



LIDCO, Pars SEE Zone, Assaluyeh,  
Integrated Methanol and Ammonia  
Plant 3000 MTPD MeOH / 900 MTPD NH3 PROJECT



Welding Book PQR / WPS

Document No. 17735-25

Page

Project No.	Vendor Doc.	P.O. No.	Department	Document Type	Serial No	Revision
N278	VD	6019	GN	WS	0027	02

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**Airpack B.V. - Air Compressor –  
Integrated Methanol and Ammonia Plant  
17735-COM Welding Book PQR / WPS (K020)**

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: <i>J. J.</i> DATE: 2024-03-21	
SIGN: <i>J. J.</i>	

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
02	21-03-2024	Issued for Information	F.T.	S.K.	
01	12-12-2023	Issued for Information	S.K.	J.J.	S.K.

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Welding Book PQR / WPS

Document No. 17735-25

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2	X	X				27	X	X				52	X	X				77	X				
3	X	X				28	X	X				53	X	X				78	X				
4	X	X				29	X	X				54	X	X				79	X				
5	X	X				30	X	X				55	X	X				80	X				
6	X	X				31	X	X				56	X	X				81	X				
7	X	X				32	X	X				57	X	X				82	X				
8	X	X				33	X	X				58	X	X				83	X				
9	X	X				34	X	X				59	X	X				84	X				
10	X	X				35	X	X				60	X	X				85	X				
11	X	X				36	X	X				61	X	X				86	X				
12	X	X				37	X	X				62	X	X				87	X				
13	X	X				38	X	X				63	X	X				88	X				
14	X	X				39	X	X				64	X	X				89	X				
15	X	X				40	X	X				65	X	X				90	X				
16	X	X				41	X	X				66	X					91	X				
17	X	X				42	X	X				67	X					98	X				
18	X	X				43	X	X				68	X					<b>ATTACHMENT</b>					
19	X	X				44	X	X				69	X					1					
20	X	X				45	X	X				70	X					2					
21	X	X				46	X	X				71	X					3					
22	X	X				47	X	X				72	X					4					
23	X	X				48	X	X				73	X					5					
24	X	X				49	X	X				74	X					6					
25	X	X				50	X	X				75	X					7					

		NARGAN COMPANY
<b>INSPECTION</b>		
1- APPROVED	<input type="checkbox"/>	
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BY: <i>M. R. G.</i>	DATE: <i>20/02/2024</i>	
SIGN: <i>M. R. G.</i>		

WPS/

PQR

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
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3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 23 April 2024	
SIGN: 	



# WPS

# SKID

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN:	

WPS record number	S2600	Revision 5	Qualified to	AWS D1.1/D1.1M:2020
Date	Thursday, 29 September 2022		Company name	Airpack Netherlands BV
Supporting PQR(s) Reference docs.	RET0278790/TK/001 - Rev 1			

Scope	Groove, no PWHT (As-welded), impact testing
Joint	Joint details for this welding procedure specification in: Production drawings

**BASE METALS**

Type	Plate: API 2W (50) AWS D1.1 Grp-no II / ISO 15608 Grp-no II
Welded to	Plate: API 2W (50) AWS D1.1 Grp-no II / ISO 15608 Grp-no II
Backing:	None
Retainers	None
Notes	

**THICKNESS RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Complete pen.	3,	8,	-	-
Impact tested	3,	8,	-	-
Partial pen.	3,	8,	-	-
Fillet welds	no min.	no max.	-	-

**DIAMETER RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Nominal pipe size	600,	no max.	-	-

**FILLER METALS**

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	THICKNESS RANGE QUALIFIED (mm)			
						As-welded		With PWHT	
						Min.	Max.	Min.	Max.
GMAW	5.18	E70C-6MH4	-	-	Lincoln, Outershield MC715-H	3,	8,	-	-
GMAW						-	-	-	-
GMAW						-	-	-	-
Sup. filler						- Required -			
Suppl. filler metal vol. (mm <sup>3</sup> )	-								

**WELDING PROCEDURE**

	GMAW	GMAW	GMAW
Welding process	GMAW	GMAW	GMAW
Type	Semi-automatic	Semi-automatic	Semi-automatic
Minimum preheat/interpass temperature (°C)	10	10	10
Maximum interpass temperature (°C)	124 Method contact thermometer	124 Method contact thermometer	124 Method contact thermometer
Filler metal size (mm)	1,2	1,2	1,2
Layer number	Root	Fill	Cap
Position	F,H	F,H	F,H
Weld progression	Not applicable	Not applicable	Not applicable
Current/polarity	DCEP (reverse polarity)	DCEP (reverse polarity)	DCEP (reverse polarity)
Waveform control	Not Used	Not Used	Not Used
Energy (J)	Not Used	Not Used	Not Used
Power (J/s)	Not Used	Not Used	Not Used
Amperes	80 - 100	175 - 185	175 - 185
Volts	14 - 16	19 - 21	19 - 21
Travel speed (mm/min)	110 - 120	460 - 500	440 - 470
Maximum heat input (kJ/mm)	0,57 - 0,70	0,40 - 0,49	0,44 - 0,53
Wire feed speed (m/min)	Not used	Not used	Not used
Arc transfer mode	Short-circuiting	Globular	Globular
Shielding: Gas type	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)
Flow rate (l/min)	14 - 16	14 - 16	14 - 16
Trailing: Gas type	None	None	None
Flow rate (l/min)	-	-	-
Backing: Gas type	None	None	None
Flow rate (l/min)	-	-	-
String or weave	Stringer or Weave	Stringer or Weave	Stringer or Weave
Orifice/gas cup size	15	15	15
C.T.W.D (mm)	15	15	15
Multi/Single pass per side	Single pass	Multiple passes	Multiple passes
Multi/single electrode	Single electrode	Single electrode	Single electrode
Maximum pass thickness (mm)	5	5	5
Weld deposit chemistry	-	-	-
Power Source	CV	CV	CV

	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 09 April 2024	
SIGN: 	

WPS record number	S2600	Revision 5	Qualified to	AWS D1.1/D1.1M:2020
Date	Thursday, 29 September 2022		Company name	Airpack Netherlands BV



**PREHEAT TABLE**

Applicable standard	
AWS D1.1 (Category B)	For thickness 3 to 19(mm): 0(°C). Preheat to 20(°C) if the base metal temperature is below 0(°C). Over 19 thru 38.1(mm): 10(°C). Over 38.1 thru 63.5(mm): 66(°C). Over 63.5(mm): 107(°C).

**TECHNIQUE**


Peening	Not used
Surface preparation	Grinding
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

**NOTES**

 NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
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3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN: 	

**Signature 1**

**Signature 2**

Name	Signature	Name	Signature
F. van Toledo			
Date		Date	
Thursday, 29 September 2022			

WPS record number	S2700	Revision 5	Qualified to	AWS D1.1/D1.1M:2020
Date	Thursday, 29 September 2022		Company name	Airpack Netherlands BV
Supporting PQR(s)	RET0278790/TK/002 - Rev 1			
Reference docs.				

Scope	General instruction welding structural for skids Groove, fillet, no PWHT (As-welded), impact testing
Joint	Joint details for this welding procedure specification in: Production drawings

**BASE METALS**

Type	Plate: API 2W (50) AWS D1.1 Grp-no II / ISO 15608 Grp-no II
Welded to	Plate: API 2W (50) AWS D1.1 Grp-no II / ISO 15608 Grp-no II
Backing:	None P-no. Grp-no.
Retainers	None
Notes	

**THICKNESS RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Complete pen.	3,	16,	-	-
Impact tested	8,	16,	-	-
Partial pen.	3,	16,	-	-
Fillet welds	no min.	no max.	-	-

**DIAMETER RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Nominal pipe size	600,	no max.	-	-

**FILLER METALS**

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	As-welded		With PWHT	
						Min.	Max.	Min.	Max.
GMAW	5.18	E70C-6MH4	-	-	Lincoln, Outershield MC715-H	3,	16,	-	-
GMAW						-	-	-	-
GMAW						-	-	-	-
Sup. filler	-	-	-	-	-	- None -			

**WELDING PROCEDURE**

	GMAW	GMAW	GMAW
Welding process	GMAW	GMAW	GMAW
Type	Semi-automatic	Semi-automatic	Semi-automatic
Minimum preheat/interpass temperature (°C)	10	10	10
Maximum interpass temperature (°C)	178 Method contact thermometer	178 Method contact thermometer	178 Method contact thermometer
Filler metal size (mm)	1,2	1,2	1,2
Layer number	Root	Filler	Cap
Position	F, H	F, H	F, H
Weld progression	Not applicable	Not applicable	Not applicable
Current/polarity	DCEP (reverse polarity)	DCEP (reverse polarity)	DCEP (reverse polarity)
Waveform control			
Energy (J)			
Power (J/s)			
Amperes	117 - 143	190 - 210	190 - 210
Volts	15 - 17	21 - 23	22 - 24
Travel speed (mm/min)	135 - 150	320 - 350	350 - 390
Maximum heat input (kJ/mm)	0,8 - 1,0	0,7 - 0,8	0,6 - 0,8
Wire feed speed (m/min)	0,	0	0
Arc transfer mode	Short-circuiting	Globular	Globular
Shielding: Gas type	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)
Flow rate (l/min)	12- 22	12 - 22	12 - 2
Trailing: Gas type	None	None	None
Flow rate (l/min)	-	-	-
Backing: Gas type	None	None	None
Flow rate (l/min)	-	-	-
String or weave	Stringer and Weave	Stringer or Weave	Stringer or Weave
Orifice/gas cup size	15	15	15
C.T.W.D (mm)	15	15	15
Multi/Single pass per side	Multiple passes	Multiple passes	Multiple passes
Multi/single electrode	Single electrode	Single electrode	Single electrode
Maximum pass thickness (mm)	5	5	5
Weld deposit chemistry	-	-	-
Power source	CV	CV	CV

<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
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3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 09 April 2024	
SIGN: 	

WPS record number	S2700	Revision 5	Qualified to	AWS D1.1/D1.1M:2020
Date	Thursday, 29 September 2022		Company name	Airpack Netherlands BV



**PREHEAT TABLE**

Applicable standard	
AWS D1.1 (Category B)	For thickness 3 to 19(mm): 0(°C). Preheat to 20(°C) if the base metal temperature is below 0(°C). Over 19 thru 38.1(mm): 10(°C). Over 38.1 thru 63.5(mm): 66(°C). Over 63.5(mm): 107(°C).

**TECHNIQUE**


Peening	Not used
Surface preparation	Grinding
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

**NOTES**

 NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN: 	



**Signature 1**

**Signature 2**

Name	Signature	Name	Signature
F. van Toledo			
Date		Date	
Thursday, 29 September 2022			

# WPS

# CS PIPING

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN: 	

WPS record number	P2000	Revision 5	Qualified to	ASME Section ASME IX:2021
Date	Tuesday, 25 January 2022		Company name	Airpack Netherlands BV
Supporting PQR(s) Reference docs.	RET0245029-001-17 – Rev 0			

Scope	Welding instruction piping Groove, no PWHT (As-welded), impact testing
Joint	Joint details for this welding procedure specification in: Production drawings,

**BASE METALS (QW-403)**

Type	Carbon steel (P1)	P-no. 1	Grp-no. 1
Welded to	Carbon steel (P1)	P-no. 1	Grp-no. 1
Backing:	Without backingP-no.		
Retainers			
Notes			

**THICKNESS RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Complete pen.	1,50	10,32	-	-
Impact tested	2.58	10.32	-	-
Partial pen.	1.50	10.32	-	-
Fillet welds	no min.	no max.	-	-

**DIAMETER RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Nominal pipe size	½"	no max.	-	-


**FILLER METALS (QW-404)**

**THICKNESS RANGE QUALIFIED (mm)**

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	As-welded		With PWHT	
						Min.	Max.	Min.	Max.
GTAW	5.18	ER70S-3	6	1	Lincoln Ellectric LNT 25 (solid wire)	1.5	10.32	-	-
Cons. insert	-	-	-	-	-	- None -			
Flux	-	-	-	-	-	- None -			

**WELDING PROCEDURE**

Welding process	GTAW	
Type	Manual	
Minimum preheat temperature (°C)	20	
Maximum interpass temperature (°C)	221 Method contact thermometer	
Tungsten size (mm)	2,4	
Tungsten type	SFA 5.12 EWCe-2	
Filler metal size (mm)	2,4	
Layer number	All	
Position	All	
Weld progression	Uphill	
Current/polarity	DCEN (straight polarity)	
Amperes	90 -120	
Volts	9 -11	
Travel speed (mm/min)	30 - 70	
Maximum heat input (kJ/mm)	1,8165	
DC pulsing current	None	
Shielding: Gas type	Argon (A5.32 SG-A) Purity min. 99.998%	
Flow rate (l/min)	12 - 16	
Trailing: Gas type	None	
Flow rate (l/min)	None	
Backing: Gas type	None	
Flow rate (l/min)	None	
String or weave	Stringer or Weave	
Orifice/gas cup size	9.5	
Multi/Single pass per side	Multi passes	
Weld deposit chemistry	-	
Notes	When, before welding, the base metal temperature is below 0°C, the base metal shall be preheated to at least 20°	

 <b>NARGAN COMPANY</b>	
<b>INSPECTION</b>	
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BY: M. REZAEI	DATE: 03 April 2024
SIGN: 	

WPS record number	P2000	Revision 5	Qualified to	ASME Section ASME IX:2021
Date	Tuesday, 25 January 2022		Company name	Airpack Netherlands BV



**PREHEAT TABLE**

Applicable standard	
ASME B31.1	Base metal p1: Min. 95 °C for thickness >25 mm and specified maximum carbon content > 0.30% Base metal p1: Min. 10 °C for thickness >25 mm and specified maximum carbon content ≤ 0.30% Base metal p1: Min. 10 °C for thickness ≤25 mm maximum carbon content no additional limits.
ASME B31.3	Base metal p1: Min. 95 °C for thickness >25 mm and specified maximum carbon content > 0.30% Base metal p1: Min. 10 °C for thickness >25 mm and specified maximum carbon content ≤ 0.30% Base metal p1: Min. 10 °C for thickness ≤25 mm maximum carbon content no additional limits.


**TECHNIQUE (QW-410)**

Peening	Not used
Surface preparation	Grinding
Initial/interpass cleaning	Grinding and Brushing
Back gouging method	None
Closed to out chamber	None
Use of thermal processes	None

**NOTES**

 <b>NARGAN COMPANY</b>	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN: 	

**Signature 1**

Name	Signature	Name	Signature
F. van Toledo			
Date		Date	
Tuesday, 25 January 2022			

WPS record number	P2500	Revision 5	Qualified to	ASME Section ASME IX:2021
Date	Tuesday, 25 January 2022		Company name	Airpack Netherlands BV
Supporting PQR(s) Reference docs.	RET0245029-001-19 – Rev 0			

Scope	Welding instruction piping Groove, no PWHT (As-welded), impact testing
Joint	Joint details for this welding procedure specification in: Production drawings,

**BASE METALS (QW-403)**

Type	Carbon steel (P1)	P-no. 1	Grp-no. 2
Welded to	Carbon steel (P1)	P-no. 1	Grp-no. 2
Backing:	Without backing		
Retainers			
Notes			

**THICKNESS RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Complete pen.	1,50	10,32	-	-
Impact tested	2.58	10.32	-	-
Partial pen.	1.50	10.32	-	-
Fillet welds	no min.	no max.	-	-

**DIAMETER RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Nominal pipe size	½"	no max.	-	-



**FILLER METALS (QW-404)**

**THICKNESS RANGE QUALIFIED (mm)**

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	As-welded		With PWHT	
						Min.	Max.	Min.	Max.
GTAW	5.18	ER70S-3	6	1	Lincoln Ellectric LNT 25 (solid wire)	1.5	10.32	-	-
Cons. insert	-	-	-	-	-	- None -			
Flux	-	-	-	-	-	- None -			

**WELDING PROCEDURE**

Welding process	GTAW	
Type	Manual	
Minimum preheat temperature (°C)	20	
Maximum interpass temperature (°C)	223 Method contact thermometer	
Tungsten size (mm)	2,4	
Tungsten type	SFA 5.12 EWCe-2	
Filler metal size (mm)	2,4	
Layer number	All	
Position	All	
Weld progression	Uphill	
Current/polarity	DCEN (straight polarity)	
Amperes	90 -115	
Volts	9 -12	
Travel speed (mm/min)	30 - 70	
Maximum heat input (kJ/mm)	1,65	
DC pulsing current	None	
Shielding: Gas type	Argon (A5.32 SG-A)	
Flow rate (l/min)	14	
Trailing: Gas type	None	
Flow rate (l/min)	None	
Backing: Gas type	None	
Flow rate (l/min)	None	
String or weave	Stringer or Weave	
Orifice/gas cup size	9.5	
Multi/Single pass per side	Multi passes	
Weld deposit chemistry	-	
Notes	When, before welding, the base metal temperature is below 0°C, the base metal shall be preheated to at least 20°	

	
<b>INSPECTION</b>	
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2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
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BY: M. REZAEI DATE: 03 April 2022	
SIGN: 	

WPS record number	P2500	Revision 5	Qualified to	ASME Section ASME IX:2021
Date	Tuesday, 25 January 2022		Company name	Airpack Netherlands BV


**PREHEAT TABLE**

Applicable standard	
ASME B31.1	Base metal p1: Min. 95 °C for thickness >25 mm and specified maximum carbon content > 0.30% Base metal p1: Min. 10 °C for thickness >25 mm and specified maximum carbon content ≤ 0.30% Base metal p1: Min. 10 °C for thickness ≤25 mm maximum carbon content no additional limits.
ASME B31.3	Base metal p1: Min. 95 °C for thickness >25 mm and specified maximum carbon content > 0.30% Base metal p1: Min. 10 °C for thickness >25 mm and specified maximum carbon content ≤ 0.30% Base metal p1: Min. 10 °C for thickness ≤25 mm maximum carbon content no additional limits.



