



## API-570 Practical Questions Introduction

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### **Purpose**

This precourse study guide is provided for you as a preparation aid to your API-570 Examination Preparation Course. The questions given are typical of those you will find on your API-570 Examination.

These questions and answers are provide to give you a chance to get a feel for the examination, these questions and answers alone are not sufficient material to pass the examination. The participant must also be familiar with the material in the reference codes. Use these as a guide to assist you with becoming familiar with the requirements.

The questions follow the "body of knowledge" as defined by API and are divided into the Code and standard where the questions were generated from. The questions are arranged in order with the referenced paragraphs in each Codes.

The key issue is that you understand the material. Please do not try to memorize the questions and answers this may be to your disadvantage.



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### Table of Content

Lesson 1	API-570 Piping Inspection Code
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Lesson 3	ASME B31.3 Process Piping & ASME B16.5 Pipe Flanges and Flanged Fitting
Lesson 4	ASME Code IX Welding Qualifications
Lesson 5	ASME Code V Nondestructive Examination



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COURSE OUTLINE

**Note:** Daily quiz will be given and quiz reviews will be conducted.  
Homework will be given after the end of the class.

- Session 1** Introduction to the Course  
8:00-4:00 Review Pre-Course Work Assignments  
API Certification Program and Examination  
ASME In Relation to API  
Review of Body of Knowledge  
ASME B31.3 Scope and Responsibilities  
ASME B31.3 Design, Materials, Fabrication
- Session 2** API-570 (Corrosion rate, remaining life)  
8:00-4:00 Piping Classification,  
Thickness measurement locations (TML)  
Injection Points, Inspection frequency  
Repair, alteration and buried circuits  
API-574
- Session 3** ASME Section IX Welding Qualifications  
8:00-4:00 Referencing Codes (ASME B31.3)  
General Requirements  
Welding Procedure Specifications (WPS)  
Purpose, Variables, Content, Format  
Procedure Qualification Record (PQR)  
Purpose, Content, Certification  
ASME Section IX Welding Qualifications (Cont.)  
Performance Qualification Record (WPQ)  
Purpose, Variables, Content, Format



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**Session 4** ASME Section IX Workshop  
8:00-12:00 WPS Development/Review/Critique

12:00-4:00 ASME Section V Non-Destructive Examination  
Arrangement/Layout  
Referencing Codes (ASME B31.3)  
Radiography (RT), Ultrasonic(UT) Visual (VT)  
Liquid Penetrant (PT); Magnetic Particle (MT)  
Personnel Requirements

**Session 5** Final Examination  
8:00-4:00 Questions 51 thru 150 Close Book Exam

Final Examination  
Questions 1 Thru 50 Open Book Exam  
Review/Wrap-Up



## LESSON 1

### API - 570 Piping Inspection Code

#### INTRODUCTION

This section includes questions from API-570 Second Edition October 1998. Piping Inspection Code



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1. API-570 Piping Inspection Code was developed for use in:
  - A Repair or alteration of metallic piping systems system in-service
  - B May be used for modification or addition of new piping systems
  - C Maybe used when in conflict with any prevailing regulatory requirements
  - D Pressure vessels, heaters, or heat exchanger internal or external pipingANS: (A) REF: API-570 1.1.1
  
2. API-570 Piping inspection Code maybe used by:
  - A Refinery and Chemical industries
  - B User must maintain or have access to an Authorized Inspection Agency
  - C User must maintain technically Qualified Piping Engineers, inspectors and examiners
  - D All of the aboveANS: (D) REF: API-570 1.1.2
  
3. API-570 applies to piping systems transporting:
  - A Process fluids
  - B Hydrocarbons
  - C Flammable or toxic service
  - D All of the aboveANS: (D) REF: API-570 1.2.1
  
4. A \_\_\_\_\_ is a physical change in any component that has design implications affecting the pressure containing capability or flexibility of a piping system beyond the scope of it's design.
  - A Rerate
  - B Repair
  - C Alteration
  - D AssemblyANS: (C) REF: API-570 3.1
  
5. A \_\_\_\_\_ is a point in the repair or alteration process beyond which work may not proceed until the required inspection has been performed and documented
  - A Hold point
  - B Witness point
  - C Verification point
  - D Inspection pointANS: (A) REF: API-570 3.13
  
6. A \_\_\_\_\_ is a level gauge glass piping assembly attached to a vessel.
  - A Water column
  - B Gage cock
  - C Pressure gage
  - D Level bridleANS: (D) REF: API-570 3.20



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7. A soil to air interface is generally the zone from \_\_\_\_\_ the soil surface.
- A 12 inches below to 6 inches above
  - B 12 inches above to 6 inches below
  - C 6 inches below and 12 inches above
  - D 12 inches below and 12 inches above
- ANS: (A) REF: API-570 3.42
8. The loss of ductility and notch toughness in susceptible low alloy steel, such as 1-1/4Cr and 2-1/4 Cr is due to:
- A prolonged services at low temperature (-20F)
  - B prolonged service at high pressure and temperature
  - C prolonged service at high temperature (700F-1070F)
  - D prolonged operation at high cyclical service
- ANS: (C) REF: API-570 3.44
9. A \_\_\_\_\_ is an area defined by a circle having a diameter not greater than 2 inches for a line diameter not exceeding 10 inches or not greater than 3 inches for larger lines.
- A Hold point
  - B Test point
  - C Witness point
  - D Area point
- ANS: (B) REF: API-570 3.46
10. In-service inspection activities involving the inspection program, frequency and maintenance of inspection records of piping systems is the responsibility of:
- A Owner
  - B Inspection Agency
  - C Testing Contractor
  - D Piping Inspector
- ANS: (A) REF: API-570 4.1
11. An Authorized Piping Inspector must have the necessary education ,training and experience required relative to design, construction , repair or inspection of piping systems and shall be certified by:
- A The Owner User when Owner is the employed
  - B The API upon submitting the application and certification fee
  - C The API in accordance with Appendix B of API-570
  - D The API after taking the written examination
- ANS: (C) REF: API-570 4.2
12. The owner/user of shall have responsibility for compliance and:
- A Employing a repair organization for repair
  - B Establishing requirements for inspection, repair and alteration
  - C Employing an inspection agency for inspection of process piping
  - D Responsible for the procurement of replacement materials
- ANS: (B) REF: API-570 4.3.1



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13. Alteration activities involving design and modification of piping systems for compliance with the Code requirements is the responsibility of:
- A Piping Engineer
  - B Repair Organization
  - C Owner
  - D Piping Inspector
- ANS: (C) REF: API-570 4.3.1
14. Repair activities including the supply of materials, equipment, quality control and workmanship necessary to maintain the piping systems shall be the responsibility of the \_\_\_\_\_ to the owner user.
- A Repair Organization
  - B Piping Inspector
  - C Contractor
  - D Piping Administrator
- ANS: (A) REF: API-570 4.3.3
15. Procedures for segregating piping systems, installing blanks (blinds), and testing tightness should be an integral part of .:
- A Preparatory work
  - B Safety practice
  - C Testing
  - D Inspection
- ANS: (B) REF: API-570 5.2
16. Before starting inspection, inspection personnel should obtain permission to work in the vicinity from:
- A Inspection supervisor
  - B Control room operator
  - C Operating personnel responsible for the system
  - D Safety engineer
- ANS: (C) REF: API-570 5.2
17. Prior to inspection, the Inspectors should be familiarizes with:
- A The prior inspection results
  - B Any repairs in the piping system
  - C Review the history of individual piping
  - D All of the above
- ANS: (D) REF: API-570 5.2
18. Injection point are sometimes subject to accelerated corrosion from normal or abnormal operating conditions, because of this they are treated as separate inspection circuits.
- A Injection points are treated as separate inspection circuit
  - B Injection points need to be inspected at a regular schedule
  - C Injection points are part of the circuit and should be treated as such
  - D Injection point must be treated as stated in both A and C
- ANS: (D) REF: API-570 5.3.1





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19. When designating an inspection point circuit for the purposes of inspection, the recommended upstream limit of the circuit is \_\_\_\_\_.
- A Minimum of 12 inches or 3 pipe diameters whichever is smaller.
  - B Minimum of 12 inches or 3 pipe diameters whichever is greater.
  - C Dependent of the class of the circuit.
  - D None of the above
- ANS: (B) REF: API-570 5.3.1
20. When designating an inspection point circuit for the purposes of inspection, the recommended downstream limit of the circuit is \_\_\_\_\_.
- A The second change in flow direction past the inspection point, or 25 feet which ever is greater.
  - B The second change in flow direction past the inspection point, or 25 feet which ever is less.
  - C The second change in flow direction past the inspection point, or 25 feet after the first change which ever is less.
  - D The second change in flow direction past the inspection point, or 25 feet after the first change which ever is greater.
- ANS: (C) REF: API-570 5.3.1
21. Which statement below regarding injection point circuit is correct:
- A Injection point circuit in some cases it may be more appropriate to extend to include the next piece of pressure equipment.
  - B Injection point circuit must always be extended to the next piece of pressure equipment
  - C Injection point circuit must always be extended to the next piece of selected equipment
  - D Injection point extension may be dependent upon the Inspector
- ANS: (A) REF: API-570 5.3.1
22. Thickness measurement locations (TMLs) selection on an injection point circuit should consider at least the following.
- A Appropriate fittings within the circuit and location where pipe wall impingement is expected.
  - B Intermediate locations along the longer straight sections of piping.
  - C Upstream and downstream limits of the injection point circuit.
  - D All of the above
- ANS: (D) REF: API-570 5.3.1
23. Which is the preferred method for inspecting injection points for establishing TMLs?
- A Acoustic emission
  - B Radiographic and/or ultrasonic
  - C Visual
  - D All of the above
- ANS: (B) REF: API-570 5.3.1



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24. Which statement below is correct regarding visual inspection:
- A A visual internal inspection may be performed but the thickness of the pipe still requires to be measured.
  - B A visual inspection of the internal surface of piping spools may be substituted for thickness measurement.
  - C An external visual inspection may be substituted for thickness measurement.
  - D None of the above is correct
- ANS: (A) REF: API-570 5.3.1
25. In addition to measuring and recording the thickness at all TMLs within an injection point circuit, which of the following inspections should be also recorded?
- A More extensive inspections should be applied at least three diameters up stream and at least ten pipe diameters downstream of the injection point.
  - B More extensive inspections should be applied least three diameters up stream and at least three pipe diameters downstream of the injection point.
  - C More extensive inspections should be applied 12 inches up stream and at least ten pipe diameters downstream of the injection point.
  - D None of the above.
- ANS: (D) REF: API-570 5.3.1
26. Inspection at deadlegs should include \_\_\_\_\_.
- A The connection at the run of active pipe.
  - B The stagnant end and at its connection to the active run.
  - C Three pipe diameters upstream and down stream of the dead leg.
  - D Both B and C are correct
- ANS: (B) REF: API-570 5.3.2
27. Typical sources of moisture that cause corrosion under insulation (CUI) include.
- A Breaks in insulation
  - B Rain, water leaks, condensation and deluge systems.
  - C Both A and B are correct
  - D None of the above.
- ANS: (B) REF: API-570 5.3.3
28. The most common forms of CUI are:
- A General corrosion of carbon steel
  - B Stress corrosion cracking
  - C Localized corrosion and stress corrosion cracking of carbon steel
  - D Localized corrosion of carbon steel and stress corrosion cracking of stainless steel
- ANS: (D) REF: API-570 5.3.3



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29. Carbon steel piping systems, including those insulated for personnel protection, are susceptible to CUI when operating at:
- A Between 25°F and 250°F
  - B Between -4°C and 120°C
  - C lower than 25°F and higher than 250°F
  - D Both A and B
- ANS: (D) API-570 5.3.3.1 (e)
30. Some piping systems susceptible to CUI include \_\_\_\_\_.
- A Carbon steels that normally operate in service above 250°F (120°C) but are in intermittent services.
  - B Dead legs and attachments that protrude from insulated piping and operate at a different temperature.
  - C Stainless steel operating between 150F and 400F
  - D All of the above
- ANS: D REF: API-570 5.3.3.1
31. Carbon steel piping systems, including those insulated for personnel protection, are susceptible to CUI when operating at:
- A Between 25°F and 250°F
  - B Between -4°C and 120°C
  - C lower than 25°F and higher than 250°F
  - D Both A and B
- ANS: (D) API-570 5.3.3.1 (e)
32. Within the piping system is susceptible to CUI, the CUI is more like to occur at which of the following locations?
- A Low points in piping systems that have a known breach in the insulation including those in long runs of unsupported piping runs.
  - B Bulges in the piping system.
  - C Carbon or low alloy steel flanges, bolting and other components under insulation in high-alloy piping systems.
  - D All of the above.
- ANS: (D) REF: API-570 5.3.3.2
33. When inspecting uncoated buried piping at grade, considerations should be given to excavating \_\_\_\_\_ deep to access the potential for hidden damage:
- A 6-18 inches
  - B 6-12 inches
  - C at least 12 inches
  - D 18-24 inches
- ANS: (B) REF: API-570 5.3.4



