

API 570

PIPING INSPECTOR

PRE-COURSE

STUDY GUIDE

API 570 TRAINING COURSE
PREPARATORY COURSE WORK

Welcome to the API 570 Training Class, hosted by Schindler & Associates of Corpus Christi, Texas. We are very pleased that you have entrusted your training to us for this important examination, and we take this responsibility very seriously. Our mission together is quite simple, and one which we will remain focused on until the day of your examination. Simply put, this mission is:

"ACHIEVE A PASSING GRADE ON THE API 570 EXAMINATION"

This is our only goal, and together, with diligence, patience, and hard work, I am confident that we will succeed in making this mission a reality.

In this regard, this Preparatory Course is provided to help get you started and better prepared for the journey ahead. It consists of the following items:

- Course Outline.
- Testing information.
- Approximately 150 review questions that can be studied to prepare for the upcoming test.
- A "mini-test" to see how well you are remembering some critical information.
- Over 250 actual past test questions (as remembered by previous students) to prepare you for the actual test questions you will need to know. (These questions may appear "disjointed" but you will get the general feel for what question was asked).

Remember! This is your examination and your training course. You will only get out of it what you are willing to put into it. Therefore, if you do not complete this material, you will only be lowering your chances of successfully completing our mission.

Please come to class as prepared as possible. It is very important to attend every class, complete all homework assignments, and pay very strict attention to the classroom presentation. Again, your participation is the key ingredient to passing the test.

Once again, we appreciate the opportunity to provide this training and we are willing to "go the extra mile" to ensure your success in the examination.

Please call us at 512 242-2107 if you have any questions or if we may be of any further service.

See you at the first class, and Good Luck for a successful Examination!

Tim Schindler
Managing Partner
Schindler & Associates

CODEWEST
API 570 PIPING INSPECTOR EXAMINATION
PREPARATORY COURSE

COURSE OUTLINE

- DAY 1 - INTRODUCTION TO COURSE AND WHAT TO EXPECT ON API 570 EXAMINATION.
- DAY 1 - BASIC PIPING INSPECTION AND TERMINOLOGY AND REVIEW OF API 574
(HOMEWORK QUESTIONS)
- DAY 1 & 2 - ASME B31.3 AND PIPING CALCULATIONS
(HOMEWORK QUESTIONS AND CALCULATIONS)
- DAY 2 & 3 - API 570 AND CORRODED PIPING CALCULATIONS.
(HOMEWORK QUESTIONS AND CALCULATIONS)
- DAY 3 & 4 - ASME B16.5, AND ASME V.
(HOMEWORK QUESTIONS)
- DAY 4 & 5 - ASME IX.
(HOMEWORK QUESTIONS)
- DAY 5 - ASME IX
- DAY 6 - FINAL EXAMINATION, REVIEW, AND ADJOURN.

INFORMATION FOR CANDIDATES

API 510, PRESSURE VESSEL INSPECTOR CERTIFICATION EXAMINATION

API 570, PIPING INSPECTOR CERTIFICATION EXAMINATION

FORMAT OF THE EXAMINATION

The API 510 and 570 inspector certification examinations consist of objective multiple-choice questions covering knowledge essential to the professional practice of inspecting in-service pressure vessels and process piping. Each exam is constructed according to detailed test specifications. Each question has four alternative answers, only one of which is correct.

The examinations contain 150 questions and are divided into two parts. Part 1 is open-book, and consists of 35-45 questions which can be answered using API and ASME reference material. Candidates will have 4 hours to complete Part 1. Part 2 is closed-book, and consists of 105-115 questions which must be answered without access to any reference material. Candidates will have 4 hours to complete Part 2. A total of 8 hours is allowed to complete each exam.

ADMISSION PROCEDURE

If your application and fee is received before the deadline, and you meet the education and experience requirements set by API, you will be allowed to sit for the exam. You should receive notification of the test site from the jurisdiction prior to the exam date. Please be aware of any special instructions that may be included in the jurisdiction notification.

