



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

Project No.	Vendor Doc.	P.O. No.	Department	Document Type	Serial No	Revision	Page
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**Airpack B.V. - Air Compressor –
Integrated Methanol and Ammonia Plant
17735-COM Welding Book PQR / WPS (K020)**

vendor shall submit welding/NDE map for fabrication of skid, CS and SS pipings.

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: <i>[Signature]</i> DATE: 2023/12/12	
SIGN: <i>[Signature]</i>	

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
01	12-12-2023	Issued for Information	S.K.	J.J.	S.K.


Welding Book PQR / WPS

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Project No.	Vendor Doc.	P.O. No.	Department	Document Type	Serial No	Revision	Page
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2	X					27	X					52	X					77	X					
3	X					28	X					53	X					78	X					
4	X					29	X					54	X					79	X					
5	X					30	X					55	X					80	X					
6	X					31	X					56	X					81	X					
7	X					32	X					57	X					82	X					
8	X					33	X					58	X					83	X					
9	X					34	X					59	X					84	X					
10	X					35	X					60	X					85	X					
11	X					36	X					61	X					86	X					
12	X					37	X					62	X					87	X					
13	X					38	X					63	X					88	X					
14	X					39	X					64	X					89	X					
15	X					40	X					65	X					90	X					
16	X					41	X					66	X					91	X					
17	X					42	X					67	X					98	X					
18	X					43	X					68	X					ATTACHMENT						
19	X					44	X					69	X					1						
20	X					45	X					70	X					2						
21	X					46	X					71	X					3						
22	X					47	X					72	X					4						
23	X					48	X					73	X					5						
24	X					49	X					74	X					6						
25	X					50	X					75	X					7						

NARGAN COMPANY	
INSPECTION	
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BY: M. BEZEL	DATE: 2020/05/20
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WPS/

PQR

	NARGAN COMPANY
INSPECTION	
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BY: M.REZAEI DATE: 27/Dec/2023	
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WPS

SKID

	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: 27/Dec/2023	
SIGN: 	

WPS record number	S2300	Revision 6	Qualified to	AWS D1.1/D1.1M:2020
Date	Tuesday, 03 January 2023		Company name	Airpack Netherlands BV
Supporting PQR(s)	RET0245029-001-25 – Rev 1			
Reference docs.	Test record: ARL 1559-13			

Scope	Fillet welds single layer a = ≤ 6 mm and multi-layer fillet welds a = ≥ 8 mm without PWHT, Fillet-weld test			
Joint	Joint details for this welding procedure specification in: Production drawings.			

Please submit joint design as per AWS D1.1 here.

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	
Notes	

THICKNESS RANGE QUALIFIED (mm)

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Complete pen.	-	-	-	-
Impact tested	-	-	-	-
Partial pen.	-	-	-	-
Fillet welds	3,0	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	ER70C-6MH4	-	-	Lincoln, Outershield MC715-H	3,	No max.	-	-
Note	-	-	-	-	-	Single pass a=6 mm and smaller Multi pass a=8 mm and larger			

WELDING PROCEDURE

Welding process	GMAW			
Type	Semi-automatic			
Minimum preheat/interpass temperature (°C)	10			
Maximum interpass temperature (°C)	112 Method contact thermometer			
Filler metal size (mm)	1,2			
Layer number	All			
Position	F, H			
Weld progression	-			
Current/polarity	DCEP (Reverse polarity)			
Amperes	1 Single Layer 220 – 269 1 Multi layer 222 – 271 2 Multi layer 213 -260 3 Multi layer 216 -264			
Volts	1 Single Layer 24,5 – 28,2 1 Multi layer 24,5 – 28,2 2 Multi layer 24,7 -28,4 3 Multi layer 24,5 – 28,2			
Travel speed (mm/min)	1 Single Layer 236 – 293 1 Multi layer 236 – 293 2 Multi layer 293 - 488 3 Multi layer 286 -477			
Maximum heat input (kJ/mm)	1 Single Layer 1,23 1 Multi layer 1,24 2 Multi layer 0,96 3 Multi layer 0,99			
Arc transfer mode	Spray			
Shielding: Gas type	AC-20 (A5.32 SG)			
Flow rate (l/min)	12-22			
Trailing: Gas type	None			
Flow rate (l/min)	None			
Backing: Gas type	None			
Flow rate (l/min)	None			
String or weave	Stringer and Weave			
Orifice/gas cup size	15			
C . T . W . D (mm)	15			
Multi/Single pass per side	Single or Multi passes			
Multi/Single electrode	Single electrode			
Maximum pass thickness (mm)	5			
Weld deposit chemistry	-			
Power source	CV			

	
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BY: M. REZAEI DATE: 27/Dec/2023	
SIGN: 	

WPS record number	S2300	Revision 6	Qualified to	AWS D1.1/D1.1M:2020
Date	Tuesday, 03 January 2023		Company name	Airpack Netherlands BV


PREHEAT TABLE

Applicable standard	
AWS D1.1 (Category A)	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): 66(°C) Over 38.1 thru 63.5(mm): 107(°C) Over 63.5 (mm): 150(°C)



TECHNIQUE

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


NOTES

 NARGAN COMPANY	
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1- APPROVED	<input type="checkbox"/>
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BY: M. REZAEI DATE: 27/Dec./2023	
SIGN: 	

Signature 1

Name	Signature	Name	Signature
F. van Toledo	 		
Date		Date	
Tuesday, 03 January 2023			

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 

Please submit joint design as per AWS D1.1 here.

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 ³)	-								

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

	
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BY: M. REZAEI DATE: 27/09/2022	
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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

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BY: M. REZAEI DATE: 27/Dec./2023	
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) Reference docs.	RET0278790/TK/002 - Rev 1			

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

Please submit joint design as per AWS D1.1 here.

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

INSPECTION	
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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	
INSPECTION	
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BY: M. REZAEI DATE: 27/Dec./2023	
SIGN: 	

Signature 1

Signature 2

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

WPS record number	S2800	Revision 6	Qualified to	AWS D1.1/D1.1M:2020
Date	Monday, 02 January 2023		Company name	Airpack Netherlands BV
Supporting PQR(s)	RET0278790/TK/003 - 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

Please submit joint design as per AWS D1.1 here.

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,	40,	-	-
Impact tested	16,	40.	-	-
Partial pen.	3,	40,	-	-
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,	40,	-	-
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)	200 Method contact thermometer	200 Method contact thermometer	200 Method contact thermometer
Filler metal size (mm)	1,2	1,2	1,2
Layer number	Root	Filler	Cap
Position	H	H	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	110 - 140	215 - 240	190 - 225
Volts	15 - 17	25 - 27	21 - 26
Travel speed (mm/min)	135 - 150	250 - 500	290 - 500
Maximum heat input (kJ/mm)	0,8 - 1,0	0,6 - 1,4	0,5 - 1,1
Wire feed speed (m/min)	0,	0	0
Arc transfer mode	Short-circuiting	Spray	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)	6	6	6
Weld deposit chemistry	-	-	-
Power Source	CV	CV	CV

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/2023	
SIGN:	

WPS record number	S2800	Revision 6	Qualified to	AWS D1.1/D1.1M:2020
Date	Monday, 02 January 2023		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	
INSPECTION	
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BY: M. REZAEI DATE: 27/Dec./2023	
SIGN: 	



Signature 1

Signature 2

Signature 1		Signature 2	
Name	Signature	Name	Signature
F. van Toledo			
Date		Date	
Monday, 02 January 2023			

WPS

CS PIPING

	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: 27/Dec/2023	
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.

Please submit joint design here.

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°

 NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
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3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/2022	
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

 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: 27/Dec./2023	
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)	RET0245029-001-19 – Rev 0			
Reference docs.				

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°

	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
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BY: M. REZAEI DATE: 27/Dec/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

 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: 27/Dec./2023	
SIGN: 	

Signature 1

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

WPS record number	PGF-2000	Revision 2	Qualified to	ASME Section ASME IX:2019
Date	Monday, 15 August 2022		Company name	Airpack Netherlands BV
Supporting PQR(s) Reference docs.	A0790094-10 – Rev 00			

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

Please submit joint design here.

BASE METALS (QW-403)

Type	Carbon steel (P1)	P-no. 1	Grp-no. 1
Welded to	Carbon steel (P1)	P-no. 1	Grp-no. 2
Backing:	Without backing		
Retainers	None		
Notes			

THICKNESS RANGE QUALIFIED (mm)

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Complete pen.	1,50	12,04	-	-
Impact tested	6.02	12.04	-	-
Partial pen.	1.50	12,04	-	-
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)

	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 Electric LNT 25 (solid wire)	No min.	4	-	-
FCAW	5.20	E71T-9M-J	8	1	Nippon steel, Nittetsu SD-3A	No min.	8,04	-	-
Cons. insert	-	-	-	-	-	- None -			
Flux	-	-	-	-	Not used	- None -			
Sup. filler	-	-	-	-	-	- None -			

WELDING PROCEDURE

	GTAW	FCAW
Welding process	GTAW	FCAW
Type	Manual	Semi-automatic
Minimum preheat temperature (°C)	20	20
Maximum interpass temperature (°C)	179	230
Tungsten size (mm)	2,4	-
Tungsten type	SFA 5.12 EWCe-2	-
Filler metal size (mm)	2,0	1,2
Layer number	All	All
Position	All	All
Weld progression	-	-
Current/polarity	DCEN	DCEP
Amperes	60 -75	250 – 265
Volts	10 -11	29-32
Travel speed (mm/min)	55 – 65	335-420
Maximum heat input (kJ/mm)	0,7224	1,4885
DC pulsing current	Not used	-
Wire feed speed	-	Not used
Arc transfer mode	-	Spray
Shielding: Gas type	Argon (A5.32 SG-A)	AC-2 (A5.32 SG-)
Flow rate (l/min)	10-14	15-20
Trailing: Gas type	Not used	Not used
Flow rate (l/min)	-	-
Backing: Gas type	Not used	Not used
Flow rate (l/min)	-	-
String or weave	Stringer or Weave	Stringer or Weave
Orifice/gas cup size	8 mm	15
C.T.W.D. (mm)	-	15-20
Multi/Single pass per side	Single pass	Multi passes
Maximum pass thickness (mm)	-	12
Weld deposit chemistry	Not used	Not used
Notes	When, before welding, the base metal temperature is below 0°C, the base metal shall be preheated to at least 20°	

	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
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BY: M. REZAEI DATE: 27/Dec/2023	
SIGN: 	



Airpack Netherlands BV
 Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands
ASME - Welding Procedure Specification (WPS)
 WeldOffice WPS

WPS record number	PGF-2000	Revision 2	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
Initial/interpass cleaning	Grinding and Brushing
Back gouging method	None
Closed to out chamber	None
Use of thermal processes	None

NOTES


INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
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Signature 1

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

WPS

SS PIPING

	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: 27/Dec/2023	
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%		

	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/2021	
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
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
SIGN:	

Signature 1

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

WPS record number	PGF-3000	Revision 0	Qualified to	ASME Section IX: 2019
Date	10/6/2020		Company name	Airpack Netherlands BV
Supporting PQR(s)	A0790094-11 - Rev 0			
Reference docs.				

Scope	Groove, fillet, no PWHT (As-welded) Joint details for this welding procedure specification in: Production drawings
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Please submit joint design here.

BASE METALS (QW-403)

Type	Austenitic stainless steel	P-no. 8	Grp-no. 1
Welded to	Austenitic stainless steel	P-no. 8	Grp-no. 1
Backing:	None	P-no.	Grp-no.
Retainers	None		
Notes			

THICKNESS RANGE QUALIFIED (mm)

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Complete pen.	1.5	12.04	-	-
Impact tested	-	-	-	-
Partial pen.	1.5	12.04	-	-
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)

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	THICKNESS RANGE QUALIFIED (mm)			
						As-welded		With PWHT	
						Min.	Max.	Min.	Max.
GTAW	5.9	ER316LSi	6	8	Lincoln Electric, LNT 316LSi	no min.	4	-	-
FCAW	5.22	E316LT0-1	6	8	Kobelco welding, DW-316L	no min.	8	-	-
Cons. insert	-	-	-	-	-	- None -			
Flux	-	-	-	-	Not used	- None -			
Sup. filler	-	-	-	-	-	- None -			

WELDING PROCEDURE

	GTAW		FCAW	
	Manual		Semi-automatic	
Minimum preheat/interpass temperature (°C)	10		10	
Maximum interpass temperature (°C)	55		150	
Tungsten size (mm)	2,4		-	
Tungsten type	SFA 5.12 EWCe-2		-	
Filler metal size (mm)	2,0		1,2	
Layer number	All		All	
Position	All		All	
Weld progression	-		-	
Current/polarity	DCEN		DCEP	
Waveform control	-		-	
Energy (J)	-		-	
Power (J/s)	-		-	
Amperes	60 - 75		190 - 210	
Volts	10 - 11		29 - 31	
Travel speed (mm/min)	20 - 35		375 - 420	
Maximum heat input (kJ/mm)	1.836		0.9305	
DC pulsing current	Not used		-	
Wire feed speed (m/min)	-		Not used	
Arc transfer mode	-		Spray	
Shielding: Gas type	Argon (A5.32 SG-A)		AC-20 (A5.32 SG-)	
Flow rate (l/min)	12-15		15-20	
Trailing: Gas type	Not used		Not used	
Flow rate (l/min)	-		-	
Backing: Gas type	A5.32 SG-NH-5		A5.32 SG-NH-5	
Flow rate (l/min)	14-16		14-16	
String or weave	Stringer or Weave		Stringer or Weave	
Orifice/gas cup size	8 mm		16	
C.T.W.D (mm)	-		15-20	
Multi/Single pass per side	Single pass		Multiple passes	
Maximum pass thickness (mm)	-		12	
Weld deposit chemistry	Not used		Not used	
Notes				

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
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BY: M. REZAEI DATE: 27/Dec./2023	
SIGN:	



WPS record number	PGF-3000	Revision 0	Qualified to	ASME Section IX: 2019
Date	10/6/2020		Company name	Airpack Netherlands BV

TECHNIQUE (QW-410)

Peening	Not used
Surface preparation	Grinding and Brushing
Initial/Interpass cleaning	Brushing and Grinding
Back gouging method	Not used

NOTES

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
SIGN:	

Signature 1

Name	Signature
F. van Toledo (Airpack)	
Date	
10/6/2020	



Signature 2

Name	Signature
L. Knops (DNVGL)	
Date	
10/6/2020	

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

Please submit joint design here.

