SkillsUSA Minnesota

2020 State Contest

Welding Fabrication
Contest Date: Saturday, April 4, 2020 8:00am-3:00pm
Contest Location: Pipefitters JATC
6200 Lakeland Ave N,
Minneapolis, MN 55428

Please review these guidelines for the state competition on April 4, 2020. Now is the time to brainstorm, practice, and design your project. Your team of three competitors will have 6.5 hours to complete your project. Keep in mind your team & project will be judged throughout your 6.5 hours. Manage your time wisely.

Dates and times for material drop off and machine setup at the Union Hall prior to the contest are yet to be determined.

Please Note: Prints of your design must be ready to turn in at orientation. (See items supplied by teams)

Project Theme:
- Job Box with Removable Tray

Material List Required- Each team will bring listed material to competition site.

Material List Supplied by Committee:
- Qty. 1 – 2’ x 4’ 11 ga. Hot Rolled Sheet Steel
- Qty. 2 – 4’ x 4’ 14 ga. Hot Rolled Sheet Steel
- Qty. 2 – 1” x 1” x 3/16” Angle Iron 10’ long
- Qty. 1 – 1”Sch. 40 Blk. Pipe 3’ long
- Qty. 1 – 3” Continuous (Piano) Hinge 3’ long
- Qty. 2 – 5” casters (swivel)
- Qty. 2 – 5” casters (rigid)
- Qty. 1 - ½” C.R. round stock 10’ long
- Qty. 1 - 48” #2/0 Passing link chain
- Qty. 16 - 5/16-18 x 1-1/2”bolts
- Qty. 32 – 5/16” flat washers
- Qty. 16 – 5-16-18 nuts

“Material lengths may be shortened for ease of transportation to the contest.”
No additional hardware or material may be use: (hinges, prefabricated handles, bolts etc.) Project design/prints may incorporate additional hardware requirements but hardware cannot be attached for judging.
Minimum Project Requirements:
- Three welding processes are required to fabricate the project. GTAW, GMAW, SMAW
- OFC must be used for a portion of cutting
- PLASMA must be used for a portion of cutting
- Job box shall have a minimum capacity of 9 cubic feet
- Job box shall have at least 1 removable tray
- Job box shall have a lockable lid
- Job box shall have handles

Welding Consumables Supplied by Committee:
- .035” (ER70S-6)
- 3/32” Lincoln ER70S-2 GTAW Filler Rods
- 3/32” E7018 SMAW Electrodes
- 1/8” E7018 SMAW Electrodes
- 3/32” E6010 SMAW Electrodes
- 1/8” E6010 SMAW Electrodes
- 3/32” EWCe-2 Electrode

Judging Overview

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
<th>Judging Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>75</td>
<td>Each safety infraction will be a 5pt deduction (minimum)</td>
</tr>
<tr>
<td>SMAW</td>
<td>100</td>
<td>welds will be judged on joint fit-up, size, contour and appearance</td>
</tr>
<tr>
<td>GMAW</td>
<td>100</td>
<td>welds will be judged on joint fit-up, size, contour and appearance</td>
</tr>
<tr>
<td>GTAW</td>
<td>100</td>
<td>welds will be judged on joint fit-up, size, contour and appearance</td>
</tr>
<tr>
<td>PLASMA</td>
<td>100</td>
<td>cuts will be judged on angle, appearance, dimension, bottom edges slag free and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cuts free of chipping marks (Cuts must be judged prior to any cleaning, grinding, etc)</td>
</tr>
<tr>
<td>OFC</td>
<td>100</td>
<td>cuts will be judged on angle, appearance, dimension, bottom edges slag free and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cuts free of chipping marks (Cuts must be judged prior to any cleaning, grinding, etc)</td>
</tr>
<tr>
<td>TEAMWORK</td>
<td>100</td>
<td>Students will be judged on equal participation, team communication and ability to work together</td>
</tr>
<tr>
<td>FABRICATION</td>
<td>150</td>
<td>10 critical dimensions judged for accuracy. Meets minimum project requirements. Overall appearance and functionality is also scored</td>
</tr>
<tr>
<td>ORAL EXPLANATION</td>
<td>50</td>
<td>2-5 minute oral explanation of the project design and team's preparation. This will be conducted during the welding competition.</td>
</tr>
<tr>
<td>WELD DRAWINGS</td>
<td></td>
<td>Minimum requirements for Blueprint: Title Block, Proper Critical Dimensions, No Tolerances, Proper Welding Symbols, Proper Finishing Symbols, Proper Views to Fabricate the project, Proper Sub Assembly Drawings</td>
</tr>
</tbody>
</table>
### Material Usage

