

SkillsUSA Welding Fabrication Competition Update – 2024

National Welding Fabrication Competitors:

Congratulations on winning your state event. Please review these guidelines for the national competition in June. Your team will have six and a half (6.5) hours to complete your project. Keep in mind that your team and project will be judged from the time starts until the end.

The following information is intended to help you prepare for the competition. Be prepared for changes; these are common in the fabrication environment. Plan for **stop points** during your build as the judges will need to inspect welds and other fabrication factors. The early release prints will not show all information including stop points that will be on the competition print.

This year's project, a skid steer attachment for a log grapple was chosen and drawn by the Vermeer Corporation, a valuable supporter of the welding fabrication competition. Teams should note that the drawing has some parts left out to keep the weight down to 93 pounds after completion. The welding fabrication committee is looking forward to another great competition. Best of luck!

Welding Fabrication Project:

Log Grapple Thumb

Equipment Supplied by the Committee:

Welding Machines

- Lincoln Electric Powerwave 300c used for GMAW/GMAW-P
- Miller Dynasty used for GTAW

Environmental Equipment

- 1 Environmental Extraction Unit per team (Miller Electric or Lincoln Electric)

Other Equipment

- Harris Calorific OFC Pipeliner Kit

Material list supplied by the committee:

All items from the bill of materials for this project will be cut and broke for the competition.

Welding Consumables Supplied by the Committee:

- .035" Lincoln SuperArc L-56 GMAW Consumable (ER70S-6)
- 1/16" Hobart ER70S-2 GTAW Filler Rods
- 3/32" Hobart ER70S-2 GTAW Filler Rods
- 3/32" EWCE-2 Electrode
- One 4 ½" grinder
- 3- cutting discs, 3- 36 Grit abrasive flapper discs per team
- Oxyacetylene goggles

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- Grinding face shields
- Toolboxes consisting of the following tools:

| Tool | Quantity |
|--|-----------------|
| Calculator | 1 |
| Clamp - 12" Bar Type | 1 |
| Clamp - 24" Bar Type | 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 |
| Wrench - 8" Adjustable | 1 |
| Wrench - Set - Combination 1/4" to 7/8" (10 pcs) | 1 |

Minimum Project Requirements:

- Three welding processes.
- Minimum welds designated for scoring include:
 - 7 GMAW (Two 3F vertical up welds required)
 - 7 GMAW Pulsed
 - 6 GTAW (Two 3F welds required)
 - 2 OFC Cuts

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Welding Fabrication Project Blueprint:

The national welding fabrication competition also includes the submission of a proposal project at orientation. The quality of the team's welding fabrication project should be worthy of becoming a potential future national project. Each team is required to submit their own project proposal blueprints. Guidelines for the project proposal includes:

- Title: “***Proposal for Future Projects***”
 - Title: Sub-heading: *descriptive name for your project.*
- Design Guidelines:
 - Maximum footprint 48” square.
 - Maximum height, 36”.
 - The steel material cost should not exceed \$500.
- Blueprint Requirements:
 - Prints of your design must be **ready to turn in at orientation.**
 - **All prints must be created by the team.**
 - No school name or identifying marks on the print other than the team's assigned competitor number.
 - **Max of 15 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 welding processes will be used on the part.
 - **All vertical welds shall be noted.**
 - Title block in lower right-hand corner with space titled Team Competitor Number.
 - **Your team's competitor number MUST be recorded** on the title block when you turn in your prints.
 - **One set of prints on 11” X 17” paper printed** in landscape mode (for grading)
 - Do not roll up paper copies
 - No bindings or covers
 - Additionally, **copy of the blueprints saved in PDF format** must be submitted on a USB drive at orientation.
 - USB drive will not be returned.
 - Drives must only contain your prints for the proposal project.
 - (Blueprint Submission Option) The team's blueprint can be neatly hand drawn if the team does not have access to design software.
 - An electrically scanned PDF copy of your hand drawn prints for the proposal project must still be submitted on USB drive.

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Scoring Overview:

| Category | Points | Judging Detail |
|-------------------------------|--------|--|
| Safety | 30 | Each safety infraction will be a 10 point deduction |
| GMAW/GMAW-P | 250 | 13 required welds will be judged on joint fit-up, size, contour, and appearance. |
| GTAW | 125 | 13 required welds will be judged on joint fit-up, size, contour, and appearance. |
| OFC | 125 | 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 | 125 | 5 critical dimensions will be judged for accuracy. Overall appearance and functionality are also scored. |
| Oral Explanation | 120 | 10 minute oral explanation of the project design and team's preparation. This will be conducted randomly during the 6.5 hour fabrication part of the competition. |
| Weld Drawings /Proposal | | 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. |
| Professional Development Test | 25 | See study guide available online at: https://www.skillsusa.org/competitions/skillsusa-championships/competition-updates/ |
| Written Knowledge Test | 100 | The 3 individual test scores will be averaged for your team's total score. |
| Clothing Penalty | -10 | |
| Resume Penalty | -10 | |
| Fabrication | 1 | Tie Breaker |
| GTAW | 1 | Tie Breaker |
| GMAW | 1 | Tie Breaker |

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Competition Safety:

- Face shields must be worn while grinding
- Helmets or oxyacetylene goggles must be worn while cutting
- **Welding jackets must be worn while welding.**
 - (Full welding jackets or half jackets with bib is REQUIRED! - **Sleeves only or your uniform shirt are NOT ACCEPTABLE as a jacket.**)
 - You may remove your long sleeve uniform shirt while wearing a welding jacket.
 - Leather work boots must be worn.
- While not welding competitors must have long sleeve uniform shirt on with sleeves always rolled down. You will be working in tight quarters and by the nature of your work you are constantly exposed to sharp material and hot parts – long sleeves minimize the risk of injury.
- **Safety glasses and hearing protection must always be worn.**
- Only one welding machine may be used at a time as there is only one piece of environmental equipment. 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 reduction in points.
- Environmental equipment **must** always be in use when welding. Points will be deducted for improper use.
- **NO MATERIAL OR TOOLS SHAL BE PLACED ON THE TOP OF THE WELDING MACHINES OR ENVIRONMENTAL EQUIPMENT.**

Other Information:

- When fabricating, supplied parts and/or steel pieces may not have 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.
- A team picture may be taken during your competition.
- All projects will be donated.
- **Teams are not permitted to bring any power tools, templates, or additional material.**
 - Decimal / Fraction conversion cards are permitted.
- **Possession or use of any electronic communication devices are not allowed in the competition area at any time.** Cell phones may not be substituted for calculators!
 - A collection box will be available to hold cell phones labeled with painters’ tape.
- Some of the 6.5 hours may be working with different types of fabrication tools and newer technology in welding processes. Teams will be provided with a Welding Procedure Specification (WPS) and graded on how well they follow it.