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		



	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/2022	
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: 27/Dec./2023	
SIGN: 	

Signature 1

Signature 2

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

PQR

SKID

	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: 27/Dec/2023	
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 ³)	-

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

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: 27/Dec/2023	
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

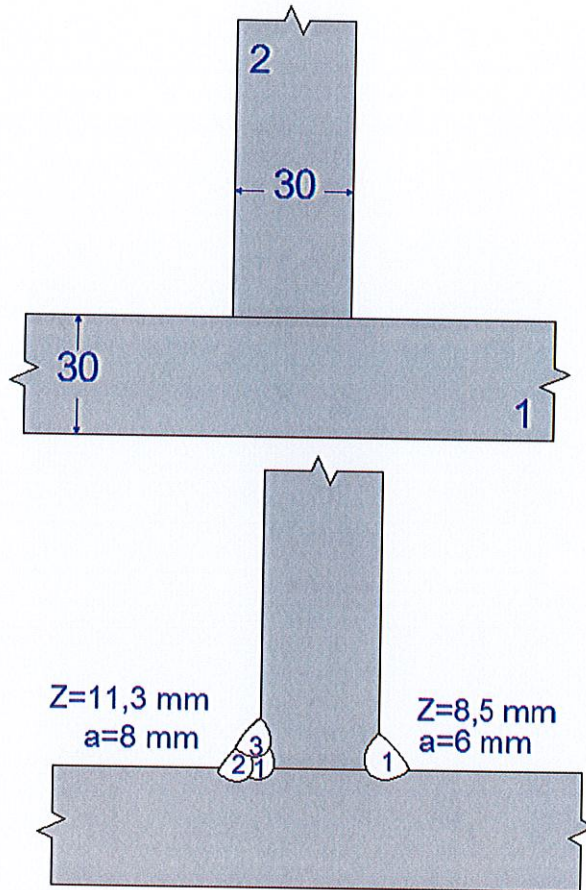
Groeneweegje 19 - 25, 4301 RN Zierikzee, The Netherlands

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	



INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
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: 27/Dec./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 ³)	-	-	-	-

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

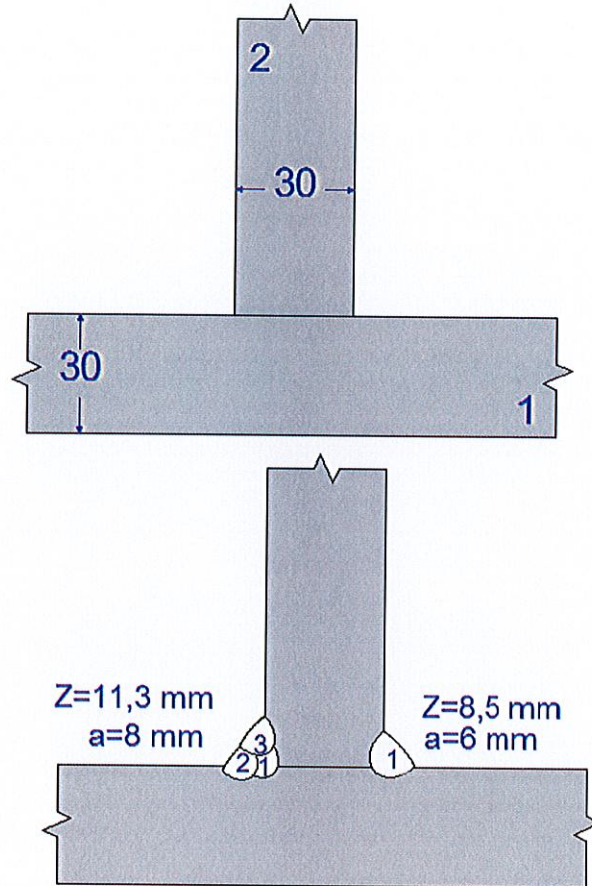
String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	15	15	15	15
C.T.W.D (mm)	15	15	15	15
Multi/single electrode	Single electrode	Single electrode	Single electrode	Single electrode
Multi/Single pass per side	Multiple passes	Single pass	Multiple 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

NARGAN COMPANY	
INSPECTION	
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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 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: 27/Dec./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, Outershield 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 ³)	-

POSITION

Position Weld progression	2G -
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PREHEAT

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

GAS



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

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	
APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	
BY: M. REZAEI DATE: 27/Dec./2023	
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 ²)	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. 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 4 of ANSI/AWS D1.1 Structural Welding Code-Steel.

	INSPECTION
1- APPROVED <input type="checkbox"/>	2- APPROVED AS NOTED <input checked="" type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
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 Konings <small>Overz. Register Nederland B.V.</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	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
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 ³)	-	-	-

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

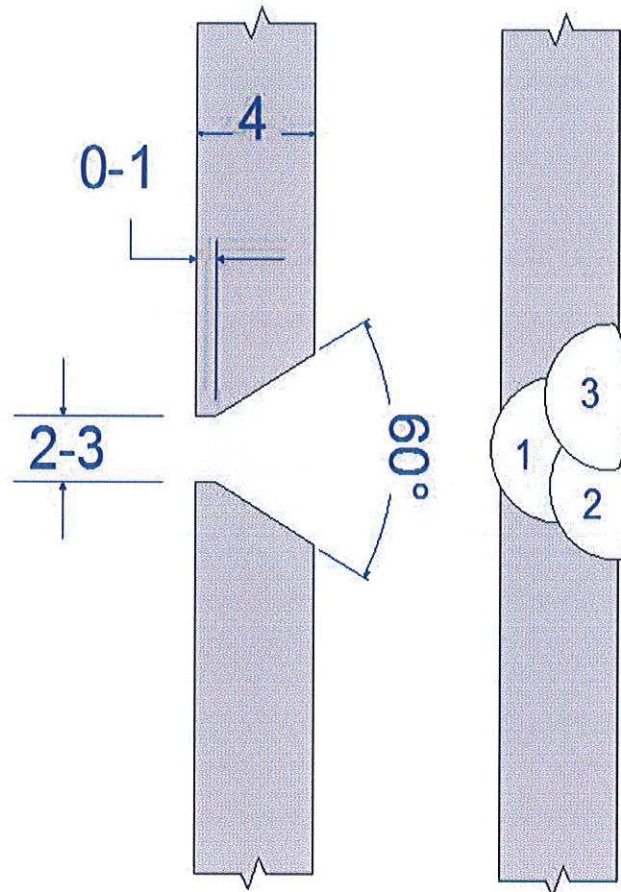
Filler metal size (mm)	1,2	1,2	1,2
Waveform control	Not Used	Not Used	Not Used
Energy (J)	-	-	-
Power (J/s)	-	-	-
Arc time (sec)	-	-	-
Weld bead length (mm)	-	-	-
Amperes	87	182	183
Volts	14.5	20.1	20.1
Travel speed (mm/min)	117	485	450
Maximum heat input (kJ/mm)	0,6469	0,4526	0,4904
Current/polarity	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
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
PREPARED DATE: 27/01/2023	
SIGN: 	

PQRD number	ARL2064-1	Revision 1	Date	11-01-2016
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 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: 27/Dec./2023	
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)
Welded to:	Plate	API 2W (50LS)	U	II	-	-	8	-
	Plate	API 2W (50LS)	U	II	-	-	8	-
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	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 ³)	-

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

	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: 27/Dec/2023	
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 ²)	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)	Impact values (J)	Impact values (% Shear)	Drop weight break (mm)
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
Dorreman 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	 INSPECTION 1- APPROVED <input type="checkbox"/> 2- APPROVED AS NOTED <input checked="" type="checkbox"/> 3- NOT APPROVED <input type="checkbox"/> BY: M. REZAEI DATE: 27/Dec/2023 SIGN: <i>M. Rezaei</i>
---	--

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.

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
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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	GMAW
Type	Semi-automatic

BASE METALS

Product form	Plate	Welded to:	Product form	Plate
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) 8		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

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
SIGN:	



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

WELDING PROCESSES				
Welding process	GMAW	GMAW	GMAW	GMAW
Type	Semi-automatic	Semi-automatic	Semi-automatic	Semi-automatic

FILLER METALS				
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 ³)	-	-	-	-

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

PREHEAT				
Preheat temperature (°C)	10	10	10	10
Maximum interpass temperature (°C)	10	69	129	178

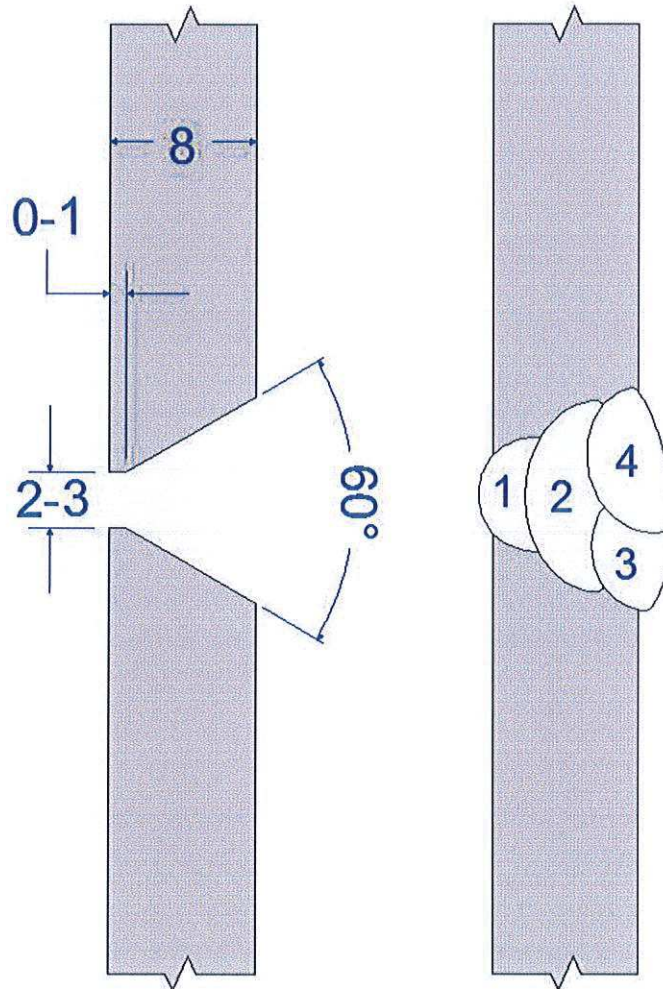
GAS				
Shielding gas: Type	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)
Flow rate (l/min)	15	15	15	15
Trailing gas: Type	None	None	None	None
Flow rate (l/min)	-	-	-	-
Backing gas: Type	None	None	None	None
Flow rate (l/min)	-	-	-	-



ELECTRICAL				
Filler metal size (mm)	1,2	1,2	1,2	1,2
Waveform control	Not Used	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

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	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

 INSPECTION
1. APPROVED <input type="checkbox"/> 2. APPROVED AS NOTED <input checked="" type="checkbox"/> 3. NOT APPROVED <input type="checkbox"/> DATE: 27 Dec 2023 SIGN: <i>M. Rijk</i>

PQRD number	ARL2064-2	Revision 1	Date	11-01-2016
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 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: 27/Dec./2023	
SIGN: 	

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

PQR record number	RET0278790/TK/003	Revision 1	WPS record number	S2800	Revision 1
Date	1-6-2016		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)
Welded to:	Plate	API 2W (50)LS	U	II	-	-	20	-
	Plate	API 2W (50)LS	U	II	-	-	20	-
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	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, OS MC715-H
Filler metal size (mm)	1,2
Deposited thickness (mm)	24,00
Maximum pass thickness (mm)	5
Weld deposit chemistry	-
Supplemental filler metal	-
Supplemental filler metal vol. (mm³)	-

POSITION

Position	2G
Weld progression	-

PREHEAT

Preheat temperature (°C)	10
Maximum interpass temperature (°C)	196

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	122 - 233
Volts	15,8 - 26,8
Travel speed (mm/min)	125 - 577
Maximum heat input (kJ/mm)	2,9078
Current/polarity	DCEP (reverse polarity)
Wire feed speed (m/min)	0
Arc transfer mode	Short-circuiting, Spray, 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

INSPECTION	
<input checked="" type="checkbox"/> 1- APPROVED <input checked="" type="checkbox"/> 2- APPROVED AS NOTED <input type="checkbox"/> 3- NOT APPROVED	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023 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/003 1-6-2016	Revision 1	WPS record number Company name Welding standard	S2800 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 ²)	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
1	20,02	19,75	380,00	-	513	Ductile-BM
2	20,04	19,43	380,76	-	518	Ductile-BM
Comments						

GUIDED BEND TESTS			
Type of test	Acceptance criteria	Result	Comments
side bend	AWS D1.1	Acceptable	
side bend	AWS D1.1	Acceptable	
side bend	AWS D1.1	Acceptable	
side 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 (mm)
1	Weld Metal	Charpy V	10 x 10	-40	106/108/92	-	No
2	HAZ	Charpy V	10 x 10	-40	188/174/262	-	No
3	HAZ + 1 mm	Charpy V	10 x 10	-40	318/323/299	-	No
4	HAZ + 2 mm	Charpy V	10 x 10	-40	374/377/338	-	No
5	HAZ + 2 mm	Charpy V	10 x 10	-40	360/357/375	-	No
Comments							

HARDNESS TEST						
Type (Scale)	Distance from surface	API 2W (50)LS	HAZ	Weld	HAZ	API 2W (50)LS
Vickers (HV)	Cap area 1-2 mm	175-179-177	173-179-188-196-187	208-188-211-210-212	199-195-191-189-179	177-174-176
Vickers (HV)	Root area 1-2 mm	174-176-174	171-178-189-186-183	186-186-180-180-179	173-176-176-175-174	173-170-171
Vickers (HV)	Cap area 1-2 mm	175-179-179	176-177-188-203-179	206-202-214-208-205	196-195-194-192-189	174-174-177
Vickers (HV)	Root area 1-2 mm	179-178-179	172-178-176-182-178	184-186-184-190-189	174-179-178-176-171	176-175-175
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	ARJ001-16-01-18390-3 ARL2064-3 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 4 of ANSI/AWS D1.1 Structural Welding Code-Steel.