<table>
<thead>
<tr>
<th>Material Usage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 lbs. – 5.0 lbs.</td>
<td>50 pts.</td>
</tr>
<tr>
<td>5.1 – 10.0 lbs.</td>
<td>45 pts.</td>
</tr>
<tr>
<td>10.1 lbs. – 15.0 lbs.</td>
<td>40 pts.</td>
</tr>
<tr>
<td>15.1 lbs. – 20.0 lbs.</td>
<td>35 pts.</td>
</tr>
<tr>
<td>20.1 lbs. – 25.0 lbs.</td>
<td>30 pts.</td>
</tr>
<tr>
<td>25.1 lbs. – 30.0 lbs.</td>
<td>25 pts.</td>
</tr>
<tr>
<td>30.1 lbs. – 35.0 lbs.</td>
<td>20 pts.</td>
</tr>
<tr>
<td>35.1 lbs. – 40.0 lbs.</td>
<td>15 pts.</td>
</tr>
<tr>
<td>40.1 lbs. – 45.0 lbs.</td>
<td>10 pts.</td>
</tr>
<tr>
<td>45.1 lbs. – 50.0 lbs.</td>
<td>5 pts.</td>
</tr>
<tr>
<td>Over 50 lbs.</td>
<td>0 pts.</td>
</tr>
</tbody>
</table>

**Items that must be supplied by Teams:**

- All Personal Protective Equipment
- Hearing and/or ear protection
- 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
- Drill bits needed to complete the project
- Blueprints – See “Blueprint requirements” below
- Résumé
  - **Teams may bring hand and power tools necessary to complete their project**.
  - **Additional GTAW filler**

**Blueprint Requirements:**

- 11 x 17 size paper printed in the Landscape mode
- Title block in lower right hand corner with space titled Team #.
  - Your team number will be recorded by the contest staff when you turn in your prints.
- No school name or identifying marks on the print
- Max of 10 pages – You must have overall dimensions of the finished product included within the drawings you submit.
- All Welds **MUST** have appropriate weld symbols included to show where the required welds and weld processes will be used on the parts
- A blueprint can be neatly hand drawn if the team does not have access to design software.
- Paper copy per group turned in to the committee. You must provide your own copies to use in the contest.
Do NOT roll up paper copies

**Minneapolis Pipefitters Supplied equipment:**
- There will be a SMAW/TIG machine and a GMAW machine for each team to use.
- A limited number of hand plasma machines and oxy/fuel torches are available to use for the cutting process.
- There will be a limited number of drill presses provided for drilling. Teams must use the drills when they are available. **To ensure that you have the correct drill bit size, you should provide your own drill bits.**
- There will be a limited number of chop saws provided. Teams may bring their own saw for cutting materials.
- Welding Machines
  - Miller XMT power sources with Miller Wire feeders (GMAW, GTAW, SMAW)
  - Miller 350P machines (GMAW)
- OFC Torches
- ESAB and Hypertherm Hand Plasma Machines

**Other Information:**
When fabricating, sometimes parts and/or steel pieces are not supplied with the correct dimensions. If the dimensions are different than your prints, “on the job” corrections must be made. Notify the judges if materials are not the correct dimensions prior to any material prep. The judges will take that into consideration when judging.

**Safety:**
- Face shields **MUST** be worn while grinding
- Helmets or oxyacetylene goggles **MUST** be worn while cutting
- Welding jackets **MUST** be worn while welding
- Safety glasses **MUST** be worn at all times
- Grinding sparks on the welding equipment or other people will result in a deduction in points
- Environmental equipment must be used at all times when welding. Points will be deducted for improper use.