

**LEAD FREE HAND SOLDERING FOR
THROUGH HOLE COMPONENTS (DVD-43C)
TRAINING CERTIFICATION EXAM v.2**

This test consists of thirty multiple-choice questions. All questions are from the video: *Lead Free Hand Soldering for Through-Hole Components (DVD-43C)*.

Each question has only one *most* correct answer. Circle the letter corresponding to your selection for each test item. If you wish to change an answer, erase your choice completely.

You should read through the questions and answer those you are sure of first. After your first pass through the test, then go back and answer the questions that you were not sure of. If two answers appear to be correct, pick the answer that seems to be the most correct response.

When you are finished, check to make sure you have answered all of the questions. Turn in the test materials to the instructor.

The passing grade for this test is 70% (21 correct answers or better).

Good luck!

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Name _____ Date _____

- 1. The two functions of a solder connection are**
 - a. flexibility and rigidity
 - b. mechanical and electrical connection
 - c. removable and conventional connection
 - d. conventional and consistent connection

- 2. An imperfect solder joint may result in**
 - a. electrostatic discharge
 - b. leakage
 - c. oxidation
 - d. electrical failure

- 3. Keeping your workstation clean means you can**
 - a. create perfect solder joints every time
 - b. avoid damage to your workstation
 - c. avoid contamination of the assembly
 - d. all of the above

- 4. ESD damage can be controlled by**
 - a. proper grounding
 - b. not touching the soldering iron tip to the component
 - c. not touching the board except with the soldering iron tip
 - d. touching component leads

- 5. Flux smoke and fumes can be removed by**
 - a. soldering at high temperatures
 - b. using fume extractors
 - c. operating at high humidity
 - d. using lead free solder

- 6. A *pointed soldering iron tip* should be used**
 - a. for small connections
 - b. for large multi-layer connections
 - c. when you want to work very slowly
 - d. none of the above

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7. When a solder joint is heated for more than 3 seconds

- a. you are probably working at maximum efficiency
- b. a fire can occur
- c. there will be uniform soldering throughout the assembly
- d. there may be heat damage to the base material and plated barrel

8. A recommended tip starting temperature for lead free hand soldering is

- a. 217 degrees C
- b. 315 degrees C
- c. 370 degrees C
- d. 410 degrees C

9. It's important to remove certain types of fluxes after hand soldering because

- a. flux residues are unsightly and should always be removed
- b. sticky residues can contaminate your hands and clothing
- c. sticky residues can hold electrically conductive contaminants and cause metal corrosion
- d. flux residues always smell bad

10. Solder wetting is defined as

- a. a wet look covering the solder joints
- b. a smooth coating of solder that remains shiny
- c. an intermetallic coating of the solder fillet
- d. a smooth, unbroken film of solder, feathered onto base metals

11. The reason it is important to use the correct solder wire diameter is

- a. for control of speed and amount of solder
- b. for quality control and ISO-9000 conformance
- c. to avoid unnecessary costs
- d. to prevent unnecessary waste

12. The reason for tinning the soldering iron tip is to

- a. make the solder flow smoothly
- b. create oxidation
- c. avoid burning solder and creating a bad smell
- d. transfer heat rapidly

13. When the soldering iron contacts the cleaning sponge for too long

- a. the cleanliness of the solder joint improves
- b. the tip may cool down too much and may affect the formation of a proper solder joint
- c. the heated moisture hardens any oxidation
- d. nothing happens

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14. Using excessive pressure when soldering can cause

- a. lifted lands
- b. damage to the base material
- c. deformed lands
- d. all of the above

15. We solder on the termination side of the board – away from the components

- a. to prevent heat damage to the components
- b. because heat dissipates faster from the termination side vs. the component side
- c. because damage to the board is more visible on this side
- d. because it's easier to access the solder connection area

16. Preheating

- a. removes oxidation and contamination
- b. softens the oxidation and removes contamination
- c. softens the solder connections throughout
- d. speeds up the soldering process to help prevent heat damage to the assembly

17. It's important to remove the flux residue right after the soldering operation because

- a. the customer might see it
- b. it looks ugly and reflects poorly on your workmanship
- c. it can harden and become difficult to remove
- d. all of the above

18. If you think components may be sensitive to cleaning fluids, you should

- a. bypass the cleaning operation
- b. dilute the cleaning solvent
- c. ask about your company's specific policy on cleaning fluids
- d. none of the above

19. An ideal lead free solder joint has

- a. a concave fillet, complete solder coverage, slightly grainy texture, wetting that feathers smoothly onto metals, and the outline of the lead is visible
- b. a convex fillet, complete solder coverage, smooth texture, wetting that feathers smoothly onto metals, and the outline of the lead visible
- c. a smooth texture, acceptable contact angle and the lead completely covered with solder
- d. the same elements as the other solder joints on the assembly

20. Class 3 requirements in the J-Standard 001 are for

- a. consumer products
- b. high reliability electronics – where failure is not an option
- c. business and computer products
- d. none of the above

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21. A cold solder joint

- a. has a contact angle that varies on either side of the connection
- b. has too much solder
- c. is an icicle with a blowhole
- d. looks duller and grainier, and is poorly wetted

22. A solder bridge is

- a. a crossing within the grain structure of the solder alloy
- b. a leaching of the flux between two adjacent lands
- c. an unwanted solder connection between two or more conductive features
- d. an unwanted connection between opposite sides of the board

23. A disturbed solder joint is caused by

- a. movement of the solder joint after the soldering iron is removed, but before the solder is cool enough to harden
- b. movement of the soldering iron during the soldering process
- c. unknown causes
- d. a supervisor who disturbs an operator just before performing rework

24. It is important to control static electricity at your workstation in order to

- a. conduct electricity properly
- b. prevent fires
- c. avoid damage to components
- d. protect your tools

25. We use solder flux to

- a. remove oxidation
- b. protect cleanliness until the surface is soldered
- c. improve heat transfer
- d. all of the above

26. You should tin the tip of your soldering iron

- a. every time it is placed in the holder
- b. before turning the soldering iron on
- c. before you begin soldering
- d. both "a" and "c"

27. When you expect your soldering iron to sit (or idle) for a while, it is important to

- a. place it as far away from you as possible
- b. wipe it clean on the sponge
- c. tin the tip with solder to prevent oxidation
- d. change the tip when you begin soldering again

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- 28. If you melt a little solder on the tip of the iron – before moving the solder wire to the other side – this results in**
- a. the formation of a heat bridge to transfer heat faster
 - b. cleaning the tip to allow faster heat transfer
 - c. removing any oxidation from the component lead and land
 - d. none of the above
- 29. Re-melting a solder joint *without* using flux usually results in**
- a. blowholes and pinholes – and occasional voids
 - b. solder texture becoming grainier, and weakening the strength of the connection
 - c. sticky residues on the circuit board
 - d. an effective solder connection
- 30. The maximum preferred solder contact angle is**
- a. any angle that doesn't cover the tip of the component lead
 - b. 45 degrees
 - c. 90 degrees or less
 - d. 180 degrees or less