



Idaho's 2019 WELDING FABRICATION

Theme

The Welding Fabrication event for Idaho's SkillsUSA State contest will be a "Jet Stove". Contestants will design from the bill of materials a Jet Stove with the capability of being fired via wood (See page 5 for materials list). Students should design and draw plans for the Jet Stove with limited help from instructors to be completed in the 4 hour time frame given. The plans need to have, welding symbols and weld sizes on the prints. The prints should have an isometric, top, side, and front views and an assembly drawing using 11x17 Legal size paper (size C drawing). Please remember to bring two copies with you of the prints. One will be given to the judges at the orientation. The second set is for you during the competition.

Teams will be required to have SMAW, GTAW and GMAW welds on the project. Teams will also have OFC and plasma cutting processes to choose from. The prints need to be brought to the Idaho SkillsUSA Welding Fabrication Committee on April 4th (the evening of the written test) and have an additional set of plans for fabrication the day of the competition.

General Rules

All welds will be left in the as welded condition (no grinding or sanding of the welds). The grinder may be used to prep the project to be welded. You may clean the project and welds with wire wheels. Grinding on OFC or plasma cut edges may be performed after judges have graded the cuts.

PURPOSE

To evaluate each contestant's preparation for employment, and to recognize outstanding students for excellence and professionalism in the field of welding fabrication.

CLOTHING REQUIREMENT

Clean 100% cotton work clothes, leather work shoes, and safety glasses with side shields or goggles. (Prescription glasses can be used only if they are equipped with side shields. If not, they must be covered with goggles.)

ELIGIBILITY

Open to active SkillsUSA members enrolled in programs with welding as the occupational objective. This is a team event. Each Team will be comprised of three student members from the same school and training program.

EQUIPMENT AND MATERIALS:

1. Supplied by the technical committee:

- All necessary welding equipment
- All Oxy-fuel torches
- All plasma cutters
- Chop Saws

2. Supplied by the contestant Team as needed:

- *****We Currently Do Not Have A Sponsor for ALL of The Materials***** ...plan on bring your own or making arrangements to have them delivered to CWI for the items we do not have sponsors for. If you have any industry partners who would be willing to donate some or all of the materials let me know, we usually have 12 teams.
- Hearing and/or ear protection
- Safety Glass with side shields (Z87 approved)
- Welding and cutting gloves
- Welding helmet with appropriate filter
Plate/lens and protective cover plate/lens in a
Flip or slide front. Auto darkening shields are permissible.
- Spare spatter and filter lenses/plates for arc welding helmet and oxyacetylene goggles
- Pocket calculator
- Lead pencil and/or ballpoint pen
- Soap stone with holder
- Scribe with magnet
- Combination square set
- Fillet weld gauge
- Wrap a round
- Speed square
- Tape measure and steel rulers
- Straight edge
- Hammer
- Vise grips
- C grips, C clamps, or pipe clamps
- Channel locks
- Crescent wrench 12"
- Protractor or angle finder
- Angle bevel
- Files any size or shape
- 50' power cord (120 V)
- Corded or cordless drill and drill bits
- Tap & Dies and oil
- 4 1/2" grinder with wheels (Cut off wheels, grinding wheels, and sanding disk, ect)
- Wire wheels
- Clear face shields (for grinding and buffing)
- Center punches

- Chipping hammer with or without wire brush
- wire brushes
- Knee pads
- Striker for OFC
- Sand paper or emery cloth

SCOPE OF THE CONTEST

The scope of the contest is defined by industry Standards. All drawings, welding symbols and welding terms conform to the latest edition of the American Welding Society (AWS) standards.

Knowledge Performance

The contest will include assesses that the practical knowledge of welding, including safety, measurement and blue print reading. Other common fabrication operations will also be assessed such as saw operation, drilling, grinding, and material handling.

Committee Identified Academic Skills

The technical committee has identified that the following academic skills are embedded in this contest.

Math Skills

- Use fractions to solve practical problems
- Measure angles
- Construct three-dimensional models

Science Skills

- Describe and recognize solids, liquids and gases
- Use knowledge of principles of electricity and Magnetism

Contest Guidelines/Build Requirements

1. Contestants must correctly use the welding equipment during the contest. The contest chairman and contest coordinator may stop a contestant at any time of the contest if they deem a contestant's manner to be hazardous to either themselves or others. Such stoppage shall disqualify the participant for that section of the contest. If the contestant is warned a second time, he or she will be disqualified as a contest participant.
2. While the contest is in progress, there shall be no communication between the contestants and their instructors, other teams or anyone else, except as directed by a judge, contest coordinator or contest chair. It is expected that team members will communicate with each other.
3. Time limits will be established on the contest (**4 hours**)

4. Welding and cutting operation instructions will be specified in drawings
5. Welding equipment used in the contest may be obtained from a variety of manufacturers and may include transformers, rectifiers and/or inverters.
6. Filler metals will be compatible with the metals being welded and will be detailed on the contest procedure sheet. Instructions to the contestants will define more specifically the filler metals that may be used.
7. ****WELD DETAIL****The main body of the jet stove will be welded with the GMAW process. All welds on the vents, covers, handles or plaques of the project will be welded with the GTAW process. All welds on and attaching the legs/stand must be welded with the SMAW process.** Tack welds may be made with any process.
8. Welds will be evaluated visually utilizing a rating system as established by the SkillsUSA technical committee. Nondestructive tests may be used to complete the project evaluation.
9. Final judging of the welded projects will be evaluated per the difficulty of the assigned task and by utilizing the following visual inspection criteria: dimensional accuracy, including distortion; conformity to drawing requirements.
10. Effective Use of Material. Contestants will be judged on **effective** and **efficient** use of material. The project is forge/kiln and should be a fully functional design capable of performing its intended purpose. With that in mind, it is not the judging committee's intent to have all designs be identical to our vision or use 100% of the material supplied. For that purpose the "Effective Use of Material" category will tie in closely with an effective design. ie: if the judges determine that your project functions properly, and you have some left over material you will likely receive full points.
11. All plate steel must have a minimum of 1 OFC or plasma cuts on it
12. All Tube assemblies must have at least 1 OFC or plasma cuts on it including the legs

BILL OF MATERIALS

Project Theme: Jet Stove

- 1) 1/8" x 2" x 24" hot rolled strip steel
- 1) 1/8" x 16" x 16" plate
- 1) 1/8" x 12" sched 40 pipe
- 1) 1/4" x 2' hot rolled round
- 1) 1/8" x 4" x 4" x 24" square tube
- 1) 1/8" x 3" x 3" x 12" square tube
- 1) 1/8" x 1" x 1" x 48" square tube
- Hardware...Builders Choice...Teams may bring their own hardware from the selection below
 - Bolts - Unlimited
 - Nuts – Unlimited
 - Washers – Unlimited
 - Screws - Unlimited

Welding Consumables Supplied by Committee

- .035" ER 70S-6 (GMAW)
- 3/32" ER 70S-2 (GTAW TIG Rod)
- 3/32"/1/8" 7018 SMAW Electrodes
- 3/32"/1/8" 6010 SMAW Electrodes