**TECHNIQUE (QW-410)**

Peening	Not used
Surface preparation	Grinding
Initial/interpass cleaning	Grinding and Brushing
Back gouging method	None
Closed to out chamber	None
Use of thermal processes	None

**NOTES**



 <b>NARGAN COMPANY</b>	
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3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN: 	

**Signature 1**

Name	Signature	Name	Signature
F. van Toledo	 		
Date		Date	
Tuesday, 25 January 2022			

# WPS

# SS PIPING

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 23 April 2024	
SIGN: 	

WPS record number	P3000	Revision 5	Qualified to	ASME Section ASME IX:2019
Date	Monday, 28 June 2021		Company name	Airpack Netherlands BV
Supporting PQR(s) Reference docs.	RET0245029-001-21 – Rev 1			

Scope	Welding instruction piping Groove, no PWHT (As-welded), impact testing
Joint	Joint details for this welding procedure specification in: Production drawings.

**BASE METALS (QW-403)**

Type	Stainless steel (P8)	P-no. 8	Grp-no. 1
Welded to	Stainless steel (P8)	P-no. 8	Grp-no. 1
Backing:		P-no.	Grp-no.
Retainers	None		
Notes			

**THICKNESS RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Complete pen.	1,50	19,06	-	-
Impact tested	-	-	-	-
Partial pen.	1.50	19.06	-	-
Fillet welds	-	-	-	-

**DIAMETER RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Nominal pipe size	no min.	no max.	-	-


**FILLER METALS (QW-404)**

**THICKNESS RANGE QUALIFIED (mm)**

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	As-welded		With PWHT	
						Min.	Max.	Min.	Max.
GTAW	5.9	ER316LSi	6	8	Lincoln Ellectric, LNT 316LSi (solid wire)	No min.	19.06	-	-
Cons. insert	-	-	-	-	-	- None -			
Flux	-	-	-	-	-	- None -			

**WELDING PROCEDURE**

Welding process	GTAW		
Type	Manual		
Minimum preheat/interpass temperature (°C)	10		
Maximum interpass temperature (°C)	150 Method contact thermometer		
Tungsten size (mm)	2,4		
Tungsten type	SFA 5.12 EWCe-2		
Filler metal size (mm)	2.0		2,4
Layer number	All		All
Position	All		All
Weld progression	Uphill		Uphill
Current/polarity	DCEN (straight polarity)		DCEN (straight polarity)
Amperes	75 - 90		85 - 115
Volts	9 - 11		9 - 12
Travel speed (mm/min)	40 - 60		30 - 70
Maximum heat input (kJ/mm)	0,87		1,93
DC pulsing current	None		
Shielding: Gas type	Argon (A5.32 SG-A) Purity min. 99.998%		
Flow rate (l/min)	12 - 16		
Trailing: Gas type	None		
Flow rate (l/min)	None		
Backing: Gas type	95%N2 Purity min. 99.998% – 5%H2 Purity min. 99.995%		
Flow rate (l/min)	10 - 14		
String or weave	Stringer or Weave		
Orifice/gas cup size	9.5		
Multi/Single pass per side	Multi passes		
Weld deposit chemistry	-		
Notes	Backing shall be maintained until the weld has been completed. Oxygen level shall be below 0.05%		

 <b>NARGAN COMPANY</b>	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN: 	

WPS record number	P3000	Revision 5	Qualified to	ASME Section ASME IX:2019
Date	Monday, 28 June 2021		Company name	Airpack Netherlands BV



**PREHEAT TABLE**

Applicable standard	
ASME B31.3	Min. 10 °C


**TECHNIQUE (QW-410)**

Peening	Not used
Surface preparation	Grinding
Initial/interpass cleaning	Grinding and Brushing
Back gouging method	None
Closed to out chamber	None
Use of thermal processes	None

**NOTES**

 NARGAN COMPANY
<b>INSPECTION</b>
1- APPROVED <input type="checkbox"/> 2- APPROVED AS NOTED <input checked="" type="checkbox"/> 3- NOT APPROVED <input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024 SIGN: 

**Signature 1**

Name	Signature	Name	Signature
F. van Toledo			
Date		Date	
Monday, 28 June 2021			

WPS record number	SP4000	Revision 3	Qualified to	ASME Section ASME IX:2019
Date	Monday, 15 August 2022		Company name	Airpack Netherlands BV
Supporting PQR(s)	RET 0278790/TK/004 Rev.1			
Reference docs.				

Scope	Fillet, no PWHT (As-welded)
Joint	Joint details for this welding procedure specification in: Production drawings, Engineering specifications

**BASE METALS (QW-403)**

Type	Plate	P-no. S355MC acc. EN 10149-2	Grp- None
Welded to	Austenitic stainless steel	P-no. 8	Grp- 1
Backing:	No		
Retainers			
Notes			

**THICKNESS RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Complete pen.	-	-	-	-
Impact tested	-	-	-	-
Partial pen.	-	-	-	-
Fillet welds	no min.	no max.	-	-

**DIAMETER RANGE QUALIFIED (mm)**

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Nominal pipe size	no min.	no max.	-	-


**FILLER METALS (QW-404)**

**THICKNESS RANGE QUALIFIED (mm)**

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	As-welded		With PWHT	
						Min.	Max.	Min.	Max.
GTAW	5.9	ER309LSi	6	8	Lincoln Ellectric LNT 309LSi	-	-	-	-
Cons. insert	-	-	-	-	-	- None -			
Flux	-	-	-	-	-	- None -			

**WELDING PROCEDURE**

Welding process	GTAW	
Type	Manual	
Minimum preheat/interpass temperature (°C)	10	
Maximum interpass temperature (°C)	10	
Tungsten size (mm)	2,4	
Tungsten type	SFA 5.12 EWLa-1	
Filler metal size (mm)	2,4	
Layer number	All	
Position	All	
Weld progression	-	
Current/polarity	DCEN	
Waveform control	Not Used	
Energy (J)	-	
Power (J/s)	-	
Amperes	125 - 145	
Volts	12 - 15	
Travel speed (mm/min)	40 - 55	
Maximum heat input (kJ/mm)	2,174	
DC pulsing current	Not used	
Shielding: Gas type	Argon (A5.32 SG-A) Purity min. 99.998%	
Flow rate (l/min)	10	
Trailing: Gas type	None	
Flow rate (l/min)	-	
Backing: Gas type	None	
Flow rate (l/min)	-	
String or weave	Stringer or Weave	
Orifice/gas cup size	9,5	
Multi/Single pass per side	Single pass	
Weld deposit chemistry	-	
Notes		

	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 09 April 2024	
SIGN: 	

WPS record number	SP4000	Revision 3	Qualified to	ASME Section ASME IX:2019
Date	Monday, 15 August 2022		Company name	Airpack Netherlands BV

**TECHNIQUE (QW-410)**


Peening	Not used
Surface preparation	Grinding and Brushing
Initial/interpass cleaning	N.A.
Back gouging method	None

**NOTES**

	NARGAN COMPANY
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 09 April 2024	
SIGN: 	



**Signature 1**

**Signature 2**

Name	Signature	Name	Signature
F. van Toledo			
Date		Date	
Monday, 15 August 2022			

PQR

SKID

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 23 April 2024	
SIGN:	



# Airpack Netherlands BV

Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

AWS - Procedure Qualification Record (PQR)

WeldOffice WPS



PQR record number Date	RET 0245029-001-25 13-6-2012	Revision 1	WPS record number Company name Welding standard	S2300 Airpack Netherlands BV AWS D1.1/D1.1M:2010	Revision 0
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### BASE METALS

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (mm)	Dia. (mm)
Welded to:	Plate	API 2W (50)	U	II	-	-	30	-
	Plate	API 2W (50)	U	II	-	-	30	-
and tested: Notes	Without PWHT, Fillet-weld test							

### JOINTS

Joint design	Fillet weld	See addition information	See addition information
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### WELDING PROCESSES

Welding process Type	GMAW Semi-automatic
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### FILLER METALS

SFA specification	5.18
AWS classification	E70C-6MH4
Filler metal F-number	6
Weld metal A-number	-
Filler metal nominal composition	N.A.
Filler metal trade name	Lincoln, Outershield MC715-H
Filler metal size (mm)	1,2
Deposited thickness (mm)	8,00
Maximum pass thickness (mm)	5
Weld deposit chemistry	-
Supplemental filler metal	-
Supplemental filler metal vol. (mm <sup>3</sup> )	-

### POSITION

Position	2F
Weld progression	-

### PREHEAT

Preheat temperature (°C)	10
Maximum interpass temperature (°C)	112

### GAS

Shielding gas: Type	AC-20 (A5.32 SG-)
	Flow rate (l/min)
Trailing gas: Type	None
	Flow rate (l/min)
Backing gas: Type	None
	Flow rate (l/min)

### ELECTRICAL

Filler metal size (mm)	1,2
Amperes	237 - 245
Volts	26,4 - 26,6
Travel speed (mm/min)	315 - 391
Maximum heat input (kJ/mm)	1,2421
Current/polarity	DCEP (reverse polarity)
Wire feed speed (m/min)	0
Arc transfer mode	Spray

<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 29 April 2024	
SIGN:	

### TECHNIQUE

String or weave	Stringer and Weave
Orifice/gas cup size	15
C.T.W.D (mm)	15
Multi/single electrode	Single electrode
Multi/Single pass per side	Single and Multiple passes
Peening	Not used
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None



# Airpack Netherlands BV

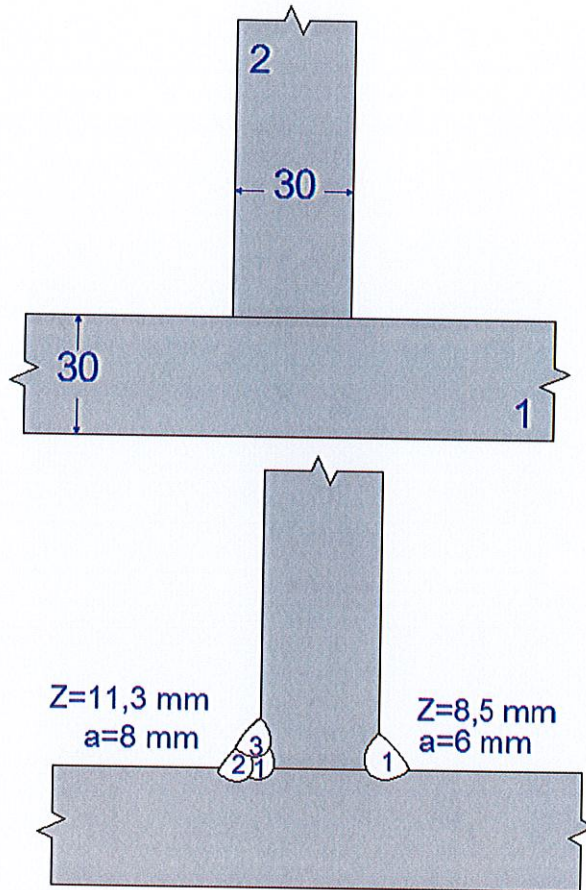
Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

AWS - Additional information (PQR)

WeldOffice WPS



PQR record number	RET 0245029-001-25	Revision 1	WPS record number	S2300	Revision 0
Date	13-6-2012		Company name	Airpack Netherlands BV	
			Welding standard	AWS D1.1/D1.1M:2010	



<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2012	
SIGN:	

# Airpack Netherlands BV

Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## AWS - Welding conditions - (PQRD Welding Data Record)

WeldOffice WPS



PQRD number	ARL1559-13	Revision 1	Date	29-5-2012
PQR number	RET 0245029-001-25	Revision 1	Welding standard	AWS D1.1/D1.1M:2010
WPS number	S2300	Revision 0	Company name	Airpack Netherlands BV
			To be tested	Without PWHT

### WELDING PROCESSES

Welding process	GMAW
Type	Semi-automatic

### BASE METALS

Product form	Plate
Material control number	362705
Specification (type or grade)	API 2W (50)
Nominal composition	C-Mn
Trade name	Dillinger Hutte
P number	U
G number	
AWS group number	II
Nominal pipe/tube size	-
Schedule	-
Length	(mm) 350
Width (OD)	(mm) 150
Thickness	(mm) 30

Welded to:

Product form	Plate
Material control number	362705
Specification (type or grade)	API 2W (50)
Nominal composition	C-Mn
Trade name	Dillinger Hutte
P number	U
G number	
AWS group number	II
Nominal pipe/tube size	-
Schedule	-
Length	(mm) 350
Width (OD)	(mm) 150
Thickness	(mm) 30

### JOINTS

Joint design	Fillet weld	See addition information	See addition information

### CLEANING/ROOT TREATMENT

Surface preparation	Grinding
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 09 April 2012	
SIGN:	



PQRD number	ARL1559-13	Revision 1	Date	29-5-2012
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**PASS INFORMATION**

Pass number	1 single layer	1 Multi layer	1 Multi layer	2 Multi layer
Layer number	1	1	2	2

**WELDING PROCESSES**

Welding process	GMAW	GMAW	GMAW	GMAW
Type	Semi-automatic	Semi-automatic	Semi-automatic	Semi-automatic

**FILLER METALS**

Material control number	P1FC110214	P1FC110214	P1FC110214	P1FC110214
SFA specification	5.18	5.18	5.18	5.18
AWS classification	E70C-6MH4	E70C-6MH4	E70C-6MH4	E70C-6MH4
Filler metal F-number	6	6	6	6
Weld metal A-number	-	-	-	-
Filler metal nominal composition	N.A.	N.A.	N.A.	N.A.
Filler metal trade name	Lincoln, Outershield MC715-H	Lincoln, Outershield MC715-H	Lincoln, Outershield MC715-H	Lincoln, Outershield MC715-H
Filler metal size (mm)	1,2	1,2	1,2	1,2
Length of filler metal consumed (mm)	-	-	-	-
Deposited thickness (mm)	4	4	4	4
Maximum pass thickness (mm)	5	5	5	5
Weld deposit chemistry	-	-	-	-
Supplemental filler metal	-	-	-	-
Supplemental filler metal vol. (mm <sup>3</sup> )	-	-	-	-

**POSITION**

Position	2F	2F	2F	2F
Weld progression	-	-	-	-

**PREHEAT**

Preheat temperature (°C)	10	10	10	10
Maximum interpass temperature (°C)	10	10	85	112

**GAS**

Shielding gas: Type	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)
Flow rate (l/min)	15	15	15	15
Trailing gas: Type	None	None	None	None
Flow rate (l/min)	-	-	-	-
Backing gas: Type	None	None	None	None
Flow rate (l/min)	-	-	-	-

**ELECTRICAL**

Filler metal size (mm)	1,2	1,2	1,2	1,2
Amperes	245	247	237	240
Volts	26.4	26.4	26.6	26.4
Travel speed (mm/min)	315	315	391	382
Maximum heat input (kJ/mm)	1,232	1,2421	0,9674	0,9952
Current/polarity	DCEP (reverse polarity)	DCEP (reverse polarity)	DCEP (reverse polarity)	DCEP (reverse polarity)
Wire feed speed (m/min)	-	-	-	-
Arc transfer mode	Spray	Spray	Spray	Spray

