




**WELDING PROCEDURE SPECIFICATION(WPS)
ES-L-30.2, QP-SPC-R-010-2 & BS 4515-1**

**WPS No.
AAIS-WPS-PL-1**

Company Name:

CONTRACT No.

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JOINTS Joint design:  Root spacing: 3 ± 1mm Backing: NO for GTAW, Yes for SMAW Groove: Single V Fillet: N/A Backing Material: Metallic: NA, Non Metallic: NA, Non fusing: NA, Others: NA Retainers: NA Prep. method: Gas Cutting/Machining/Grinding		BASE MATERIAL Spec. & type: API 5L X60 / X65 (PIPE) TO API 5L X60 / X65 (PIPE) P.No.1 Gr.No. 2 TO P.No.1 Gr.No.2 Source of Steel: V & M GERMANY Supply Condition: HOT FINISH SEAMLESS LINE PIPE Base metal: Thickness(mm): Diameter (mm): Groove: 12.5mm to 25.0mm 114.3 mm < OD ≤ 323.9 mm Fillet Joint: ALL DEPOSITED METAL Groove (MAX): GTAW max. 9.0 mm SMAW max. 19.54 mm Fillet (MAX): ALL Overlay thickness qualified mm (min): N/A	
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FILLER METALS <table border="1"> <tr> <th></th> <th>Root</th> <th>Filling</th> </tr> <tr> <td>Process:</td> <td>GTAW</td> <td>SMAW</td> </tr> <tr> <td>Filler type:</td> <td>SOLID WIRE</td> <td>COVERED ELECTRODE</td> </tr> <tr> <td>Supplier:</td> <td>OKTIGROD13.12</td> <td>ESAB OK 48.08</td> </tr> <tr> <td>Size mm Ø:</td> <td>2.4mm</td> <td>2.5, 3.2 & 4.0mm</td> </tr> <tr> <td>SFA No.:</td> <td>A5.28</td> <td>A5.5</td> </tr> <tr> <td>AWS No.:</td> <td>ER80S-G</td> <td>E7018-G</td> </tr> <tr> <td>F No.:</td> <td>6</td> <td>4</td> </tr> <tr> <td>A No.:</td> <td>3</td> <td>1</td> </tr> </table>			Root	Filling	Process:	GTAW	SMAW	Filler type:	SOLID WIRE	COVERED ELECTRODE	Supplier:	OKTIGROD13.12	ESAB OK 48.08	Size mm Ø:	2.4mm	2.5, 3.2 & 4.0mm	SFA No.:	A5.28	A5.5	AWS No.:	ER80S-G	E7018-G	F No.:	6	4	A No.:	3	1	POSITION QUALIFIED Groove position: ALL Weld progress: UPHILL Fillet position: ALL PREHEAT Preheat Temp. °C (Min): Ambient 40 °C Maintenance: Not required Method: N/A Interpass Temp °C (Max): 186 °C Temp. Measurement: by Digital Thermometer and temp. indicating crayons	
	Root	Filling																												
Process:	GTAW	SMAW																												
Filler type:	SOLID WIRE	COVERED ELECTRODE																												
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F No.:	6	4																												
A No.:	3	1																												
Flux trade name: N/A Supplier: N/A Electrode flux comp.: N/A Supplementary filler: N/A Particle size: N/A Powder filler: N/A Others: N/A Addition of cold filler: N/A Neutral, Active or Alloy flux: N/A																														

HEAT TREATMENTS Type: NA Temp. °C: NA H.R. °C/h: NA C.R. °C/h: NA Soaking Time: NA		TECHNIQUE String & weave bead: Root(String) & Weaving(Fill & cap) Orifice of gas cup size: Ø4, Ø6, Ø8 mm Initial interpass cleaning: Power Brush / Grinding / Chipping Method of backgouging: N/A Oscillation: N/A Contact tube to work distance: N/A Number of Welders: One Multipass or Single: Multipass Single or Multiple electrode: Single Electrode spacing: N/A Welding method: Manual Closed to out chamber: N/A Magnetic control device: NA Overlap: 1.6 mm to 3 mm max. Peening: N/A Others: Time lapse between subsequent passes maximum 3-4 minutes	
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GAS <table border="1"> <tr> <th>Gases</th> <th>% Composition</th> <th>Flow rate</th> </tr> <tr> <td>Shielding: Argon</td> <td>99.997</td> <td>8-14 L/Min</td> </tr> <tr> <td>Backing: N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Trailing: N/A</td> <td>N/A</td> <td>N/A</td> </tr> </table>				Gases	% Composition	Flow rate	Shielding: Argon	99.997	8-14 L/Min	Backing: N/A	N/A	N/A	Trailing: N/A	N/A	N/A		
Gases	% Composition	Flow rate															
Shielding: Argon	99.997	8-14 L/Min															
Backing: N/A	N/A	N/A															
Trailing: N/A	N/A	N/A															

