Welding

CONTEST DATE & LOCATION: Refer to the Kansas State Championships Conference Packet

PURPOSE: To evaluate each contestant’s preparation for employment and to recognize outstanding students for excellence and professionalism in the field of Welding

ELIGIBILITY: Open to active SkillsUSA members enrolled in programs with welding as the occupational objective

CLOTHING REQUIREMENT: STRICT ENFORCEMENT of PPE (Personal protective equipment) will be observed during the welding competition. All issues concerning inadequate or inappropriate PPE must be resolved during the allowed check-in time for each student. If the issue cannot be resolved during this time period, the student will not be allowed to compete. Please review the list of PPE requirements for this will be strictly enforced.

Students are required to wear the Official SkillsUSA Kansas T-shirt and blue jeans (no tears, holes, or bagginess, rolled up pant legs or frayed jeans) clean and neat with appropriate LEATHER BOOTS for contest. Students may wear the Official SkillsUSA Khaki work shirt and pants (both the shirt and pants must be 100 percent cotton); black, brown or tan leather high-top work boots (no shoes of any kind, leather or otherwise). PLEASE review the new guidelines in the Technical Standard concerning the dress code. Compliance with this dress code will be assessed in the final score for each student. Denim or FRC Pants will be permitted.

* 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.)

Official SkillsUSA blue work shirt attire

NOTE: The Official Kansas State T-shirt will be mailed to schools prior to the competition.

Updated 4/2020
ATTENTION!!!!!!

STRICT ENFORCEMENT OF PPE (Personal protective equipment) WILL BE OBSERVED DURING THE 2018 WELDING COMPETITION.

ALL ISSUES CONCERNING INADEQUATE OR INAPPROPRIATE PPE MUST BE RESOVED DURING THE ALLOWED CHECK-IN TIME FOR EACH STUDENT. IF THE ISSUE CANNOT BE RESOLVED DURING THIS TIME PERIOD, THE STUDENT WILL NOT BE ALLOWED TO COMPETE. PLEASE REVIEW THE LIST OF PPE REQUIREMENTS FOR THIS WILL BE STRICTLY ENFORCED.

- Each student contestant is assigned a specific check-in time this is the time listed on the schedule sheet provided by Skills USA Kansas.

- Prior to the contestant’s check-in time they are welcome to wait in the designated gathering area in the Ade-Wifco RCIC building.
  - The designated gathering area will be accessed by following the signs around the back of the building. Do not enter the main entrance of the building!!! **UPDATE:** Due to the possibility of rain on Tuesday/Wednesday and the potential for mud on the north side of the building please use the main front entrance to the building. AW106 will be used as a gathering point before and after the contest.

- You will not check-in prior to your assigned time.

- A contest judge will come get each group of 4 contestants from the gathering area at the designated time.

- This time slot will be the only opportunity for the student to enter the competition.
KANSAS STATE CHAMPIONSHIPS (KSC) CONTEST UPDATE

- Contestants will not be able to return to the check-in area after the contest. Advisors will be allowed to join their students during check-in and take all un-needed equipment and gear back to the gathering area. After the contest contestants will be allowed to return to the gathering area to pick up their stuff.

- Once contestants leave the check-in area for the written test they are to have no further contact with their advisor.

- Contestants not having the required PPE during check-in will not be allowed to enter the contest at a later time.

- **No communication devices will be allowed in the competition area.**

**Contest Format**

1. Check-In (25 minutes) – Contest begins for the contestant (5 minute rotation time)
2. Written Test (25 minutes) (5 minute rotation time)
3. GMAW Process (25 minutes) (5 minute rotation time)
4. SMAW Process (25 minutes) (5 minute rotation time)
5. FCAW Process (25 minutes) (5 minute rotation time)
6. Oxy-Fuel Cutting (25 minutes) (5 minute rotation time)
7. GTAW Process (25 minutes) (5 minute rotation time)
PLEASE REVIEW THE NEW GUIDELINES PROVIDED BY SKILLSUSA (see skillsusastore.org ref. #101-12xx) CONCERNING THE DRESS CODE.

