

Iowa SkillsUSA Welding Fabrication Competition 2020

State Welding Fabrication Competitors:

I apologize for the delay in getting this information out. Based on feedback from competitors at the 2019 national competition, we will not use that project this year. For the state competition, we will go back to the format of the team designing and building the project around a theme.

This year, we will have the Welding Fabrication contest at the DMACC Ankeny campus on **THURSDAY, APRIL 23**. We will have a maximum of 10 teams (combined secondary/post-secondary) compete. Entry will be on a “first come first serve” basis. The entry fee for each team is \$100.00

Please review these guidelines for the state competition. Now is the time to plan and practice your build. Your team will have 5 hours to complete your project. Keep in mind your team & project will be judged throughout your 5 hours. Manage your time wisely.

The Welding Fabrication event for Iowa SkillsUSA contest will have a theme of a “**Short Shop Chair**”. Your chair shall have (4) 3” swivel wheels and a swivel platform with a 6” x 6” 4-bolt pattern with 5/16” diameter holes, for which a “off the shelf” padded seat can be affixed. To give prospective on the project, although not a requirement, the chair frame without the wheels will likely be approximately 10”-18” in height. The 3/4” diameter rod should fit into the 3/4” sched 40 pipe. This project will be useful in your shops while students are working on projects close to the ground. Contestants will design from the bill of materials with limited help from instructors. The students will design their chairs to be completed in the 5-hour time frame given. The plans need to have, welding symbols and weld sizes on the prints. **The prints should have top, side, and front views and an assembly drawing using 11”x17” size paper (size C drawing). Teams will be required to have SMAW, FCAW, GTAW and GMAW welds on the project.** Teams will also be required to use OFC. The prints need to be brought to the SkillsUSA Welding Fabrication Committee on the day of the competition.

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.

Contest Guidelines

1. Contestants must correctly use the welding equipment during the contest. The contest chairman and contest coordinator may stop a contestant at any section 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 to each other.
3. Time limits will be established on the contest (**5 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. 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.
7. Final judging of the welded projects will be evaluated according to the difficulty of the assigned task and by utilizing the following visual inspection criteria: dimensional accuracy, including distortion; conformity to drawing requirements.
8. Effective Use of Material. Contestants will be judged on **effective** and **efficient** use of material. The project is Shop Chair 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 your project functions properly, and you have some left-over material you will likely receive points.
9. All plate steel must have a minimum of 2 OFC or plasma cuts on it

Bill of Materials

Project Theme: Short Shop Chair

Material List Supplied by Committee

- 1/8" x 1" x 1" x 170" angle iron
- 11 ga x 16" x 16" mild steel plate
- 3/16" x 8" x 8" mild steel plate
- 1/4" x 16" x 16" mild steel plate
- 3/4" Sched 40 pipe x 4"
- 3/4" dia rod x 8"
- 3) 3/4" flat washers
- 4) 3" swivel wheels
- 1) 3/16" Cotter Pin
- 1) 1-3/16" x 2" x .188" (Heavy Duty Compression Spring)

- Welding Consumables Supplied by Committee:
 - 0.035 Lincoln SuperArc L-56 GMAW (ER70S-6)
 - 0.045 Lincoln Ultracore 71A85 FCAW (E71T-1)
 - 3/32" Lincoln ER70S-2 GTAW filler rod
 - 3/32" Lincoln Excalibar 7018 MR (E7018) SMAW electrode
 - 1/8" Lincoln Excalibar 7018 MR (E7018) SMAW electrode
 - 3/32" Lincoln Fleetweld 5P (E6010) SMAW electrode
 - 1/8" Lincoln Fleetweld 5P (E6010) SMAW electrode

- Minimum Project Requirements:
 - 5 Individual SMAW Welds of 3" or greater (Two 3F vertical up welds required)
 - 5 Individual GMAW Welds of 3" or greater (Two 3F vertical up welds required)
 - 5 Individual GTAW Welds of 3" or greater (Two 3F vertical up welds required)
 - 5 Individual FCAW Welds of 3" or greater (Two 3F vertical up welds required)
 - 5 Individual OFC Cuts of 3" or greater

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

- **Blue Print Requirements for Project:**
 - One set of prints on 11" x 17" paper printed in the Landscape mode (for grading)
 - In addition a USB type drive containing prints in PDF format is required
 - USB drive will not be returned
 - Drives will only contain prints for project theme
 - No bindings or covers
 - Title block in lower right hand corner with space titled Team #.
 - **Your team number will be recorded** by the SkillsUSA 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
 - All vertical welds shall be noted
 - A blueprint can be neatly hand drawn if the team does not have access to design software.
 - An electronically scanned pdf copy is still required for all prints.
 - All prints **MUST** be created by the team.
 - Do NOT roll up paper copies

