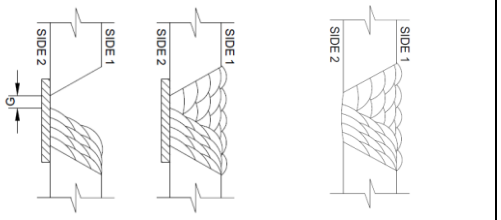
POLAR POCKET WPDS	Pocket-FC-06	0	April 17, 2025
	WPDS No.	Rev.	Date

Seaspan Vancouver Shipyards Co. Ltd.	Applicable Standard(s)	Lloyds Register - Rules for the Manufacture, Testing and Certification of Materials 2022

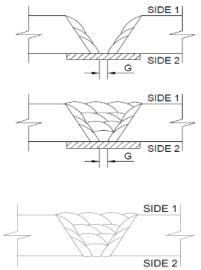
	Process/Mode	Electrode (Wire) Classification	Brand Name(s)	Manufacturer(s)
1	FCAW/Semi-Auto(Hand)	**AWS A5.20 E71T-1C/9C-J LR Grade: 4Y40S**	**Dual Shield Prime 71 LT H4/C1**	**ESAB**

Material Designation	Base material 1	Base material 2	Min. Preheat / Interpass Temp.	50°C for root and hot pass, fill/cap to be as per VSY Preheat and Interpass Temperature Requirements for Welding
	EH 36 and all lower grades excluding A,B, D and E (Note 6)	EH 36 and all lower grades excluding A,B, D and E (Note 6)		
Delivery Condition(s)	All except QT	All except QT		
Nominal Pipe Size	**500mm and above**	**500mm and above**	PWHT	**N/A**
Thickness or Dia	**3 mm - 60 mm**	**3 mm - 60 mm**	Max. Interpass Temp.	**180°C**
Welding Position	**All positions excluding Vertical down Ceramic Backing: 1G, 2G and 3G-up ONLY.**		Joint Design	**Major/deep weld repairs wide gaps buttering (Note 4)**

Groove angle = 40-80°
Root gap after buttering: 4-7mm
Root face= 0-3mm

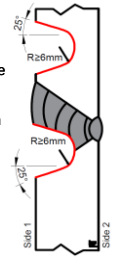


TYPICAL 2G BUTTERING/WELDING SEQUENCE



TYPICAL 3G BUTTERING/WELDING SEQUENCE

U-shape profile with bottom radius of not less than 6mm and 25° wall



REPAIR EXCAVATION PROFILE

COMPLETE JOINT PENETRATION	Welding Layer	JOINT TYPE	Back Purge	N/A	Contact Tip to Work Distance	9.5-20 mm
■ Back-gouged to sound metal	multi-layer	■ BUTT	Backing type	Ceramic/Steel		
■ Welded onto backing	One/Two side	■ CORNER	Welding Technique	Stringer/Slight Weave	Interpass Cleaning	Grinding and Wire Wheel
☐ Welded from one side without backing	Gun travel angle	■ LAP	Max. Bead Width	16mm	Shielding Gas	100% CO2
☐ Welded both sides w/o back-gouging	Pull w/ slight push on Vu	■ TEE	Tungsten Electrode	N/A Ø:	Gas Flow	16-25 LPM
Method of steel preparation	Oxy fuel/Plasma cut | Grinding | Milling	■ EDGE	No. of electrodes	1		34-53 CFH

BM Thickness Range mm	Layers / Passes	Position	Electrode Size range (mm)	Welding Process	Current type /Polarity	Consumable	Current (A)	Voltage (V)	WFS (IPM)	Travel Speed (mm/min)	Heat Input kJ/mm
3 ≤ T ≤ 60	Root (Ceramic)	1G, 2G, 3G up	1.2, 1.4	FCAW	CV/DC+	E71T-1C/9C	130 - 250	19 - 25	170 - 300	55 - 140	**See Note 8**
3 ≤ T ≤ 60	Buttering/ Hot/Fill/Cap	All ex. Vd	1.2 - 1.6	FCAW	CV/DC+	E71T-1C/9C	110 - 430	16 - 38	135 - 500	75 - 750	

Note 1: Heat Input (kJ/mm) = [V x A x 60] / [Travel Speed (mm/min) x 1000]

Note 2: Grind joint 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.

Note 3: Travel angle = 5-10° Pull / slight push should be used for Vu welding position

Note 4: This WPS qualifies both buttering and repairing welds where the gap is less than or equal to 16 mm or 1.5 x thickness, whichever is smaller.

Note 5: As required, the gouging may be performed completely through the thickness. Excavated surfaces are to be re-prepped to the original joint configuration. Weld buttering to be performed on one or both sides of the plate as required.

Note 6: Welding of the normal strength hull structure steel to normal strength hull structure steel (Grade A,B,D and E) using Dual Shield Prime 71 LT is subject to special agreement with Lloyds Register.

Note 7: For the root pass on the ceramic backing, it is recommended to use 1.2mm (0.045") wire size with max. 180 amps.

Note 8:

Base Metal THK (mm)	3 ≤ T < 15	15 ≤ T ≤ 60
Root Heat Input (kJ/mm)	1.4 - 2.4	1.4 - 2.8
Buttering/Hot/Fill/Cap Heat Input (kJ/mm)	0.4 - 2.5	0.4 - 2.7

Reference WPS No.	FC-CS-R-01 (Rev. 2)	Engineer Stamp

Vancouver Shipyards Co. Ltd. #1002295
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
Dr. P. BABAGHORBANI
43695
2025-04-17

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☐ Welded from one side without backing | Gun travel angle | ■ LAP | Max. Bead Width | 16mm | Shielding Gas | 100% CO2
☐ Welded both sides w/o back-gouging | Pull w/ slight push on Vu | ■ TEE | Tungsten Electrode | N/A Ø: | Gas Flow | 16-25 LPM
Method of steel preparation | Oxy fuel/Plasma cut \| Grinding \| Milling | ■ EDGE | No. of electrodes | 1 | | 34-53 CFH
BM Thickness Range mm | Layers / Passes | Position | Electrode Size range (mm) | Welding Process | Current type /Polarity | Consumable | Current (A) | Voltage (V) | WFS (IPM) | Travel Speed (mm/min) | Heat Input kJ/mm
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