COMPLIANCE WITH THIS DRESS CODE WILL BE ASSESSED IN THE FINAL SCORE FOR EACH STUDENT. DENIM OR FRC PANTS WILL BE PERMITTED.

Welding Schedule Set:

<table>
<thead>
<tr>
<th>TIME</th>
<th>CONTESTANT #</th>
<th>STUDENT</th>
<th>SCHOOL/COLLEGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 am</td>
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<td>6:30 am</td>
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<td>7:00 am</td>
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<td>7:30 am</td>
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<td>8:00 am</td>
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<td>8:30 am</td>
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<tr>
<td>9:00 am</td>
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</tbody>
</table>

Updated 4/2020
<table>
<thead>
<tr>
<th>Time</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 am</td>
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<tr>
<td>10:00 am</td>
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<tr>
<td>10:30 am</td>
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<tr>
<td>11:00 am</td>
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<tr>
<td>11:30 am</td>
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</tr>
</tbody>
</table>

**** CONTINUED ON NEXT PAGE ****
TOOLS / SAFETY EQUIPMENT

No communication devices will be allowed in the competition area.

No contact by teachers or coaches during the competition.

Each contestant will supply the following safety equipment:

- Welding cap/beanie
- Hearing and/or ear protection
- Eye protection (must have side shields or fit over prescription glasses)
- Welding Jacket, Leather Cape Sleeves (and bib) or FR Welding Shirt (Long sleeved t-shirt, flannel shirts, or “heavy” button front shirts will not be acceptable if it isn’t designed for welding don’t try it!!!)
- Full length jeans without holes
- Leather boots
- Welding gloves—full length (gauntlet) for SMAW, GMAW, and FCAW
- Welding gloves — appropriate for GTAW
- Welding helmet with appropriate filter plate/lens and protective cover lens for tacking and welding; auto darkening filter plate/lens permissible. Spare filter plate and cover lens
- Cutting goggles—with shade 5 lens/cover lens for OFC/PAC; helmet with shade 5 capability permissible; face shield head gear with shade 5 permissible. Spare filter and cover lens
- Pocket calculator – Not for weld settings
- Fillet weld gauges—standard set
- Lead pencil
- Soap stone (with or without holder) or silver pencil
- Sharpie type marker
- Scribe with or without magnet
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☐ Compass
☐ Protractor
☐ Combination square set
☐ 10-foot (3.1 meters) minimum steel tape measure
☐ 16-ounce (.45 kilogram) ball peen hammer
☐ Center punch
☐ Cold chisel
☐ 11R or 10-inch (254 millimeters) vise grips
☐ 6-inch (152 millimeters) side cutting pliers or diagonal cutting pliers
☐ 6-inch (152 millimeters) needle nose pliers – welders permissible
☐ Chipping hammer
☐ Stainless steel wire brush for GTAW
☐ Carbon steel wire brush for SMAW
☐ Friction lighter (striker) and tip cleaner
☐ A one-page résumé to submit in hard copy format at check-in.
   Failure to do so will result in a 10-point penalty.

**PPE will be strictly enforced**

All tools will be placed into a bucket that is provided by the contest committee during check-in.

Only the tools on the list above are allowed into the contest.

No copies of the pre-test or outside notes are allowed.

Slide-rulers with welding settings, welding guides and other information are not allowed.

Each contestant will be given a set of welding/cutting print and welding procedures before the start of each portion of the contest.

**All students are required to wear the Skills T-shirts or contest official dress for the competitions.***

**** CONTINUED ON NEXT PAGE ****
DEMOnstration:
AWS SENSE WPS WILL BE USED FOR WELDING PARAMETERS. PLEASE REVIEW THESE DOCUMENTS WITH YOUR STUDENTS PRIOR TO THE WELDING COMPETITION.

