

CIMC: Introduction to Agricultural Power and Technology

Unit 3- Shielded Metal Arc Welding

1. Shielded Metal Arc Welding also goes by other names. Which of the following is another term for this type of welding?
 - A. SMAW
 - B. Stick welding
 - C. Arc welding
 - D. All of the above
2. One of the main tools for a welder using the SMAW process is a metal rod called _____.
 - A. An arc
 - B. An electrode
 - C. A welding machine
 - D. A slag
3. A student must protect the weld from contaminants during the cool down. What's the best way for him/her to do this?
 - A. Shield with a protective covering
 - B. Aim a fan at the weld to cool it faster
 - C. Keep a very clean work area
 - D. Allow the flux from the electrode to form slag on top of the world
4. Which is a part of flux-covered electrodes?
 - A. Metal deposits
 - B. Baked on chemical covering
 - C. Base metal
 - D. Molten metal
5. What parts of the electrode melt?
 - A. Core of metal wire and flux covering
 - B. Slag and filler metal
 - C. Core metal wire and base metal
 - D. Flux covering and baked on chemical coverings
6. Explain what AC current is?
 - A. Current that travels in complete loop
 - B. Current that only flows in one direction
 - C. Current that alternates from one direction to another
 - D. Current that changes 80 times a second, expressed as 80 Hertz
7. DCEN is a direct current that used to be known as:
 - A. Direct current, straight polarity

- B. Direct current, electrode positive
- C. Direct current, reverse polarity
- D. Direct current, flowing from workpiece

8. If your welding machine is rated at 200, how long will you be able to work at the rated amperage and rated speed?

- A. Four out of ten minutes
- B. Five out of ten minutes
- C. Six out of ten minutes
- D. Eight of ten minutes

9. The welding machine that a student will use changes high-voltage, low-amperage AC to low-voltage, high-amperage AC or DC. It is called _____.

- A. AC transformer
- B. AC or DC generator
- C. DC transformer
- D. AC or DC transformer-rectifier

10. Welding machines with a 220/240 volt input current are usually _____.

- A. AC transformer
- B. DC motor
- C. DC transformer
- D. AC or DC transformer- rectifier

11. If you need to reverse polarity, what is the best type of welding machine to accomplish this?

- A. DC generator
- B. AC transformer
- C. AC or DC transformer-rectifier
- D. DC transformer

12. You need to attach the welding cables to the workpiece or the table where the workpiece is located. You will accomplish this with_____.

- A. Electrode holders
- B. The welding machine
- C. A fastener
- D. Clamps

13. What would you look for to find an electrode that can be used in flat positions and horizontal fillets?

- A. A code that begins with an "E"
- B. The next to the last digit a "2"
- C. The next to the last digit a "4"
- D. The last digit a "0"

14. If you have numbered electrodes to match specific types of metals, you have a _____ electrode.

- A. Copper
- B. Silicon
- C. Steel
- D. Nickel

15. You are given a base metal that is $5/32$ " thick. What would be the best electrode diameter to use when working on this base metal?

- A. $1/8$ "
- B. $5/32$ "
- C. $3/16$ "
- D. $3/8$ "

16. If you were going to proceed with a welding job in the vertical up positions, you would _____ the amperage setting.

- A. Not touch
- B. Turn off
- C. Turn up
- D. Turn down

17. The angle of the electrode to the axis of a weld when the electrode is perpendicular is called the _____.

- A. Start angle
- B. Finish angle
- C. Work angle
- D. Travel angle

18. The angle of the electrode in relation to the workpiece surface when the electrode is perpendicular is called the _____.