ELECTRICAL CHARACTERISTICS Current: DC POLARITY: See below table Pulsing: N/A Amps range: See below table Volts range: See below table Metal transfer mode for GMAW: N/A Electrode wire speed range cm/min: N/A					
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WELDING SEQUENCE										
Weld layers	Welding Progression	Process	Filler metal		Current		Volt Range	Travel Speed mm/min	Heat Input KJ/mm (Max.)	Remarks
			AWS Class	Dia. mm	Type & Polarity	Amps Range				
Root	Up Hill	GTAW	ER80S-G	2.4	DCEN	58-138	9-13	57-85	0.83-1.5	
Hot	Up Hill	GTAW	ER80S-G	2.4	DCEN	70-138	9-13	85-97	0.5-1.5	
Filling	Up Hill	SMAW	E7018-G	2.5	DCEP	83-134	21-28	85-170	1.0-2.9	
Filling	Up Hill	SMAW	E7018-G	3.2	DCEP	108-151	21-28	85-170	1.0-2.9	
Caping	Up Hill	SMAW	E7018-G	2.5	DCEP	106-132	21-28	100-210	0.9-1.5	

Prepared By.

Reviewed /Witnessed By.

Approved By.

AAIS

VELOSI

AAIS

Date.




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JOINTS
Joint design: 
Root spacing: 3 ± 1mm
Backing: NO for GTAW, Yes for SMAW
Groove: Single V
Fillet: N/A
Backing Material:
Metallic: NA, Non-Metallic: NA, Non-Ferrous: NA, Others: NA
Retainers: NA
Prep method: Gas Cutting/Machining/Grinding

BASE MATERIAL
Spec. & type: **API 5L X60 / X65 (PIPE) TO API 5L X60 / X65 (PIPE)**
P No.1 Gr.No.2 TO P No.1 Gr.No.2
Source of Steel: V & M GERMANY Supply Condition: FULL THICKNESS SEAMLESS LINE PIPE
Base metal: Thickness(mm): Diameter (mm):
Groove: 12.5mm to 25.0mm 114.3 mm < OD < 323.9 mm
Fillet Joint: ALL
DEPOSITED METAL
Groove (MAX): GTAW max. 9.0 mm SMAW max. 19.54 mm
Fillet (MAX): ALL
Overlay thickness qualified mm (min): N/A

FILLER METALS	Root		Filing	
	Process:	GTAW	Process:	SMAW
Filler type:	SOLID WIRE		COVERED ELECTRODE	
Supplier:	OK7IGROD13.12		ESAB OK 48.08	
Size mm Ø:	2.4mm		2.5, 3.2 & 4.0mm	
SFA No.:	A5.28		A5.5	
AWS No.:	ER80S-G		E7018-G	
F No.:	6		4	
A No.:	3		1	
Flux trade name:	N/A	Supplier:	N/A	
electrode flux comp.:	N/A	Supplementary flux:	N/A	
Particle size:	N/A	Powder filler:	N/A	
Others:	N/A	Addition of cold filler:	N/A	
		Neutral, Active or Alloy flux:	N/A	

POSITION QUALIFIED
Groove position: ALL
Weld progress: UP/HILL
Fillet position: ALL
PREHEAT
Preheat Temp. °C:(Min) Ambient 40 °C
Maintenance: Not required
Method: N/A
Interpass Temp °C:(Max) 185 °C
Temp. Measurement by Digital Thermometer and temp. indicating crayons

HEAT TREATMENTS
Type: NA
Temp. °C: NA
H.R. °C/H: NA
C.R. °C/H: NA
Soaking Time: NA

TECHNIQUE
String & weave bead: Root(String) & Weaving(Fill & cap)
Orifice of gas cup size: Ø4, Ø6 Ø8 mm
Initial interpass cleaning: Power Brush / Grinding / Chipping
Method of backgouging: N/A
Oscillation: N/A
Contact tube to work distance: N/A
Number of Welders: One
Multipass or Single: Multipass
Single or Multiple electrode: Single
Electrode spacing: N/A
Welding method: Manual
Closed to out chamber: N/A
Magnetic control device: NA
Overlap: 1.5 mm to 3 mm max.
Peening: N/A
Others: Time lapse between subsequent passes maximum 3-4 minutes

GAS

	Gases	% Composition	Flow rate
Shielding:	Argon	99.997	8-14 L/Min.
Backing:	N/A	N/A	N/A
Trailing:	N/A	N/A	N/A

ELECTRICAL CHARACTERISTICS
Current: DC POLARITY: See below table
Pulsing: N/A
Amps range: See below table Volts range: See below table
Metal transfer mode for GMAW: N/A
Electrode wire speed range cm/min: N/A

WELDING SEQUENCE										
Weld layers	Welding Progression	Process	Filler metal		Current		Volt Range	Travel Speed mm/min	Heat Input KJ/mm (Max.)	Remarks
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Capping	Up Hill	SMAW	E7018-G	2.5	DCEP	106-132	21-28	100-210	0.9-1.5	

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