multiple disciplines of NDT. For every NDT work undertaken we depute qualified and industry experienced NDT technicians to execute the job to full satisfaction of client requirement complying to the highest level of safety standards.

> EILAB deploys Rope Access IRATA Level III supervisors along with IRATA Level I/II technicians to serve the needs of Oil and Gas, Marine and General Engineering Industry to facilitate working at heights and "Normally difficult to Access" locations.

All the Rope Access Supervisors possess IRATA Level III qualification whose credentials are integrated with multi-discipline NDT ASNT Level II qualification in NDT techniques.

Technicians with ASNT Level II qualification in NDT are being continually trained to acquire IRATA Level I/ Level II qualification in Rope Access.

Rope Access Personnel maintain the highest level of safety by strict adherence to comprehensive Industrial Rope Access Trade Association (IRATA) guidelines for techniques, training, and supervision.

S



Shutdown or In-line inspection works at process plants in petroleum and petrochemical industries are undertaken by our extensively experienced Plant Inspectors certified in multiple API Inspection codes as below.

API 510 - Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration.

API 570 - Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems.

API 653 - Tank Inspection, Repair, Alteration, and Reconstruction.

Quality Inspection

Our Quality Inspectors ensures materials are inspected on all aspect of physical, chemical, dimensional and verify that requirements of a specification, regulation and/or contract are met.

Material Test report or certificates are reviewed in accordance with the applicable specification or contract requirement, for chemical composition, mechanical properties, heat number, dimension.

Quality Inspection Activities

MTR Review
Visual Inspection
Dimensional Inspection

Welding Inspection

Our Welding Inspectors are CSWIP and AWS qualified and has a wide variety of knowledge, including an understanding of welding drawings, symbols, and procedures; weld joint design; code and standard requirements; and inspection and testing techniques. All welding possesses ASNT NDT Level II certification.

Welding Inspection Methods

Visual Inspection – When performed correctly, a visual inspection is often the easiest and least-expensive method for many applications. However, a good-looking weld doesn't always ensure internal quality, and discontinuities aren't always visible to the naked eye. Information relating to weld size are gathered and checked.

Surface Crack Detection — Used to detect fine cracks, seams, porosity, and other surface-breaking discontinuities, surface crack detection is usually applied using one of two methods: liquid penetrant inspection or magnetic particle inspection.

Radiographic and Ultrasonic Weld Inspection – Methods known as Non-Destructive Testing (NDT) and used typically to examine the internal structure of the weld to establish the weld's integrity without destroying the welded component.

IN-LINE INSPECTION CORROSION SURVEY RELIABILITY AND FITNESS

Identifying damage conditions and the mechanisms that induce them.

We provide inspection services at each element of an asset's lifecycle that is comprised of design, construction, commissioning, operation, modifications, and decommissioning, ensuring integrity of the asset.

ASSET INTEGRITY MANAGEMENT SERVICES

- In-service Inspections and Monitoring
- Corrosion Survey and extent of deterioration
- Remaining Life Assessment
- Structural Stability Assessment
- Fitness for Service Evaluation
- Condition Assessment
- Coatings Assessment

ASSETS WE SERVICE

- Tanks, Pressure Vessels, Piping Systems
- Chillers, Heat Exchangers
- Distillation Columns
- Water Treatment Equipment
- Pumps, Evaporators
- Jacketed Vessels or Reactors
- Separators, Air-Receivers, De-Salters

And many other assets from Refineries, Platforms, Tanks Farms, Power Plants, Pharmaceuticals, Chemical and Fertilizer industries.



THAT'S HOW WE DO

Software and Data Analytics – In our service integrated with Finite Element Method Software, we promote a modern, proactive and holistic strategy for managing our clients' assets.

Risk Based Inspection – Essentially undertaken by our qualified and industry experienced Plant Inspectors to develop inspection plan based on knowledge of the risk of failure and its consequence as per API RP 580 and 581.