Please report to the test site no later than 7:30 AM on the morning of the exam. Seating of candidates, distribution of test materials, and testing instructions will begin at 8:00 AM. Remember to allow adequate travel time to find the testing site on the morning of the exam.

On the morning of the exam, candidates should bring an appropriate form of picture identification bearing their signature. Examples of acceptable forms of ID are a driver's license, a passport, or an employee identification card. Social security cards are not acceptable.

If you move or change your address, it is your responsibility to notify API and the jurisdiction of your new mailing address at least 4 weeks before the exam date so that your score report can reach you in a timely manner.

EXAMINATION PROCEDURES

- The testing time for each part of the exam is 4 hours. Additional time has been allowed for instructions. There is a one-hour lunch break scheduled after Part 1 of the exam, but if you complete Part 1 before time is called, you may leave the testing room. However, you may not re-enter the room until Part 2 of the exam is about to begin.
- Candidates should bring some sharpened #2 pencils with erasers, a non-programmable calculator, and a set of API and ASME reference materials. Highlighting, underlining, page tabs, or written notes in the margins of the code books are acceptable. **Note: API and ASME publications are copyrighted material. Photocopies of these reference documents are not permitted in the examination room.**
- No loose notes, papers, or other books of any sort may be brought into the examination room.

- No test materials, documents, notes or memoranda of any sort are to be taken from the examination room.
- No questions concerning the content of the examination may be asked during the testing period. Candidates should listen carefully to instructions given by the proctor.
- Candidates have the opportunity to comment on any question believed to be misleading or inaccurate at the end of the examination. A form for this purpose will be provided to candidates upon request. Be specific when commenting on a question as each comment will be individually reviewed by the Examination Committee. Individual responses to question comments will not be provided.
- Proctors are authorized to maintain secure and proper test administration procedures, including relocation of candidates. Candidates may not communicate with each other during the examination.

SUGGESTIONS FOR TAKING THE EXAMINATION

- Answer the questions in order, but don't waste time on questions containing unfamiliar or difficult material. You can come back to them later, time permitting.
- Make educated guesses at correct answers rather than leaving the answer spaces blank. The score on the test will be based on only the number of correct responses, with no penalty for wrong answers.
- Record your answers carefully on the separate answer sheet. The numbering of the questions in the test booklet should match the numbering of the responses on the answer sheet.
- Should you change your mind on any answer, erase previously marked responses thoroughly. Multiple responses to a question will be scored as incorrect. Avoid making any stray marks on the answer sheet.

A criterion referenced passing score has been established by a panel of content experts using appropriate standard setting procedures. The passing score for each administration of the API 510 and 570 inspector certification examinations are based on a statistical equating process which adjusts for fluctuation in difficulty levels across different examinations. Equating ensures that candidates are evaluated according to the same competency standard from year to year.

After each examination administration, individual test questions subject to comments from candidates are evaluated for their clarity and accuracy by the API Exam Construction Task Group prior to the grading process. Questions determined to be ambiguous may be scored with multiple correct answers at no penalty to the candidates.

Exams are scored using an automated system. Any grievance or requests for manual scoring must be submitted in writing to API within 90 days after receipt of your score. Requests for manual scoring must include a viable reason why your exam should be re-graded. There is a \$50 fee for manual scoring of exams. Requests should be submitted to:

American Petroleum Institute
Industry Services Dept.
Inspector Certification Programs
1220 L Street, NM
Washington, D.C. 20005-4070
202-962-4739 (Fax)

AFTER THE EXAM

Approximately 8 weeks after the examination, candidates will receive score reports. These reports will contain the date of the test administration, the title of the examination, the candidate's name and address, the candidate's identification number, the candidate's total score, and the candidate's subscores on each of the content areas covered in the test. Should you pass the exam, you will receive a wallet card and certificate approximately 6 weeks after notification of your score. **Please do not call API for test results; these results will not be given over the telephone.**

SPECIAL ACCOMMODATIONS

Candidates with special needs may request special testing arrangements by submitting, with their application; (a) a letter describing the basis for the need, such as a physical disability or cognitive impairment; (b) a detailed description of the type of accommodation, such as large print or extended time; and (c) written verification of the need, such as a letter or report from a licensed health professional. The request and its accompanying documentation should be sent to API with the application. There is no additional charge for special accommodations.