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/2023	
SIGN:	

Signature 1

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

Signature 2

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

<input checked="" type="checkbox"/> Witnessed	
<input checked="" type="checkbox"/> Reviewed	
<input checked="" type="checkbox"/> Examined	
<input checked="" type="checkbox"/> Test Konings	

PQRD number	ARL2064-3	Revision 1	Date	11-01-2016
PQR number	RET0278790/TK003	Revision 1	Welding standard	AWS D1.1/D1.1M:2015
WPS number	S2800	Revision 1	Company name	Airpack Netherlands BV
			To be tested	Without PWHT

WELDING PROCESSES

Welding process	GMAW
Type	Semi-automatic

BASE METALS


Product form	Plate	Welded to:	Product form	Plate
Material control number	815634 272762/1		Material control number	815634 272762/1
Specification (type or grade)	API 2W (50)LS		Specification (type or grade)	API 2W (50)LS
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)	20		Thickness (mm)	20

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	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
SIGN: 	

PQRD number	ARL2064-3	Revision 1	Date	11-01-2016
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PASS INFORMATION

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

WELDING PROCESSES

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

FILLER METALS

Material control number	P1FC150311	P1FC150311	P1FC150311	P1FC150311	P1FC150311	P1FC150311
SFA specification	5.18	5.18	5.18	5.18	5.18	5.18
AWS classification	E70C-6MH4	E70C-6MH4	E70C-6MH4	E70C-6MH4	E70C-6MH4	E70C-6MH4
Filler metal F-number	6	6	6	6	6	6
Weld metal A-number	-	-	-	-	-	-
Filler metal nominal composition	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Filler metal trade name	Lincoln, OS MC715-H	Lincoln, OS MC715-H	Lincoln, OS MC715-H	Lincoln, OS MC715-H	Lincoln, OS MC715-H	Lincoln, OS MC715-H
Filler metal size (mm)	1,2	1,2	1,2	1,2	1,2	1,2
Length of filler metal consumed (mm)	-	-	-	-	-	-
Deposited thickness (mm)	4	4	4	4	4	4
Maximum pass thickness (mm)	5	5	5	5	5	5
Weld deposit chemistry	-	-	-	-	-	-
Supplemental filler metal	-	-	-	-	-	-
Supplemental filler metal vol. (mm³)	-	-	-	-	-	-

POSITION

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

PREHEAT

Preheat temperature (°C)	10	10	10	10	10	10
Maximum interpass temperature (°C)	10	35	56	84	106	119

GAS



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

ELECTRICAL

Filler metal size (mm)	1,2	1,2	1,2	1,2	1,2	1,2
Waveform control	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used
Energy (J)	-	-	-	-	-	-
Power (J/s)	-	-	-	-	-	-
Arc time (sec)	-	-	-	-	-	-
Weld bead length (mm)	-	-	-	-	-	-
Amperes	122	219	227	223	233	233
Volts	15.8	26.0	26.0	26.0	26.0	26.6
Travel speed (mm/min)	125	430	360	259	336	297
Maximum heat input (kJ/mm)	0,9252	0,7945	0,9837	1,3432	1,0818	1,2238
Current/polarity	DCEP (reverse polarity) DCEP (reverse polarity) DCEP (reverse polarity) DCEP (reverse polarity) DCEP (reverse polarity) DCEP (reverse polarity)					
Wire feed speed (m/min)	-	-	-	-	-	-
Arc transfer mode	Short-circuiting	Spray	Spray	Spray	Spray	Spray

TECHNIQUE

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	15	15	15	15	15	15
C.T.W.D (mm)	15	15	15	15	15	15
Multi/single electrode	Single electrode	Single electrode	Single electrode	Single electrode	Single electrode	Single electrode
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
Single electrode	15
Multiple passes	<input type="checkbox"/>
Not used	<input type="checkbox"/>
BY: M. REZAEI DATE: 21 Dec 2023	SIGN: 



PQRD number	ARL2064-3	Revision 1	Date	11-01-2016
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PASS INFORMATION

Pass number	7	8	9	10	11	12
Layer number	5	5	5	5	6	6

WELDING PROCESSES

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

FILLER METALS

Material control number	P1FC150311	P1FC150311	P1FC150311	P1FC150311	P1FC150311	P1FC150311
SFA specification	5.18	5.18	5.18	5.18	5.18	5.18
AWS classification	E70C-6MH4	E70C-6MH4	E70C-6MH4	E70C-6MH4	E70C-6MH4	E70C-6MH4
Filler metal F-number	6	6	6	6	6	6
Weld metal A-number	-	-	-	-	-	-
Filler metal nominal composition	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Filler metal trade name	Lincoln, OS MC715-H	Lincoln, OS MC715-H	Lincoln, OS MC715-H	Lincoln, OS MC715-H	Lincoln, OS MC715-H	Lincoln, OS MC715-H
Filler metal size (mm)	1,2	1,2	1,2	1,2	1,2	1,2
Length of filler metal consumed (mm)	-	-	-	-	-	-
Deposited thickness (mm)	4	4	4	4	4	4
Maximum pass thickness (mm)	5	5	5	5	5	5
Weld deposit chemistry	-	-	-	-	-	-
Supplemental filler metal	-	-	-	-	-	-
Supplemental filler metal vol. (mm³)	-	-	-	-	-	-

POSITION

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

PREHEAT

Preheat temperature (°C)	10	10	10	10	10	10
Maximum interpass temperature (°C)	106	98	116	137	153	159

GAS

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

ELECTRICAL

Filler metal size (mm)	1,2	1,2	1,2	1,2	1,2	1,2
Waveform control	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used
Energy (J)	-	-	-	-	-	-
Power (J/s)	-	-	-	-	-	-
Arc time (sec)	-	-	-	-	-	-
Weld bead length (mm)	-	-	-	-	-	-
Amperes	226	233	227	217	224	222
Volts	26.6	26.6	26.6	26.7	26.6	26.8
Travel speed (mm/min)	248	577	443	291	527	351
Maximum heat input (kJ/mm)	1,4544	0,6445	0,8178	1,1946	0,6784	1,017
Current/polarity	DCEP (reverse polarity) DCEP (reverse 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	Spray	Globular

TECHNIQUE

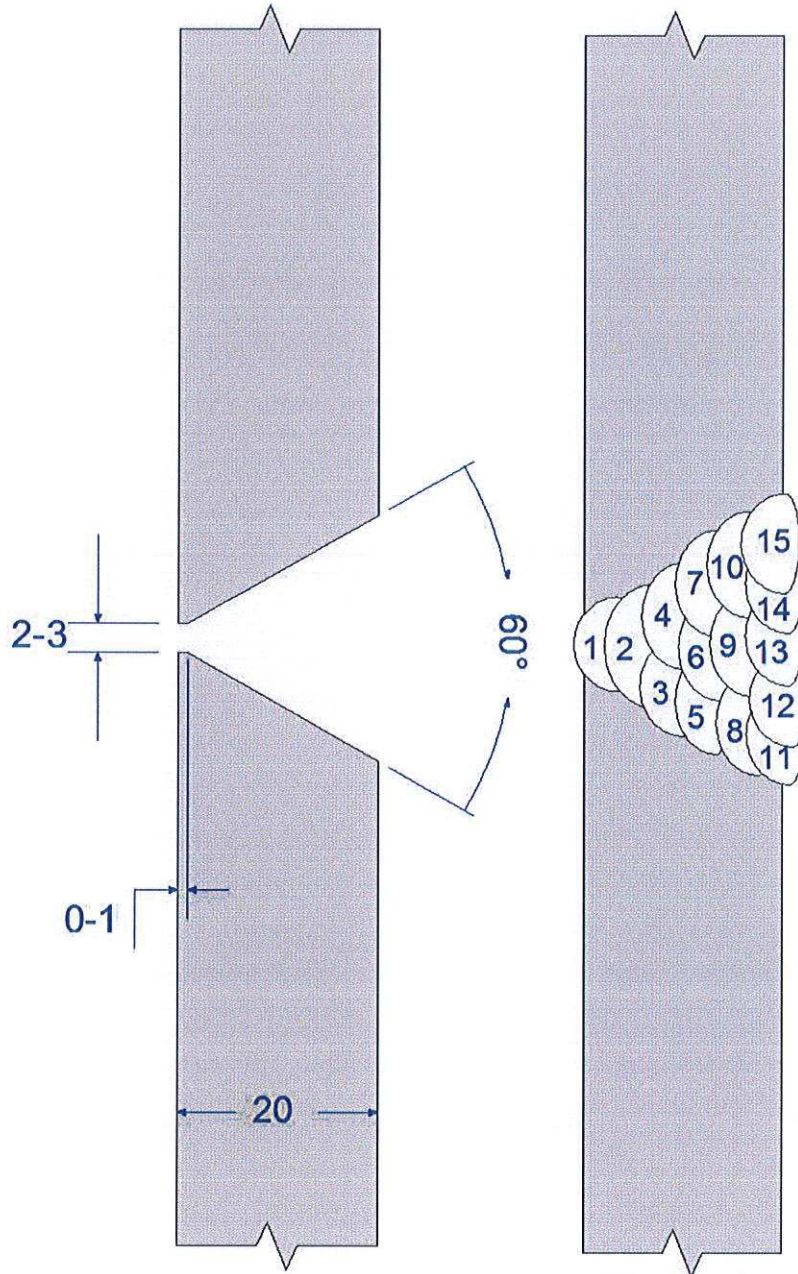
String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	15	15	15	15	15	15
C.T.W.D (mm)	15	15	15	15	15	15
Multi/single electrode	Single electrode	Single electrode	Single electrode	Single electrode	Single electrode	Single electrode
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 AS NOTED <input type="checkbox"/> 2. APPROVED AS NOTED <input checked="" type="checkbox"/> 3. NOT APPROVED <input type="checkbox"/> BY: M. REZAEI DATE: 27/Dec/2023 SIGN:

PQRD number	ARL2064-3	Revision 1	Date	11-01-2016
PASS INFORMATION				
Pass number	13	14	15	
Layer number	6	6	6	
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, OS MC715-H	Lincoln, OS MC715-H	Lincoln, OS MC715-H	
Filler metal size (mm)	1,2	1,2	1,2	
Length of filler metal consumed (mm)	-	-	-	
Deposited thickness (mm)	4	4	4	
Maximum pass thickness (mm)	5	5	5	
Weld deposit chemistry	-	-	-	
Supplemental filler metal	-	-	-	
Supplemental filler metal vol. (mm ³)	-	-	-	
POSITION				
Position	2G	2G	2G	
Weld progression	-	-	-	
PREHEAT				
Preheat temperature (°C)	10	10	10	
Maximum interpass temperature (°C)	178	196	169	
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	220	210	194	
Volts	26.8	26.8	21,7	
Travel speed (mm/min)	387	382	430	
Maximum heat input (kJ/mm)	0,9141	0,884	0,5685	
Current/polarity	DCEP (reverse polarity)	DCEP (reverse polarity)	DCEP (reverse polarity)	
Wire feed speed (m/min)	-	-	-	
Arc transfer mode	Globular	Globular	Globular	
TECHNIQUE				
Stringer 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	

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 21 Dec 2023	
SIGN: 	

PQRD number	ARL2064-3	Revision 1	Date	11-01-2016
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 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: 27/Dec./2023	
SIGN: 	

<input type="checkbox"/> Witnessed <input checked="" type="checkbox"/> Reviewed <input type="checkbox"/> Examined <small>Ton Konings</small>	 
---	--

PQR

CS PIPING

	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: 27/Dec/2023	
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	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/2023	
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 Date	RET 0245029-001-17 13-6-2012	Revision 0	WPS record number Company name Welding standard	P2000 Airpack Netherlands BV ASME Section IX:2010 including addenda 2011	Revision 1
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TENSILE TESTS (QW-150)

Reduced section

Specimen number	Width (mm)	Thickness (mm)	Area (mm ²)	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
1	19.01	4.53	86,115	-	538 N/mm ²	Ductile-Base Metal
2	19.02	4.73	89,965		527 N/mm ²	Ductile-Base Metal

Comments

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

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	52	-	-	-
2	Weld Metal	Charpy V	10 x 4	-55	19	-	-	-
3	Weld Metal	Charpy V	10 x 4	-55	55	-	-	-
4	HAZ	Charpy V	10 x 4	-55	74	-	-	-
5	HAZ	Charpy V	10 x 4	-55	61	-	-	-
6	HAZ	Charpy V	10 x 4	-55	58	-	-	-

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 12.6043-1A
			Test file number	ARL1559-1
			Tests conducted by	A. Karstanje