**TECHNIQUE**

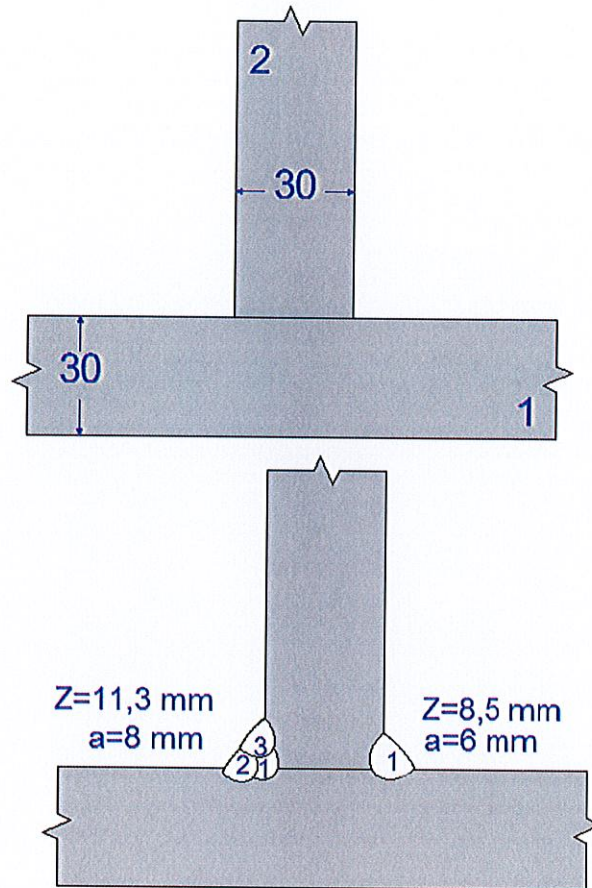
String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	15	15	15	15
C.T.W.D (mm)	15	15	15	15
Multi/single electrode	Single electrode	Single electrode	Single electrode	Single electrode
Multi/Single pass per side	Multiple passes	Single pass	Multiple passes	Multiple passes
Peening	Not used	Not used	Not used	Not used
Initial/interpass cleaning	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding
Back gouging method	None	None	None	None

<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
SIGN: <i>M. Roza</i>	

**PASS PERFORMED/WITNESSED BY**

Welders name	T. Lajos	T. Lajos	T. Lajos	T. Lajos
Recorded/witnessed by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)
Date	29-5-2012	29-5-2012	29-5-2012	29-5-2012
Data entry by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)

PQRD number	ARL1559-13	Revision 1	Date	29-5-2012
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 <b>NARGAN COMPANY</b>	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 09 April 2012	
SIGN: 	



PQR record number Date	RET0278790/TK/001 1-6-2016	Revision 1	WPS record number Company name Welding standard	S2600 Airpack Netherlands BV AWS D1.1/D1.1M:2015	Revision 1
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**BASE METALS**

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (mm)	Dia. (mm)
Welded to:	Plate	API 2W (50LS)	U	II	-	-	4	-
	Plate	API 2W (50LS)	U	II	-	-	4	-
and tested:	Without PWHT, With impacts, With hardness							
Notes								

**JOINTS**

Joint design	Single-V-groove	See addition information	See addition information
Backing:	None		
Retainers	None		
Groove angle (deg.)	60		
Root opening (mm)	2-3		
Root face (mm)	0-1		

**WELDING PROCESSES**

Welding process Type	GMAW Semi-automatic
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**FILLER METALS**

SFA specification	5.18
AWS classification	E70C-6MH4
Filler metal F-number	6
Weld metal A-number	-
Filler metal nominal composition	N.A.
Filler metal trade name	Lincoln, Outersheld MC715-H
Filler metal size (mm)	1,2
Deposited thickness (mm)	4,00
Maximum pass thickness (mm)	3
Weld deposit chemistry	-
Supplemental filler metal	-
Supplemental filler metal vol. (mm <sup>3</sup> )	-

**POSITION**

Position Weld progression	2G -
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**PREHEAT**

Preheat temperature (°C)	10
Maximum interpass temperature (°C)	124

**GAS**




Shielding gas:	Type	AC-20 (A5.32 SG-)	
	Flow rate (l/min)	15	
Trailing gas:	Type	None	
	Flow rate (l/min)	-	
Backing gas:	Type	None	
	Flow rate (l/min)	-	

**ELECTRICAL**

Filler metal size (mm)	1,2
Waveform control	Not Used
Energy (J)	Not Used
Power (J/s)	Not Used
Arc time (sec)	Not Used
Weld bead length (mm)	Not Used
Amperes	87 - 183
Volts	14,5 - 20,1
Travel speed (mm/min)	117 - 485
Maximum heat input (kJ/mm)	0,45 - 0,64
Current/polarity	DCEP (reverse polarity)
Wire feed speed (m/min)	0
Arc transfer mode	Short-circuiting, Globular

**TECHNIQUE**

String or weave	Stringer and Weave
Orifice/gas cup size	15
C.T.W.D (mm)	15
Multi/single electrode	Single electrode
Multi/Single pass per side	Multiple passes
Peening	Not used
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

	NARGAN COMPANY
	INSPECTION
<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/>
<input checked="" type="checkbox"/> APPROVED AS NOTED	<input type="checkbox"/>
3- NOT APPROVED	
BY: M. REZAEI DATE: 09 April 2024	
SIGN: 	



**Airpack Netherlands BV**  
 Groenewegje 19 - 25, 4301 RN Zierikzee, The Netherlands  
**AWS - Procedure Qualification Record (PQR) - Test results (as welded)**  
 WeldOffice WPS

PQR record number Date	RET0278790/TK/001 1-6-2016	Revision 1	WPS record number Company name Welding standard	S2600 Airpack Netherlands BV AWS D1.1/D1.1M:2015	Revision 1
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TENSILE TESTS						Reduced section
Specimen number	Width (mm)	Thickness (mm)	Area (mm <sup>2</sup> )	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
1	20.01	3.83	76,838	-	527	Ductile-BM
2	20.02	3.82	76,476	-	502	Ductile-BM
Comments						

GUIDED BEND TESTS			
Type of test	Acceptance criteria	Result	Comments
Root bend	AWS D1.1	Acceptable	
Root bend	AWS D1.1	Acceptable	
Face bend	AWS D1.1	Acceptable	
Face bend	AWS D1.1	Acceptable	
Comments			

TOUGHNESS TESTS								
Specimen number	Notch location	Notch type	Specimen size (mm) x (mm)	Test temperature (°C)	Impact values (J)	Impact values (% Shear)		Drop weight break
1	Weld Metal	Charpy V	10 x 3	-40	29/34/36	-	-	No
2	HAZ	Charpy V	10 x 3	-40	34/48/38	-	-	No
3	HAZ + 1 mm	Charpy V	10 x 3	-40	55/47/48	-	-	No
4	HAZ + 2 mm	Charpy V	10 x 3	-40	52/52/53	-	-	No
5	HAZ + 5 mm	Charpy V	10 x 3	-40	48/48/51	-	-	No
Comments								

HARDNESS TEST						
Type (Scale)	Distance from surface	API 2W (50LS)	HAZ	Weld	HAZ	API 2W (50LS)
Vickers (HV)	Cap area 1-2 mm	170-172-170	192-208-218-218-214	203-211-211-211-208	209-207-203-208-208	169-167-167
Vickers (HV)	Cap area 1-2 mm	166-167-167	192-204-212-211-206	207-203-207-205-200	216-214-216-211-194	170-170-169
Comments						

OTHER TESTS			
Type of test	Acceptance criteria	Result	Comments
2x Macroscopic examination	AWS D1.1	Acceptable	
RT examination	AWS D1.1	Acceptable	
MT examination	AWS D1.1	Acceptable	
Comments			

CERTIFICATION				
Welder's name	ID Number	Stamp number	Mechanical testing by	Element Breda (NL)
Dorremans M.	ID Card IKP0996J6	W-013	Laboratory test number Test file number Tests conducted by	ARJ001-16-01-18390-1 ARL2064-1 A. Karstjanje

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of section 4 of ANSI/AWS D1.1 Structural Welding Code-Steel.

<b>INSPECTION</b>
1- APPROVED <input type="checkbox"/>
2- APPROVED AS NOTED <input checked="" type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024
SIGN:

Signature 1		Signature 2	
Name	Signature	Name	Signature
F. van Toledo		T. Konings(Lloyds)	
Date		Date	
1-6-2016		1-6-2016	

<input checked="" type="checkbox"/> Witnessed <input checked="" type="checkbox"/> Reviewed <input checked="" type="checkbox"/> Examined Ton Kraevigs <small>Overzigt Register Nederland BV</small>	
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PQRD number	ARL2064-1	Revision 1	Date	11-01-2016
PQR number	RET0278790/TK/001	Revision 1	Welding standard	AWS D1.1/D1.1M:2015
WPS number	S2600	Revision 1	Company name	Airpack Netherlands BV
			To be tested	Without PWHT

**WELDING PROCESSES**

Welding process	GMAW
Type	Semi-automatic

**BASE METALS**


Product form		Welded to:	Product form	
Material control number	816729 293819/1		Material control number	816729 293819/1
Specification (type or grade)	API 2W (50LS)		Specification (type or grade)	API 2W (50LS)
Nominal composition	C-Mn		Nominal composition	C-Mn
Trade name	Voestalpine Grobblech		Trade name	Voestalpine Grobblech
P number	U		P number	U
G number			G number	
AWS group number	II		AWS group number	II
Nominal pipe/tube size	-		Nominal pipe/tube size	-
Schedule	-		Schedule	-
Length (mm)	500		Length (mm)	500
Width (OD) (mm)	200		Width (OD) (mm)	200
Thickness (mm)	4		Thickness (mm)	4

**JOINTS**

Joint design	Single-V-groove	See addition information	See addition information
Backing:	None		
Retainers	None		
Groove angle (deg.)	60		
Root opening (mm)	2-3		
Root face (mm)	0-1		

**CLEANING/ROOT TREATMENT**

Surface preparation	Grinding
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 09 April 2024	
SIGN: 	

PQRD number	ARL2064-1	Revision 1	Date	11-01-2016
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**PASS INFORMATION**

Pass number	1	2	3
Layer number	1	2	2

**WELDING PROCESSES**

Welding process	GMAW	GMAW	GMAW
Type	Semi-automatic	Semi-automatic	Semi-automatic

**FILLER METALS**

Material control number	P1FC150311	P1FC150311	P1FC150311
SFA specification	5.18	5.18	5.18
AWS classification	E70C-6MH4	E70C-6MH4	E70C-6MH4
Filler metal F-number	6	6	6
Weld metal A-number	-	-	-
Filler metal nominal composition	N.A.	N.A.	N.A.
Filler metal trade name	Lincoln, Outershield MC715-H	Lincoln, Outershield MC715-H	Lincoln, Outershield MC715-H
Filler metal size (mm)	1,2	1,2	1,2
Length of filler metal consumed (mm)	-	-	-
Deposited thickness (mm)	2	2	2
Maximum pass thickness (mm)	3	3	3
Weld deposit chemistry	-	-	-
Supplemental filler metal	-	-	-
Supplemental filler metal vol. (mm <sup>3</sup> )	-	-	-

**POSITION**

Position	2G	2G	2G
Weld progression	-	-	-

**PREHEAT**

Preheat temperature (°C)	10	10	10
Maximum interpass temperature (°C)	10	69	124

**GAS**


Shielding gas: Type	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)
Flow rate (l/min)	15	15	15
Trailing gas: Type	None	None	None
Flow rate (l/min)	-	-	-
Backing gas: Type	None	None	None
Flow rate (l/min)	-	-	-

**ELECTRICAL**

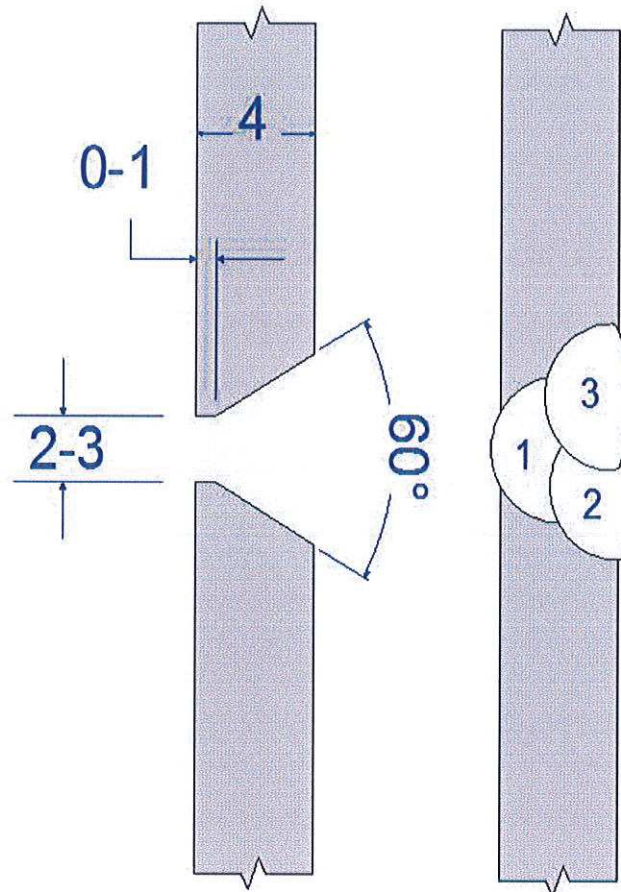
Filler metal size (mm)	1,2	1,2	1,2
Waveform control	Not Used	Not Used	Not Used
Energy (J)	-	-	-
Power (J/s)	-	-	-
Arc time (sec)	-	-	-
Weld bead length (mm)	-	-	-
Amperes	87	182	183
Volts	14.5	20.1	20.1
Travel speed (mm/min)	117	485	450
Maximum heat input (kJ/mm)	0,6469	0,4526	0,4904
Current/polarity	DCEP (reverse polarity)	DCEP (reverse polarity)	DCEP (reverse polarity)
Wire feed speed (m/min)	-	-	-
Arc transfer mode	Short-circuiting	Globular	Globular



**TECHNIQUE**

String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	15	15	15
C.T.W.D (mm)	15	15	15
Multi/single electrode	Single electrode	Single electrode	Single electrode
Multi/Single pass per side	Multiple passes	Multiple passes	Multiple passes
Peening	Not used	Not used	Not used
Initial/interpass cleaning	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding
Back gouging method	None	None	None

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
PREPARED DATE: 03/11/2014	
SIGN: <i>M. Reijnders</i>	

PQRD number	ARL2064-1	Revision 1	Date	11-01-2016
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 NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN: 	



**Airpack Netherlands BV**  
 Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands  
**AWS - Procedure Qualification Record (PQR)**  
 WeldOffice WPS

PQR record number	RET0278790/TK/002	Revision 1	WPS record number	S2700	Revision 1
Date	31-5-2016		Company name	Airpack Netherlands BV	
			Welding standard	AWS D1.1/D1.1M:2015	

**BASE METALS**

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (mm)	Dia. (mm)
<b>Welded to:</b>	Plate	API 2W (50LS)	U	II	-	-	8	-
	Plate	API 2W (50LS)	U	II	-	-	8	-
<b>and tested:</b>	Without PWHT, With impacts, With hardness							
<b>Notes</b>								

**JOINTS**

Joint design	Single-V-groove	<b>See addition information</b>	<b>See addition information</b>
Backing:	None		
Retainers	None		
Groove angle (deg.)	60		
Root opening (mm)	2-3		
Root face (mm)	0-1		

**WELDING PROCESSES**

Welding process	GMAW
Type	Semi-automatic

**FILLER METALS**

SFA specification	5.18
AWS classification	E70C-6MH4
Filler metal F-number	6
Weld metal A-number	-
Filler metal nominal composition	N.A.
Filler metal trade name	Lincoln, Outershield MC715-H
Filler metal size (mm)	1,2
Deposited thickness (mm)	6,00
Maximum pass thickness (mm)	3
Weld deposit chemistry	-
Supplemental filler metal	-
Supplemental filler metal vol. (mm <sup>3</sup> )	-

**POSITION**

Position	2G
Weld progression	-

**PREHEAT**

Preheat temperature (°C)	10
Maximum interpass temperature (°C)	178

**GAS**

Shielding gas:	Type	AC-20 (A5.32 SG-)
	Flow rate (l/min)	15
Trailing gas:	Type	None
	Flow rate (l/min)	-
Backing gas:	Type	None
	Flow rate (l/min)	-

**ELECTRICAL**

Filler metal size (mm)	1,2
Waveform control	Not Used
Energy (J)	Not Used
Power (J/s)	Not Used
Arc time (sec)	Not Used
Weld bead length (mm)	Not Used
Amperes	130 - 197
Volts	15,9 - 22,2
Travel speed (mm/min)	142 - 383
Maximum heat input (kJ/mm)	0,67 - 0,67
Current/polarity	DCEP (reverse polarity)
Wire feed speed (m/min)	0
Arc transfer mode	Short-circuiting, Globular

**TECHNIQUE**

String or weave	Stringer and Weave
Orifice/gas cup size	15
C.T.W.D (mm)	15
Multi/single electrode	Single electrode
Multi/Single pass per side	Multiple passes
Peening	Not used
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

<b>INSPECTION</b>	
1- APPROVED <input checked="" type="checkbox"/>	2- APPROVED AS NOTED <input checked="" type="checkbox"/>
3- NOT APPROVED <input type="checkbox"/>	
BY: M. REZAEI DATE: 09 April 2024	
SIGN:	



**Airpack Netherlands BV**  
 Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands  
**AWS - Procedure Qualification Record (PQR) - Test results (as welded)**  
 WeldOffice WPS

PQR record number Date	RET0278790/TK002 31-5-2016	Revision 1	WPS record number Company name Welding standard	S2700 Airpack Netherlands BV AWS D1.1/D1.1M:2015	Revision 1
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TENSILE TESTS						Reduced section
Specimen number	Width (mm)	Thickness (mm)	Area (mm <sup>2</sup> )	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
1	20.03	7.23	144,817	-	529	Ductile-BM
2	20.03	7.28	145,818	-	530	Ductile-BM

Comments

GUIDED BEND TESTS			
Type of test	Acceptance criteria	Result	Comments
Face bend	AWS D1.1	Acceptable	
Face bend	AWS D1.1	Acceptable	
Root bend	AWS D1.1	Acceptable	
Root bend	AWS D1.1	Acceptable	

Comments

TOUGHNESS TESTS								
Specimen number	Notch location	Notch type	Specimen size (mm) x (mm)	Test temperature (°C)	(J)	Impact values (% Shear)	(mm)	Drop weight break
1	Weld Metal	Charpy V	10 x 5	-40	56/56/60	-	-	No
2	HAZ	Charpy V	10 x 5	-40	51/69/60	-	-	No
3	HAZ + 1 mm	Charpy V	10 x 5	-40	115/104/84	-	-	No
4	HAZ + 2 mm	Charpy V	10 x 5	-40	104/99/100	-	-	No
5	HAZ + 5 mm	Charpy V	10 x 5	-40	119/115/104	-	-	No

Comments

HARDNESS TEST						
Type (Scale)	Distance from surface	API 2W (50LS)	HAZ	Weld	HAZ	API 2W (50LS)
Vickers (HV)	Cap area 1-2 mm	166-164-164	184-193-204-205-204	213-214-217-199-211	205-199-198-196-186	167-170=170
Vickers (HV)	Root area 1-2 mm	171-169-165	186-198-206-206-188	173-184-186-188-187	187-186-186-188-170	165-166-164
Vickers (HV)	Cap area 1-2 mm	165-168-167	197-206-211-211-211	220-221-207-208-219	209-211-207-209-198	168-165-166
Vickers (HV)	Root area 1-2 mm	167-170-164	187-199-196-191-207	192-196-188-194-189	178-186-180-175-174	162-163-166

Comments

OTHER TESTS			
Type of test	Acceptance criteria	Result	Comments
2x Macroscopic examination	AWS D1.1	Acceptable	
RT examination	AWS D1.1	Acceptable	
MT examination	AWS D1.1	Acceptable	

Comments

CERTIFICATION			
Welder's name	ID Number	Stamp number	Mechanical testing by
Dorremans M.	ID Card IKP0996J6	W-013	Laboratory test number Test file number Tests conducted by
			Element Breda (NL) ARJ001-16-01-18390-2 ARL2064-2 A. Karstarje

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of section 4 of ANSI/AWS D1.1 Structural Welding Code-Steel.

