Course code: 16-69459

NR 34.14 Basic Safety in Tightness Tests

Book at maersktraining.com

AVAILABLE LOCATIONS
Rio de Janeiro

AVAILABLE LANGUAGES
English, Portuguese

NR-34, item 34.14.2.1, requires that tightness tests be performed only by workers who have been trained in the Basic Safety Course in Tightness Testing described in Annex I, item 5, of the standard - a 24-hour initial course made up of an 8-hour theoretical module and a 16-hour practical module. A tightness test is a non-destructive test carried out by applying pressure to a part, compartment or piping in order to detect leaks (item 34.14.1); it is not a hydrostatic strength test, and confusing the two is a recurring source of accidents. The purpose of this course is to qualify the worker to prepare, execute and close a tightness test safely: to check the four mandatory components of the test system, to isolate and signal the risk area, to raise pressure gradually and block it at the test pressure, to depressurise through the relief valve, and to recognise the prohibitions that apply while the system is pressurised. This blended variant delivers the theoretical module by e-learning and keeps the full 16-hour practical module face to face, so that the hands-on requirement of Annex I, item 5.2, is preserved in full while classroom time away from the yard is reduced.

Essential Information

Prerequisites
1) Be 18 years of age or over and fit for work, with a valid occupational health certificate (ASO) issued under NR-07, including fitness for the activity to be performed. 2) Be literate in the language of delivery (Portuguese or English) and able to read and interpret test procedures, work permits and signage. 3) No previous tightness testing training is required - this is the initial 24 h course under NR-34, Annex I, item 5.

Who is it for?

This course is intended for workers in the shipbuilding and ship repair industry (NR-34 scope) who are designated by the employer to prepare, execute, monitor or supervise tightness tests on parts, compartments and piping - including boilermakers, pipefitters, welders, mechanical assemblers, NDT assistants, test area attendants and area isolation attendants. It is also suitable for supervisors, foremen, work permit issuers and HSE professionals who authorise, release or inspect tightness testing activities. Participants act as the 'trained professional' (profissional capacitado) required by NR-34, item 34.14.2.1; the design of the test system remains the responsibility of the legally qualified professional (item 34.14.5). The blended format suits companies whose workforce is distributed across yards, vessels and offshore units: the 8 h theoretical module is completed remotely by e-learning, at the learner's own pace, and only the 16 h practical module requires attendance.

Assessment

"Two-part assessment, both parts mandatory. 1) Theoretical assessment, at the end of the 8 h e-learning module: multiple-choice questionnaire delivered in the language of the course (Portuguese or English), pass mark 70%. Completion of this assessment is a condition for admission to the practical module. 2) Practical performance assessment, during the 16 h face-to-face module: direct observation of the learner against a practical performance assessment form, pass mark 70%. A certificate is issued only on approval in both parts."

Certification

Upon successful completion you will receive a Maersk Training certificate aligned to NR-34, item 34.14 (Tightness Tests) and NR-34 Annex I, item 5 - Basic Safety Course in Tightness Testing, 24 h, inserted by Ordinance MTE No. 1,897 of 9 December 2013.

Course content

- **NR-34 Item 34.14**
  Scope and structure of NR-34 item 34.14; professional roles and responsibilities; initial and refresher training requirements; training records and documentation.
- **Physical Quantities**
  Gauge pressure, absolute pressure and vacuum; temperature, volume and area; unit conversion; calibrated instrument range, resolution and reading.
- **Test System**
  Mandatory test system components; safety valve setting; pressure gauge calibration; design and calculation memorandum.
- **Hazard Identification and Risk Analysis**
  Hazard and risk concepts; hazard identification and risk analysis techniques; Preliminary Risk Analysis (APR) and control measures.
- **Principles and Application of Tightness Testing**
  Principles and purpose of tightness testing; differences from hydrostatic testing; application in shipbuilding and ship repair activities.
- **Technical Standards and Test Procedures**
  Reference standards for leak detection; qualified test procedures; test parameters and acceptance criteria; documentation and traceability.
- **Systems to Be Tested**
  Exposed joints, flexible lines and safety cables; component removal; system isolation; positive pressure, vacuum box and capillarity test methods.
- **Work Permit (PT)**
  Issuing, validation, suspension and closing of the Work Permit; safety measures required before starting the test.

