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

Company Name: **Seaspan Vancouver Shipyards Co. Ltd. Seaspan Vancouver Drydock Co. Ltd. Seaspan Victoria Shipyards Co. Ltd.**	By: SKC ENGINEERING WELDING • MATERIALS • MECHANICAL • INSPECTION • TESTING SKC ENGINEERING 19165 94th AVENUE, SURREY, BC, V4N 3S4 P (604) 882 1889 • F (604) 882 1811 • www.skcsiu.com

Acceptance Standard: **ASME BPVC Section IX Ed. 2017**

Welding Procedure Specification No.:	**ASME-Pipe-06-01 (DIS TIG TIG)**	Revision:	**1**
Supporting PQR No.(s):	**DNVGL-Pipe-06-01 (DIS TIG TIG)**	Issue Date:	**15-Feb-19**
Welding Process(es)	**GTAW**	WO:	**W13830-D2**
Type(s):	**Manual**		

JOINTS (QW-402)

Joint design	**Refer Details**	Root Spacing:*	**1/32 in - 1/8 in**
Backing	**With**	Retainers (+/-)	**No Retainers**

☐ Metal ☐ Nonfusing Metal
☐ Non-metallic ■ Other **Purging Gas**

* 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 one side (open root) or from both sides with back gouge to sound metal or welded from one side with backing.

BASE METALS (QW-403)

P no.	**1**	Group no.	**1**	to	P no.	**8**	Group no.	**1**

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 15/32 in (12 mm)**	Fillet:	**All thicknesses**
Pipe Diameter Groove	**All**	Fillet:	**All**
T Limits Impact	**N/A**		

FILLER METALS (QW-404)

Welding Process	**GTAW**
Filler Metal F No.	**6**
Filler Weld metal analysis A No.	**8**
SFA Specification	**5.9**
Filler Metal Classification	**ER309L**
Filler Metal Size	**3/32, 1/8 in (2.4, 3.2 mm)**
Consumable Inserts	**None**
Filler Metal Product Form	**Solid rod**
Deposit Weld Metal thickness (t)	
Groove	**Max 15/32 in (12 mm)**
Fillet	**All sizes**
Flux (addition/deletion)	**None**
Filler (addition/deletion)	**None**
Other	

QW-482 (BACK)

WPS no. ASME-Pipe-06-01 (DIS TIG TIG) **Rev. 1**

POSITIONS (QW-405)		POSTWELD HEAT TREATMENT (QW-407)			
Position(s) of Groove	All	PWHT	None		
Welding Progression:	Up	Temperature	N/A	Time	N/A
Position(s) of Fillet	All	T Limits	N/A		

PREHEAT (QW-406)		GAS (QW-408)			
Preheat Temp. Min.	Ambient (15°C)		Gas(es)	Percent Composition (Mixture)	Flow rate(cfph)
Interpass Temp. Max	135°C	GTAW			
Preheat Maintenance	As Above	Shielding	Argon	100% Argon	20-30
(continuous or special heating where applicable	N/A	Trailing	None		
should be recorded)		Backing	Argon	100% Argon	10-15

ELECTRICAL CHARACTERISTICS (QW-409)			
Max Heat Input (kJ/in)	41.6 (As per PQR DNVGL-Pipe-06-01)		
Current AC or DC	DC	Polarity	SP (EN)
Amps (range)	See below	Volts (range)	See below
Pulsing I	N/A		
Tungsten Electrode	1/8" EWTh-2 (2% Thoriated)		
Other			

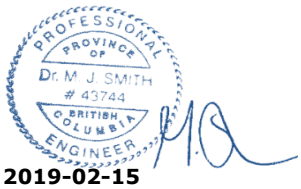
TECHNIQUE (QW-410)	
Welding Process	GTAW
String or weave bead	Stringer
Orifice or gas cup size	8 mm
Method cleaning	Brushing, grinding
Method of back gouging	Grinding, Arc Gouging
Oscillation	None
Multiple or single pass (per side)	Multipass, as required
Single or multi electrode	Single
Closed to out chamber	N/A
Electrode spacing	N/A
Manual or automatic	Manual
Peening	None
Use of thermal processes	None
Other	

Layers /Passes	Process	Filler Metal Classification	Filler Metal Diameter in (mm)	Type Polarity	Amps	Volts	ATS (ipm)	Other
Root / Hot	GTAW	ER309L	3/32, 1/8 (2.4, 3.2)	DC SP(EN)	90-140	11-15	2 - 6	
Fill & Cap	GTAW	ER309L	3/32, 1/8 (2.4, 3.2)	DC SP(EN)	90-140	11-15	2 - 6	

Welding Notes:

Base metal shall be in clean condition. Dirt of any kind must be removed along with residual oil and grease.
Avoid sources of the elements that can cause cracking or microfissuring in the weld (like crayon, paint identification, temperature indication markers, and other contaminants).

Manufacturer : **Seaspan Vancouver Shipyards**



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Prepared by: **Mathew Smith P.Eng.**

Date: **Feb-15-2019**