NARGAN COMPANY


INSPECTION

1- APPROVED

2- APPROVED AS NOTED


3- NOT APPROVED

BY: M. REZAEI DATE: 27/Dec./2013

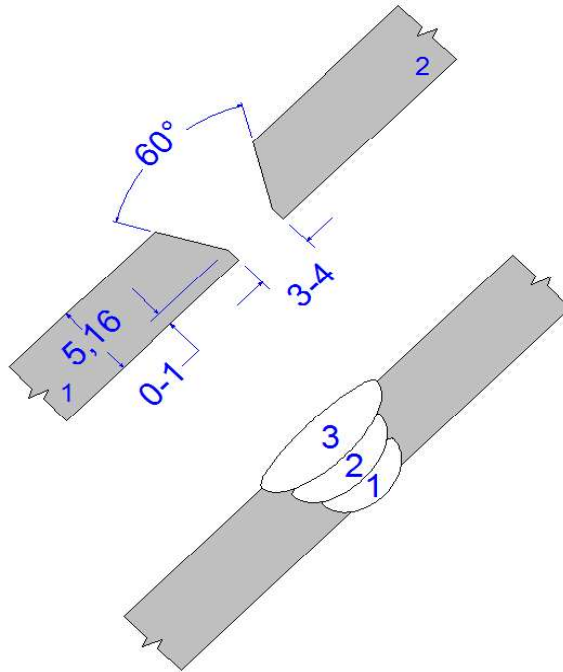
SIGN: 

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	Name	Signature
Franky van Toledo		W. Komdeur Llyds	 <p>Lloyd's Register Nederland B.V. A member of The Lloyd's Register group.</p> <p>Wim Komdeur Witvreesdijk 20 1118 CA Amsterdam</p> <p>Lloyd's Register</p>
Date		Date	
8-6-2012		8-6-2012	

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)

 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: 27/Dec/2013
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

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: 27/Dec/2023	
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)

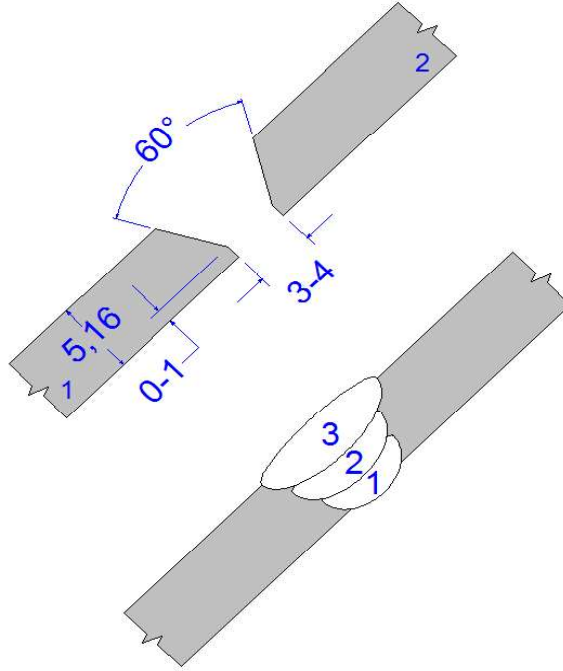
String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	9,5	9,5	9,5
Multi/Single pass per side	Multiple passes	Multiple passes	Multiple passes
Peening	Not used	Not used	Not used
Initial/interpass cleaning	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding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

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/2012	
SIGN:	



PASS PERFORMED/WITNESSED BY

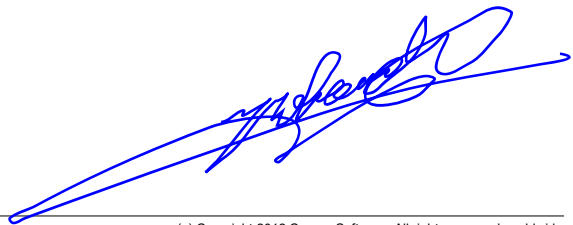
Welders name	A. Sumantri	A. Sumantri	A. Sumantri
Recorded/witnessed by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)
Date	29-5-2012	29-5-2012	29-5-2012
Data entry by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)

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	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./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		

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: 27/Dec/2023	
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 ²)	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
1	19.04	4.62	87,965	-	536 N/mm ²	Ductile-Base Metal
2	19.05	4.64	88,392	-	537 N/mm ²	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: 27/Dec./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

Signature 2

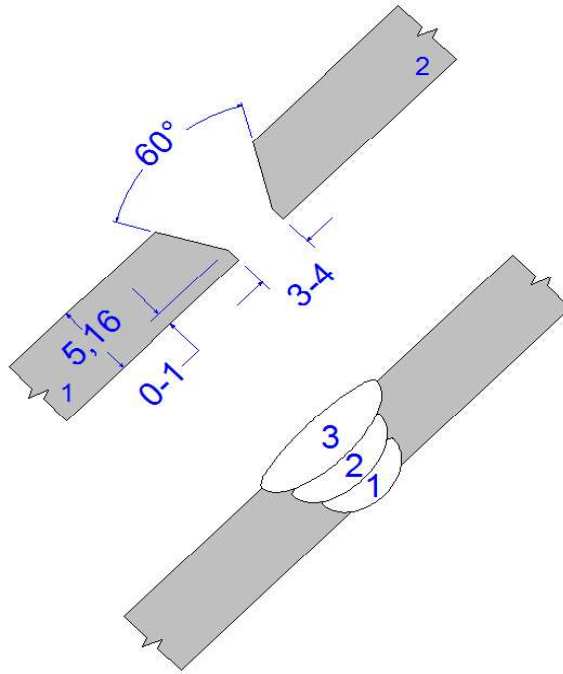
Name	Signature	Name	Signature
Franky van Toledo		W. Komdeur (Lloyds)	
Date		Date	
8-6-2012		8-6-2012	

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


Wim Komdeur
Witnessed by:

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	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
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

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: 27/Dec./2023	
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)

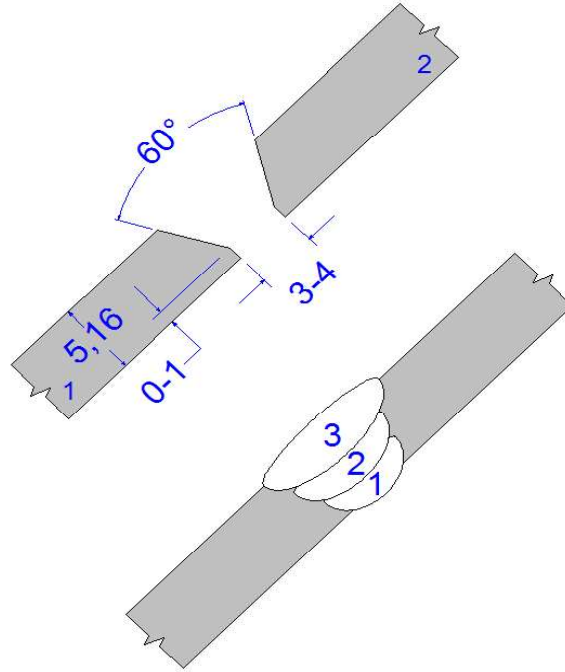
String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	9,5	9,5	9,5
Multi/Single pass per side	Multiple passes	Multiple passes	Multiple passes
Peening	Not used	Not used	Not used
Initial/interpass cleaning	Brushing and Grinding	Brushing and Grinding	Brushing and Grinding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

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/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: 27/Dec/2012	
SIGN: 	



PQR record number Date	A0790094-10 10/6/2020	Revision 0	WPS record number Company name Welding standard	PGF-2000 Airpack Netherlands BV ASME Section IX: 2019	Revision 0
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BASE METALS (QW-403)

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick.	(mm) Dia.	(mm)
Welded to:	Pipe	SA-333 (6)	1	1	101.60	40	6.02	114.30	
	Pipe	SA-350 (LF2)	1	2	101.60	40	6.02	114.30	
and tested:	Without PWHT, With impacts, With hardness								
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)	3-4		
Root face (mm)	0-1		

WELDING PROCESSES

Welding process	GTAW	FCAW
Type	Manual	Semi-automatic

FILLER METALS (QW-404)

SFA specification	5.18	5.20
AWS classification	ER70S-3	E71T-9M-J
Filler metal F-number	6	6
Weld metal A-number	1	6
Filler metal nominal composition	Not used	Not used
Filler metal trade name	Lincoln Electric	Nippon Steel & Sumikin Welding
Filler metal size (mm)	2.4	1.2
Deposited thickness (mm)	2.00	4.02
Maximum pass thickness (mm)	12	12
Weld deposit chemistry	Not used	Not used
Supplemental filler metal	-	Not used
Supplemental filler metal vol. (mm ³)	-	Not used

POSITION (QW-405)

Position	1G Rotated	1G Rotated
Weld progression	-	-

PREHEAT (QW-406)

Preheat temperature (°C)	10	10
Maximum interpass temperature (°C)	123	174

GAS (QW-408)


Shielding gas:	Type	Argon (A5.32 SG-A)	AC-2 (A5.32 SG-)
	Flow rate (l/min)	10-14	15-20
Trailing gas:	Type	Not used	Not used
	Flow rate (l/min)	-	-
Backing gas:	Type	Not used	Not used
	Flow rate (l/min)	-	-

ELECTRICAL (QW-409)

Filler metal size (mm)	2.4	1.2
Waveform control		
Energy (J)		
Power (J/s)		
Arc time (sec)		
Weld bead length (mm)		
Amperes	68	258 - 263
Volts	10.8	31.6
Travel speed (mm/min)	61	335 - 421
Maximum heat input (kJ/mm)	0.7224	1.4885
Tungsten size (mm)	2.4	-
Tungsten type	SFA 5.12 EWCe-2	-
Current/polarity	DCEN	DCEP
DC pulsing current	Not used	-
Wire feed speed (m/min)	-	0
Arc transfer mode	-	Spray

TECHNIQUE (QW-410)

String or weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	8 mm	15
C.T.W.D (mm)	-	15-20
Multi/Single pass per side	Single pass	Multiple passes
Peening	Not used	Not used
Initial/interpass cleaning	Brushing and Grinding	Brushing and Grinding
Back gouging method	Not used	Not used

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/2023	
SIGN: 	

Witnessed Reviewed

And found to comply with:

Date: 27/10/20

Sign: Knops



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

PCR record number Date	A0790094-10 10/6/2020	Revision 0	WPS record number Company name Welding standard	PGF-2000 Airpack Netherlands BV ASME Section IX: 2019	Revision 0
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TENSILE TESTS (QW-150)

Specimen number	Width (mm)	Thickness (mm)	Area (mm ²)	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
42663-1	18.95	5.15	97.593	-	558	Ductile-Base Metal
42663-1	18.98	5.31	100.784	-	548	Ductile-Base Metal

Comments: 2 reduced section tension tests per QW-151.2 and QW-462.1(b)

GUIDED BEND TESTS (QW-160)

Type of test	Acceptance criteria	Result	Comments
2 transverse face bends per QW-161.2 and QW-462.3(a) 2 transverse root bends per QW-161.3 and QW-462.3(a)	QW-163 QW-163	Acceptable Acceptable	see - ASME IX - QW-451.1 see - ASME IX - QW-451.1

Comments:

TOUGHNESS TESTS (QW-170)

Specimen number	Notch location	Notch type	Specimen size (mm) x (mm)	Test temperature (°C)	Impact values (J)	Impact values (% Shear)	(mm)	Drop weight break
42663-WF	Weld Metal	V-notch	10 x 5	-40	49-62-56	-	-	-
42663-HA	HAZ A350	V-notch	10 x 5	-40	47-40-47	-	-	-
42663-HB	HAZ A333	V-notch	10 x 5	-40	71-77-66	-	-	-
42663-2A	FL +2 A350	V-notch	10 x 3.3	-40	25-51-51	-	-	-
42663-2B	FL +2 A333	V-notch	10 x 3.3	-40	51-50-48	-	-	-
42663-5A	FL +5 A350	V-notch	10 x 3.3	-40	29-33-41	-	-	-
42663-5B	FL +5 A333	V-notch	10 x 3.3	-40	56-58-50	-	-	-

Comments: Test method ASME IX QW-171

HARDNESS TEST

Type (Scale)	Distance from surface	SA-333 (6)	HAZ	Weld	HAZ	SA-350 (LF2)
Vickers (HV) Cap	1.5 - 2 mm	157-156-161	176-184-199-199-201	192-192-184	204-199-194-189-175	180-182-186
Vickers (HV) Cap	1.5 - 2 mm	169-171-174	190-197-200-202-203-	151-152-155	190-189-184-192-184	173-173-174

Comments: Test method ASME IX QW-171

OTHER TESTS

Type of test	Acceptance criteria	Result	Comments
Macroscopic examination	ASME IX	Acceptable	

Comments:

CERTIFICATION

Welder's name A. Sumantri	ID Number ID Card IXH4P6551	Stamp number W-102	Mechanical testing by Laboratory test number Test file number Tests conducted by	Element Breda (NLD) ARJ001-20-09-42663-1 ARL2542-1 Daniel Schutt
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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.

