# **TOHAMA Co. Profile**

**شركة تهامة للفحص الهندسي** دمم

G INSPECTION Co.

L.L.C

**TOHAMA FOR ENGINEER** 

2017

E-Mail:tohamainspection@gmail.com

البصرة حي المهندسين مجاور شركة المرابع الخضراء

## **Co. Name : TOHAMA For Engineering Inspection Co.**

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Leader ship : representative & chairman Expert Saad Mandil

Core business :

Mechanical engineering testing.

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## • Mechanical engineering testing :

Tohama is a private company was established in Iraq / Basra .... (registration No.000087161-02) providing destructive DT and non-destructive testing NDT and inspection activities throughout qualified inspectors and technicians staff ASNT (American Society for Non-destructive Testing) level ll. They have more than twenty years experience in inspections jobs in many locations and fields, like: rehabilitation for steel structures of the main three bridges in Basra, power plants ,high pressure boilers , main steam lines, they do inspection for most fixed and rotated equipment in a chemical and petrochemical plants such as pressure vessels, heat exchangers, tanks, heaters, reformers, separators piping, pipelines, valves, safety valves....etc. vacuum and pressure leak testing accordance to related standards and client specification requirements .Our team deals with many types of materials in industry ,carbon steel, low alloy steel, stainless steels.... and they have a good experience more than nineteen years in execution stress relieving PWHT for welding joints ( for piping and their components, pressure vessels and tanks).

Tohama staff have inspectors that executing NDT inspections on rotary equipments like pumps ,rotors ,compressors, fans ,turbines ,gears and capable to check dimensions , run out ,tolerances ,clearances and alignment...etc.

#### 1. Our Services :

- Visual testing (VT).
- Radiographic testing (RT).
- Liquid Dye Penetrant testing (LPT).
- Magnetic Particle testing (MT).
- Ultrasonic Flaw detection (UT).
- Portable Hardness Measurement.
- Ultrasonic Thickness Gauging survey, Storage/Sphere Tanks, pressure vessels piping's Inspection.
- Heat treatment (preheating and PWHT).
- Pressure leak testing (pneumatic and hydrostatic).
- Vacuum leak testing.
- Dimensions and clearances check and most inspections activities related rotary machines .
- Load testing, lifting, mobile crane, overhead crane...
- Material testing/ chemical composition test...
- Holiday detector test for insulation inspection ...

## 2. Radiogragraphy (RT) :

TOHAMA undertakes X-ray. Radiographic inspection is based on the exposure x ray. The principle of industrial radiography is Differential Absorption. This means that different materials absorbs different amount of radiation based on thickness variation, density or presence of defects like cracks, lack of fusion, lack of penetration, gas porosities slag, undercuts etc. Tohama have 300KV & 250KV X-ray equipments and their accessories for radiation safety requirements ,manual and auto film processing type COMPACT 2 NDT.



**Radiographic equipment** 







**Radiation Alert Detector, Geiger counter, and Survey Meter** 



RT automatic processing unit

#### **3. Penetrant Inspection Process(PT):**

The Liquid Penetrant Inspection method is applicable for inspecting material or components when attempting to locate flaws open to the surface of mostly nonporous material.

How to Penetration Test?

These basic steps are uniform for the most part, but vary mostly in how each is completed, based on the particular technique being used. It is important for the inspector to know the tolerances and how to maintain the control of them i.e. using a timer for all dwell times and eye adaptation requirements.

- Pre clean article to be inspected.
- Apply penetrant to test part.
- Allow correct dwell time to elapse.
- Remove excess penetrant from part surface.
- Dry, if applicable.
- Apply developer and allow to dwell.
- Inspect component.
- Post-clean part.



Visible Red Dye Check (Visible Penetrant Testing

#### 4. Magnetic Particle Inspection(MT):

Magnetic particle inspection is the process of detecting flaws and surface discontinuities within materials that form permanent magnetic poles with provision of electricity. These materials are commonly known as "ferroelectric" materials, and their common examples include iron, nickel and cobalt. Magnetic particle inspection is used in industrial applications to determine the level of flaws within metal's surface and subsurface through examining the movement of applied particles over them and actually determines the levels of purity, continuity and cracks that they have. This process usually involves magnetizing the subject material under specially designed conditions, which can be specified according to the type of electric current, type of magnet, type of particles and type of magnetization technique used.



Magnetic test equipment



## <u>UV lamp</u>





Permanent magnate

MT cans

#### • Practices:

The wet magnetic particles, fluorescent or not, are suspended in water or liquid wax. The metal surface being tested is magnetized; then the particles are sprayed onto the metal. Metal that is free of flaws will have a uniform red, black, gray or yellow coating, depending on the color of the particles, but flaws in the magnetized metal attract extra particles. Hence the flaws appear to the inspector as easily seen lines or pits. If the wet magnetic particles are fluorescent, the flaws will glow brightly in the dark under ultraviolet rays when the inspector shines a black light on the particle-coated metal.

