



Seaspan Vancouver Shipyards Co. Ltd.
Seaspan Victoria Shipyards Co. Ltd.
Seaspan Vancouver Drydock Co. Ltd.

DNV·GL

WPS No:
DNVGL-Pipe-03-05
Revision No:
0

WELDING PROCEDURE SPECIFICATION (WPS)

General information ☐ pWPS

Manufacturer: Seaspan Vancouver Shipyards Co. Ltd.
Manufacturer address: 50 Pemberton Ave., North Vancouver, B.C. V7P 2R2
Welding procedure qualification test records: PQR DNVGL-Pipe-03-05

Welding process (ISO 4063):	141-GTAW Manual	Number of electrodes:	1	Tungsten electrode designation and Ø:	EWTh-2 3.2 mm
Welding position(s) (ISO/ASME): All ex. 3G down		Joint type:	Plate, Pipe and socket Butt, T, K, Y CJP, PJP Groove, Fillet weld	Stringer/weave	Stringer and slight weave
Welding layer:	Multi-layer One/ Two side	Backing: Gas flow rate:	Without or With	Method of preparation:	Plasma / Oxy fuel cut
Min. preheating temperature:	Ambient	Max. interpass temperature:	62 °C	PWHT details:	None

Material specification

Base material 1 group:	ASTM A106 Gr. B and all P-No 1, Group No. 1 materials	Base material 2 group:	ASTM A106 Gr. B and all P-No 1, Group No. 1 materials
Delivery condition(s):	AR Hot Rolled Seamless pipe	Delivery condition(s):	AR Hot Rolled Seamless pipe
Thickness range Butt: Fillet Throat: Leg size:	3 – 8 mm 3 – 8 mm 4.2 – 11.3 mm	Thickness range Butt: Fillet Throat: Leg size:	3 – 8 mm 3 – 8 mm 4.2 – 11.3 mm
Outside diameter range:	≥ 25 mm	Outside diameter range:	≥ 25 mm

Welding consumables

No.	Filler metal and flux				Shielding gas		Nozzle diameter (mm)	DNV GL grade(s)
	Type	Manufacturer	Brand Name/ Designation	ISO or AWS classification	Type	Purity		
1	Bare Rod	Pinnacle Alloys	ER70S-2	AWS A5.18 ER70S-2	Straight Argon	100%	8 mm	-

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Joint preparation (sketch) and welding details

Joint design	Welding sequences
State rolling direction, if applicable	For multiple welding process qualification, the deposited weld metal thickness shall be recorded for each filler metal and process used.
<div data-bbox="341 525 730 798"> </div> <p>Thickness $T = 3 - 8 \text{ mm}$ Groove angle (β) = $70 - 90^\circ$ Root face $R_f = 0 - 3 \text{ mm}$ Butt Root gap $G = 2 - 3 \text{ mm}$ Fillet Root gap $G = 0 - 3 \text{ mm}$</p> <p>All position except 3G down Single or Double Vee groove/ Bevel T, K, Y Complete/ Partial Joint Penetration</p> <div data-bbox="211 1113 828 1323"> </div> <div data-bbox="324 1344 730 1533"> </div> <p>Note:</p> <ul style="list-style-type: none"> * Branch connections shall be qualified separately * This procedure is applicable for welding from one side with/ without backing (gas purging) and both side with/ without gouging * Grind weld joint preparation edges and adjacent surfaces to bright metal prior to welding to remove all traces of paint, primer, scale, rust, moisture and any other contaminants. Wire brush, grinding to be used for interpass cleaning. * Any change in wire brand name/designation is permitted as long as AWS/ISO consumable classification remains the same as PQR. 	<p>Multi Runs/ Multi layers</p> <p>As required</p>

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Run ⁽¹⁾	Process ⁽²⁾	C ⁽³⁾	Ø ⁽⁴⁾ (mm)	Gas flow (l/min)	Current (A)	Voltage (V)	C&P ⁽⁵⁾	v ⁽⁶⁾ (in/min)	s ⁽⁷⁾ (in/min)	F/B ⁽⁸⁾	HI ⁽⁹⁾ (kJ/cm)
Root	141-GTAW	1	2.4	11-20	57 – 83	9.4 – 13.8	DC-	1.55 – 2.10	N/A	F/B	7.14 – 1.89
Hot/ Fill/ Cap	141-GTAW	1	2.4 & 3.2	11-20	72 – 110	10.2– 16.0	DC-	1.68 – 2.27	N/A	F/B	9.18 – 15.30

(1) Root, fill or cap. (2) Ref. ISO4063. (3) Welding consumable, see previous table. (4) Filler metal diameter. (5) Current and polarity, /P for pulse welding. Details to be specified below. (6) Travel speed. (7) Wire feed speed. (8) Forehand "F" or backhand "B" progression. (9) Heat input not compensated for process efficiency (arc energy).

Note:

- * The values for the Current (A) and Voltage (V) are -15%, +25% and Travel speed (V) are ±15% based on the PQR DNVGL-Pipe-03-05.
- * Range of the Heat Inputs are ± 25% based on the actual values in the PQR DNVGL-Pipe-03-05.
- * Selection of Current (A), Voltage (V), Wire Feed Speed (S) and Travel speed (V) shall be in compliance with approved range of heat input provided above.

Further information

Shop primer for fillet weld			
Manufacturer:	N/A	Brand name:	N/A
		Max. dry film thickness:	N/A µm

Place: **Vancouver, BC, Canada**

Date : **October-08-2019**



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Place: **Vancouver, BC, Canada**

Date : **October-08-2019**



Surveyor - DNV GL Maritime Vancouver