Each student will be expected to demonstrate the following process:

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>POSITION</th>
<th>EQUIPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL KNOWLEDGE TEST</td>
<td>#2 Pencil</td>
<td><strong>Test will include 50 multiple choice questions covering GMAW, GTAW, SMAW, FCAW, welding symbols and general welding knowledge. This will also be used as the tie breaker for the contest.</strong></td>
</tr>
<tr>
<td>GMAW-S</td>
<td>2F, 3F, 4F, 1G, 2G, 3G</td>
<td>Millermatic 252</td>
</tr>
<tr>
<td><strong>SHORT-CIRCUIT WITH AR/CO2 75/25</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMAW</td>
<td>2F, 3F, 4F, 1G, 2G, 3G</td>
<td>Lincoln Invertec 275S</td>
</tr>
<tr>
<td><strong>E6010 AND 7018 WILL BE USED ON THIS EXAM</strong></td>
<td></td>
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</tr>
<tr>
<td>FCAW</td>
<td>2F, 3F, 1G, 2G, 3G</td>
<td>Millermatic 252</td>
</tr>
<tr>
<td><strong>E71T-1 WITH AR/CO2 75/25</strong></td>
<td></td>
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<tr>
<td>OXY-FUEL CUTTING</td>
<td>FLAT</td>
<td>Victor Performer Cutting Torch with Edge style Regulators</td>
</tr>
<tr>
<td><strong>Acetylene Fuel Gas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GTAW</td>
<td>2F, 3F, 1G, 2G</td>
<td>Lincoln Square-wave 200</td>
</tr>
<tr>
<td><strong>All consumables will be provided</strong></td>
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</tr>
</tbody>
</table>

All projects will have blueprint provided with a tolerance of +/- 1/16” unless otherwise noted on the individual blueprint or feature.

IMPORTANT:
WHILE WELDING, BASE PLATE DESIGNATED “A” MUST REMAIN IN THE HORIZONTAL AND IN FULL CONTACT WITH WELDING TABLE. ONE WARNING WILL BE GIVEN BEFORE THE LOSS OF POINTS.

CONTESTANTS DEMONSTRATING UNSAFE BEHAVIOR WILL BE STOPPED BY THE FLOOR JUDGE AND PREVENTED FROM MOVING FORWARD IN THAT INDIVIDUAL PORTION OF THE CONTEST. THIS WILL BE DOCUMENTED ON THE SCORE SHEET AS TO WHY THE CONTESTANT WAS STOPPED.

Updated 4/2020
TEACHERS, ADVISORS, ADMINISTRATORS OR COACHES WILL NOT HAVE ANY CONTACT WITH THE COMPETITORS DURING THE COMPETITION AFTER THEY MOVE FROM CHECK-IN AND ONTO THE WRITTEN TEST.

THERE WILL BE NO COMMUNICATION DEVICES ALLOWED AFTER THE STUDENT CHECKS IN. SIMPLY PUT, IF CAUGHT – YOU ARE DISQUALIFIED.

NOTE: Any questions concerning the operation of the equipment used during this competition should be direct to:

**Miller** – [www.millerwelds.com](http://www.millerwelds.com)
Byron Nield
byron.nield@millerwelds.com
316-665-2439


**Lincoln Electric** – [www.lincolnelectric.com](http://www.lincolnelectric.com)
Andrew Lochotzki -
andrew_lochotzki@lincolnelectric.com
913.302.2107


**ESAB/Victor** – [www.esabna.com](http://www.esabna.com)
Mike Cook
mike.cook@esab.com
405-740-1210

Victor Oxy-Fuel Torches W/Edge Regulators -

AWS SENSE WPS WILL BE USED FOR WELDING PARAMETERS. PLEASE REVIEW THESE DOCUMENTS WITH YOUR STUDENTS PRIOR TO THE WELDING COMPETITION.
SkillsUSA

**Welding Procedure Specification**

**WPS No.** WPS 101  
**Revision** 3  
**Date** 4/21/2013  
**By** NP  
**Authorized By** GH  
**Date** 5/19/2011  
**Prequalified** □

**Welding Process(es)** SMAW  
**Type** □ Manual □ Machine □ Semi-Auto □ Auto □

**Supporting PQR(s)** Prequalified

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**JOIN**

Type  Butt / T-Joint  
Backed Yes □ No □ Single Weld □ Double Weld □

**Backing Material** A-36

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**Root Opening** 1/8" ± 1/16"  
**Root Face Dimension** 0° - 1/8"  
**Groove Angle** 45 Deg.  
**Radius** (J-U) N/A

