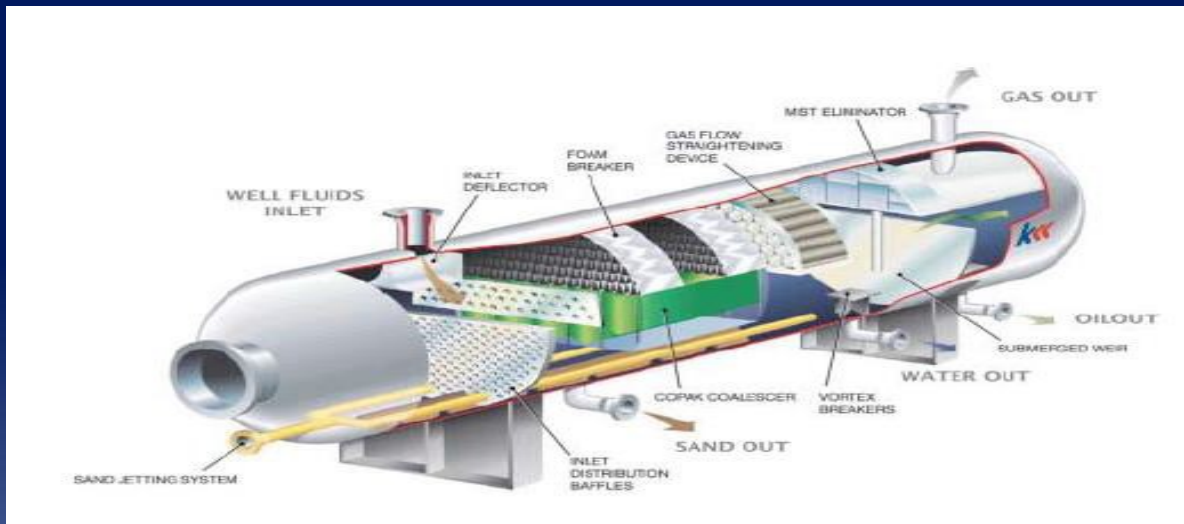




API Training Programs

API 510 - Authorized Pressure Vessel
Inspector








Described the API 510 Training Program



Certified API 510 Pressure Vessel inspectors must have a broad knowledge base relating to maintenance, inspection, repair, and alteration of pressure vessels. The API 510 examination is designed to determine if individuals have such knowledge.

This certification program benefits employers and the industry as a whole by helping to:

-  Improve management control of process unit operation, repair, and maintenance
-  Reduce the potential for inspection delays
-  Provide a continued high level of safety through the use of highly specialized and experienced inspectors

API 510 certification is valid for a three-year term.

The examination consists of two parts.

-  The closed-book part tests the candidate on knowledge and tasks requiring everyday working knowledge of API Standard 510 and the applicable reference documents.
-  The open-book portion of the examination requires the use of more detailed information that the inspector is expected to be able to find in the documents, but would not normally be committed to memory.

Are you qualified to take the API 510 exam?

As outlined in the Appendix B of the API 510 Standard, the minimum qualification requirements for API 510 Pressure Vessel inspector certification are based on the



combination of education and experience related to pressure vessels. This experience must have been acquired within the last 10 years while employed by, or under contract with, an authorized inspection agency as defined in API 510.

Based on the 10th edition of API 510, a National Board certification is no longer accepted as a substitution for passing the exam.

Prior to submitting an application, please use the table below to determine if you qualify to take the API 510 exam.

Education	Minimum Years of Experience	Description of Experience Required
BS or higher in engineering or technology	1 year	Supervision or performance of inspection activities as described in API 510
2-year degree or certificate in engineering or technology	2 years	Design, construction, repair, operation, or inspection of pressure vessels, of which one year <u>must</u> be in supervision or performance of inspection activities as described in API 510
High school diploma or equivalent	3 years	Design, construction, repair, operation, or inspection of pressure vessels, of which one year <u>must</u> be in supervision or performance of inspection activities as described in API 510
No formal education	5 or more years	Design, construction, repair, operation, or inspection of pressure vessels, of which one year <u>must</u> be in supervision or performance of inspection activities as described in API 510



Outline of API-510 Pressure Vessel Inspector Certification Examination

I. Thickness measurements, Inspection Intervals and Vessel Integrity:

- 📄 Code calculation questions will be oriented toward existing pressure vessels, not new pressure vessels.
- 📄 API Authorized Pressure Vessel Inspectors should be able to check and perform calculations relative to in-service deterioration, repairs, rerates, or alterations.
- 📄 Only internal and external pressure loadings will be considered for the API 510 examination.

II. Welding Procedure and Qualification Evaluation Based On ASME Boiler and Pressure Vessel Code, Section IX:

- 📄 The inspector should have the knowledge and skills required to review a Procedure Qualification Record and a Welding Procedure Specification and to be able to determine the following:
 - A.** Determine if procedure and qualification records are in compliance with applicable ASME Boiler and Pressure Vessel Code and any additional requirements of API- 510 The weld procedure review will include:
 - ✓ One Weld Procedure Specification (WPS); and
 - ✓ One Procedure Qualification Record (PQR).
 - B.** Determine if all required essential and non-essential variables have been properly addressed. (Supplemental essential variables will not be a part of the WPS/PQR).
 - C.** Determine that the number and type of mechanical tests that are listed on PQR are the proper tests, and whether the results are acceptable.



