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Continuing Education Course #033
Welding Technology

1. What is the significance of an “Essential” variable?
 - ☐ a. Are the only variables permitted in a welding procedure
 - ☐ b. Must be addressed in a procedure qualification
 - ☐ c. Are applicable only when the Construction Code has toughness requirements
 - ☐ d. There is no special significance
2. What is the significance of a “Supplementary Essential” variable?
 - ☐ a. Are specified at the discretion of the welding procedure writer
 - ☐ b. There is no special significance
 - ☐ c. Are applicable only when the Construction Code has toughness requirements
 - ☐ d. Are the only variables permitted in a welding procedure
3. What provides the shielding in the shielded metal arc welding (SMAW) process?
 - ☐ a. Decomposition of the electrode covering
 - ☐ b. A gas or gas mixture
 - ☐ c. The transferred filler metal droplets
 - ☐ d. Base metal dissolved into the weld puddle
4. What are two variations of the shielded metal arc welding (SMAW) process?
 - ☐ a. With and without external shielding gas
 - ☐ b. Short circuiting (short arc) and spray transfer
 - ☐ c. Manual and automatic
 - ☐ d. Cellulosic coated and low hydrogen coated electrodes
5. What provides the shielding in the gas tungsten arc welding (GTAW) process?
 - ☐ a. A gas or gas mixture
 - ☐ b. Decomposition of the electrode covering
 - ☐ c. The transferred filler metal droplets
 - ☐ d. Base metal dissolved into the weld puddle
6. What type of filler metal/electrode is used in the flux cored arc welding (FCAW) process?
 - ☐ a. Tubular
 - ☐ b. Solid wire
 - ☐ c. Covered electrode
 - ☐ d. Tungsten
7. What is the temperature that distinguishes torch brazing (TB) from soldering?
 - ☐ a. 1000°F
 - ☐ b. 840°F

- ☐ c. There is no distinction
 - ☐ d. 500°F
8. Name an important application for braze welding (BW).
- ☐ a. Joining austenitic stainless steel
 - ☐ b. Hardfacing overlay
 - ☐ c. Repair of cast iron
 - ☐ d. Corrosion resistant overlay
9. What are two transfer modes when using the gas metal arc welding (GMAW) process?
- ☐ a. Spray and globular
 - ☐ b. Low hydrogen
 - ☐ c. Ionic
 - ☐ d. Phased array
10. Name three of the five types of joints.
- ☐ a. Groove, fillet, and edge
 - ☐ b. Fillet, corner, and edge
 - ☐ c. Butt, corner, and edge
 - ☐ d. Butt, fillet, and groove
11. Which of the following are structural (load-bearing) welds?
- ☐ a. Fillet welds
 - ☐ b. Groove welds
 - ☐ c. Hardfacing
 - ☐ d. Both a and b
12. In a butt joint groove weld, which requires less weld metal?
- ☐ a. A single Vee
 - ☐ b. A double Vee
 - ☐ c. There is no difference
 - ☐ d. A lap Vee
13. What is the purpose of a P-number designation?
- ☐ a. To group base metals with similar toughness requirements
 - ☐ b. To group base metals with similar weldability
 - ☐ c. To group filler metals with similar characteristics
 - ☐ d. To identify a welding process
14. What is the purpose of a Group number designation?
- ☐ a. To group base metals with similar toughness requirements
 - ☐ b. To distinguish martensitic and ferritic stainless steels
 - ☐ c. To group base metals with similar weldability
 - ☐ d. To group filler metals
15. What is the principal concern when welding P3 through P5C base materials?
- ☐ a. Excessive thermal expansion
 - ☐ b. Overcoming the surface layer of aluminum oxide
 - ☐ c. Avoiding sigma phase
 - ☐ d. Increasing hardenability as the P number increases