ASME B31.3

EXAMINATION QUESTIONS

1. Who has the overall responsibility for compliance to B31.3 rules?
2. Who is responsible for ensuring that all examinations, inspections, and tests are done to the Code?
3. B31.3 applies to "BEP".

True or False (circle one)

4. B31.3 applies to raw, intermediate, and finished chemicals.

True or False (circle one)

5. Category "D" fluid service is flammable.

True Or False (circle one)

6. Category "M" fluid service could be applied to steam or water service.

True Or False (circle one)

7. What is "normal" fluid service?

8. What is "high pressure" fluid service?

9. The responsibility for all welding rests with the _____.

10. B31.3 allows the use of welding procedures qualified by others to be used.

True Or False (circle one)

11. What must be done if a weld is not aligned within the tolerances allowed in B31.3?

12. Flared tubing shall be examined for imperfections prior to _____.

13. Inspection is performed by _____.

14. Examination is performed by _____.

15. Piping installations shall be examined prior to initial operation.

True or False (circle one)

16. In normal fluid service, _____% of circumferential butt welds must be radiographically examined.

17. A hydrostatic leak test pressure is applied at _____X the design pressure.

18. Category "M" fluid service allows the use of single welded slip-on-flanges.

True or False (circle one)

19. In Category "M" piping, the extent of sampling radiography is _____% in lieu of the normal 5% of all circumferential butt welds.

20. A crack is allowed in a weld detected by radiography if it is less than 1/8".

True or False (circle one)

21. If two welds in normal service fail radiography, how many additional welds will need to be radiographed to meet B31.3?

22. Tack welds shall be made by a qualified welder or welding operator.

True or False (circle one)

23. How much gap ("back-off") is normally required (at fit-up) to make a socket weld connection?

24. The maximum Brinell hardness for P-6 welds is _____.

25. The formula for calculating the required thickness of straight pipe is _____.

26. If weld repairs are required, and the original joint was PWHT, the repair does not need to be re-PWHT?

True or False (circle one)

27. Visual examination must always be documented on all items according to B31.3.

True or False (circle one)

28. Category M fluid service prohibits socket weld greater than _____" NPS.

29. High pressure piping requires visual examination of what items?

ASME B31.3

REFERENCE SHEET

1. 300(b)(1)
2. 300(b)(4)
3. 300.1.3(b)
4. 300.1.1(b)(1)
5. 300.2
6. 300.2
7. 300.2
8. 300.2
9. 328.1
10. 328.2.2
11. 328.4.3(a)
12. 335.4.1
13. 340.2
14. 341.1
15. 341.3.1
16. 341.4.1(b)(1)
17. 345.4.2(a)
18. M308.2(a)
19. M341.4(b)(1)
20. Table 341.3.2
21. 341.3.4
22. 328.5.1(c)
23. Figure 328.5.2C
24. Table 331.1.1
25. 304.1.1(a)
26. 328.6 & 341.3.3
27. 344.2.2
28. M311.1(b)
29. K341.4.1(a)

API 570

EXAMINATION QUESTIONS

1. Where original construction code requirements govern, may API 570 override the construction code?
2. What is the intent of API 570?
3. Who is the authorized piping inspector responsible to?
4. List 6 duties of an Authorized Piping Inspector.
5. There are 4 education/experience requirements to be a "Qualified" authorized Piping Inspector, name them.
6. API 570 is intended for use by whom?
7. The fluid services API 570 is intended to cover can generally be described as what?
8. What are injection points and why must they receive special attention?
9. What is "CUI"?
10. What is a "TML"?
11. What are the preferred methods of inspecting injection points for thickness?
12. What is a "deadleg"?
13. What are three areas susceptible to CUI on insulated piping systems?
14. What are three locations susceptible to CUI on insulated piping systems?
15. What is "creep" dependent upon?
16. What are the 5 types of inspection or surveillance?
17. What are the three classes of piping given in API 570?