	<b>INSPECTION</b>
1- APPROVED <input type="checkbox"/>	2- APPROVED AS NOTED <input checked="" type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN:	

Signature 1		Signature 2	
Name	Signature	Name	Signature
F. van Toledo		T. Konings (Lloyds)	
Date		Date	
1-6-2016		1-6-2016	

<input checked="" type="checkbox"/> Witnessed <input checked="" type="checkbox"/> Reviewed <input checked="" type="checkbox"/> Examined <input checked="" type="checkbox"/> Non Konings	 Lloyd's Register Energy Energy Register Netherlands B.V.
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PQRD number	ARL2064-2	Revision 1	Date	11-01-2016
PQR number	RET0278790/TK/002	Revision 1	Welding standard	AWS D1.1/D1.1M:2015
WPS number	S2700	Revision 1	Company name	Airpack Netherlands BV
			To be tested	Without PWHT

**WELDING PROCESSES**

Welding process Type	GMAW Semi-automatic
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**BASE METALS**

Product form	Plate
Material control number	816729 293819/1
Specification (type or grade)	API 2W (50LS)
Nominal composition	C-Mn
Trade name	Voestalpine Grobblech
P number	U
G number	
AWS group number	II
Nominal pipe/tube size	-
Schedule	-
Length (mm)	500
Width (OD) (mm)	200
Thickness (mm)	8

Welded to:		
Product form	Plate	
Material control number	816729 293819/1	
Specification (type or grade)	API 2W (50LS)	
Nominal composition	C-Mn	
Trade name	Voestalpine Grobblech	
P number	U	
G number		
AWS group number	II	
Nominal pipe/tube size	-	
Schedule	-	
Length (mm)	500	
Width (OD) (mm)	200	
Thickness (mm)	8	

**JOINTS**

Joint design	Single-V-groove	See addition information	See addition information
Backing:	None		
Retainers	None		
Groove angle (deg)	60		
Root opening (mm)	2-3		
Root face (mm)	0-1		

**CLEANING/ROOT TREATMENT**

Surface preparation	Grinding
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 09 April 2024	
SIGN:	



PQRD number	ARL2064-2	Revision 1	Date	11-01-2016
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<b>PASS INFORMATION</b>				
Pass number	1	2	3	4
Layer number	1	2	3	3

<b>WELDING PROCESSES</b>				
Welding process	GMAW	GMAW	GMAW	GMAW
Type	Semi-automatic	Semi-automatic	Semi-automatic	Semi-automatic

<b>FILLER METALS</b>				
Material control number	P1FC150311	P1FC150311	P1FC150311	P1FC150311
SFA specification	5.18	5.18	5.18	5.18
AWS classification	E70C-6MH4	E70C-6MH4	E70C-6MH4	E70C-6MH4
Filler metal F-number	6	6	6	6
Weld metal A-number	-	-	-	-
Filler metal nominal composition	N.A.	N.A.	N.A.	N.A.
Filler metal trade name	Lincoln, Outershield MC715-H	Lincoln, Outershield MC715-H	Lincoln, Outershield MC715-H	Lincoln, Outershield MC715-H
Filler metal size (mm)	1,2	1,2	1,2	1,2
Length of filler metal consumed (mm)	-	-	-	-
Deposited thickness (mm)	2	2	2	2
Maximum pass thickness (mm)	3	3	3	3
Weld deposit chemistry	-	-	-	-
Supplemental filler metal	-	-	-	-
Supplemental filler metal vol. (mm <sup>3</sup> )	-	-	-	-

<b>POSITION</b>				
Position	2G	2G	2G	2G
Weld progression	-	-	-	-

<b>PREHEAT</b>				
Preheat temperature (°C)	10	10	10	10
Maximum interpass temperature (°C)	10	69	129	178

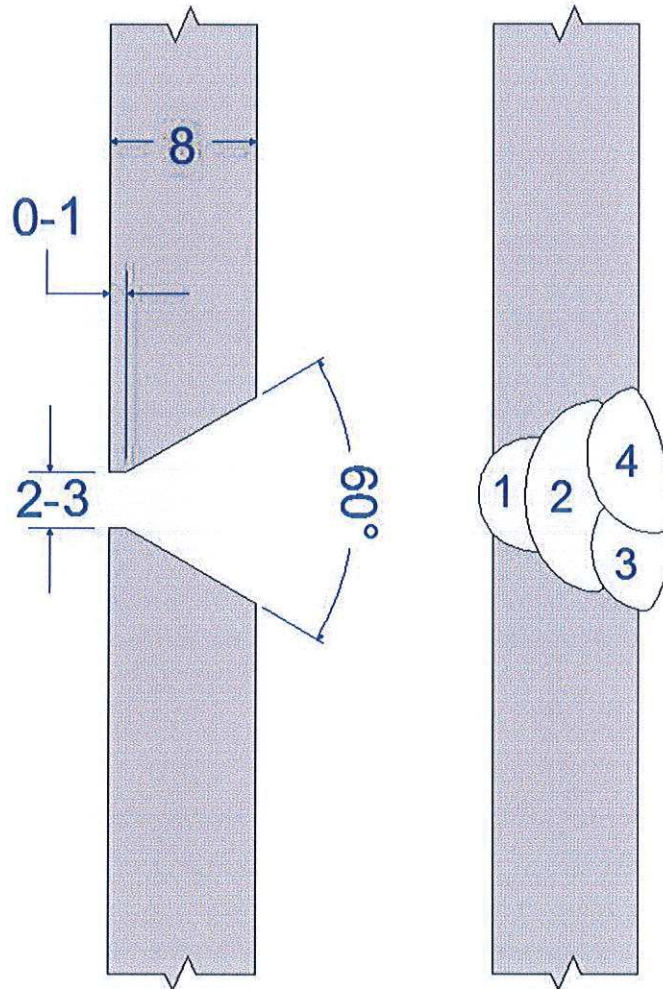
<b>GAS</b>				
Shielding gas: Type	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)
Flow rate (l/min)	15	15	15	15
Trailing gas: Type	None	None	None	None
Flow rate (l/min)	-	-	-	-
Backing gas: Type	None	None	None	None
Flow rate (l/min)	-	-	-	-



<b>ELECTRICAL</b>				
Filler metal size (mm)	1,2	1,2	1,2	1,2
Waveform control	Not Used	Not Used	Not Used	
Energy (J)	-	-	-	
Power (J/s)	-	-	-	
Arc time (sec)	-	-	-	
Weld bead length (mm)	-	-	-	
Amperes	130	196	197	194
Volts	15,9	21,7	22,2	22,2
Travel speed (mm/min)	142	340	383	355
Maximum heat input (kJ/mm)	0,8734	0,7506	0,679	0,7214
Current/polarity	DCEP (reverse polarity)	DCEP (reverse polarity)	DCEP (reverse polarity)	DCEP (reverse polarity)
Wire feed speed (m/min)	-	-	-	-
Arc transfer mode	Short-circuiting	Globular	Globular	Globular

<b>TECHNIQUE</b>				
String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	15	15	15	15
C.T.W.D (mm)	15	15	15	15
Multi/single electrode	Single electrode	Single electrode	Single electrode	Single electrode
Multi/Single pass per side	Multiple passes	Multiple passes	Multiple passes	Multiple passes
Peening	Not used	Not used	Not used	Not used
Initial/interpass cleaning	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding
Back gouging method	None	None	None	None

 <b>INSPECTION</b>
1. APPROVED <input type="checkbox"/> 2. APPROVED AS NOTED <input checked="" type="checkbox"/> 3. NOT APPROVED <input type="checkbox"/> DATE: 03/01/2016 SIGN: <i>M. Rijk</i>

PQRD number	ARL2064-2	Revision 1	Date	11-01-2016
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 <b>NARGAN COMPANY</b>	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI    DATE: 09 April 2024	
SIGN: 	

<input type="checkbox"/> Witnessed <input checked="" type="checkbox"/> Reviewed <input type="checkbox"/> Examined <input type="checkbox"/> Test Kovings	 Lloyd's Register Energy
	

# PQR

## CS PIPING

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN: 	

# Airpack Netherlands BV

Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Procedure Qualification Record (PQR) - QW-483

WeldOffice WPS



PQR record number	RET 0245029-001-17	Revision 0	WPS record number	P2000	Revision 1
Date	13-6-2012		Company name	Airpack Netherlands BV	
			Welding standard	ASME Section IX:2010 including addenda 2011	

### BASE METALS (QW-403)

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (mm)	Dia. (mm)
Welded to:	Pipe/Tube	SA-333 (6)	1	1	63,50	Standard	5,16	73,03
	Pipe/Tube	SA-333 (6)	1	1	63,50	Standard	5,16	73,03
and tested:	Without PWHT, With impacts							
Notes								

### JOINTS (QW-402)

Joint design	Single-V-groove	See addition information	See addition information
Backing:	None		
Retainers	None		
Groove angle (deg.)	60		
Root opening (mm)	4		
Root face (mm)	0-1		

### WELDING PROCESSES

Welding process	GTAW
Type	Manual

### FILLER METALS (QW-404)

SFA specification	5.18
AWS classification	ER70S-3
Filler metal F-number	6
Weld metal A-number	1
Filler metal nominal composition	N.A.
Filler metal trade name	Lincoln Electric, LNT 25
Filler metal size (mm)	2,4
Deposited thickness (mm)	5,16
Maximum pass thickness (mm)	4
Weld deposit chemistry	-

### POSITION (QW-405)

Position	6G
Weld progression	Uphill

### PREHEAT (QW-406)

Preheat temperature (°C)	10
Maximum interpass temperature (°C)	166

### GAS (QW-408)

Shielding gas: Type	Argon (A5.32 SG-A)
Flow rate (l/min)	14
Trailing gas: Type	None
Flow rate (l/min)	-
Backing gas: Type	None
Flow rate (l/min)	-

### ELECTRICAL (QW-409)

Filler metal size (mm)	2,4
Amperes	97 - 101
Volts	9,6 - 10,3
Travel speed (mm/min)	33 - 69
Maximum heat input (kJ/mm)	1,8165
Tungsten size (mm)	2,4
Tungsten type	SFA 5.12 EWCe-2
Current/polarity	DCEN (straight polarity)
DC pulsing current	None

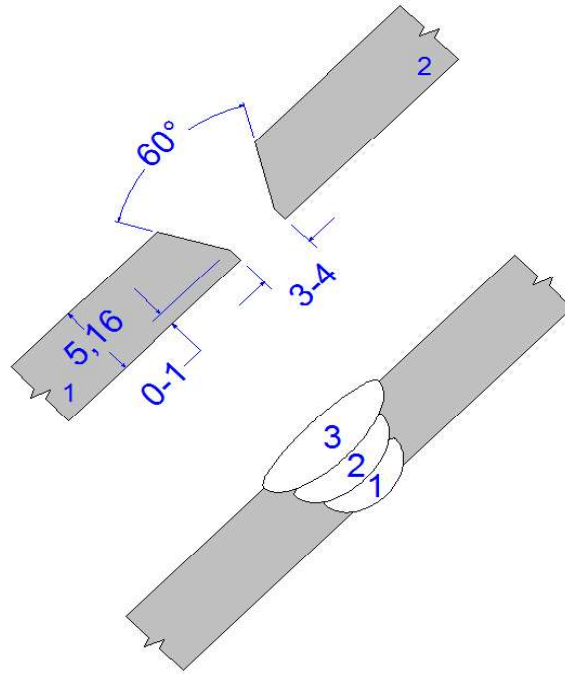
NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN:	

### TECHNIQUE (QW-410)

String or weave	Stringer and Weave
Orifice/gas cup size	9,5
Multi/Single pass per side	Multiple passes
Peening	Not used
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None



PQR record number	RET 0245029-001-17	Revision 0	WPS record number	P2000	Revision 1
Date	13-6-2012		Company name	Airpack Netherlands BV	
			Welding standard	ASME Section IX:2010 including addenda 2011	



Pipe diameter 2½" x STD (73,0,3x5,15 mm)

 <b>NARGAN COMPANY</b>	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI	DATE: 03 April 2014
SIGN:	



# Airpack Netherlands BV

Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Welding conditions - (PQRD Welding Data Record)

WeldOffice WPS



PQRD number	ARL1559-1	Revision 0	Date	29-5-2012
PQR number	RET 0245029-001-17	Revision 0	Welding standard	ASME Section IX:2010 including addenda 2011
WPS number	P2000	Revision 1	Company name	Airpack Netherlands BV
			To be tested	Without PWHT

### WELDING PROCESSES

Welding process	GTAW
Type	Manual

### BASE METALS (QW-403)

Product form	Pipe/Tube
Material control number	353566
Specification (type or grade)	SA-333 (6)
Nominal composition	C-Mn-Si
Trade name	Vallourec & Mannesmann
P number	1
G number	1
AWS group number	U
Nominal pipe/tube size	63,50
Schedule	Standard
Length (mm)	150
Width (OD) (mm)	73,03
Thickness (mm)	5,16

Welded to:

Product form	Pipe/Tube
Material control number	353566
Specification (type or grade)	SA-333 (6)
Nominal composition	C-Mn-Si
Trade name	Vallourec & Mannesmann
P number	1
G number	1
AWS group number	U
Nominal pipe/tube size	63,50
Schedule	Standard
Length (mm)	150
Width (OD) (mm)	73,03
Thickness (mm)	5,16

### JOINTS (QW-402)

Joint design	Single-V-groove	See addition information	See addition information
Backing:	None		
Retainers	None		
Groove angle (deg.)	60		
Root opening (mm)	4		
Root face (mm)	0-1		

### CLEANING/ROOT TREATMENT

Surface preparation	Grinding
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2012	
SIGN:	

# Airpack Netherlands BV

Groenewegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Welding parameters - (PQRD Welding Data Record)

WeldOffice WPS



PQRD number	ARL1559-1	Revision 0	Date	29-5-2012
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### PASS INFORMATION

Pass number	1	2	3
Layer number	1	2	3

### WELDING PROCESSES

Welding process	GTAW	GTAW	GTAW
Type	Manual	Manual	Manual

### FILLER METALS (QW-404)

Material control number	334136	334136	334136
SFA specification	5.18	5.18	5.18
AWS classification	ER70S-3	ER70S-3	ER70S-3
Filler metal F-number	6	6	6
Weld metal A-number	1	1	1
Filler metal nominal composition	N.A.	N.A.	N.A.
Filler metal trade name	Lincoln Electric, LNT 25	Lincoln Electric, LNT 25	Lincoln Electric, LNT 25
Filler metal size (mm)	2,4	2,4	2,4
Length of filler metal consumed (mm)	-	-	-
Deposited thickness (mm)	3	3	3
Maximum pass thickness (mm)	4	4	4
Weld deposit chemistry	-	-	-
Flux nominal composition	N.A.	N.A.	N.A.
Flux trade name	N.A.	N.A.	N.A.