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34. Interfaces between concrete-to-air or asphalt-to-air surfaces of buried piping are normally cathodically protected and the Inspector should:
- A Inspect for deterioration of caulking of seals at the interface
  - B Inspect for corrosion beneath the surface when the piping is within 10 years
  - C Not to look at this item unless it is not cathodically protected
  - D A and B above
- ANS: C REF: API-570 5.3.4
35. For an effective program in selecting the appropriate areas for TML, which statement below are key elements when selecting TMLs.
- A The inspectors knowledge of service to where corrosion is likely to occur
  - B Extensive use of nondestructive examination (NDE)
  - C Communication with operating personnel
  - D All of the above
- ANS: (C) REF: API-570 5.3.5
36. Some of the service-specific and localized corrosion includes \_\_\_\_\_.
- A Ammonium salt condensation locations in hydroprocess streams.
  - B Underdeposit corrosion in slurries, crystallizing solutions, or coke producing fluids.
  - C Chloride carryover in catalytic reformer regeneration systems.
  - D All of the above
- ANS: (D) REF: API-570 5.3.5
37. The removal of surface material by the action of numerous individual impacts of either solids or liquids is called:
- A Corrosion
  - B Erosion
  - C Fretting
  - D Embrittlement
- ANS: (B) REF: API-570 5.3.6
38. Corrosion/erosion results in significantly greater metal loss than can be expected from corrosion alone. This type of corrosion occurs at:
- A High-velocity and high-turbulence areas.
  - B Fluid flow at high-velocity areas
  - C High fluid volumetric flow areas
  - D High fluid turbulence areas
- ANS: (A) REF: API-570 5.3.6



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39. The method of NDE used to evaluate areas suspected of having localized corrosion/erosion should include \_\_\_\_\_.
- A Methods that yield thickness data over a small areas so the corrosion rates can be calculated more accurately.
  - B Methods that yield thickness data over a wide area.
  - C Either A or B is acceptable.
  - D None of the above.
- ANS: (B) REF: API-570 5.3.6
40. Piping systems can resist to various forms of environmental cracking by:
- A Upsetting the process condition of the systems
  - B Expose to wet hydrogen sulfide
  - C Proper selection of construction materials
  - D Exposure to condensation
- ANS: (C) REF: API-570 5.3.7
41. Stress corrosion cracking (SCC) is a form of environmental cracking. Examples of environmental cracking include \_\_\_\_\_.
- A Polthionic acid SCC
  - B Caustic embrittlement
  - C Hydrogen blistering
  - D All of the above.
- ANS: (D) REF: API-570 5.3.7
42. Areas suspected of environmental cracking should not be examined using:
- A Radiography
  - B Ultrasonic
  - C Liquid Penetrant
  - D Magnetic Particle- Wet fluorescent method
- ANS: (A) REF: API-570 5.3.7
43. When environmental cracking is found in a pressure vessel and the piping system is equally susceptible, what action is required for the attached piping systems.
- A The piping system are typically unaffected since environmental cracking is a local condition.
  - B The piping system should be inspected throughout its entire length.
  - C Selected spools should be designated for inspection prior to upcoming turnarounds.
  - D None of the above.
- ANS: (C) REF: API-570 5.3.7
44. External or internal pipe coatings or linings should be inspected for:
- A Holes or Breaks
  - B Separation
  - C Blisters
  - D All of the above
- ANS: D



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45. When lining inspection reveals an internal bulging of the refractory lining, which action should be taken by the inspector:
- A Remove portion of the refractory lining to permit inspection of the piping beneath
  - B Use ultrasonic examination technique to determine the wall thickness of the pipe from the external surface
  - C Use radiographic examination technique to determine active corrosion on smaller lines
  - D All of the above
- ANS: D

46. Which method of NDE is used for measurement and detection of holes, blisters or lining separation?
- A Liquid penetrant (PT)
  - B Radiography (RT)
  - C Ultrasonic (UT)
  - D All of the above
- ANS: (C) REF: API-570 5.3.8

47. Which NDE method is used for detection of corrosion on small size pipe when operating deposits such as coke is present on the external surface?
- A Liquid penetrant (PT)
  - B Radiography (RT)
  - C Ultrasonic (UT)
  - D All of the above
- ANS: (B) REF: API-570 5.3.8

48. The onset of low-cycle fatigue is often caused by \_\_\_\_\_.
- A Excessive piping vibration
  - B Heat-up and cool-down cycles
  - C Both A and B
  - D None of the above
- ANS: (B) REF: API-570 5.3.9

49. The onset of high-cycle fatigue is often caused by \_\_\_\_\_.
- A Excessive piping vibration
  - B Heat-up and cool-down cycles
  - C Both A and B
  - D None of the above
- ANS: (A) REF: API-570 5.3.9



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50. Where is fatigue cracking typically detected?
- A High stress areas such as branch connections
  - B Locations where metals have different coefficients of thermal expansion such as weld joint between different materials.
  - C Both A and B are correct
  - D None of the above.
- ANS: (C) REF: API-570 5.3.9
51. Which NDE method is used to detect fatigue cracking?
- A Liquid penetrant (PT)
  - B Radiography (RT)
  - C Ultrasonic (UT)
  - D All of the above
- ANS: (A) REF: API-570 5.3.9
52. Which statement below is incorrect:
- A Creep cracking is dependent on time, temperature and stress.
  - B Creep cracking will not occur if a system is operated within the design parameters.
  - C Creep cracking is accelerated when operation at creep range is cyclic
  - D Creep can occur in 1-1/4 Cr steels operating at 900F
- ANS: (B) REF: API-570 5.3.10
53. Creep cracking which occurs under design conditions may be detected by using either liquid penetrant, magnetic particle and the following methods
- A Radiography and Ultrasonic
  - B Radiography, Ultrasonic and in-situ metallography
  - C Radiographic, Ultrasonic and Visual
  - D Ultrasonic and Visual examination
- ANS: (B) REF: API-570 5.3.10
54. Which NDE method(s) are used to detect creep cracking?
- A Radiographic (RT)
  - B Acoustic emission (AE)
  - C Liquid penetrant (PT)
  - D All of the above
- ANS: (D) REF: API-570 5.3.10
55. Brittle fracture normally occurs at low temperature when stress is applied to carbon or low alloy steels. The potential for brittle failure shall be considered when performing:
- A hydrotesting
  - B pneumatic testing
  - C adding any additional loads
  - D All of the above
- ANS: (D) REF: API-570 5.3.11



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56. Freeze damage may occur when water or aqueous solutions in piping systems freezes and expands. When this occur, which item below would you as an Inspector do?
- A Check the piping system for freeze damage before the system thaws
  - B Check the system for damage before operation
  - C Check the low points, driplegs and deadlegs as these areas are susceptible to damage
  - D Both A and B should be done

ANS: (D) REF: API-570 5.3.12

57. Different types of inspection and surveillance are appropriate depending on the circumstances and the piping system. These should include at least \_\_\_\_\_.

- A Internal and external visual inspections
- B Thickness measurement, and vibrating piping inspection.
- C Supplemental inspections
- D All of the above

ANS: (D) REF: API-570 5.4

58. When conducting internal inspections of large-diameter transfer lines, ducts, or other large-diameter piping systems, inspections must be performed:

- A Using a remote visual inspection technique
- B Using methods and procedure similar to API-510
- C Using the alternate inspection by thickness measurement
- D All of the above

ANS: (B) REF: API-570 5.4.1

59. Thickness measurements are taken to determine the condition and remaining life of a piping system. Thickness measurements can be taken when \_\_\_\_\_.

- A The piping system is in operation.
- B The piping system is out of operation.
- C Both A and B
- D None of the above.

ANS: (C) REF: API-570 5.4.2

60. What API standard outlines the methods and procedures for external visual inspection of piping systems?

- A API-570
- B API-510
- C API-Recommended Practice 574
- D None of the above.

ANS: (C) REF: API-570 5.4.3





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61. An external visual inspection is performed to determine the outside condition of the piping including \_\_\_\_\_.
- A Insulation system
  - B Painting and coating systems.
  - C Associated hardware.
  - D All of the above
- ANS: (D) REF: API-570 5.4.3
62. External inspections includes surveys for the condition of piping hangers and supports, which item below is an inspection item:
- A Cracked or broken hangers
  - B "Bottoming out" of spring supports
  - C Support shoe displaced from support member
  - D All of the above
- ANS: (D) REF: API-570 5.4.3
63. Bellows expansion joints should be visually inspected for:
- A Paint chipping
  - B unusual deformation, misalignment or displacements that exceed design
  - C Cracks
  - D Corrosion/erosion
- ANS: (B) REF: API-570 5.4.3
64. In addition to the inspector what other personnel can perform external inspections?
- A Any plant personnel
  - B Personnel suitable trained and appointed by management
  - C Qualified operating and maintenance personnel when acceptable to the inspector.
  - D Only the inspector can perform this activity
- ANS: (C) REF: API-570 5.4.3
65. Junctions where vibrating piping systems are restrained, what method(s) of NDE should be used to assess pipe condition?
- A Magnetic particle (MT) or liquid penetrant (PT)
  - B Radiographic (RT) or Ultrasonic (UT)
  - C Both A and B
  - D None of the above.
- ANS: (A) REF: API-570 5.4.4
66. What type of abnormal condition should be reported to the Inspection or Engineering for assessment:
- A Vibrating or swaying piping
  - B Line movements that may have resulted from line hammer
  - C Abnormal thermal expansion
  - D All of the above
- ANS: (D) REF: API-570 5.4.4



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67. In addition to required inspections, supplemental inspection shall be performed on a piping system, what inspection method(s) should be used for these inspections?
- A Radiography or thermography to check for fouling or plugging
  - B Acoustic emission or acoustic leak detection for leak detection
  - C Ultrasonic or radiography for localized corrosion
  - D All of the above
- ANS: (D) API-570 5.4.5
68. Thickness measurement locations (TML's) are specific areas along a piping circuit where inspections are to be made. When selecting TML's which of the following shall be considered?
- A The class of the piping system
  - B The pipe diameter
  - C The potentials for localized and service specific corrosion
  - D None of the above
- ANS: (C) REF: API-570 5.5.1
69. Which piping systems will have more TML and monitored more frequently:
- A Piping with high potential consequences if failure occurs
  - B Piping system with a higher corrosion rate
  - C Piping systems with more potential for localized corrosion
  - D All of the above
- ANS: (D) REF: API-570 5.5.2
70. The TML's should include measurements at \_\_\_\_\_.
- A The four quadrants on pipe and fittings
  - B Inside and outside radius of elbows and tees
  - C Both A and B
  - D None of the above
- ANS: (C) REF: API-570 5.5.2
71. TML's may be reduced or eliminated especially in olefin plant cold side or clean hydrocarbon product provided:
- A The piping has been measured and found no corrosion for the last three inspections
  - B The product has a history of no localized corrosion
  - C Persons knowledgeable in corrosion should be consulted
  - D TML's cannot be eliminated
- ANS: (C) REF: API-570 5.5.2



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72. An effective, integrated program of piping inspection will include as many required wall thickness measurements as is possible while the plant is on-stream. Which of the following method(s) are used for this?
- A Ultrasonic scanning measurements
  - B Radiography
  - C Both A and B
  - D None of the above
- ANS: (C) REF: API-570 5.5.2
73. To provide more accurate corrosion rate determination, the TML's should be:
- A Documented
  - B Marked on the inspection drawing and on the piping system
  - C Stamped on the pipe for permanent identification
  - D None required as long as the data is retrievable
- ANS: (B) REF: API-570 5.5.2
74. A piping circuit with a known uniform corrosion rate should \_\_\_\_\_.
- A Have one TML
  - B Have more than one TMLs
  - C Have no TMLs.
  - D None of the above.
- ANS: (A) REF: API-570 5.5.3
75. Which condition below requires less thickness measurement locations:
- A Higher potential for creating a safety or environmental emergency in the event of a leak
  - B Relatively noncorrosive piping systems
  - C More complexity in terms of fittings, branches, deadlegs, injection points, and other similar items
  - D Higher potential for local corrosion
- ANS: (B) REF: API-570 5.5.3
76. TML's may be eliminated for piping systems with which characteristic?
- A Extremely low potential for creating a safety or environmental emergency in the event of a leak
  - B Noncorrosive systems
  - C Systems not subject to changes that could cause corrosion
  - D All of the above
- ANS: (D) REF: API-570 5.5.3
77. Which is the preferred NDE method used for thickness measurements of piping NPS 1 and less?
- A Ultrasonic (UT)
  - B Radiography (RT)
  - C Eddy Current (ET)
  - D All of the above
- ANS: (B) REF: API-570 5.6



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78. Which NDE method(s) is used for determining thickness?  
A Radiography (RT)  
B Ultrasonic (UT)  
C Both A and B  
D None of the above.  
ANS: (C) REF: API-570 5.6
79. When taking thickness measurements at a TML, only the \_\_\_\_\_ reading may be used for determining the remaining life.  
A Lowest  
B Average  
C A or B  
D A and B  
ANS: (C) REF: API-570 5.6
80. Temperature effect which requires adjustment by appropriate temperature correction factor when performing ultrasonic thickness measurement occurs at a temperature above \_\_\_\_\_.  
A 150 °F  
B 65 °C  
C 120 °F  
D A or B  
ANS: D REF: API-570 5.6
81. When pressure tests are conducted, it shall be in accordance with requirements in \_\_\_\_\_.  
A ASME Section V  
B API 570  
C ASME B31.3  
D The owners instructions  
ANS: (C) REF: API-570 5.7
82. Which statement below is correct regarding pressure testing of piping system:  
A Pressure test may be conducted using the content provided the minimum temperature is not less than 60 F  
B Pneumatic test may be applied in-lieu of hydrostatic test upon the discretion of the Inspector  
C Pressure relieving devices of the proper setting and other appurtenances removed during testing must be reinstalled or reactivated  
D Test pressure shall not be over the set pressure of the pressure relieving device  
ANS: (C) REF: API-570 5.7



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83. When a flammable liquid is used for the pressure test, the flash point of the liquid shall be at least or greater than \_\_\_\_\_.