18. What is the maximum interval for visual inspection on Class 3 piping?
19. The formula for Remaining Life is?
20. Who authorizes repair/alteration work prior to commencement?
21. Welding procedures must be qualified to _____ by the repair organization.
22. Design of butt joints shall be _____ groove welds.
23. Non-metallic piping and polymeric or glass-lined piping is excluded from the Scope of API-570.
- True or False (circle one)
24. TML's should be established at both _____ stream and _____ stream limits of the injection point circuit.
25. Cathodically protected buried pipe must be monitored at monthly intervals per API 570?
- True or False (circle one)
26. Corrosion rates are calculated two ways - name them.
27. For permanent repairs, a full encirclement welded split-sleeve or box may be welded to the piping.
- True or False (circle one)
28. Upon inspection, a fastener is found to lack full engagement by two full threads. Is this acceptable?
- Yes or No (circle one)
29. Name two services for Class 1 piping.
30. Remaining life is calculated how?
31. The records of piping systems shall include piping service, classification, id #'s, inspection intervals, and _____.
32. The formula for determining MAWP of existing piping systems is _____.

33. Which system should have more TML's - high pressure hydrogen or a non-flammable liquid?
34. After ultrasonic readings are completed at TML's on insulated piping, what should be done to the insulation to reduce the potential for CUI?
35. The recommended upstream limit for an injection point circuit is _____.
36. API Authorized Inspectors shall have at least _____ experience in piping if they have a high school education.
37. Name the three elements which will help identify the potential for service-specific and localized corrosion and select appropriate TML's.
38. What is API Publication 920 useful for?
39. If radiography of in-service piping reveals a fabrication defect in a weld, an analysis of the weld shall be done by one or more of 4 entities - name them.
40. Are thickness measurements of valve bodies normally made when inspecting pipe circuits?
41. What is the LT corrosion rate formula?
42. What is the ST corrosion rate formula?
43. What is RBI and when can it be used?
44. RBI assessment includes the combination of assessment of _____ and _____ of failure.
45. The classification of piping into risk categories is based on the _____ of failure.
46. An RBI assessment can be used to establish an inspection strategy to better define _____, _____, _____, _____.
47. RBI assessment can be used to _____ or _____ the inspection intervals in Table I of Section 4. However, the RBI assessment must be conducted at intervals not to exceed _____ limits.

API 570

REFERENCE SHEET

1. 1.1.1.3
2. 1.1.1.2
3. 1.4.4
4. 3.1, 3.5.3, 3.6, 3.7, 4.3, 5.5, 6.1.1, 6.1.2, 6.3
5. 2.2
6. 1.1.1.2
7. 1.1.2.1
8. 3.3.1, Appendix A
9. Appendix A
10. Appendix A
11. 3.3.1
12. Appendix A, 3.3.2
13. 3.3.3.1
14. 3.3.3.2
15. 3.3.10
16. 3.4
17. 4.1
18. Table 1
19. 5.1.1
20. 6.1.1
21. 6.2.1
22. 6.2.3
23. 1.1.2.2
24. 3.3.1
25. 7.1.5, 7.2.5
26. 5.1.1
27. 6.1.3.1
28. 3.11
29. 4.2.1
30. 5.1.1
31. 5.6
32. Table 2
33. 3.5.3
34. 3.6
35. 3.3.1
36. 2.2
37. 3.3.5
38. 1.3
39. 3.10
40. 3.9
41. 5.1.1
42. 5.1.1
43. 3.1 and 4.1
44. 3.1 and 4.1
46. 4.1
47. 4.1

API 574

EXAMINATION QUESTIONS

1. API 574 is a mandatory practice that must be used in all situations.
True or False (circle one)
2. API 574 covers the inspection of pressure vessels used in refineries.
True or False (circle one)
3. What kind of piping is generally used for severe service in refineries?
4. The manufacturer's under tolerance on seamless piping is _____%.
5. Tubing is similar to piping but is sized based on actual _____ diameter.
6. Name 4 kinds of valves.
7. Name three kinds of common joining methods.
8. Socket welded joints are usually applied on piping _____" NPS or under.
9. What is the primary purpose of Inspection?
10. What kinds of NDE can be used to take thickness readings of pipe on-stream?
11. Name 4 inspection tools that an Inspector should have while making an inspection.
12. Name 14 specific items that can cause deterioration of piping systems.
13. What are "hotspots"?
14. What are two indications of misalignment/?
15. What is "fouling"?
16. Pressure tests, if conducted should be applied in accordance with_____.