- A. Travel angle
- B. Work angle
- C. Finish angle
- D. Start angle

19. What problem might you find with too much arc gap?

- A. A crackling sound
- B. Too much penetration
- C. Arc will be difficult to maintain
- D. Filler metal will melt off in large wobbly drops

20. Left handed welders need to learn the electrode which way when making flat beads?

- A. Left
- B. Right

- C. 30 degrees to the left
- D. 30 degrees to the right

21. What is the best work angle to keep your electrode in?
- A. 90 degrees
 - B. 75 degrees
 - C. 50 degrees
 - D. 30 degrees
22. What type of bead running technique should you use for overhead welds?
- A. Stringer bead
 - B. Triangular weave
 - C. Side to side weave
 - D. Circular motion
23. You would most likely use padding on _____ surfaces.
- A. Vertical
 - B. Flat or curved
 - C. Horizontal
 - D. All
24. A welding student forgets to fill in the crater at the end of the weld. This will cause _____.
- A. A good weld
 - B. An incomplete weld with a gap
 - C. A lot of slag
 - D. An incomplete weld, but no gap
25. What tool do you use with feathering to get a sloping, sharp edge at the end of a bead?
- A. A hand grinder
 - B. An electrode
 - C. A chipping hammer
 - D. A file
26. How can you make sure you have a good tie-in when starting from a tack weld?
- A. Feathered edges
 - B. Grinding the end
 - C. Chipped and brushed tie-in point
 - D. All of the above
27. Beveling is one method of preparing joints for welding. The most common method of beveling uses a _____.
- A. Grinder
 - B. Machining tool
 - C. Oxyacetylene cutting torch

D. Chipping hammer

28. Which of the following factors does not control the quality of SMAW welds?

- A. Distance
- B. Type of current
- C. Angle
- D. Travel speed

29. What determines the type of electrode you should use?

- A. Welding position
- B. Welding machine amperage
- C. Welding current
- D. Work angle

30. What causes poor penetration and a humped bead?

- A. Fast speed
- B. Low speed
- C. Low current
- D. Low voltage

31. Your arc length is too long and travel speed too slow. What possible welding problem might you have?

- A. Weld spatter
- B. Arc blow
- C. Pinholes and porosity
- D. Slag inclusion

32. Your weld shows incomplete penetration. What could be the cause?

- A. Electrode too large
- B. Insufficient current
- C. Faulty joint design
- D. All of the above

33. A student's weld shows excessive weld reinforcement. This was most likely caused by _____.

- A. Poor electrode movement
- B. Too fast a travel speed
- C. Arc blow
- D. Out of position welding

34. You are going to make a cut with a 3/8 inch carbon electrode. The amount of air pressure you use should be _____.

- A. 40
- B. 50

- C. 60
- D. 80

35. A student plans to gouge cast iron, what type of CAC-A electrode should he/she use?

- A. Graphite
- B. Flux-coated steel
- C. Copper-coated
- D. Silicon

36. What shape of electrode can gouge both a U groove and a flat groove?

- A. Flat
- B. Round
- C. Triangular
- D. Semi-round

37. You used a slow travel speed in gouging. This produced a(n) _____ groove.

- A. Deeper
- B. Wider
- C. Longer
- D. Unchanged

38. what gouging technique allows you to move left or right as long as the airstream is behind the electrode?

- A. Vertical
- B. Overhead
- C. Horizontal
- D. Flat

39. What gouging technique should always be performed in the down position?

- A. Vertical
- B. Overhead
- C. Horizontal
- D. Flat

Unit 5- Gas Tungsten Arc Welding

1. The _____ allows you to switch to hand, foot, or panel operation.

- A. Weld control switch
- B. Remote control switch
- C. High frequency spark switch
- D. Post flow

2. What functions as a pilot arc to bridge the gap between the electrode and base metal?

- A. High frequency

- B. Post flow
- C. Fine adjustment current control
- D. Soft-start switch

3. A benefit to using the pulse current in a GTAW machine is that it _____.
- A. Aids in welding thicker base metals
 - B. Uses less electricity
 - C. Makes has tungsten welding easier
 - D. Minimizes heat build-up in base metals
4. The amount of current of rate of electron flow in a welding circuit is called _____.
- A. Voltage
 - B. GTAW current
 - C. Charged flow
 - D. Amps
5. If you plan on doing some light-duty gas tungsten welding, you would most likely use a _____ system.
- A. Water cooled
 - B. Water heated
 - C. Air heated
 - D. Air cooled
6. Which type of GTAW systems should be checked during set-up and monitored during operation?
- A. Water cooled
 - B. Air cooled
 - C. Both systems
 - D. Neither system
7. While you're welding with a water cooled system, the electrical power shuts off because of _____.
- A. Overheated
 - B. A diminished coolant supply
 - C. Damaged equipment
 - D. All of the above
8. The non-consumable conductor of the welding current is the _____.
- A. Nozzle
 - B. Cap
 - C. Electrode
 - D. None of the above
9. What part of the GTAW torch aids in prevention of contamination in the weld zone?

