



Iowa SkillsUSA

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2017 Welding Fabrication Contest

Theme: Smoker

Materials:

2 - 48"x48"x 3/16" (allowance will be giving towards material thickness)

1 - 1.5" x 1.5" x 24' square tube (wall thickness can be determined by each team)

1 - 5' of 4" Sch. 40 Pipe (allowance will be giving towards sch. thickness)

2 - 4' x 4' Flattened expanded metal or wire mesh (Style / Openings can be determined by each team)

Each team must utilize 90% of the total materials

Additional items can be added so long as they on called for on the print (examples Bolts, Chain, Braided Cable Pulleys, hinges etc.)

Equipment:

The types of welding to be performed on the project will be GTAW, GMAW, SMAW.

The welds must be split evenly between the three welding practices and documented on the welding symbols on the print.

Cutting of the parts will be done with Oxy-Fuel, PAW, or Grinding; NO shear will be allowed.

Parts can be drilled on a drill press

Blueprint Min. Requirements:

Title Block

Proper Critical Dimensions

NO tolerances are acceptable

Proper Welding Symbols

Proper Finishing Symbols

Proper Views needed to fabricate the project

Video/Power Point

Because the teams do not construct the project on sight, as is done at Nationals, each team must submit a five minute video or power point presentation showing the design and construction process being completed by the team, to help maintain the validity of the contest.

Notebook

A notebook must be submitted with the project prior to the judging. It must contain pictures, blueprints, planning sketches, and supporting evidence of the materials used in the project. It should include a brief description of the project and the processes used to design the project. The notebook must include a letter certifying that the project was designed and constructed by the team. The letter must contain an itemized list of all expenses. The letter must identify the school, city, state, and local advisor. The letter must specify the division, (secondary or post-secondary) and the letter must be signed by the local administrator.

Presentation

The team will participate in a presentation where the teams will have to explain what type of welding practices used, gas and settings that they would use to build this item in a fabrication setting and what they wished they would have changed, after they completed the project or to improve the project. The presentation will include a question and answer session from the judges. The questions will include information on the project, notebook, video, design and construction processes, workmanship, etc. All team members need to participate. This is a professional presentation, so dress appropriately.

Judging and Grading:

Accuracy of Dimensional Cuts -- 100 points
Project Assembly According to Print -- 100 points
Correct Placement of Welds on Project -- 100 points
Quality of the Welds -- 200 points
Quality of Craftsmanship When Assembled -- 100 points
Team Presentation and Q&A -- 100 points
Notebook and Prints-- 100 points
Video/Power Point -- 75 points
Complete utilization of materials -- 25 points
Written test -- 50 points
Resume -- 50 points
Total of 1000 Points

Contest Procedure:

The notebook and blueprints must be turned in at the contest site.

The project will be completed prior to the contest and will be judged at the State Conference on April 28, 2017.

The team will do an oral interview at the contest. All team members need to participate.

Each team member will need to turn in a resume at the contest site.

There is no time limit on the project construction at the state contest but the National contest has a time limit of 6.5 hours.

Shears and brakes are not available at the national contest so should not be used on the state contest project.

A video will be turned in to help in the validity of the contest.

A written test will be taken at the state contest.

1. **Alternating Current (AC) is used to GTA weld Aluminum because:**
 - A. The electrode positive portion of the AC current cycle provides cleaning action at the Aluminum surface
 - B. Aluminum conducts AC better than DC
 - C. AC power supplies are generally less expensive than DC power supplies
 - D. The electrode negative portion of the AC current cycle provides cleaning action at the Aluminum surface
 - E. None of the above

2. **Which type of power supply is used for the SMAW process?**
 - A. DCEP
 - B. DCEN
 - C. Constant Voltage
 - D. Constant Current

3. **Acetylene gas becomes unstable at what pressure?**
 - A. 3 PSI
 - B. 8 PSI
 - C. 15 PSI
 - D. 75 PSI

4. **Which one of the following is a ferrous metal?**
 - A. aluminum
 - B. copper
 - C. magnesium
 - D. mild steel

5. **The selection of the correct filter plate shade number depends on the:**
 - A. Brightness of the sun in the weld area
 - B. Type of shielding gas in use
 - C. Amount of current being used
 - D. Type of filler metal being used
 - E. All of the above