- A 60°F
- B 90°F
- C 120°F
- D 150°F

ANS: (C) REF: API-570 5.7

84. When pressure tests are required, they shall be conducted.

- A Before heat treatment
- B After heat treatment
- C Before or after heat treatment
- D None of the above.

ANS: (B) REF: API-570 5.7

85. The Inspector must verify proper materials were used during repairs to piping systems either on all materials used or by sampling. The Inspector can verify the use of proper material by which methods?

- A Testing by the chemical spot checking, X-ray with fluorescent analyzer, or optical spectographical analyzer
- B Examining material test reports
- C Verify marking on the material components or bolting
- D All of the above.

ANS (D) REF: API-570 5.8

86. Normally, thickness readings are not routinely taken on valves in piping circuits when dismantled for servicing and repair. However gate valves in an corrosive/erosive environments should have thickness reading at \_\_\_\_\_.

- A The valve ends
- B The valve bonnet.
- C Between the valve seats
- D Thickness readings are not required.

ANS: (C) REF: API-570 5.9

87. Control valves or other throttling valves, particularly in high-pressure drop-and-slurry services can be susceptible to localized corrosion/erosion. The corrosion/erosion is typically found \_\_\_\_\_.

- A At the orifice
- B Uniform through the valve
- C Upstream of the orifice
- D Downstream of the orifice

ANS: (D) REF: AP:I-570 5.9



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88. When the valve body are pressure tested after service, the test should be conducted in accordance with:
- A API-570
  - B API-570
  - C API-598
  - D API-576
- ANS: (C) API-570 5.9
89. Check valves should be visually check and inspected internally. Which item below is not a required inspection item for inspecting check valves?
- A check that the flapper is free to move without excessive wear
  - B Excessive wear on flapper stop
  - C **Valve leak check**
  - D Flapper nut properly secured to the flapper bolt
- ANS: C
90. What steps should be taken when weld imperfections are found during radiographic profile examination of welds in a piping system?
- A Further inspection with weld quality ultrasonic or radiographic shall be made to assess the magnitude of the imperfections.
  - B An effort should be made to determine if the imperfections are from original construction or from environmental cracking.
  - C If imperfections were from original construction the an inspection or engineering analysis is required to asses the impact of the weld quality on the piping system.
  - D All of the above.
- ANS: (D) REF: API-570 5.10
91. Who is responsible for performing the engineering analysis to determine the impact of weld imperfections?
- A Inspectors or Certified welding inspectors judgment
  - B Piping engineer judgment
  - C Engineering fitness-for-service analysis
  - D One or more of the above.
- ANS: (D) REF: API-570 5.10
92. Newly installed fasteners shall be sampled and examined to determine whether they meet the material specifications. The method of verifying acceptance to the material specification is by:
- A Verification of the markings that are identified in the applicable ASME or ASTM standards
  - B Verification of the material by subjecting the fasteners to chemical testing
  - C Verify the fasteners from the certified material test report
  - D None of the above is the correct method of verifying acceptance
- ANS: (A) REF: API-570 5.11



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93. Fasteners should extend completely through their nuts. Any fastener failing to do so is considered acceptably engaged if the lack of complete engagement is not more than

- A one thread
- B two threads
- C three threads
- D None of the above

ANS: (A) REF: API-570 5.11

94. Flanged joints, clamped and pumped with sealant should be:

- A Inspected for leakage at the bolts
- B Remove and inspect each fasteners
- C When repumping of sealant is contemplated, the fasteners should be replaced first
- D Both A and C

ANS: (D) REF: API-510 5.11

95. The frequency and extent of inspection of piping circuits depends upon:

- A Form of defect detected in piping and the consequence of failure
- B Form of defect detected in piping and the likelihood of failure
- C Form of degradation affecting piping and the consequence of failure
- D None of the above

ANS: C REF: API-570 6.1

96. Risk base inspection is based on the likelihood of failure and the consequence of failure as used in this code to either increase or decrease the limit and the extent of inspection based on the assessment. By performing the assessment, a better strategy may be used to established:

- A A controlled inspection frequency
- B The most appropriate inspection methods, tools and techniques based on the expected form of degradation
- C Pressure testing of the piping circuit may not be necessary
- D Increase examination of the piping circuit to assure prevention of failure

ANS: C REF: API-570 6.1

97. The classification of piping systems is based on \_\_\_\_\_.

- A Piping pressure and temperature ratings
- B Materials of construction
- C Potential safety and environmental effects
- D All of the above.

ANS: (C) REF: API-570 6.2



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98. Which class has the highest potential of resulting in an immediate emergency when a leak occurs.

- A Class 1
- B Class 2
- C Class 3
- D None of the above

ANS: (A) REF: API-570 6.2.1

99. The majority of piping systems is classified as \_\_\_\_\_.

- A Class 1
- B Class 2
- C Class 3
- D None of the above

ANS: (B) REF: API-570 6.2.2

100. The criteria used for establishment of inspection intervals is \_\_\_\_\_.

- A Corrosion rate and remaining life calculations
- B Piping service classification and jurisdictional requirements
- C The inspectors judgment
- D All of the above.

ANS: (D) REF: API-570 6.3

101. Thickness measurements shall be scheduled based on :

- A Half the remaining life
- B The maximum intervals in years defined in API-570
- C The consequence of failure
- D The shorter of A and B

ANS: (D) REF: API-570 6.3

102. How often does a Class 2 piping system require thickness measurement?

- A Every 3 years
- B Every 5 years
- C Every 10 years
- D None of the above.

ANS: (C) REF: API-570 6.3 Table 6-1

102. How often does injection points in a piping system measure?

- A 2 years
- B 3 years
- C 5 years
- D As often as required depending on the last inspection result

ANS: (B) REF: API-570 6.3 Table 6-1





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104. A pipeline containing diesel is located running along a river should have the thickness measurement conducted every \_\_\_\_ years.
- A 10
  - B 3
  - C 5
  - D Depend upon the piping system class
- ANS: (C) REF: API-570 6.3 Table 6-1
105. External and CUI inspection on a pipeline containing gasoline fuel on-site should be conducted at least every \_\_\_\_ years.
- A 10
  - B 3
  - C 5
  - D Depend upon the piping system class
- ANS: (A) REF: API-570 6.3 Table 6-1
106. The remaining life of an anhydrous hydrogen chloride piping was found to be 11 years. When will be the next visual inspection schedule on this pipe?
- A 5 years
  - B 3 years
  - C 11 years
  - D 10 years
- ANS: (A) REF: API-570 6.3 Table 6-1
107. What is the recommended extent of CUI inspection by NDE following visual inspection for Class 1 piping systems within susceptible temperature range?
- A 75% of all suspected areas
  - B 50% of all suspected areas
  - C 33% of all suspected areas
  - D 25% of all suspected areas
- ANS: (B) REF: API-570 6.4
108. What is the recommended extent of CUI inspection following visual inspection for Class 3 piping systems at areas with damaged insulation?
- A 75% of damaged insulation
  - B 50% of damaged insulation
  - C 25% of damaged insulation
  - D 10% of damaged insulation
- ANS: (C) REF: API-570 6.4
109. What are the inspection requirements for small bore piping (SBP).
- A Same as other piping for primary process
  - B Different if it is secondary process piping
  - C Both A and B are correct
  - D None of the above
- ANS: (C) REF: API-570 6.6.1



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110. A 1-1/2" level bridle in Class 2 system should be inspected:
- A At an inspection interval as the primary process piping
  - B Where the corrosion has been experienced or anticipated
  - C At the Inspectors option
  - D A small bore in secondary system does not require inspection
- ANS: (B) REF: API-570 6.6.1
111. Inspection of secondary, auxiliary SBP associated with instruments and machinery:
- A Is optional
  - B Same as other piping if a class 1 system
  - C May be optional if a class 2 or 3 piping
  - D Inspection of auxiliary piping is not required
- ANS: (A) REF: API-570 6.6.2
112. Determine the remaining life for the following piping system. Design pressure 600 psi @ 300°F, material A-53-B-ERW pipe NPS 6 sch 40. The thickness at the last inspection was .157" the thickness from the previous inspection was .201" the inspection interval is 5 years.
- A 4.1 years
  - B 3.2 years
  - C 2.3 years
  - D 1.2 years
- ANS: (B) REF: API-570 7.1.1
113. Determine the remaining life for the following piping system. Design pressure 800 psi @ 200°F, material A-106-B pipe NPS 12 standard wall. The thickness at the last inspection was .3" the thickness from the previous inspection was .34" the inspection interval is 5 years.
- A 6 years
  - B 5 years
  - C 4 years
  - D 3 years
- ANS: (B) REF: API-570 7.1.1
114. When calculating for the remaining life of a piping system, which corrosion rate must be used:
- A Short term Corrosion Rate due to less number of years in between
  - B The higher rate of either the short or the long term corrosion rate
  - C Long term rate due to a larger amount of material corroded
  - D Shorter or longer depends upon the Inspector
- ANS: (B) REF: API-570 7.1.1



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115. When is the next required inspection interval for a Class 1 piping system made from A-106-B NPS 8 sch. 40 designed for 600 psi @ 300°F? The measured thickness at the last inspection was .210" and the inspection records indicate a corrosion rate of .01"/year.
- A 10 years
  - B 8 years
  - C 5 years
  - D 4 years
- ANS: (D) REF: API-570 7.1.1
116. When calculating for the maximum allowable working pressure for continued service of a piping system:
- A Use the lowest grade of material and joint efficiency when the original material is unknown
  - B The wall thickness used for calculating the pressure should be the actual thickness measure minus twice the estimated corrosion loss before the date of the next inspection
  - C Loading must be taken in consideration
  - D All of the above must be used
- ANS: (D) REF: API-570 7.2
117. Determining the maximum allowable working pressure of the piping system for continued use shall be in accordance with:
- A Applicable Code
  - B ASME B 31.1
  - C ASME B31.3
  - D ASME B31.7
- ANS: (A) REF: API-570 7.2
118. When calculating the minimum thickness on corroded area based on a weld having a joint factor of less than 1.0 is used, the weld area, or area remote from the weld is considered as:
- A The surface at a weld
  - B 1 inch of the parent metal from both sides of the weld
  - C Or, twice the minimum thickness on either side of the weld
  - D All of the above
- ANS: (D) REF: API-570 7.4
119. During inspection, you have observed an unexpected movement on a section of the pipe. As an Inspector, what should you do:
- A Inform the operator to shut down the system immediately
  - B Discuss with the Piping Engineer the need of a piping stress analysis
  - C Note the movement on the report and submit it to your supervisor
  - D Do nothing unless it is a not acceptable item when performing external inspection
- ANS: (B) REF: API-570 7.5



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120. The owner must maintain records for each piping system. These records must contain pertinent data as to:
- A Piping service
  - B Name of the Inspector performing the inspection
  - C Identification number
  - D All of the above
- ANS: (D) REF: API-570 7.6
121. Prior to repair, the Inspector may give prior approval for routine repairs provided the Inspector:
- A Is guaranteed that work comply with the Code
  - B Satisfied with the competency of the repair organization
  - C Welder qualification will be reviewed later
  - D Welding procedure used is qualified by the repair organization
- ANS: (B) REF: API-570 8.1.1
122. All materials and welding procedures used for on-stream welding must be approved by the :
- A Inspector
  - B Piping Engineer
  - C Owner
  - D Repair organization
- ANS: (C) REF: API-570 8.1.2
123. Longitudinal cracks on pipe may be repaired using welded split sleeve, provided the :
- A Inspector has approved the repair
  - B The owner has approved the repair method
  - C The Piping Engineer has approved the repair and is satisfied that the cracks would not propagate
  - D Can be used provided it is considered a temporary repair
- ANS: (C) REF: API-570 8.1.3.1
124. Temporary repairs may remain in place for a longer period of time if only approved and documented by the:
- A Inspector
  - B Piping Engineer
  - C Design Engineer
  - D Owner
- ANS: (B) REF: API-570 8.1.3.1
125. Insert patches may be used to repair damaged corroded area if:
- A Full penetration groove welds are provided
  - B The weld shall be examined by the suitable NDE method
  - C Rounded corners must be used for the patch
  - D All of the above
- ANS: (D) REF: API-570 8.1.3.2



