

Leak Testing (LT)

16 to 28 April, 2015

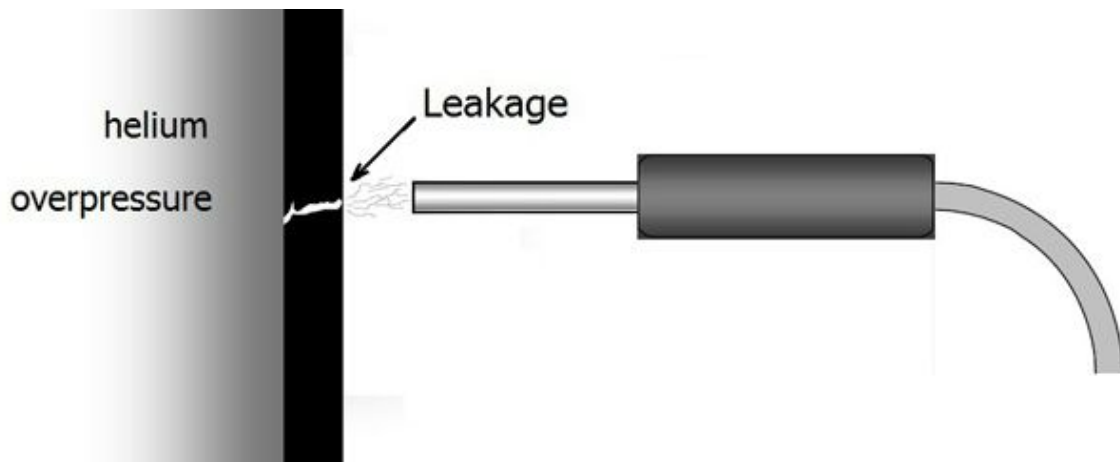


Gavade Institute of Non-Destructive Testing & Training (GINDT)

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Leak Testing (LT)



Leak Testing (LT)

Leak Testing is used to detect through leaks using one of the four major LT techniques: Bubble, Pressure Change, Halogen Diode and Mass Spectrometer Testing.

Bubble Leak Testing relies on the visual detection of a gas (usually air) leaking from a pressurized system; Pressure Change Leak Testing can be performed on closed systems only-- detection of a leak is done by either pressurizing the system or pulling a vacuum then monitoring the pressure.

Pressure Change Testing

Pressure Change Testing can be performed on closed systems only. Detection of a leak is done by either pressurizing the system or pulling a vacuum then monitoring the pressure. Loss of pressure or vacuum over a set period of time indicates that there is a leak in the system. Changes in temperature within the system can cause changes in pressure, so readings may have to be adjusted accordingly.

Halogen Diode Leak Testing is done by pressurizing a system with a mixture of air and a halogen-based tracer gas-- after a set period of time, a halogen diode detection unit, or "sniffer", is used to locate leaks.

Mass Spectrometer Leak Testing can be done by pressurizing the test part with helium or a helium/air mixture within a test chamber then surveying the surfaces using a sniffer, which sends an air sample back to the spectrometer.

Course Content: **Leak Testing (LT)**

Principles theory

- Physical principles in leak testing
- Principles of gas flow
- Proper selection of LT as method of choice

Equipment/Material

- Leak testing standards
- Detector/instrument performance factors
- Vacuum pumps
- Bubble testing practices and techniques
- Absolute pressure testing equipment
- Absolute pressure hold testing of containers
- Absolute pressure leakage rate testing of containers
- Analysis of data for determination of accurate results
- Halogen testing equipment
- Helium mass spectrometer testing equipment

Technique/Calibration

- Bubble test
- Pressure change/measurement test
- Halogen diode detector leak test
- Mass spectrometer leak testing
- Helium mass spectrometer vacuum testing by dynamic method
- Helium mass spectrometer vacuum testing by static method

Interpretation/Evaluation

- Basic techniques and/or units
- Test materials and equipment effects
- Effects of temperature and other atmospheric conditions
- Calibration for testing
- Probing/scanning or measurement/monitoring
- Leak interpretation evaluation
- Acceptance and rejection criteria

Procedures

Leak testing procedures

Leak testing specifications

Safety and Health

- Safety considerations
- Safety precautions
- Pressure precautions
- Safety devices
- Hazardous and tracer gas safety
- Types of monitoring equipment
- Safety

Leak Testing, as the name implies, is used to detect through leaks using one of the four major LT techniques:

Bubble, Pressure Change, Halogen Diode and Mass Spectrometer Testing.