### POSITION (QW-405)

Position	6G	6G	6G
Weld progression	Uphill	Uphill	Uphill

### PREHEAT (QW-406)

Preheat temperature (°C)	10	10	10
Maximum interpass temperature (°C)	10	112	166

### GAS (QW-408)

Shielding gas: Type	Argon (A5.32 SG-A)	Argon (A5.32 SG-A)	Argon (A5.32 SG-A)
Flow rate (l/min)	14	14	14
Trailing gas: Type	None	None	None
Flow rate (l/min)	-	-	-
Backing gas: Type	None	None	None
Flow rate (l/min)	-	-	-

### ELECTRICAL (QW-409)

Filler metal size (mm)	2,4	2,4	2,4
Amperes	97	101	97
Volts	10.1	9.6	10.3
Travel speed (mm/min)	64	69	33
Maximum heat input (kJ/mm)	0,9185	0,8431	1,8165
Tungsten size (mm)	2,4	2,4	2,4
Tungsten type	SFA 5.12 EWCe-2	SFA 5.12 EWCe-2	SFA 5.12 EWCe-2
Current/polarity	DCEN (straight polarity)	DCEN (straight polarity)	DCEN (straight polarity)
DC pulsing current	None	None	None

### TECHNIQUE (QW-410)

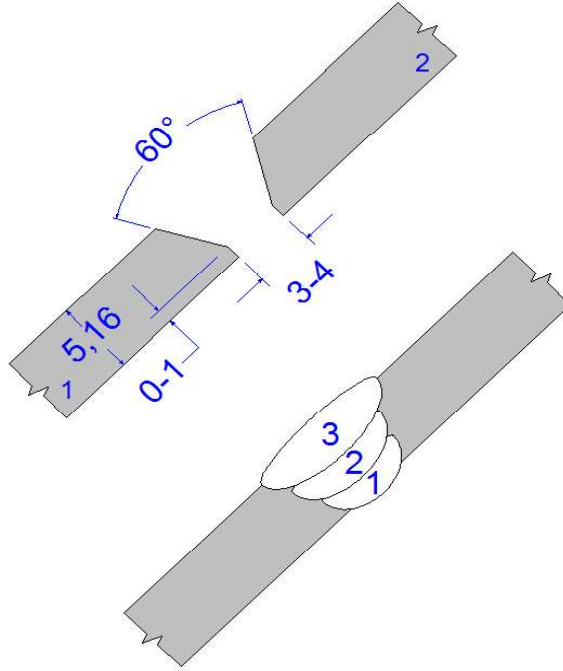
String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	9,5	9,5	9,5
Multi/Single pass per side	Multiple passes	Multiple passes	Multiple passes
Peening	Not used	Not used	Not used
Initial/interpass cleaning	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding
Back gouging method	None	None	None

NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2012	
SIGN:	



### PASS PERFORMED/WITNESSED BY

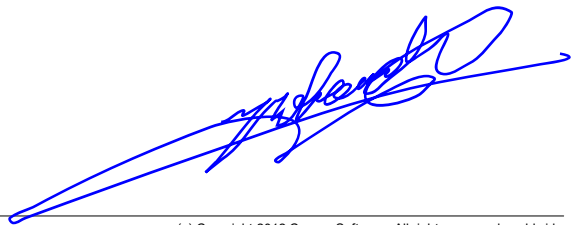
Welders name	A. Sumantri	A. Sumantri	A. Sumantri
Recorded/witnessed by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)
Date	29-5-2012	29-5-2012	29-5-2012
Data entry by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)

PQRD number	ARL1559-1	Revision 0	Date	29-5-2012
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Pipe diameter 2½" x STD (73,0,3x5,15 mm)

 NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI	DATE: 03 April 2012
SIGN:	



# Airpack Netherlands BV

Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Procedure Qualification Record (PQR) - QW-483

WeldOffice WPS



PQR record number	RET 0245029-001-19	Revision 0	WPS record number	P2500	Revision 0
Date	13-6-2012		Company name	Airpack Netherlands BV	
			Welding standard	ASME Section IX:2010 including addenda 2011	

### BASE METALS (QW-403)

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (mm)	Dia. (mm)
Welded to:	Pipe/Tube	SA-350 (LF2)	1	2	63,50	Standard	5,16	73,03
	Pipe/Tube	SA-350 (LF2)	1	2	63,50	Standard	5,16	73,03
and tested:	Without PWHT, With impacts							
Notes								

### JOINTS (QW-402)

Joint design	Single-V-groove	See addition information	See addition information
Backing:	None		
Retainers	None		
Groove angle (deg.)	30		
Root opening (mm)	4		
Root face (mm)	0-1		

Test specimen for PQR is not pipe and it is flanges.

### WELDING PROCESSES

Welding process	GTAW
Type	Manual

### FILLER METALS (QW-404)

SFA specification	5.18
AWS classification	ER70S-3
Filler metal F-number	6
Weld metal A-number	1
Filler metal nominal composition	N.A.
Filler metal trade name	Lincoln Electric, LNT 25
Filler metal size (mm)	2,4
Deposited thickness (mm)	5,16
Maximum pass thickness (mm)	4
Weld deposit chemistry	-

### POSITION (QW-405)

Position	6G
Weld progression	-

### PREHEAT (QW-406)

Preheat temperature (°C)	10
Maximum interpass temperature (°C)	167

### GAS (QW-408)

Shielding gas: Type	Argon (A5.32 SG-A)
Flow rate (l/min)	14
Trailing gas: Type	None
Flow rate (l/min)	-
Backing gas: Type	None
Flow rate (l/min)	-

### ELECTRICAL (QW-409)

Filler metal size (mm)	2,4
Amperes	93 - 98
Volts	9,6 - 10,6
Travel speed (mm/min)	37 - 58
Maximum heat input (kJ/mm)	1,65
Tungsten size (mm)	2,4
Tungsten type	SFA 5.12 EWCe-2
Current/polarity	DCEN (straight polarity)
DC pulsing current	None

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2024	
SIGN:	

### TECHNIQUE (QW-410)

String or weave	Stringer and Weave
Orifice/gas cup size	9,5
Multi/Single pass per side	Multiple passes
Peening	Not used
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

# Airpack Netherlands BV

Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Procedure Qualification Record (PQR) - Test results (as welded)

WeldOffice WPS



PQR record number	RET 0245029-001-19	Revision 0	WPS record number	P2500	Revision 0
Date	13-6-2012		Company name	Airpack Netherlands BV	
			Welding standard	ASME Section IX:2010 including addenda 2011	

### TENSILE TESTS (QW-150)

Reduced section

Specimen number	Width (mm)	Thickness (mm)	Area (mm <sup>2</sup> )	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
1	19.04	4.62	87,965	-	536 N/mm <sup>2</sup>	Ductile-Base Metal
2	19.05	4.64	88,392	-	537 N/mm <sup>2</sup>	Ductile-Weld

Comments

### GUIDED BEND TESTS (QW-160)

Type of test	Acceptance criteria	Result	Comments
Root bend	QW 163	Acceptable	
Root bend	QW 163	Acceptable	
Face bend	QW 163	Acceptable	
Face bend	QW 163	Acceptable	

Comments

### TOUGHNESS TESTS (QW-170)

Specimen number	Notch location	Notch type	Specimen size (mm) x (mm)	Test temperature (°C)	Impact values			Drop weight break
					(J)	(% Shear)	(mm)	
1	Weld Metal	Charpy V	10 x 4	-55	20	-	-	-
2	Weld Metal	Charpy V	10 x 4	-55	43	-	-	-
3	Weld Metal	Charpy V	10 x 4	-55	34	-	-	-
4	HAZ	Charpy V	10 x 4	-55	43	-	-	-
5	HAZ	Charpy V	10 x 4	-55	10	-	-	-
6	HAZ	Charpy V	10 x 4	-55	34	-	-	-

Comments

### CERTIFICATION

Welder's name	ID Number	Stamp number	Mechanical testing by	Schielab BV Breda (NLD)
A. Sumantri	ID Card IXH4P6551	A1	Laboratory test number	SL 12.6045-1A
			Test file number	ARL1559-3
			Tests conducted by	A. Karstanje

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2012	
SIGN:	

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

### Signature 1

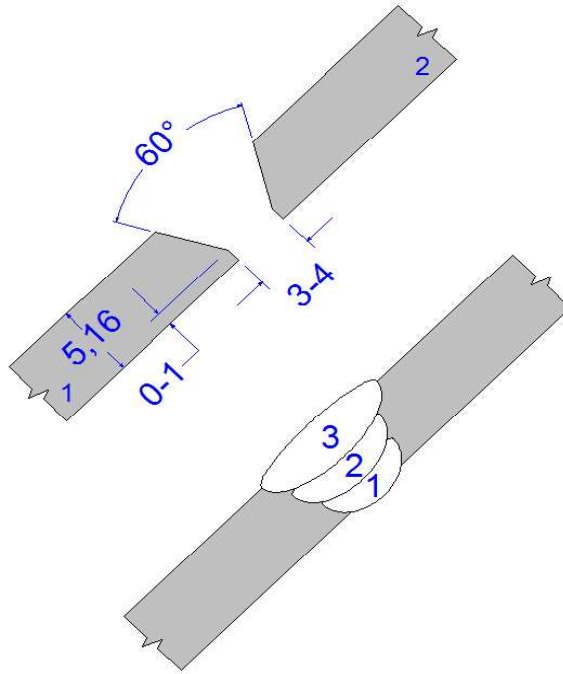
Name	Signature
Franky van Toledo	
Date	
8-6-2012	

### Signature 2



Name	Signature
W. Komdeur (Lloyds)	
Date	
8-6-2012	

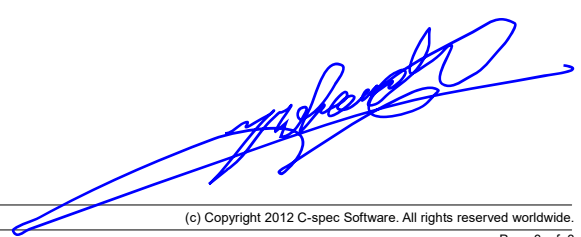
Lloyd's Register Nederland B.V. A member of the Lloyd's Register group	
Wim Komdeur	
Lloyd's Register	

PQR record number	RET 0245029-001-19	Revision 0	WPS record number	P2500	Revision 0
Date	13-6-2012		Company name	Airpack Netherlands BV	
			Welding standard	ASME Section IX:2010 including addenda 2011	



Pipe diameter 2½" x STD (73,0,3x5,15 mm)

 NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI	DATE: 03 April 2024
SIGN:	



# Airpack Netherlands BV

Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Welding conditions - (PQRD Welding Data Record)

WeldOffice WPS



PQRD number	ARL1559-3	Revision 0	Date	29-5-2012
PQR number	RET 0245029-001-19	Revision 0	Welding standard	ASME Section IX:2010 including addenda 2011
WPS number	P2500	Revision 0	Company name	Airpack Netherlands BV
			To be tested	Without PWHT

### WELDING PROCESSES

Welding process	GTAW
Type	Manual

### BASE METALS (QW-403)

Product form	Pipe/Tube
Material control number	29685
Specification (type or grade)	SA-350 (LF2)
Nominal composition	C-Mn-Si
Trade name	Sochorvá válcovna S.A.
P number	1
G number	2
AWS group number	U
Nominal pipe/tube size	63,50
Schedule	Standard
Length (mm)	150
Width (OD) (mm)	73,03
Thickness (mm)	5,16

Welded to:

Product form	Pipe/Tube
Material control number	29685
Specification (type or grade)	SA-350 (LF2)
Nominal composition	C-Mn-Si
Trade name	Sochorvá válcovna S.A.
P number	1
G number	2
AWS group number	U
Nominal pipe/tube size	63,50
Schedule	Standard
Length (mm)	150
Width (OD) (mm)	73,03
Thickness (mm)	5,16

### JOINTS (QW-402)

Joint design	Single-V-groove	See addition information	See addition information
Backing:	None		
Retainers	None		
Groove angle (deg.)	60		
Root opening (mm)	4		
Root face (mm)	0-1		

### CLEANING/ROOT TREATMENT

Surface preparation	Grinding
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2012	
SIGN:	

# Airpack Netherlands BV

Groenewegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Welding parameters - (PQRD Welding Data Record)

WeldOffice WPS



PQRD number	ARL1559-3	Revision 0	Date	29-5-2012
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### PASS INFORMATION

Pass number	1	2	3
Layer number	1	2	3

### WELDING PROCESSES

Welding process	GTAW	GTAW	GTAW
Type	Manual	Manual	Manual

### FILLER METALS (QW-404)

Material control number	334136	334136	334136
SFA specification	5.18	5.18	5.18
AWS classification	ER70S-3	ER70S-3	ER70S-3
Filler metal F-number	6	6	6
Weld metal A-number	1	1	1
Filler metal nominal composition	N.A.	N.A.	N.A.
Filler metal trade name	Lincoln Electric, LNT 25	Lincoln Electric, LNT 25	Lincoln Electric, LNT 25
Filler metal size (mm)	2,4	2,4	2,4
Length of filler metal consumed (mm)	-	-	-
Deposited thickness (mm)	3	3	3
Maximum pass thickness (mm)	4	4	4
Weld deposit chemistry	-	-	-
Flux nominal composition	N.A.	N.A.	N.A.
Flux trade name	N.A.	N.A.	N.A.

### POSITION (QW-405)

Position	6G	6G	6G
Weld progression	-	-	-

### PREHEAT (QW-406)

Preheat temperature (°C)	10	10	10
Maximum interpass temperature (°C)	10	154	167

### GAS (QW-408)


Shielding gas: Type	Argon (A5.32 SG-A)	Argon (A5.32 SG-A)	Argon (A5.32 SG-A)
Flow rate (l/min)	14	14	14
Trailing gas: Type	None	None	None
Flow rate (l/min)	-	-	-
Backing gas: Type	None	None	None
Flow rate (l/min)	-	-	-

### ELECTRICAL (QW-409)

Filler metal size (mm)	2,4	2,4	2,4
Amperes	93	98	96
Volts	9.6	9.9	10.6
Travel speed (mm/min)	58	54	37
Maximum heat input (kJ/mm)	0,9236	1,078	1,6502
Tungsten size (mm)	2,4	2,4	2,4
Tungsten type	SFA 5.12 EWCe-2	SFA 5.12 EWCe-2	SFA 5.12 EWCe-2
Current/polarity	DCEN (straight polarity)	DCEN (straight polarity)	DCEN (straight polarity)
DC pulsing current	None	None	None

### TECHNIQUE (QW-410)

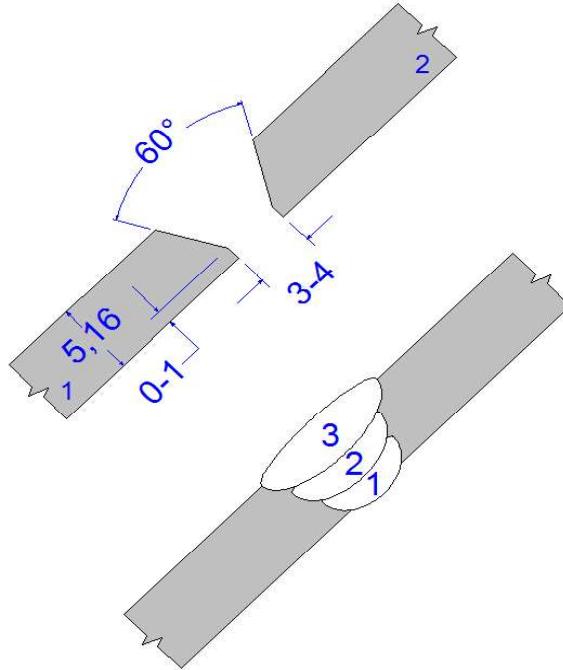
String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	9,5	9,5	9,5
Multi/Single pass per side	Multiple passes	Multiple passes	Multiple passes
Peening	Not used	Not used	Not used
Initial/interpass cleaning	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding
Back gouging method	None	None	None

NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI	DATE: 23 April 2012
	

### PASS PERFORMED/WITNESSED BY

Welders name	A. Sumantri	A. Sumantri	A. Sumantri
Recorded/witnessed by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)
Date	29-5-2012	29-5-2012	29-5-2012
Data entry by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)

PQRD number	ARL1559-3	Revision 0	Date	29-5-2012
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Pipe diameter 2½" x STD (73,0,3x5,15 mm)

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2012	
SIGN: 	



# PQR

## SS PIPING

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 23 April 2024	
SIGN: 	

# Airpack Netherlands BV

Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Procedure Qualification Record (PQR) - QW-483

WeldOffice WPS



PQR record number	RET 0245029-001-21	Revision 1	WPS record number	P3000	Revision 1
Date	13-6-2012		Company name	Airpack Netherlands BV	
			Welding standard	ASME Section IX:2010 including addenda 2011	