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126. Temporary repairs for leak may be may be accomplished using sealant pumped into the system should be reviewed and accepted by either the Inspector or Piping engineer. Considerations must be taken on the:
- A Compatibility of the sealant with the leaking material
  - B Risk of sealant affecting downstream instruments or components
  - C Material of the sealant
  - D Both A and B
- ANS: D REF: API-570 8.1.4
127. Hot tap welding during operation must be done in accordance with:
- A API Publication 2201
  - B API Publication 2207
  - C API Recommended Practice 576
  - D API Recommended Practice 572
- ANS: (A) REF: API-570 8.2
128. Preheat method may be used in-lieu of postweld heat treatment for repairs, alteration and weld metal build-up of piping system provided the material is:
- A P1 and P3
  - B Piping Engineer is consulted
  - C P1 and P3 with the exception of Mn-Mo steels for P3
  - D Both B & C are correct
- ANS: (C) REF: API-570 8.2.2.1
129. Local postweld heat treatment cannot be substituted for the 360 degree banding on all materials, if:
- A The application is review and procedure developed by the Engineer
  - B A preheat of 300F or higher is maintained
  - C The PWHT is performed for environmental cracking resistance
  - D The required PWHT temperature is maintained for a distance not less than 2 times the base metal thickness
- ANS: (C) REF: API-570 8.2.2.2
130. Materials used for repairs or alteration must be:
- A Known weldable quality
  - B Conform to the applicable Code
  - C Compatible with the original material
  - D All of the above
- ANS: (D) REF: API-570 8.2.4
131. Ultrasonic examination acceptance standards use for evaluating repair welds are found in:
- A ASME B31.3
  - B ASME Section V Article 4
  - C ASME Section V Article 5
  - D Applicable construction Code and the owner's specification
- ANS:(D) REF: API-570 8.2.5



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132. Pressure test are normally required after alterations and major repairs. When a pressure test is not necessary or practical;
- A NDE shall be utilized in lieu of a pressure test
  - B Pneumatic test may be applied
  - C Substituting special procedures may be accomplished only after consultation with the Inspector and the Engineer
  - D Both A & C
- ANS: (D) REF: API-570 8.2.6
133. The pressure test of the final closure weld connecting a new replacement section to an existing pipe shall be performed if:
- A The new replacement section has been pressure tested
  - B The straight section of the pipe is not axially aligned (mitered cut)
  - C Final closure is 100% radiographed
  - D MT or PT performed on the root pass
- ANS: (B) REF: API-570 8.2.6
134. Which item below do not pertain to pressure test of an altered item:
- A Pressure test requires the approval of the Piping Engineer
  - B Pressure test may not be performed if not deemed necessary to the Inspector
  - C Pneumatic test may be substitute for hydrostatic test
  - D Nontoxic liquid medium may be used for hydrostatic test
- ANS: (A) REF: API-570 8.2.6
135. Rerating of pressure piping systems can be accomplished only after the following have been achieved:
- A Use the original piping data for the proposed new service condition
  - B Rerated piping system must be leak tested even when the temperature increase does not affect the tensile stress of the material
  - C Calculation performed
  - D A decrease in minimum operating temperature is justified by impact test results when required by the applicable code.
- ANS: D REF: API-570 8.3
- 136.. What document(s) define the recommended guidelines for cathodic protection.
- A API 653
  - B API 574
  - C NACE RP0169 and API RP651
  - D None of the above.
- ANS: (C) REF: API-570 9.0



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137. Pipe coating holiday survey are used to:
- A locate coating defects on buried coated pipes
  - B Ensure that new coating is intact
  - C Evaluate coating serviceability for buried piping
  - D All of the above
- ANS: (D) REF: API-570 9.1.3
138. An above grade visual surveillance should be conducted by the owner approximately every \_\_\_\_\_.
- A 2 years
  - B yearly
  - C 6 months
  - D At the owners option
- ANS: (C) REF: API-570 9.2.1
139. Underground piping should be surveyed for points of probable corrosion. How is this survey performed?
- A Measuring the pipe-to-soil electrical potential
  - B Complete excavation of the line.
  - C Both A and B
  - D None of the above
- ANS: (A) REF: API-570 9.2.1
140. A close-interval potential survey on cathodically protected pipe should be conducted ever \_\_\_\_\_.
- A 2 years
  - B 5 years
  - C 10 years
  - D None of the above
- ANS: (B) REF: API-570 9.2.2
141. Buried piping longer than 100 feet and not cathodically protected should have a soil corrosivity measurements every \_\_\_\_\_ years.
- A 5
  - B 10
  - C 3
  - D 2
- ANS: (A) REF: API-570 9.2.4
142. What document(s) define the recommended guidelines for cathodic protection.
- A ASME B31.3
  - B API 574
  - C NACE RP0169 and API 651
  - D None of the above
- ANS: (C) REF: API-570 9.2.5



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143. When a pipe is inside pipe casing, what type of inspection should be performed to determine condition of the buried piping?
- A Perform a pipe to soil potential survey
  - B Pipe coating holiday testing
  - C Inspect the casing if soil and/or water has entered the casing
  - D Ensure that the casing is properly coated
- ANS: (C) REF: API-570 9.2.6
144. What is the holding time for a leak test of buried piping?
- A 1 hour
  - B 6 hours
  - C 12 hours
  - D 24 hours
- ANS: (C) REF: API-570 9.2.7
145. Which soil resistivity indicated below is more corrosive on buried piping
- A < 2,000 ohm-cm
  - B 2,000-5,000 ohm-cm
  - C 10,000 ohm-cm
  - D >10,000 ohm-cm
- ANS: (A) REF: API-570 9.2.7
146. Inspection of buried piping may be supplemented by leak testing. Which statement below is applicable to the testing procedure.
- A With a pressure equal to the operating pressure of the system for a period of 12 hours
  - B With a pressure equal to 10% above the operating pressure for six hours
  - C After 6 hours the pressure should be noted and pressurized to the original pressure if the pressure decreases more than 5%
  - D With a pressure equal to 1.1 operating pressure for 12 hours and repressurized after 6 hours and isolated
- ANS: (D) REF: API-570 9.2.7
147. An authorized Piping Inspector shall be the required education and experience equal to:
- A A college degree plus one year of experience in the petroleum industries
  - B A two year associate degree plus two years of experience in the petrochemical industries
  - C A high school education plus three (3) years of experience in the petrochemical industries
  - D Five years of experience inspecting in-service piping systems
- ANS: (D) REF: API-570 Appendix A.2.1





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148. When the corrosion area of a pipe exceeds  $\frac{1}{2}$  the diameter of the pipe size, a temporary patch about equal the size of the corroded area may be installed by fillet welding as temporary installation provided:

- A The patch corners are rounded to at least 1" radius
- B The diameter of the electrode is not more than  $\frac{5}{32}$ "
- C On-stream welding must meet the API Publication 2201
- D A full encirclement sleeve should be use

ANS: (D) REF: API-570 APP.C



## LESSON 2

### API 574 Inspection of Piping, tubing, Valves, and Fittings

#### INTRODUCTION

This section includes questions from API-574 Standards Second Edition June 1988. Inspection Practices for Piping Components



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1. Piping made for refinery service can be made from which of the following materials
  - A Rolled and welded
  - B Cast
  - C Drawn through dies
  - D All of the aboveANS: (D) REF: API-574 4.1.1
  
2. Over what size can pipe be made from rolling plate material?
  - A 14 inches
  - B 12 inches
  - C 16 inches
  - D 36 inchesANS:(C) REF: API-574 4.1.1
  
3. Centrifugal cast pipe is normally manufactured to which thickness?
  - A Schedule 40
  - B Any desired thickness
  - C Schedule 80
  - D Standard wallANS:(B) REF: API-574 4.1.1
  
4. Steel and alloy piping are manufactured to standard dimensions up to 48 inches known as:
  - A Weights
  - B Standard pipe sizes
  - C Nominal pipe sizes
  - D SchedulesANS:(D) REF: API-574 4.1.1
  
5. The standard thickness of pipe apply to pipe sizes up which of the following sizes?
  - A 48 inches
  - B 36 inches
  - C 14 Inches
  - D 12 inchesANS: (B) REF: API-574 4.1.1



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6. What are the traditional thickness designations for steel and alloy pipe?
- A Standard weight
  - B Extra Strong
  - C Double extra strong
  - D All of the above
- ANS: (D) REF: API-574 4.1.1
7. Steel and alloy piping are manufactured to standard dimensions in pipe sizes up to:
- A 48"
  - B 36"
  - C 24"
  - D 52"
- ANS: (A) REF: API-574 4.1.1
8. Which of the following documents define the dimensions of welded and seamless steel pipe?
- A ASME B31.3
  - B ASTM B16.19M
  - C ASME B16.5
  - D ASME B36.10M
- ANS: (D) REF: API-574 4.1.1
9. Which of the following documents define the dimensions of welded and seamless stainless steel pipe?
- A ASME B31.3
  - B ASTM B16.19M
  - C ASME B16.5
  - D ASME B36.10M
- ANS: (B) REF: API-574 4.1.1
10. What is the manufacturing under tolerance for wrought piping products made to nominal wall thickness?
- A  $\pm 1/16$ "
  - B 0.01"
  - C 12.5%
  - D  $+ 1/16 - 0$ "
- ANS: (C) REF: API-574 4.1.1



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11. What is the under tolerance of welded pipe often used for refinery service (For example ASTM A 358, A 671, and A 672)?

- A  $\pm 1/16''$
- B 0.01"
- C 12.5%
- D  $+ 1/16 - 0''$

ANS:(B) REF: API-574 4.1.1

12. What is the under tolerance of cast pipe as specified in ASTM A 530?

- A  $\pm 1/16''$
- B 0.01"
- C 12.5%
- D  $+ 1/16 - 0''$

ANS:(D) REF: API-574 4.1.1

13. The outside diameter of piping \_\_\_\_\_.

- A remains the same regardless of thickness
- B varies with the pipe thickness
- C is the same as the pipe size
- D changes with pipe schedule

ANS:(A) REF: API-574 4.1.1

14. When does the nominal pipe size become the actual outside diameter for steel pipe?

- A up to 12 inches
- B 14 inches and over
- C all sizes
- D they are never the same

ANS:(B) REF: API-574 4.1.1

15. Which of the following affects the strength of pipe materials?

- A grade
- B heat treatment
- C alloying material
- D all of the above

ANS:(D) REF: API-574 4.1.1



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16. Cast iron pipe is not recommended for what type of service?  
A water  
B non-hazardous  
C pressurized hydrocarbon  
D Steam  
ANS: (C) REF: API-574 4.1.1
17. The standards and sizes for cast iron pipe are \_\_\_\_\_.  
A the same as steel pipe  
B determined by the user  
C differ from welded or seamless pipe  
D change with pipe thickness  
ANS: (C) REF: API-574 4.1.1
18. What are the general differences between piping and tubing?  
A none, they are the same  
B tubing is manufactured in many inside diameters and thicknesses  
C tubing is always seamless  
D the tube size is its actual outside diameter  
ANS: (D) REF: API-574 4.2
19. The stated size of tubing is its actual size minus 1/8" for \_\_\_\_\_.  
A all tubing  
B tubing over 2 inches OD  
C ASTM B 88 tubing  
D steam trace tubing  
ANS: (C) REF: API-574 4.2
20. Which statement is correct concerning valves used in piping systems.  
A Valves are made in standard pipe sizes, materials and pressure ratings.  
B Each valve manufacturer rates valves to standards developed in house by the manufacture  
C Only forged vales can be used for piping systems  
D None of the above are correct  
ANS: (A) REF: API-574 4.3.1



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21. What product forms are used to make valve bodies?  
A castings, forgings  
B bar stock  
C combination of the products in A and B above welded together  
D All of the above  
ANS: (D) REF: API-574 4.3.1
22. The seating surfaces in the body can be:  
A integral with the body  
B can be made as inserts  
C must be made of hard material  
D A & B is correct  
ANS: (D) REF: API-574 4.3.1
23. What types of materials are valve inserts made from?  
A the same material as the valve body  
B different material from the valve body  
C both A and B are correct  
D none of the above  
ANS: (C) REF: API-574 4.3.1
24. When special nonmetallic materials that could fail during a fire are used as seating surface what can be provide in the valve to make it safer?  
A no additional requirements can be met  
B only fire proof materials are permitted  
C metal to metal back up seating can be provided  
D none of the above  
ANS: (C) REF: API-574 4.3.1
25. What are the typical configuration for valve end preparations?  
A Flanged, or threaded  
B Recessed for socket welding  
C Beveled for butt welding  
D All of the above  
ANS: (D) REF: API-574 4.3.1
26. What is the purpose for power actuated valves?  
A large size or inaccessible location  
B actuation by instruments  
C both A and B  
D none of the above  
ANS: (C) REF: API-574 4.3.1