## 5. Visual Testing (VT) :

Visual inspection is examination of the material, or product for conditions of nonconformance using light and the eyes, alone or conjunction with various aids. Visual inspection is the most commonly employed NDT method.

Visual inspection often also involves, shaking, listening, feeling the component being inspected. Visual inspection is commonly employed to support other NDT methods. Some of the common applications of vt inspection are :

- flaw detection of surface anomalies such as : scratches, excess surface roughness ,and areas void of paint or plating ,crack ,porosity ,corrosion .
- Dimension conformance.
- Precision measurements.



WELDING GAUGES



VISUAL TESTING OF WELDS

## **6. Ultrasonic Testing (UT) :**

is a versatile inspection technique. It is used to test a variety of both metallic and nonmetallic products such as welds, forgings, castings, sheet, tubing, plastics and ceramics. Ultrasonic has an advantage of detecting subsurface discontinuities with access to only one side of the specimen.

The objective of UT ultrasonic testing is to ensure product reliability by means of:

- 1. Obtaining information related to discontinuities.
- 2. Disclosing the nature of the discontinuity without impairing the usefulness of the part.
- 3. Separating acceptable and unacceptable materials in accordance with predetermined standards.
  - UT inspection system consists of pulser & receiver, transducer, and display devices.
  - A pulser/receiver is an electronic device that can produce high voltage electrical pulses. Driven by the pulser, the transducer generates high frequency ultrasonic energy.
  - The sound energy is introduced and propagates through the materials in the form of waves.
  - When there is a discontinuity (such as a crack) in the wave path, part of the energy will be reflected back from the flaw surface.
  - The reflected wave signal is transformed into an electrical signal by the transducer and is displayed on a screen.
  - Signal travel time can be directly related to the distance that the signal traveled and information about the reflector location, size, orientation and other features can sometimes be gained.





Ultrasonic flaw detector with probes



Calibration blocks for UT



## Thickness measurement Equipment



Thickness measurement Equipment

## 7. Heat Treatment Facility(PWHT):

TOHAMA offers post weld heat treatment by using electricity as source of heating for stress relieving of weld joints. All TOHAMA heat treatment services are designed to minimize downtime, improve structural integrity, and enhance effective plant life. Additionally, depending on the mobility of the required equipment many of our heating processes can be applied on-site or at your facility. TOHAMA has specialized fully automatic programmable equipment capable of controlling Heating rate, Holding time and cooling rate to carry out a wide range of heat treatment processes like post weld heat treatment of PQR test coupons, and various components. TOHAMA is capable of doing Post weld heat treatment

of carbon steel piping welds (pipe-work, headers, flange joints, valves and branches) by means of the electrical resistance method, in the form of ceramic heater pads. The Heat treatment equipment is supplied with chart recorder to record up to 6 thermocouples simultaneously for meeting the critical requirement of heat treatment.



<u>Stress relieving at field (PWHT)</u>



<u>Heat treatment equipment</u>

#### 8. Hardness Testing:

The principal purpose of the hardness test is to determine the suitability of a material, or the particular treatment to which the material has been subjected. The hardness test is typically performed by measuring the depth of indenter penetration or by measuring the size of an impression left by an indenter . The hardness of a material can be defined as *"the resistance the material exhibits to permanent deformation by penetration of another harder material"*.



<u>Hardness test device</u>

## • Surface Preparation :

Hardness test specimens must have a polished surface whereas it is regular hardness testing to just have a ground or clean surface. In general, however, it can be said that the variation of the measured hardness result relates directly to the quality of the surface preparation.

![](_page_20_Picture_2.jpeg)

**Roughness tester** 

### 9. Hydrostatic Testing :

Hydrostatic Leak Testing is used to test components for leaks by pressurizing them inside with a liquid. This testing method can be used on piping, tanks, valves and containers with welded or fitted sections. Hydrostatic Testing can be a nondestructive test as well as used as a burst test.

#### • Method :

Hydrostatic Leak Testing requires that a component be completely filled with a liquid such as water. Pressure is slowly applied to the liquid until the required pressure is reached. this pressure is held for the required time at which point the component is inspected visually to locate leaks.

![](_page_21_Picture_4.jpeg)

<u>High pressure hydrostatic testers</u> <u>500 BAR model</u>

#### **10. Vacuum Testing :**

Vacuum testing is a leak detection method for seam welding in the bottom of tanks and welding joint between shell and bottom performed using a testing box approximately 150 mm (6 in.) wide by 750 mm (30 in.) long with a clear Window in the top, which provides proper visibility to view the area under inspection. During testing, illumination shall be adequate for proper evaluation and interpretation of the test. The open bottom shall be sealed against the tank surface by a suitable gasket. Connections, valves, lighting and gauges, as required, shall be provided. A soap film solution or commercial leak detection solution, applicable to the conditions, shall be used.