### BASE METALS (QW-403)

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (mm)	Dia. (mm)
Welded to:	Pipe/Tube	SA-312 (TP316L)	8	1	63,50	160	9,53	73,03
	Pipe/Tube	SA-312 (TP316L)	8	1	63,50	160	9,53	73,03
and tested:	Without PWHT							
Notes								

### JOINTS (QW-402)

Joint design	Single-V-groove	See addition information	See addition information
Backing:	None		
Retainers	None		
Groove angle (deg.)	60		
Root opening (mm)	4		
Root face (mm)	0-1		

### WELDING PROCESSES

Welding process	GTAW
Type	Manual

### FILLER METALS (QW-404)

SFA specification	5.9	
AWS classification	ER316LSi	
Filler metal F-number	6	
Weld metal A-number	8	
Filler metal nominal composition	N.A.	
Filler metal trade name	Lincoln Electric, LNT 316LSi	
Filler metal size (mm)	2,0	2,4
Deposited thickness (mm)	9,53	
Maximum pass thickness (mm)	4	
Weld deposit chemistry	-	

### POSITION (QW-405)

Position	6G
Weld progression	Uphill

### PREHEAT (QW-406)

Preheat temperature (°C)	10
Maximum interpass temperature (°C)	132

### GAS (QW-408)

Shielding gas: Type	Argon (A5.32 SG-A)		
Flow rate (l/min)	14		14
Trailing gas: Type	None		
Flow rate (l/min)	-		-
Backing gas: Type	95%N2 - 5%H2		
Flow rate (l/min)	12		12

### ELECTRICAL (QW-409)

Filler metal size (mm)	2,0	2,4
Amperes	84	92 - 94
Volts	10,1	9,7 - 10,4
Travel speed (mm/min)	58	30 - 62
Maximum heat input (kJ/mm)	0,87	1,93
Tungsten size (mm)	2,4	
Tungsten type	SFA 5.12 EWCe-2	
Current/polarity	DCEN (straight polarity)	DCEN (straight polarity)
DC pulsing current	None	

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI	DATE: 03 April 2012
SIGN:	

### TECHNIQUE (QW-410)

String or weave	Stringer and Weave
Orifice/gas cup size	9,5
Multi/Single pass per side	Multiple passes
Peening	Not used
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

# Airpack Netherlands BV

Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Procedure Qualification Record (PQR) - Test results (as welded)

WeldOffice WPS



PQR record number	RET 0245029-001-21	Revision 1	WPS record number	P3000	Revision 1
Date	13-6-2012		Company name	Airpack Netherlands BV	
			Welding standard	ASME Section IX:2010 including addenda 2011	

### TENSILE TESTS (QW-150)

Reduced section

Specimen number	Width (mm)	Thickness (mm)	Area (mm <sup>2</sup> )	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
1	19.00	9.42	178,980	-	555 N/mm <sup>2</sup>	
2	19.00	9.30	176,700	-	581 N/mm <sup>2</sup>	

Comments	
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### GUIDED BEND TESTS (QW-160)

Type of test	Acceptance criteria	Result	Comments
Face bend	QW 163	Acceptable	
Face bend	QW 163	Acceptable	
Root bend	QW 163	Acceptable	
Root bend	QW 163	Acceptable	

Comments	
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### CERTIFICATION

Welder's name	ID Number	Stamp number	Mechanical testing by	
A. Sumantri	ID Card IXH4P6551	A1	Laboratory test number	Schielab BV Breda (NLD)
			Test file number	SL 12.6047-1A
			Tests conducted by	ARL1559-5 A. Karstanje

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2012	
SIGN:	

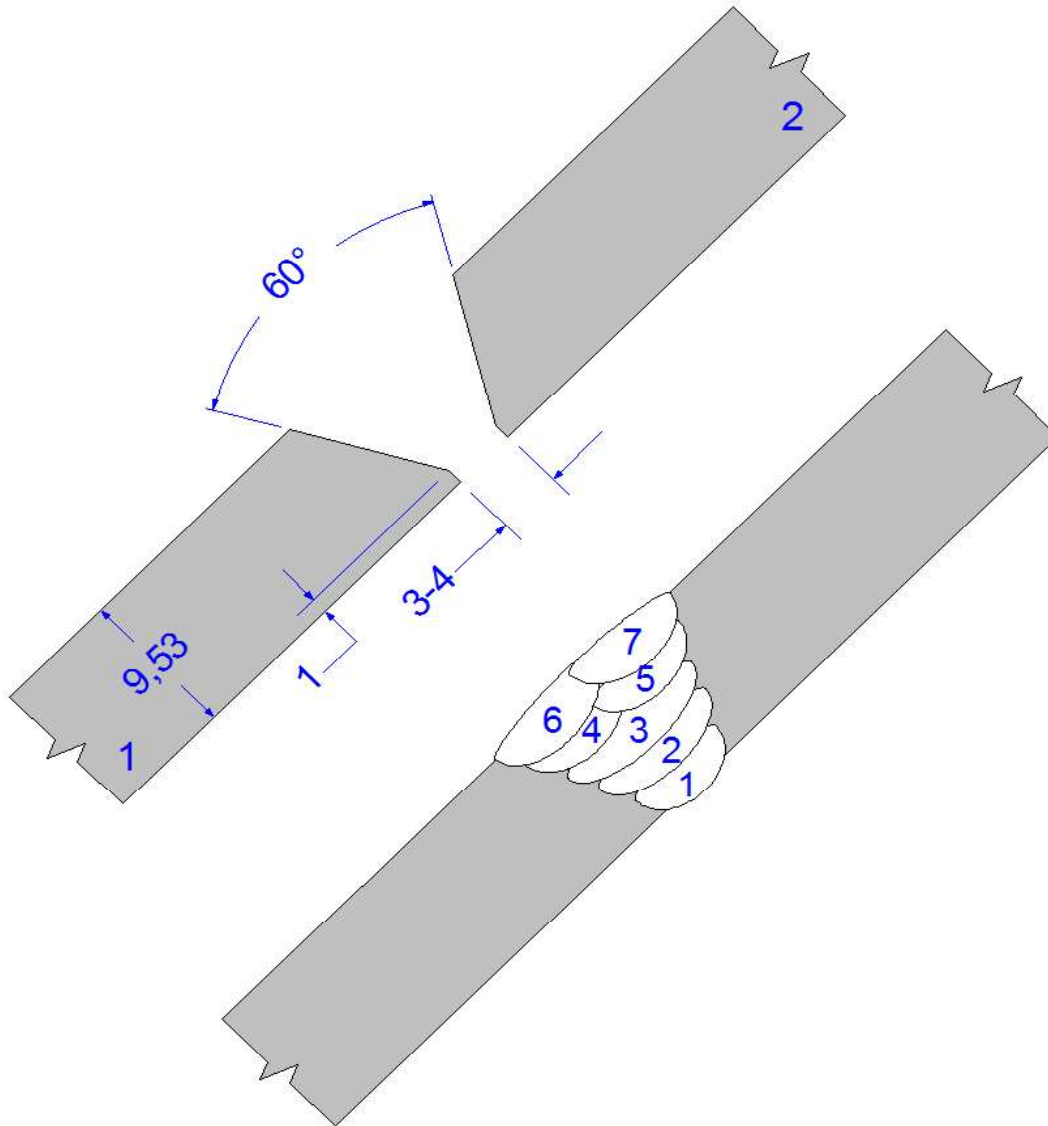
### Signature 1

Name	Signature
Franky van Toledo	
Date	
8-6-2012	



### Signature 2

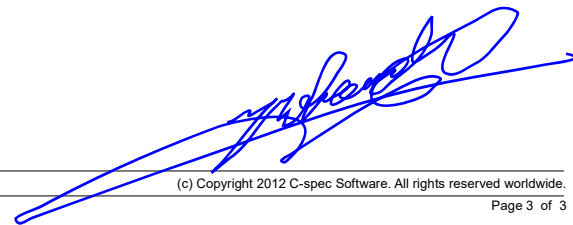
Name	Signature
W. Komdeur (Lloyds)	
Date	
8-6-2012	

PQR record number	RET 0245029-001-21	Revision 1	WPS record number	P3000	Revision 1
Date	13-6-2012		Company name	Airpack Netherlands BV	
			Welding standard	ASME Section IX:2010 including addenda 2011	



Pipe diameter 2½" xSCH160 (73,03x9,53 mm)

 <b>NARGAN COMPANY</b>	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2014	
SIGN: 	



# Airpack Netherlands BV

Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Welding conditions - (PQRD Welding Data Record)

WeldOffice WPS



PQRD number	ARL1559-5	Revision 1	Date	29-5-2012
PQR number	RET 0245029-001-21	Revision 1	Welding standard	ASME Section IX:2010 including addenda 2011
WPS number	P3000	Revision 1	Company name	Airpack Netherlands BV
			To be tested	Without PWHT

### WELDING PROCESSES

Welding process	GTAW
Type	Manual

### BASE METALS (QW-403)

Product form	Pipe/Tube	Welded to:	Product form	Pipe/Tube
Material control number	3D995		Material control number	3D995
Specification (type or grade)	SA-312 (TP316L)		Specification (type or grade)	SA-312 (TP316L)
Nominal composition	16Cr-12Ni-2Mo		Nominal composition	16Cr-12Ni-2Mo
Trade name	Changshu Walsin Spec.		Trade name	Changshu Walsin Spec.
P number	8		P number	8
G number	1		G number	1
AWS group number	U		AWS group number	U
Nominal pipe/tube size	63,50		Nominal pipe/tube size	63,50
Schedule	160		Schedule	160
Length (mm)	150		Length (mm)	150
Width (OD) (mm)	73,03		Width (OD) (mm)	73,03
Thickness (mm)	9,53		Thickness (mm)	9,53

### JOINTS (QW-402)

Joint design	Single-V-groove	See addition information	See addition information
Backing:	None		
Retainers	None		
Groove angle (deg.)	60		
Root opening (mm)	4		
Root face (mm)	0-1		

### CLEANING/ROOT TREATMENT

Surface preparation	Grinding
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2012	
SIGN:	

PQRD number	ARL1559-5	Revision 1	Date	29-5-2012
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**PASS INFORMATION**

Pass number	1	2	3	4	5	6
Layer number	1	2	3	4	4	5

**WELDING PROCESSES**

Welding process	GTAW	GTAW	GTAW	GTAW	GTAW	GTAW
Type	Manual	Manual	Manual	Manual	Manual	Manual

**FILLER METALS (QW-404)**

Material control number	80V7074	55072526	55072526	55072526	55072526	55072526
SFA specification	5.9	5.9	5.9	5.9	5.9	5.9
AWS classification	ER316LSi	ER316LSi	ER316LSi	ER316LSi	ER316LSi	ER316LSi
Filler metal F-number	6	6	6	6	6	6
Weld metal A-number	8	8	8	8	8	8
Filler metal nominal composition	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Filler metal trade name	Lincoln LNT 316LSi	Lincoln LNT 316LSi	Lincoln LNT 316LSi	Lincoln Electric, LNT 316LSi	Lincoln LNT 316LSi	Lincoln LNT 316LSi
Filler metal size (mm)	2,0	2,4	2,4	2,4	2,4	2,4
Length of filler metal consumed (mm)	-	-	-	-	-	-
Deposited thickness (mm)	3	2	2	2	2	2
Maximum pass thickness (mm)	4	4	4	4	4	4
Weld deposit chemistry	-	-	-	-	-	-
Flux nominal composition	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Flux trade name	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

**POSITION (QW-405)**

Position	6G	6G	6G	6G	6G	6G
Weld progression	Uphill	Uphill	Uphill	Uphill	Uphill	Uphill

**PREHEAT (QW-406)**

Preheat temperature (°C)	10	10	10	10	10	10
Maximum interpass temperature (°C)	10	86	126	131	124	127

**GAS (QW-408)**

Shielding gas: Type	Argon (A5.32 SG-A)	Argon (A5.32 SG-A)	Argon (A5.32 SG-A)	Argon (A5.32 SG-A)	Argon (A5.32 SG-A)	Argon (A5.32 SG-A)
Flow rate (l/min)	14	14	14	14	14	14
Trailing gas: Type	None	None	None	None	None	None
Flow rate (l/min)	-	-	-	-	-	-
Backing gas: Type	95%N2 - 5%H2	95%N2 - 5%H2	95%N2 - 5%H2	95%H2 - 5%N2	95%H2 - 5%N2	95%N2 - 5%H2
Flow rate (l/min)	12	12	12	12	12	12

**ELECTRICAL (QW-409)**

Filler metal size (mm)	2,0	2,4	2,4	2,4	2,4	2,4
Amperes	84	92	94	94	94	94
Volts	10,1	9,7	10,1	9,7	10	10,4
Travel speed (mm/min)	58	62	31	54	45	41
Maximum heat input (kJ/mm)	0,8777	0,8636	1,8375	1,0131	1,2533	1,4306
Tungsten size (mm)	2,4	2,4	2,4	2,4	2,4	2,4
Tungsten type	SFA 5.12 EWCe-2	SFA 5.12 EWCe-2	SFA 5.12 EWCe-2	SFA 5.12 EWCe-2	SFA 5.12 EWCe-2	SFA 5.12 EWCe-2
Current/polarity	DCEN (straight polarity)	DCEN (straight polarity)	DCEN (straight polarity)	DCEN (straight polarity)	DCEN (straight polarity)	DCEN (straight polarity)
DC pulsing current	None	None	None	None	None	None

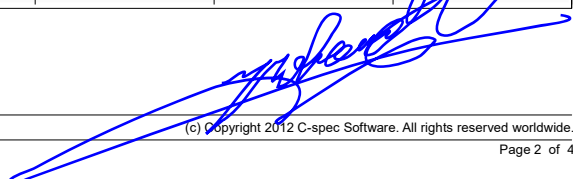
**TECHNIQUE (QW-410)**

String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	9,5	9,5	9,5	9,5	9,5	9,5
Multi/Single pass per side	Multiple passes	Multiple passes	Multiple passes	Multiple passes	Multiple passes	Multiple passes
Peening	Not used	Not used	Not used	Not used	Not used	Not used
Initial/interpass cleaning	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding
Back gouging method	None	None	None	None	None	None

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- MULTIPLE PASSES	<input type="checkbox"/>
BY: M. REZAEI	DATE: 03 April 2012
SIGN: <i>M. Rezaei</i>	

**PASS PERFORMED/WITNESSED BY**

Welders name	A. Sumantri	A. Sumantri	A. Sumantri	A. Sumantri	A. Sumantri	A. Sumantri
Recorded/witnessed by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)
Date	29-5-2012	29-5-2012	29-5-2012	29-5-2012	29-5-2012	29-5-2012
Data entry by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)



# Airpack Netherlands BV

Groenewegje 19 - 25, 4301 RN Zierikzee, The Netherlands

## ASME - Welding parameters - (PQRD Welding Data Record)

WeldOffice WPS



PQRD number	ARL1559-5	Revision 1	Date	29-5-2012
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### PASS INFORMATION

Pass number	7			
Layer number	5			

### WELDING PROCESSES

Welding process	GTAW			
Type	Manual			

### FILLER METALS (QW-404)

Material control number	55072526			
SFA specification	5.9			
AWS classification	ER316LSi			
Filler metal F-number	6			
Weld metal A-number	8			
Filler metal nominal composition	N.A.			
Filler metal trade name	Lincoln LNT 316LSi			
Filler metal size (mm)	2,4			
Length of filler metal consumed (mm)	-			
Deposited thickness (mm)	3			
Maximum pass thickness (mm)	4			
Weld deposit chemistry	-			
Flux nominal composition	N.A.			
Flux trade name	N.A.			