6. The weld symbol drawn below indicates:



- A. A full-penetration square groove weld
B. A fillet weld with melt-through permitted
C. A Butt weld with the arrow side ground flush
D. A fillet weld with the arrow side ground flush
7. **When GTA welding Carbon Steel plate, the Tungsten electrode should be:**
- A. Located well inside the cup
B. Balled
C. Pointed at the tip
D. Ground in such a fashion as to leave grind marks around the tip
E. None of the above
8. **Which of the following are functions of the coating on SMAW electrodes:**
- A. Alloying
B. De-Oxidization
C. Shielding
D. All of the above
E. None of the above
9. **When using an Oxy-Acetylene torch, the oxygen cylinder valve should be opened all the way.**
- A. True
B. False
10. **The primary reason some suppliers coat their GMAW filler wire with copper is to:**
- A. Aid in deoxidizing the weld metal in the weld pool
B. Help smooth out the feeding of the wire
C. Improve electrical transfer at the contact tip
D. Prevent rusting of the filler wire

11. **Potential hazards relating to electric arc welding include:**
- A. Heat
 - B. Radiation
 - C. Toxic gasses
 - D. All the above
12. **The size of a coated electrode is determined by the**
- A. overall diameter
 - B. amperage setting
 - C. core diameter
 - D. AWS classification of electrodes
13. **If the Tungsten electrode turns blue after GTA welding, you should:**
- A. Increase amperage
 - B. Increase preflow
 - C. Increase postflow
 - D. Decrease amperage
14. **When experiencing 'arc blow' during SMAW welding, one possible remedy could be:**
- A. Use a full length electrode
 - B. Shorten the arc length
 - C. Change to DCEN from AC current
 - D. Whip the electrode
15. **When Oxy-Fuel cutting, a general rule is that the torch angle should vary according to:**
- A. Type for fuel gas used
 - B. Size of tip used
 - C. Pressure settings
 - D. Thickness of metal to be cut

16. Which of the following is not an advantage of the Gas Metal Arc Welding process?
- A. Higher deposition rates compared to other welding methods
 - B. Relatively easy process for beginners to learn
 - C. Suitable for ferrous alloys
 - D. Suitable for nonferrous alloys
 - E. None of the above
17. Undercutting is a condition that occurs when
- A. welding current is too high
 - B. welding travel speed too slow
 - C. welding current is too low
 - D. arc length is too short
18. The distance through a fillet weld, from the face to the root is called the:
- A. Leg
 - B. Stem
 - C. Throat
 - D. Heart
19. The proper current type for most welding of Stainless Steels with the GTAW process is:
- A. DCEN
 - B. DCEP
 - C. Pulsed AC
 - D. None of the above
20. Which of the following SMAW electrodes are not suitable for use in all positions?
- A. E6011
 - B. E6018
 - C. E7024
 - D. E7018

21. Argon and helium gases are
- A. inert
 - B. reactive
 - C. reducing
 - D. oxidizing
22. In GMAW welding, shielding of the molten metal is accomplished through the use of:
- A. Granular Flux
 - B. Coating generated gas
 - C. Slag
 - D. Inert and reactive gasses
23. The safest clothing materials to wear in a welding environment are:
- A. Asbestos and Kevlar
 - B. Cotton and Wool
 - C. Nylon and Rayon
 - D. Polyester and Nylon
24. Which of the following is not considered a type of joint?
- A. Butt
 - B. T
 - C. Fillet
 - D. Corner
 - E. Edge
25. A green paint band on a GTA electrode indicates:
- A. Pure Tungsten electrode
 - B. Thorium
 - C. Lanthanum
 - D. Zirconium

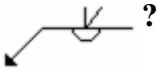
26. **When using the SMAW process, as the arc length increases, the current does what?**
- A. Increases
 - B. Decreases
 - C. Initially increases then subsequently decreases
 - D. Initially decreases then subsequently increases
 - E. None of the above
27. **The flux on a SMAW electrode is broken down by the heat of the welding arc to produce,**
- A. Slag that reacts with the molten weld metal to reduce contaminants
 - B. Shielding gases to protect the molten weld from contaminating gases
 - C. A and B
 - D. None of the above.
28. **Which of the following shielding gasses is the most economical to use for GMAW welding of Carbon Steel with the short circuiting transfer method?**
- A. Argon
 - B. Carbon Dioxide
 - C. 98% Argon, 2% Oxygen mix
 - D. 75% Argon, 25% Carbon Dioxide mix
29. **An acceptable method of shielding yourself from the light from an electric arc while tackwelding is to:**
- A. Simply close your eyes while tackwelding
 - B. Hold your hands in front of the arc
 - C. Squint your eyes tightly while tacking
 - D. None of the above are acceptable
 - E. All of the above are acceptable