- A. Electrode
- B. Torch body
- C. Nozzle
- D. Diffuser

10. If you wanted the least expensive nozzle for the job, you would probably choose a _____ nozzle.

- A. Ceramic
- B. Fused quartz
- C. Metal
- D. Alumina

11. A GTAW application that might break other nozzles is best suited for a _____ nozzle.

- A. Ceramic
- B. Fused quartz
- C. Metal
- D. Alumina

12. What is the benefit to using helium as a shielding gas in GTAW?

- A. Provides good arc stability
- B. Provides faster welding speeds
- C. Provides better shielding
- D. Works well with thin metals

13. If you plan to weld aluminum with AC, what would be the best shielding gas to use?

- A. Hydrogen
- B. Oxygen
- C. Argon
- D. Helium

14. If you have a floating-ball type flow meter, how should you set it up?

- A. Vertical position
- B. Horizontal position
- C. Diagonal position
- D. Position doesn't matter

15. What color are tungsten electrodes?

- A. Brown
- B. Green
- C. Yellow
- D. All of the above

16. You plan a GTAW process on stainless steel. You should use a _____ electrode.

- A. Pure

- B. Zirconiated
- C. Thoriated
- D. Green

17. You need to grind electrodes for DC welding. The best grinder is _____.

- A. A tungsten grinder
- B. 100-grit grinding wheel
- C. grinding wheel used only for tungsten electrodes
- D. a file

18. What does not determine how far a tungsten electrode can extend from the nozzle?

- A. Type of electrode
- B. Type of welding
- C. Joint design
- D. Welding position

19. You must select a filler metal for a GTAW welding job with a stainless steel metal. A good choice is a _____ filler metal.

- A. Stainless steel
- B. Copper
- C. Aluminum
- D. Magnesium

20. A source of contamination is _____.

- A. Water
- B. GTAW nozzle
- C. Unclean work areas
- D. All of the above

21. You are about to begin manual welding with a filler rod. Your first step is to _____.

- A. Turn on a fan
- B. Strike the electrode
- C. Hold the torch perpendicular to the base
- D. Select and prepare tungsten electrode, adjust electrode extension and adjust machine controls

22. In your GTAW application, you have copper backup bars in order to _____.

- A. Increase the welding heat
- B. Physically support the joint and the weld puddle
- C. Decrease the welding heat
- D. Assist in visibility of the weld zone

23. A purging gas should be directed to protect the back side of the weld from contamination in what kind of weld?

- A. Fillet weld
- B. Butt weld
- C. Groove welds
- D. None of the above

24. While welding, you notice the electrode consumption is going very fast. One of the causes of excessive electrode consumption is _____.

- A. Too little heating in holder
- B. Operating on reverse polarity
- C. Using hydrogen
- D. Too much shielding gas

25. You notice gas pockets in your weld. What is one of the ways to solve the problem?

- A. Dampen your base metal
- B. Remove condensed moisture from lines, and blow out all air before striking arc
- C. Use a large electrode
- D. Keep the tungsten electrode out of welding pool

Unit 8- Plasma Arc Cutting

1. How should a welding student initiate the flow of cutting gas into a plasma arc nozzle?

- A. Twist the pressure safety valve
- B. Turn on the trigger switch or button on the torch
- C. Flip on the regulator
- D. Light the torch

2. Some of the safety equipment that you should use for PAC includes _____.

- A. Ear plugs
- B. Apron
- C. Safety shoes
- D. All of the above

3. Ultraviolet/infrared rays are emitted during plasma arc cutting. If you're cutting with 350 amperage, you should wear a number _____ shade filter lens to protect your eyes.

