



UTAH 2024  
WELDING  
FABRICATION  
COMPETITION

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**PURPOSE**

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

# PROJECT

## Saw Horses

The Welding Fabrication competition for Utah Skills USA will be in person this year. Each team shall build the same project as set forth in the prints given on the day of competition. As always welds need to be judged prior to grinding. The project drawing will be provided on the day of the competition. However, teams shall submit a set of drawings of a project they would like to build in a future competition.

### NEW for 2024

**\*\*Teams shall demonstrate their ability to set up and perform a basic fillet weld using the GMAW-P process on ¼” steel. They will demonstrate this on camera and submit this video to the Skills USA committee prior to the competition. (see requirements below). The start of the video shall have all cables, mig gun, wire and other necessary components sitting on the floor adjacent to the welding machine to be used in this video. (Gas cylinder to be safely mounted prior to video) The video shall capture all connections, settings and explanations of setting the power source up for welding. One of the team members may act as camera person while the other two perform the task of setting up the machine. Video shall not exceed 7 min. in length.**

The teams shall cut materials to size per bill of materials. It must be in as-milled condition. Teams shall bring the parts cut to the size and labeled as specified in the bill of materials **to orientation.**

### ***Team Project Outcomes:***

- Demonstrate knowledge of AWS terms, codes & weld symbols.
- Demonstrate ability to follow blueprints in fabrication.
- Complete project in the 4-hour time frame given.
- Demonstrate ability to fit up and fabricate to prints.
- Demonstrate knowledge and skills in the GMAW and GTAW weld processes.
- Demonstrate knowledge and skills in PLASMA/OFC cutting.
- Demonstrate ability to safely operate various shop power tools. i.e.: grinding, cutting.

### ***Teams Deliverables:***

**100pts**

- ❖ Submit a set of drawings for your selected project. PDF Drawings shall include –
  - Title block.
  - Weld symbols and weld size.
  - Welding processes.
  - Cut list
- ❖ Submit a 7 min. video on “how to set up a welding machine” per team (see video description below)
- ❖ Bring to orientation the correct B.O.M. cut and labeled.

SkillsUSA Committee Members:

<p><b>Rex Hardman</b>  <a href="mailto:Rex.Hardman@millerwelds.com">Rex.Hardman@millerwelds.com</a>  <b>1-435-229-8968</b></p>		<p><b>Hunter Torman</b>  <b>Gavin Martin</b></p>
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## VIDEO AND DRAWINGS

The team video topic is: **Demonstrate proper set up and use of a welding machine designed for GMAW-P.**

Items to include in video –

**How to connect weld cables and Mig gun.**

**How to install proper wire and feed through gun.**

**Proper gas and how to connect and set gas flow.**

**Show proper set up of front-end parts on gun (eg., Nozzle, tip, gas diffuser).**

**Submit private video link to the email address above (Make sure school name is listed in subject line)**

## DRAWINGS (Print)

Prints shall be emailed to the committee chair no later than end of day **March 4, 2024**. Be sure to put your **school's name** in the subject line of the email and on your drawing. Please format drawings for 11"x 17" paper.

Make sure file is not too large to email. Send drawings as PDF if using Solidworks or AutoCAD.

## GENERAL RULES

- All welds will be left in the as welded condition until after grading. (No grinding of the welds until they have been judged). The grinder may be used to prep the project to be welded. You may clean the project and welds with a wire brush.
- Flapper wheels may be used for preparing weld joints. NOTE: Make sure all welds are graded before grinding.

## ORIENTATION

Orientation will be held Thursday @ 10AM, **March 28th** at Local 27 Iron Workers Training Center located at 7022 West North Frontage Rd., West Valley City, UT. **Teams will receive their time slots for the competition at the orientation meeting.** The welding fabrication competition will begin with the first group starting at 12:30PM till 4:30PM on **March 28th**. The second group will begin at 8 AM till 12AM on **March 29th**.

Lunch will be provided for the contestants on the day of competition.

*Note:* You will need to bring your parts cut per bill of materials to orientation.