III. NONDESTRUCTIVE EXAMINATION (ASME V, ASME VIII Div.1 & API 510):

- A.** Article 1, General Requirements
- B.** Article 2, Radiographic Examination
- C.** C. Article 6, Liquid Penetrant Examination, including Mandatory Appendices II and III
- D.** Article 7, Magnetic Particle Examination (Yoke and Prod techniques only)
- E.** Article 23, Ultrasonic Standards, Section SE-797 only
- F. ASME Section VIII, Div. 1 and API-510. General non-destructive examination requirements: ASME Section VIII, Div. 1: -**
 - 1)** The inspector should be familiar with and understand the general rules for NDE (UG, UW, Appendices 4, 6, 8, and 12)
 - 2)** API 510: The inspector should be familiar with and understand the general rules for NDE in API-510.

IV. PRACTICAL KNOWLEDGE - SPECIFIC:

- 1)** Organization and Certification Requirements.
- 2)** Types and Definitions of Maintenance Inspections.
- 3)** Types of Process Corrosion and Deterioration.
- 4)** Modes of Mechanical, Thermal, and High Temperature Deterioration.
- 5)** Pressure Vessel Materials and Fabrication Problems.
- 6)** Welding on Pressure Vessels.
- 7)** Non-destructive Examination (NDE) Methods
- 8)** Corrosion and Minimum Thickness Evaluation.
- 9)** Estimated Remaining Life.
- 10)** Inspection Interval Determination and Issues Affecting Intervals.
- 11)** Relief Devices.
- 12)** Maintenance Inspection Safety Practices.
- 13)** Inspection Records and Reports.
- 14)** Repairs/Alterations to Pressure Vessels.
- 15)** Rerating Pressure Vessels.
- 16)** Pressure Testing After Repairs, Alterations, or Rerating



- 17) API RP-572, Inspection of Pressure Vessels – Entire document is subject to testing with the exception of All Annexes.
- 18) API RP 576, Inspection of Pressure-Relieving Devices - Entire document is subject to testing with the exception of annexes

OVERALL OBJECTIVE OF THE TRAINING API 510 PROGRAM

The course provides participants with the knowledge necessary to:

- ✚ Be prepared for the next he API 510 pressure vessel inspector certification exam and have enough knowledge and skills to pass in order to receive the API 510 pressure vessel inspector certificate.
- ✚ Effectively use major codes: ASME B&PV Sections V, VIII, & IX
- ✚ Perform all basic vessel calculations needed for the API exam (e.g. tmin, test pressure, MAWP, Static head, MDMT, corrosion rates, remaining life, etc.).
- ✚ Use API's requirements during inspection, repairs, and alterations of pressure vessels.
- ✚ Review welding procedures (WPS/PQR) and welder performance qualifications (WPQ).

LIST OF REFERENCES

- ✚ **API Standard 510**, Pressure Vessel Inspection Code: Maintenance Inspection, Rating, Repair, and Alteration, **10th Edition, May 2014.**
- ✚ **API Recommended Practice 571**, Damage Mechanisms Affecting Fixed Equipment in the Refining Industry, **2nd EDITION, April 2011**
ATTENTION: Only the following sections / mechanisms from RP 571 are included on the exam:

Section 3, Definitions

Par. 4.2.3 Temper Embrittlement



4.2.7 Brittle Fracture

4.2.9 Thermal Fatigue

4.2.14 Erosion/Erosion-Corrosion

4.2.16 Mechanical Fatigue

4.3.2 Atmospheric Corrosion

4.3.3 Corrosion Under Insulation (CUI)

4.3.4 Cooling Water Corrosion

4.3.5 Boiler Water Condensate Corrosion

4.3.10 Caustic Corrosion

4.4.2 Sulfidation

4.5.1 Chloride Stress Corrosion Cracking (Cl-SCC)

4.5.2 Corrosion Fatigue

4.5.3 Caustic Stress Corrosion Cracking (Caustic Embrittlement)

5.1.1.4 Hydrochloric Acid (HCl) Corrosion

5.1.1.10 Sour Water Corrosion (Acidic)

5.1.2.2 Amine Stress Corrosion Cracking

5.1.2.3 Wet H₂S Damage (Blistering/HIC/SOHIC/SCC)

5.1.3.1 High Temperature Hydrogen Attack (HTHA)

✚ **API Recommended Practice 572**, Inspection of Pressure Vessels, **3rd Edition, November 2009**.

✚ **API Recommended Practice 576**, Inspection of Pressure-Relieving Devices, 3rd Edition, **November 2009**.

✚ **API Recommended Practice 577**, Welding Inspection and Metallurgy, **2nd Edition, December 2013**.

✚ **American Society of Mechanical Engineers (ASME)**, Boiler and Pressure Vessel Code, **2015 Edition**

i. **Section V**, Nondestructive Examination, Articles 1, 2, 6, 7 and 23 (Section SE-797 only))

ii. **Section VIII**, Rules for Construction of Pressure Vessels, Division 1; Introduction (U), UG, UW, UCS,

Appendices 1-4, 6, 8 and 12



iii. Section IX, Welding and Brazing Qualifications, (Welding only)

API 510, 2021 Calendar

API 510 Pressure Vessel Inspector Certification Preparatory			
Course ID	ST-API-01	City	Jeddah
Duration	10 Days	Fees (Seminar with Exam plus Books, classroom +coffee break)	SAR 13,000.00
Start Date		End Date	
19-Sep-21		30-Sep-21	

Free seats if available (without exam): 2

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