30. **When two members are in the same plane with their edges meeting the joint is termed a:**
- A. Corner joint
 - B. Lap joint
 - C. Butt joint
 - D. Tee Joint
31. **When the electrode holder is connected to the positive (+) terminal on a Direct Current power supply, it is called:**
- A. Direct Current Straight Polarity (DCSP)
 - B. Direct Current Reverse Polarity (DCRP)
 - C. Direct Current Direct Deposit (DCDD)
 - D. Direct Current Indirect Polarity (DCID)
32. **Which of the following popular SMAW electrodes is classified as low-hydrogen?**
- A. E6011
 - B. E6024
 - C. E7014
 - D. E7028
 - E. None of the above
33. **When selecting a cutting tip for Oxy-Acetylene cutting, one should consider:**
- A. Use the cleanest, newest tip available
 - B. How fast does the job need to be done
 - C. The thickness of the metal being cut
 - D. All of the above
34. **What metal will a plasma cutter cut?**
- A. stainless steel
 - B. aluminum
 - C. carbon steel
 - D. All of the above

35. **When selecting a dark filter lens for a welding helmet, the higher the lens number is, the more arc light is blocked out.**
A. True
B. False
36. **Before opening the cylinder valves on Oxy-Fuel cylinders, the regulator adjusting screws should be turned in all the way.**
A. True
B. False
37. **Oxygen can be used for shielding gas when GMAW or GTAW welding, in an emergency.**
A. True
B. False
38. **Low hydrogen electrodes should be stored in a (an):**
A. Electric Oven
B. Electrode oven
C. A cool, dry place
D. A warm, humid place
E. Both (A) and (B) above
39. **What is the name for the opening produced during a cutting operation?**
A. Drag line
B. Slag
C. Kerf
D. Wraparound
E. None of the above
40. **The stringer bead weld is made with appreciable transverse oscillation.**
A. True
B. False

41. **Electric Arc welding performed with proper safety equipment presents great safety hazards.**
A. True
B. False
42. **On a completed groove weld, the surface of the weld on the side where the welding was performed is called the :**
A. Crown
B. Weld reinforcement
C. Weld Face
D. Root Face
E. None of the above
43. **Using the GTAW process, Aluminum can be successfully welded using DCSP.**
A. True
B. False
44. **When welding with the SMAW process, increasing the arc gap tends to have what effect on the molten pool?**
A. Heat up
B. Cool down
C. No effect- Molten Pool remains at the same temperature
D. None of the above
45. **When welding with an Oxy-Acetylene torch, the hottest part of the flame is:**
A. The tip of the inner cone
B. The yellow area of the flame
C. The blue area of the flame
D. None of the above
46. **"Arc Blow" is not found when using AC arc welding power sources.**
A. True
B. False

47. **Oil or grease, used as a lubricant around Oxy-Fuel equipment, is very hazardous.**
A. True
B. False
48. **Amperage (amp) is a measurement of the current in the welding circuit.**
A. True
B. False
49. **Welding or cutting on zinc plated (galvanized) steel may cause**
A. metal fume fever
B. air quality problems
C. a rust resistant surface
D. A and B
50. **The minimum protective shade number to be used for GMAW or FCAW processes is**
A. #7
B. #8
C. #10
D. #12
51. **What metal will a plasma cutter cut?**
A. stainless steel
B. aluminum
C. carbon steel
D. All of the above
52. **To safely light an oxy-fuel torch, a _____ should be used.**
A. Match
B. Friction spark lighter
C. Butane lighter
D. Welding arc

53. Acetylene cylinders should be
- A. stored and used in an upright position
 - B. used as leg for a steel bench
 - C. used as roller to move a heavy load
 - D. Heated to get all the acetylene out of the tank.
54. The most common inspection method for welding is
- A. dye penetrant inspection
 - B. visual inspection
 - C. Magnetic particle inspection
 - D. X-ray inspection
55. The "60" in E 6010 electrode specification stands for:
- A. Pounds of electrodes per can
 - B. Minimum current setting
 - C. Tensile Strength
 - D. All of the above
56. What type of weld does this welding symbol refer to  ?
- A. Fillet With Backing
 - B. Square Groove With Backing
 - C. Bevel Groove With Backing
 - D. Bevel Groove Without Backing
 - E. Square Groove Without Backing



SKILLS USA 2012
AWS Iowa Section