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/2023	
SIGN: <i>M. Rezaei</i>	

Signature 1

Name F. van Toledo (Airpack)	Signature
Date 10/6/2020	

Signature 2

Name L. Knops (DNVGL)	Signature
Date 10/6/2020	

	Witnessed <input checked="" type="checkbox"/> Reviewed <input checked="" type="checkbox"/> And found to comply with: Date: 7/10/20 Sign: L. Knops
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PQR record number Date	A0790094-10 10/6/2020	Revision 0	WPS record number Company name Welding standard	PGF-2000 Airpack Netherlands BV ASME Section IX: 2019	Revision 0
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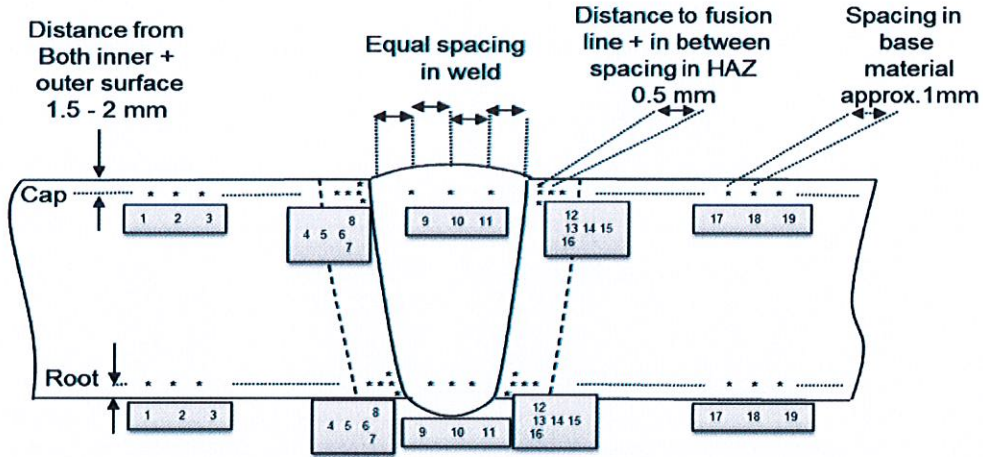
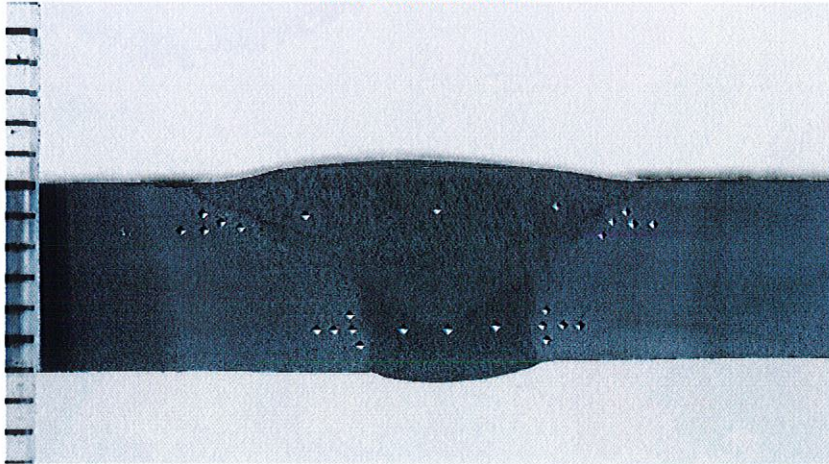


Fig. 1: Location of indentations.

SA-333Gr 6 side

SA-350(LF2) side

MACRO PHOTO
 Cross section no. 42663-1



 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: 27/Dec./2023	
SIGN: 	

Missed Reviewed
 And found to comply with:
 Date: 7/10/20
 Sign: L. Knops



PQRD number	ARL2542-1	Revision 0	Date	9/22/2020
PQR number	A0790094-10	Revision 0	Welding standard	ASME Section IX: 2019
WPS number	PGF-2000	Revision 0	Company name	Airpack Netherlands BV
			To be tested	Without PWHT

WELDING PROCESSES

Welding process	GTAW	FCAW
Type	Manual	Semi-automatic

BASE METALS (QW-403)

Product form	Pipe	Welded to:	Product form	Pipe
Material control number	33058		Material control number	294658
Specification (type or grade)	SA-333 (6)		Specification (type or grade)	SA-350 (LF2)
Nominal composition	C-Mn-Si		Nominal composition	C-Mn-Si
Trade name	Artrom S.A.		Trade name	Donalam
P number	1		P number	1
G number	1		G number	2
AWS group number	U		AWS group number	U
Nominal pipe/tube size	101.60		Nominal pipe/tube size	101.60
Schedule	40		Schedule	40
Length	(mm) 150		Length	(mm) 150
Width (OD)	(mm) 114.30		Width (OD)	(mm) 114.30
Thickness	(mm) 6.02		Thickness	(mm) 6.02

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)	3-4		
Root face (mm)	0-1		

CLEANING/ROOT TREATMENT

Surface preparation	Grinding and Brushing
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: 27/Dec./2023	
SIGN:	

Witnessed Reviewed
 And found to comply with:
 Date: 7/10/20
 Sign: L. Knops

PQRD number	ARL2542-1	Revision 0	Date	9/22/2020
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PASS INFORMATION

Pass number	1	2	3
Layer number	1	2	3

WELDING PROCESSES

Welding process	GTAW	FCAW	FCAW
Type	Manual	Semi-automatic	Semi-automatic

FILLER METALS (QW-404)

Material control number	870264	01588	01588
SFA specification	5.18	5.20	5.20
AWS classification	ER70S-3	E71T-9M-J	E71T-9M-J
Filler metal F-number	6	6	6
Weld metal A-number	1		
Filler metal nominal composition	Not used	Not used	Not used
Filler metal trade name	Lincoln Electric	Nippon Steel & Sumikin Welding	Nippon Steel & Sumikin Welding
Filler metal size (mm)	2,4	1,2	1,2
Length of filler metal consumed (mm)	Not used	Not used	Not used
Deposited thickness (mm)	2,02	2	2
Maximum pass thickness (mm)	12	12	12
Weld deposit chemistry	Not used	Not used	Not used
Flux nominal composition	Not used	-	-
Flux trade name	Not used	-	-
Supplemental filler metal	-	Not used	Not used
Supplemental filler metal vol. (mm³)	-	Not used	Not used

POSITION (QW-405)

Position	1G Rotated	1G Rotated	1G Rotated
Weld progression	-	-	-

PREHEAT (QW-406)

Preheat temperature (°C)	10	10	10
Maximum interpass temperature (°C)	10	123	174

GAS (QW-408)


Shielding gas: Type	Argon (A5.32 SG-A)	AC-2 (A5.32 SG-)	AC-2 (A5.32 SG-)
Flow rate (l/min)	10-14	15-20	15-20
Trailing gas: Type	Not used	Not used	Not used
Flow rate (l/min)	-	-	-
Backing gas: Type	Not used	Not used	Not used
Flow rate (l/min)	-	-	-

ELECTRICAL (QW-409)

Filler metal size (mm)	2,4	1,2	1,2
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
Arc time (sec)	352	51	64
Weld bead length (mm)	358	358	358
Amperes	68	258	263
Volts	10.8	31.6	31.6
Travel speed (mm/min)	61	421	335
Maximum heat input (kJ/mm)	0.7224	1.1619	1.4885
Tungsten size (mm)	2,4	-	-
Tungsten type	SFA 5.12 EWCe-2	-	-
Current/polarity	DCEN	DCEP	DCEP
DC pulsing current	Not used	-	-
Wire feed speed (m/min)	-	Not used	Not used
Arc transfer mode	-	Spray	Spray

TECHNIQUE (QW-410)

String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	8 mm	15	15
C.T.W.D (mm)	-	15-20	15-20
Multi/Single pass per side	Single pass	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	Not used	Not used	Not used

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: 27/Dec/2023	
SIGN: 	

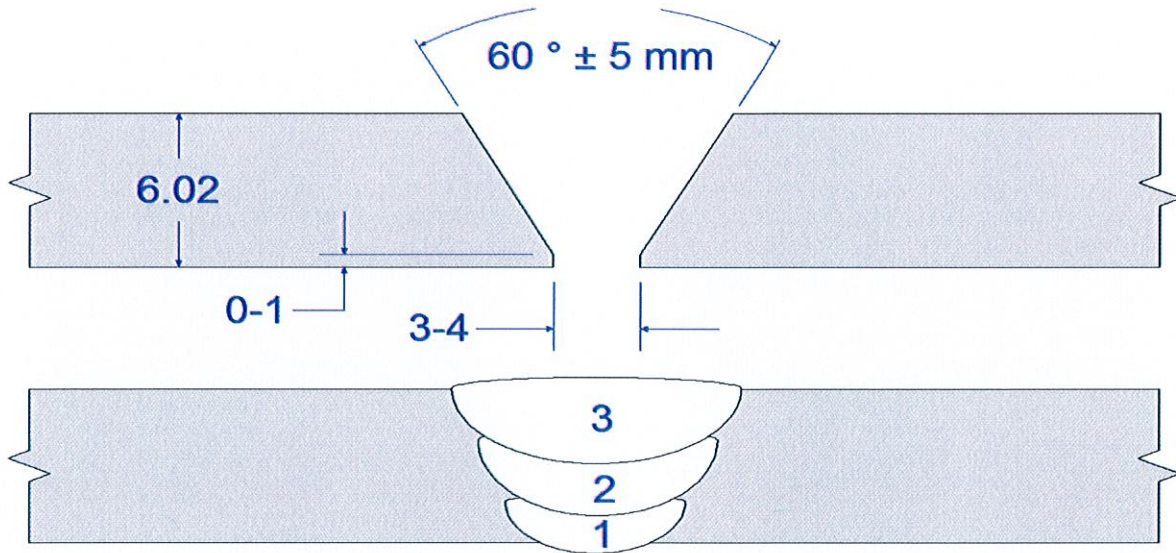
PASS PERFORMED/WITNESSED BY

Welders name	A. Sumantri	A. Sumantri	A. Sumantri
Recorded/witnessed by	L. Knops DNVGL	L. Knops DNVGL	L. Knops DNVGL
Date	9/22/2020	9/22/2020	9/22/2020
Data entry by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)




 Checked Reviewed
 And found to comply with:
 Date: 7/10/20
 Sign: L. Knops

PQRD number	ARL2542-1	Revision 0	Date	9/22/2020
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SA-350 (LF2) pipe machined from bar.



Pipe diameter 114,3 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: 27/Dec/2023	
SIGN: 	


 Witnessed Reviewed
 And found to comply with:
 Date: 7/10/20
 Sign: L. Knops

Arjan Roza Lastechniek
 G. Sterkenburgstraat 38
 4268 GS MEEUWEN

 Date(s) tested : 05-Oct-20
 Date reported : 05-Oct-20
 Element report number : ARJ001-20-09-42663-1

Customer reference : ARL2542

TEST REPORT
WELDING PROCEDURE QUALIFICATION TEST RECORD



Testing in accordance with	: ASME IX: 2019
Purchase order no.	: ARL2542-1
Manufacturer	: Airpack Nederland BV.
WPS	: PGF-2000
Description of sample(s)	: Pipe with Single-V-groove
Dimension(s)	: 4" Sch 40S (Ø 114,3 x 6,02 mm)
Material grade	: 1) P1 Gr.1 – P1 Gr. 1 2) P1 Gr.1 – P1 Gr. 2 (Machined from bar)
Material standard	: 1) ASTM SA A333 Gr. 6 2) ASTM SA A350 LF2 +N
Welding process(es)	: 1) GTAW (Root) 2) FCAW (Filler and Cap)
Filler A-Number F-number	: 1) Root F-no.6 A-no 1 2) Filler and cap F-no.6
Filler Brand and type	: 1) Lincoln Electric LNT 25 (AWS A5.18: ER70S-3) 2) Nittetsu, SF-3A (AWS A5.20: E71T-9M-J)
Shielding gas	: 1) A5.31 SG-A 2) A5.32 SG-AC-20
Backing gas	: N.A.
Welding position	: 1G Rotated
Preheat / Interpass temp.	: 10 °C / 174°C
Joint type	: Single-V-groove
Welder	: Sumantri A.
Date / place of birth	: 23-02-1962 / Oost- en West-Souburg
Stamp. No. / ID	: A3 / ID Card

Note: The above mentioned data is only for information and is no part of the examination in this test report

TRANSVERSE TENSILE TEST ON WELD METAL

Test method: ASME IX QW-152		Test temperature: R.T.		
Specimen	Size [mm]	Tensile strength [MPa] Rm	Fracture location	Remark
42663-1	18.95 x 5.15	558	BM	--
42663-1	18.98 x 5.31	548	BM	--
Requirements ASTM A333 Gr.6;		≥ 415		--

Note: BM= base material HAZ= heat affected zone WM= weld material

 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: 27/Dec./2023	
SIGN: 	

MACRO EXAMINATION

Method: ASME IX QW 183			Magnification: 5x
Specimen	Etchant:	Observations:	Remark
42663-1	Nital	No significant inclusions or other defects	Acceptable

Note: See macro photo page 3

GUIDED BEND TEST

Test method: ASME IX QW-162						Test temperature: R.T.	
Specimen	Type	Size [mm]	Former [mm]	Roller distance [mm]	Bend Angle [°]	Results	Remark
42663-1	Face bend	40 x 6	24	40	180	Acceptable	--
42663-1	Face bend	40 x 6	24	40	180	Acceptable	--
42663-1	Root bend	40 x 6	24	40	180	Acceptable	--
42663-1	Root bend	40 x 6	24	40	180	Acceptable	--

HARDNESS MEASUREMENT

Test method: ASME IX QW-171																			
Location of indentations: as per ISO 9015-1 and fig. 1 below																			
Specimen: 42663-1																			
Location	BM			HAZ					WM			HAZ					BM		
Indent	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Cap	157	156	161	176	184	199	199	201	192	192	184	204	199	194	189	175	180	182	186
Root	169	171	174	190	197	200	202	203	151	152	155	190	189	184	192	184	173	173	174

Note: BM= base material HAZ= heat affected zone WM= weld material

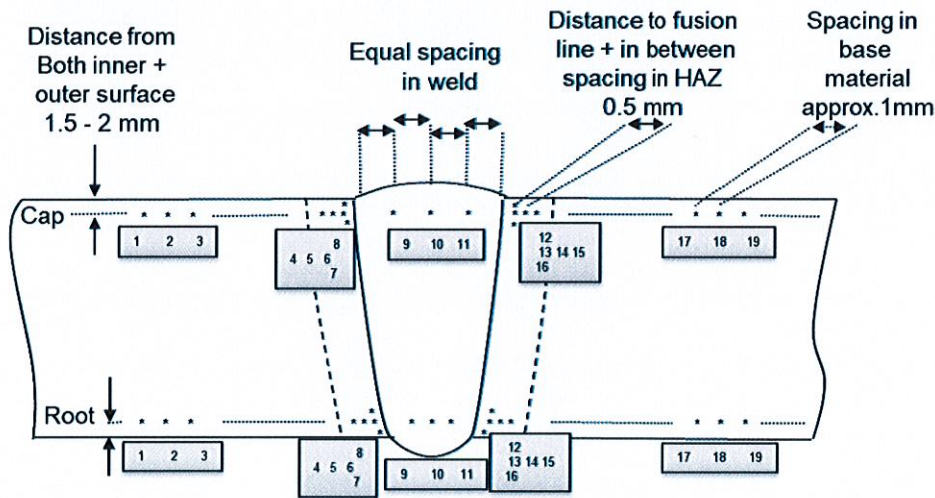


Fig. 1: Location of indentations.