The inspection plan deploys techniques at a frequency that provides adequate confidence about the condition, taking account of the damage mechanisms and the reliability of the inspection techniques used.

Fitness for Service – FFS Assessment as per API 579/ASME FFS-1 along with Remaining Life Assessment have demonstrated benefits in a wide range of projects. Our FFS assessment offers a comprehensive analysis on asset's current and future integrity. It sets out for our clients a clear program of repair, inspection and mitigation actions, which, when scheduled and completed, ensure safety and reliability,

Inspection Techniques – Conventional and Advanced NDT coupled with Rope Access.

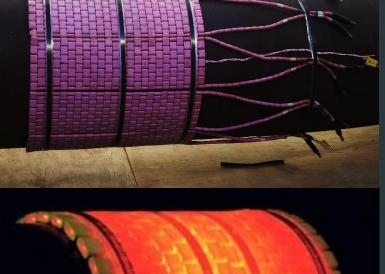
REDUCE • RELIEF • RESTRUCTURE

Post-weld Heat Treatment

Stress Relief Heat Treatment

To Reduce, Redistribute and Restructure the residual stresses in the material that have been introduced by welding. PWHT is typically essential to reduce residual stresses, as a method of hardness control, or even to enhance material strength.





PWHT is performed usually after welding in order to ensure the material strength of a part is retained after welding.

The versatile equipment which operates on electrical resistance heating method is also portable to be carried to jobs and conduct the treatment 'in-situ". With advanced control equipment, all the operations of heat treatment services are managed efficiently to the strict tolerances.

With a fleet of over 50 PWHT machines, we bolster our specialty services.

With a team of highly skilled and experienced PWHT technicians, we serve customers in fabrication and heavy steel industries.

HEATING • SOAKING • COOLING

Typical cycle for ASTM A 106 Gr. B

Heating Rate: 200°C/Hour

❖ Soaking: 600-620°C for 1 Hour

Cooling: 200°C/Hour

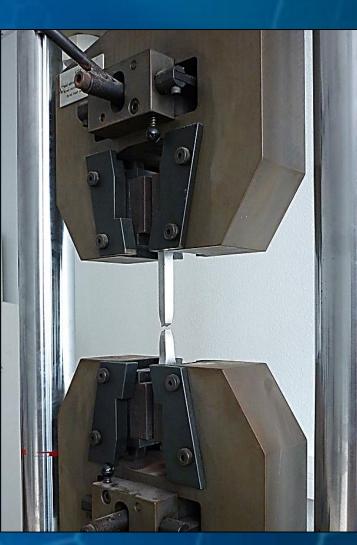
ADVANTAGES

- Improved ductility of the material
- Improved metallurgical structure
- Improved or reduced hardness
- Reduced risk of brittle fracture
- Relaxed thermal stress
- Tempered metal
- Removal of diffusible hydrogen (to prevent hydrogen induced cracking)

TENSION IT ALL

Ferrous and Non-ferrous Metal Mechanical Testing

Mechanical testing laboratory is one of our core testing service. With mechanical testing, we cover wide of test which primarily aims to determine a material's mechanical properties.



Why Mechanical & Destructive Tests!!

At our full-fledged mechanical testing laboratory, we carry out a variety of tests to determine the mechanical properties intrinsic to the material and to qualify materials as per international standard after materials are given thermomechanical treatment.

- Base Material Test for compliance to material specification
- Welder Qualification Test to certify the welder proficiency
- Welder Procedure Qualification Test to verify the welding procedure







Complete Set of Mechanical Tests

- Tensile Test, transverse/longitudinal to establish the properties such as Young modulus, yield (or proof) stress, tensile stress and % elongation to failure
- 3-point or 4-point longitudinal/transverse bend tests
- Nick break & fracture tests on welded joints to check the weld soundness
- Charpy impact test specimens at ambient or cryogenic temperatures
- Hardness test using a variety of hardness testers (Brinell, Rockwell, Vickers)
- Micro hardness measurements

Leeb hardness tests as well as ferrite measurements are carried out at site by using portable equipment. Such testing is particularly suited for jobs that do not allow the samples to be transported to the laboratory.