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27. A gate valve basically consists of:
- A a locking mechanism
  - B a flapped gate that closes quickly
  - C a body with a gate that interrupts flow
  - D none of the above
- ANS: (C) REF: API-574 4.3.2
28. The port opening in gate valves larger than NPS 2 typically is \_\_\_\_\_.
- A the same size as the valve openings
  - B reduced in size from the valve opening
  - C increased in size from the valve opening
  - D none of the above
- ANS: (A) REF: API-574 4.3.2
29. Which statement best describes a globe valve?
- A Globe valves are commonly used to regulate fluid flow.
  - B The port opening is typically at right angles to the inlet and outlet.
  - C The seating may be flat or tapered.
  - D All of the above.
- ANS: (D) REF: API-574 4.3.3
30. What statement best describes a plug valve?
- A Plug valves consist of a tapered or cylindrical plug which fits snugly into a corresponding seat.
  - B Plug valves are used to regulate flow.
  - C Plug valves have a typical wheel handle
  - D All of the above
- ANS: (A) REF: API-574 4.3.4
31. Which statement best describes a ball valve?
- A A ball valve is similar to a plug valve except that the plug in a ball valve is spherical instead of tapered or cylindrical.
  - B Ball valve usually function as block valves.
  - C They are well suited for quick on/off or bubble tight service conditions.
  - D All of the above
- ANS: (D) REF: API-574 4.3.5





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32. What type of seat material is used for ball valves?
- A All metal seats for high pressure service
  - B Elastomeric seating materials.
  - C Both A and B are correct.
  - D None of the above.
- ANS: (C) REF: API-574 4.3.5
33. Which statement best describes the operation of a diaphragm valve?
- A The valve closes by using a diaphragm that forces the gate against the seat using the seat to block fluid flow.
  - B When the spindle is screwed down it forces the flexible diaphragm against a seating the valve body blocking fluid flow.
  - C Both A and B are correct
  - D None of the above.
- ANS:(B) REF: API-574 4.3.6
34. To completely open a butterfly valve the operator must.
- A Turn the valve stem 180 degrees
  - B Turn the stem at least five turns to prevent from slamming shut.
  - C Turn the stem 90 degrees
  - D None of the above
- ANS:(C) REF: API-574 4.3.7
35. There are four types of check vales a, swing check, piston check, ball check, spring-loaded wafer check. What is there primary purpose?
- A Used to automate sampling inspection.
  - B Automatically prevent backflow.
  - C To keep turbulence in check.
  - D All of the above.
- ANS: (B) REF: API-574 4.3.8
36. Slide valves are typically used for what type of service?
- A High temperature, erosive
  - B Low temperature
  - C Class 1 service
  - D none of the above
- ANS: (A) REF: API-574 4.3.9



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37. What is the primary purpose of a fitting?
- A Change direction of flow
  - B Allow piping run to be diverted or added to.
  - C Both A and B are correct
  - D None of the above
- ANS: (B) REF: API-574 4.4
38. Fitting are made from various materials that meet primary ANSI standards. These materials include which of the following product forms?
- A Cast, forged
  - B formed and welded
  - C Seamlessly draw
  - D All of the above
- ANS:(D) REF: API-574 4.4
39. Standard pipe threads are available for pipe size up to \_\_\_\_\_ NPS.
- A 6
  - B 10
  - C 12
  - D 24
- ANS: (D) REF: API-574 4.5.2
40. Threaded joints are generally limited to piping in non-critical service that has a nominal pipe size of \_\_\_\_\_ inches or smaller.
- A 1
  - B 2
  - C 3
  - D 4
- ANS: (B) REF: API-574 4.5.2
41. Butt welded joints are commonly used in the petroleum industry. What standard is used for preparation of the ends for fusion welding?
- A ASME B31.3
  - B ASME B16.9
  - C ASME B16.25
  - D ASME B31.1
- ANS: (C) REF: API-574 4.5.3.2



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42. When using socket weld fittings, the pipe is inserted to the bottom of the fitting to:
- A prevent accumulation of debris at the fitting
  - B allow for pipe expansion
  - C allow for weld shrinkage during welding
  - D Both B & C are correct
- ANS: (D) REF: API-574 4.5.3.3
43. A large number of failures occur at pipe-to-pipe welded branch connection. What is the reason for these failures?
- A The branch connections are subject to higher than normal stresses.
  - B Their configuration concentrates the stresses.
  - C Both A and B are correct.
  - D None of the above.
- ANS: (C) REF: API-574 4.5.3.4
44. What standard should be used for the design and installation of branch connections for process piping?
- A ASME B31.3
  - B ASME B16.9
  - C ASME B16.25
  - D ASME B31.1
- ANS: (A) REF: API-574 4.5.3.4
45. What standard covers flanges over NPS 24?
- A ANSI B16.5
  - B API 605
  - C MSS SP-44
  - D Both B and C
- ANS: (D) REF: API-574 4.5.4
46. Which of the following types of joining methods are acceptable for tubing?
- A Welding
  - B Brazing or soldering
  - C Flared or compression joints
  - D All of the above
- ANS: (D) REF: API-574 4.5.6

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47. Propriety joints offer designs that are advantageous over conventional joints for certain services. The disadvantage(s) to these joints is \_\_\_\_\_.
- A They usually have lower pressure and temperature ratings.
  - B They cannot tolerate significant axial or lateral movements.
  - C Both A and B are correct
  - D There is no disadvantages
- ANS: (C) REF: API-574 4.5.7
48. What is the reason for inspecting piping systems?
- A Ensure plant safety and reliability
  - B Identify active deterioration mechanism
  - C Predict future repairs or replacements
  - D B and C above
- ANS: (D) REF: API-574 5.1
49. What is the reason for mandating inspection of piping systems in petrochemical plant that may carry flammable fluids that are dangerous to plant personnel.
- A OSHA Regulations
  - B Safety
  - C Economics
  - D Insurance
- ANS: (B) REF: API-574 5.2
50. Which Federal regulation mandates the use of API-570 for inspecting equipment and piping systems that operates on significant quantities of hazardous chemicals ?
- A 29 CFR 1910.119
  - B 20 CFR 1910.120
  - C 10 CFR 50 App. B
  - D Non of the above
- ANS: (A) REF: API-574 5.2
51. Piping as used in petrochemical plant are frequently replaced due to deterioration cause by:
- A excessive vibration in the piping systems
  - B thinning by corrosion
  - C unusual upset during operation that causes cracks on the joints
  - D erosion and impingement
- ANS: (B) REF: API-574 6.2



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52. When grouping piping circuits, several factors are considered that affects the rate and nature of pipe wall corrosion. Which factor below is not a factor.
- A piping metallurgy
  - B temperature
  - C injector of water or chemicals
  - D designed corrosion allowance
- ANS: (D) REF: API-574 6.2.1
53. Piping systems that are more susceptible to accelerated corrosion rates are in areas where:
- A increase velocity or turbulence
  - B the change of direction occurs
  - C no flow occurs like in a deadleg
  - D all of the above
- ANS: (D) REF: API-574 6.2.2
54. Injection points may be designated as itself for the purpose of inspection with the recommended area to be included are:
- A 12 inches upstream and up to the second change in flow direction
  - B 3 pipe diameters upstream and up to 25 feet of downstream piping
  - C 12 inches upstream or 3 times the pipe diameter whichever is less
  - D none of the above accurately describes the area required
- ANS: (D) REF: API-574 6.3.1
55. Deadlegs in piping systems should be inspected for:
- A weld joint integrity at stagnant end and at the connection to active line
  - B creep and fatigue cracking at the high point in a hot piping system
  - C corrosion due to ammonium salt by ultrasonic scanning
  - D erosion at the area of high turbulence in the connection tie-in
- ANS: (D) REF: API-574 6.3.2
56. CUI in piping shall be inspected externally in susceptible areas for deterioration. The most common forms of deterioration are:
- A Corrosion of austenitic stainless steel in contact with carbon steel
  - B General corrosion of carbon steel
  - C Stress corrosion cracking of austenitic stainless steel
  - D All of the above
- ANS: (C) REF: API-574 6.3.3



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57. Piping system susceptible to CUI are in areas where moisture seeps inside the insulation that causes corrosion. Operating temperature of the system is one of the major factor in susceptibility when the systems operates at a temperature range of:
- A above 250 °F for corrosion of austenitic stainless piping
  - B 25 °F to 120 °F for corrosion of carbon steel piping
  - C carbon steel system constantly operating above 250 °F
  - D steam traced piping systems
- ANS: (B) REF: API-574 6.3.3.1
58. When inspecting uncoated buried piping at grade, considerations should be given to excavating \_\_\_\_\_ deep to access the potential for hidden damage:
- A 6 -18 inches
  - B 6 -12 inches
  - C at least 12 inches
  - D 18-24 inches
- ANS: (B) REF: API-574 6.3.4
59. Interfaces between concrete-to-air or asphalt-to-air surfaces of buried piping without cathodic protection, the Inspector should:
- A Inspect for deterioration of caulking or seals at the interface
  - B Inspect for corrosion beneath the surface when the piping is within 10 years
  - C Inspect for corrosion beneath the surface when the piping is within 10 years when seal deteriorated at the interface
  - D A and B above
- ANS: ( C ) REF: API-574 6.3.4
60. Corrosion occurs in areas where corrodants exist, areas more susceptible to corrosion in the piping systems are:
- A Downstream of an injection point and upstream product separator
  - B Steam system where condensation occurs
  - C Area upstream from a control valve
  - D A and B above
- ANS: (D) REF: API-574 6.3.5
61. Caustic stress corrosion cracking or chloride stress corrosion cracking of austenitic stainless steel is and example of:
- A Brittle fracture
  - B Environmental cracking
  - C Creep cracking
  - D Fatigue cracking
- ANS: (B) REF: API-574 6.3.7



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62. Internal coating or linings may be inspected using ultrasonic examination as an alternate for determining bonded or clad material. This type of examination is for :
- A Detection of corrosion cracking beneath the linings
  - B Detect unbonded lining materials, holes or blistering
  - C Measure wall thickness
  - D B and C above
- ANS: (D) REF: API-574 6.3.8
63. The type of deterioration in piping system that results in cyclic stress due to the change pressure, mechanical vibration, or temperature change is called:
- A Brittle fracture
  - B Fatigue crack
  - C Creep cracking
  - D Environmental cracking
- ANS: (B) REF: API-574 6.3.9
64. An effective, integrated program of piping inspection will include as many required wall thickness measurements as is possible while the plant is on-stream. Which of the following method(s) are used for this?
- A Ultrasonic thickness measurements
  - B Radiography
  - C Both A and B
  - D None of the above
- ANS: (C) REF: API-574 7.2
65. On-stream inspection can reduce down time by \_\_\_\_\_.
- A Extending process runs and preventing some unscheduled shutdowns.
  - B Permitting prefabrication of replacement piping before a shutdown.
  - C Eliminating unnecessary work.
  - D All of the above
- ANS: (D) REF: API-574 7.2
66. Many condition assessments can be made when a piping system is in-service these includes:
- A Pipe support systems
  - B Leakage
  - C Thickness measurements
  - D All of the above
- ANS: (D) REF: API-574 7.2



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- 66.. Leaks noted by operators during operation should be:
- A Left unrepaired until the next scheduled inspection.
  - B Assess the severity of the leak
  - C Inform the Inspector who can check it's seriousness and determine proper corrective action
  - D Repair all leaks
- ANS: (C) REF: API-574 7.2
67. In preparation for inspection the following steps shall be taken.
- A Scaffolding should be erected where required and buried pipe should be excavated at inspection points.
  - B All inspect tolls should be checked for working condition accuracy.
  - C Equipment need for personal safety should be checked for condition and all necessary warning signs and barricades should be erected around work areas.
  - D All of the above.
- ANS: (D) API-574 8.2
68. Which statement below is not considered misalignment of piping system:
- A Dislodge pipe so that the weight is unevenly distributed on the hangers or supports
  - B No sign of deformation of a vessel wall in the vicinity of a pipe attachment
  - C Pipe supports forced out of plumb by expansion of the piping
  - D Shearing of foundation bolts of mechanical equipment to which piping is attached
- ANS: (B) REF: API-574 10.1.1.2
69. Hot spots when suspected may be measured using:
- A portable thermocouple
  - B temperature indicating crayons
  - C infrared temperature indicating device
  - D all of the above may be used
- ANS: (D) REF: API-574 10.1.1.7





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70. Surface temperature over 200 °F may have an effect on the thickness reading normally higher than the thickness by \_\_\_\_\_% at a temperature reading between 300 °F - 700 °F.

- A 1% to 5 %
- B 1 % to 3%
- C 3% to 5%
- D 5% maximum

ANS: (A) REF: API-574 10.1.2.1

71. Special UT instruments are required for surface temperatures above 200°F. In addition to special instruments, a variation in the readings can occur at higher temperatures. What is the approximate variation in thickness reading at 500°F?

- A 1 percent above actual thickness
- B 3 percent above actual thickness
- C 5 percent above actual thickness
- D None of the above

ANS: (B) REF: API-574 10.1.2.1

72. Which statement below is not an advantage for conducting radiography at the site.

- A Radiography is low cost compared to other methods
- B Radiography can be used for determining pipe internal pitting
- C Radiography can be performed while the unit is operating
- D Radiography can be performed without the removal of insulation

ANS: (A) REF: API-574 10.1.2.2

73. Cracks in alloy steel due to hardness of the weld are caused by:

- A improper preheat or postweld heat treatment
- B improper current used during welding
- C unqualified welding procedure
- D improper weld material used during welding

ANS: (A) REF: API-574 10.2.1.5.2

74. Which type of corrosion usually affects underground pipe?

- A Internal corrosion
- B External corrosion
- C both A and B
- D None of the above

ANS: (B) REF: API-574 10.3



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75. Underground piping should be surveyed for points of probable corrosion. How is this survey performed?

