



PAINTING COATING INSPECTOR INTERVIEW

1. Define Adhesion ?

Ans. Adhesion is the force required to separate two surface in touch.(ASTM-D6677)

2. Define Viscosity ?

Ans. Fluid resistance to flow.(ASTM-D0562)

3. Define Primer ?

Ans. Anti corrosive to protect the steel.

4. Define Mid coat ?

Ans. Protects underlying coating builds thickness and provide good adhesion.

5. Define finish coat ?

Ans. It shall have a uniform glossy colors.

6. What is the SA 2-1/2

Ans. Very through blast cleaning. Surface shall be free from oil,gress,dirt,millscale,rust and foreign matter. Any remaining traces of contamination shall down only as straight stains in form spots or strips.

7. Define visco elastic coating ?

Ans. Non cured coating with visco elastic properties that can be applied in the form of wrapping on the pipe body according with APCS 113C.

8. Define Thixotropic coating ?

Ans. A type of coating that thickness or gels in short time but it become more fluid when agitated / stirred.

9. What is the approved coating ?

Ans. A coating material that meets the requirements of that applicable APCS or SAMSS, and approved by CSD/Coating team.

10. Define corrosion ?

Ans. Corrosion is the deterioration of a material ,usually a metal ,because of a reaction with its environment. corrosion is an electro.

11. What is necessary element for corrosion to occurs ?

Ans. Element for accruing accorcion is 1.anode 2.cathode 3.electolyte 4.matalic pathway.

12. What is Relative Humidity ? (RH)

Ans. The amount of water vapor in the air what express as a percentage is called Relative Humidity.

13. What is Dew Point? DP

Ans. It is the temperature which condensation would from on the surface.

14. Define POT LIFE?

Ans. Pot life is the period of the after mixing in which paint should be used.

15. Define Induction time or period?

Ans. Induction period is the length of time after maxing in which paint should stand before use.

16. Define Shelf Life?

Ans. Length of time a paint can be store in a day and cold storage area.

17. Define Flash Point?

Ans. Flash point is the point which vapor will ignite if can external source origination is introduced. flash point is the minimum temp, At which paint can be applied. flash point is measured in a close type able cup.

18. Define Tie coat?

Ans. A tie coat is used to tie incompatible paint system together, example is maintenance coating.

19. What is a DED MAN handle?

Ans. Automatic cut off device, which is hold on by the operator or blaster released automatically cuts of supply.

20. Name the three(3) adhesion test?

Ans. (1.cross cut) (2.pull off dolly test) (3.cross hatch test)

21. Name six(6) solvent ?

Ans. 1.water, 2.xylene, 3.white sprit, 4.MEK, 5.Acetone, 6.butenol, 7.ethanol.

22. Why need blasting on bar pipe ?

Ans. To remove dust,rust,mill scale and other contamination from pipe surface. Blasting is also required to make up roughness for proper bonding of paint material to pipe surface.

23. Types of defect on bar pipe ?

Ans. 1.Rout face damage, 2.bevel damage, 3.dent, 4.bent, 5.oveality, 6.scratches, 7.out of roundness, 8.flatness etc.

24. What is a knock out pot or device ?

Ans. Moisture separating device on a compressed air line.

25.Give two methods for checking WFT ?

Ans. 1.WFT comb gauge, 2.Eccentric wheel.

26. Raw materials blasting ?

Ans. 1.shots & grits, 2.gernet, 3.copper slag, 4.sand.

27. What is SSPC- - PA 2?

Ans. Coating thickness (DFT) measurement method / standard.

28. After blasting, how to remove garnet from the internal side of the tank?

Ans. By using dry brush and vacuum / sucking filter.

29. What is maximum blasting profile range?

Ans. 30 to 70um

30. What is the main cause of sagging?

Ans. Over deputation of paint in a concentrated area.

31. What is difference between SSP - SP 7 and NACE 04 ?

Ans. Both are same - Brush off blast clean.

32. What to do if sub-contractor found using profile gauge ?

Ans. What is QCP ?

Ans. Its quality control plan, Procedures, ITP and ISO Standard included in it.

33. What is the minimum blasting pressure ?

Ans. 90 PSI.

34. In which direction hypodermic needle gauge is used ?

Ans. Towards nozzle at 45 degree.

35. For what purpose hypodermic needle gauge is used ?

Ans. It is used to measure the blasting air pressure.

36. What is atomization ? What is 45:1 ?

Ans. Airless pump increase the pressure coming in a receiver 45 times and discharge 1 time at very high speed and pressure.

37. What are the main things describe in PQP ?

Ans. From scope of work a quality plan is prepared. Including documentation, inspection painting procedure and ISO standard.

38. What is 9001 ?

Ans. A guide line of standard, which lead us how to work with quality.

