

# A BROAD RANGE & UNIQUE MIX OF COMPETENCIES

## EXPERTISE

RESOLVING COMPLEX PROBLEMS AND ADVISING INDUSTRIAL COMPANIES

Our experts work to understand the origin of failures and to extend the life-cycle of in-service equipment and advise industrial companies regarding their choice for the design, fabrication & maintenance strategy of their equipment.



**Expertise:** Metallurgical investigations, root causes damage analysis for industrial companies, legal experts or insurance company failure analysis).

**Fitness-For-Service (FFS):** Assessment of the integrity of components containing flaw, prediction of the remaining life of old equipment (RLA), assessment of the potential to repair a damaged structure.



**Consulting services:** Mechanical Engineering, stress analysis, design verification or optimization (pressure vessels, metallic structures, piping and pipelines, storage tanks, handling and lifting equipment), recommendations regarding component design, welding, material selection, repairing procedures.



**Replicas:** Determination of microstructures degradation without destructive sampling on-site or in-service equipment, characterization of surface-breaking defects or cracks, evaluation of possible metallurgical damages to at high temperature and high pressure (e.g. furnace tube, boiler tube, turbine component, steam pipe, pressure vessel, and tank).



## PERSONNEL TRAINING & CERTIFICATION

PROVIDING SKILLS, FROM THE TRAINEE WELDER TO THE EXPERIENCED ENGINEER

We develop our training courses according to the industrial needs and offer more than 170 various courses

### Non Destructive Testing

Training & Certification for NDT Techniques:

- MT Level 1 & 2\*
- PT Level 1 & 2\*
- RT Level 1 & 2\*
- UT Level 1 & 2\*
- VT Level 1 & 2\*

\* According to SNT-TC-1A

### Welding

- Writing of Welding Procedure Specification (WPS)
- Welding, Brazing, & Fusing Qualifications (ASME IX)
- Code and Standard (ASME B31.3 & ASME VIII Div.1)
- Plastics Welding Qualification & Thermoplastics Welded Assemblies

### Metallurgy & Corrosion

- Basics of General Metallurgy
  - Metallurgy & Weldability of Stainless Steels
  - Welding Metallurgy of Fabrication
  - Welding Defect & Quality EN code (EN 5817-1 & EN 6520-2)
  - Damage Mechanisms in Refineries & Chemical Industries
- \* Customized trainings can be provided upon request

### Reality Training Program (RTP)

Our consultants, industry-specific specialists who have higher level of knowledge will assist in providing unique solutions, facilitate in house project management and conduct project coaching to achieve your business goal.

### Team Building

Teams that bond together, succeed together. We provide team building activities that will bring people together through high impact activities.



In collaboration with



A Group PROVIDING SERVICES to the INDUSTRIAL WORLD

testing • calibration • training • consultation



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## RESEARCH & EDUCATION

CONTRIBUTING TO THE TECHNOLOGICAL DEVELOPMENT OF YOUR BUSINESS

Four technological platforms dedicated to:

**01** Joining (arc, laser, hybrid laser, electron beam, FSW, brazing)

**02** Modelling & characterization of materials and assemblies (corrosion, fatigue, fracture mechanics)

**03** Non-destructive testing (industrial maintenance, new equipment, composites)

**04** Process development for continuous fiber reinforced composite

## INSPECTION

ENSURING THE COMPLIANCE AND SAFETY OF YOUR FACILITIES

We giving you a full range of solutions, from design to commissioning and maintenance.

### Second & third-party inspection:

Manufacturing follow-up of industrial equipment (pressure vessels, piping, structural works), tank inspection, Welding Procedure Specification (WPS), Welder Qualification Test (WQT), Procedure Qualification Record (PQR), Welder qualification and welding procedure specification, material and quality assurance system, optimizing equipment fleet management, monitoring of anti-corrosion coating processes. Inspection of equipment relating to the transportation of dangerous goods (ADR).

**Technical Assistance:** offers a wide range of technical and engineering staffing services through its network offices including short term and permanent staff, on either international or local assignments to ensure the success of your projects.

# A BROAD RANGE & UNIQUE MIX OF COMPETENCIES

## TESTING AND EVALUATING THE QUALITY OF YOUR EQUIPMENT & PRODUCTS

WE USE THE MOST ADVANCED TESTING METHODS TO ENSURE THE QUALITY OF YOUR EQUIPMENT DURING ITS PRODUCTION AND TO MONITOR ITS OPERATING LIFE

**01**

### Mechanical Testing

- Tensile
- Impact
- DWTT
- Bending
- CTOD
- Hardness (Vickers/Rockwell/Brinell)
- Portable Hardness Testing

**02**

### Metallurgical Analysis

- Macro & Microstructure Analysis
- Graphite Analysis
- Grain Flow Analysis
- Ferrite/Pearlite Analysis
- Grain Flow Analysis (Forming Products)
- Spectrometry (OES and XRF)
- Positive Material Identification (PMI)
- Scanning Electron Microscope (SEM) / Energy Dispersive X-Ray Spectrometer
- Energy Dispersive X-Ray Spectroscopy (EDS)

**03**

### Conventional NDT\*

- Ferrite Scope
- Coating Thickness Gauges
- Magnetic Particle Testing (MT)
- Penetrant Testing (PT)
- Ultrasonic Testing (UT)
- Ultrasonic Thickness Measurement (UTM)
- Visual Testing (VT)
- Holiday Testing
- \* 100% of our operators have certification

**04**

### Ultrasonic Immersion Testing

- Hydrogen Damage Specimen
- High Resolution Ultrasonic Inspection

**05**

### Advanced Ultrasonic Testing

- Ultrasonic Phased Array Testing (PAUT)
- Time of Flight Diffraction (TOFD)
- \* Both techniques include, New Weld Testing and Corrosion Mapping

**06**

### Tube Inspection

- ET: Eddy Current Testing / Eddy Array
- RFT: Remote Field Testing
- NFT: Near Field Testing
- MFL: Magnetic Flux Leakage
- IRIS: Internal Rotary Inspection System
- RVI: Remote Visual Inspection (3D & Measurements)

**07**

### Storage Tank Floor Inspection

- MFL Floor Scanner

**08**

### Corrosion Testing (Certified by ISO 17025)

- Sulfide Stress Corrosion
  - \* Method A: SSC Tensile
  - \* Method B: SSC 3 and 4 points
  - \* Hydrogen Induced Cracking (HIC)
- Salt Spray
- Stress Corrosion
- Intergranular Corrosion
- Hydrogen Embrittlement
- Caustic Corrosion
- Pitting Corrosion