- Mass Spectrometer Testing
- Halogen Diode Detector Testing Method
- Bubble Leak Testing Method
- Pressure Change Measurement Testing Method

Vacuum Box Testing is normally and widely using for "New Tanks constructed" as per API-650 Above Ground Storage Tanks or which Tanks are placed "in-service" as per API-653.

Bubble Leak Testing

Gavade Institute of Non-Destructive Testing & Training (GINDT)

Bubble Leak Testing, as the name implies, relies on the visual detection of a gas (usually air) leaking from a pressurized system. Small parts can be pressurized and immersed in a tank of liquid and larger vessels can be pressurized and inspected by spraying a soap solution that creates fine bubbles to the area being tested. For flat surfaces, the soap solution can be applied to the surface and a vacuum box can be used to create a negative pressure from the inspection side. If there are through leaks, bubbles will form, showing the location of the leak.

Pressure Change Testing

Pressure Change Testing can be performed on closed systems only. Detection of a leak is done by either pressurizing the system or pulling a vacuum then monitoring the pressure. Loss of pressure or vacuum over a set period of time indicates that there is a leak in the system. Changes in temperature within the system can cause changes in pressure, so readings may have to be adjusted accordingly.

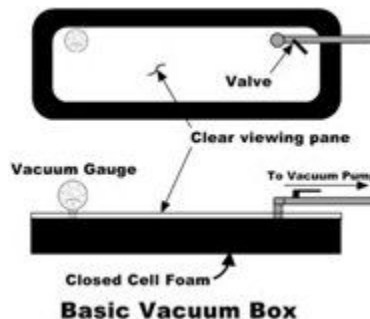
Halogen Diode Testing or Halogen Diode Leak Detection (HDLD)

Halogen Diode Testing is done by pressurizing a system with a mixture of air and a Halogen-based tracer gas. After a set period of time, a halogen diode detection unit, or "sniffer", is used to locate leaks.

Mass Spectrometer Testing or Mass Spectrometer Leak Detection (MSLD)

Mass Spectrometer Testing can be done by pressurizing the test part with helium or a Helium / Air mixture within a test chamber then surveying the surfaces using a sniffer, which sends an air sample back to the spectrometer. Another technique creates a vacuum within the test chamber so that the gas within the pressurized system is drawn into the chamber through any leaks. The mass spectrometer is then used to sample the vacuum chamber and any helium present will be ionized, making very small amounts of helium readily detectable.

Vacuum Box Testing is normally and widely using for Tanks constructed as per API-650 Above Ground Storage Tanks



"NDT Level-II/2 in Leak Testing" Training is conducted as per our Company Written Practice and SNT-TC-1A Edition: 2011 (recommended by ASNT)

Attached details of LT-2 for reference, there may be slightly changes as per ASNT-SNT-TC-1A Edition: 2011

<http://www.gindt.co.in/leaktesting.php>

FACULTY

Eminent faculty from reputed institutions and organizations.

WHO CAN ATTEND

This course is suitable for the novice NDT/ NDE professionals, practicing Engineers, Energy audit professionals, maintenance, condition monitoring professional, researchers and QA personnel who intend to carry out the Leak Testing into the field of Refrigeration System, Liquid Oxygen Plant, Petrochemical Plant and Oil and Gas Refinery and the requirement mentioned in API-570. It is also ideal for the personnel already involved in Leak Testing as it would enhance their understanding and sharpen their skills with respect to image processing and interpretation. The course is also suitable for Supervisory personnel, In-service Inspection personnel of Piping, Quality Assurance and practicing NDE surveyors and Inspection Engineer.