39. What does QMS mean ?

Ans. Quality Manager System

40. What happen if coating thickness is more then enough ?

Ans. There will be solidification and cracking.

41. What to do if chloride contamination increased 100 PPM on blasted surface ?

Ans. The blasted surface shall be washed out thoroughly.

42. What is the difference between a APCS 1A, 1B, and 1C ?

Ans. 1A : Epoxy coating system with inorganic zinc primer.

1B : Epoxy coating system with zinc phosphate primer.

1C : Epoxy coating system with zinc rich epoxy primer.

43. What is the thickness of metal jacketing sheet on vertical and horizontal section of vessel ?

Ans. Generally 0.8mm.

44. What is the required distance when installing support rings on flanges, elbow and tee ?

Ans. On flange 50mm, on elbow and tee 30mm.

45. What is the total DFT when using APCS 26 on new construction?

Ans. 200um .

46. What is the chloride range on grit blasted steel surface ?

Ans. 40 mg/m

47. What is the reason to hot insulation ?

Ans. To mention internal temperature perfection.

48. When S clamp is used ?

Ans. On vertical position, to hold the further insulation sheet with existing cladding sheet.

49. What is the requirement when coating anode area in the immersion service ?

Ans. In 2 square meter area of anode DFT shall be 30% extra then actual DFT.(APCS-2A) Not applicable for APCS-19 and APCS-20 series.

50. At what pressure in PSI, length of time and distance is required for blotter test ?

Ans. Pressure (50 psi) 1 minute-distance 45-60cm.

51. What coating system is recommended under installation for vessel and equipment with temp range is 65C to 90C centigrade ?

Ans. APCS-2C

52. Normally what is the blast nozzle length and width ?

Ans. Nozzle length 6 inch and width is 3/8 or 9mm.

53. How to apply coat for epoxy paint in winter ?

Ans. Apply coat for epoxy in the morning time in winter. steel temperature should be 25-30 degree centigrade. Otherwise there would be bubbling and moisture under the film from the air.

54. How to conduct a chloride test of garnet ?

Ans. Put some garnet and distilled water in a test tube. Mix thoroughly to make solution. Dip a litmus paper to check the PH (Power of Hydrogen) Value. The acceptable range is in between 4.5 to 7 P.H put the solution in another test tube and check the chloride value accordingly.

55. How to test air receiver tank and after how many duration ?

Ans. They shall be hydro tested at a pressure of at least (250psi) at ambient temperature using clean water. These vessels shall be revalidate by hydro testing at least annually.

56. When relief valves, gauge, and devices shall be tested ?

Ans. All pressure relief valves, gauge, and devices shall be tested annually and tagged with the expiration date.

57. What is SAMSS ?

Ans. Saudi Aramco Materials System Specifications.

58. What is ASTM ?

Ans. American Society for Testing and Materials.

59. What is SSPC ?

Ans. The Society for Protective Coating.

60. What is the reference standard for profile measurement ?

Ans. Clemtex Anchored Pattern Standard. **SAES-H-001**

61. What will be the re-coat interval timing stringent application condition ?

Ans. 1. In this condition use the use latest Materials Technical Data Sheet of the manufacturer. 2. Use this material data sheet as a supporting document to the Saudi Aramco Data Sheet given in SAES-H-101. **SAES-H-001**

62. What is the repair procedure for immersion service ?

Ans. (1). Use heavy duty textile or fabric adhesive tape and cover all coated areas near to the defective area. (2). Clean defective area by solvent or detergent wash. (3). For area less than 0.1m, grind to a rough metal surface using at least on 80 grit disc Sander. (4). Feather edge the coating at least 50mm beyond bare metal. (5). For area greater than 0.1 m, blast clean. To obtain the metal surface par. (6). Remove dust and debris by brush or vacuum. (7). Apply coating spray for areas greater than 0.1m to the original specification. (8). The primer of a multi-coat system shall be 15%. (9). The coating shall be holiday tested when fully cured. **SAES-H-001**

63. When it is mandatory to issue NCR (non-conformance report) ?

Ans. The NCR is issued when

1. Coating materials deficiencies.
2. Application malfunctioning.
3. Remedial action and method of repair shall be defined.

64. What is prohibited near the painting activity area ?

Ans. Smoking, open flames heating coils are prohibited in areas where coating is in progress.

65. What type of electrical lighting and equipment should be near the painting area ?

Ans. All these should be explosion proof.

66. Solvent cleaning and coating is not allowed on hot surface, What is the temperature range ?

Ans. Solvent and coatings shall not be applied to surface warmer than 80C.

67. What is standard to obtain work permit ?

Ans. Work permits for hot work, cold work, a confined space entry shall be obtained in accordance with **GI-0002.100**

68. Where and when is the requirement of mechanical force ventilation ?

Ans. Mechanical (Forced) ventilation shall be used in confined space whenever abrasive blasting, solvent cleaning, and/or coating application are in progress.