**Back Gouge** Yes □ No □

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**BASE METALS**

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**Material Spec.** A-36 to A-36

**Type or Grade**

**Thickness:** Groove (in.) 1/8" - 3/4"  
**Diameter (Pipe, in.)** 4" - Unlimited

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**FILLER METALS**

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**AWS Specification** E5.1

**AWS Classification** E-7018

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**FORGING MATERIALS**

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**AWS Specification**

**AWS Classification**

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**SHIELDING**

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**Gas** N/A

**Composition** N/A

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**Preheat Temp., Min.** 60 Deg.F

**Thickness** Up to 3/4"  
**Temperature** N/A

**Over 3/4" to 1-1/2"**  
**Over 1-1/2" to 2-1/2"**  
**Over 2-1/2"**  
**Interpass Temp., Min.** N/A  
**Max.** N/A

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**POSITION**

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**Position of Groove** 1G, 2G, 3G, 4G  
**Fillet** 1F, 2F, 3F, 4F

**Vertical Progression:** □ Up □ Down

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**ELECTRICAL CHARACTERISTICS**

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**Transfer Mode (GMAW):**

□ Short-Circuiting  
□ Globular  
□ Spray

**Current:** □ AC □ DCEP □ DCEN □ Pulsed

**Other** N/A

**Tungsten Electrode (GTAW):**

**Size** N/A  
**Type** N/A

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**TECHNIQUE**

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**Stringer or Weave Bead** Both

**Multi-pass or Single Pass (per side)** Single / Multiple

**Number of Electrodes** 1

**Electrode Spacing:** Longitudinal N/A  
**Lateral** N/A  
**Angle** N/A

**Contact Tube to Work Distance** N/A

**Peening** N/A

**Interpass Cleaning** Chip slag and wire brush

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**POSTWELD HEAT TREATMENT**

**PWHT Required** □

**Temp.** N/A  
**Time** N/A

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**WELDING PROCEDURE**

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<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter Cur. Type</th>
<th>Amperes</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>SMAW</td>
<td>E-7018</td>
<td>3/32</td>
<td>DCEP</td>
<td>70-110</td>
<td>N/A</td>
<td>4-10 ipm</td>
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</tr>
<tr>
<td>All</td>
<td>SMAW</td>
<td>E-7018</td>
<td>1/8</td>
<td>DCEP</td>
<td>90-150</td>
<td>N/A</td>
<td>4-10 ipm</td>
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**Updated 4/2020**
SkillsUSA
Welding Procedure Specification

WPS No. WPS 103  Revision 2  Date 04/20/2013  By NP
Authorized By GH  Date 5/16/2011  Prequalified □
Welding Process(es) GTAW  Type: Manual □ Machine □ Semi-Auto □ Auto □
Supporting PQR(s) Prequalified

**JOINT**
- Type: T-Joint / Corner / Groove
- Backing: Yes □ No □ Single Weld □ Double Weld □
- Backing Material: N/A
- Root Opening: 0 Groove
- Root Face Dimension: 0
- Angle: 30-90
- Radius (J-U): N/A
- Back Gouge: Yes □ No □
- Method: N/A

**BASE METALS**
- Material Spec.: 308
- Type or Grade: to 308
- Thickness: Groove: Unlimited - N/A
- Diameter (Pipe, ): N/A - N/A

**FILLER METALS**
- AWS Specification: A5.10
- AWS Classification: ER308

**SHEILDING**
- Flux: Gas 100% Argon
- N/A Composition: 100% Argon
- Electrode-Flux (Class): Flow Rate: 15-25 CFH
- N/A Gas Cup Size: 3/8” Min. (#6)

**PREHEAT**
- Preheat Temp., Min.: 60 Deg.F
- Thickness Up to 3/4” Temperature: N/A
- Over 3/4” to 1-1/2” N/A
- Over 1-1/2” to 2-1/2” N/A
- Over 2-1/2” N/A
- Interpass Temp., Min. N/A Max. N/A