## 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

Official SkillsUSA khaki work shirt and pants, leather work boots/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.) To purchase official work clothes, contact Midwest Trophy Manufacturing Co. Inc. by calling 1-800-324-5996 or order online at [www.mtmrecognition.com/skillsusa/](http://www.mtmrecognition.com/skillsusa/).

*Note:* Contestants must wear their official contest clothing and work boots/shoes to the contest orientation meeting. Leather boots/shoes must be worn during competition. NO OPEN TOED shoes will be allowed.

## ELIGIBILITY

Contest is open to active SkillsUSA members enrolled in programs with welding as the occupational objective. This is a team event. Each team shall 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/filler material (welding machines, plasma cutter, cutting torch, chop saw)

Filler Material- ER70S-6 (.035") GMAW/ ER70S-2 (3/32") GTAW

Welding Equipment to be determined and provided by Miller Electric Mfg. LLC.

**Allowed and supplied by contestants.**

- Welper style pliers
- Hearing and/or ear protection
- Steel from Bill of Material (See attached)
- Safety glasses 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
- Welding helmet and/or oxyacetylene/plasma cutting goggles
- Pocket calculator
- Lead pencil and/or ballpoint pen
- Soap stone with holder
- Scribe with magnet
- Combination square set/framing square
- Fillet weld gauge
- Speed square/protractor (any device to find/measure angles)
- Tape measure
- Straight edge
- Hammer
- Vise grips
- C grips/clamps
- Channel locks
- Crescent wrench
- Protractor or angle finder

- Angle bevel
- Files- any size or shape
- 50' power cord (120 V Industrial power cord 12GA)
- 4 1/2" grinder with wheels (Grinding/flapper wheels allowed)
- Clear face shields (for grinding and buffing)
- Center punches
- Chipping hammer with or without wire brush
- Wire brushes
- Knee pads
- Level
- Heavy duty hand drill capable of ½" holes (corded recommended, battery OK)
- Drill bits – see B.O.M. below

## **SCOPE OF THE CONTEST**

Industry standards define the scope of the contest. All drawings, welding symbols, and welding terms shall conform to the latest edition of the American Welding Society (AWS) standards.

The contest will include assessments of the practical knowledge of welding including safety, measurement, and blueprint reading. Other common fabrication operations will also be assessed, such as assembly sequence, cutting operations (OFC/plasma cutting), drilling, grinding, material handling and other common preparation work prior to fabrication.

## **COMMITTEE IDENTIFIED ACADEMIC SKILLS**

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

- Print reading and understanding.

