QW-482 suggested format for welding procedure specifications (WPS)
(see QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name:	National Energy Equipment Inc.	By:	SKC ENGINEERING WELDING • MATERIALS • MECHANICAL • INSPECTION • TESTING SKC ENGINEERING 19155 34th AVENUE, SURREY, BC, V3Z 3S4 P (604) 882 1668 • F (604) 882 1611 • www.skcasl.com
Welding Procedure Specification No.:	GMAW-AL-01	Revision:	0
Supporting PQR No.(s):	GMAW-AL-01	Issue Date:	4-Feb-19
Welding Process(es)	GMAW	WO:	W13939-D2
Type(s):	Semi-Automatic		

JOINTS (QW-402)

Joint design:	Refer Details	Root Spacing:*	1/32 in - 1/8 in
Backing	With or Without	Retainers (+/-)	No Retainers
Backing Material	P no. 22		

■ Metal ☐ Nonfusing Metal
☐ Non-metallic ☐ Other

* For welds with backing use Root Spacing = 1/8 in - 3/16 in.
Sketches, production drawings, weld symbols or written description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

Details

All ASME VIII Div 1 & B31.3 Standard Groove Weld Joint Design & Fillets

All CJP welded from both sides with back gouge to sound metal or welded from one side with backing.

BASE METALS (QW-403)

P no.	22	Group no.	N/A	to P no.	22	Group no.	N/A
or							
Specification type and grade							
to Specification type and grade							
or							
Chem. Analysis and Mech. Properties							
to Chem. Analysis and Mech. Properties							

Thickness Range

Base Metal Groove	1/16 in (1.5 mm) to 0.5 in (12.7 mm)	Fillet:	All thicknesses
Pipe Diameter Groove	All	Fillet:	All

T Limits Impact	N/A
I Pass > 1/2 in (13 mm)	None
T Limits (S. cir. arc.)	N/A

FILLER METALS (QW-404)

Welding Process	GMAW
Filler Metal F No.	F22
Filler Weld metal analysis A No.	ER5356
SFA Specification	5.10
Filler Metal Classification	ER5356
Filler Metal Size	0.035 in (0.9 mm)
Consumable Inserts	None
Filler Metal Product Form	Solid wire
Deposit Weld Metal thickness (t)	
Groove	0.5 in (12.7 mm) max.
Fillet	All sizes
Suppmental Filler Metal	None
Alloy Element	None
t Limits (S. cir. arc.)	N/A

QW-482 (BACK)

WPS no. GMAW-AL-01 Rev. 0

POSITIONS (QW-405)	
Position(s) of Groove	All
Welding Progression	Up
Position(s) of Fillet	All

POSTWELD HEAT TREATMENT (QW-407)			
PWHT	None		
Temperature	N/A	Time	N/A
T Limits	N/A		

PREHEAT (QW-406)	
Preheat Temp. Min.	65°F (18°C)
Interpass Temp. Max	180°F (82°C)
Preheat Maintenance	As Above
(continuous or special heating where applicable	N/A
should be recorded)	

GAS (QW-408)			
GMAW	Gas(es)	Percent Composition (Mixture)	Flow rate(cfph)
Shielding	Argon	100% Argon	20-30
Trailing	None		
Backing	None		

ELECTRICAL CHARACTERISTICS (QW-409)			
Max Heat Input (KJ/in)	As per welding parameters		
Current AC or DC	DC	Polarity	RP (EP)
Amps (range)	See below	Volts (range)	See below
Mode of Transfer	Global, Spray or Pulsed		
Tungsten Electrode	N/A		
Other			

TECHNIQUE (QW-410)	
Welding Process	GMAW
String or weave bead	Stringer / slight weave
Orifice or gas cup size	9/16 in (14 mm)
Method cleaning	Brushing, grinding
Method of back gouging	Grinding, Plasma Arc or Mechanical Gouging
Oscillation	None
Multiple to single pass (per side)	Single / Multipass, as required
Single to multi electrode	Single
Contract tube to work distance	0.75 in - 1 in (19 mm - 25 mm)
Electrode spacing	N/A
Manual or automatic	Semi-Automatic
Peening	None
Use of thermal processes	None
Other	

Layers /Passes	Process	Filler Metal Classification	Filler Metal Diameter in	Type Polarity	Amps	Volts	Wire Feed Speed (ipm)	ATS (ipm)
Root / Hot	GMAW	ER5356	0.035 in	DC RP (EP)	180-240	21-25	473-577	10-20
Fill & Cap	GMAW	ER5356	0.035 in	DC RP (EP)	180-240	21-25	473-577	10-20

Welding Notes:

Base metal shall be clean, dry & without water stain. Prepare weld joints by mechanical means (cutting, sawing, shearing etc), plasma arc cutting, laser cutting or water jet cutting. It is recommended to use acetone as a cleaning agent prior to welding (before removal of the oxide layer) and between passes. Immediately prior to welding remove oxide using either a stainless steel brush or a non-resin bonded grinding disk (resin bonded disks may be used for post weld operations only). Remove smut between passes with a stainless steel wire brush. Ideally aluminum welding operations will be kept separate from welding on other materials. Do not use equipment for the welding of Aluminum that has been previously used for the welding or cleaning of other materials.

Manufacturer: National Energy Equipment Inc.

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — Dr. M. J. SMITH # 43744 — 2019-02-06

Certified by Manufacturer: Zanyar Farhadi, National Quality Systems Manager

Date: 2019-02-13

Authorized By: Mathew Smith, P. Eng.

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