- A Measuring the pipe-to-soil electrical potential
- B Complete excavation of the line.
- C Both A and B
- D None of the above

ANS: (A) REF: API-574 10.3.1.2

76. Valve wall thickness are normally thicker than the pipe attached to it. The formula for calculating retirement thickness of valves and fittings used is:

- A By using a factor of 1.5 the pipe thickness and the allowable stress for the material specified in ASME B 31.3
- B Use the ASME B16.34 Table 3
- C Use API standard 600 for thickness requirements
- D By using a factor of 1.5 the thickness of a cylinder designed for a stress of 7000 psi

ANS: (A) REF: API-574 11.2



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## LESSON 3

### ASME B31.3 Process Piping

#### INTRODUCTION

This section includes questions from ASME Code B31.3 Process Piping 1999 edition and B16.5 Piping Flanges and Flange Fitting



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1. Determine the minimum required thickness for a straight pipe made from NPS 8, A-312-304L Seamless pipe for a system pressure of 400psi @400°F.  
A .1021"  
B .1091"  
C .1122"  
D .1201"  
ANS: (B) REF: ASME B31.3 304.1.2 ✓ 1
  
2. What is the maximum allowable pressure of a new piping system made from NPS 10 sch 60 A-53-Type F operating at a temperature of 400°F with a corrosion allowance of 1/8"?  
A 818 psi  
B 681 psi  
C 577 psi  
D 481 psi  
AND: (D) REF: ASME B31.3 304.1.2 ✓ 2
  
3. What is the maximum allowable working pressure for the following system NPS 8 sch 40 A-53-B ERW pipe with an operating temperature of 300°F with a corrosion allowance of 1/16"?  
A 719 psi  
B 864 psi  
C 423 psi  
D 567 psi  
ANS: (B) REF: ASME B31.3 304.1.2 ✓ 3
  
4. What is the required thickness of a blank made from A-516-70 plate with a ring joint design with a gasket pitch diameter of 12" design pressure of 400 psi @ 300°F.  
A .432"  
B .562"  
C .692"  
D .734"  
ANS: (C) REF: ASME B31.3 304.5.3 ✓ 4
  
5. For calculating the minimum thickness for a blind flange, the "d<sub>g</sub>" stands for:  
A Inside diameter or gasket or flat face flanges  
B Gasket pitch outer diameter for ring joints  
C Gasket pitch diameter for ring joints  
D A or C above  
ANS: (D) REF: ASME B31.3 304.5.3 ✓ 5



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6. A process in which a ferrous metal is heated to a suitable temperature above the transformation temperature range and is subsequently cooled in still air at room temperature is called:
- A Annealing
  - B Normalizing
  - C Quench and tempering
  - D Postweld heat treatment
- ANS: (B) REF: ASME B31.3 300.2 ✓ 6
7. Is impact testing required for the 2" thick plate weld made from A-285 Grade C material designed for a pressure of 300 psi at +35°F?
- A Yes
  - B No
- ANS: (A) REF: ASME B31.3 323.3 ✓ 7
8. Is impact testing required for the pipe made from A-139 Grade A material NPS 14 sch.80 designed for a pressure of 300 psi at +35°F?
- A Yes
  - B No
- ANS: (A) REF: ASME B31.3 FIG.323.2.2
9. Who is responsible for the quality of welding welded to ASME B 31.3 Code?
- A The certifying Lab
  - B The employer.
  - C The Authorized Inspector.
  - D The welder
- ANS: (B) REF: ASME B31.3, 328.1 ✓ 8
10. Qualification of welding procedures and welder performance shall be in accordance with:
- A ASME Code Section IX Art. I
  - B ASME Code Section IX with exceptions modified in ASME B31.3
  - C ASME Code Section IX Art.2
  - D ASME Code Section IX Art.3
- ANS: (B) REF: ASME B31.3 328.2.1 ✓ 9



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11. What alternative Heat Treatment may be used in lieu of Post Weld Heat Treatment of completed welds?  
A Normalizing  
B Normalizing and Tempering  
C Annealing  
D all of the above  
ANS: (D) ASME B31.3, 328.2.1 ✓ 10
12. For B31.3 piping system, a welding procedure qualified by one Employer may be used by another Employer provided:  
A The Inspector has approved the WPS and is satisfied that the condition specified in the Code were met.  
B The Inspector and the design Engineer has been informed of the WPS  
C The both Employers are the same organization  
D The WPS has been reviewed and approved by the Owner  
ANS: (A) REF: ASME B31.3, 328.2.2
13. Welding Procedure Specifications (WPS), and welders and welding operators must be qualified in accordance with \_\_\_\_\_.  
A API-570  
B API-650  
C ASME B31.3  
D Section IX of the ASME Code  
ANS: (D) REF: ASME B31.3, 328.2.1(a) ✓ 11
14. Welding procedure may be qualified by others provide:  
A The welding process is limited to SMAW or GTAW  
B Accepted by the welding procedure and procedure qualification record by signature  
C Currently employs a welder who qualifies the performance test using the procedure and the material specified in the WPS  
D All items above must be complied with  
ANS: (D) REF: ASME B31.3 328.2.2 ✓ 12
15. Welders qualified by others may be allowed for the repair organization provided:  
A Approved by the Inspector  
B The repair organization shall obtain a copy of the qualification test record  
C Records of welder's identification assigned  
D All of the above  
ANS: (D) REF: ASME B31.3 328.2.3, 328.2.4 ✓ 13



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16. A filler metal AWS classification is not listed in the ASME IX may be used to make production welds:
- A When approved by the owner and the WPS using the filler metal is qualified
  - B May not be used unless the filler metal has a designated F number
  - C When approved by the Inspector and the WPS using the filler metal is qualified
  - D May not be used unless the filler metal is approved by ASME as Code case

ANS: (A) REF: ASME B31.3, 328.3.1

ok 14

17. For a ASME B31.3 piping system, what is the allowable inside surface misalignment?

- A 1/4 t
- B 1/8"
- C 1/16"
- D Per WPS

ANS: (D) REF: ASME B31.3, 328.4.3 ✓

ok 15

18. Which statement below states the welding requirements required per Code:

- A Tack welds need not be made by a qualified welding operator
- B Peening is allowable on the root, and final pass
- C Each welding operator shall be assigned an identification symbol so as to identify the symbol adjacent to the weld
- D In addition to the stamping, a record of the welder making the weld shall be documented

ANS: (C) REF: ASME B31.3 328.5.1 ✓

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19. For ASME B31.3 construction, what are the permitted method(s) of welder identification (ID) of production welds?

- A Welder ID Stamping on the weld in every joint
- B Welder ID Stamping adjacent to the weld in every joint
- C A record of welded joints and the welders making the joints
- D All of the above

ANS: (D) REF: ASME B31.3, 328.5.1(b) ✓

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20. Welding activity may not continue or be stopped whenever:

- A The welder is not qualified
- B The manufacturer has not qualified a procedure
- C The Inspector has a hold point on the weld
- D The weld area is impinged with rain, sleet, snow

ANS: (D) REF: ASME B31.3 328.5.1 (e) ✓

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21. An ASME B31.3 piping system includes slip-on flanges for the small diameter pipe. A single fillet weld is used for the attachment of the flange. Where must this weld be?

- A Either the inside or outside as defined in the WPS
- B This design is not permitted by the code
- C At the hub of the flange
- D None of the above

ANS: (C) REF: ASME B31.3, 328.5.2(b)

*ok 19*

22. A branch connection as shown in Fig. 328.5.4D(3) has a fillet welded between the repad and the branch as 3/8" leg size and a 3/16" fillet welded between the repad on to the header. The repad is 1/4" thick, while the branch and header are 3/8" thick. Choose the incorrect statement below:

- A The fillet weld joining the repad to the branch is acceptable
- B The fillet weld joining the repad to the header is not acceptable because the throat size is less than half the header thickness
- C The fillet weld joining the repad to the header is acceptable
- D The fillet weld throat size joining the repad to branch is more than the required size  $t_c$ .

ANS: (B) REF: ASME B31.3 328.5.4

*OK*

23. A NPS 10 extra strong (XS) pipe A-53B material is to be welded together using GTAW welding process. Which statement below is true regarding preheat requirements:

- A A 50 °F minimum temperature shall be used for preheat
- B A 175 °F minimum temperature is recommended
- C A 50 °F minimum temperature is mandatory for preheat when the ambient temperature below 32 °F
- D Preheat is not required provided the welding procedure was qualified without preheat

ANS: (C) ASME B31.3 330.1.1

24. Pre Preheat zone is defined as the area of the weld and \_\_\_\_\_ inch(es) beyond each edge of the weld.

- A One half
- B One
- C Two
- D One and a half

ANS: (B) REF: ASME B31.3, 330.1.4





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25. When hardness test is used to verify satisfactory heat treatment, what area of the joint are considered?
- A the entire weld area
  - B the heat affected zone
  - C the weld and heat affected zone
  - D the weld, heat affected zone and base metal
- ANS: (C) REF: ASME B31.3, 330.1.1
26. When does the preheat as recommended by the Code become a requirements of the Code?
- A When the ambient temperature during welding is 32° F or lower
  - B When the ambient temperature during welding is between 32° F and 50° F
  - C When the preheat temperature in the WPS is 50° F and the ambient temperature is 70° F
  - D When the ambient temperature during welding is 32° C or lower
- ANS: (A) REF: ASME B31.3, 330.1.1
27. A NPS 14 sch.80 pipe A-333 Gr.4 material is to be welded together using GTAW welding process. What would be the required preheat temperature during welding?
- A 250 °F
  - B 300 °F
  - C 200 °F
  - D The minimum temperature is only recommended
- ANS: (B) REF: ASME B31.3 Table 330.1.1
28. The preheat requirements for unlisted materials shall be in \_\_\_\_\_.
- A the WPS
  - B the Engineering Design
  - C both A and B are correct
  - D none of the above
- ANS: (C) REF: ASME B31.3 330.1.2
29. A P-1 Carbon steel pipe joined by SMAW welding process has a thickness of 1.25". What would be the heat treat temperature range and the minimum holding time be?
- A 1100 °F- 1200 °F and 1 hr minimum
  - B 1100 °F - 1325 °F and 1 hr 15 minutes
  - C 1100 °F - 1200 °F and 1 hr 15 minutes
  - D 1100 °F - 1325 °F and 1 hr minimum
- ANS: (C) REF: ASME B31.3 Table 331.1.1

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30. A NPS 14 sch.80 pipe A-333 Gr.4 material is to be welded together using GTAW welding process. What would be the postweld heat treatment temperature range and the minimum holding time be?

- A 1100 °F - 1325 °F and 60 minutes
- B 1300 °F - 1375 °F and 60 minutes
- C 1100 °F - 1200 °F and 45 minutes
- D 1300 °F - 1375 °F and 45 minutes

ANS: (B) REF: ASME B31.3 Table 331.1.1

31. A NPS 14 sch.80 pipe P-1 and P-4 materials are to be welded together using GMAW welding process. What would be the postweld heat treatment temperature range and the minimum holding time be?

- A 1100 °F - 1200 °F and 60 minutes
- B 1300 °F - 1375 °F and 45 minutes
- C 1100 °F - 1200 °F and 45 minutes
- D 1300 °F - 1375 °F and 60 minutes

ANS: (D) REF: ASME B31.3 Table 331.1.1

32. An NPS8 ,A-335-P7, sch.120 is welded to an A-106-B pipe of the same nominal thickness and pipe diameter using SMAW process. What is the proper heat treatment procedure ?

- A Heat treat at 1100 - 1325F for a period of 1 hr.
- B Heat treat at 1100- 1200F for a period of 1 hr,
- C Heat treat at 1150-1225 F for a period of 2 hr.
- D Heat treat at 1300-1400F for a period of 2 hr. .