OUTCOME OF THE COURSE:

Preparation of Leak Testing Procedure, understanding of Specific requirement of Leak Testing application and Interpretation of ASME Section V Article 10, Leak Testing (Including Mandatory Appendix I Bubble Test –Direct Pressure Technique):

The inspector should be familiar with and understand the general rules for applying and using the leak testing method including, but not limited to the following:

- a) The scope of Article 10,
- b) General requirements such as but not limited to:
 - Procedures
 - Equipment
 - Calibration
 - Test
 - Evaluation
- c) Documentation and record keeping

COURSE AND EXAM FEE'S

Rs. 16000/- + 12.36% = INR **17,978.00**

Course fee includes course material and refreshments including lunch and delegates kit and exam fee.

PAYMENT

Amount in Word Rupees: **Seventeen Thousand Nine Hundred Seventy Eight only**

The mode of payment will be by local cheque or DD in favour of "**Gavade Institute of Non-Destructive Testing & Training**" Payable at Belgavi.

The course fee can also be directly wire transferred to bank. The person making direct payment to bank please provides the payment details along with the registration form. The bank details for E-transfer are

Account Name: **Gavade Institute of Nondestructive Testing & Training (GINDT)**

A/C No.: 33892850593 (11 Eleven Digit)

Branch Code: 4160

IFSC Code: SBIN0004160

SWIFT Code: SBININBB263

STATE BANK OF INDIA

SME BRANCH BELGAUM

"RAMESH ARCADE"

1ST FLOOR, NEAR ARUN THEATRE, CONGRESS ROAD

BELGAVI – 590 006

Karnataka State, INDIA

COURSE DATE

The course will be from **16 to 28 April, 2015**

EXAMINATION DATE:

The examination will be conducted on **28th April, 2015**

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ELIGIBILITY CRITERIA

Minimum Educational Qualification: Technical degree at least 2 years engineering or science, Diploma in Mechanical Engineer.

Experience*: A minimum 24 months in the Leak Testing with above mentioned application in the field Leak Rate measurement / condition monitoring. Process Industries and Petrochemical Experience.

Vision requirements: As per SNT-TC-1A Edition: 2011

J1 and J2 to e qualified at 12 inch distance and Color Blindness

The course will be conducted as per the guidelines provided in SNT-TC-1A. At the end of the course, examination will be conducted and successful candidates will be awarded

“**NDT Level-II** certificates in **Leak Testing** by GINDT.

*Candidates not meeting experience criteria can attend only the training. Examination for all such candidates the will be conducted separately later after meeting the minimum experience criteria.

REGISTRATION:

Participants who desire to attend the course are requested to first submit the qualification documents (Educational, Eye certificate and Experience details) to Course Director.

Note: The last date for registration is **31st March, 2015**.

COURSE DIRECTOR

Sunil B. Gavade

REGISTRATION FORM

Training + Examination & Certification Course on **Leak Testing (LT)**

From: 16 to 28 February 2015

1. Name : _____

2. Designation : _____

3. Address for : _____

Correspondence : _____

_____ PIN

Tel. Off : _____ Res: _____

Fax : _____ E mail: _____

4. Organization : _____

Address : _____

_____ PIN

Tel. Off : _____ Fax: _____

Email : _____

5. Fees* Leak Testing fees: Rs. 16,000/- + 12.36% = INR **17,978.00**

Amount in Word Rupees: Seventeen Thousand Nine Hundred Seventy Eight only

*Fees shall be paid after approval from Course Director verifying candidate's initial qualification documents. For details refer section Eligibility Criteria and Registration of this brochure.

Enclosed DD/Cheque No. _____ Drawn on. _____ Bank Name _____

_____ Dated. _____ for Rs. _____

Cheque / DD to be drawn in favour of "Gavade Institute of Non-Destructive Testing & Training (GINDT) " payable at Belgavi, Karnataka.

Please provide the E-Transfer details on separate sheet, and attached to this filled form.

Date:

Signature