**WELDING PROCEDURE**

<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter Cur. Type</th>
<th>Amps</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GTAW</td>
<td>ER308</td>
<td>1/16</td>
<td>70 - 110</td>
<td>N/A</td>
<td>4-8 ipm</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>GTAW</td>
<td>ER308</td>
<td>3/32”</td>
<td>DCEN</td>
<td>110-125</td>
<td>4-8 ipm</td>
<td></td>
</tr>
</tbody>
</table>

**POSITION**
- Position of Groove: All
- Fillet: All
- Vertical Progression: □ Up □ Down

**ELECTRICAL CHARACTERISTICS**
- Transfer Mode (GMAW):
  - Short-Circuiting □ Globular □ Spray □
  - Current: DCEN □ DCEP □ AC □ Pulsed □
- Tungsten Electrode (GTAW):
  - Size: 3/32” □ Type: EWCe2

**TECHNIQUE**
- Stringer or Weave Bead: Stringer
- Multi-pass or Single Pass (per side): Multiple/SINGLE
- Number of Electrodes: 1
- Electrode Spacing: Longitudinal N/A Lateral N/A Angle N/A
- Contact Tube to Work Distance: N/A
- Peening: N/A
- Interpass Cleaning: N/A

**POSTWELD HEAT TREATMENT**
- PWHT Required: □
- Temp. N/A
- Time: N/A

*Updated 4/2020*
## SkillsUSA

### Welding Procedure Specification

<table>
<thead>
<tr>
<th>WPS No.</th>
<th>WPS 104</th>
<th>Revision</th>
<th>2</th>
<th>Date</th>
<th>06/20/2015</th>
<th>By NP</th>
<th>Prequalified</th>
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<td>Authorized By</td>
<td>EN</td>
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</tbody>
</table>

**Welding Process(es)**

- GMAW-S

**Supporting PQR(s)**

- Prequalified

### JOINT

- Type: T-Joint
- Backing: Yes
- Backing Material: N/A
- Root Opening: N/A
- Root Face Dimension: N/A
- Groove Angle: N/A
- Radius (J-U): N/A
- Back Gouge: Yes
- Method: N/A

### BASE METALS

- Material Spec.: A 36
- Type or Grade: to A 36
- Thickness: N/A
- Fillet (in): 1/8
- Diameter (Pipe, N/A): N/A

### FILLER METALS

- AWS Specification: A5.18
- AWS Classification: ER70S-6

### SHIELING

- Flux: Gas
- Composition: 75% Argon/25% CO2
- Electrode-Flux (Class): N/A
- Gas Cup Size: 1/2" - 3/4"

### PREHEAT

- Preheat Temp., Min.: 50 Deg.F
- Thickness: Up to 3/4"
- Temperature: N/A
- Over 3/4" to 1-1/2": N/A
- Over 1-1/2" to 2-1/2": N/A
- Over 2-1/2": N/A

### POSTWELD HEAT TREATMENT

- PWHT Required: N/A
- Temperature: N/A

### TECHNIQUE

- Stringer or Weave Bead: Stringer
- Multi-pass or Single Pass (per side): Single
- Number of Electrodes: 1
- Electrode Spacing: Longitudinal: N/A
- Lateral: N/A
- Angle: N/A
- Contact Tube to Work Distance: 1/4" to 3/8"
- Peening: N/A
- Interpass Cleaning: Chip slag and wire brush

### ELECTRICAL CHARACTERISTICS

- Transfer Mode (GMAW):
  - Short-Circuiting: N/A
  - Globular: N/A
  - Spray: N/A
- Current: AC: N/A
- DCEP: N/A
- DCEN: N/A
- Pulsed: N/A
- Other: N/A
- Tungsten Electrode (GTAW):
  - Size: N/A
  - Type: N/A

### WELDING PROCEDURE

<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter Cur. Type</th>
<th>Amps</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GMAW</td>
<td>ER70S-6</td>
<td>0.035&quot; DCEP</td>
<td>90-150</td>
<td>16-20</td>
<td>6-8 ipm</td>
<td>WFS 140-35 0 ipm</td>
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</table>

