

Welding Procedure Specification (WPS)

Sheet 1 of 3

Code: AWS D1.1

Company Name: Advantech Industries

**Address: 3850 Buffalo Rd, Rochester,
New York, 14624, USA**

**Identification
#:**

**ADV-71
MC,ADV-73
GTA**

**WPS
Prequalified:**

**Supporting
PQR No.(s):**

**PQR's ADV-71
MC**

**Welding
Process:**

GTAW/GMAW

Process Type:

Manual/Semi-Auto

Position(s):

1G

**Base Metal Part I
(Material Spec., type or
grade):**

**Unlisted ASTM A322, ASTM
A304(4140)**

**Base Metal Part II
(Material Spec., type or
grade):**

**Any Steels in Group I and II of
Table 3.1-AWS D1.1**

**Qualified Thickness and
Diameter Range:**

Groove (Fillet): mm (in)

1/8"-1.0"

**Filler Metals:
AWS Classification/AWS
Specification:**

ER80S-Ni1

A5.28

Joint Details/Sketch:

[IMAGE]

Joint Design Used: mm (in)

Root Opening G: *0-1/8"*

Root Face RF: *0-1/8"*

Groove

Angle: *45 Deg.*

Radius (J-U):

Weld Type:

**Complete Joint Penetration Groove
Weld**

Joint Type:

Butt Joint

**Backing
Option:**

**Welded without
backing**

Backing Material:

**Back Gouging
Method:**

allowed optional

Electrical Characteristics:

Current Type/Polarity: DCEN

Transfer Mode (GMAW): N/A

Tungsten Electrode (GTAW):

Type: A5.12 EWTh-2

Size: mm (in) 5/32" max.

Shielding:

Gas Composition (Flux for SAW): 100% Ar

Gas Flow Rate lt/min. (CFH): 15-25

Gas Cup Size: 6-8

Welding Procedure

Weld Layers	Pass No.	Process	Filler Metal Classification	Filler Metal Diameter mm (in)	Current Amps	Current Type & Polarity	Wire Feed Speed (in/min)	Volts	Travel Speed (in/min)	Remarks [Heat Input] J/mm (J/in)

Technique:

Stringer or Weave Bead: *Either*

Contact Tube to Work Distance: *n/a*

Initial/Interpass Cleaning: *wire brush or grinding*

Peening: *none*

Number of Electrodes: *1*

Electrodes Spacing: *Longitudinal: n/a*

Lateral: n/a

Angle: n/a

Heat Treatment:

Preheat Temp. Min °C (°F): *400 Deg F*

Interpass Temp. Min/Max °C (°F): *400 Deg.F to 575 Deg*

Postweld Heat Treatment: Temp. °C (°F): *1076-1094 Deg. F*

Time: *1.5 Hours*

Additional Notes:

Hydrogen reduction after welding by post-heating (392-572 Deg.F for 2 hours) before intermedicate cooling to 212 Deg. F

Cover the part using weld blankets to control cool down.Use of induction heated blankets is recommended.

Do not allow the part to cool at a rate faster than 150 Deg. F/ Hour.

PWHT 1076-1094 Deg. F for 1.5 Hours

Once the part has reached a temperature below 350 Deg. F, the part may be allowed to air cool.

NDT requirements:

After PWHT cool down period, and a minimum 48 hour wait period,part shall be visually inspected per AWS D1.1 VT/MT/UT

Manufacturer/ Contractor
Welding Engineer:

Authorized by:

Name: *Advantech Industries*

Name: *Richard Manginell*

Title:

Title: *CWI 98030431*

Date:

Date:

Heat Treatment (AWS Code's Guideline):

PREHEAT TABLE:

POSTWELD HEAT TREATMENT:

WPS Qualified Range (AWS Code's Guideline):

When position tested is 1G or 1G Rotated (CJP Groove) on Plate or Pipe:

Qualified Position: F (CJP and PJP Groove, Fillet) on Plate, Pipe, Box Tube (Table 4.1/Table 9.9 of AWS D1.1)

When thickness tested (CJP Groove-Plate) is T from 1/8 in. (3 mm), but less than 1 in. (25 mm);

Qualified Thicknesses (CJP Groove-Plate, Pipe or Tube): 1/8 in. (3 mm) Min., 2T Max.

Plus any size of Fillet or PJP Groove welds for any thickness (Table 4.2 AWS D1.1)

T: Thickness of Test Plate in PQR

[Note: For PJP Groove and Fillet welds to be qualified based on CJP Groove, additional three macroetch test specimens are required to evaluate weld soundness and to verify that the required weld size is produced (AWS D1.1 Clause 4.11.3).]

When material tested is any Unlisted Steel to any Unlisted Steel or any Steel listed in Table 3.1 or Table 4.9 of AWS D1.1:

WPS Base Metal Allowed by PQR: Only the Specific Combination of Steels listed in the PQR (Table 4.8 AWS D1.1)

Qualified WPS Filler Metal Allowed by PQR for GTAW (TIG) Process:

-Only same electrode classification (or lower strength one) used in PQR.

-Increase or decrease of filler metal diameter up to 1/16 in. (1.6 mm) from nominal filler metal wire size used in PQR are allowed in WPS.

-Change to an electrode classification not covered in AWS A5.18 or A5.28; Addition or deletion of filler metal; and change from cold wire feed to hot wire feed or vice versa require re-qualification of WPS (Table 4.5 AWS D1.1).