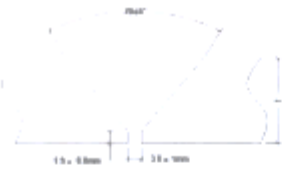
AAIS All Asset Integrity Systems	**WELDING PROCEDURE SPECIFICATION(WPS)** **ES-L-30.2, QP-SPC-R-010-2 & BS 4515-1**	**WPS No.** **AAIS-WPS-PL-2**
Company Name:	**CONTRACT No.**	**Page.1**

JOINTS

Joint design



Root spacing	3 ± 1mm
Backing	NO for GTAW Yes for SMAW
Groove	Single V
Fillet	N/A

Backing Material

Metallic	Non Metallic	Non fusing	Others
NA	NA	NA	NA

Retainers: N/A

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

FILLER METALS	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

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

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 Termometer and temp. indicating crayons

HEAT TREATMENTS

Type:	N/A
Temp. °C:	N/A
H.R. °C/H:	N/A
C.R. °C/H:	N/A
Soaking Time:	N/A

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 cms/min:		N/A	

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

WELDING SEQUENCE

Weld layers	Welding Progression	Process	Filler metal AWS Class	Filler metal Dia. mm	Current Type & Polarity	Current Amps Range	Volt Range	Travel Speed mm/min	Heat Input KJ/mm (Max.)	Remarks
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.		

AAIS All Asset Integrity Systems	WELDING PROCEDURE SPECIFICATION(WPS) ES-L-30.2, QP-SPC-R-010-2 & BS 4515-1	WPS No. AAIS-WPS-PL-2
Company Name:	**CONTRACT No.**	**Page.2**

Welding process(es) and type: GTAW + SMAW (MANUAL)

JOINTS

Groove design	:	As shown in sketch Page 3, 4, 5 OF 5
Backing	:	No for GTAW Yes for SMAW
Groove	:	Single V
Fillet	:	N/A

Preparation Method: Cutting and Grinding for bevel preparation

BASE MATERIAL

Spec. & type:	API 5L X80 / X85 (SMLS PIPE)	to	API 5L X80 / X85 (SMLS PIPE)		
P.No. 1	Gr.No. 2	to	P.No 1	Gr.No. 2	
Heat No :	320729				
Base Metal :	Thickness (mm)		Pipe Diameter :		
Groove Joint :	14.27 mm		8" NPS (168.3 mm)		
Fillet Joint :	N/A		N/A		

POSITION

Groove position	2G
Weld progress:	N/A
Fillet position	N/A

GAS

Shielding gas(es)	:	Argon
% Composition	:	99.997
Flow rate:	:	8-14 l/min
Gas backing	:	N/A
Flow rate:	:	N/A
Trailing Shielding gas composition	:	N/A

PREHEAT

Temp. °C	Ambient 40 °C
Maintenance	Not Required
Method:	N/A
Interpass °C:	180°C max

HEAT TREATMENTS

Type:	N/A
Temp. °C:	N/A
Time (H):	N/A
H.T. °C/H:	N/A
C.R. °C/H:	N/A
PWHT REPORT NO	N/A

TECHNIQUE

String & weave bead:	Root(String): Fill & Capping(Weave)
Orifice of gas cup size(mm)	Ø4.Ø6.Ø8
Initial interpass cleaning:	Power brush and grinding
Method of backgouging:	N/A
Oscillation:	N/A
Contact tube to work distance:	N/A
Multipass or Single:	Multi-pass
Single or Multiple electrode:	Single
Overlap:	1.6 mm to 3 mm max.
Peening:	N/A
Cleaning / Gauging:	Power brush, chipping and grinding
Filler metal Product form:	N/A
Mode of Metal Transfer (FCAW) :	N/A
Supplementary filler:	N/A
Others:	Maximum time laps between two subsequent passes is maximum 4 minutes.

FILLER METALS & ELECTRICAL CHARACTERISTIC

Process:	GTAW	SMAW
Filler type:	Solid Wire	Covered Electrode
Supplier:	ESAB OK TIG ROD 13.12 LOT NO. PV919052625	ESAB OK 48.08 LOT NO. SB418062 LOT NO. SB250335
Size mm dia.	2.4	2.5, 3.2
SFA No.:	A5.28	A5.5
AWS No.:	ER80S-G	E7018-G
F No.:	6	4
A No.:	3	1
DEPOSITED METAL THK (mm)	4.5 mm	9.77 mm
Amps	See table on page 3,4,5 of 5	See table on page 3,4,5 of 5
Volts	See table on page 3,4,5 of 5	See table on page 3,4,5 of 5
Travel speed (mm/min.)	See table on page 3,4,5 of 5	See table on page 3,4,5 of 5
Heat input (kj/mm)	See table on page 3,4,5 of 5	See table on page 3,4,5 of 5
Current & Polarity	DCEN	DCEP

Flux type:	N/A	Particle size:	N/A
Supplier:	N/A		
Electrode flux classification:	N/A		
Tungsten size and type:	2.4 MM DIA , 2 % THORIATED TUNGSTEN		

Prepared By.	Reviewed /Witnessed By.	Approved By.
AAIS	VELOSI	AAIS
Date.		