69. What to do when alkaline catalysts (such as used many epoxy coating) come in contact with the skin ?

Ans. If alkaline come in contact with the skin, it shall be immediately washed off with water to avoid chemical burns.

70. Is compressors air and solvent be used by personnel for personal cleaning or personal cooling ?

Ans. Neither compressors air nor equipment cleaning solvents shall be used by personnel for personal cleaning or personal cooling.

71. What is necessary to prevent shock from electrically driven power tools ?

Ans. Electrically driven power tools shall be properly grounded (earth) to prevent shock.

72. How to prevent shock at the blast nozzle ?

Ans. The blast nozzle shall be electrically connected to an external ground (earth) to prevent electrical shock to operating personnel.

73. What shall be the ground wire ?

Ans. The grounding wire shall be AWG-4 or large.

74. How to make safe the compressor hoses, air line, and blasting hoses ?

Ans. Compressor hoses, air line, and blasting hoses shall be pinned at each coupling.

75. What is not permitted to use for solvent cleaning ?

Ans. Benzene, gasoline, carbon, tetrachloride, and chlorinated hydrocarbons shall not be used.

76. Where and how to mix coating material ?

Ans. Coatings shall be mixed outside confined areas, in an adequately ventilated area. Use electrically driven power mixers and shall be grounded.

77. What is necessary airless gun while spraying ?

Ans. The tip guard.

78. What is important whenever the airless gun is left unattended ?

Ans. The trigger safety catch.

79. At what pressure Hoses, pumps, and accessories shall be operated ?

Ans. Hoses, pumps, and accessories shall be operated to pressure of 5000 psi, and never be exceeded. In case working pressure in the coating line exceeds, safety pressure relief valves shall be used on discharge side of the pressure pump (s).

80. What is necessary Prior to servicing of spray tip ?

Ans. The pump shall be shut down and the fluid pressure in the system relieved before servicing or cleaning any components, including spray tips.

81. When Airless spray equipment shall not be operated ?

Ans. If any of the pressure system components is not in good condition.

82. At what temperature the solvent shall not be flushed into container ?

Ans. Solvent shall not be flushed into container that are hotter than 50°C.

83. In which condition blasting and coating shall not be performed ?

Ans. Blasting and coating shall not be performed if one or more of the following conditions exist unless the coating is specifically formulated for the averted condition.

a) Air temperature is less than 10°C.

b) The substrate contains oil, grease, dirt, loose coating, loose rust, or other surface contaminants.

c) The substrate temperature is less than 3°C (5 F) above the dew point.

d) Strong wind blows sand, salt spray, or other foreign matter onto the surface.

e) Strong wind causes dry spray or seriously disturbs the spray pattern.

84. What is used for solvent cleaning ?

Ans. Use non-greasy solvent or cleaner.

85. What is the criteria to store coating material and for how long at construction site ?

Ans. Coating material must be covered with canvas or tarpaulins. temperature storage period at site is 14 days.

86. What coating material Shall be stored in air condition storage area ?

Ans. Temperature sensitive and self-polymerization coating material.

87. What is the standard to mark the coating container ?

Ans. 09-SAMSS-060.

88. Which coating container shall not be used ?

Ans. Coating shall not be used from a leak container. Coating which have exceeded the shelf life shall not be used.

89. What is the reference standard for abrasive blasting?Vis 1.

Ans. The reference standards for abrasive blasting is SISO 05-59-00 and SSPC-

90. What type of abrasive shall be used for blasting purpose ?

Ans. The type of abrasive to be used shall be used by the degree of cleanliness and surface profile requirement as per the applied APCS.

91. What abrasive material is prohibited for blasting ?

Ans. Silica Sand abrasive material is prohibited in Saudi Aramco as per GI-0006.021 requirements.

92. How to store the abrasive material ?

Ans. Abrasive Shall be kept dry and clean.

93. How much content of sulfate, chloride and calcium carbonate is permitted in abrasive material ?

Ans. Sulfate content shall be less than 50 PPM, the chloride shall be less than 50 PPM, and calcium carbonate shall be 0.10% maximum by weight.

94. How to remove existing coating for inspection propose ?

Ans. Use other non-silica sand abrasive such as garnet, grit and slag. The affected areas shall be re-blasted with suitable abrasive prior to re-coating.

95. What should be done prior to blasting operation?

Ans. Prior to blasting, rough welds and cut-offs shall be grounded. Weld spatter shall be removed.