### POSITION (QW-405)

Position	6G			
Weld progression	Uphill			

### PREHEAT (QW-406)

Preheat temperature (°C)	10			
Maximum interpass temperature (°C)	132			

### GAS (QW-408)

Shielding gas: Type	Argon (A5.32 SG-A)			
Flow rate (l/min)	14			
Trailing gas: Type	None			
Flow rate (l/min)	-			
Backing gas: Type	95%N2 - 5%H2			
Flow rate (l/min)	12			

### ELECTRICAL (QW-409)

Filler metal size (mm)	2,4			
Amperes	94			
Volts	10.3			
Travel speed (mm/min)	30			
Maximum heat input (kJ/mm)	1,9364			
Tungsten size (mm)	2,4			
Tungsten type	SFA 5.12 EWCe-2			
Current/polarity	DCEN (straight polarity)			
DC pulsing current	None			

### TECHNIQUE (QW-410)

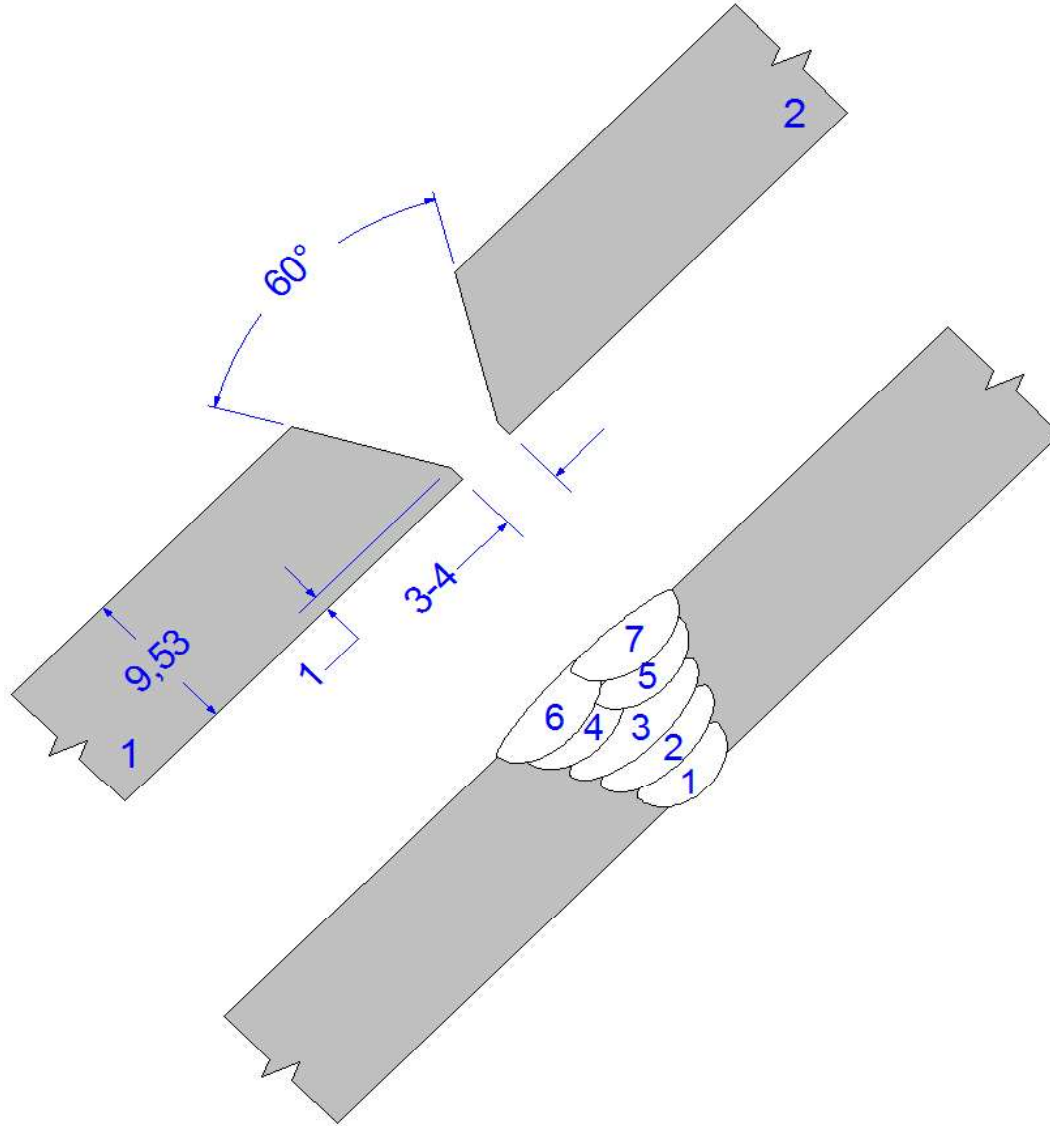
String or weave	Stringer and Weave			
Orifice/gas cup size	9,5			
Multi/Single pass per side	Multiple passes			
Peening	Not used			
Initial/interpass cleaning	Brushing and Grinding			
Back gouging method	None			

NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2012	
SIGN:	


### PASS PERFORMED/WITNESSED BY

Welders name	A. Sumantri			
Recorded/witnessed by	A.J.H. Roza (IWT/IWI)			
Date	29-5-2012			
Data entry by	A.J.H. Roza (IWT/IWI)			

PQRD number	ARL1559-5	Revision 1	Date	29-5-2012
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Pipe diameter 2½" xSCH160 (73,03x9,53 mm)

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI	DATE: 03 April 2012
SIGN:	





PQR record number	RET0278790/TK/004	Revision 1	WPS record number	SP4000	Revision 1
Date	1-6-2016		Company name	Airpack Netherlands BV	
			Welding standard	ASME Section ASME IX:2015	

**BASE METALS (QW-403)**

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (mm)	Dia. (mm)
Welded to:	Plate	S355MC acc. EN 10149-2	U	None	-	-	10	-
	Pipe	SA-312 (TP316L)	8	1	38,10	80	5,08	48,26
and tested:	Without PWHT, Fillet-weld test							
Notes								

**JOINTS (QW-402)**

Joint design	Fillet weld	See addition information	See addition information
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**WELDING PROCESSES**

Welding process	GTAW
Type	Manual

**FILLER METALS (QW-404)**

SFA specification	5,9
AWS classification	ER309LSi
Filler metal F-number	6
Weld metal A-number	8
Filler metal nominal composition	-
Filler metal trade name	Lincoln Ellectric LNT 309LSi
Filler metal size (mm)	2,4
Deposited thickness (mm)	0,00
Maximum pass thickness (mm)	5
Weld deposit chemistry	-

**POSITION (QW-405)**

Position	2F
Weld progression	-

**PREHEAT (QW-406)**

Preheat temperature (°C)	10
Maximum interpass temperature (°C)	10

**GAS (QW-408)**

Shielding gas: Type	Argon (A5,32 SG-A)
Flow rate (l/min)	10
Trailing gas: Type	None
Flow rate (l/min)	-
Backing gas: Type	None
Flow rate (l/min)	-

**ELECTRICAL (QW-409)**

Filler metal size (mm)	2,4
Waveform control	Not Used
Energy (J)	-
Power (J/s)	-
Arc time (sec)	-
Weld bead length (mm)	-
Amperes	131
Volts	13,2
Travel speed (mm/min)	47
Maximum heat input (kJ/mm)	2,174
Tungsten size (mm)	2,4
Tungsten type	SFA 5.12 EWLa-1
Current/polarity	DCEN
DC pulsing current	Not used

**TECHNIQUE (QW-410)**

String or weave	Stringer and Weave
Orifice/gas cup size	9,5
Multi/Single pass per side	Single pass
Peening	Not used
Initial/interpass cleaning	N.A.
Back gouging method	None

NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 20 April 2024	
SIGN:	





**Airpack Netherlands BV**  
 Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands  
**ASME - Procedure Qualification Record (PQR) - Test results (as welded)**  
 WeldOffice WPS

PQR record number	RET0278790/TK/004	Revision 1	WPS record number	SP4000	Revision 1
Date	1-6-2016		Company name	Airpack Netherlands BV	
			Welding standard	ASME Section ASME IX:2015	

**TENSILE TESTS (QW-150)**

Specimen number	Width (mm)	Thickness (mm)	Area (mm <sup>2</sup> )	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location

Comments

**GUIDED BEND TESTS (QW-160)**

Type of test	Acceptance criteria	Result	Comments

Comments

**FILLET WELD TESTS (QW-180)**

Type of test	Acceptance criteria	Result	Fillet leg size (mm) x (mm)
4x Macroscopic examination	ASME IX	Acceptable	4,2x4,2

Comments

**CERTIFICATION**

Welder's name	ID Number	Stamp number	Mechanical testing by	Element Breda (NLD)
Dorreman M.	ID Card IKP0996J6	W-013	Laboratory test number	ARJ001-16-01-18390-4
			Test file number	ARL2064-4
			Tests conducted by	A. Karstanje

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03 April 2016	
SIGN:	

**Signature 1**

Name	Signature
F. van Toledo	
Date	
1-6-2016	

**Signature 2**

Name	Signature
T. Konings (Iloyds)	
Date	
1-6-2016	

<input type="checkbox"/> Witnessed <input checked="" type="checkbox"/> Reviewed <input type="checkbox"/> Examined <input type="checkbox"/> Ion Konings	 Lloyd's Register Energy
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PQRD number	ARL2064-4	Revision 1	Date	1-6-2016
PQR number	RET0278790/TK/004	Revision 1	Welding standard	ASME Section ASME IX:2015
WPS number	SP4000	Revision 1	Company name	Airpack Netherlands BV
			To be tested	Without PWHT

**WELDING PROCESSES**

Welding process	GTAW
Type	Manual

**BASE METALS (QW-403)**

Product form	Plate
Material control number	140287
Specification (type or grade)	S355MC acc. EN 10149-2
Nominal composition	C-Mn
Trade name	Severstal
P number	U
G number	None
AWS group number	II
Nominal pipe/tube size	-
Schedule	-
Length	(mm) 150
Width (OD)	(mm) 150
Thickness	(mm) 10

**Welded to:**

Product form	Pipe
Material control number	470133
Specification (type or grade)	SA-312 (TP316L)
Nominal composition	16Cr-12Ni-2Mo
Trade name	Salzgitter
P number	8
G number	1
AWS group number	U
Nominal pipe/tube size	38,10
Schedule	80
Length	(mm) 150
Width (OD)	(mm) 48,26
Thickness	(mm) 5,08

**JOINTS (QW-402)**

Joint design	Fillet weld		
		See addition information	See addition information

**CLEANING/ROOT TREATMENT**

Surface preparation	Grinding and Brushing
Initial/interpass cleaning	N.A.
Back gouging method	None

NARGAN COMPANY	
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 09 April 2024	
SIGN:	

PQRD number	ARL2064-4	Revision 1	Date	1-8-2016
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**PASS INFORMATION**

Pass number	1
Layer number	1

**WELDING PROCESSES**

Welding process	GTAW
Type	Manual

**FILLER METALS (QW-404)**

Material control number	55E80442
SFA specification	5.9
AWS classification	ER309LSi
Filler metal F-number	6
Weld metal A-number	8
Filler metal nominal composition	-
Filler metal trade name	Lincoln Ellectric LNT 309LSi
Filler metal size (mm)	2,4
Length of filler metal consumed (mm)	-
Deposited thickness (mm)	throat thickness 3 mm
Maximum pass thickness (mm)	5
Weld deposit chemistry	-
Flux nominal composition	-
Flux trade name	-

**POSITION (QW-405)**

Position	2F
Weld progression	-

**PREHEAT (QW-406)**

Preheat temperature (°C)	10
Maximum interpass temperature (°C)	10

**GAS (QW-408)**



Shielding gas:	Type	Argon (A5.32 SG-A)	
	Flow rate (l/min)	10	
Trailing gas:	Type	None	
	Flow rate (l/min)	-	
Backing gas:	Type	None	
	Flow rate (l/min)	-	

**ELECTRICAL (QW-409)**

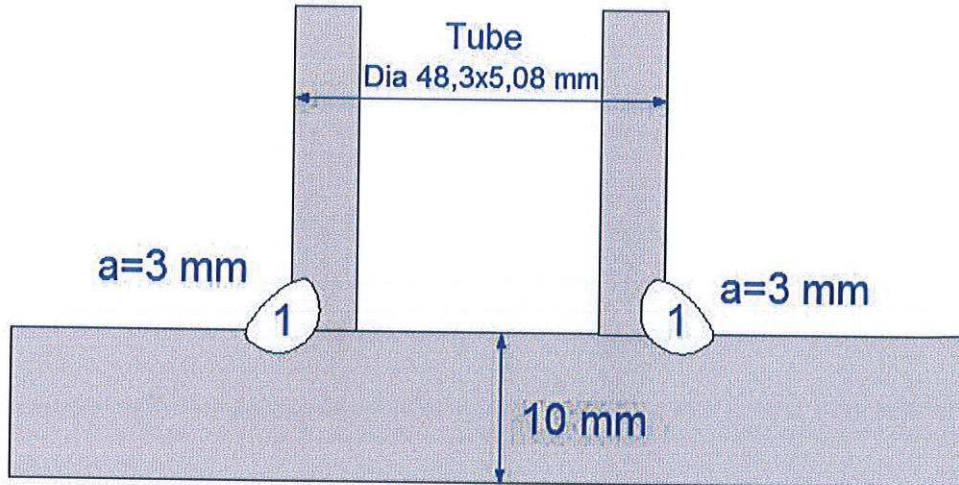
Filler metal size (mm)	2,4
Waveform control	Not Used
Energy (J)	none
Power (J/s)	none
Arc time (sec)	none
Weld bead length (mm)	none
Amperes	131
Volts	13.2
Travel speed (mm/min)	47
Maximum heat input (kJ/mm)	2,2075
Tungsten size (mm)	2,4
Tungsten type	SFA 5.12 EWL a-1
Current/polarity	DCEN
DC pulsing current	Not used

**TECHNIQUE (QW-410)**

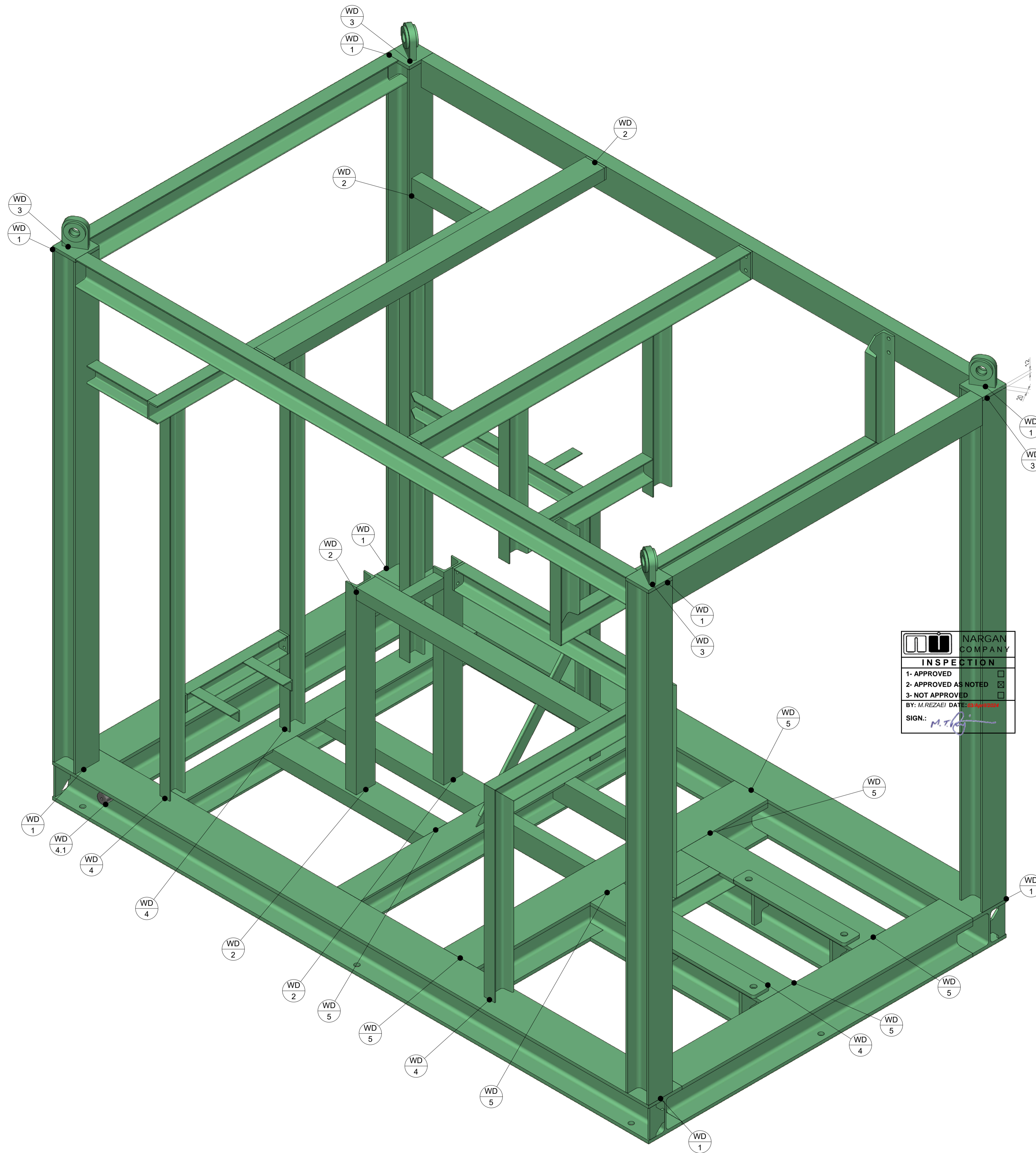
String or weave	Stringer and Weave
Orifice/gas cup size	9,5
Multi/Single pass per side	Single pass
Peening	Not used
Initial/interpass cleaning	N.A.
Back gouging method	None

	NARGAN COMPANY
<b>INSPECTION</b>	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 03/08/2024	
SIGN: 	

PQRD number	ARL2064-4	Revision 1	Date	1-6-2016
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	<b>NARGAN COMPANY</b>
<b>INSPECTION</b>	
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3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 09 April 2016	
SIGN: 	