ANS: (D) REF: ASME B31.3 Table 331.1.1

33. When performing Post Weld Heat Treatment of weld having two different material thickness:

- A the thinner part shall be used for determining the heat treatment time
- B the thicker part shall be used for determining the heat treatment time
- C either thickness may be used provided the weld is tapered
- D either thickness may be used as long as the difference in thickness in not more than 1/8"

ANS: (B) REF: ASME B31.3, 331.1.3

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34. The examiner must provide the Inspector with \_\_\_\_\_.
- A Certification that the quality control requirements of the code and the engineering design have been carried out.
  - B Certification of all materials
  - C Both A and B
  - D None of the above.
- ANS: (A) REF: ASME B31.3 341.2
35. Porosity used as a standard for radiography is found in:
- A ASME B31.3
  - B Sect V *oh*
  - C SNT-TC-1A
  - D API-570
- ANS: (A) REF: ASME B31.3 TABLE 341.3.2
36. A NPS 10 girth weld in the normal fluid service was radiographed and found to have three indications. How would you as the Inspector evaluate the interpretation:
- A Accept the weld for lack of fusion due to the total length is 1/4"
  - B Accept the weld for slag inclusion length which is equal to 1/2 T
  - C Accept the weld for a crack-like indication 1/4T in length
  - D Accept the weld because the three indications are within the allowable limit of the Code
- ANS: (B) REF: ASME B31.3 Table 341.3.2
37. Which statement below is correct regarding the qualification of examination personnel:
- A Examiners shall have training and experience in accordance with SNT-TC-1A
  - B Examiners must be certified to their employer's program using SNT-TC-1A as a guide
  - C Examiners may be tested and certified by the owner's quality program
  - D Examiners should be requalified every three years in accordance with the owner's qualification program
- ANS: (B) REF: ASME B31.3 342.1



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38. Qualifications requirements for personnel performing magnetic examination on weld metal build-up are found in:
- A SNT-TC-1A.
  - B Sect V
  - C Sect VIII
  - D API-570
- ANS: (A) REF: ASME B31.3 342.1
39. Radiographic examination procedure when used, shall be written as required in accordance with the requirements of:
- A API-570
  - B SNT-TC-1A
  - C ASME Section V, Art.1 T-150
  - D ASME Section V, Art.2
- ANS: (C) REF: ASME B31.3 343
40. Personnel performing nondestructive examination shall be qualified in accordance with:
- A The recommended guidelines of SNT-TC-1A
  - B SNT-TC-1A may be used only as a guide
  - C The requirements of the ASME Code
  - D ASNT
- ANS: (B) REF: ASME B31.3 342.1 footnote
41. Radiography of pipe welds shall be performed in accordance with the requirements of:
- A ASME Section V, Art.2
  - B ASME Section V, Art.9
  - C ASME Section V, Art.5
  - D ASME Section V, Art.6
- ANS: (A) REF: ASME B31.3 344.5
42. Ultrasonic examination of newly fabricated welds shall be performed in accordance to:
- A ASME Code V Art.2
  - B ASME Code V Art.5
  - C ASME Code V Art.3
  - D ASME Code V Art.6
- ANS: (B) REF: ASME B31.3 344.6.1



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43. Visual examination is the observation of the portion of the components or joints that can be conducted before, during or after manufacture, fabrication and assembly. Visual examination:
- A Must be perform to ASME Section V, Art.9
  - B May be performed by personnel performing production work
  - C May be performed to verify compliance to engineering design
  - D Both A and C
- ANS: (D) REF: ASME B31.3 344.2
44. Ultrasonic examination acceptance standards use for evaluating repair welds are found in:
- A ASME Section V Article 3
  - B ASME Section V Article 4
  - C ASME Section V Article 22
  - D The original construction code
- ANS: (D) REF: ASME B31.3 344.6.2
45. Unless specified in the engineering design document, in-process examination shall be performed using the following method:
- A liquid penetrant
  - B magnetic particle
  - C visual examination
  - D visual aided by liquid penetrant
- ANS: (C) REF: ASME B31.3 344.7
46. The minimum hold time for a hydro leak test is \_\_\_\_\_.
- A 5 minutes
  - B 10 minutes
  - C 15 minute
  - D As defined by the owner.
- ANS: B REF: ASME B31.3 345.2.2
47. A complete piping system requires a leak test even when the piping subassemblies were tested separately.
- A True
  - B False
- ANS: (B) REF: ASME B31.3 345.2.3



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48. When minor repairs or additions are performed on a piping system after the leak test the system must be retested.
- A True
  - B False
- ANS: (B) REF: ASME B31.3 345.2.6
49. A piping system designed at 500 psi and 600 °F is to be hydrostatically tested using the liquid content which is flammable. The pipe material is A-53B seamless NPS6 sch.80 pipe. What is the hydrostatic test pressure if the test is conducted at 70F?
- A 750 psi
  - B 794 psi
  - C 812 psi
  - D 777 psi
- ANS: (B) REF: ASME B31.3 Table A-1, 345.4.2
50. When the piping attached to a vessel is to be pressure tested in conjunction with the vessel:
- A The test pressure for the pipe may be the same or less than the test pressure for the vessel and both being tested using the test pressure for the pipe
  - B The test pressure of the pipe may be higher than the pressure vessel provided the test pressure conducted using the vessel pressure is not less than 77% of the piping test pressure
  - C Both A and B
  - D Both A and B provided the owner approves the test pressure for conducting the test in item B
- ANS: (D) REF: ASME B31.3 345.4.3
51. When a pressure relief device is installed in the system to be pneumatically tested and the test pressure is 600 psi, what must the set pressure of the relief valve be?
- A 660 psi
  - B 650 psi
  - C 640 psi
  - D 625 psi
- ANS: (B) REF: ASME B31.3 345.5.2



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52. A piping system designed at 500 psi at 600 °F is to be pneumatically tested using the content of the system. The pipe material is A-53B seamless NPS6 sch.80 pipe. What is test pressure if the test is conducted at 70F?

- A 750 psi
- B 794 psi
- C 550 psi
- D 625 psi

ANS: (B) REF: ASME B31.3 345.5.4

53. What type of test may be substituted for a hydrostatic leak test for Category "D" fluid service?

- A A leak test is optional for Category D fluid service
- B A sensitive leak test may be used.
- C An initial service test may be used
- D No alternatives are allowed.

ANS: C REF: ASME B31.3 345.7

54. Pressure test after the completion of a piping system constructed to ASME B31.3 may not be conducted provided:

- A All the welds in the system is being examined
- B Flexibility analysis of the piping is made
- C A sensitive leak test is performed
- D All of the above

ANS: (D) REF: ASME B31.3 345.9 —

55. What is the measurement between the mating and the flange surfaces on a Class 300 raised- face flanges.

- A 0.25"
- B .125"
- C 0.06"
- D 0.187"

ANS: (C) REF: ASME B16.5 Table 11

56. What is the inner dimension of a NPS 2 Class 300 welding neck flange?

- A 0.244"
- B 0.207"
- C 0.246"
- D 0.187"

ANS: (B) REF: ASME B16.5 Table 12



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57. What is the minimum thickness dimension for a NPS 4 Class 1500 blind flange?

- A 2.12"
- B 1.88"
- C 1.62"
- D 1.50"

ANS: (A) REF: ASME B16.5 Table 24

58. What is the outside diameter of a raised-face width gasket for a Class 400 slip-on type NPS 12 with gasket edges extending to the bolt?

- A 18"
- B 16"
- C 16.5"
- D 16.62"

ANS: (C) REF: ASME B16.5 Table E1 Fig. E3

59. For calculating the minimum blind flange thickness, the " $d_g$ " dimension for the gasket pitch diameter in the formula is \_\_\_\_\_ for a NPS 10 Class 600 ring joint face.

- A 10.635"
- B 12.75"
- C 13.5"
- D 11.0"

ANS: (B) REF: ASME B31.3 Table 5





## LESSON 4

### ASME Code IX Welding Qualifications

#### INTRODUCTION

This section includes questions from ASME Code IX. This includes the general requirements, welding qualifications, performance qualifications and welding variables.



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1. A welding procedure qualified under the 1965 ASME Code Section IX:  
A is obsolete  
B is still applicable  
C must be Re-qualified every 3 years when Code is re-issued  
D is not addressed by the Code  
ANS: (B) REF: Section IX Forward
  
2. The 6G position for welding is a .  
A qualification position  
B production welding position  
C rod position  
D vessel position  
ANS: (A) REF: IX QW-120
  
3. A groove weld WPS is qualified using an 8 inch thick test coupon. The testing equipment for tensile and bends only accommodates 1-1/2 inch wide by 1-1/2 inch thick specimens. Only one welding process, F-number and base material is used. How many bend and tensile of tests are required?  
A 24 bends & 12 tensiles  
B 4 bends & 2 Tensiles  
C 12 bends & 24 Tensiles  
D 12 bends & 6 Tensiles  
ANS: (A) REF: Section IX, QW-151
  
4. Who is responsible for preparing the Welding Procedure Specification?  
A purchasing  
B erector/Manufacturer/Repairer  
C weld Testing Laboratory  
D a qualified welder  
ANS: (B) REF: IX QW-200.1
  
5. A WPS requires addressing of:  
A Non-essential variables  
B Essential & Nonessential variables  
C Essential Variables only  
D Supplementary essential and Nonessential variables  
ANS: (B) REF: Section IX QW-200.1(b)



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7. When changing a non-essential variable on a welding procedure, the procedure must be .
- A revised
  - B re-qualified
  - C no action required
  - D none of the above
- ANS: (A) REF: Section IX, QW-200.1(c)
8. An SMAW WPS specifies an amperage range of 50-300 amps for E7018 electrodes. The welder wants to use 400 amps to weld a groove weld. What must be done as a minimum?
- A Re-qualify the procedure
  - B Revise the WPS.
  - C Make a new coupon with a new PQR
  - D Revise the old PQR
- ANS: (B) REF: Section IX, QW-200.1(c), QW-253
9. A WPS qualified with notch toughness testing may be used for welds requiring:
- A No impact test requirements
  - B Impact testing at the qualified temperature
  - C Welders qualified with impact test requirements
  - D A & B is applicable
- ANS: (D) REF: Section IX, QW-200.1(c)
10. A procedure qualification record (PQR) shall address.
- A non-essential variables
  - B essential variables
  - C supplemental essential variables when required
  - D both B & C
- ANS: (D) REF: Section IX, QW-200.2(b)
11. An example of a SMAW nonessential variable is:
- A AWS class.
  - B Group Number
  - C Filler Metal Diameter
  - D Both A & C
- ANS: (D) REF: Section IX, QW-253



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12. A welder passes a 6G test using NPS 6 pipe 3/8" thick with an F-4 electrode. Which statements below are true?
- A the welder may weld in any position
  - B the welder may weld on any thickness base metal
  - C the welder may use an F-3 electrode in production
  - D all of the above are true
- ANS: (D) REF: Section IX, QW-253, 433
13. Which statement below is incorrect in qualifying a welding procedure using the GTAW process:
- A the base metal qualified is unlimited regardless of coupon thickness
  - B the addition of welding positions is an essential variable
  - C deposited thickness "t" is unlimited
  - D all of the above
- ANS: (D) REF: Section IX, QW-256
14. Which of the following qualifies a welder to weld a NPS 2 groove pipe weld ?
- A Two bend tests using plate coupon
  - B Two tension test using a NPS 1 welded pipe
  - C Radiography using one NPS 1 welded pipe
  - D None 6" length minimum
- ANS: (D) REF: Section IX QW-302.2
15. What is the minimum test coupon length for a Welder to be qualified by radiography on production welds.
- A Entire weld circumference of the pipe
  - B 30"
  - C 6"
  - D Both A & C
- ANS: (D) REF: Section IX, QW-302.2
16. A welder qualified to weld in the process for groove joint:
- A Is qualified to weld all groove joints
  - B Is qualified to weld all sizes of fillet welds
  - C Is qualified to weld corrosion resistance overlay welds
  - D A & B only
- ANS:(B) REF: Section IX, QW-303.1



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17. Which welding process may not be used for qualifying a welder by radiography?
- A GMAW short circuit transfer
  - B SAW
  - C GTAW
  - D SMAW
- ANS: (A) REF: Section IX, QW-304
18. Welders qualifications shall expire if they do not weld \_\_\_\_\_
- A within a given process for a 6 month period
  - B using a given procedure for a 6 month period
  - C on a piping system for 6 months
  - D for a 3 month period
- ANS: (A) REF: Section IX, QW-322
19. A welder qualified to weld a single V joint open butt weld GTAW welding process is not qualified to weld:
- A Double V joint welded on both sides
  - B Single V joint with backing ring
  - C Single V joint without consumable insert
  - D Single V joint with consumable insert
- ANS: (D) REF: Section IX QW-356, QW-404.22
20. A Welder using GTAW process must requalify if the Welder:
- A welded with the addition of a backing ring
  - B deposited a 3" thick weld metal when qualified with a 3/4" thick coupon
  - C welded with the addition of inert backing gas
  - D welded with a different polarity using direct current
- ANS: (D) REF: Section IX, QW-356, QW-409.4
21. A welder who is qualified using a double-groove weld:
- A is also qualified to make a single V-groove weld without backing
  - B is also qualified to make a single V-groove weld with backing
  - C may weld in the 6G position
  - D must requalify every 2 months
- ANS: (B) REF: Section IX, QW-402.4



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22. A Welder qualified in the 6G position using SMAW process E-6010 (F-3) without backing may be qualified to weld:

- A F4 filler metal with backing
- B F3 with backing
- C F2 without backing
- D F1 without backing

ANS: (B) REF: Section IX, QW-404.15, QW-433

23. A WPS qualified for welding with consumable insert requires a qualification test on coupon welded with:

- A Consumable insert
- B Backing ring
- C open butt
- D Any condition above is acceptable

ANS: (D) REF: Section IX, QW-404.22, nonessential variable GTAW

24. Base metals are grouped into groupings according to their welding characteristics.

- A F-number
- B AWS
- C A-number
- D P-number

ANS: (d) REF: IX QW-421

25. What is the minimum specified tensile strength for SA-106-C?

- A 66,400
- B 70,000
- C 72,000
- D 60,000

ANS: (B) REF: Section IX, QW-422

26. A welder was qualified with a P-1 test coupon using SMAW E7018 electrodes. What below would not be permitted for this welder for this qualification?