96. How to conduct a blotter test ?

Ans. Attach a piece of blotter or absorbent paper to a clip board. Distance 45-60 cm in front of the blast nozzle during air flow only. With Of a nozzle pressure (50psig) for approximately 1 minute. The blast system Shall be operated for at least 5 minutes under actual at field conditions the specified pressure prior to making the blotter test.

97. Prior to blasting operation what shall be installed in vessels, tanks and in confined space ?

Ans. High intensity flood or spotlights shall be installed, for visibility. Suction Blowers shall be fitted to remove dust and fine blasting debris during the blasting operation.

98. After blasting what is the precaution to enter in the tanks / vessels ?

Ans. Wear rubber-soled shoes with clean disposable covers, sweatbands and lint-free gloves.

99. After abrasive blasting how to remove spent abrasive from external surface ?

Ans. Use dry brushing and clean compressed air to blow off abrasives and dust accordingly.

100. After abrasive blasting how to remove spent abrasive from internal Surface ?

Ans. Use dry brushing and vacuum cleaned subsequently.

101. When abrasive-cleaned surface shall be primed ?

Ans. Within 4 hours before the Surface condition degrades below the specified cleanliness level.

102. After how long Abrasive blasted surface shall call for inspection prior priming ?

Ans. If the surface are hold for more than 4 hours after blasting.

103. How to mix coating material?

Ans. For quantities over 5L, use a power stirrer. For quantities less than 5L, mix by hand. All coating mixing shall 'be homogeneous.

104. How to mix thixotropic coating ?

Ans. For thixotropic coatings mixing use, a power mixer regardless of the quantity.

105. What to do if sludge if found in the bottom of the coating container ?

Ans. Continuously stir to mix sludge until the coating is fully homogeneous. If sludge first cannot be dispersed, the coating shall not be used.

106. How to add thinner paint when it is required ?

Ans. Add thinner type and quantity as per Saudi Aramco data sheet during adding the thinner remain continue stirring until coating become homogeneously.

107. Can a coating material of different manufacturers be used in each coat? Ans. No, each coating system Shall be supplied by the same manufacturer unless otherwise approved by the consulting services department. The manufacturer shall also either supply the thinner or approve the thinner being used with his products.

108. Is partial mixing in a two-component and multi-component coatings is allowed ?

Ans. No it is prohibited.

109. In which condition the coating material of the project can be changed/ replaced?

Ans. a) Technical/quality issues on the existing coating product.

b) Insufficient inventory of existing material, or

c) Existing product is delaying the project completion schedule.

110. In multi-coat applications, primer, intermediate coat, and top coats can be of same color ?

Ans. Primer, intermediate coat, and topcoat shall be of contrasting colors and from the same coating manufacturer. **(APCS-2A)**

111. From where to check the paint re-coat interval time ?

Ans. Check the Saudi Aramco / manufacturer data for recoating timing. The latest Materials Technical Data Sheet of the manufacturer shall be used as a supporting document to the Saudi Aramco data Sheet.

112. How to check the DFT of the paint system ?

Ans. DFT shall be within the minimum and maximum limits allowed in the applicable APCS. Dry film thickness shall be checked in accordance with SSPC-PA 2.

113. How much adhesion strength of all coating systems is required ?

Ans. Adhesion strength of all coating systems shall be as per Saudi Aramco material system specification.

114. What is the recommended brush size ?

Ans. 125 mm.

115. What is required prior to the coating application, and what is required during application ?

Ans. Coating to be sprayed shall be filtered through a 30 to 60-mesh screen prior to use. It shall be continuously agitated with a low-speed stirrer during application.

116. Is APCS-2C Epoxy coating system for immersion service is recommended for potable water immersion service ?

Ans. APCS-2C is not normally recommended for potable water immersion service. Need to check with RSA.

117. What is the minimum DFT for immersion service (coatings for tanks and vessels including Vapor Zones) ?

Ans. 500 um .

118. What is use to coat the interior of nozzles and traps inside tanks and vessels ?

Ans. A 360° spray gun nozzle with proper tip size.

119. How to make and holiday test for tanks, vessels and other structure in immersion service ?

Ans. Use a wet sponge for holiday test. At 67.5 volts The coating thickness shall be less than 500 micron. A small amount of wetting agent shall be added to the water to aid in finding holidays, Dry spark tester shall be used for holiday detection if the coating dry film thickness exceeds 500 microns. Holidays shall be repaired in accordance with paragraph 8.5 .

120. When it is allowed to high voltage dry spark holiday detector shall be used to detect pinholes and coating film discontinuity ?

Ans. After the full coating system is fully cured.

121. How to use substance with coating ?

Ans. Mixing the catalyst shall be according to Saudi Aramco approved data Sheets (SAES-H-101V) Using Power slow stirrer to prevent air ingress to the mixed coating material. Partial mixing catalyst with coating is prohibited. For small areas, coating manufacturers shall supply smaller quantity containers with their measured catalyst for time mixing.