17. Hammer testing should not be performed on piping while it is in service.
True Or False (circle one)
18. What locations are most susceptible to cracks?
19. Why are valves usually substantially thicker than the piping they are attached to?
20. What two types of plug valves are discussed in API 574?
21. A gate valve is characterized by partially-open/ partially-closed operations.
True or False (circle one)
22. What size of pipe does Table 2 cover, maximum?
23. Sketch an eccentric reducer.
24. Lap joint flanges must be installed on the pipe prior to completing the butt weld attaching the retaining ring.
True or False (circle one)
25. Leaks in utility piping (air, steam, water) are usually more dangerous than those in hydrocarbon service.
True or False (circle one)
26. What type of equipment may be used in helping perform positive material identification of materials?
27. The gasket seating faces of flanges should be checked (if internally inspected) for _____.

API 574

REFERENCE SHEET

1. 1
2. 1
3. 4.1.1
4. 4.1.1
5. 4.2
6. 4.3
7. 4.5
8. 4.5.3.1
9. 5.1
10. 10.1.2
11. Table 2
12. 6.3
13. 10.1.1.7
14. 10.2.1.6
15. 10.2.1.1
16. 10.2.3
17. 10.2.4
18. 10.2.1.2
19. 10.2.1.4
20. 4.3.4
21. 4.3.2
22. Table 1
23. Figure 9
24. Figure 13
25. 10.1.1.1
26. 10.4.2
27. 10.2.1.5.1

ASME SECTION IX
EXAMINATION QUESTIONS

1. The purpose of a WPS and PQR is to determine if a welder has the skill necessary to make sound production welds.
True or False (circle one)

2. A WPS must only address essential and, if applicable, supplementary essential variables.
True or False (circle one)

3. A non-essential variable may be changed without re-qualification because
 - A. nobody cares about non-essential variables
 - B. the welder is allowed to change variables at his discretion
 - C. non-essential variables do not affect the mechanical or notch-toughness properties
 - D. non-essential variables cannot be changed without re-qualification

4. Groove weld coupons shall qualify the thickness ranges of both base metal and _____ to be used in production.

5. Tension tests may be used in lieu of bend tests to qualify welders or welding operators.
True or False (circle one)

6. A welders qualification expires if he has not used a process during a period of _____ or more.

7. A groove weld bend test reveals a linear indication on the face of the bent surface that measures exactly 1/8" long. No other indications are seen. Does this coupon pass or fail?
 - A. Pass
 - B. Fail

8. The purpose of the tensile test is to
 - A. determine notch toughness
 - B. determine ductility
 - C. determine welder's ability
 - D. determine the ultimate strength of groove welds

9. Notch toughness tests are made using either of two acceptable methods. What are the names of these methods?

10. The test data recorded on a PQR (non-editorial) may be changed provided:
 - A. The AI approves
 - B. The test data on a PQR is a record of what occurred and should never be changed Only editorial information can be changed on a PQR.
 - C. The API 510 Inspector approves
 - D. The date on the WPS is changed

11. Change in a supplementary essential variable requires requalification.

True Or False (circle one)

12. Can welders be qualified by radiograph when using P 6X materials?

13. It is permissible to sub-contract welding of coupons as well as other work to prepare coupons.

True Or False (circle one)

14. If a welder fails to qualify for a welding process he may make an immediate retest. If he fails by mechanical test, how many more test coupons must be welded?