**Updated 4/2020**
KANSAS STATE CHAMPIONSHIPS (KSC) CONTEST UPDATE

SkillsUSA
Welding Procedure Specification

WPS No. WPS 108
Revision 1 Date 4/19/2016 By NP

Authorized By EN Data 4/19/2016 Prequalified

Welding Process(es) FCAW-G Type: Manual ☐ Machine ☐ Semi-Auto ☐ Auto ☐
Supporting PQR(s) Prequalified

JOINT
Type T-Joint, Butt, Flanged
Back ing Yes ☐ No ☐ Single Weld ☐ Double Weld ☐
Back ing Material N/A
Root Opening 0-3/16 In. Root Face Dimension N/A
Groove Angle N/A Radius (J-J) N/A
Back Gouge Yes ☐ No ☐
Method N/A

BASE METALS
Material Spec. A-36 to A-36
Type or Grade N/A
Thickness: Groove ( ) Unlimited - N/A
Fillet (n) Unlimited -
Diameter (Pipe, ) N/A N/A

FILLER METALS
AWS Specification A5.20
AWS Classification E71T-1

POSITION
Position of Groove All Fillet All
Vertical Progression: Up ☐ Down ☐

ELECTRICAL CHARACTERISTICS
Transfer Mode (GMAW):
Short-Circuiting ☐ Globular ☐ Spray ☐
Current: AC ☐ DCEP ☐ DCEN ☐ Pulsed ☐
Other N/A
Tungsten Electrode (GTAW):
Size N/A Type N/A

TECHNIQUE
Stringer or Weave Bead Both
Multi-pass or Single Pass (per side) Multi Pass/Single
Number of Electrodes 1
Electrode Spacing: Longitudinal N/A
Lateral N/A
Contact Tube to Work Distance 1/2" to 3/4"
Peening N/A
Interpass Cleaning Chip slag and wire brush

POSTWELD HEAT TREATMENT PWHT Required ☐
Temp. N/A Time N/A

WELDING PROCEDURE

<table>
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<th>Filler Metal Class</th>
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<th>Volts</th>
<th>Travel Speed</th>
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</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>FCAW-G</td>
<td>E71T-1M</td>
<td>0.045</td>
<td>DCEP</td>
<td>200-290</td>
<td>24-28</td>
<td>5-12</td>
<td>WFS.340-500lpm</td>
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</table>

RECOMMENDED SETTINGS:

<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter</th>
<th>Cur. Type</th>
<th>Amperes</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
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<tbody>
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<td>1F/2F</td>
<td>FCAW-G</td>
<td>E71T-1M</td>
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<td>DCEP</td>
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Updated 4/2020
### KANSAS STATE CHAMPIONSHIPS (KSC) CONTEST UPDATE

#### SkillsUSA

**Welding Procedure Specification**

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<th>WPS No.</th>
<th>WPS 106</th>
<th>Revision</th>
<th>2</th>
<th>Date 4/20/2012</th>
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<td>Welding Process(es)</td>
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<tr>
<td>JOINT</td>
<td>T-Joint</td>
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<tr>
<td>Backing</td>
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<td>Single Weld ■</td>
<td>Double Weld □</td>
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<td>Root Opening</td>
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<td>Groove Angle</td>
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<td>Method</td>
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<td>Type or Grade</td>
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<td>Thickness:</td>
<td>Groove (in)</td>
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<td>Fillet (Unlimited)</td>
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<td>Vertical Progression:</td>
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<td>ELECTRICAL CHARACTERISTICS</td>
<td>Transfer Mode (GMAW):</td>
<td>Short-Circuiting</td>
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<td>Globular</td>
<td>□</td>
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<td>□ DCCEP</td>
<td>□ DCEN</td>
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<td>Interpass Cleaning</td>
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#### WELDING PROCEDURE

<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter Cur. Type</th>
<th>Amps</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
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<tbody>
<tr>
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Updated 4/2020