122. On what method coating shall Be applied ?

Ans. Coating shall be applied in a single coat Wet-On-Wet" method.

123. What is the ratio of airless spraying equipment ?

Ans. 45:1 or higher.

124. What is the repair procedure for damage coating ?

A. (1)- Cobra areas adjacent to defects with heavy duty textile or fabric adhesive tape before commencing repair or patch up. (2)- clean defective area by solvent or detergent wash. (3)- For areas less than 0.1 m² grind to a rough metal surface using at least on 80 grit disc sander. Spot blast to bare steel. Feather edge the coating at least 50 mm beyond bare metal. (4)- For areas greater than 0.1 m², blast clean to obtain the metal surface pre- treatment originally specified. Feather edge the coating at least 50 mm beyond bare metal. (5)- Remove dust and debris by brush or vacuum. (6)- Apply coating by brush for areas less than 0.1 m² and by spray for areas greater than 0.1 m² to the original Specification except that the first coat of a multi-coat system shall be thinned. (7)- The full Coat of the repair coating shall be holiday tested when cured.

125. How to apply glass flake paint? And how much is the recommended DFT ?

Ans. Single coat application by airless **(45:1) (APCS-2F)** DFT 600 - 1000 micron **(APCS-2F)** Blasting grade SA3

126. Which paint system to applied over slightly rusted steel ?

Ans. Rust conversion primer / Alkyd Topcoat system -St 2 (SP 2) or St 3 (SP 3) **(APCS-7)**

127. Describe the coating system of **APCS-12** ?

Ans. Nonskid Epoxy coating system for floors and Decks. Nonskid aggregate shall be provided by the coating material system manufacturer.

128. When St 3 [SP3] (hand and power tool cleaning) used for surface Preparation ?

Ans. For area less than 0.1m² St 3 [SP3] St 3 (SP3) [hand and power tool cleaning] used for surface preparation **(SAES-H-101)** .

129. In **APCS-2A** what is the special requirement for portable water paint ? Ans. Requires Current 24 month certificate stating that the product is tested and used for potable water application. **APCS-2B**.

130. Does glass flake paint also need stripe coat ?

Ans. Yes, weld line, accessories, welded bracket should be stripe coated prior to spray apply Coating of glass flake. **APCS-2F**

131. In Coat Tar Epoxy Coating System for immersion Service what shall be done if primer is holding ?

Ans. In such need to apply on additional Coat. **APCS-3**

132. When the nonskid aggregate shall be applied during coating application?

Ans. (1). Nonskid aggregate shall be applied after the 2nd (mid) coat. (APCS-12) (2). A final topcoat shall be applied over the aggregate sealing it in. (APCS- 12)

133. Which coating system is used for galvanized steel and aluminum for appearance or increased chemical resistance ?

Ans. **APCS-26** - Epoxy Mastic coating (Self-Priming) Sweep blast to lightly roughen the surface. **APCS – 26** On new galvanizing, solvent clean prior to sweep blasting. **APCS – 26**

134. Which paint is applied over damp surface ?

Ans. Epoxy coating for application into damp steel surface: System-One-Coat **APCS-22B**

135. What does SAEP mean ?

Ans. Saudi Aramco Engineering procedures.

➤ APCS-113C, APCS-113A & APCS-113B

1. What is wrapping ? (Stopaq wrapping)

Ans. It's protective wrapping. Use to protect the surface from corrosion.

2. How to prepare the surface for wrapping ?

Ans. Remove dust, Light abrade the Surface by Sand paper and then air blow.

3. Why holiday test is conducted ?

Ans. The holiday cannot be seen by naked eye. So to detect that small holiday a test is conducted which is call holiday test. It is of 2 type (high voltage spark test, wet sponge low voltage holiday detector)

4. What is the adhesion test standard ?

Ans. ASTM D-4541 (DOLLY) – ASTM D-3359 (CROSS CUT)

5. DFT is 1500um what is the required voltage for holiday detection ?

Ans. High voltage spark detector.

6. The STOPAQ system consists of which material ?

Ans. (a) Wrapping-band CZ H. **APCS-113C** (b) Polyvinyl Chloride (PVC) Outer Wrap. **APCS-113C**

7. For STOPAQ wrapping, what is the blast cleaning recommendation in case of bare steel ?

Ans. Blast cleaning is recommended if it pipe length is more than 1 meter. **APCS-113C** Recycled abrasive can be used. **APCS-113C** Tool cleaning (wire brushing) according to SSPC SP 2 is acceptable. **APCS-113C**