15. Variable QW 402.4 for SMAW procedure qualification is an _____ variable
(essential, non-essential, or supplemental essential)

16. Variable QW 404.24 for SAW procedure qualification is an _____ variable
(essential, non-essential, or supplemental essential)

17. A 6 G position qualification qualifies a welder for _____ positions.

18. Each manufacturer must certify the PQR (by signature) indicating that the information given is true and correct.

True Or False (circle one)

19. Variable QW 405.1 (for welders qualifying with the SMAW process) is an _____ variable
(essential, non-essential, supplemental essential)

20. Each welder must pass a _____ examination, as well as radiography or mechanical testing, as required by the Code.

21. What is the 1 G position?

22. What is an essential variable?

23. Tension tests are not required for qualification of welders.

True or False (circle one)

24. What types of tests are specified as "Root", "Face", "Side"?

25. A welder that does not use a process for _____ months or longer must be _____.

26. Radiography can be used in lieu of bend testing for qualification of welding procedures?

True or False (circle one)

27. What are A #'s?

28. Welders qualified on plate are qualified to weld on pipe of any diameter.

True or False (circle one)

29. How many bend tests are required to qualify a welder in a 5 G or 6 G position?

30. How many tension tests are required to be conducted for procedure qualification tests?

ASME SECTION IX
REFERENCE SHEET

1. QW-100.1
2. QW-200.1(b)
3. QW-401.4
4. QW-202.2
5. QW-452
6. QW-322.1
7. QW-163
8. QW-141.1
9. QW-170
10. QW-200.2(c)
11. QW-401.3
12. QW-304
13. QW-302
14. QW-321.2
15. QW-253
16. QW-254
17. QW-461.9
18. QW-200.2(b)
19. QW-353
20. QW-304.1
21. QW-121, 122
22. QW-401
23. QW-452
24. QW-451, 452
25. QW-322.1
26. QW-451
27. QW-404.5
28. QW-461.9
29. QW-302.3
30. QW-451

ASME SECTION V
EXAMINATION QUESTIONS

1. How many steps are (basically) used in applying a liquid penetrant test?
2. How many steps are (basically) used in applying a magnetic particle test?
3. A written procedure is always required when conducting NDE to ASME V requirements.
True or False (circle one)
4. List 4 things to visually inspect for, prior to welding.
5. What types of materials are inspected using the liquid penetrant inspection method?
6. Define dwell time.
7. When precleaning an item for magnetic particle inspection, the cleaning has to be as exacting as for liquid penetrant inspection.
True or False (circle one)
8. List three advantages for using ultrasonic testing.
9. Ultrasonic testing can best locate discontinuities that are _____ to the sound beam.
10. List three advantages of radiographic inspection.
11. If an examination consists of more than one technique (such as PT), the procedure should address the particulars of each technique.
True or False (circle one)
12. List 3 limitations of Ultrasonic testing.
13. Radiography shows best the discontinuities that are in what position to the X-ray beam?
14. You must have access to both sides of the part in order to produce a radiograph.
True or False (circle one)
15. Which NDE testing method is the most viable for finding fine surface cracks in a very clean, very smooth surface?
16. The metals usually inspected using the magnetic particle method are referred to as_____.

17. What does the term "ET" stand for, as it applies to NDE?
18. In RT, what is a penetrometer, and what is it used for?
19. Name three items of information that must be included on a UT written procedure.
20. Name three items of information that must be included on an MT written procedure.

ASME SECTION V

REFERENCE SHEET

1. SE-165, Figure 1
2. SE-709
3. T-150(c)
4. T-941.2, T-951, (B31.3, 344.7.1)
5. T-600
6. SE-1316, 9
7. T-642, T-7411.1
8. Article 5, Article 23 (various)
9. T-542.7.2.3 (At right angles)
10. SE-1255
11. Yes, T-621
12. Article 5, Article 23 (various)
13. Parallel
14. Appendix A
15. WFMT for ferromagnetic, Fluorescent PT for nonferromagnetic
16. T-720, Ferromagnetic
17. Eddy current, Article 1, I-130
18. Article 2, Appendix V, V-230
19. T-522
20. T-750