METALLOGRAPHY

A team of qualified and experienced metallurgists perform the metallurgical evaluation of samples by metallography. Scanning Electron Microscopy (SEM/EDS) equipment provides magnification to 300,000X for microanalysis of very small samples and areas of interest. Tests include but not limited to.

- Microstructural Evaluation
- Grain Size Measurement
- Inclusion Count
- Ferrite Content
- Coating Thickness
- Case Depth
- Carburizing
- Thermal Damage
- Micro Hardness

Macroscopic and microscopic examinations, give information about defects, flow pattern after forging, rolling direction, inclusion content/cleanliness, type of structure (austenite/ferrite/bainite/martensite), grain size, amount of ferrite, depth of (de)carburization etc.

Field metallography testing by replica technique is the specialty of EILAB & extensively utilized for the evaluation of boiler tubes, heat exchanger tubes, reactors, furnace tubes, with respect to any microstructural degradation caused due to the varied operating conditions.

FAILURE ANALYSIS

In every industry extensive effort are deployed to prevent/minimize incidents caused my material failure. After such an incident, determining the root cause is not only important for the issue of legal liability. It also enables manufacturers, owners and operators to improve their procedures and carry out maintenance preventing further damage and injuries.

Our failure analysis services are used by steel manufacturers and distributors, insurance companies, engineering companies, heavy industries, petroleum industries and government bodies.

The failure analysis department of our laboratory has a team of highly skilled and experienced metallurgist. Their work is an interdisciplinary investigation which combines mechanical, metallurgical, and chemical testing. If necessary, our in-house NDT competences are also used to create complete picture of what caused the material failure.



Fracture Surface – Fatigue Failure

The final reports provide details of investigation, causes of failure and remedial actions/recommendations.

CORROSION AND OTHER SPECIALIZED TEST

Corrosion tests to check susceptibility to inter Granular Corrosion, Pitting Corrosion, Stress Corrosion cracking under Sulfide, Chloride and other halides and hydrogen induced cracking are performed at our test house. Fracture tests like CTOD and K_{IC} (Strain Fracture Toughness) are also undertaken.



SO IT REACTS

Analytical Chemical Testing

EILAB Chemistry department is equipped to conduct analysis of metal, oil, gas, drilling fluids, chemicals, mud, effluents etc. and also help the industry by providing extensive consultancy in identifying & cross-checking material's elemental composition, comparing results, analyzing investigating, arbitrations on material selection & evaluation. The tests conducted regularly are highlighted below:

- Analysis of precious metals
- Scales analysis
- Potable and wastewater analysis
- Effluent and Sludge analysis
- Soil, Cement, Fly ash
- Refractories analysis
- Analysis of drilling fluids
- Analysis of ores and minerals
- Industrial effluents analysis
- Mud analysis
- Paints analysis
- Oils and Fuels analysis

Analytical Chemical Instrument



Optical Emission Spectroscope: Stationary metal analyzer, material testing to each constituent elements, including metal analysis of carbon, phosphorous, sulfur and nitrogen.



Inductively coupled plasma - optical emission spectrometry:

ICP-OES spectrometers measure the concentration of elements from ppb or ppt to % using de-excitation of atoms and ions in a plasma.



Gas Chromatography:

Used to measure the chemical composition in gases and evaporable liquids in all stages of production and in all areas of refineries, oil refining, and chemical industries.



Atomic Absorption Spectrometer:

Quantitative determination of chemical elements using optical absorption. AAS can be used to determine over 70 different elements in solution, or directly in solid samples.



Melting Point and Dropping Point:

Used to measure melting point, melting range, boiling point, slip melting point and cloud point fully automatically.