8. What is the recommended overlap for Stopaq wrapping 1" layer ?

Ans. Overlap of 10 mm or larger regardless of the width of the roll.
APCS- 113C

9. When a roll of the wrapping-band is finished in 1st layer then how to start another roll of Stopaq wrapping ?

Ans. The next roll should we use starting at a distance of at least 100 mm before the end of the finished roll. **APCS-113C**

6. Is Stopaq wrapping system be applied on existing strong coating ?

Ans. It is acceptable to apply the STOPAQ® system over an existing coating that is bonded strongly to the steel pipe. **APCS-113C**

7. How to finish the Stopaq wrapping of the end of the pipe ?

Ans. After the pipe is completely wrapped, circumferential wrap is done at the pipe end. This acts as a "seal" to ensure that the end of the of the wrapping-band will not be removed. **APCS-113C**

8. How to get a startup Stopaq wrapping layer on the pipe?

Ans. Leave 10 mm area of the first Stopaq layer and start 2nd layer of Stopaq wrapping. **APCS-113C**

9. What about the overly lap of the 2nd layer of Stopaq wrapping ?

Ans. Longitudinal overlap 50% regardless of the roll Stopaq roll. **APCS-113C**

10. When a roll of the wrapping-band is finished in 2nd layer then how to start another roll of Stopaq wrapping ?

Ans. The next roll should be used starting at a distance of at least 25cm before the end of the finished roll. **APCS-113C**

11. How to remove blisters, irregularities, bubbles and Stopaq wrapping ?

Ans. Use the roller longitudinally along the pipe, starting from the blister toward the edge of the outer wrap. This way blisters, irregularities, bubbles shall be removed. **APCS-113C**

12. How to repair the Stopaq damage area ? **APCS-113C**

Ans. (a) Cut out the damaged area using a sharp blade cutter. Chamfer the surrounding coating. (b) Use new patch of wrapping band to cover the area. (c) Do not overlap the patch on the sound coating. (d) Use several strip of the wrapping and if necessary to be applied next another (minimum 10 mm overlap with one another). (e) Install the outer wrap over the wrapping band patch. (f) Make several wraparounds over the new patch of wrapping band until it is completely covered.

13. How to conduct holiday for Stopaq wrapping ?

Ans. a) Use a high-voltage, "spark" holiday detector at a voltage ranging from 15,000 to 25,000 volts. use a full-circle coiled spring electrode. (b) Move the probing electrode over the pipe surface in one direction at a rate approximately 0.3 m/second. Mark defective areas.

14. How to store the Stopaq wrapping material ?

Ans. Stopaq wrapping material store temperature not exceed 30°C. Stopaq wrapping material is not recommended to be stored directly under sunlight for more than eight (8) hours.

15. How much is the recommended surface temperature and RH for Stopaq wrapping ?

Ans. (1). The substrate temperature shall be 5°F higher than the dew point. (2). Do not apply the coating when the pipeline temperature is less than 5°F above the dew point. (3). Relative humidity shall not exceed 85% to ensure that no condensate is forming on the substrate during application.

16. What is Transition Lines ?

Ans. Pipeline or piping changes from buried condition to above ground condition, either in or off plant.

17. Will all the buried and subsea level pipes be coated internally or externally ?

Ans. Yes all the buried pipes on onshore and subsea shall be externally coated. More over Plant piping and other above ground pipeline in industrial or marine exposure shall also be externally coated.

18. What is the holiday percentage % on these pipes ?

Ans. all the buried pipes on onshore and subsea shall be 100% holiday free and all holidays shall be repaired prior to burial.

19. At changes from buried to Above ground service how the pipe line coating will be applied ?

Ans. (a) For **sharp** angle risers (46 to 90 degree). the coating shall extend at least **1 m** measured along the pipe above grade. (b) For **shallow** angle risers (45 degree or less) the coating shall extend at least **8 m** measured along the pipe above ground. For maintenance coating, if there is a support in 8 m along the pipe above-ground portions shall be coated as per APCS-115, This coating will protect it from the direct sunlight.

20. What type of coating systems shall not be used projects as the primary external coating on buried pipelines ?

Ans. Liquid coating system shall not be used on new projects as the primary external coating on buried pipelines.

21. At road crossings what will be the minimum allowable surface preparation prior to coating ?

Ans. Near white metal Sa 2.5 .

22. The Cast iron pipe that has been shop-coated with enamel (or similar) require additional external coating prior to burial ?

Ans. It does not require additional external coating prior to burial.

23. Howrah buried stainless steel lines shall be coated ?

Ans. Buried stainless steel lines shall be externally coated with holiday-free liquid coating approved by the RSA.

24. How to coat thrust board pipe ?

Ans. Pipe to be thrust bored shall be coated with APCS-104 and top coated with APCS-113A to 1000 micron (40 mils) or APCS-105.

25. What is the coating system for 4 inches buried pipes ?

Ans. 4 inches and smaller pipes shall be coated with APCS-113A, APCS-113C.