- **Collective and Individual Protection**
  Collective protection measures; safety signage; PPE according to test method; restrictions and prohibited activities during pressurisation.
- **Risk Area Isolation**
  Risk-area limits and isolation requirements; access control and area release; visual identification of the system and isolated area.
- **Test System and Area Readiness**
  Pre-test inspection of the test system, equipment, safety devices and work area before execution.
- **Practical Tightness Testing**
  Supervised execution of an applicable tightness test method and application and control of the required test parameters.
- **Leak Detection and Interpretation**
  Application of the appropriate leak-detection technique and interpretation of indications observed during the selected test method.
- **Abnormal and Unsafe Conditions**
  Response to abnormal or unsafe conditions, including stop-work, area control and communication requirements.
- **Test Completion and Closure**
  Pressure or vacuum relief where applicable; equipment removal; restoration; recording of results; review of deviations and practical activity closing.

Key Learning Objectives

01 LO1 — Identify the scope, structure and main safety requirements of NR-34 item 34.14 for tightness testing activities.

02 LO2 — Differentiate the roles and responsibilities of trained and legally qualified professionals involved in tightness testing.

03 LO3 — Recognise initial and refresher training requirements and the requirements for maintaining training records and documentation.

04 LO4 — Explain the basic principles, purpose and application of tightness testing and differentiate it from hydrostatic testing.

05 LO5 — Differentiate gauge pressure, absolute pressure and vacuum and interpret relevant physical quantities and unit conversions.

06 LO6 — Interpret readings from calibrated instruments, considering their range, resolution and measurement conditions.

07 LO7 — Identify applicable technical standards and interpret qualified tightness test procedures, parameters and acceptance criteria.

08 LO8 — Recognise documentation and traceability requirements applicable to tightness testing activities and results.

09 LO9 — Identify the mandatory components of a tightness test system and their functions.

10 LO10 — Recognise requirements for safety valve settings, pressure gauge calibration and test system design and calculation documentation.

11 LO11 — Identify safety requirements for exposed joints, flexible lines, safety cables, component removal and system isolation.

12 LO12 — Differentiate applicable tightness test methods, including positive pressure, vacuum box and capillarity methods.

13 LO13 — Identify hazards and risks and apply basic risk analysis techniques to tightness testing activities.

14 LO14 — Interpret the Preliminary Risk Analysis (APR), including applicable hazards, risks and control measures.

15 LO15 — Explain requirements for issuing, validating, suspending and closing the Work Permit (PT) for tightness testing.

16 LO16 — Identify the safety measures and controls to be verified before authorising a tightness test.

17 LO17 — Identify collective protection measures, safety signage and PPE required according to the test method and associated hazards.

18 LO18 — Recognise safety restrictions and prohibited activities applicable while the system is pressurised.

19 LO19 — Determine risk-area limits and isolation requirements and identify the requirements for access control, release and visual identification.

20 Objective — Demonstrate preparation for the practical activity, including safety briefing, PPE, Work Permit, APR, area isolation and applicable controls.

21 LO21 — Demonstrate the pre-test inspection of the test system, equipment and safety devices to confirm readiness for safe execution.

22 LO22 — Perform, under supervision, an applicable tightness test method in accordance with the relevant test procedure.

23 LO23 — Apply and control the test parameters required by the selected tightness test method.

24 LO24 — Apply the appropriate leak-detection technique and identify and interpret indications observed during the selected test method.

25 LO25 — Respond appropriately to abnormal or unsafe conditions, applying stop-work, area control and communication requirements.

26 LO26 — Demonstrate safe test completion, including pressure or vacuum relief where applicable, equipment removal, restoration and recording of results.

27 LO27 — Review the practical activity, test results and identified deviations and demonstrate the requirements for safe activity closure.