Thermal Analysis/Calorimetry:

Used to measure properties of a material at different temperatures, like, mass, dimension, optical properties, gaseous decomposition products, heat difference, and temperature difference.



pH Meter:

Everything needed for precise and fast pH, conductivity, ion concentration, ORP and dissolved oxygen measurements.



Titrators:

Concentration determination with highest precision and productivity. Complete range of titrators and accessories covering most titration applications.

MICROBIOLOGICAL, ENVIRONMETAL AND FIELD TEST

Our laboratory is equipped with Microbiological Tests on water and other liquid samples, with the testing like Biocides Evaluation, COD and BOD Levels etc.

We also provide Environmental Testing Services by conduction Air Monitoring – Ambient and Stack Emissions, Noise Level Measurements.

We provide in-situ laboratory services on site or fields. This facility is utilized by various Oil and Gas producing companies wherever site analysis is called for. The field staff of EILAB Chemistry department regularly perform PMI, sampling, analysis at various offshore

MAJOR SERVICES

- ❖ NDT
- Field Inspection Services
- Asset Integrity Management Services
- PWHT Services
- Mechanical Testing
- Metallurgical Evaluation
- Analytical Chemical Laboratory

HIGHLIGHTS OF MAJOR PROJECTS WHERE OUR SERVICES UTILIZED

- Noor Energy DEWA ACWA POWER
- **Expo 2020**
- Expolink 2020
- DEWA Plants & Projects
- Oil Terminal & Jetty at HFZA
- Dubai International Airport & Expansion Projects
- New Doha International Airport
- Airport Cargo Terminal
- Sour Service Equipment Offshore & Das Island
- Ruwais Refinery Expansion
- UAE Takreer Projects
- Foroozan Enhancement Project
- MIRFA to HABSHAN Project
- ZADCO Storage Tanks
- Palm Jumeirah Sofitel Resort

SOME OF OUR MAJOR CLIENTS

- DEWA, RTA
- ❖ ADNOC
- ❖ ADMA OPCO
- ADGAS
- ❖ PETROFAC
- ❖ ADPC
- ❖ SAIPEM
- ❖ BECHTEL
- ZADCO
- **❖** BOROGUE
- **❖** EVERSENDAI
- CBEME
- CHINA STATE

- ❖ ENOC
- ❖ BUNDUQ
- DRYDOCKS DUBAL
- LAMPRELL
- DUCAST
- EMAL
- AL NABOODAH
- ❖ VTTI FUJAIRAH
- **SAMSUNG ENG.**
- ❖ ASSENT
- GALADARI ENG.
- **❖** GENERAL ELECTRIC
- SIEMENS



OVER THREE DECADES OF PROFESSIONAL EXCELLENCE

Analytical and Technical Laboratory in the Middle East having Metallurgy, Mechanical Testing, Chemical Testing, NDT, Marine Survey, Field Inspection, Asset Integrity Services and PWHT facilities all under one roof that employs over 100 professionals.

Versatile Integrated Quality Management System and International Approval such as

- ❖ ISO 9001:2105
- ❖ ISO 14001:2015
- ❖ ISO 45001:2018
- ❖ ISO/IEC 17025:2017
- ❖ ISO/IEC 17020:2012
- Approvals by local Legal Authorities-Civil Defense, FANR & Municipalities for carrying out RT with radioactive isotopes
- Approval by ABS & RINA for conducting NDT
- Approval by Lloyds, ABS, DNV-GL, Bureau VERITAS, NKK, RINA for Ultrasonic thickness survey
- Approvals by all major petroleum companies in the U.A.E. and other Middle East countries.

TEAM OF PROFESSIONAL EXPERTS

- Metallurgist
- Chemists
- QA/QC Engineers
- Welding Inspectors
- API Inspectors
- Painting/Coating Inspectors
- Corrosion Engineers
- Level III NDE Supervisors
- ASNT/PCN Qualified Level I & II Level NDT Technicians
- Experienced PWHT Technicians
- ❖ IRATA Level III Rope Access Supervisors
- ❖ IRATA Level I & II qualified rope Access NDT Technicians





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