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
SIGN:	

CHARPY V-NOTCH IMPACT TEST

Test method: ASME IX QW-171							
Specimen	Notch	Size [mm]	Temp [°C]	Absorbed Energy [J]			
				Single		Average	
42663-WF	Midweld	10x5	-40	49	62	56	56
42663-HA	HAZ A350	10x5	-40	47	40	47	45
42663-HB	HAZ A333	10x5	-40	71	77	66	71
42663-2A	Fusion line +2mm A350	10x3.33	-40	25	51	51	42
42663-2B	Fusion line +2mm A333	10x3.33	-40	51	50	48	50
42663-5A	Fusion line +5mm A350	10x3.33	-40	29	33	41	34
42663-5B	Fusion line +5mm A333	10x3.33	-40	56	58	50	55

Note: Values above 360 Joule exceed 80% of the machine capacity and should be considered as 'approximate values'.




The above mentioned items satisfy the requirements.



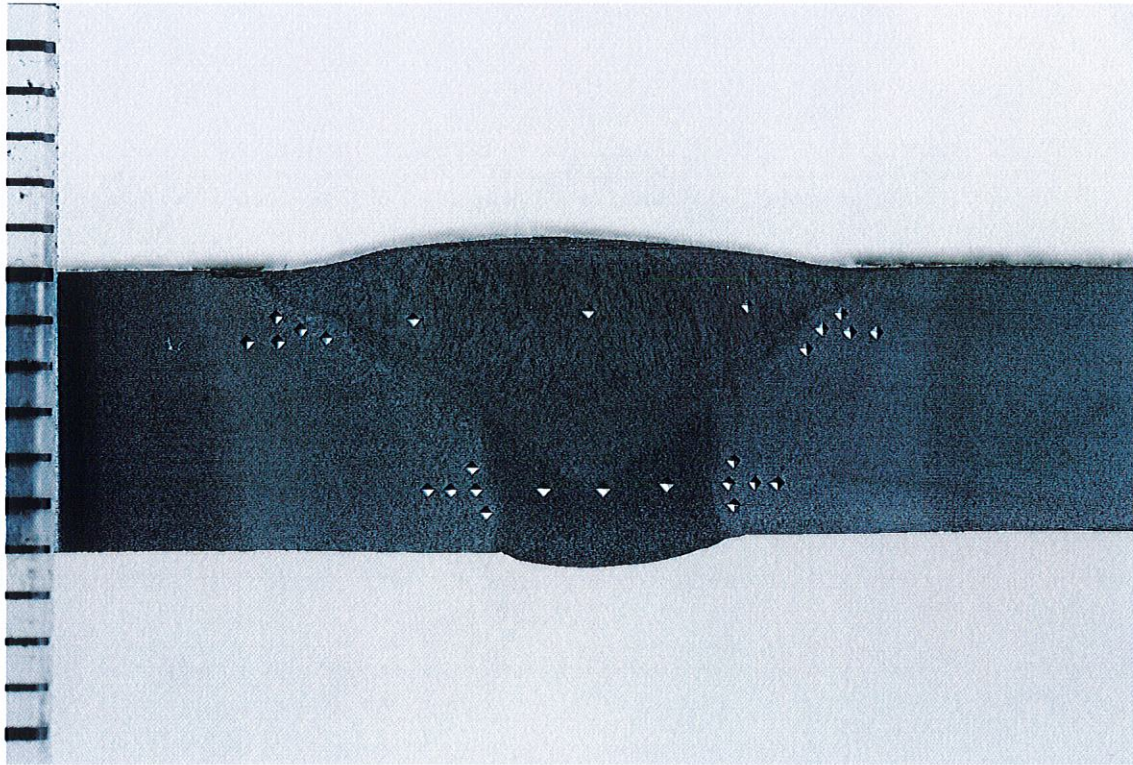
Element Materials Technology el Schutt


All characteristics of the above object(s) have, as far as accessible and relevant, been verified by Element Materials Technology Rotterdam b.v. (Element). Other information was provided by the purchaser. This information was verified as far as possible and has been copied into this report, unchanged. Element does not bear responsibility for the correctness of this submitted information. Any kind of "witnessing" and conclusions by a third party is not covered by the RVA accreditation L063 and is no part of the Element report. We hereby certify that the reported test data is correct and that the above object(s) was (were) tested/examined in accordance with purchaser's requirements and/or the above procedure(s) and/or code(s)/specification(s). If a declaration of conformity is issued in the report with regard to compliance with a specification or standard, this declaration is only applicable to the product(s) examined. In this assessment, the decision rule is applied that assumes that the expanded measurement uncertainty is not included in the assessment. On occasion a test is subcontracted by Element, the accreditation number of the subcontracted party is reported. Interpretations, opinions, conclusions and advice are partly based on the examination results and partly on information supplied by the purchaser. This report has legal value only when furnished with an authorized signature. If, upon reproduction, only part of this report is copied, Element will not bear any responsibility for content, purport and conclusions of that reproduction.

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: 27/Dec./2023	
SIGN: 	




MACRO PHOTO
Cross section no. 42663-1



 NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
<small>BY: M. REZAEI DATE: 27/Dec./2023</small>	
<small>SIGN:</small> 	

PQR

SS PIPING

	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: 27/Dec/2023	
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: 27/Dec/2023	
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 ²)	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
1	19.00	9.42	178,980	-	555 N/mm ²	
2	19.00	9.30	176,700	-	581 N/mm ²	

Comments

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

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.

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2012	
SIGN:	

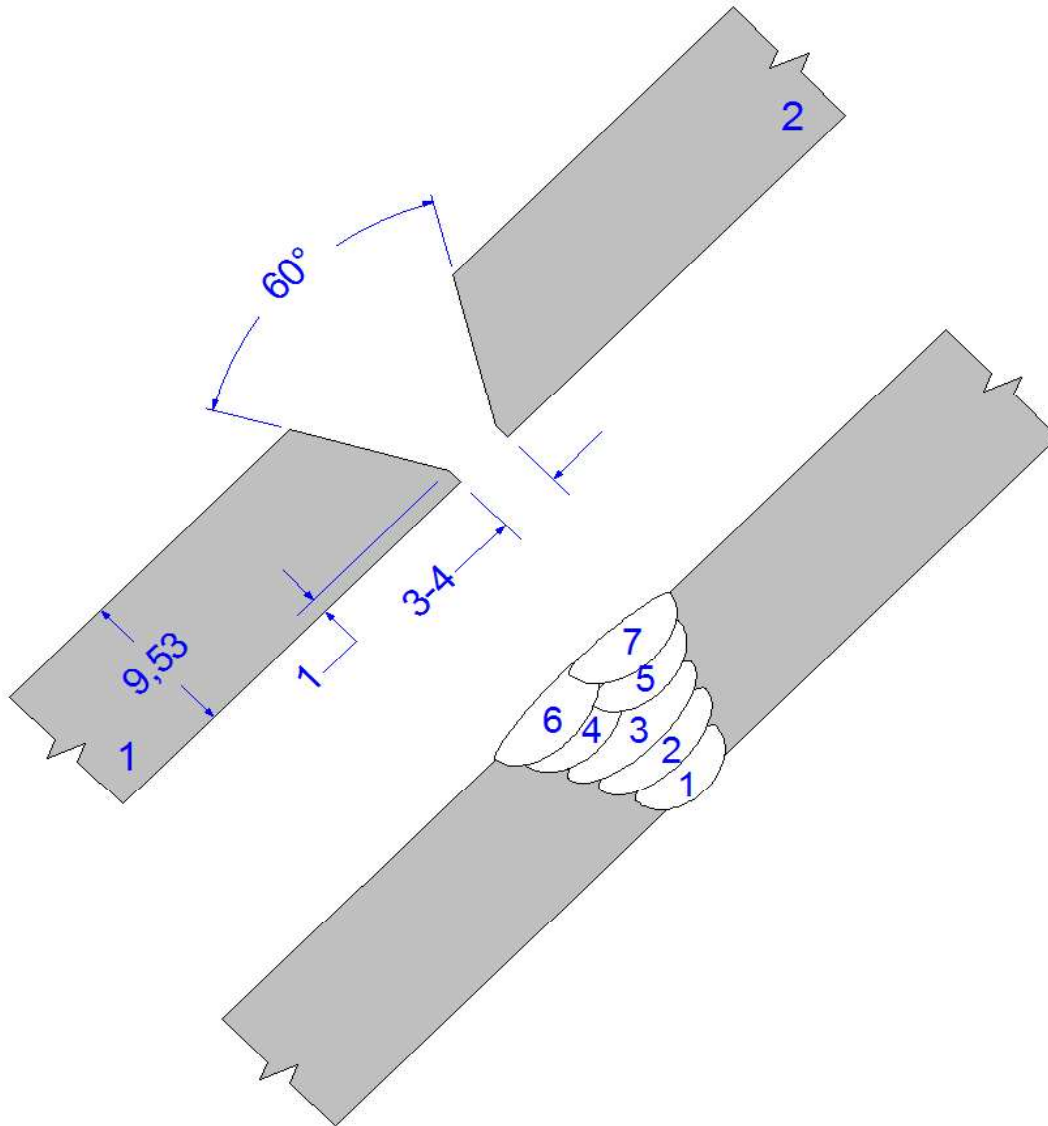
Signature 1

Name	Signature
Franky van Toledo	
Date	
8-6-2012	

Signature 2

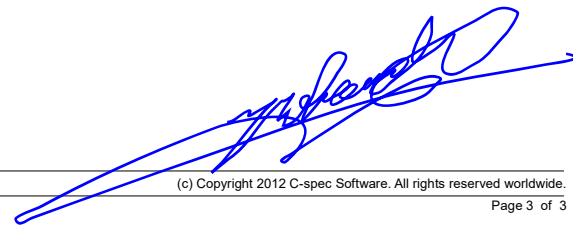
Name	Signature
W. Komdeur (Lloyds)	
Date	
8-6-2012	

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)

 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: 27/Dec/2013	
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	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
SIGN:	

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	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: 27/Dec/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)

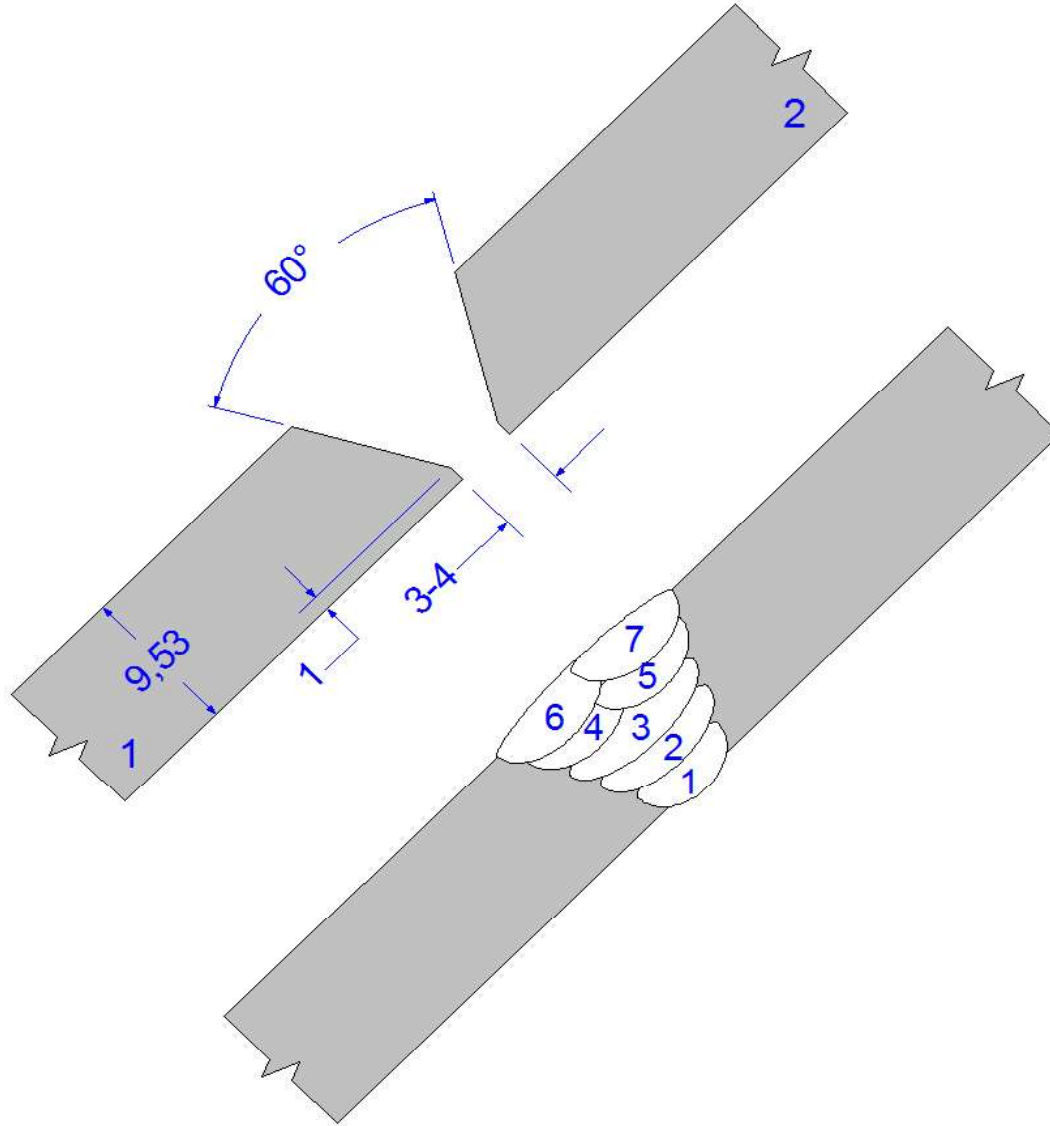
String or weave	Stringer and Weave			
Orifice/gas cup size	9,5			
Multi/Single pass per side	Multiple passes			
Peening	Not used			
Initial/interpass cleaning	Brushing and Grinding			
Back gouging method	None			