- A P5 to P1-11
- B P1 to P1-11
- C P25 to P8
- D P8 to P8

ANS: (C) REF: Section IX, QW-423



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27. What is the minimum required base metal thickness for welding procedure qualification when the production weld will be 8" thick?
- A 4 inches
  - B 3/4 inch
  - C 1 1/2 inches
  - D 8 inches
- ANS: (C) REF: Section IX, QW-451.1
28. A welding procedure qualified on 1/4 inch thick plate can be used to weld groove welds in materials from to.
- A 3/16 to 3/4
  - B 1/16 to 3/4
  - C 3/8 to 3/4
  - D 1/16 to 1/2
- ANS: (D) REF: QW-451.1
29. In performance qualification of pipe groove welds to ASME Section IX, which position requires more than two guided bend specimens for qualification?
- A 2G and 4G
  - B 3G and 4G
  - C 5G and 6G
  - D 4G and 6G
- ANS: (C) REF: Section IX, QW-452
30. How many test specimens are required for qualifying a welder welding a 6" NPS coupon on the 5G position ?
- A 4 bend test
  - B 2 bend test
  - C 2 bend & 2 tensile
  - D 4 tensile test
- ANS: (A) REF: Section IX QW-452.1, Note (4)
31. When qualifying a welder for an 8" groove weld in production, what is the minimum weld deposit required during performance qualification testing?
- A 4 inches
  - B 3/4 inch
  - C 1 1/2 inch
  - D 8 inches
- ANS: (B) REF: Section IX, QW-452.1



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32. When qualifying a welding procedure using A 7/16" plate, What type of test are required?

- A 2 face bend, 2 root bend and 2 tensile test
- B 4 side bend and 2 tensile test
- C 4 side bend and radiography
- D either A or B

ANS: (D) REF: Section IX, QW-452.1

33. A welder is qualified in the 2G position on plate with backing using the GTAW process. Which below welding would not be permitted?

- A Pipe groove welds in the F and H positions
- B Plate groove welds in the H and V positions
- C Fillet welds in the F and H positions
- D Pipe groove welds in the F position

ANS: (B) REF: Section IX, QW-461.9

34. What are the positions used to qualify a welder for all position pipe welding?

- A Must use the fixed horizontal (2G) and the fixed vertical (5G).
- B Fixed vertical (5G) and the multiple position (6G).
- C Fixed horizontal (2G) and the multiple position (6G).
- D Fixed horizontal (2G) and the fixed vertical (5G); or the multiple position (6G)

ANS: (D) REF: Section IX, QW-461.9

35. For a filler metal E-7018, what does the number 1 stands for?

- A Welding position for flat only
- B Welding position for vertical and flat only
- C Welding position for all positions
- D Welding position for flat and horizontal position only

ANS: (C) REF: HSB Technical handbook





## LESSON 5

### ASME Code V Nondestructive Examination

#### INTRODUCTION

This section includes questions from ASME Code Section V. The NDE methods included in this lessons are Radiography, Ultrasonic, Magnetic Particle, Liquid Penetrant and Visual examination.



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1. The ultrasonic examination of welds shall \_\_\_\_\_  
A be performed to a written procedure  
B be approved by ASNT  
C be proven to the satisfaction of the Inspector.  
D both A and C are correct  
ANS: (D) REF:ASME V, T-150, B31.3 3.4.3
  
2. Backscatter radiation is indicated by use of a lead letter "B" whose dimensions are  
A 1/2" thick by 1/16" high  
B 1/2" thick by 1/8" high  
C 1/8" thick by 1/2" high  
D 1/16" thick by 1/2" high  
ANS: (D) REF: ASME V T-223
  
3. How is radiographic density measured?  
A by the use of a penetrometer.  
B by film density  
C comparing to known defects  
D by the use of a densitometer  
ANS: (D) REF. ASME V T-225
  
4. Film used for radiographs that are to be in compliance with Section V shall be:  
A industrial film  
B Type 1  
C Medical quality or greater  
D Both a & c  
ANS: (A) REF: ASME V T-230
  
5. In accordance with Section V, intensifying screens:  
A Can always be used.  
B Can be used unless restricted by the referencing Code.  
C Can never be used.  
D Can be used only with Type 1 film.  
ANS: (B) REF. ASME V, T-232
  
6. A \_\_\_\_\_ is an image quality indicator used in a radiograph.  
A A step wedge comparison film.  
B A densitometer.  
C A penetrometer.  
D All of the above.  
ANS: (C) REF: ASME V, T-262



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7. A densitometer shall be calibrated:
- A traceable to a national standard
  - B prior to use or every shift
  - C annually
  - D all of the above
- ANS: (A) REF:ASME V T-262
8. What is the minimum number of penetrameters required for a complete girth seam containing 30 radiographs shot with a single exposure?
- A 3
  - B 15
  - C 6
  - D 30
- ANS: (A) REF:ASME V, T-271.2
9. Radiographic location markers are to be placed:
- A on the exposure holder/cassette
  - B on the part
  - C between the part and the film
  - D either b or c above
- ANS: (B) REF: ASME V-T275
10. A weld with a total thickness of 1.5 inch is to be radiographed using a film side penetrameter, hole type. The penetrameter designation should be:
- A 25
  - B 30
  - C 35
  - D Both A and B are acceptable.
- ANS: (A) REF: ASME V, T-276
11. If penetrameters are not placed adjacent to the welds, what rules apply?
- A The penetrameter should be placed on the source side of the material being radiographed.
  - B The penetrameter may be placed on the film side of the material being radiographed
  - C Lead letter "F" at least as high as the identification number is placed adjacent to the film side penetrameter.
  - D All of the above
- ANS: (D) REF: Section V, T277



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12. When performing radiographic examination of an array of objects, how many penetrameters are required?

- A 1
- B 3
- C 4
- D 1 per object

ANS: (D) REF. ASME V T-277.2

13. From what type of material should shims be fabricated when they are to be used to radiograph welds?

- A Malleable materials capable of being drilled
- B From the same heat number as the material being inspected
- C fabricated of radiographically similar material to the object to be inspected.
- D all of the above

ANS: (C) REF: Section V, T277.3

14. What is the minimum permitted density of radiographic film using an Iridium source?

- A 2.0
- B 1.8
- C 1.3
- D 4.0

ANS: (A) REF: V-T282.1

15. What is the minimum allowable density through the image of the penetrameter for radiographs made with a 2000 kv tube?

- A 1.8 - 4.0
- B 1.3 - 2.8
- C 2.0 - 4.0
- D 1.3 - 1.8

ANS: (A) REF: ASME V T-282.1

16. Under ASME Code Section V, what are the upper and lower densities acceptable for viewing if the density through the body of the penetrameter is 2.7? Assume single film viewing.

- A 2.295 to 3.510
- B 1.890 to 3.105
- C 1.8 to 4.0
- D 1.3 to 4.0

ANS: (A) REF. ASME V T-282.2



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17. What are penetrameters used for?
- A A penetrometer is used for evaluating radiographic technique in that it serves as an image quality indicator.
  - B It indicates the magnetic properties of the materials
  - C Is the same as penetration in Ultrasonic Inspection
  - D both a & c above
- ANS: (A) REF. ASME V T-283
18. When reviewing a radiograph, a dark image of the letter B can be seen on the film.
- A This is cause for rejection
  - B This is not cause for rejection
  - C This is the same as a light letter B
  - D An unusual safety hazard existed during the exposure
- ANS: (B) REF: ASME V T-284
19. What is the acceptable geometrical unsharpness for examining a weld having a material thickness of less than 2 inches?
- A 0.20"
  - B 0.02"
  - C 0.03"
  - D 0.04"
- ANS: (B) REF: ASME V T-285
20. A radiographic review form is completed:
- A after the Inspector accepts the films
  - B before being presented to the Inspector
  - C need not be completed
  - D none of the above
- ANS: (B) REF: ASME V T-292 (b)
21. When performing straight beam calibration using the side drill holes in the basic calibration block, the examination surface and the calibration block surface must a temperature difference within \_\_\_\_\_°F.
- A 50
  - B 25
  - C 100
  - D 75
- ANS: (B) REF: ASME V Art.4 App.C-1



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22. UT screen height linearity checks:  
A use 12 dB increments  
B may use a straight beam unit  
C may use an angle beam unit  
D both b & c  
ANS: (D) REF: ASME V Article 5, Mandatory Appendix I
23. Ultrasonic examination acceptance standards use for evaluating repair welds are found in:  
A ASME Section V Article 3  
B ASME Section V Article 4  
C ASME Section V Article 22  
D in the referencing construction code  
ANS: (D) REF: ASME V T-510
24. Ultrasonic examination shall be performed having a minimum overlap of \_\_\_\_% of the transducer dimension perpendicular to the direction of the scan.  
A 50  
B 10  
C 20  
D 25  
ANS: (B) REF: ASME V T-523
25. UT equipment calibration for screen height linearity:  
A must be performed in accordance with appendix 1 of article 4  
B every three months  
C every extended use of six months  
D Both A & C  
ANS: (D) REF: ASME V, T-532
26. When examining a 10" NPS circumferential weld joining two pipes of A-106 B materials, which calibration block below is acceptable for use (thickness of the block and pipe to be examined are the same):  
A 10" NPS A-312 T304  
B 6" NPS A-106 B pipe  
C 8" NPS A-335 P-22 pipe  
D 10" NPS A-335 P-11 pipe  
ANS: (D) REF: ASME V T-542.8



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27. The temperature requirements for liquid penetrant examination range is:
- A 60 °F minimum
  - B 60 °F to 120 °F
  - C 50 °F to 125 °F
  - D 70 °F to 125 °F
- ANS: (C) REF: ASME V T-621
28. Acceptable Liquid Penetrant techniques are:
- A water washable
  - B post-emulsifying
  - C solvent removable
  - D all of the above
- ANS: (D) REF: ASME V T-651
29. Barring excessive bleedout, final interpretation shall be made within \_\_\_\_\_ to \_\_\_\_\_ minutes after developer coating is applied.
- A 7-30
  - B 5-20
  - C 10-30
  - D 7-20
- ANS: (A) REF: V T-676.1
30. Dry magnetic particle shall not be used if the surface temperature exceeds:
- A 135° F
  - B 1280° F
  - C 600° F
  - D no temperature limit is given
- ANS: (C) REF: V T-731
31. A suitable field strength is indicated when:
- A a clearly defined line of magnetic particles forms across the copper face of the indicator
  - B no clearly defined line of magnetic particles forms across the copper face of the indicator
  - C 2 clearly defined lines of magnetic particles form across the copper face of the indicator
  - D none of the above
- ANS: (A) REF: ASME V T-753.1



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32. What is the accuracy for calibrating magnetic particle equipment:
- A 5% of full scale
  - B 10% of full scale
  - C 5% of maximum reading
  - D 10% of maximum reading
- ANS: (B) REF: ASME V T-761(C)
33. Calibration for magnetic particle equipment with an ammeter shall be performed every:
- A year
  - B when repaired
  - C prior to use when calibration expired
  - D all of the above
- ANS: (D) REF: ASME V T-761
34. Yokes are calibrated and found acceptable for use if they can pick up
- A A/C units, 10 pounds
  - B D.C. units, 40 pounds
  - C permanent magnetic units 40 pounds
  - D all of the above
- ANS: (D) REF: ASME V T-762
35. When performing magnetic particle examination of welds using the prod method, what is the maximum and minimum prod spacing specified in the Code?
- A between 3" to 6" spacing
  - B between 3" to 8" spacing
  - C between 4" to 6" when the thickness is 3/4" or less
  - D a maximum of 8" provided the technique is acceptable to the Inspector
- ANS: (B) REF: ASME V T-773.3
36. Personnel performing visual weld examination, shall:
- A be able to distinguish a 1/32" fine line during procedure demonstration
  - B be capable of reading J-1 letters on standard Jaeger test charts for near vision
  - C have pass the API-570 Inspectors examination
  - D be able to read engineering drawings and understand welding technology
- ANS: (B) REF: ASME V T-924





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37. The three different methods of conducting "Visual Examinations"(VT) are:  
A Direct, indirect and previously recorded  
B Translucent, direct and previously recorded  
C Translucent, direct and indirect or (remote visual examination)  
D all of the above  
ANS: (C) REF: ASME V T-950
38. The general shape of gas cavities on a radiograph:  
A appear darker in contrast with areas of defect-free material  
B are generally round in shape  
C are acceptable  
D both a & b  
ANS: (D) REF: General Knowledge
39. When performing liquid penetrant examination on a completed pipe weld joint, which type of discontinuity cannot be detected by this method.  
A surface cracks  
B porosity  
C plate lamination  
D cold lap  
ANS: (C) REF: General knowledge
40. Personnel performing visual examination of welds must have a visual acuity examined using Jaeger J-1 chart on an interval not to exceed:  
A 12 months  
B 6 months  
C one month  
D not required  
ANS: (A) REF: ASME V Art.9