16. What is the principal drawback to using Carbon Equivalent (CE) to determine preheat and post weld heat treatment requirements?
- ☐ a. Considers only the carbon content of the weld metal
 - ☐ b. Does not address heat treated condition or degree of restraint
 - ☐ c. Is valid only for copper based alloys
 - ☐ d. Considers only the heat treated condition
17. What is the distinction between P6 and P7 stainless steel base materials?
- ☐ a. P6 is martensitic and P7 is ferritic
 - ☐ b. P6 is austenitic and P7 is ferritic
 - ☐ c. P6 is ferritic and P7 is martensitic
 - ☐ d. There is no difference
18. What is an F number?
- ☐ a. F numbers are identical to A numbers
 - ☐ b. A grouping of base metals with similar weldability
 - ☐ c. A grouping of filler metals with similar welding characteristics
 - ☐ d. A grouping of filler metals with similar toughness
19. What is an A number?
- ☐ a. The composition of ferritic filler metal before welding
 - ☐ b. A designation for aluminum alloys
 - ☐ c. A grouping based on deposited ferritic weld metal composition
 - ☐ d. A designation for an automatic welding process
20. What is the “rule of thumb” in welding filler metal selection?
- ☐ a. Use the lowest cost filler metal
 - ☐ b. Try to match the base metal composition
 - ☐ c. The deposited weld bead should not exceed the width of a thumb
 - ☐ d. The weld metal composition should always match the base metal
21. Progression is applicable for welding in what position?
- ☐ a. Horizontal
 - ☐ b. Flat
 - ☐ c. Vertical
 - ☐ d. Overhead
22. Position is usually a variable for?
- ☐ a. Procedure qualification
 - ☐ b. Performance qualification
 - ☐ c. The shielded metal arc welding (SMAW) process only
 - ☐ d. The gas tungsten arc welding (GTAW) process only
23. Name two purposes of preheat
- ☐ a. Reducing porosity and hydrogen cracking
 - ☐ b. Reducing porosity and reducing corrosion resistance
 - ☐ c. Improving metallurgical structure and increasing martensite formation
 - ☐ d. Increasing hydrogen content and reducing porosity
24. The maximum interpass temperature for austenitic stainless steels should be limited to?

- ☐ a. Reduce distortion
 - ☐ b. Prevent sensitization
 - ☐ c. Prevent hydrogen cracking
 - ☐ d. Both a and b
25. Post weld heat treatment (PWHT) includes?
- ☐ a. Stress relief and solution annealing
 - ☐ b. Solution annealing and shot peening
 - ☐ c. Preheating and interpass temperature maintenance
 - ☐ d. Vibration stress relief
26. Weld size is important in determining PWHT requirements because?
- ☐ a. Weld size determines the “quench mass” during welding
 - ☐ b. Preheat was less likely maintained during making large welds
 - ☐ c. Residual stresses are usually proportional to weld size
 - ☐ d. Residual stresses may exist up to the yield point
27. A commonly used shielding gas is?
- ☐ a. Argon
 - ☐ b. Air
 - ☐ c. Methane
 - ☐ d. Water vapor
28. Purging must be maintained for some specified thickness because?
- ☐ a. Heat from subsequent layers may be sufficient to cause harm from atmospheric gases
 - ☐ b. Gas pressures must be equalized
 - ☐ c. Dissolved gases in the weld puddle cannot be allowed to escape
 - ☐ d. The low hydrogen coating is not sufficient to protect the backside of the weld
29. The two types of current used in welding are?
- ☐ a. Straight and reverse polarity
 - ☐ b. Ionizing
 - ☐ c. AC and DC
 - ☐ d. Pulsed and short circuiting
30. Arc blow is?
- ☐ a. Melting through the root of full penetration joints
 - ☐ b. Extinguishing the arc due to excessive shielding gas flow
 - ☐ c. Moving of the arc caused by drafts
 - ☐ d. Deflection of the arc such as may occur in corners
31. Technique includes many things including?
- ☐ a. String or weave beads
 - ☐ b. Current polarity
 - ☐ c. Bead sequencing
 - ☐ d. Both a and c
32. A example of technique includes?
- ☐ a. Temperbead welding
 - ☐ b. Stud welding

- ☐ c. Filler metal selection
- ☐ d. Base material selection

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