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec/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: 27/Dec/2012	
SIGN: 	



PQR record number Date	A0790094-11 10/6/2020	Revision 1	WPS record number Company name Welding standard	PGF-3000 Airpack Netherlands BV ASME Section IX: 2019	Revision 0
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BASE METALS (QW-403)

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (mm)	Dia. (mm)
Welded to:	Pipe	SA-312 (TP316L)	8	1	101.60	40	6.02	114.30
	Pipe	SA-312 (TP316L)	8	1	101.60	40	6.02	114.30
and tested: Notes	Without PWHT, With hardness							

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)	3-4		
Root face (mm)	0-1		

WELDING PROCESSES

Welding process Type	GTAW Manual	FCAW Semi-automatic
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FILLER METALS (QW-404)

SFA specification	5.9	5.22
AWS classification	ER316LSi	E316LT0-1
Filler metal F-number	6	6
Weld metal A-number	8	8
Filler metal nominal composition	Not used	Not used
Filler metal trade name	Lincoln Electric, LNT 316LSi	Kobelco welding, DW-316L
Filler metal size (mm)	2,0	1,2
Deposited thickness (mm)	2,00	4,00
Maximum pass thickness (mm)	12	12
Weld deposit chemistry	Not used	Not used
Supplemental filler metal	-	Not used
Supplemental filler metal vol. (mm ³)	-	Not used

POSITION (QW-405)

Position	1G Rotated	1G Rotated
Weld progression	-	-

PREHEAT (QW-406)


Preheat temperature (°C)	10	10
Maximum interpass temperature (°C)	55	101

GAS (QW-408)

Shielding gas: Type	Argon (A5.32 SG-A)	AC-20 (A5.32 SG-)
Flow rate (l/min)	12-15	15-20
Trailing gas: Type	Not used	Not used
Flow rate (l/min)	-	-
Backing gas: Type	A5.32 SG-NH-5	A5.32 SG-NH-5
Flow rate (l/min)	14-16	14-16

ELECTRICAL (QW-409)

Filler metal size (mm)	2,0	1,2
Waveform control		
Energy (J)		
Power (J/s)		
Arc time (sec)		
Weld bead length (mm)		
Amperes	68	196 - 197
Volts	10.8	29.5 - 29.6
Travel speed (mm/min)	24	376 - 421
Maximum heat input (kJ/mm)	1.836	0.9305
Tungsten size (mm)	2,4	-
Tungsten type	SFA 5.12 EW/Ce-2	-
Current/polarity	DCEN	DCEP
DC pulsing current	Not used	
Wire feed speed (m/min)	-	0
Arc transfer mode	-	Spray

INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/dec/2023	
SIGN: 	

TECHNIQUE (QW-410)

String or weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	8 mm	16
C.T.W.D (mm)	-	15-20
Multi/Single pass per side	Single pass	Multiple passes
Peening	Not used	Not used
Initial/interpass cleaning	Brushing and Grinding	Brushing and Grinding
Back gouging method	Not used	Not used

PQR record number Date	A0790094-11 10/6/2020	Revision 1	WPS record number Company name Welding standard	PGF-3000 Airpack Netherlands BV ASME Section IX: 2019	Revision 0
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TENSILE TESTS (QW-150)

Specimen number	Width (mm)	Thickness (mm)	Area (mm ²)	Ultimate total load (N)	Ultimate unit stress (MPa)	Type of failure and location
42663-4	18.98	5.83	110.653	-	592	Ductile-Weld Ductile-HAZ
42663-4	19.01	5.39	102.464	-	539	

Comments: 2 reduced section tension tests per QW-151.2 and QW-462.1(b)

GUIDED BEND TESTS (QW-160)

Type of test	Acceptance criteria	Result	Comments
2 transverse face bends per QW-161.2 and QW-462.3(a) 2 transverse root bends per QW-161.3 and QW-462.3(a)	QW-163 QW-163	Acceptable Acceptable	see - ASME IX - QW-451.1 see - ASME IX - QW-451.1

Comments:

HARDNESS TEST

Type (Scale)	Distance from surface	SA-312 (TP316L)	HAZ	Weld	HAZ	SA-312 (TP316L)
Vickers (HV) root	1.5-2 mm	158-158-158	173-178-173-175-169	169-182-165	174-179-172-178-175	159-160-159
Vickers (HV) Cap	1.5-2 mm	164-165-164	182-181-179-177-185	188-189-191	182-176-187-187-187	162-163-163

Comments:

OTHER TESTS

Type of test	Acceptance criteria	Result	Comments
Macroscopic examination Determination of the volume fraction ferrite	ASME IX -	Acceptable -	See report ARJ001-20-09-42663-4 rev 1

Comments:

CERTIFICATION

Welder's name	ID Number	Stamp number	Mechanical testing by Laboratory test number Test file number Tests conducted by	Element Breda (NLD) ARJ001-20-09-42663-4 ARL2542-4 Daniel Schutt
A. Sumantri	ID Card IXH4P6551	W-102		

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

INSPECTION

1- APPROVED

2- APPROVED AS NOTED

3- NOT APPROVED

BY: M. REZAEI DATE: 27/Dec/2023

SIGN:

Witnessed Reviewed

And found to comply with:

05 NOV 2020

Date: 05 NOV 2020

Sign: L. Knops

Signature 1

Name	Signature
F. van Toledo (Airpack)	
Date	
11/4/2020 (rev 1)	

QUALITY INSPECTED

DATE: 11/4/2020

NAME: F. van Toledo

AIRPACK NEDERLAND B.V.

Signature 2

Name	Signature
L. Knops (DNVGL)	
Date	
11/4/2020 (rev 1)	

PQR record number Date	A0790094-11 10/6/2020	Revision 1	WPS record number Company name Welding standard	PGF-3000 Airpack Netherlands BV ASME Section IX: 2019	Revision 0
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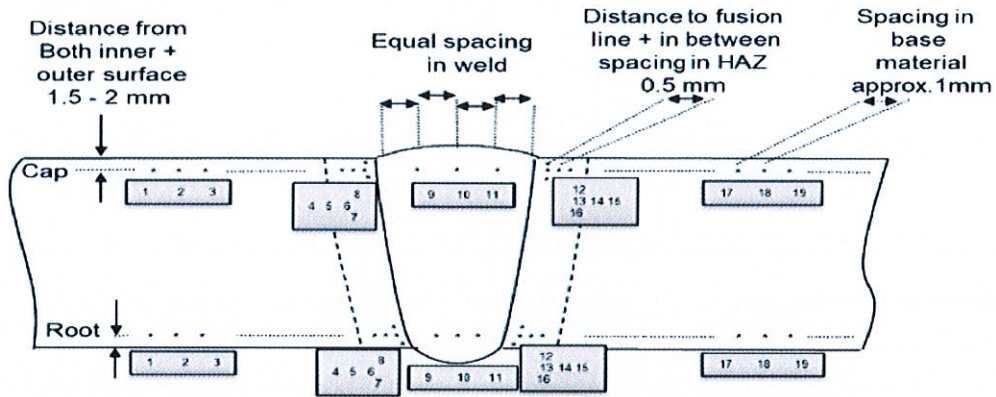
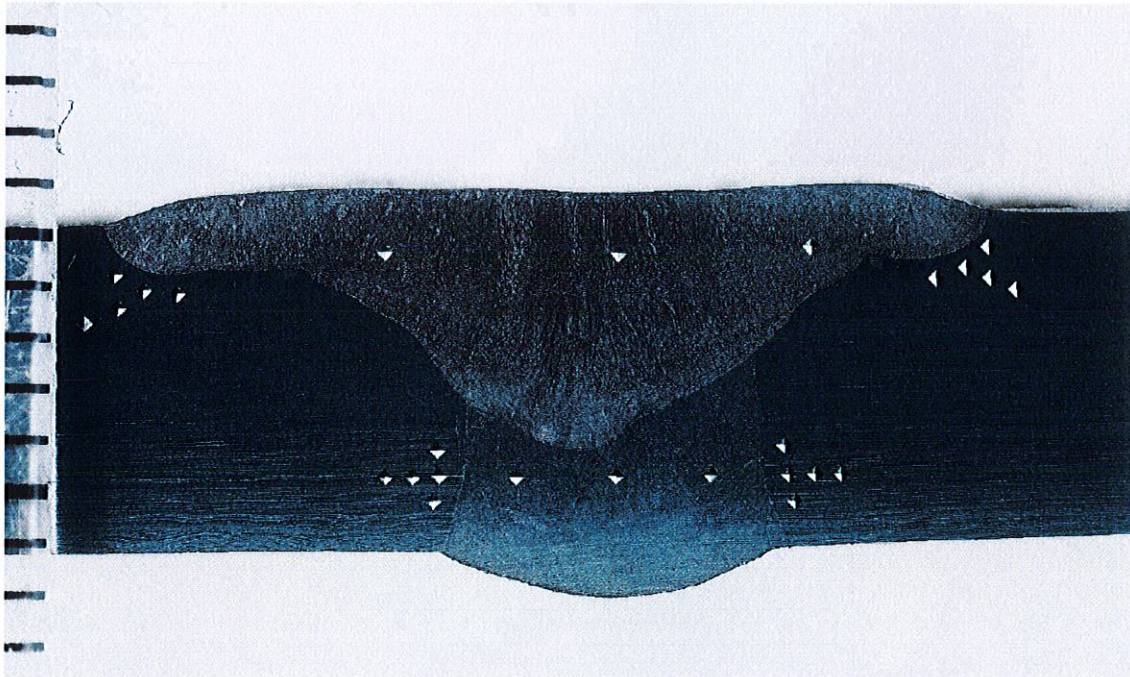


Fig. 1: Location of indentations.

MACRO PHOTO
 Cross section no. 42663-4



INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
SIGN:	



PQRD number	ARL2542-4	Revision 0	Date	10/6/2020
PQR number	A0790094-11	Revision 0	Welding standard	ASME Section IX: 2019
WPS number	PGF-3000	Revision 0	Company name	Airpack Netherlands BV
			To be tested	Without PWHT

WELDING PROCESSES

Welding process	GTAW	FCAW
Type	Manual	Semi-automatic

BASE METALS (QW-403)

Product form	Pipe	Welded to:	Product form	Pipe
Material control number	QS477		Material control number	QS477
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	Salzgitter		Trade name	Salzgitter
P number	8		P number	8
G number	1		G number	1
AWS group number	U		AWS group number	U
Nominal pipe/tube size	101.60		Nominal pipe/tube size	101.60
Schedule	40		Schedule	40
Length	(mm) 150		Length	(mm) 150
Width (OD)	(mm) 114.30		Width (OD)	(mm) 114.30
Thickness	(mm) 6.02		Thickness	(mm) 6.02

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)	3-4		
Root face (mm)	0-1		

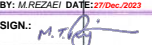
CLEANING/ROOT TREATMENT

Surface preparation	Grinding and Brushing
Initial/Interpass cleaning	Brushing and Grinding
Back gouging method	Not used

Witnessed Reviewed
 And found to comply with:
 Date: 7/10/20
 Sign: L. Knops

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: 27/Dec./2023	
SIGN:	

