

# Skills USA Welding Fabrication Competition Update – 2014

State Welding Fabrication Winners:

Congratulations on your accomplishments thus far. Please review these guidelines for the national competition in June. Now is the time to brainstorm, practice, and design your project to be built. Your team 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. **Please note prints of your design must be ready to turn in at orientation. (See items supplied by teams)**

- **Project Theme:**
  - Box Utility Trailer/Cart
  
- **Material List Supplied by Committee**
  - Quantity 1: 2" x 1/4" x 36" mild steel flat bar
  - Quantity 2 : 10ga x 48" x 48" mild steel plate
  - Quantity 3 : 1/8" x 1 1/2" x 1 1/2" x 10' length box tubing
  - Quantity 2 : 1/8" x 1" x 1" x 10' length angle iron
  - Quantity 1: 5/8" dia. x 9' length steel rod
  - Quantity 2: 10" dia. 5/8" bore wheels
  - Quantity 1: 3' of 3/4" dia SCH 40 pipe
  - Quantity 4: 1/8" cotter pin (split)
  - Quantity 4: 1/8" cotter pin (R-clip)
  - Quantity 8: 5/8" flat washers
  - Quantity 1: 3' chain
  
- **Welding Consumables Supplied by Committee:**
  - .035 Lincoln GMAW Consumable (ER70S-6)
  - .045 Lincoln FCAW Consumable (E71T-1)
  - 3/32" Hobart ER70S-2 GTAW Filler Rods
  - 3/32" Hobart E7018 SMAW Electrodes
  - 1/8" Hobart E7018 SMAW Electrodes
  - 3/32" Hobart E6010 SMAW Electrodes
  - 1/8" Hobart E6010 SMAW Electrodes
  
- **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 5" or greater
  - 10 Drilled Holes made using the supplied Mag Drills
  - 80% of Total Weight of Material is required for project.
  - The utility trailer box must have a minimum volume of 10 cubic ft and be equipped with a hinged tailgate.
  - The utility trailer must be equipped with an adjustable tongue support and wheel fenders.
  - The utility trailer tongue shall attach to the towing device using a 5/8" dia. pin.

- **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
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 in the welding booth
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
MATERIAL USAGE	50	If the team's scrap material weighs 0-5lbs, the team will receive all 50pts. For each lb of material over 5 lbs, the team will be docked points based on the total scrap weight

- **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 (Spares will be provided if needed)
- **A USB drive or CD containing all electronic file(s) must be turned in at orientation: a (.pdf) file and a (.dxf) file is preferred.**
- A blueprint can be hand drawn neatly if the team does not have access to design software. However, a scanned pdf copy is still required electronically.
- **(4)Printed 11"x 17"Copies of Project Print(s) : 1 set for team, 2 sets for judges, 1 set for chairman**
- Résumé
- **Students are not permitted to bring any power tools or templates.**
- Teams may bring own hand tools but are not needed to complete the project.
  - See Welding Fabrication National Standards for more information.

- **Tools Supplied by Committee to each team:**

- Welding Machines
  - Lincoln Electric PowerMig 350MP used for GMAW/FCAW
  - Miller Electric Dynasty 280 for SMAW/GTAW
- Environmental Equipment
  - 1 Environmental Extraction Unit per team(Miller Electric or Lincoln Electric)
- Harris Calorific OFC Torch
- Materials from Bill of materials
- 4 and ½” Metabo grinder
- 3 cutting disks, 3 grinding disks and 3 sanding disks per team
- Oxyacetylene goggles
- Grinding face shields
- Tool boxes consisting of the following tools:

Equipment Description	Part Number	Quantity
Pliers -Lineman's (Large)		1
Pliers-Diagonal Wire Cutters		1

### Skills USA Welding Fabrication Inventory List By Box

Pliers-Large Channel Lock		1
Pliers-Large Slip Joint		1
Pliers-Needle Nose (Large)		1
Pliers-Small Channel Lock		1
Pliers-Small Slip Joint		1
Wrench- 8" Adjustable		1
Wrench Set-Combination 1/4" to 7/8" (10 pcs)		1

Equipment Description	Part Number	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
Screwdrivers-Flat Blade (Various Sizes)		5
Screwdrivers-Phillips Head (Various Sizes)		3
Square-Framing		1
Vise Grips 10WR (Regular Type)		1
Vise Grips 11R (Short C-Clamp Type/With Out Feet)		2
Vise Grips 11SP (Short C-Clamp Type/Feet)		2
Vise Grips 18SP (Long C-Clamp Type/Feet)		2

- **Other tools**

- There will be a limited number of Milwaukee Mag Drills 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.** Backup drill bits will be made available of various sizes but quantities may be limited.

- **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
- Only one grinder and one welding machine may be used at a time due to close proximity of teammates and only one piece of environmental equipment
- 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.