- **Judging Overview:**

Category	Points	Judging Detail
Safety	75	Each safety infraction will be a 5pt deduction
SMAW	100	5 required welds will be judged on joint fit-up, size, contour and appearance
GMAW	100	5 required welds will be judged on joint fit-up, size, contour and appearance
GTAW	100	5 required welds will be judged on joint fit-up, size, contour and appearance
FCAW	100	5 required welds will be judged on joint fit-up, size, contour and appearance
OFC	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 any cleaning, grinding, etc)
TEAMWORK	100	Students will be judged on equal participation, team communication and ability to work together
FABRICATION	150	10 critical dimensions will be judged for accuracy. Overall appearance and functionality is also scored
ORAL EXPLANATION	50	2-5-minute oral explanation of the project design and team's preparation. This will be conducted randomly during the 5-hour fabrication part of the competition
WELD DRAWINGS		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
WRITTEN TEST	75	The 3 individual test scores are averaged for your team's total score
Lbs. of Unused Material	50	0 lbs. – 5.0 lbs. - 50 pts. 5.1 – 10.0 lbs. - 45 pts 10.1 lbs. -15.0 lbs. - 40 pts. 15.1 lbs. – 20.0 lbs. – 35 pts. 20.1 lbs. – 25.0 lbs. – 30 pts. 25.1 lbs. – 30 lbs. - 25 pts. 30.1 lbs. – 35.0 lbs. 20 pts. 35.1 lbs. – 40.0 lbs. - 15 pts. 40.1 lbs. – 45.0 lbs. - 10 pts. 45.1 lbs. - 50.0 lbs. - 5 pts. Over 50.1 lbs. - 0 pts.

- **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
 - Welding helmet, face shield, or goggles with an appropriate filter plate or lens (#5-#6) for OFC
 - Spare spatter and filter lenses/plates for arc welding helmet and oxyacetylene goggles
 - Grinding face shields
 - Blueprints for your fabrication project – See “Blueprint requirements for Project”
 - Résumé
 - Teams may NOT bring any additional hand tools.

- **Tools Supplied by Committee to each team:**
 - Welding Machines
 - Lincoln Electric C300 Powerwave used for GMAW/FCAW
 - Miller Electric Dynasty for SMAW/GTAW
 - Environmental Equipment
 - 1 Environmental Extraction Unit per team
 - OFC Torch Kit
 - Tungsten Electrodes
 - Materials from Bill of Materials
 - Two 4 ½” angle grinders
 - 3 cutting disks, 3 grinding disks and 3 sanding disks per team
 - Tool boxes consisting of the following tools:

Tool	Quantity
Calculator	1
Clamp - 12" Bar Type	1
Clamp - 24" Bar Type	1
Drill bit set	1
Hammer - 3# (Short Handle)	1
Hammer – Chipping	2
Level - 24" Bubble Type	1
Measuring Tape - 25'	3
Pliers - Channel Lock (Large)	1
Pliers - Channel Lock (Small)	1
Pliers - Diagonal Wire Cutters	1
Pliers - Lineman's (Large)	1
Pliers - Needle Nose (Large)	1
Pliers - Slip Joint (large)	1
Pliers - Slip Joint (Small)	1
Screwdrivers - Flat Blade (Various Sizes)	5
Screwdrivers - Phillips Head (Various Sizes)	3
Square – Framing	1

Tin Snips	1
Vise Grips - 10WR (Regular Type)	1
Vise Grips - 11R (Short C-Clamp Type/Without feet)	2
Vise Grips - 11SP (Short C-Clamp Type/With feet)	2
Vise Grips - 18SP (Long C-Clamp Type/With feet)	2
Wire hand brush	1
Wrench - 8" Adjustable	1
Wrench - Set - Combination 1/4" to 7/8" (10 pcs)	1

- **Other tools:**
 - One drill press will be available. All teams must share the drill press which will be available at a first come / first serve basis. **Plan your time and work accordingly.**

- **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**
 - **Hearing protection must be worn at all times**
 - Only one welding machine may be used at time as there is only one piece of environmental equipment. Two grinders may be used in conjunction with the use of the one welding machine.
 - Grinding sparks on the welding equipment and/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.

- **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.
 - The oral interview will be conducted randomly during the 5-hour fabrication part of the competition.
 - A team picture may be taken after your oral presentation has concluded
 - Pictures will be sent out to teams after the competition
 - All projects must be removed by the team after the competition is completed.
 - **Teams are not permitted to bring any power tools, templates or additional material.**
 - **Possession or use of any electronic communication devices are not allowed in the contest area at any time.**
 - **A collection box will be available to hold cell phones labeled with painters tape and team #**
 - **Cell phones may not be substituted for calculators!**

- **Ideas for Future Projects**
 - If your team has a suggestion for a project that is worthy of being a fabrication project please bring information with you to turn in with your prints
 - It’s encouraged to think of projects that can improve communities in some way
 - This is not a requirement
 - Provide as much information as possible to describe the project
 - Label the information as “Suggestion for Future Projects”
 - No points will be awarded for submissions
 - No guarantees the project will be chosen

- **Time Schedule for Welding Fabrication (Thursday, April 23)**
 - 7:00 - 7:30 Conference registration/team check-in (Building 10)
 - 7:30 - 8:15 written test
 - 8:15 - 8:45 safety brief
 - 8:45 - 11:45 competition
 - 11:45 - 12:45 lunch (no competition)
 - 12:45 - 2:45 competition
 - 2:45 - 3:30 clean-up