26. In APCS-113A what is the required DFT for buried pipe line ?

Ans. 600 - 1000 microns applied in wet on wet single-coat application.

27. What is the recommended voltage for holiday test of the buried pipe line ?

Ans. 2400 + 50 volts DC.

28. In APCS-102 FBE coating, what is blasting grade and profile range on field weld joints ?

A. Blasting grade: Sa3 white metal. Profile range 50 to 100 microns.

29. What is the overlap for Visco-Elastic and adhesive tape ?

Ans. (1). 20% the width of the tape for pipes with diameters up to 10".
(2). 15 mm for pipes with diameters larger than 10". (3). For outer tape: 50% of the tape width.

30. How much Visco-Elastic coating the girth weld bare area ?

Ans. (1). Cover 3 times the weld joint for pipe diameter up to 12" (2). Cover 4 times weld joint for pipe diameter greater than 12".

31. In APCS-113D Liquid Coatings for Renovation and repair of Buried Pipeline in Dry Soil service. What is the DFT range? And how much is the recommended voltage for holiday test ?

Ans. (1) DFT range is from 500 - 750 microns. (2). Use high DC voltage spark teste for holiday detection at 2400 + 50 volts DC.



Inorganic zinc & zinc rich

1. What are the precaution during inorganic zinc application?

Ans. Continuous sitting / Mixing and pot life.

2: What is mud cracking?

Ans. The paint crack to over thickness of inorganic zinc paint.

3. When check the WFT of inorganic zinc paint?

Ans. Cannot check WFT of inorganic zinc paint.

4. How to make touchup of inorganic zinc paint?

Ans. Make touchup with zinc rich epoxy.

5. What to do case of high DFT of inorganic paint?

Ans. Re-Blast.

6. What is temperature range of inorganic zinc ?

Ans. 150C° to 400C° .

7. When strip coat is applied in case the primer is inorganic zinc ?

Ans. After the application of primer inorganic zinc.

8. What is the recommended coating system is used when **repairing galvanizing damage** ?

Ans. **APCS 1C** - only primer zinc rich epoxy.

9. How to conduct adhesion test on inorganic zinc primer ?

Ans. MEK-Methyl Ketone-rub test.

10. How to avoid pinhole on inorganic zinc primer when applying epoxy top coat on over ?

Ans. Wash out the surface with water brush to remove zinc oxide and then apply paint with 10% to 20% thinner. First apply mist coat then apply full coat of paint.

11. When removing zinc oxide formation by high pressure water cleaning what will be quality of sweet water ?

Ans. Chloride content shall be less than 40PPM.

12. When using inorganic zinc as a primer, what precaution shall be taken Prior to 2nd coat application ?

Ans. (1). When using inorganic zinc primer the surface shall be checked for zinc oxide formation. (2). Wash out any zinc oxide formation with high pressure sweet water.

3. In water chloride contents shall be 50PPM and TDS of 500PPM.

4. A mist-coat of epoxy, Thinned 10 to 20% should first be applied to the inorganic zinc primer. **SAES-H-001**

13. Where it is important to apply strip coat ?

Ans. Apply strip coat on all weld lines, edges, bolts, nuts, rivets, structures and equipment in offshore and immersion services. **When inorganic zinc is used strip coating should be applied after the first coating.**

14. Is Heavy dry spray allowed during application of inorganic zinc primer? Ans. No, it's prohibited.

15. How to brought up the inorganic zinc film thickness, which found low?

Ans. By using zinc rich epoxy. **(APCS-1D)**

16. Which primer can be used commonly in **APCS-19** and **APCS-12** no-skid epoxy coating ?

Ans. Zinc-Rich Epoxy primer **(SAES-H-101).**

17. What is most important when applying inorganic zinc primer solvent base?

Ans. Relative humidity must exceed 50% during coating application and curing. **APCS-17A**

18. What is most important when applying inorganic zinc primer water base?

A. Relative humidity must be less than 50% during coating application and curing. **APCS-17A**

19. Which paint system is used under insulation ?

Ans. Inorganic Zinc primer, Solvent-Based. **(APCS- 17A)** Inorganic Zinc primer, Water-Based. **(APCS-17B)**

ENGINEERING STANDARD

SAES-H-001: Coating Selection and Application Requirements for Industrial Plants and Equipment

SAES-H-002: Internal and External Coating for Steel Pipelines and Piping

SAES-H-002V: Approved Saudi Aramco Data Sheets for the Pipeline Maintenance External

SAES-H-003: Protective Coating for Industrial Concrete Structures

SAES-H-004: Protective Coating Selection and Application Requirements for Offshore Structures and Facilities

