



**Welding Fabrication  
(WF)  
Manufacturing**

**Skilled and Technical Sciences Contests**

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***Blueprints MUST be completed prior to conference. Teams who do not submit completed blueprints at the Contest Briefing will not be allowed to compete.***

**Contest Guide**

Please review the following guidelines for the Illinois state competition that will be held on Friday, April 20, 2018. Now is the time to brainstorm, practice, and design the welding project. Welding Fabrication Teams will have **four (4) hours** to complete the project. Keep in mind teams and the project will be judged throughout the four-hour timed competition, so manage time wisely!

***Please note that teams must bring two (2) sets of prints, one set of prints must be turned in at orientation, and the second set of prints will be used to build the project. (See items below.)***

**Project Theme:** Toolbox

**Material List Supplied by Committee**

- Qty. 1 - 2' x 4' 11ga Plate
- Qty. 1 - 10' long 1" x 1" x 1/8" Angle Iron
- Qty. 1 - 3' long 1/2" HR Round Bar
- Qty. 1 - 10' long 1" x 1/8" Flat Bar
- Qty. 2 - Weld on hinges

**Welding Consumables Supplied By Committee**

- 1/16" Lincoln TIG consumable (ER70S-6)
- 3/32" Lincoln TIG consumable (ER70S-6)
- 3/32" Lincoln Electric 7018 SMAW Electrodes

### **Minimum Project Requirements**

- 5 Individual SMAW 7018 Welds - 2" minimum (Two 3F vertical up welds required, tack welds not considered one of the five)
- 5 Individual GTAW Welds - 2" minimum (Two 3F vertical up welds required, tack welds not considered one of the five)
- 5 Individual PAC Cuts
- 80% of Total Weight of the Material is required for this project.
- The lid on the toolbox must open and close using the supplied hinges.

### **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 dark helmets are permissible.
- Spare spatter and filter lenses/plates for arc welding helmet and oxy-acetylene goggles or face shield.
- 3 sets of blueprints – see “Blueprint Requirements” below.
- **STUDENTS ARE NOT PERMITTED TO BRING ANY TEMPLATES.**
- Teams must bring their own hand and power tools. (Recommended grinder, square, and file at a minimum). See Welding Fabrication National Standards for more information.

### **Blueprint Requirements**

- 11 x 17 size paper printed in the Landscape mode.
- No bindings or covers.
- Title Block in the lower right hand corner with space titled Team #.
  - Team numbers will be recorded when the prints are submitted.
- No school name or identifying marks on the print.
- Max of 10 pages – prints must have overall dimensions of the finished product included within the submitted drawings.
- All welds **MUST** have appropriate weld symbols included to show where the required welds, weld processes, and weld positions will be used on the project.
- All prints will be submitted prior to the start of the contest (at orientation).
- A blueprint can be neatly drawn if the team does not have access to design software.
- Two (2) paper copy submissions per group to be turned into the committee. Teams must provide their own copies to use in the contest.
- Do NOT roll up paper copies.

### **Tools Supplied by Committee to Each Team**

- Welding Machines and consumables.
- PAC Machines and consumables.

- Supplies from the Bill of Materials.

### **Other Information**

When fabricating, sometimes parts and/or steel pieces are not supplied with the correct dimensions. If the dimensions are different than the 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 and glasses must be worn while grinding.
- Helmets, face shields or oxy-acetylene goggles must be worn while cutting.
- All proper PPE must be worn while welding, including tacking. If a team is seen tacking without proper PPE, points will be deducted from the overall score, and depending on the situation, one or more team members may be dismissed from the competition.
- Safety glasses must be worn AT ALL TIMES.
- Only one grinder or welder may be used at a time due to close proximity of teammates.
- Gloves must be worn at all times while handling material. Treat all supplied metal as "hot" at all times when handling or points will be deducted.
- Ear plugs must be worn at all times from the start of the competition. All the various teams may be grinding, hammering, etc. at any given time so ear plugs are required throughout the competition.
- All major safety violations will result in immediate dismissal of the individual from the contest. The remaining members of the team will be allowed to finish the competition, but points will be deducted from the overall team's score.

**Scoring**

| <u>Type</u>    | <u>Skills Area</u>     | <u>Max Points</u> |
|----------------|------------------------|-------------------|
| Standard       | PAC Cuts               | 100               |
| Standard       | SMAW 7018              | 150               |
| Standard       | GTAW                   | 150               |
| Standard       | Teamwork               | 100               |
| Standard       | Fabrication            | 150               |
| Standard       | Oral Explanations      | 50                |
| Standard       | Drawings               | 100               |
| Standard       | Material Usage         | 100               |
| Standard       | Safety/PPE             | 100               |
| <b>Total</b>   |                        | <b>1000</b>       |
| <b>Penalty</b> | <b>Resume</b>          | <b>20</b>         |
| <b>Penalty</b> | <b>Proper Clothing</b> | <b>20</b>         |

| <b>Category</b>         | <b>Points</b> | <b>Judging</b>   |
|-------------------------|---------------|--|
| <b>SAFETY</b>           | 100           | Each safety violation will be a 5-10pt deduction depending on the violation  |
| <b>SMAW – E7018</b>     | 150           | 5 required welds will be judged on joint fit-up, size, contour and appearance.   |
| <b>GTAW</b>             | 150           | .5 required welds will be judged on joint fit-up, size, contour and appearance.  |
| <b>PAC</b>              | 100           | 5 required cuts will be judged on angle, appearance, dimension, bottom edges slag free and cuts free of chipping marks. (Cuts must be judged prior to and cleaning, grinding, etc.)                                |
| <b>TEAMWORK</b>         | 100           | Students will be judged on equal participation, team communication and ability to work together.   |
| <b>FABRICATION</b>      | 150           | 10 critical dimensions will be judged for accuracy. Overall appearance and functionality is also scored.   |
| <b>ORAL EXPLANATION</b> | 50            | 2-5 minute oral explanation of the project design and team’s preparation. This will be conducted in the welding area.  |
| <b>WELD DRAWINGS</b>    | 100           | 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. |
| <b>MATERIAL USAGE</b>   | 100           | If the team’s scrap metal weighs 0-5 lbs, the team will receive all 50 pts. For each lb of material over 5 lbs, the team will be docked points based on the total scrap weight                                     |
| <b>RESUME</b>           | <b>20</b>     | <b>Resumes are to be turned in at orientation.</b>   |
| <b>CLOTHING</b>         | <b>20</b>     | <b>Participants must be in SkillsUSA approved attire for the contest.</b>  |