

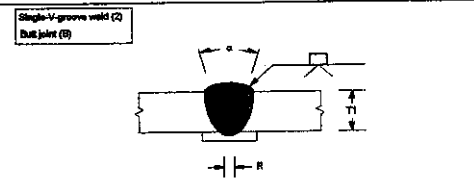
# Great Lakes Stainless

## Welding Procedure Specification

**GLSGMAW-SA-36**

WPS No. GLSGMAW-SA-36 Revision \_\_\_\_\_ Date \_\_\_\_\_ By Charles K. Hunt CWI #0 4081281  
 Authorized By Todd Sears Date 9/11/2013 Prequalified   
 Welding Process(es) GMAW Type: Manual  Machine  Semi-Auto  Auto   
 Supporting PQR(s) GLSGMAWS

**JOINT**  
 Type Butt  
 Backing Yes  No  Single Weld  Double Weld   
 Backing Material A-36 Steel  
 Root Opening 1/4" Root Face Dimension \_\_\_\_\_  
 Groove Angle 45 deg. Radius (J-U) \_\_\_\_\_  
 Back Gouge Yes  No   
 Method \_\_\_\_\_



| Welding Process | Joint Designation | Base Metal Thickness (Unrooted) | Groove Preparation |              |                          |                          | Permitted Welding Positions | CWI Required for PQR/W | Notes |
|-----------------|-------------------|---------------------------------|--------------------|--------------|--------------------------|--------------------------|-----------------------------|------------------------|-------|
|                 |                   |                                 | Root Opening       | Groove Angle | As Detailed (see 2.10.1) | As Per List (see 2.12.1) |                             |                        |       |
| GMAW<br>FVCH    | B.1.2(a)-CP       | U                               | R = 3/16           | α = 30°      | R = +1/16, -0            | +14, -176                | FVCH                        | Required               | A     |
|                 |                   |                                 | R = 3/8            | α = 30°      | α = +10°, -0°            | +07, -0°                 | FVCH                        | Not req.               | N     |
|                 |                   |                                 | R = 1/4            | α = 45°      |                          |                          | FVCH                        | Not req.               |       |

**BASE METALS**  
 Material Spec. ASTM to ASTM  
 Type or Grade A-36 to A-36  
 Thickness: Groove (in) 1/8 - 3/4  
 Fillet (in) 1/8 - Unlimited  
 Diameter (Pipe, ) \_\_\_\_\_ - \_\_\_\_\_

**POSITION**  
 Position of Groove 3G Fillet \_\_\_\_\_  
 Vertical Progression:  Up  Down

**FILLER METALS**  
 AWS Specification A5.18  
 AWS Classification ER70S-6

**ELECTRICAL CHARACTERISTICS**  
 Transfer Mode (GMAW):  
 Short-Circuiting  Globular  Spray   
 Current: AC  DCEP  DCEN  Pulsed   
 Other \_\_\_\_\_  
 Tungsten Electrode (GTAW):  
 Size \_\_\_\_\_ Type \_\_\_\_\_

**SHIELDING**  
 Flux \_\_\_\_\_ Gas Argon/Co2  
 Composition 75%/25%  
 Electrode-Flux (Class) \_\_\_\_\_ Flow Rate 25 CFH  
 Gas Cup Size 5/8"

**TECHNIQUE**  
 Stringer or Weave Bead Both  
 Multi-pass or Single Pass (per side) Multiple  
 Number of Electrodes \_\_\_\_\_  
 Electrode Spacing: Longitudinal \_\_\_\_\_  
 Lateral \_\_\_\_\_  
 Angle \_\_\_\_\_  
 Contact Tube to Work Distance 3/8"  
 Peening \_\_\_\_\_  
 Interpass Cleaning Brush, Wire wheel, Grind

**PREHEAT**  
 Preheat Temp., Min. 70 deg. F  
 Thickness Up to 3/4" Temperature None  
 Over 3/4" to 1-1/2" 50 deg. F  
 Over 1-1/2" to 2-1/2" 150 deg. F  
 Over 2-1/2" 225 deg. F  
 Interpass Temp., Min. 70 deg. F Max. None

**POSTWELD HEAT TREATMENT** PWHT Required   
 Temp. \_\_\_\_\_ Time \_\_\_\_\_

| WELDING PROCEDURE |         |                    |          |           |             |       |              |             |
|-------------------|---------|--------------------|----------|-----------|-------------|-------|--------------|-------------|
| Layer/Pass        | Process | Filler Metal Class | Diameter | Cur. Type | Amps or WFS | Volts | Travel Speed | Other Notes |
| 1/Root            | GMAW    | ER70S-6            | .035"    | DCEP      | 110/200     | 17.8  | 10-12 ipm    |             |
| 2nd.              | GMAW    | ER70S-6            | .035"    | DCEP      | 110/200     | 17.8  | 8-10 ipm     |             |
| 3rd/Cap           | GMAW    | ER70S-6            | .035"    | DCEP      | 110/200     | 17.8  | 6-8 ipm      |             |

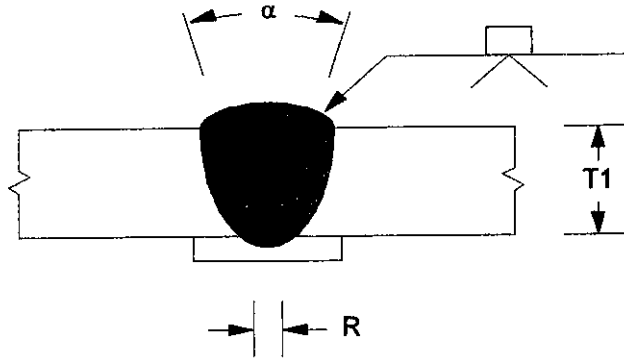


Charles K Hunt  
 CWI 04081281  
 QC1 EXP. 8/1/2016

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## Welding Procedure Specification

Single-V-groove weld (2)  
Butt joint (B)



| Welding Process | Joint Designation | Base Metal Thickness (U=unlimited) |    | Groove Preparation |                     |                          |                        | Permitted Welding Positions    | Gas Shielding for FCAW | Notes  |
|-----------------|-------------------|------------------------------------|----|--------------------|---------------------|--------------------------|------------------------|--------------------------------|------------------------|--------|
|                 |                   | T1                                 | T2 | Root Opening       | Groove Angle        | Tolerances               |                        |                                |                        |        |
|                 |                   |                                    |    |                    |                     | As Detailed (see 3.13.1) | As Fit Up (see 3.13.1) |                                |                        |        |
| GMAW<br>FCAW    | B-U2a-GF          | U                                  | -  | R = 3/16           | $\alpha = 30^\circ$ | R = +1/16, -0            | +1/4, -1/16            | F, V, OH                       | Required               | A<br>N |
|                 |                   |                                    |    | R = 3/8            | $\alpha = 30^\circ$ |                          |                        | $\alpha = +10^\circ, -0^\circ$ | +10°, -5°              |        |
|                 |                   |                                    |    | R = 1/4            | $\alpha = 45^\circ$ |                          |                        | F, V, OH                       | Not req.               |        |

MEMO