SAES-H-101: Approved Protective Coating System for Industrial Plant & Equipment

SAES-H-101V: Approved Saudi Aramco Data Sheets - Paint and Coating

SAES-H-102: Safety Requirements for Coating Applications

SAES-H-200: Storage and Handling and Installation of Externally Coated Pipe

SAES-H-201: General Specification for Over-the-Ditch External and Internal FBE Coating of Field Girth Welds

SAES-H-204: General Specification and Application Procedures of Heat-Shrink Sleeves to Coated Pipe

SAES-B-067: Safety Identification and Safety Colors

ENGINEERING PROCEDURE

SAEP-316= Performance Qualification Requirements of Coating Personnel

SAES= Saudi Aramco Engineering Standard

SAEP= Saudi Aramco Engineering Procedure

SAIC= Saudi Aramco Inspection Checklist

SAITP= Saudi Aramco Inspection Typical Plan

APCS= Approved Protective Coating System

SSPC-SP-1= Means Solvent Cleaning.

SSPC-SP-2= Means Hand Tools Cleaning.

SSPC-SP-3= Means Power Tools Cleaning.

SSPC-SP-4= Means Flame Cleaning.

SSPC-SP-5= Means White Metal Blast Cleaning.

SSPC-SP-6= Means Commercial Blast Cleaning.

SSPC-SP-7= Means Brush Off Blast Cleaning.

SSPC-SP-8= Means Pickling.

SSPC-SP-9= Means Weather Followed Blast Cleaning.

SSPC-SP-10= Means Near White Metal Blast Cleaning.

SSPC-SP-11= Means Power Tool Cleaning to Bare Metal.

SSPC-SP-12= Means Water Jetting Blast Cleaning.

SSPC-SP-13= Means Surface Preparation of Concrete Coating.

SSPC-SP-14= Means Industrial Blast Cleaning.

SSPC-VS-1= Means Visual Standard for Abrasive Blast Cleaned Steel.

SSPC-VS-2= Means STD Method of Evaluating Degree of Rusting on Paint Steel Surface.

SSPC-PA2= Method of Measurement of DFT with magnetic Gauge.

SSPC-PA5= APPENDIX-E= Means of Measurement of WFT.

Painting Equipment.

- **Compressor**
- **Air Receiver**
- **Air Less Pump**

Delivery pressures greater than 5000psi dependent on pump ratio.

- **Gum**
- **Tip**

Tip give us angle and viscosity.

- **Power Stirrer**

For quantities over 5L, a power stirrer shall be used

- **Paint System**

Primer (Direct contact the surface)

Mid Coat

Top Coat

Blasting Equipment.

- **Compressor** (600CFM or 100_120 psi)
- **After Cooler**
- **Air Receiver** (Function like as outlet.
- **Blasting Pot** (Capacity in liter)
- **Air & Blasting Hose** (Carbon)
- **Air Filter**
- **Dadman Handle** (Must be ground with AWG4 weir for safety.
- **Nozzle** (Nozzle length 6 inch and width is 3/8 or 9mm)

Abrasives.

Garnet.

Fore external use (Size 30/60 or 100/120)

Recyclable (more than 3 times)

Grit.

Fore internal use (Recyclable)

Note:

Abrasive must be clean and dry. Abrasive save to water. Use only non-silica
Abrasive

APCS-1A

1. Primer= **Resist 78** Inorganic Zinc-Primer: Solvent-Based

(DFT **65** microns) (Thinner no.**25**) (Volume Solide **72+2%**)

2. Intermediate= **Penguard Express** Epoxy intermediate coat

(DFT **130** microns) (Thinner no.**17**) (VS **74%+2**)

3. Top Coat= **Penguard FC** Epoxy Top Coat

(DFT **80** microns) (Thinner no.**17**) (VS **62%+2**)

(Total DFT 275)

APCS-1B

1. Primer= **Penguard Express ZP** Epoxy Primer

(DFT **50** microns) (Thinner no.**17**) (VS **74+2%**)

Use Epoxy Intermediate Coat and Topcoat of **APCS-1A**

APCS-1C

1. Primer= **Barrier 77** Zinc-Rich Epoxy Primer

(DFT **40** microns) (Thinner no.**17**) (VS **53+2%**)

Use Epoxy Intermediate Coat and Topcoat of **APCS-1A**

APCS-1D

Use **APCS-1A** as primer and intermediate coat

3. Top Coat= **Hardtop XP** Polyurethane Top coat

(DFT **50** microns) (Thinner no.**17**) (VS **63+2%**)

APCS-1E

Use ***APCS-1B*** as primer and intermediate coat

Use Polyurethane Topcoat of ***APCS-1D*** as topcoat

APCS-F

Use ***APCS-1C*** as primer and intermediate coat

Use Polyurethane Topcoat of ***APCS-1D*** as topcoat