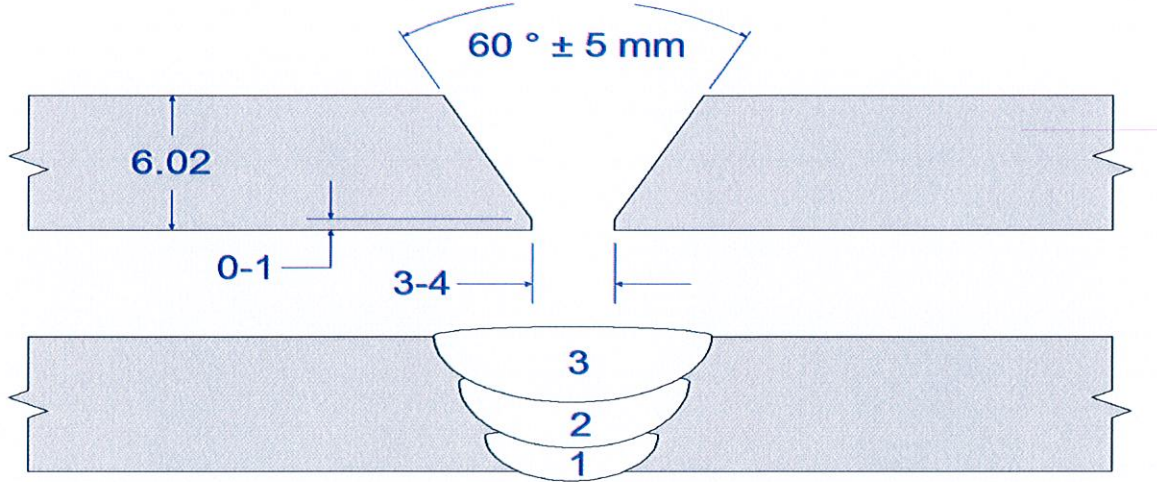
PQRD number	ARL2542-4	Revision 0	Date	10/6/2020
PASS INFORMATION				
Pass number	1	2	3	
Layer number	1	2	3	
WELDING PROCESSES				
Welding process	GTAW	FCAW	FCAW	
Type	Manual	Semi-automatic	Semi-automatic	
FILLER METALS (QW-404)				
Material control number	30268743	KC19-410	KC19-410	
SFA specification	5.9	5.22	5.22	
AWS classification	ER316LSi	E316LT0-1	E316LT0-1	
Filler metal F-number	6	6	6	
Weld metal A-number	8	8	8	
Filler metal nominal composition	Not used	Not used	Not used	
Filler metal trade name	Lincoln Electric, LNT 316LSi	Kobelco welding, DW-316L	Kobelco welding, DW-316L	
Filler metal size (mm)	2,0	1,2	1,2	
Length of filler metal consumed (mm)	Not used	Not used	Not used	
Deposited thickness (mm)	2,02	2,0	2,0	
Maximum pass thickness (mm)	12	12	12	
Weld deposit chemistry	Not used	Not used	Not used	
Flux nominal composition	Not used	-	-	
Flux trade name	Not used	-	-	
Supplemental filler metal	-	Not used	Not used	
Supplemental filler metal vol. (mm ³)	-	Not used	Not used	
POSITION (QW-405)				
Position	1G Rotated	1G Rotated	1G Rotated	
Weld progression	-	-	-	
PREHEAT (QW-406)				
Preheat temperature (°C)	10	10	10	
Maximum interpass temperature (°C)	10	55	101	
GAS (QW-408)				
Shielding gas: Type	Argon (A5.32 SG-A)	AC-20 (A5.32 SG-)	AC-20 (A5.32 SG-)	
Flow rate (l/min)	12-15	15-20	15-20	
Trailing gas: Type	Not used	Not used	Not used	
Flow rate (l/min)	-	-	-	
Backing gas: Type	A5.32 SG-NH-5	(A5.32 SG-NH-5	A5.32 SG-NH-5	
Flow rate (l/min)	14-16	14-16	14-16	
ELECTRICAL (QW-409)				
Filler metal size (mm)	2,0	1,2	1,2	
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	
Arc time (sec)	882	51	57	
Weld bead length (mm)	358	358	358	
Amperes	68	196	197	
Volts	10.8	29.5	29.6	
Travel speed (mm/min)	24	421	376	
Maximum heat input (kJ/mm)	1.836	0.824	0.9305	
Tungsten size (mm)	2,4	-	-	
Tungsten type	SFA 5.12 EWCe-2	-	-	
Current/polarity	DCEN	DCEP	DCEP	
DC pulsing current	Not used	-	-	
Wire feed speed (m/min)	-	Not used	Not used	
Arc transfer mode	-	Spray	Spray	
TECHNIQUE (QW-410)				
String or weave	Stringer and Weave	Stringer and Weave	Stringer and Weave	
Orifice/gas cup size	8 mm	16	16	
C.T.W.D (mm)	-	15-20	15-20	
Multi/Single pass per side	Single pass	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	Not used	Not used	Not used	
PASS PERFORMED/WITNESSED BY				
Welders name	A. Sumantri	A. Sumantri	A. Sumantri	
Recorded/witnessed by	L. Knops DNVGL	L. Knops DNVGL	L. Knops DNVGL	
Date	9/22/2020	9/22/2020	9/22/2020	
Data entry by	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	A.J.H. Roza (IWT/IWI)	

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: 27/Dec/2023	
SIGN: 	

Witnessed Reviewed
 And found to comply with:

 Date: 7/10/20
 Sign: L. Knops

PQRD number	ARL2542-4	Revision 0	Date	10/6/2020
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Pipe diameter 114,3 mm

Witnessed Reviewed
 And found to comply with:
 Date: *7/10/20*
 Sign: *L. Knops*

NARGAN COMPANY	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: <i>M. REZAEI</i> DATE: <i>27/Dec/2023</i>	
SIGN: <i>M. Rezaei</i>	

TRANSVERSE TENSILE TEST ON WELD METAL

Test method: ASME IX QW-152			Test temperature: R.T.	
Specimen	Size [mm]	Tensile strength [MPa] Rm	Fracture location	Remark
42663-4	18.98 x 5.83	592	WM	--
42663-4	19.01 x 5.69	539	HAZ	--
Requirements ASTM A312 TP316L;		≥ 485		--

Note: BM= base material HAZ= heat affected zone WM= weld material

MACRO EXAMINATION

Method: ASME IX QW 183			Magnification: 5x	
Specimen	Etchant:	Observations:	Remark	
42663-4	Nital	No significant inclusions or other defects	Acceptable	

Note: See macro photo page 4

GUIDED BEND TEST

Test method: ASME IX QW-162						Test temperature: R.T.	
Specimen	Type	Size [mm]	Former [mm]	Roller distance [mm]	Bend Angle [°]	Results	Remark
42663-4	Face bend	40 x 6	24	40	180	Acceptable	--
42663-4	Face bend	40 x 6	24	40	180	Acceptable	--
42663-4	Root bend	40 x 6	24	40	180	Acceptable	--
42663-4	Root bend	40 x 6	24	40	180	Acceptable	--

HARDNESS MEASUREMENT

Test method: ASME IX QW-171																			
Location of indentations: as per ISO 9015-1 and fig. 1 below																			
Specimen: 42663-4																			
Location	BM			HAZ					WM			HAZ					BM		
Indent	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Cap	158	158	158	173	178	173	175	169	169	182	165	174	179	172	178	175	159	160	159
Root	164	165	164	182	181	179	177	185	188	189	191	182	176	187	187	187	162	163	163

Note: BM= base material HAZ= heat affected zone WM= weld material

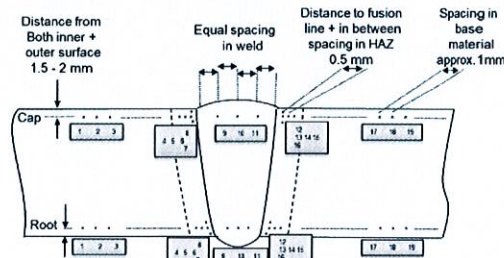


Fig. 1: Location of indentations.

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: 27/Dec/2023	
SIGN: 	

FERRITE MEASUREMENTS

Test method: Element procedure SOP 30-01					
Equipment: Fisher Ferritscope MP30					
Results: % values					
Specimen: 42663-4					
Location	WM	WM	WM	WM	WM
Indent	1	2	3	4	5
Cap	7.6	7.7	7.5	7.1	7.9
Mid	5.3	7.3	6.6	7.3	7.7
Root	4.1	3.0	3.1	2.9	3.4



element
Sandra Wevers

Witnessed Reviewed
 And found to comply with:
05 NOV 2020
 Date:
 Sign: L. Knops

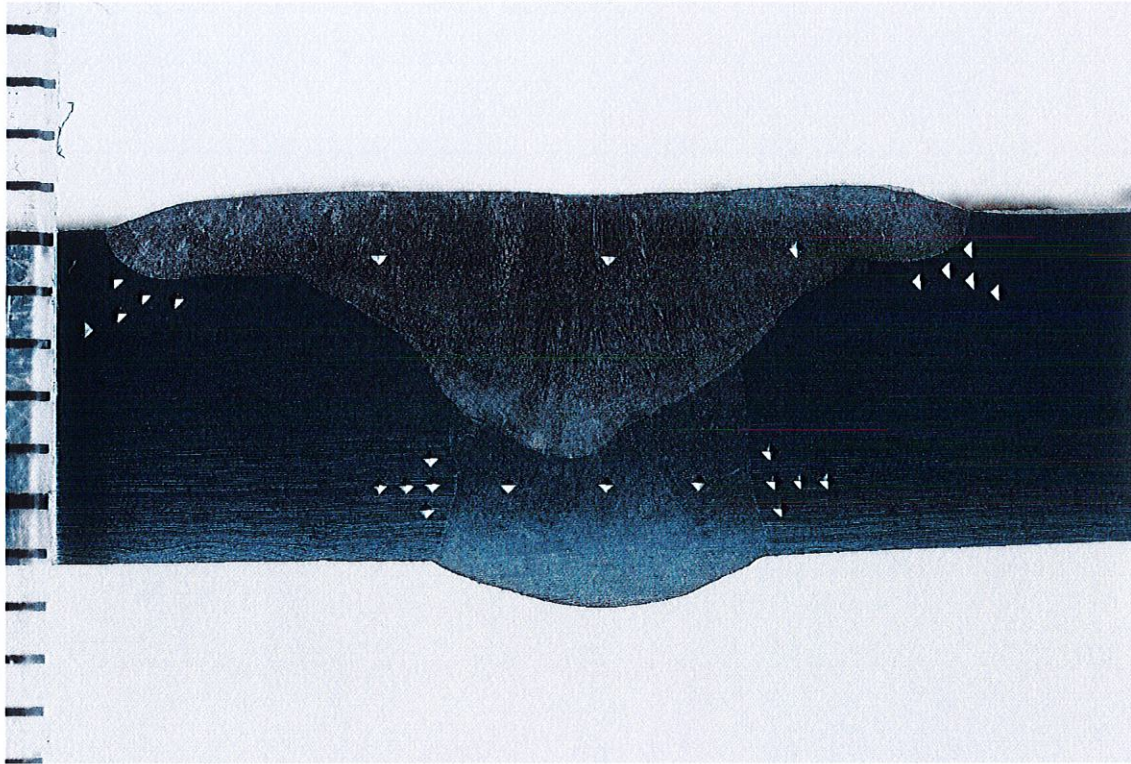
The above mentioned items satisfy the requirements.


Element Materials Technology

All characteristics of the above object(s) have, as far as accessible and relevant, been verified by Element Materials Technology Rotterdam b.v. (Element). Other information was provided by the purchaser. This information was verified as far as possible and has been copied into this report, unchanged. Element does not bear responsibility for the correctness of this submitted information. Any kind of "witnessing" and conclusions by a third party is not covered by the RVA accreditation L063 and is no part of the Element report. We hereby certify that the reported test data is correct and that the above object(s) was (were) tested/examined in accordance with purchaser's requirements and/or the above procedure(s) and/or code(s)/specification(s). If a declaration of conformity is issued in the report with regard to compliance with a specification or standard, this declaration is only applicable to the product(s) examined. In this assessment, the decision rule is applied that assumes that the expanded measurement uncertainty is not included in the assessment. On occasion a test is subcontracted by Element, the accreditation number of the subcontracted party is reported. Interpretations, opinions, conclusions and advice are partly based on the examination results and partly on information supplied by the purchaser. This report has legal value only when furnished with an authorized signature. If, upon reproduction, only part of this report is copied, Element will not bear any responsibility for content, purport and conclusions of that reproduction.


INSPECTION
 1- APPROVED
 2- APPROVED AS NOTED
 3- NOT APPROVED
 BY: M. REZAEI DATE: 27/Dec./2023
 SIGN: 

MACRO PHOTO
Cross section no. 42663-4



 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: 27/Dec./2023	
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
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27 Dec. 2023	
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 ²)	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
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
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	
INSPECTION	
1- APPROVED	<input type="checkbox"/>
2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/Dec./2023	
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)

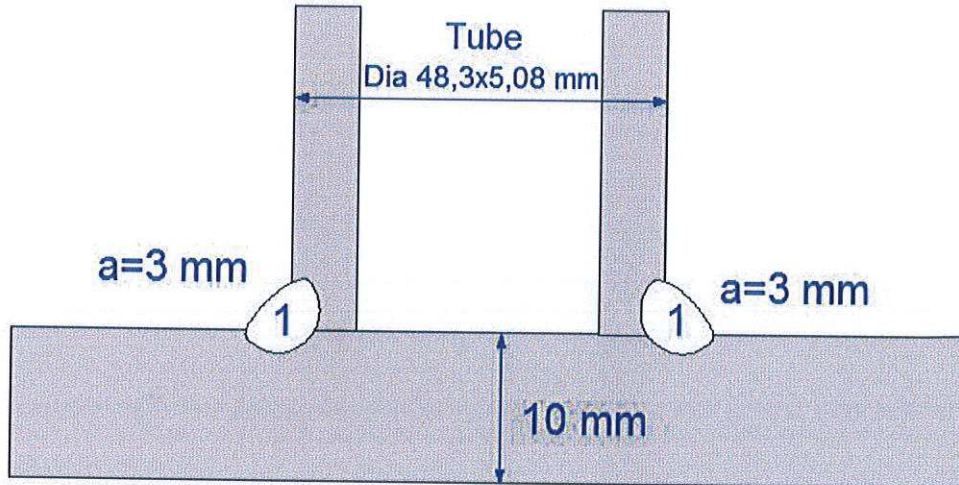
Filler metal size (mm)	2,4
Waveform control	Not Used
Energy (J)	none
Power (J/s)	none
Arc time (sec)	none
Weld bead length (mm)	none
Amperes	131
Volts	13.2
Travel speed (mm/min)	47
Maximum heat input (kJ/mm)	2,2075
Tungsten size (mm)	2,4
Tungsten type	SFA 5.12 EWL a-1
Current/polarity	DCEN
DC pulsing 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
INSPECTION	
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2- APPROVED AS NOTED	<input checked="" type="checkbox"/>
3- NOT APPROVED	<input type="checkbox"/>
BY: M. REZAEI DATE: 27/08/2023	
SIGN: 	

PQRD number	ARL2064-4	Revision 1	Date	1-6-2016
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INSPECTION	
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BY: M. REZAEI DATE: 27/Dec./2023	
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