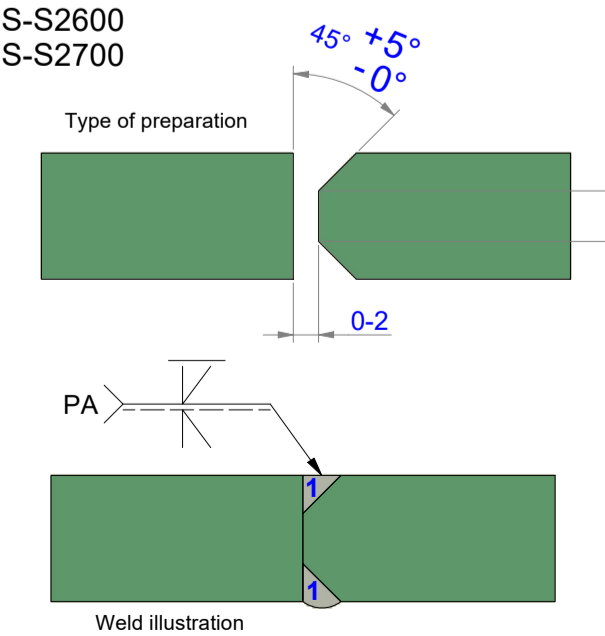


<b>INSPECTION</b>	
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2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 20-3-2024	
SIGN: <i>M. T. Rezai</i>	

**NOTE:**  
Material of construction: S235JR  
Material Thickness: Min. 6 mm and max. 20 mm

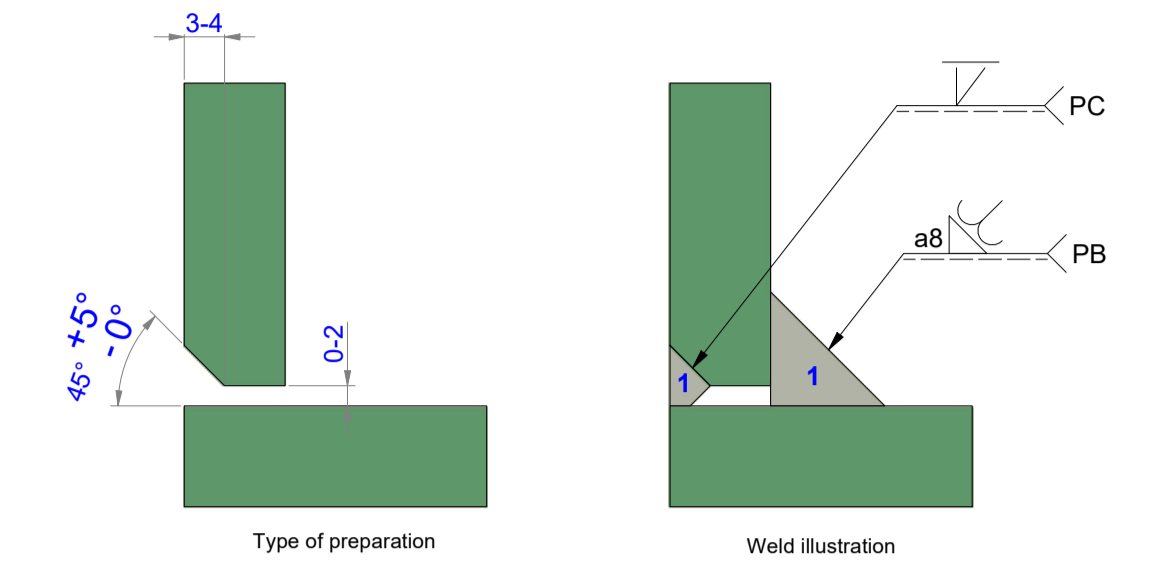
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PQR/ WPS reference:  
PQR/ WPS-S2300  
PQR/ WPS-S2600  
PQR/ WPS-S2700



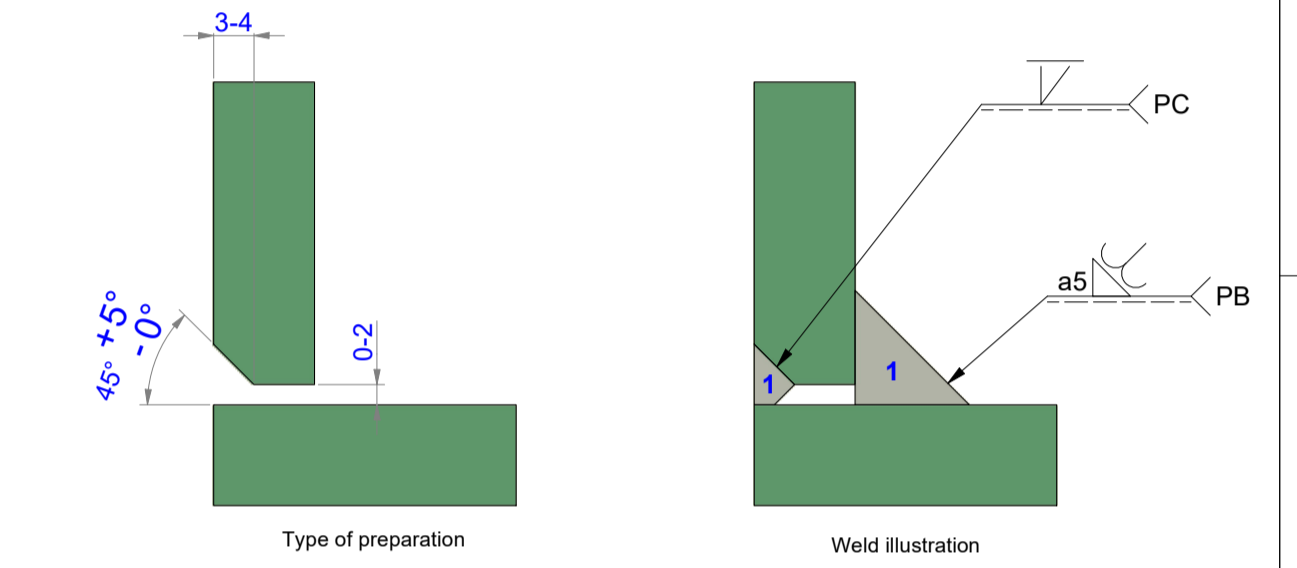
**WD-1**

PQR/ WPS reference:  
PQR/ WPS-S2300  
PQR/ WPS-S2600  
PQR/ WPS-S2700



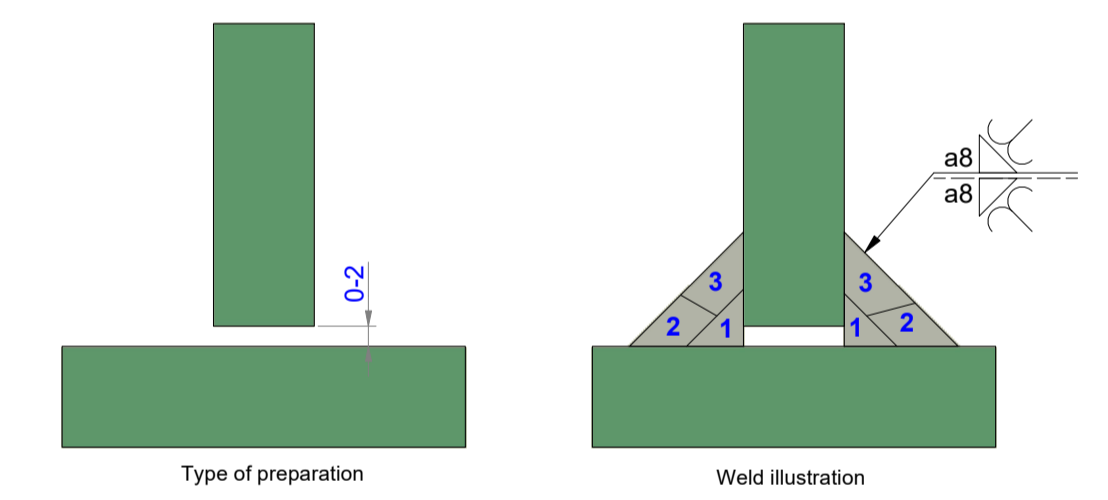
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PQR/ WPS reference:  
PQR/ WPS-S2300  
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PQR/ WPS-S2700



**WD-3**

PQR/ WPS reference:  
PQR/ WPS-S2300

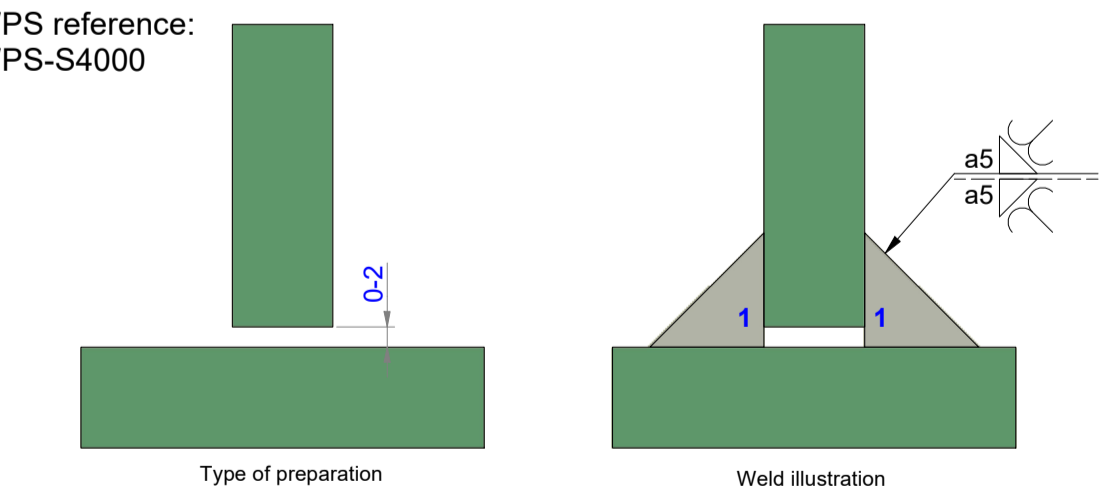


**WD-4**

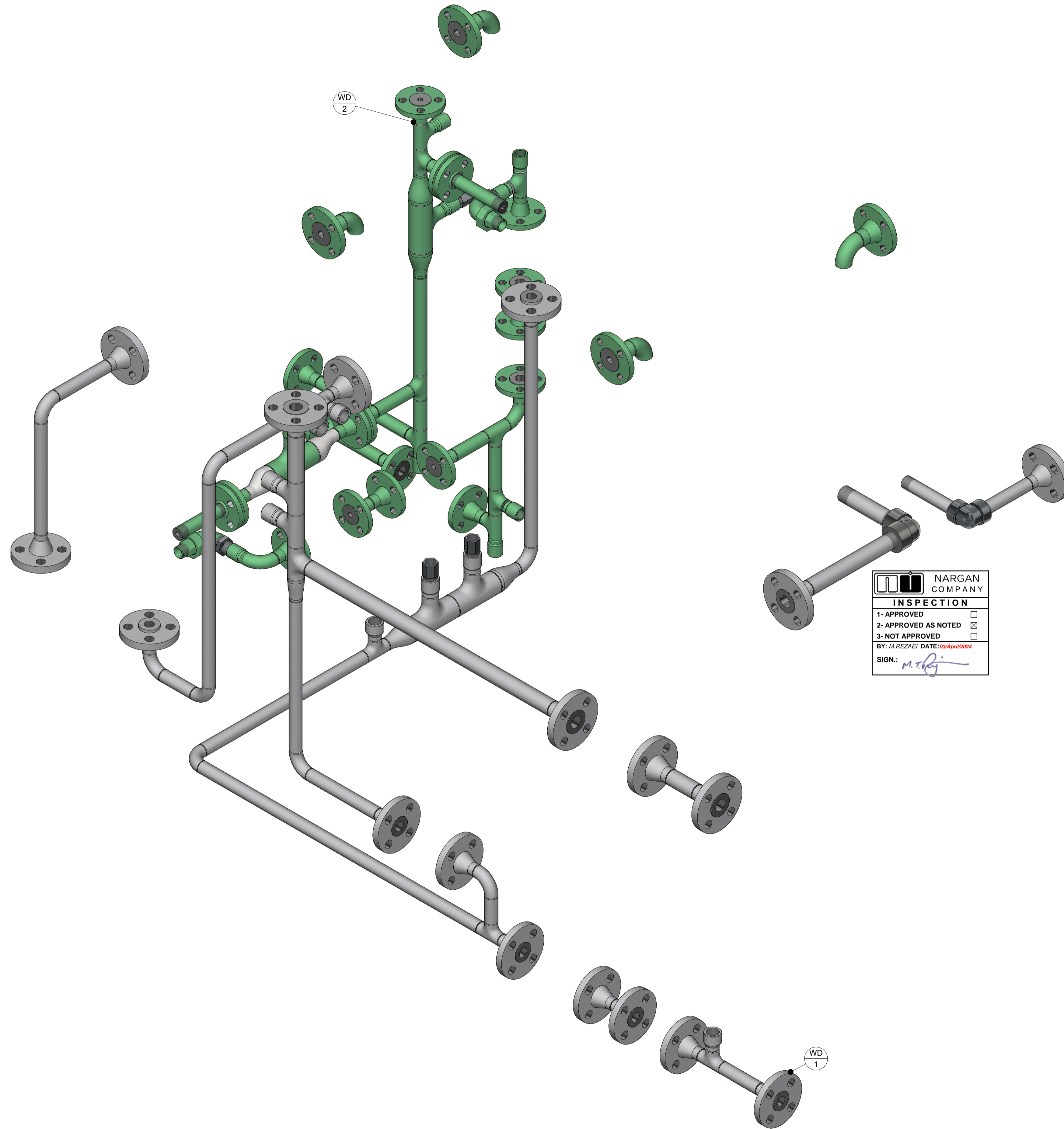
PQR/ WPS reference:  
PQR/ WPS-S2300

**WD-4.1**

PQR/ WPS reference:  
PQR/ WPS-S4000



Subject: <b>Weld Map Skid</b>		Projection:	This drawing is owned by Airpack and shall not be printed or copied in any other way than with Airpack's PERMISSION
Client: Lavan Industry Development Company (LIDCO)	Client Ref: Weldmap	Date: 20-3-2024	MODIFICATIONS
Client Doc. No: 17735-25B	Checked by: FvT	SK	
		Plant Location: The Netherlands	Airpack Ref: 17735-COM
Airpack Nederland BV Groeneveldje 25 4321 RN Zierikzee The Netherlands Telephone (31) (0) 111 - 415455 E-mail: airpack@airpack.nl URL: http://www.airpack.nl		Scale:	Drawing No: 17735-25B Weldmap Skid



**NARGAN COMPANY**  
**INSPECTION**  
 1- APPROVED   
 2- APPROVED AS NOTED   
 3- NOT APPROVED   
 BY: M. REZAEI DATE: 03 April 2024  
 SIGN: *M. Rezaei*

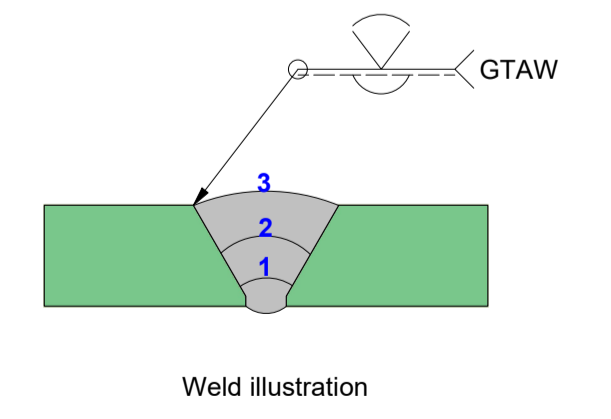
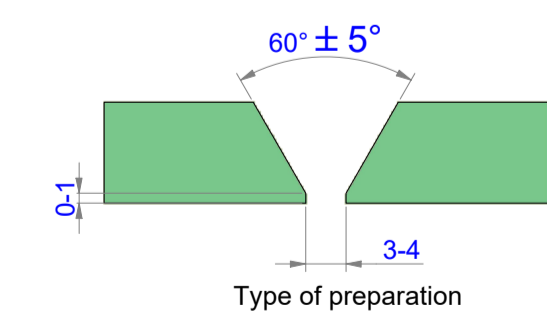
**Type-1**

WPS/PQR reference:  
 P2000 Material of construction: A/SA 106-B / A/SA 234 WPB  
 P2500 Material of construction: A/SA 105N

**Type-2**

WPS/PQR reference:  
 P3000 Material of construction: A/SA 316L

Material Thickness: Min. 2,9 mm and max. 3,7 mm



Subject		Projection	This drawing is owned by Airpack and shall not be printed or copied in any other way than with Airpack's PERMISSION
<b>Weld Map Piping</b>			
Client	Lavan Industry Development Company (LIDCO)	MODIFICATIONS	
Client Ref.	Weldmap	Date	20-3-2024
Client Doc. No.	17735-25A	Drawn by	FvT
 Airpack Nederland BV Groeneveldje 25 4321 RN Zierikzee The Netherlands Telephone (31) (0) 111 - 415455 E-mail: airpack@airpack.nl URL: http://www.airpack.nl		Checked by	
		Plant Location	
		Scale	
		Airpack Ref.	17735-COM
		Drawing No.	17735-25A Weldmap Piping Sheet 1 of 1