- A. 12
- B. 14
- C. 11
- D. 9

4. A significant danger to the workplace from plasma arc cutting is _____.

- A. Electrical shorts
- B. Fire
- C. Power outage
- D. Crowding from all the equipment

5. A disadvantage to PAC systems is the _____.
- A. High cost for all the fuel gas used
 - B. Lack of portability
 - C. Inability to work with carbon steels like oxy/fuels cuttings
 - D. Slow cutting speeds
6. PAC systems can work with what metals?
- A. All electricity conductive metals
 - B. Ferrous metals
 - C. Nonferrous metals
 - D. Stainless steel
7. If you want to reduce the costs of plasma arc cutting, one way is to _____.
- A. Not use preheating
 - B. Use any type of fuel gas
 - C. Use air from a shop air compressor
 - D. None of the above
8. Materials or components that are used during the plasma arc process are called _____.
- A. Consumables
 - B. Currents
 - C. Gases
 - D. Slag
9. If the electric current flows between the electrode and torch nozzle first, and then the arc transfers to the workplace, it is called _____.
- A. Plasma arc cutting
 - B. Transferred mode
 - C. Non-transferred mode
 - D. None of the above
10. Which transfer mode are you most likely to use as it is the most commonly used?
- A. Plasma arc cutting
 - B. Transferred mode
 - C. Non-transferred mode
 - D. None of the above
11. When are you choosing an electrode for plasma arc cutting, what do you need to consider?
- A. The type of metal in the work piece
 - B. The heat of the torch
 - C. The type of cut needed
 - D. The cutting gas that will be used

12. If you will be performing a PAC process with nitrogen as the cutting gas, your best choice of electrode is _____.

- A. Tungsten
- B. 2% thoriated or zirconiated
- C. 5% zirconiated
- D. hafnium

13. If you are going to cut on thick metal, you'll want a _____ nozzle.

- A. 0.25
- B. 1.2
- C. 18.0
- D. 1/8

14. The correct way to install or remove cutting nozzle _____.

- A. Is by proper tools
- B. By hand
- C. Depends on PAC system
- D. Depends on nozzle manufacturer

15. One of the purposes of shielding cups is to protect the _____.

- A. Metal work piece
- B. Welder
- C. Workplace
- D. Torch components

16. What machine cutting technique works best with a crown shield cup?

- A. Plasma cutting
- B. Oxy/fuel cutting
- C. Stand-off cutting
- D. Contract cutting

17. If you're looking for a shielding device with a longer consumable life, your best bet is to go with a _____ shielding cup.

- A. Standard
- B. Metal retaining
- C. Wire stand-off assembly
- D. Crown shield

18. The PAC system you're working with uses a coolant as its secondary air. The secondary air you're using is _____.

- A. Carbon
- B. Nitrogen
- C. Water
- D. All of the above

19. Which of the following is not a consumable in a PAC system?
- A. Shielding cup
 - B. Electrode
 - C. Torch
 - D. Cutting nozzle
20. In checking your electrode, you find that 3/8" remains on the hex area. What do you do?
- A. Replace the electrode
 - B. Continue to use the electrode
 - C. Look for burned areas
 - D. It depends on your project and metal being cut
21. When working a PAC application at 30 psi, the system shuts down because _____.
- A. Of high flow pressure that can damage components
 - B. Of a high gas pressure at Cyh
 - C. Flow pressure dropped below 40 psi, causing safety interlocks
 - D. Of a low gas pressure a Scfh
22. The gas pressure should be at _____.
- A. 40 psi
 - B. 70 psi
 - C. what the equipment manufacturer recommends
 - D. none of the above
23. Many PAC systems have a in-line filter between the air supply and the regulator. A typical in-line filter looks like _____.
- A. A mesh screen
 - B. A piece of pipe
 - C. Circular assembly
 - D. A straw
24. A regulator assembly includes all these items except for a(n)_____.
- A. Adjusting knob
 - B. Plunger
 - C. Drain
 - D. Filter
25. If you need to cut a thick metal quickly, what would be a good method?
- A. Hand cutting
 - B. Oxy/fuel cutting
 - C. Acetylene cutting
 - D. Mechanized PAC system

26. A potential problem found in the metal gouging process is _____.
- A. More difficult to maintain an arc
 - B. Increased wear on consumables
 - C. Increased chance of inferior welds
 - D. Cracks
27. An improper cutting speed and torch parts that are worn or damaged can lead to _____.
- A. Too much spatter or scale
 - B. Difficulty maintaining an arc
 - C. Insufficient penetration
 - D. Dross formation