## Math Skills

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

## Science Skills

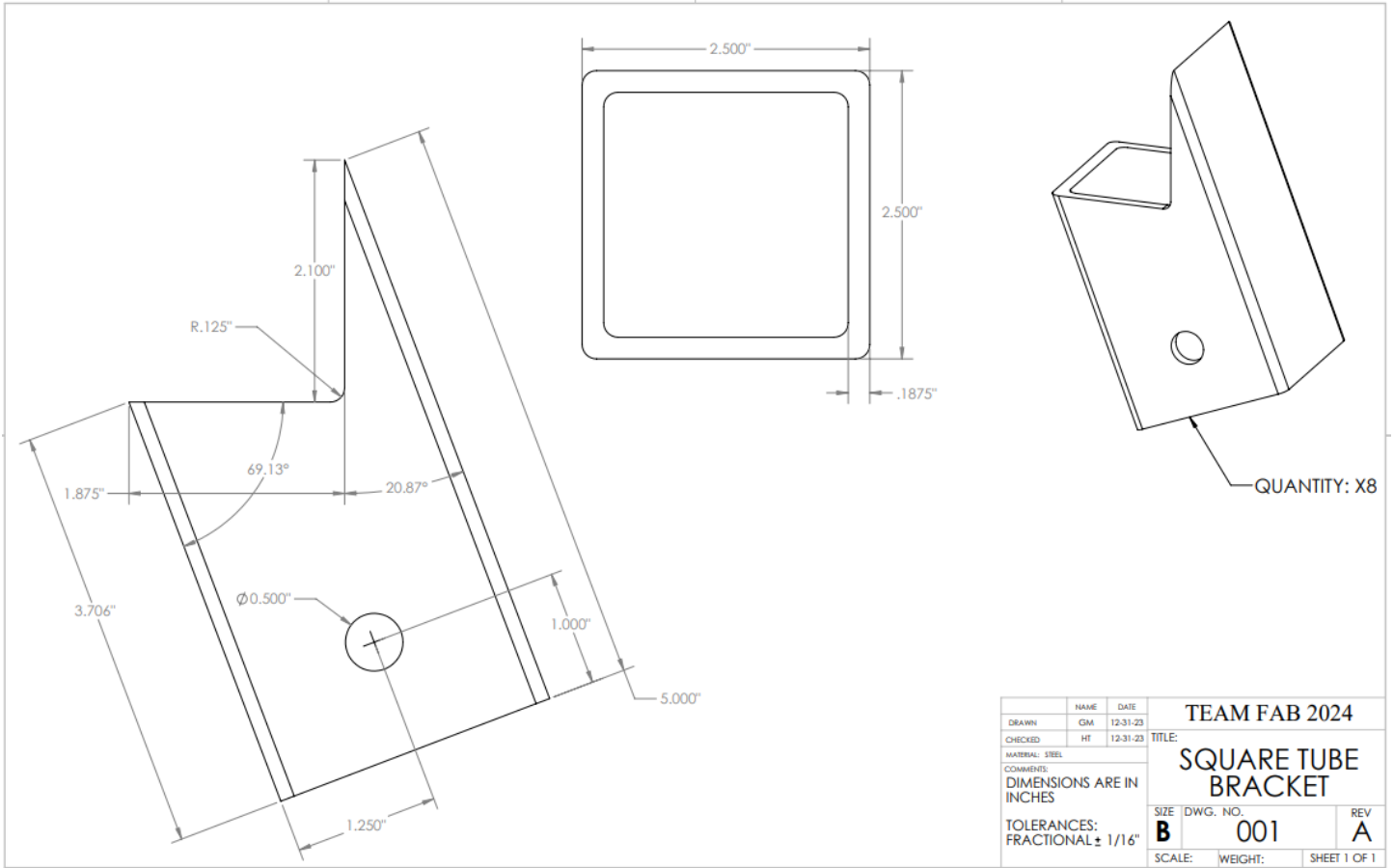
- Use knowledge of principles of electricity, Magnetism and Fusion.

## CONTEST GUIDELINES

1. Contestants must correctly use the welding equipment during the contest. The contest chairperson 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 a violation 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, 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 (**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. Welds will be evaluated visually utilizing a rating system as established by the SkillsUSA Technical Committee. Nondestructive and/or destructive tests may be used to complete the project evaluation.
8. 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 and conformity to drawing requirements.



Bill of Materials Skills USA Team Fab 2024				
Quantity	Material	Length	Thickness	McMaster Part Number
4	2" x 2" square tubing	80"	3/16"	
1	4" flat strap	36"	1/4"	
2	4" x 4" square tubing	65"	1/4"	
8	Bolts 1/2" -13	3 1/2"		<a href="#">91257A726</a>
8	Nylock nuts 1/2" -13			<a href="#">94895A823</a>
16	Washer 1/2"			90107A033
8	2 1/2" x 2 1/2" square tube brackets as per print below.			The team is to make these by hand.
2ea - Min.	<a href="#">1/4" Drill bits for pilot holes</a>			
2ea - Min.	<a href="#">1/2" Drill bits</a>			



TEAM FAB 2024		
DRAWN	NAME	DATE
CHECKED	GM	12-31-23
MATERIAL: STEEL		TITLE:
COMMENTS: DIMENSIONS ARE IN INCHES		SQUARE TUBE BRACKET
TOLERANCES: FRACTIONAL $\pm 1/16"$	SIZE DWG. NO.	REV
	<b>B</b> 001	<b>A</b>
SCALE:	WEIGHT:	SHEET 1 OF 1