Vacuum testing shall be performed in accordance with a written procedure prepared by the Manufacturer of the tank as API standard recommendations.

![](_page_22_Picture_3.jpeg)

Vacuum test equipmen

# Samples of Engineering Inspection Activities

item	Type of job	location
1	Radiographic test (RT)	ALYAMAMA/Shell co. (SIPD) / Majnoon
2	Radiographic test (RT)	ALYAMAMA/Shell co. (GIS) north Romaila
3	Magnetic test (MT) & thickness	ALYAMAMA/Shell co. (GIS) north Romaila
	measurement	
4	Heat treatment (PWHT) & hardness	STX/ENI co. Romaila
5	Air Leak test	Luck oil co. west Qurna
6	Hydrostatic test	ARABIAN INDUSTRIES / exxon mobil co. (GIS) north
		Romaila
7	Hydrostatic test	ALYAMAMA / Shell co. (GIS) north Romaila
8	Hydrostatic test	Shell co. (GIS) north Romaila
9	Radiographic test (RT)	ALDAR INTERNATIONAL
10	Magnetic test (MT)	ALDAR INTERNATIONAL
11	Ultrasonic test (UT)	BASRAH MAS COMPANY/ ICCSI Philippian co.
12	PWHT	ALBELED ALMUBAREK
13	Hydrostatic	EMC/S.O.C
14	Radiographic test (RT)	AWI company / exxon mobil co.
15	Magnetic test (MT)	AWI company / exxon mobil co.
16	Radiographic test (RT) ,(UT) & (PT)	Ratbaa company / Shell co. (SIPD) / Majnoon
17	Radiographic test (RT) & (UT)	GOTTWALD / Iraq
18	PWHT and Preheating	Arabian Industries / exxon mobil co.
19	Radiographic test (RT) & (MT)	Arabian Industries / BP
20	Radiographic test (RT)	ALDAR INTERNATIONAL/ ENI co.
21	Heat treatment (PWHT)	ALDAR INTERNATIONAL/ ENI co.

ANCEN	IRQAO	REGISTRATION CERTIFICATE On behalf of ASCB(E)
REGISTRANT		Tohama For Engineering Inspection Co. L.L.C.
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MANAGEMENT	REPRESENTATIVE	
TELEPHONE		
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WEBSITE		http://www.tohamainspection.com
REGISTERED S	TANDARD	ISO/IEC 17025:2006
SCOPE OF ACTI	VITIES	Laboratory Tests such as Test of Compressive Strength and Test of Density
CERTIFYING BC	OY	ASCB(E) - List
CERTIFICATION	REFERENCE	201708-2
ACCREDITOR		A3CB(E)
NACE CODE		
IRGAO LISTING	D	C22267-48372
LAST CERTIFICA	ATION DATE	11 June 2017
REGISTRATION	EXPIRY DATE	11 June 2018
CERTIFICATE ST	TATUS	Full
THIS For fu	CERTIFICATE	SCB SCB SCB SCB SCB SCB SCB SCB

	Inter-company transmittal Iraq Southern Gas utilisation Project	
Project: ISG Iraq Southern Gas ut	ilisation Project	
Issue date: 24-10-2014	0	
Transmittal to		
AI Yamama Engineering		
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Please distribute to : Recipient	Issue code Comments	
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Documents		
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<u>3000-ALYAM-N001-PR01-U10000- MS-1580-00003</u>	01A The profile of TOHAMA NDT Laboratory for pre- IFA 1 A qualification	13-11-20
Legend		
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A Approved		
Status code(s) : IFA Issued for Approval		4
Approval code(s) :		
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lighter and	If applicable, please resubmit documents before due date	
Please sign a d	copy of this transmittal and return by mail as acknowledgement of receipt	4
Raised by: Eusebio Maximo	Date signed:	Sector 1

3

Republic of Iraq Ministry of Oil South Oil Company [State Co.]

Reference: Date: جمعورية العراق وزارة النفط شركة نفط الجنوب [شركة عامة]

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م/ تسجيل شركة

السادة الاعزاء:

نهديكم اطيب تحياتنا

اشارة الى رسالتكم المؤرخة في ٢٠١٥/٥/١٩ نود اعلامكم انه تم تسجيل شركتكم لدينا وعلى الدعوات المباشرة برقم تسجيل (١٦٠) بعد زيادة راس المال على ان لايقل عن (٢ مليار دينار عراقي).

شاكرين تعاونكم معنا..... مع التقدير

![](_page_26_Picture_11.jpeg)

صبيح جبار كريم مدير الهيأة التجارية

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